PENNSYLVANIA AMERICAN WATER

Teresa K. Harrold
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VIA eFiling

October 13, 2023

Rosemary Chiavetta, Secretary
Commonwealth of Pennsylvania
Pennsylvania Public Utility Commission
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120

In re: **Application of Pennsylvania-American Water Company under Sections 1102(a) and 1329 of the Pennsylvania Public Utility Code, 66 Pa C.S. §§ 1102(a) and 1329, for approval of (1) the transfer, by sale, to Pennsylvania-American Water Company, of substantially all of the assets, properties and rights related to the wastewater collection and treatment system owned and operated by Towamencin Township and Towamencin Municipal Authority, and (2) the rights of Pennsylvania-American Water Company to begin to offer or furnish wastewater service to the public in the Township of Towamencin and portions of the Townships of Franconia, Lower Salford and Worcester and the Borough of Lansdale, all in Montgomery County, Pennsylvania**

Docket No: A-2023-3039900

Pennsylvania-American Water Company Responses to the Bureau of Technical Utility Services Deficiencies – August 31, 2023

Dear Secretary Chiavetta:

Enclosed for filing with the Commission are Responses of Pennsylvania-American Water Company (the "Company") to the 66 Pa. C.S. Section 1329 Application Completeness Review of Pennsylvania-American Water Company – Wastewater Division Acquisition of Towamencin Township Wastewater System Assets at Docket No. A-2023-3039900.

Copies are being served upon the advocates in accordance with the attached Certificate of Service and in accordance with the Commission's Final Supplemental Implementation Order entered February 28, 2019 at Docket No. M-2016-2543193.

The Company respectfully requests that the Secretarial Letter conditionally accepting the Application for filing provide a due date for protests and notices of intervention, which is required on the form of notice approved by the Commission in *Application of Pennsylvania-American Water Company Pursuant to Sections 1102 and 1329 of the Public Utility Code for Approval of its Acquisition of the Water System Assets of the Steelton Borough Authority,* Docket No. A-2019-3006880 (Opinion and Order entered Oct. 3, 2019) and found at Application Appendix A-18-d.

Thank you for your attention to this matter. If you have any questions, please do not hesitate to contact me.

Sincerely,

Teresa K. Harrold

Enclosure

cc: Certificate of Service
Sean Donnelly, Bureau of Technical Utility Services

37. Checklist Item No. 12 – Application Completeness Review No. 26 requested that PAWC-WD amend the Application's Appendix A-12 to provide a proposed tariff containing a rate equal to the existing rates of the seller at the time of acquisition. PAWC-WD 's response indicated that Towamencin's Rules and Regulations around metering are not "rates." Additionally, PAWC-WD indicated that no customers in Towamencin utilize deduct meters and thus there will be no "continued use of Deduct Meters" upon acquisition and that the proposed tariff contains Towamencin's existing rates, as required by Section 1329. However, Section 1329 of the Pennsylvania Public Utility Code, 66 C.S. § 1329, does not include a distinction that a rate must be charged to at least one customer in order for that rate to be considered an existing rate. Section 127-35, Nonresidential users; private systems; industrial establishments of Towamencin's Regulations and Rates indicates that "[e]xclusion from the sewer system and treatment plant of nonprocess, nonsanitary waters not requiring treatment may be required by the Township or such exclusion may be optional with the property owner if not required by the Township. When such waters are not discharged to the sewer system, sewer rentals shall be based upon total water consumption less waters not discharged to the sewer system. Waters not discharged to the sewer system may be determined from meters installed and maintained by the owner[.]". As such, Towamencin has established that sewer rates for nonresidential uses, private systems and industrial users shall be based on total water consumption minus the amount of water not discharged to the sewer system. Please amend the Application's Third Amended Appendix A-12 to provide a proposed tariff containing a rate equal to the existing rates of the seller at the time of acquisition. Item No. 12 – Application Completeness Review No. 1 requested that PAWC-WD amend the Application's Appendix A-12 to provide a proposed tariff containing a rate equal to the existing rates of the seller at the time of acquisition, including provisions to allow for the continued use of Deduct Meters for customers whose bills are determined based on water usage. PAWC-WD's response indicated that additional changes to the pro forma tariff to permit the continued use of deduct meters are unnecessary because the pro forma tariff includes the language, "Based on Water Usage or Sewage Flows, determined at PAWC's discretion." However, Section 53.25 of the Pennsylvania Code, 52 Pa. Code § 53.25, indicates, "A utility shall set forth all rules and regulations which apply generally to all classes of service covered by the tariff, and definitions of technical terms and abbreviations used in the tariff, the meanings of which are not common knowledge and cannot be gathered exactly from the context in which used." The option to use a deduct meter cannot exactly be gathered from the proposed language identified and the language included in Section 127-35 of Towamencin's rates, rules, and regulations does not leave the option to install Deduct Meters to the Towamencin's discretion. Please amend the Application's Appendix A-12 to provide a proposed tariff containing a rate equal to the existing rates of the seller at the time of acquisition, including provisions to allow for the continued use of Deduct Meters for customers whose bills are determined based on water usage.

Response: Please see **Fourth Amended Appendix A-12,** *pro forma* Tariff Supplement No. XX to Tariff Wastewater PA P.U.C. No. 16 of PAWC, Wastewater Division.

38. Checklist Item No. 12 – Application Completeness Review No 33 requested that PAWC-WD amend the Application's Appendix A-18-a to include copies of the effective ordinances, resolutions, tariffs, agreements, permits, and/or contracts establishing flow surcharge rates. PAWC-WD's response indicated that the permits that establish the typical domestic pollutant concentrations that are used to determine flow surcharges are attached to PAWC-WD's response as the Application's Attachment 29-A Confidential. However, the Pro Forma Tariff does not include a flow surcharge rate formula that identifies the unit costs that are used in the flow surcharge rate formulas identified in these permits. Please amend the Application's Appendix A-12 to provide a proposed tariff or tariff supplement containing a rate equal to the existing rates of the seller at the time of acquisition that includes either a flow surcharge rate formula that matches the flow surcharge rate formulas identified in the permits provided as the Application's Attachment 29-A Confidential or a similar provision indicating that the flow surcharge rate shall be calculated in accordance with the flow surcharge rates under the permits provided as the Application's Attachment 29-A and filed with the Commission on August 10, 2023 at Docket A-2023-3039900.

Response: Please see **Fourth Amended Appendix A-12,** *pro forma* Tariff Supplement No. XX to Tariff Wastewater PA P.U.C. No. 16 of PAWC, Wastewater Division.

39. Checklist Item No. 22.b. - Application Completeness Review No. 36.b. requested that PAWC-WD provide a complete copy of the 2013 Hatfield Act 537 Plan along with the DEP review and approval letters. PAWC-WD's response included a copy of an Amended Attachment 21-B.1. However, the Amended Attachment 21-B.1 is incomplete and is missing Exhibit V-2, and Exhibit V-3 is missing Page 7 of the Agreement dated September 17, 2010, and Pages 6 and 7 of the Agreement for Construction of Sewer Lines for Parcel Number 35-00-02842-003. Please provide a complete copy of the 2013 Hatfield Act 537 Plan along with the DEP review and approval letters.

Response: Please see **First Amended Attachment 21-B.1**. The Company conducted a review of the Norristown DEP Planning Section files for Hatfield Township. Exhibit V-2 was listed in the table of contents but confirmed not to exist in DEP's official record of the Plan. It is not present in DEP's bound copy of the 2013 Hatfield Act 537 Plan, nor found in any of the Norristown DEP Planning Section files. The missing pages within Exhibit V-3 were available and are included in **First Amended Attachment 21-B.1**.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE

NOV 05 2013

Mr. Andrew Haines, Manager
Hatfield Township
1950 School Road
Hatfield, PA 19440

Re: Act 537 Plan Update
APS ID 642877, AUTH ID 862201
Hatfield Township
Montgomery County

Dear Mr. Haines:

We have completed our review of your municipality's updated official sewage facilities plan (Plan) titled *Hatfield Township Act 537 Sewage Facilities Plan,* as prepared by CET Engineering Services, dated November 2010 and revised October 16, 2013. The review was conducted in accordance with the provisions of the Pennsylvania Sewage Facilities Act.

Approval of the Plan is hereby granted. The Plan provides for the following:

1. Hatfield Township Municipal Authority (HTMA) will apply for a rerate of the wastewater treatment facility from an annual average flow of 6.98 MGD to 7.55 MGD.

2. Hatfield Township and HTMA will use 250 gpd/EDU for sewage facilities planning.

3. Hatfield Township will implement a township-wide on-lot sewage management ordinance, Ordinance 608, enacted September 29, 2010, and supplemented by Ordinance 627, enacted July 13, 2011.

4. Hatfield Township will negotiate and coordinate with Towamencin Township to enter into an agreement for the sanitary sewer service for the Derstine Road Sewer Area, portions of Basins 14 and 16 and the Derstine Run development.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717.787.3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800-654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717.787.3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

IMPORTANT LEGAL RIGHTS ARE AT STAKE; HOWEVER, SO 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 (717.787.3483) FOR MORE INFORMATION.

If you have any questions, please contact Ms. Stefanie Yosmanovich of this office.

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Clean Water

cc: Montgomery County Planning Commission
Montgomery County Health Department
Mr. Dorney - Hatfield Township Municipal Authority
CET Engineering Services
Towamencin Township
Ms. Seimes - Hilltown Township
Mr. Definis - Hatfield Borough
Mr. Gregan - Montgomery Township
Mr. Baver - Franconia Township
Ms. Vollero - RCSOB, 11th Floor, Sewage Facilities
Ms. Yosmanovich
Ms. Maisey
Planning Section
Re 30 (GJE13CLW)301-2

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE

May 16, 2012

Mr. Andrew Haines, Manager
Hatfield Township
1950 School Road
Hatfield, PA 19440

Re: Request for Flow Determination
Hatfield Township Act 537 Plan
Hatfield Township
Montgomery County

Dear Mr. Haines:

The Southeast Regional Office (SERO) is in receipt of the February 9, 2012, correspondence from Ms. Jodi Reese of CET Engineering Services, requesting that the Department of Environmental Protection (Department) allow the use of 216 GPD/EDU in reviewing Hatfield Township's (Township) pending Act 537 Plan Update. The Hatfield Township Municipal Authority (HTMA) would prefer to use a single per EDU flow figure for both Act 537 planning and tapping fee calculation purposes. The flow figure currently used for tapping fee calculation is 216 GPD/EDU, which was presented as the flow figure for new connections in the Act 537 plan update.

In its letters of January 25, 2011 and August 31, 2011, SERO asked that HTMA provide justification for its use of 216 GPD/EDU as a planning flow figure. SERO had expressed concerns that the flow per EDU in HTMA's sewer system is actually 326 GPD/EDU, based on data included with the Act 537 plan update, and further urged HTMA to use a flow figure of 262.6 GPD/EDU for new connections. Representatives of SERO met with Hatfield Township and HTMA representatives on November 30, 2011, to discuss the matter further, but no resolution was reached.

Ms. Reese's February 9, 2011, letter bases the use of 216 GPD/EDU for new connections on the use of improved modern materials for pipe construction, the requirement that all new construction be equipped with water conservation plumbing fixtures, and on the basis of metered flows from a force main serving 125 homes. Upon consideration of this information, we cannot agree to your request to use 216 GPD/EDU for planning purposes for the following reasons:

1. The flow data cited was obtained from a force main connection. Force mains and low pressure sewers tend to be less prone to infiltration and inflow (I/I) over time and thus may not provide an accurate long-term estimate of future flows.

2. The flow data does not account for the demographic shift in household size that can occur as community's age.

3. The flow number does not meet the criteria set forth in the Domestic Wastewater Facilities Manual.

4. The Municipal Authorities Act and the Sewage Facilities Act are two separate statutes with different purposes. While the regulatory frameworks for one statute may result in the use of different flow number, that should not create any conflicts in the creation of tapping fees or in sound sewage planning.

We recognize that HTMA may not wish to expand its wastewater treatment facility beyond a capacity that it feels is appropriate. In order to offer a resolution to this situation, the Department is willing to approve the wastewater treatment plant capacity proposed in the Act 537 plan update, if Hatfield Township and HTMA commit to use a flow figure of at least 250 GPD/EDU for planning and if HTMA commits to conduct a comprehensive I/I removal program as part of the Act 537 plan. By committing to a comprehensive I/I removal program, Hatfield could expect to realize additional capacity in the treatment plant, and the Department is willing to consider this work in the planning evaluation of flows.

I hope this addresses your concerns.

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Clean Water

cc: Adam Bram, Esq.
Ms. Mahoney
Ms. Yosmanovich
Re 30 (GJE12CLW)136-10

Joel Kostelac

From: Tom Whittle
Sent: Thursday, August 15, 2013 2:56 PM
To: Joel Kostelac
Subject: FW: Hatfield Township's Pending 537 Plan
Attachments: 20130815102935095.pdf

CompleteRepository: 8910075
Description: 00592.660000-00 Hatfield Township Municipal Authority-537 Plan
JobNo: 10075
OperatingCentre: 89
RepoEmail: 8910075@ghd.com
RepoType: Job

-----Original Message-----
From: Peter Dorney [mailto:pdorneyhtma@verizon.net]
Sent: Thursday, August 15, 2013 2:34 PM
To: 'Paul Mullin'; 'Steve Hann'
Cc: Jodi Reese; Tom Whittle
Subject: FW: Hatfield Township's Pending 537 Plan

Here is the first email today from DEP.

-----Original Message-----
From: Yosmanovich, Stefanie [mailto:syosmanovi@pa.gov]
Sent: Thursday, August 15, 2013 11:30 AM
To: Peter Dorney (pdorneyhtma@verizon.net)
Cc: Abibro@hatfield-township.org
Subject: Hatfield Township's Pending 537 Plan

Pete, Aaron,

Beth Mahoney and I were contacting you both this morning regarding Hatfield Township's pending 537 Plan. The 2012 Chapter 94 (Municipal Wasteload
Management) states that Hatfield is awaiting a response from the Department regarding the letter sent to us on February 9, 2012 from CET Engineering Services.

Attached is the Department's response to the February 9, 2012 letter.

Please inform the Department the status of a resubmission.

Thank you,

Stefanie

Stefanie Yosmanovich | Sewage Planning Specialist 2 Department of Environmental Protection|Clean Water Program Southeast Regional Office

October 16, 2013

Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, PA 19401-4915

Attn: Ms. Jenifer Fields, P.E.
Regional Manager, Clean Water

Re: Hatfield Township Act 537 Plan Revision

Dear Ms. Fields,

In response to your letter dated May 16, 2012, and subsequent August 15, 2013 correspondence from Stefanie Yosmanovich in regard to the Hatfield Township Act 537 Plan Revision, the Township and Authority have agreed to utilize 250 gpd/EDU for planning, as suggested. The appropriate areas of the plan have been revised and are attached.

Should you have any questions, please don't hesitate to contact me. Thanks very much.

Sincerely,

GHD INC.

Joel Kostelac, PE
Project Manager

Enclosures

Cc: Peter Dorney, Executive Director, HTMA
Andrew Haines, Township Manager, Hatfield Township
GHD File 89/10075

GHD
1240 North Mountain Road Harrisburg PA 17112 USA
T 1 717 541 0622 F 1 717 541 8004 E harrisburg@ghd.com W www.ghd.com

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE

August 31, 2011

Mr. Andrew Haines, Manager
Hatfield Township
1950 School Road
Hatfield, PA 19440

Re: Act 537 Plan Update
APS ID 642877, AUTH ID 862201
Hatfield Township
Montgomery County

Dear Mr. Haines:

On August 1, 2011, this office received a resubmission of your Proposed Official Sewage Facilities Plan Update for Hatfield Township, Montgomery County titled *Hatfield Township Act 537 Plan,* as prepared by CET Engineering Services dated November 2010 and revised July 2011. This plan is being submitted to the Department of Environmental Protection (Department) in accordance with the provisions set forth by Section 5 of the Pennsylvania Sewage Facilities Act and Chapter 71, the Administration of Sewage Facilities Program.

We have now completed our technical review of the plan and have identified the following deficiencies that must be resolved before the Department can approve the plan:

1. Item 3 in the Department's January 25, 2011, letter recommended that HTMA reevaluate their use of 216 gpd/equivalent dwelling unit (EDU) and provide a justification for the use of 216 gpd/EDU. The justification provided is not adequate. The Department agrees that new sewer construction material is superior to the material used in 1960, which is when sewers were first constructed in Hatfield Township. However, the justification does not take into account for new flow going through older sewers in Hatfield Township. Flows for new sewer connections should take into account I/I from older portions of the sewer system. If Hatfield Township has a low percentage of old sewers in the Hatfield Township or has retrofitted the older sewers, please provide that information to the Department. Further, on pages 3–6, Hatfield Township has demonstrated that the 5-year average flow per EDU in Hatfield Township is 326 gpd which is significantly higher than the 216 gpd/EDU that Hatfield Township is currently using. The flow figure 216 gpd/EDU is lower than what the Department's Domestic Wastewater Facilities Manual recommends for new sewer systems which is 262.5 gpd/EDU. The Department strongly recommends that Hatfield Township reevaluate its use of 216 gpd/EDU.

2. In the resubmission received on August 1, 2011, the information on pages 4–5 has changed. The flow per proposed EDU has changed from 275 gpd/EDU to 216 gpd/EDU. However, the Chapter 94 projected connections flow did not change in Table IV-5. Please provide an explanation for the change.

3. Table IV-5 utilizes the flow figure of 275 gpd/EDU and shows that at build-out of Hatfield Township, connection of all on-lot systems, the 5-year projected connections combined with the current annual average flow, the estimated daily average flow is 7.640 MGD. Utilizing the flow of 326 gpd/EDU, which Hatfield Township has demonstrated is their current and actual flow per EDU, the total estimated average daily flow would be 7.911 MGD. The Department recommends Hatfield Township reevaluated its use of 216 gpd/EDU and the proposed annual average rerate of 7.55 MGD to accommodate a higher flow per EDU and the resulting higher annual average rerate flow.

4. The Department did not receive a full revised sewage management ordinance. Please submit to the Department a copy of the full revised ordinance or identify if Ordinance No. 627 is an addendum to Ordinance No. 608.

5. The Department recommends that the implementation schedule be revised to include an estimated completion date. The estimated completion date can be stated in terms of "immediately after approval of Department permits is received" or "number of months after approval of Department permits is received."

The municipality must resubmit all deficiency items together. The municipal secretary's signature will be accepted by the Department as documentation that the municipality has determined the resubmission to be consistent with Act 537 sewage planning requirements. If the information requested below is not received by September 30, 2011, we will be obligated to return the submission in its entirety.

Please note that per Pa. Code, Title 25, Chapter 71, Section 71.32(b), the Department will either approve or disapprove an Official Sewage Facilities Plan within 120 days after our receipt of a complete submission. The Department's 120-day review terminates on November 29, 2011.

If there are any questions concerning the information required, please contact me at 484.250.5186.

Sincerely,

Stefanie Kosmanovich
Sewage Planning Specialist 2
Water Management

cc: Montgomery County Planning Commission
Montgomery County Health Department
Mr. Dorney - Hatfield Township Municipal Authority
CET Engineering Services
Planning Section
Re 30 (joh11wqm)243-5

CET ENGINEERING SERVICES

September 27, 2011

Stefanie Yosmanovich
Water Department
Southeast Regional Office
Pennsylvania Department of Environmental Protection
2 East Main Street
Norristown, PA 19401-4915

Re: Hatfield Township Act 537 Plan Revision
Response to Review Comments

Dear Ms. Yosmanovich,

In response to your August 31, 2011 letter and on behalf of Hatfield Township and the Hatfield Township Municipal Authority we offer the following responses.

1. Infiltration occurs when groundwater enters into the collection system through cracks in pipes, loose or poorly constructed fittings, or variety of other entry points. Some level of infiltration exists in collection systems regardless of sewage flow in these areas. Older sewers do not experience more infiltration simply when wastewater flows increase. In older areas of the system a greater volume of groundwater can enter as compared to tighter, newer areas of the system and this existing volume of infiltration is captured and accounted for in the existing plant flows used in the projections provided. Flow from new connections does not experience additional infiltration as it is conveyed to the WWTP. 326 gpd/EDU is the current average daily flow for existing connections, and includes accurate levels of infiltration and inflow from these connections. 216 gpd/EDU was selected to be consistent with the 2010 Chapter 94 submission as well as current tapping fee law. As demonstrated in our July 27, 2011 letter (attached for reference), this value is conservative and does include some allowance for I/I in new connections beyond what is metered now in the areas indicated in points 3 and 4. This I/I occurs at these connections and does not increase as the flow continues.

   HTMA and Hatfield Township is utilizing 216 gpd/EDU to provide a realistic expectation of how much additional capacity may be necessary and to avoid placing an undue burden on the ratepayer. Understanding that there may be some uncertainty in the buildout flow projections, preliminary treatment limits and the Selected Alternative were based on a required flow of 7.55 MGD, above the 7.35 MGD required as indicated in Table IV-5.

   Also, as can be seen by the two attached charts, plant flow is affected significantly more by precipitation than it is by new connections. Flow and precipitation generally follow the same trend, while flow does not respond in the same manner when new connections are added. This is due to inflow and infiltration in the older portions of the existing collection system. HTMA has performed significant inspection of old and new sewer lines within its system, and the overriding conclusion is that areas with newer construction materials such as PVC pipe as opposed to clay and concrete pipe, have in general only minor I/I. Furthermore, as HTMA's

I/I program continues to address the areas of concern in the older areas of the system, assuming similar precipitation, it is highly probable that the gpd/EDU will decrease over time. HTMA also provides a much more significant level of testing and inspection today of new lines and connections than that which occurred 20 years ago, when the use of PVC became prevalent, assuring less chance for infiltration.

HTMA would like to point out that any projection that evaluates final flow through the complete build-out of the system is a rough estimate of what will actually occur. Plant flows will continue to be evaluated through the Chapter 94 process. Should a shortfall be anticipated, HTMA would likely be required to re-evaluate their flows. Conversely, should the use of exaggerated flows be required, it is improbable that DEP would allow HTMA to decrease its permitted flow.

2. The value on page 4-5 was changed so that the flow values for all future connections discussed in the plan revision were consistent. The total flow number listed for Chapter 94 Projected Connections on Table IV-5 is incorrect and should match the value of 0.331 MGD stated in the first paragraph on page 4-5. The Total Estimated Average Daily Flow is correctly listed as 7.35 MGD.

3. Table IV-5 was revised with the revised submission in July and utilizes 216 gpd/EDU for all future EDUs. Current EDUs are based on existing flows to the WWTP and include the 326 gpd/EDU value. The Total Estimated Average Daily Flow is 7.35 MGD and as stated, the proposed annual average flow is 7.55 MGD.

4. Ordinance No. 627 supplements Ordinance No. 608.

5. This has been revised and is attached. However, since final treatment limits will dictate the scope of any potential upgrades to the WWTP a range is still indicated for these milestones.

Due to the extreme importance of this issue for HTMA and Hatfield Township, both now and in the future, HTMA believes it would be prudent to participate in a meeting with DEP to further explain and defend its position.

Sincerely,

Joel Kostelac, P.E.
Staff Engineer

Enclosure

Cc: Andrew Haines, Hatfield Township
Peter Dorney, Hatfield Township Municipal Authority

Table 1. Plant Flow vs. Preciptation

	Year	Annual Avg. Flow (MGD)	Annual Total Rainfall	Total Rainfall[1]	Flow:Rain Ratio
1	2002	4.87	39.93	3.99	1.22
2	2003	6.73	57.47	5.75	1.17
3	2004	5.92	52.44	5.24	1.13
4	2005	5.86	43.40	4.34	1.35
5	2006	6.62	55.41	5.54	1.20
6	2007	5.80	47.82	4.78	1.21
7	2008	5.98	50.30	5.03	1.19
8	2009	6.35	52.31	5.23	1.21
9	2010	5.74	43.57	4.36	1.32
	AVG	5.99	49.18	4.92	1.22

(1) Total Rainfall was divided by 10 to normalize the data, as shown flow to rainfall ratios are consistent

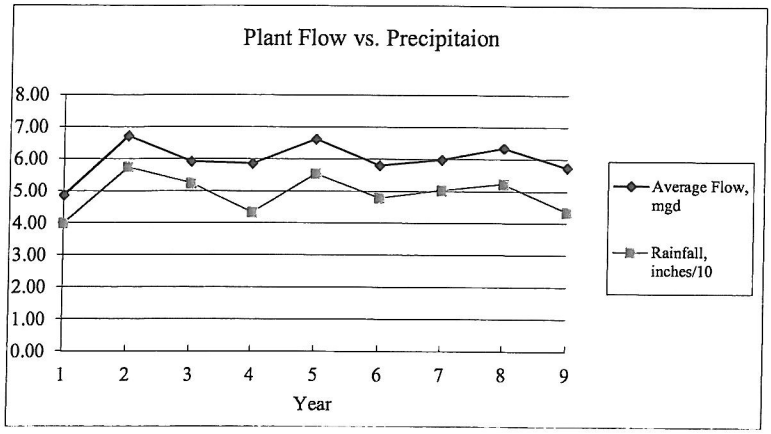
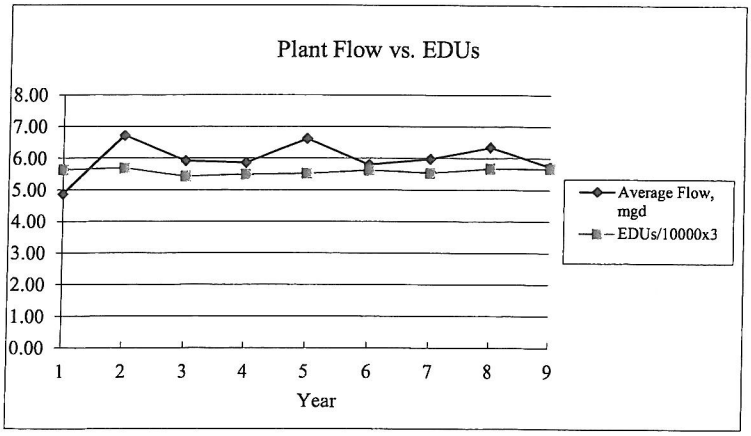


Table 2. Plant Flow vs. EDUs

	Year	Annual Avg. Flow (MGD)	EDUs[1]
1	2002	4.87	5.637
2	2003	6.73	5.688
3	2004	5.92	5.430
4	2005	5.86	5.490
5	2006	6.62	5.517
6	2007	5.80	5.625
7	2008	5.98	5.535
8	2009	6.35	5.676
9	2010	5.74	5.676
	AVG	5.99	5.59

(1) Similar to above, an arithmatic change was made to normalize the values; and to clearly illustrate trending



C. IMPLEMENTATION SCHEDULE

The Township intends to implement both selected alternatives upon approval of this plan revision by DEP. The anticipated schedule is listed below:

- Act 537 Plan Comment and External Review Period: March – April 2010
- Address Comments as necessary: April 2010
- Draft On-lot Management Ordinance: April – August 2010
- Adoption of On-lot Management Ordinance: September 2010
- Adoption of Act 537 Plan Revision: October 2010
- Submission of Act 537 Plan Revision to DEP November 2010
- Receipt of DEP Comments to Act 537 Revision: January 2011
- Submission of Revisions to Act 537 Plan Revision: May 2011
- Receipt of DEP Approval to Act 537 Revision: Time Zero (T)
- Implementation of Alternative 2: T+3 months
- Submission of Water Quality Management (WQM) Permit Pt. I Application: T+9 months
- Submission of WQM Pt. II Application: 1 to 6 months following DEP approval of Pt. I Application[12]
- Implementation of Alternative 1: 1 to 6 months following DEP approval of Pt. II Application[3]

[1] Based on DEP timing for review, approval, and issuance of new limits. Required to determine actual toxic limits since they are not available through the PTR process
[2] Timing of this submission is dependent on final limits received and the scope of the application. This could range from a Design Engineers report only to a preliminary design for a process upgrade (necessitated by lower limits)
[3] Depends on (2) and the scope of any required project

ORDINANCE NO. 627

AN ORDINANCE ESTABLISHING REGULATIONS FOR THE INSPECTION, PUMPING, MAINTENANCE, OPERATION, REHABILITATION AND ADMINISTRATION OF ONLOT SEWAGE SYSTEMS AND PROVIDING PENALTIES FOR VIOLATIONS THEREOF

WHEREAS, Hatfield Township (the "Township) has an obligation to provide for and/or insure adequate sewage treatment and protection of the public health by preventing the discharge of untreated or inadequately treated sewage as mandated by municipal codes, the Clean Streams Law (35 P.S. §691.1001) and the Pennsylvania Sewage Facilities Act (35 P.S. §750.1 et seq.).

WHEREAS, the Township Act 537 Official Wastewater Facilities Plan has evaluated the need to provide adequate sewage facilities and has found the formation of an On-Lot Sewage Management Program to be an effective method of preventing and abating water pollution and hazards to the public health.

WHEREAS, the purpose of this Ordinance is to: (1) keep the Township compliant with the requirements of the Clean Streams Law (Act of 1937, P.L. 1987, No. 394) and the Pennsylvania Sewage Facilities Act (Act of 1966 P.L. 1535, No. 537, as amended, known as Act 537); (2) provide for inspection, pumping, maintenance, and rehabilitation of on-lot sewage disposal systems; (3) establish penalties and appeal procedures necessary for the proper administration of such a management program.

WHEREAS, the Commissioners of the Township after due consideration of the proposed ordinance at a duly advertised public meeting, has determined that the health, safety and general welfare of the citizens and residents of Hatfield Township will be served by the passing of the within ordinance.

NOW, THEREFORE, IT IS HEREBY ENACTED AND ORDAINED by the Board of Commissioners of Hatfield Township, Montgomery County, Pennsylvania, as follows:

§I. Amendment of the Code.

Chapter 224, Sewers and Sewage Disposal, Article IV, On-Lot Sewage Management Program is hereby amended as follows:

i. Section 224-38, Subsection A is hereby amended to read as follows:

A. Upon adoption of this Ordinance, The Township shall provide written notification to all owners of property served by an on-lot sewage system that their system must be pumped within 90 days of receipt of notification or provide notification to the Township that the on-lot system had been pumped within the previous three (3) years. Thereafter, the Township shall follow a schedule whereby all of the owners of properties within the Township served by an on-lot sewage system are notified once every three (3) years. The notified property owners must have the sewage system pumped within the time specified in the Township's letter, unless the owner(s) can provide the Township with a pumping certification indicating that the on-lot sewage system was pumped within one (1) year prior to the date of the Township's notice letter.

ii. Section 224-38, Subsection B is hereby amended to read as follows:

B. Commencing from the date of the pumping as prescribed in section 224-38(A), removal of septage or other solids from an on-lot sewage system shall be performed at least once every three (3) years thereafter or whenever an inspection reveals solids or scum in excess of 1/3 liquid depth of the tank, or more frequently if recommended by the manufacturer of any of the component parts of the system. The property owner shall furnish a copy of the pumping certification to the Township within thirty (30) days of the date of the pumping.

iii. Section 224-38, Subsection C is hereby amended to read as follows:

C. The Township may allow an on-lot sewage system to be pumped out at less frequent intervals when the owner can demonstrate that the sewage system and/or uses thereof are unique and do not require pumping every three (3) years. In no case shall such period extend beyond six (6) years. The Township shall solely determine if an extension of time will be granted and the length of the extension.

iv. Section 224-38, Subsection G is hereby amended to read as follows:

G. Any person owning a structure served by a sewage system containing an aerobic treatment tank shall follow the operation and maintenance recommendations of the equipment manufacturer. In no case may the service or pumping interval for aerobic treatment tanks exceed that required for septic tanks. The Owner shall provide an adequate supply of electrical power with the proper phase, frequency, and voltage as recommended by the equipment manufacturers of the various components of the system.

§II. Repealer.

All ordinances or parts of ordinances which are inconsistent herewith are hereby repealed, it being understood and intended that all ordinances and the Code of Ordinances for the Township of Hatfield such as are not otherwise specifically in conflict or inconsistent with this ordinance, shall remain in full force and effect, the same being reaffirmed hereby.

§III. Severability.

If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such provisions shall be separate, distinct and independent, and such holding shall not effect the validity of the remaining portions of this Ordinance.

§IV. Failure to Enforce not a Waiver.

The failure of the Township to enforce any provision of this Ordinance shall not constitute a waiver by the Township of its rights of future enforcement hereunder.

§V. Effective Date.

This ordinance shall take effect within five (5) days of passage.

§VI. **Enactment.**

Under the authority conferred by the First Class Township Code and other relevant statutory law, the Commissioners of the Township of Hatfield in the County of Montgomery, Commonwealth of Pennsylvania do hereby enact and ordain this ordinance to the Code of Ordinances for the Township of Hatfield this 13 day of July 2011.

HATFIELD TOWNSHIP

Attest: _____

By: _____

HATFIELD TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA
RESOLUTION #11-22

A RESOLUTION OF THE COMMISSIONERS OF HATFIELD TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA, ADOPTING THE TOWNSHIP'S 537 PLAN.

RECITALS

A. Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection ("DEP") adopted pursuant thereto and being Chapter 71 of Title 25 of the Pennsylvania Code, requires Hatfield Township ("Township") to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the Township.

B. Hatfield Township Municipal Authority ("Authority"), the entity responsible for the disposal and treatment of sewage wastes within the Township, through its engineer, CET Engineering Services, has prepared an "Act 537 Plan Update" which provides for the sewage facilities in a portion of Hatfield Township.

C. Based upon studies and available alternatives, the alternative of choice to be implemented is the re-rate of the existing Advanced Wastewater Treatment Facility to meet existing and future flow requirements and the implementation of a Sewage Management Program to provide oversight of the existing on-lot sewage disposal systems within the Township. The key implementation activities and dates are detailed in Section VIII-C of the 537 Plan.

D. The Township finds that the Act 537 Plan Update described above conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of Hatfield Township hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the "Official Plan" of the Township, the above referenced Act 537 Plan Update. The Township hereby assures the Department of the complete and timely implementation of the said plan as required by law.

Andrew S. Haines, Manager

HATFIELD TOWNSHIP
BOARD OF COMMISSIONERS

BY: Thomas C. Zipfel

Thomas C. Zipfel, President

HATFIELD
TOWNSHIP

PRINTED WITH SOY INK

October 28, 2011

Beth Mahoney
Water Management
Southeast Regional Office
Pennsylvania Department of Environmental Protection
2 East Main Street
Norristown, PA 19401-4915

Re: Hatfield Township Act 537 Plan Revision

Dear Ms. Mahoney,

As requested in your telecon with Joel Kostelac, P.E., CET Engineering Services, on October 27, 2011 Hatfield Township will not pursue a "deemed approval" of our 537 Plan submittal currently under review by your office. Please contact CET at (717) 541-0622 to schedule a meeting to discuss the important issues affecting the plan approval.

Thanks very much.

Sincerely,

Andrew S. Haines
Township Manager

Cc: Joel Kostelac, P.E., CET Engineering Services
Peter Dorney, Hatfield Township Municipal Authority

CET ENGINEERING SERVICES

A Subsidiary of

GHD CLIENTS | PEOPLE | PERFORMANCE

February 9, 2012

Jenifer Fields, P.E.
Clean Water Department, Program Manager
Southeast Regional Office
Pennsylvania Department of Environmental Protection
2 East Main Street
Norristown, PA 19401-4915

Re: Hatfield Township Act 537 Plan Revision

Dear Ms. Fields:

The Hatfield Township Municipal Authority (HTMA) met and discussed the impact of having two different flow rates per EDU: one for tapping fee calculations as required by the Municipal Authorities Act (Act 57) and one for Act 537 Planning as discussed during the November 30, 2011 meeting with SERO.

Hatfield Township and the HTMA would like the SERO to forward this letter to DEP Central Office for their review of using **216 gpd/EDU for the Annual Average Flow Rate** from new connections for Act 537 planning purposes. This flow rate is considered to be a conservative value. The justification of that flow rate is provided below.

1. Sewers were first constructed in Hatfield beginning in 1960. During that time, pipe material, pipe joints, and installation practices were significantly inferior as compared to today. HTMA has "STANDARD CONSTRUCTION AND MATERIAL SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEM EXTENSIONS" that must be followed for new construction which include use of superior pipe material, inspection during construction, and testing of all sewer mains and laterals (air testing) and manholes (vacuum testing). These specifications have been in place since the year 2000.

2. In 2004, Pennsylvania adopted the Uniform Construction Code (UCC) which requires water conservation plumbing fixtures in new home construction.

3. A force main sewer to HTMA from Chalfont – New Britton is metered. The sewered area initially had 124 residential EDUs with construction of the homes completed in 2009 using PVC sewers. All flow is pumped and metered into the HTMA sewer system.

   The total flow for 2010 was 7,900,730. With 124 EDUs, the flow per EDU is **175 gpd/EDU**.

   In 2011, there were 125 residential EDUs with a total flow of 7,142,986. The weekly average flows ranged from 136 to 182 gpd/EDU and the annual average flow rate was **158 gpd/EDU**.

4. The Township is about 85% built-out. The projected flows will be applied only to the remaining 15%.

5. The projected flow is added to the current flows to the WWTP. The current flows take into account all the existing I/I in the older portions of the sewer system (calculated at 326 gpd/EDU by Chapter 94).

6. In a quick review of projected flows used by the CET-GHD office for other approved Act 537 Plans, I find that approved flows for future projections ranges from 170 to 250 gpd/EDU.

HTMA and Hatfield Township are utilizing 216 gpd/EDU in order to provide a realistic expectation of how much additional treatment capacity may be necessary in order to be consistent with Pennsylvania requirements, including the Municipal Authorities Act.

HTMA would like to point out that any projection that evaluates final flow through the complete build-out of the system is a rough estimate of what will actually occur. The HTMA will evaluate the potential for exceedance of these flows prior to any such occurrence through annual Chapter 94 reporting.

Sincerely,
CET engineering - GHD

Jodi L. Reese, P.E.
Project Manager

xc: Andrew Haines, Hatfield Township
Peter Dorney, Hatfield Township Municipal Authority
Steven Hann, Hamburg, Rubin, Mullin, Maxwell & Lupin

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE

May 16, 2012

Mr. Andrew Haines, Manager
Hatfield Township
1950 School Road
Hatfield, PA 19440

Re: Request for Flow Determination
Hatfield Township Act 537 Plan
Hatfield Township
Montgomery County

Dear Mr. Haines:

The Southeast Regional Office (SERO) is in receipt of the February 9, 2012, correspondence from Ms. Jodi Reese of CET Engineering Services, requesting that the Department of Environmental Protection (Department) allow the use of 216 GPD/EDU in reviewing Hatfield Township's (Township) pending Act 537 Plan Update. The Hatfield Township Municipal Authority (HTMA) would prefer to use a single per EDU flow figure for both Act 537 planning and tapping fee calculation purposes. The flow figure currently used for tapping fee calculation is 216 GPD/EDU, which was presented as the flow figure for new connections in the Act 537 plan update.

In its letters of January 25, 2011 and August 31, 2011, SERO asked that HTMA provide justification for its use of 216 GPD/EDU as a planning flow figure. SERO had expressed concerns that the flow per EDU in HTMA's sewer system is actually 326 GPD/EDU, based on data included with the Act 537 plan update, and further urged HTMA to use a flow figure of 262.6 GPD/EDU for new connections. Representatives of SERO met with Hatfield Township and HTMA representatives on November 30, 2011, to discuss the matter further, but no resolution was reached.

Ms. Reese's February 9, 2011, letter bases the use of 216 GPD/EDU for new connections on the use of improved modern materials for pipe construction, the requirement that all new construction be equipped with water conservation plumbing fixtures, and on the basis of metered flows from a force main serving 125 homes. Upon consideration of this information, we cannot agree to your request to use 216 GPD/EDU for planning purposes for the following reasons:

1. The flow data cited was obtained from a force main connection. Force mains and low pressure sewers tend to be less prone to infiltration and inflow (I/I) over time and thus may not provide an accurate long-term estimate of future flows.

2. The flow data does not account for the demographic shift in household size that can occur as community's age.

3. The flow number does not meet the criteria set forth in the Domestic Wastewater Facilities Manual.

4. The Municipal Authorities Act and the Sewage Facilities Act are two separate statutes with different purposes. While the regulatory frameworks for one statute may result in the use of different flow number, that should not create any conflicts in the creation of tapping fees or in sound sewage planning.

We recognize that HTMA may not wish to expand its wastewater treatment facility beyond a capacity that it feels is appropriate. In order to offer a resolution to this situation, the Department is willing to approve the wastewater treatment plant capacity proposed in the Act 537 plan update, if Hatfield Township and HTMA commit to use a flow figure of at least 250 GPD/EDU for planning and if HTMA commits to conduct a comprehensive I/I removal program as part of the Act 537 plan. By committing to a comprehensive I/I removal program, Hatfield could expect to realize additional capacity in the treatment plant, and the Department is willing to consider this work in the planning evaluation of flows.

I hope this addresses your concerns.

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Clean Water

cc: Adam Bram, Esq.
Ms. Mahoney
Ms. Yosmanovich
Re 30 (GJE12CLW)136-10

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE

January 25, 2011

Mr. Andrew Haines, Manager
Hatfield Township
1950 School Road
Hatfield, PA 19440

Re: Act 537 Plan Update
APS ID 642877, AUTH ID 862201
Hatfield Township
Montgomery County

Dear Mr. Haines:

On November 24, 2011, this office received your Proposed Official Sewage Facilities Plan Update (Plan) for Hatfield Township (Township), Montgomery County, titled *Hatfield Township Act 537 Plan,* as prepared by CET Engineering Services, dated November 2010. This Plan is being submitted to this Department of Environmental Protection (Department) in accordance with the provisions set forth by Section 5 of the Pennsylvania Sewage Facilities Act and Chapter 71, the Administration of Sewage Facilities Program.

A preliminary review has indicated that the plan update is incomplete for the following reasons:

1. Please provide a site plan showing the service areas in the adjacent municipalities that are served by the Hatfield Township Municipal Authority (HTMA).

2. Please clarify the following for Table III-1 on page 3-3:

   a. Please identify what the acronyms PHF and AAF stand for.

   b. Note 3 refers to a PHF of 4; please identify what this means and how this number was derived.

   c. The capacities listed for the wastewater treatment facility are the maximum month flows. We recommend that the Table also contain the average annual permitted capacity and that the average annual projected and average annual remaining capacities be included in the Table.

3. Page 3-6, demonstrates that the 5-year average flow per equivalent dwelling unit (EDU) in the Township is 326 gpd. However, HTMA is using 216 gpd/EDU and no justification has been provided for the continued use of this flow. It does not appear that HTMA has considered the impact of I/I in the existing facilities between the new connections to the wastewater treatment facility. The Department recommends that HTMA reevaluate the use of 216 gpd/EDU and instead either use 326 gpd/EDU, as demonstrated by the 5-year average flow, or use an EDU figure of 262.5 gpd, as supported by the Department's Domestic Wastewater Facilities Manual.

4. Paragraph 2 on page 3-6 references an annual average flow of 5.98 MGD. This flow figure appears to be out of date according to the 2009 Chapter 94 Report flow noted in Table III-3. This number should be revised according to the 2009 Chapter 94 Report. All calculations should also be revised accordingly.

5. Please provide a detailed cost analysis for the upgrades for the wastewater treatment facility and for the implementation of the sewage management program. Specifically:

   a. What will the upgrades to the treatment facility cost?

   b. The cost analysis of the sewage management program does not appear to include all of the lots in the Township that have an on-lot sewage disposal system. The calculation only appears to include the 30 lots in the Derstine Road Study Area. Please clarify.

   c. Chapter 71 requires the Township to identify both a primary and contingency funding source to implement its plan. Please identify the contingency funding source.

6. Please provide copies of the on-lot sewage needs surveys that were returned to HTMA and the door to door surveys that were completed.

7. The Sewage Needs Table in Exhibit III-3 has a column heading of <72. Please identify what this heading describes.

8. Exhibit IV-8 includes a letter from Hilltown Township noting concerns that they have about the Plan revision. Please provide a copy of Hatfield Township's response to Hilltown Township.

9. The Department notes that the wastewater treatment facility discharges to the West Branch of the Neshaminy Creek. The Neshaminy Creek is an impaired waterway and may require certain treatment requirements. If HTMA has not done so already, please contact Mr. Sohan Garg, NPDES Permits Chief, at sgarg@state.pa.us to request Preliminary Treatment Requirements for the expansion of the treatment facility.

   Please include a copy of your preliminary treatment limits with your response and provide documentation that the wastewater treatment facility will be able to meet these limits.

10. The Department has the following concerns regarding the on-lot operation and maintenance ordinance included in Exhibit V-5:

    a. Section 224-38, Maintenance, states that properties with an on-lot disposal system will be notified once every 4 years to get their system pumped. Please refer to the enclosed fact sheet. The Department recommends that septic tanks be pumped once every 3 years or whenever an inspection reveals solids or scum in excess of 1/3 of the liquid depth of the tank, or more frequently if recommended by the manufacturer of any of the component parts of the system.

    b. For aerobic systems, the Department recommends that the ordinance include language similar to "The Owner shall provide an adequate supply of electrical power with the proper phase, frequency, and voltage as recommended by the equipment manufacturers of the various components of the system."

    c. Please identify how the pumping schedule will be established for the existing on-lot disposal systems within the Township.

11. The Department recommends that the implementation schedule be revised as follows:

    a. We discourage the use of actual dates; rather, the schedule should start with the Department approval of the Act 537 Plan as "Time Zero." Any schedule of items after that should be referenced by the number of months after "Time Zero."

    b. The implementation schedule does not include the submission of permits to the Department that will be required for the upgrades.

    c. The schedule should also include an estimated completion date.

    d. The Department recommends that a new Resolution of Adoption be passed since the original one contains the previous implementation schedule.

When the necessary revisions have been completed, as listed above, this Department will initiate a review in accordance with the provisions of Chapter 71, Administration of the Sewage Facilities Program.

If there are any questions concerning the information required, please contact me at 484.250.5186.

Sincerely,

Stefanie Yosmanovich
Sewage Planning Specialist 2
Water Management

cc: Montgomery County Planning Commission
Montgomery County Health Department
Mr. Dorney - Hatfield Township Municipal Authority
CET Engineering Services
Planning Section
Re 30 (GJS11WQM)24-4

CET ENGINEERING SERVICES

July 27, 2011

Stefanie Yosmanovich
Water Department
Southeast Regional Office
Pennsylvania Department of Environmental Protection
2 East Main Street
Norristown, PA 19401-4915

Re: Hatfield Township Act 537 Plan Revision
Response to Preliminary Review Comments

Dear Ms. Yosmanovich,

In response to your January 25, 2011 letter and on behalf of Hatfield Township and the Hatfield Township Municipal Authority we offer the following responses. As discussed, new copies of all the revised sections are attached with page references for revisions noted below.

Comment 1. Please provide a site plan showing the service areas in the adjacent municipalities that are served by the Hatfield Township Municipal Authority.
Response 1. Plate 1 has been revised and is attached.

Comment 2. Please clarify the following for Table III-1 on page **3-3**:

a. Please identify what the acronyms PHF and AAF stand for.
Response 2a. (See Page 3-3): PHF stands for Peak Hourly Flow; AAF stands for Annual Average Flow

b. Note 3 refers to a PHF of 4; please identify what this means and how this number was derived.
Response 2b. (See Page 3-3): This note describes how the Peak Hourly Flow (PHF) of tributary EDUs was derived. A peaking factor of 4 (PHF to AAF) was selected, and thus the AAF contribution of 216 gpd/EDU was multiplied by 4 for a PHF contribution of 864 gpd / EDU. A peaking factor of 4 is a widely accepted factor when estimating peak flows from average flows.

c. The capacities listed for the wastewater treatment facility area the maximum month flows. We recommend that the Table also contain the average annual permitted capacity and that the average annual projected and average annual remaining capacities be included in the Table.
Response 2c. (See Page 3-6): Pumping station and interceptor design capacities are based on peak hourly flows, not average annual flows. In regard to the WWTP a comparison of annual average flow and projected annual average flow is shown on Table III-3 on page 3-6. An additional column has been added showing the remaining capacity.

Comment 3. Page 3-6, demonstrates that the 5-year average flow per EDU in the Township is 326 gpd. However, HTMA is using 216 gpd/EDU and no justification has been provided for the

continued use of this flow. It does not appear that HTMA has considered the impact of I/I in the existing facilities between the new connections to the wastewater treatment facility. The Department recommends that HTMA reevaluate the use of 216 gpd/EDU and instead either use 326 gpd/EDU, as demonstrated by the 5-year average flow, or use an EDU figure of 262.5 gpd as supported by the Department's Wastewater Facilities Manual.

Response 3. HTMA is using 216 gpd/EDU for the average flow rate from new and is considered to be a conservative value. The justification of that flow rate is provided below.

1. **Sewers were first constructed in Hatfield beginning in 1960. During that time, pipe material, pipe joints, and installation practices were significantly inferior as compared to today. HTMA has "STANDARD CONSTRUCTION AND MATERIAL SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEM EXTENSIONS" that must be followed for new construction which include use of superior pipe material, inspection during construction, and testing of all sewer mains and laterals (air testing) and manholes (vacuum testing). These specifications have been in place since the year 2000.**

2. **In 2004, Pennsylvania adopted the Uniform Construction Code (UCC) which requires water conservation plumbing fixtures in new home construction.**

3. **A force main sewer to HTMA from Chalfont – New Britton is metered. The sewered area has 124 residential EDUs with construction of the home completed in 2009 using PVC sewers. The flow is pumped and metered into the HTMA sewer system. The total flow for 2010 is 7,900,730. With 124 EDUs, the flow per EDU is 175 gpd/EDU.**

4. **The Clemens Road Pump Station serves 360 residential EDUs, Lowe's, a bank, and a commercial building.**
   - **The sewer system is PVC pipe.**
   - **The flows from the non-residential establishment are estimated from 2010 water meter readings (North Penn Water Company) to be 3, 882,425 gal/yr.**
     1. **Lowe's: 2,300,000 gal/yr (6,301 gpd);**
     2. **Bank: 16,425 gal/yr (45 gpd);**
     3. **Commercial buildings: 1,556,000 gal/r (4,263 gpd).**
   - **The residential units were connected between 1978 and 2004 (199 in 1978, 98 in 1997, 56 in 2004, 7 miscellaneous)**
   - **Total pump station flow for 2010: 26,189,200.**
   - **Average Flow Rate: 170 gpd/EDU [(26,189,200 – 3,882,425) + 365 + 360]**

Comment 4. Paragraph 2 on page 3-6 references an annual average flow of 5.98 MGD. This flow figure appears to be ouf of date according to the 2009 Chapter 94 Report flow noted in Table III-3. This number should be revised according to the 2009 Chapter 94 Report. All calculations should be revised accordingly.

Response 4 (See Page 3-6). These numbers and calculations have been revised.

Comment 5. Please provide a detailed cost analysis for the upgrades for the wastewater treatment facility and for the implementation of the sewage management program. Specifically:

a. What will the upgrades to the treatment facility cost?

Response 5a. The selected alternative does not involve a physical upgrade to the treatment plant and as such, no cost analysis was accomplished.

b. The cost analysis of the sewage management program does not appear to include all of the lots in the Township that have an on-lot sewage disposal system. The calculation only appears to include the 30 lots in the Derstine Road Study Area.
Response 5b (See Page 6-4). This analysis has been revised to reflect all known systems.

c. Chapter 71 requires the Township to identify both a primary and contingency funding source to implement its plan. Please identify the contingency funding source.
Response 5c. Should existing revenues or reserves not be sufficient the Township or HTMA will secure funding through a bond sale.

Comment 6. Please provide copies of the on-lot sewage needs surveys that were returned to HTMA and the door to door surveys that were completed.
Response 6. Copies are attached for your use.

Comment 7. The Sewage Needs Table in Exhibit III-3 has a column heading of <72. Please identify what this heading describes.
Response 7. This heading refers to systems that were installed prior to 1972.

Comment 8. Exhibit IV-8 includes a letter from Hilltown Township noting concerns that they have about the Plan Revisions. Please provide a copy of Hatfield Township's response to Hilltown Township.
Response 8. Upon receipt of the response letter from Hilltown Township, HTMA made several attempts to address their concerns. Specifically, HTMA offered Hilltown Township service, but the terms of a service agreement could not be agreed upon. Most recently, in conjunction with the 2010 Chapter 94 prep, HTMA did receive correspondence regard Hilltown connections of the next five years. This correspondence is included.

Comment 9. The Department notes that the wastewater treatment facility discharges to the West Branch of the Neshaminy Creek. The Neshaminy Creek is an impaired waterway and may require certain treatment requirements. If HTMA has not done so already, please contact Mr. Sohan Garg, NPDES Permits Chief, at sgarg@state.pa.us to request Preliminary Treatment Requirements for the expansion of the treatment facility.

Please include a copy of your preliminary treatment limits with your response and provide documentation that the wastewater treatment facility will be able to meet these limits.
Response 9. HTMA can meet the proposed upper limits at the increased flow and is currently treating to well below these parameters. Since the final TN and TP lower limits listed are based on the Departments assessment only, as to future limits that may be placed in an EPA TMDL, or statewide nutrient criteria, they are not addressed. When these limits are finalized, HTMA will conduct the necessary evaluation to determine if and what process upgrades are required. There is sufficient space on the site to accommodate future upgrades. Regarding toxics, these limits were not evaluated by the Department. Evaluation via PennTOX was requested and the Department stated this was not accomplished at the PTR phase and would occur during the permitting phase. As such, any necessary upgrades would be evaluated at the time final limits are established. Again, there is sufficient space on site to accommodate future process upgrades.

Comment 10. The Department has the following concerns regarding the on-lot operation and maintenance ordinance included in Exhibit V-5:

a. Section 224-38, Maintenance, states that properties with an on-lot disposal system will be notified once every 4 years to get their system pumped. Please refer to the enclosed fact sheet. The Department recommends that septic tanks be pumped once every 3 years or whenever an inspection reveals solids or scum in excess of 1/3 liquid depth of the tank, or more frequently if recommended by the manufacturer of any of the component parts of the system.
Response 10a. The language in the ordinance has been modified. A copy of the new ordinance is attached.

b. For aerobic systems, the Department recommends that the ordinance include language similar to "The Owner shall provide an adequate supply of electrical power with the proper phase, frequency, and voltage as recommended by the equipment manufacturers of the various components of the system."
Response 10b. There are no aerobic systems within the HTMA service area, however this language has been added to the ordinance.

c. Please identify how the pumping schedule will be established for the existing on-lot disposal systems within the Township.
Response 10c. Upon approval of the Plan revision, all those individuals utilizing on-lot systems will be notified they have 90 days to pump the system or provide evidence of pumping within the last 3 years.

Comment 11. The Department recommends that the implementation schedule be revised as follows:

a. We discourage the use of actual dates; rather, the schedule should start with the Department approval of the Act 537 Plan as "Time Zero". Any schedule of items after that should be referenced by the number of months after "Time Zero".
Response 11a (See Page 8-3) . The implementation schedule has been revised.

b. The implementation schedule does not include the submission of permits to the Department that will be required for the upgrades.
Response 11b. There are currently no capital upgrades planned, and therefore, no permits required. However, dates and milestones with regard to the plant re-rate are included.

c. The schedule should also include an anticipated completion date.
Response 11c. See response 11b.

d. The Department recommends that a new Resolution of Adoption be passed since the original one contains the previous implementation schedule.
Response 11d. A new resolution has been passed and is attached.

Thanks very much, please don't hesitate to contact us should you have any concerns.

Sincerely,

Joel Kostelac, P.E.
Staff Engineer

Enclosure

Xc: Andrew Haines, Hatfield Township
Peter Dorney, Hatfield Township Municipal Authority

C. ROBERT WYNN ASSOCIATES, INC.

MUNICIPAL & CIVIL ENGINEERING

211 West Broad Street • Quakertown • PA • 18951
(215) 536-7336 • FAX (215) 536-5361

January 13, 2011

Mr. Peter Dorney, Executive Director
Hatfield Township Municipal Sewer Authority
3200 Advance Lane
Colmar, PA 18915

Subject: Chapter 94 Annual Report
Hatfield Township Municipal Authority
Hilltown Township Report Requirements
File No. 03-047

Dear Mr. Dorney,

The following is a response to your November 223, 2010 correspondence and specifically, the Hilltown Township Checklist included on Pages 24-28. The comments refer to the annual report requirements 94-12 Annual Report identified as incomplete on the report checklist (response shown in *italic*):

1. Section (a)(4) - The map should show all known proposed projects that require public sewer but that are in the preliminary planning stages.

   Enclosed is a map prepared from Figure 7-3 from the Hilltown Township Act 537 Plan Route 309 Study Area Alternative No. 2. The figure has been revised to identify proposed sewer connections and HTMA sewer extension to serve the three parcels within the Township. The planning modules were approved by Hilltown Township on November 22, 2010 and will eliminate an existing holding tank at the Hilltown Tavern along Route 309. The modules have not yet been approved by PADEP.

2. Section (a)(4) - A list accompanying the map summarizing each extension or project and the population to be served.

   Enclosed is the list dated January 13, 2011 identifying an estimated 80 EDUs proposed for service in the period from 2010 thru 2014 and identified in correspondence dated March 29, 2010 to CET Engineering Services.

3. Section (a)(4) - The list should include any include any schedules describing how the project will be completed over time and the effects that this build outright will have on the population served.

   The initial phase approved by the Township on November 22, 2010 includes connection to three parcels and elimination of a holding tank serving the Hilltown Tavern. Future service will include proposed commercial development/redevelopment (Shopping Center Complex) at the intersection of Route 309 and Swartley Road, as well as extension north along Route 309 to serve commercial properties and eliminate three holding tanks.

4. Section (a)(5) - A discussion of the permittees program for sewer system monitoring, maintenance, repair, and rehabilitation, including routine and special activities, personnel and equipment use, sampling frequency, quality assurance, data analysis, and infiltration/inflow monitoring.

   Sanitary sewer system is owned and operated by the Hatfield Township Municipal Authority, who is responsible for maintenance.

5. Section (a)(5) - A calibration report shall be included for all flow measuring, indicating and recording equipment within the collection/conveyance system. Calibration should occur annually.

   Hatfield Township Municipal Authority owns and maintains the sanitary sewer system, and should be responsible for the calibration report.

6. Section (a)(6) - A discussion of the condition of the sewer system, including portions of the sewer system where conveyance capacity is being exceeded or is projected to be exceeded in the next five years.

   Hatfield Township Municipal Authority owns and maintains the sewer system. Hilltown Township performs no inspections, and is unaware of the condition of the sanitary sewer system.

7. Section (a)(6) - Existing capacity should be documented with actual metering of present maximum flows. If not already existing, the permittee should consider best placement of flow meters to document the capacity of major interceptors (greater than 10" in diameter) and/or where lines cross municipal borders. A discussion of present maximum flows should be documented with hourly or instantaneous peak readings taken during the major storm events (greater than 1" of rain). Autodialers may be installed to alert of high flow conditions. The Chapter 94 Report should compare the peak instantaneous flow for each major storm event to the design hydraulic conveyance capacity of the sewer in order to determine whether sufficient capacity is available. The ratio of peak (hourly or instantaneous) to annual average flows should be determined to assess the actual peaking factor for this system.

   Hatfield Township Municipal Authority owns and maintains sanitary sewer system. Hilltown Township has no information regarding existing capacity or metering of flow.

8. Section (a)(6) - A discussion of portions of the system where rehabilitation or cleaning is needed or underway to maintain the integrity of the system and prevent or eliminate bypassing, combined sewer overflow, sanitary sewer overflow, excess infiltration, and other system problems.

   Hatfield Township Municipal Authority owns and maintains sanitary sewer system. Hilltown Township has no information regarding necessary rehabilitation, cleaning, bypass overflow or infiltration.

If you have any questions, please do not hesitate to contact me.

Very truly yours,

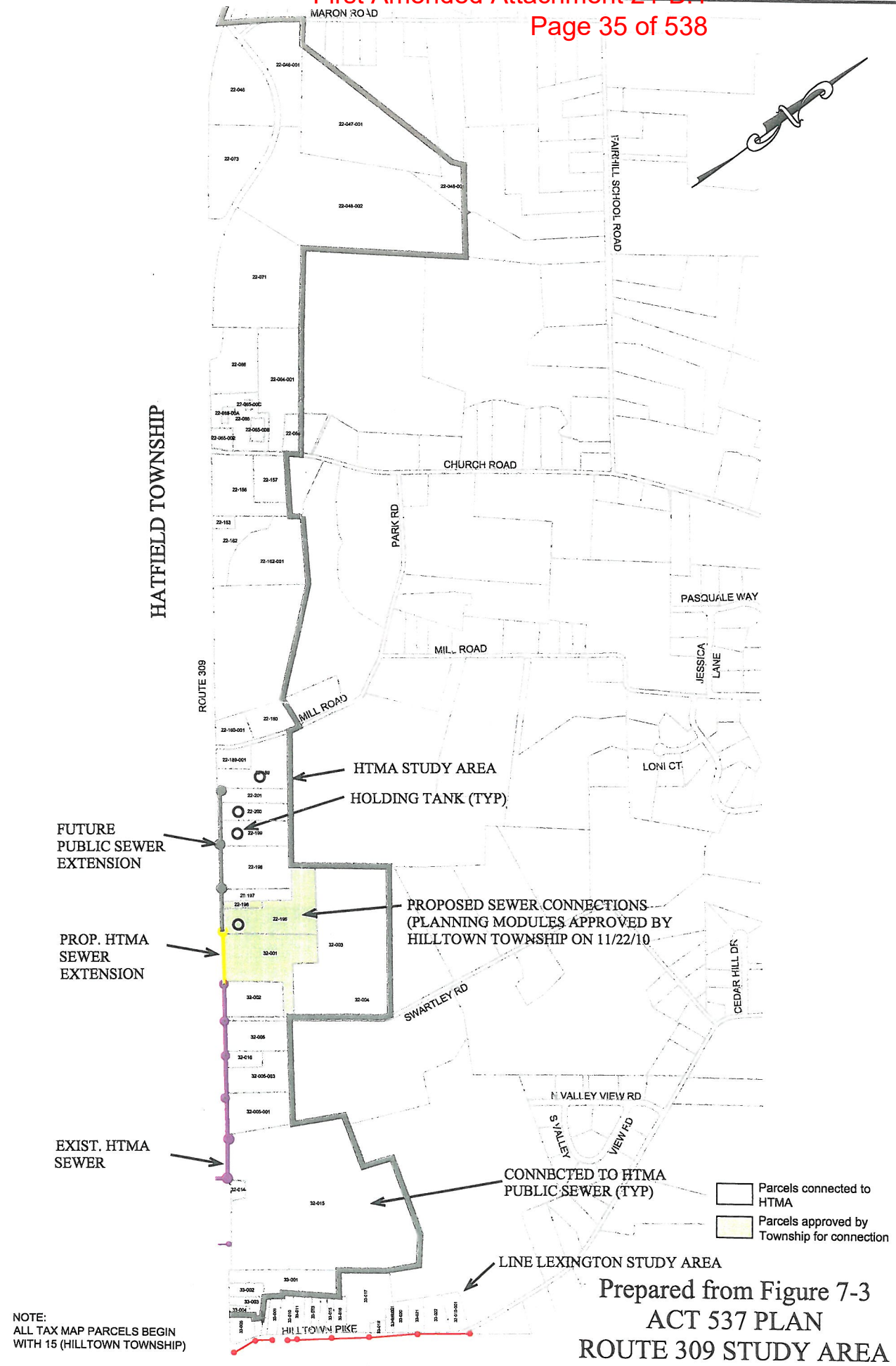
C. Robert Wynn, P.E.
Township Engineer

CRW/ajp

cc: Nancy Adams, Environmental Scientist, CET Engineering Services
Christopher S. Christman, Township Manager (via email)

Projected EDUs (2010 thru 2014)
Hatfield Township Municipal Authority
Hilltown Township
January 13, 2010
File No. 03-047

Tax Map Parcel	Type of Development	EDUs	Comment
15-32-001	Existing - 2 offices, 2 residences	4	Planning module approved by Township on 11/22/10
15-22-195/196	Existing restaurant	7	Planning module approved by Township on 11/22/10
15-32-003	Future retail development including supermarket, stores, restaurants, bank	62	Preliminary plan not submitted
15-22-198	Existing residence & insurance office	2	Currently served by on-lot sewage disposal system
15-22-199	Existing retail business	1	Currently served by holding tank
15-22-200	Existing landscape office	1	Currently served by holding tank
15-22-201	Existing Auto Repair	1	Currently served by on-lot sewage disposal system
15-22-189	Auto dealer repair/detail business (Peruzzi)	2	Currently served by holding tank


MARON ROAD
FAIRHILL SCHOOL ROAD
HATFIELD TOWNSHIP
CHURCH ROAD
PARK RD
PASQUALE WAY
MILL ROAD
JESSICA LANE
ROUTE 309
MILL ROAD
LONI CT
HTMA STUDY AREA
HOLDING TANK (TYP)
FUTURE PUBLIC SEWER EXTENSION
PROPOSED SEWER CONNECTIONS (PLANNING MODULES APPROVED BY HILLTOWN TOWNSHIP ON 11/22/10
PROP. HTMA SEWER EXTENSION
SWARTLEY RD
CEDAR HILL DR
N VALLEY VIEW RD
S VALLEY VIEW RD
EXIST. HTMA SEWER
CONNECTED TO HTMA PUBLIC SEWER (TYP)
Parcels connected to HTMA
Parcels approved by Township for connection
LINE LEXINGTON STUDY AREA
HILLTOWN PIKE
NOTE:
ALL TAX MAP PARCELS BEGIN WITH 15 (HILLTOWN TOWNSHIP)
Prepared from Figure 7-3
ACT 537 PLAN
ROUTE 309 STUDY AREA
ALTERNATIVE #2
EXTEND HTMA PUBLIC SEWER SYSTEM
JANUARY 13, 2011

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Southeast Regional Office

March 30, 2011

Mr. Joel Kostelac, P.E.
CET Engineering Services
1240 N. Mountain Road
Harrisburg, PA 17112

Re: Preliminary Treatment Requirements
Hatfield Township Municipal Authority
NPDES No. PA0026247
Hatfield Township
Montgomery County

Dear Mr. Kostelac:

This is in response to your February 11, 2011, request for Preliminary Treatment Requirements for the discharge of an annual average flow of 7.55 million gallons per day (MGD) to West Branch Neshaminy Creek. This request is for an existing treatment facility owned by the Hatfield Township Municipal Authority (HTMA). The facility is currently permitted for an annual average flow of 6.43 MGD.

Please note that the Department is currently drafting a NPDES permit renewal for an annual average flow of 6.43 MGD. HTMA is still required to submit an application for an amendment to the NPDES permit for an increased annual average flow, as approved by 537 planning. Also, HTMA recently signed a consent order and agreement which includes more stringent effluents limits for total phosphorus than is contained in their existing NPDES permit.

In order to assist with the long term design of the wastewater treatment facility to address the increase of permitted flow, the listed stream impairments, and the lack of assimilative capacity at the point of discharge – the Department proposes the preliminary effluent limits attached to this letter. We have included the effluent limits from the existing NPDES permit for comparison.

West Branch Neshaminy Creek is dominated by treated sewage effluent at the design flow condition. Since there is no additional available assimilative capacity in the stream, this requires that the organic load discharged from the facility be capped at existing permitted load. This is reflected in a moderate reduction of approximately 17% for the proposed effluent concentrations for $CBOD_5$ and ammonia-nitrogen.

West Branch Neshaminy Creek is listed as impaired due to excessive nutrients. The Department is expecting nutrient criteria in the near future, and the Environmental Protection Agency (EPA) is in the process of developing a Total Maximum Daily Load (TMDL) for the Neshaminy Creek basin. We anticipate that the final TMDL will require significant reductions for phosphorus and possibly nitrogen. In the interim, the permitted discharge load of phosphorus will be capped based on the existing discharge load.

If you have any questions, please call Mr. Orest Kolodij at 484-250-5191.

Sincerely,

Sohan L. Garg

Sohan L. Garg, P.E.
Environmental Engineer Manager
NPDES Permits Section
Water Management

Enclosures

cc: Hatfield Township
Mr. Peter Dorney, HTMA
Mr. Bill Gelles
Mr. Jenifer Fields
Planning Section
File

Hatfield Township Municipal Authority
Summary of Proposed Preliminary Treatment Requirements – for 7.55 MGD

Parameter	Existing Limit	Proposed Limit
	Monthly Average (mg/l)	Monthly Average (mg/l)
CBOD5		
(5-1 to 10-31)	10	8.5
(11-1 to 4-30)	20	17
Total Suspended Solids	30	30
Ammonia as N		
(5-1 to 10-31)	2.0	1.7
(11-1 to 4-30)	6.0	5.1
Nitrate and Nitrate as N		
(7-1 to 10-31)	9.0	9.0
Total Nitrogen as N		6.0 – 11.0[3]
Total Phosphorus as P		
(4-1 to 10-31)	2.0 / 1.0[1]	0.1 – 0.6[2]
(11-1 to 3-31)	1.0[1]	0.2 – 1.0[2]
Dissolved Oxygen	6.0 (minimum)	6.0 (minimum)
Fecal coliform	200#/100-ml geo. mean	200#/100-ml geo. mean
Total Residual Chlorine	N/A (UV disinfection)	N/A (UV disinfection)
Toxics		(not evaluated)

Notes:

[1]Existing Consent Order and Agreement includes a 1.0 mg/l average monthly limit for total phosphorus, and a 0.5 mg/l rolling 12-month average limit.

[2]An NPDES permit renewal for 6.43 MGD is currently under development. The permitted discharge load for total phosphorus is capped based on the existing load. The upper value listed represents the existing load. The lower value listed represents anticipated water quality based effluent limits.

[3]There is a TN limit of 11 mg/l inherent in the existing permit effective for the months July thru October. There is a possibility in the future that this limit may be reduced or extended to cover additional months.

HATFIELD TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA
RESOLUTION #11-22

A RESOLUTION OF THE COMMISSIONERS OF HATFIELD TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA, ADOPTING THE TOWNSHIP'S 537 PLAN.

RECITALS

A. Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection ("DEP") adopted pursuant thereto and being Chapter 71 of Title 25 of the Pennsylvania Code, requires Hatfield Township ("Township") to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the Township.

B. Hatfield Township Municipal Authority ("Authority"), the entity responsible for the disposal and treatment of sewage wastes within the Township, through its engineer, CET Engineering Services, has prepared an "Act 537 Plan Update" which provides for the sewage facilities in a portion of Hatfield Township.

C. Based upon studies and available alternatives, the alternative of choice to be implemented is the re-rate of the existing Advanced Wastewater Treatment Facility to meet existing and future flow requirements and the implementation of a Sewage Management Program to provide oversight of the existing on-lot sewage disposal systems within the Township. The key implementation activities and dates are detailed in Section VIII-C of the 537 Plan.

D. The Township finds that the Act 537 Plan Update described above conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of Hatfield Township hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the "Official Plan" of the Township, the above referenced Act 537 Plan Update. The Township hereby assures the Department of the complete and timely implementation of the said plan as required by law.

Andrew S. Haines, Manager

HATFIELD TOWNSHIP
BOARD OF COMMISSIONERS

BY: Thomas C Zipfel

Thomas C. Zipfel, President

I, Andrew S. Hames, Secretary of Hatfield Township, hereby certify that the foregoing is a true copy of Township Resolution #11-22 adopted 13th July 2011.

ORDINANCE NO. 627

AN ORDINANCE ESTABLISHING REGULATIONS FOR THE INSPECTION, PUMPING, MAINTENANCE, OPERATION, REHABILITATION AND ADMINISTRATION OF ONLOT SEWAGE SYSTEMS AND PROVIDING PENALTIES FOR VIOLATIONS THEREOF

WHEREAS, Hatfield Township (the "Township) has an obligation to provide for and/or insure adequate sewage treatment and protection of the public health by preventing the discharge of untreated or inadequately treated sewage as mandated by municipal codes, the Clean Streams Law (35 P.S. §691.1001) and the Pennsylvania Sewage Facilities Act (35 P.S. §750.1 et seq.).

WHEREAS, the Township Act 537 Official Wastewater Facilities Plan has evaluated the need to provide adequate sewage facilities and has found the formation of an On-Lot Sewage Management Program to be an effective method of preventing and abating water pollution and hazards to the public health.

WHEREAS, the purpose of this Ordinance is to: (1) keep the Township compliant with the requirements of the Clean Streams Law (Act of 1937, P.L. 1987, No. 394) and the Pennsylvania Sewage Facilities Act (Act of 1966 P.L. 1535, No. 537, as amended, known as Act 537); (2) provide for inspection, pumping, maintenance, and rehabilitation of on-lot sewage disposal systems; (3) establish penalties and appeal procedures necessary for the proper administration of such a management program.

WHEREAS, the Commissioners of the Township after due consideration of the proposed ordinance at a duly advertised public meeting, has determined that the health, safety and general welfare of the citizens and residents of Hatfield Township will be served by the passing of the within ordinance.

NOW, THEREFORE, IT IS HEREBY ENACTED AND ORDAINED by the Board of Commissioners of Hatfield Township, Montgomery County, Pennsylvania, as follows:

§I. Amendment of the Code.

Chapter 224, Sewers and Sewage Disposal, Article IV, On-Lot Sewage Management Program is hereby amended as follows:

i. Section 224-38, Subsection A is hereby amended to read as follows:

A. Upon adoption of this Ordinance, The Township shall provide written notification to all owners of property served by an on-lot sewage system that their system must be pumped within 90 days of receipt of notification or provide notification to the Township that the on-lot system had been pumped within the previous three (3) years. Thereafter, the Township shall follow a schedule whereby all of the owners of properties within the Township served by an on-lot sewage system are notified once every three (3) years. The notified property owners must have the sewage system pumped within the time specified in the Township's letter, unless the owner(s) can provide the Township with a pumping certification indicating that the on-lot sewage system was pumped within one (1) year prior to the date of the Township's notice letter.

ii. Section 224-38, Subsection B is hereby amended to read as follows:

B. Commencing from the date of the pumping as prescribed in section 224-38(A), removal of septage or other solids from an on-lot sewage system shall be performed at least once every three (3) years thereafter or whenever an inspection reveals solids or scum in excess of 1/3 liquid depth of the tank, or more frequently if recommended by the manufacturer of any of the component parts of the system. The property owner shall furnish a copy of the pumping certification to the Township within thirty (30) days of the date of the pumping.

iii. Section 224-38, Subsection C is hereby amended to read as follows:

C. The Township may allow an on-lot sewage system to be pumped out at less frequent intervals when the owner can demonstrate that the sewage system and/or uses thereof are unique and do not require pumping every three (3) years. In no case shall such period extend beyond six (6) years. The Township shall solely determine if an extension of time will be granted and the length of the extension.

iv. Section 224-38, Subsection G is hereby amended to read as follows:

G. Any person owning a structure served by a sewage system containing an aerobic treatment tank shall follow the operation and maintenance recommendations of the equipment manufacturer. In no case may the service or pumping interval for aerobic treatment tanks exceed that required for septic tanks. The Owner shall provide an adequate supply of electrical power with the proper phase, frequency, and voltage as recommended by the equipment manufacturers of the various components of the system.

§II. Repealer.

All ordinances or parts of ordinances which are inconsistent herewith are hereby repealed, it being understood and intended that all ordinances and the Code of Ordinances for the Township of Hatfield such as are not otherwise specifically in conflict or inconsistent with this ordinance, shall remain in full force and effect, the same being reaffirmed hereby.

§III. Severability.

If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such provisions shall be separate, distinct and independent, and such holding shall not effect the validity of the remaining portions of this Ordinance.

§IV. Failure to Enforce not a Waiver.

The failure of the Township to enforce any provision of this Ordinance shall not constitute a waiver by the Township of its rights of future enforcement hereunder.

§V. Effective Date.

This ordinance shall take effect within five (5) days of passage.

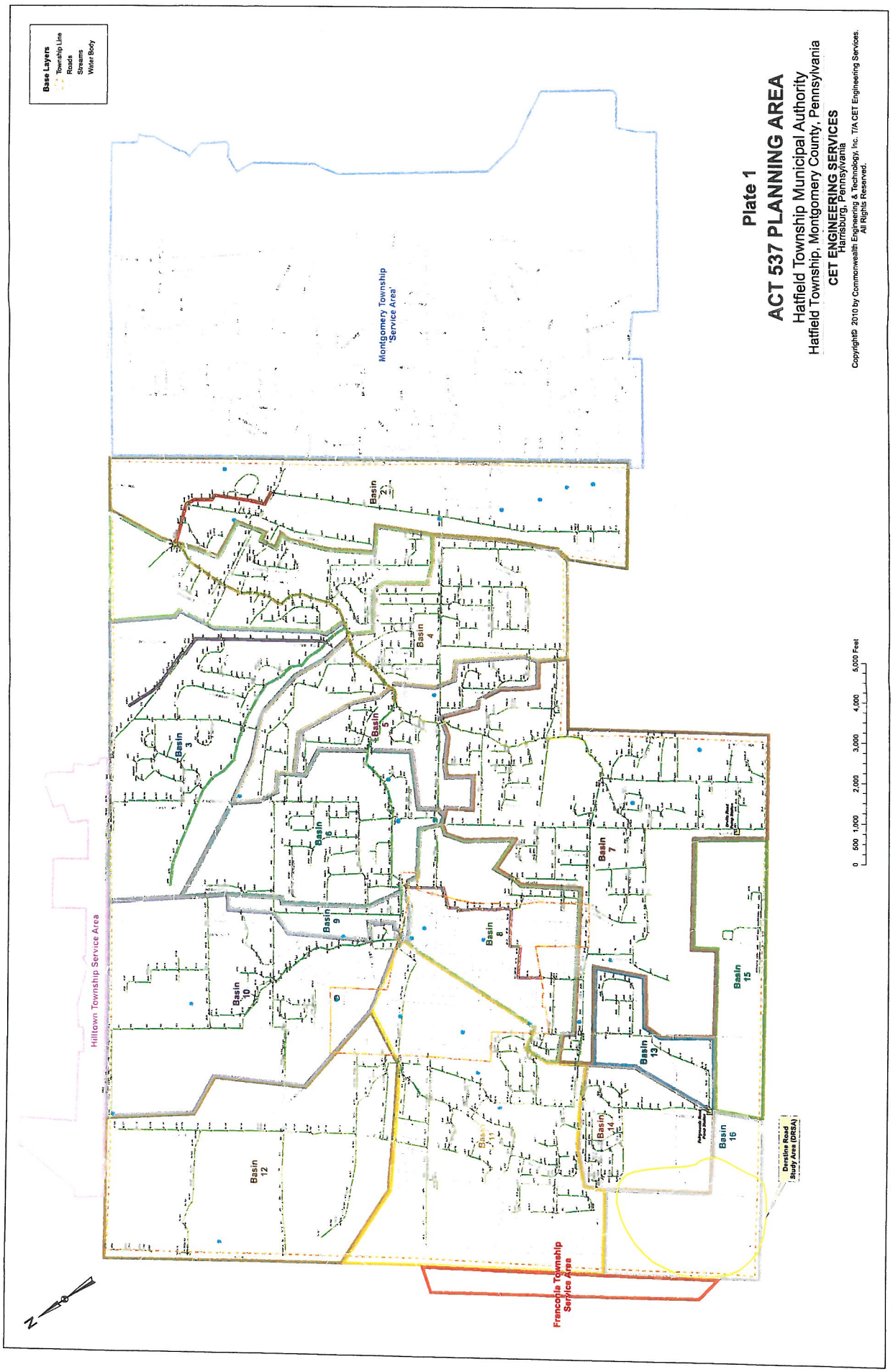
§VI. **Enactment.**

Under the authority conferred by the First Class Township Code and other relevant statutory law, the Commissioners of the Township of Hatfield in the County of Montgomery, Commonwealth of Pennsylvania do hereby enact and ordain this ordinance to the Code of Ordinances for the Township of Hatfield this 13 day of July 2011.

Attest: _____

HATFIELD TOWNSHIP

By: _____


Base Layers
Township Line
Roads
Streams
Water Body
Plate 1
ACT 537 PLANNING AREA
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Harrisburg, Pennsylvania
Copyright© 2010 by Commonwealth Engineering & Technology, Inc. T/A CET Engineering Services.
All Rights Reserved.
Montgomery Township 'Service Area'
Hilltown Township Service Area
Franconia Township Service Area
Derstine Road Study Area (DRSA)
Basin 1
Basin 2
Basin 3
Basin 4
Basin 5
Basin 6
Basin 7
Basin 8
Basin 9
Basin 10
Basin 11
Basin 12
Basin 13
Basin 14
Basin 15
Basin 16
0 500 1,000 2,000 3,000 4,000 5,000 Feet
N

Act 537 Sewage Facilities Plan

Hatfield Township
Montgomery County, Pennsylvania

November 2010
Approved November 2013

Prepared by:
GHD

1240 North Mountain Rd.
Harrisburg, PA 17112
Ph: 717-541-0622
Fax: 717-541-8004

Hatfield Township
Act 537 Plan

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EXHIBITS

FIGURES

PLATES

APPENDICES

I. PREVIOUS WASTEWATER PLANNING

A. PLANS AND STATUS OF IMPLEMENTATION

The Pennsylvania Sewage Facilities Act (P.L. 1535 No. 537 of January 24, 1966, effective January 1, 1968, as amended, and enforced upon promulgation of rules and regulations codified under PA Code Chapters 71, 72 and 73) requires that all Commonwealth municipalities develop and implement comprehensive official plans that provide adequate sewage systems for the resolution of existing sewage disposal problems, and for the future sewage disposal needs of new land development and the municipality. Act 537 planning has been a municipal requirement since 1971.

1972 – MONTGOMERY COUNTY – OFFICIAL SEWAGE FACILITIES PLAN

The Montgomery County Planning Commission developed an Official Act 537 Sewage Facilities Plan in 1972, and later updated this in 1978. This plan emphasized large regional treatment plants and expansive interceptor sewers. The Township of Hatfield adopted the Montgomery County prepared Act 537 Plan and constructed an Advanced Wastewater Treatment Facility in 1970 – 1972, as well as a major relief interceptor sewer in 1982 - 1983.

1984 – HATFIELD TOWNSHIP – OFFICIAL PLAN REVISION

The Township submitted an Act 537 Plan Revision in July 1984, which was approved in January 1985. A copy of this approval is located in Exhibit I-1. This Plan Revision established the Hatfield Township Municipal Authority (HTMA) service area. This service area consists of all of Hatfield Township, Hatfield Borough, Hilltown Township in the Line Lexington – Rte. 309 Area, Franconia Township adjacent to Township Line Rd and Rte 309 South, and portions of Montgomery Township.

The primary recommendation of the Plan Revision was to construct a new $7.2 million, 6.43 million gallon per day (MGD) counter current, low-load aeration treatment facility. Capacity in the treatment facility was divided between Hatfield Township (3.79 MGD), Hatfield Borough (0.50 MGD) and Montgomery Township (2.14 MGD). Other contributing municipalities did not enter into capacity agreements. This facility was constructed in 1986 - 1987.

The 1984 Official Plan Revision also identified the “Fairgrounds area between Cowpath and Elroy Rd.” as the single remaining unsewered area of the Township. At the time of the plan preparation, the engineering design and negotiations with developers to provide sewer service to this area was underway. Since that time sewer service has been provided.

The Township kicked off the current plan revision in mid-2008 with the submission of a Plan of Study and Task Activity Report. These items were approved in August 2008, and a copy of the documents and approval is located in Exhibit I-2.

B. HATFIELD TOWNSHIP PLANNING

In response to a January 26, 2005 Notice of Violation for a Sanitary Sewer Overflow in the Neshaminy Interceptor, a Corrective Action Plan (CAP) was prepared in July of 2007. The CAP focused on two primary goals. The first was to reduce to the extent possible, surcharging and overflows within the collection system caused by infiltration and inflow (I/I). The second was to provide for an upgrade in capacity to the Neshaminy Interceptor. This interceptor, running parallel to the Neshaminy Creek, transports the majority of the wastewater flows from within the HTMA service area to the WWTP.

In September 2007, the CAP was approved by DEP. A copy of this plan and approval can be found in Exhibit I-3. Since that time, Hatfield Township and HTMA have moved forward towards the goals of the plan. Maintenance tasks accomplished include televising over 300 laterals, repairing over 900 laterals, installing over 200 observation tees, conducting more than 200 manhole inspections and repairing and lining numerous manholes. HTMA accomplishes its collection system maintenance through two (2) separate ongoing sewer maintenance contracts, one for excavation and one for trenchless technology, and with its own staff of four (4) employees and one (1) manager dedicated to the collection system.

In addition to an overall reduction in I/I flows, HTMA is in the construction phase of a Wet Weather Flow Equalization project. This project involves the construction of two (2) new 4.0 million gallon tanks for offline storage during extreme wet weather events. It also includes the rehabilitation of an existing, unutilized pump station and the construction of a new diversion chamber. This project was bid in early 2009 with construction expected to be complete in 2010.

The Township and HTMA are currently in the permitting process for the replacement of portions of the Neshaminy Interceptor. The Authority is proposing to replace approximately 11,500 feet of existing sanitary sewer. Much of this replacement sewer will consist of 42” and 36” diameter PVC pipe. Construction is expected to commence on this project in 2010.

On March 3, 2008, Hatfield Township Municipal Authority entered into a Consent Order and Agreement (CO&A) with Pennsylvania DEP. This CO&A adjusted the annual average design flow of the plant to 6.98 MGD and required the submission of a Connection Management Plan (CMP). This CMP was submitted in February of 2008 and is updated on a regular basis. A copy of the CO&A and most current CMP can be found in Exhibit I-4. The CMP outlines the remaining capacities in the WWTP for Hatfield Township and the contributing municipalities. These capacities as well as future capacity will be discussed further later in this Plan revision.

C. PLAN REVISIONS, SUPPLEMENTS, AND EXEMPTIONS

In accordance with Ch. 71.58, DEP has delegated the authority to review and approve new land development planning to Hatfield Township. Planning Modules approved by the Township do not constitute a revision or exception to revise, but are a supplement to the Township’s official sewage facilities plan.

Planning Module Component 1 is used for exceptions to planning requirements, if the following conditions exist:

- Subdivision contains less than 10 lots (created after May 15, 1972).
- Soils or site conditions are suitable for onlot sewage systems.
- Proposed sewage system is not underlain by carbonate geology.
- Proposed sewage system is not within one-quarter mile of water supplies that exceed 5 ppm (mg/L) nitrate-nitrogen.
- Proposed development is outside a high quality or exceptional value watershed.
- Subdivision lots and remaining tracts are each larger than 1 acre.

Planning Module Component 2 is used for individual and community onlot systems:

- Non-excepted systems and residential spray irrigation systems
- Proposed retaining tanks – holding tanks, privies, chemical, incinerating, recycling or composting toilets
- Proposed community onlot sewage disposal systems permitted by the County
- Proposing individual or community large volume onlot sewage disposal systems permitted by DEP

Planning Module Component 3 is used for sewage collection and treatment facilities when the following is proposed:

- A subdivision served by sewage collection, conveyance or treatment facilities
- A tap-in to public sewers from a lot with 2 EDUs or more
- Construction or modification of wastewater collection, conveyance or treatment facilities that require a DEP permit

II. PHYSICAL IMPACTS ON WATER RESOURCES AND WASTEWATER SYSTEMS

This section discusses the effects and constraints on water supply and wastewater disposal by land use activities and the natural environment – planning, surface water, groundwater, soils, geology, topography, potable water supplies, wetlands, and floodplains.

A. PLANNING AREAS, MUNICIPAL BOUNDARIES, AND SERVICE AREA BOUNDARIES.

Hatfield Township's *Planning Area* consists of all the land within the municipal boundaries of the Township, and the areas within the adjacent municipalities served by Hatfield Township Municipal Authority sewer facilities. This service area consists of all of Hatfield Township, the Borough of Hatfield, portions of Montgomery Township to the east, Hilltown Township to the north and Franconia Township to the west.

Hatfield Township, Montgomery County, a first-class Township incorporated in 1742, has evolved from a rural farming community into a suburban community with a mix of residential, commercial and industrial users including a well-known food processing operation. The Township, which surrounds the 0.6 sq.mi. Borough of Hatfield, is approximately 30 miles north of Philadelphia. The Township lies primarily in the Neshaminy Creek watershed and covers an area of approximately 10 square miles.

Primary vehicular access to the Township is via PA Route 309 in the northern portion and the Northeast Extension of the PA Turnpike to the south. These prominent traffic routes provide access to population centers in the Route 309 corridor as well as the City of Philadelphia. Additionally, the North Penn Railroad passes through the center of the township in a northwestern direction.

According to the Delaware Valley Regional Planning Commission, the projected 2010 population of the Township is 18,174. With the addition of contributing municipalities to the sewer service area, the HTMA system served 19,214 EDU's in 2009[1].

Most of the planning area is served by the public sewerage and collection system owned and operated by the HTMA. The Planning Area is made up of 16 drainage areas totaling approximately 6,400 acres in Hatfield Township and two basins in Montgomery Township. This area is depicted Plate 1. The North Penn Water Authority (NPWA) provides public water service to the majority of the Township and the Planning Area. There are a relatively small number of on-lot sewage systems and individual wells throughout the Township with the largest concentration of about 30 conventional on-lot systems in the Derstine Road area.

This area, shown on Plate 1, and Figure II-1, is referred to as the Derstine Road Study Area (DRSA).

[1] According to 2009 Chapter 94 Wasteload Management Report (Exhibit III-3)

B. PHYSICAL CHARACTERISTICS

The planning area lies predominantly within the Neshaminy Creek watershed, Sub-Basin 2 (the Central Delaware) of the Delaware River Basin. A small portion of the Skippack Creek watershed drains the southwestern corner of the planning area, specifically the DRSA. The Skippack is tributary to the Lower Perkiomen Creek watershed and the Lower Delaware sub-basin (Sub-Basin 3). These boundaries, along with other streams, waterbodies, and topography can be found on Plate 2

Pennsylvania's Unified Watershed Assessment identified watersheds that do not meet clean water, natural resource, and public health goals and are most in need of restoration. A Watershed Restoration Actions Strategy (WRAS) was developed for the State Water Plan Subbasin 02F "Neshaminy Creek Watershed, Bucks and Montgomery County" and Subbasin 03E "Lower Schuykill River Watershed, Montgomery County" in 2004[23]. WRASs are dynamic documents that are to be updated regularly as more information becomes available and as remediation measures are implemented and water quality improvements are documented.

The West Branch of the Neshaminy Creek is designated by DEP as both a warm water fishery (WWF) and migratory fishery (MF). In the southwestern portion of the Township the Skippack Creek is a trout stream fishery (TSF). These terms are defined in Table II-1 below:

Table II-1: DEP Neshaminy and Skippack Creek Use Designations.

Warm Water Fishes (WWF) - Maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.
Migratory Fishes (MF) - Passage, maintenance and propagation of anadromous and catadromous fishes and other fishes which ascend to flowing waters to complete their life cycle.
Trout Stocking (TSF) - Maintenance of stocked trout from February 15 to July 31 and maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.

According to the "2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report[4]" portions the West Branch Neshaminy Creek or their unnamed tributaries are listed under Category 5 or requiring a TMDL. These waterbodies do not meet Pa DEP guidelines for the protection of aquatic life. The most common cause for this is agriculture or land development practices leading to excessive siltation. However, in some cases agriculture and municipal point sources have caused excessive algal growth and nutrient impairment. In response to this, Pa DEP issued a 2003 TMDL for nutrients for the Neshaminy Creek Watershed.

[2] http://www.depweb.state.pa.us/watershedmgmt/lib/watershedmgmt/nonpoint_source/wras/wras-02f.pdf
[3] http://www.depweb.state.pa.us/watershedmgmt/lib/watershedmgmt/nonpoint_source/wras/wras-03e.pdf
[4] http://www.depweb.state.pa.us/watersupply/cwp/view.asp?a=1261&q=535678

This TMDL was later withdrawn in 2008. The Pa DEP intends to issue a new TMDL for the streams and tributaries listed in Category 5 not later than 2015. A full listing of the streams and tributaries of the West Branch Neshaminy, their impairments, potential TMDL timings and causes can be found in Exhibit II-1.

The DRSA is drained by numerous unnamed tributaries to the Skippack Creek. These feed Unnamed Tributary 01097, which is listed under Category 4c in the 2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report. Category 4c waters are impaired for one or more designated use but not needing a TMDL, as the source of impairment is not a pollutant. A full listing of the streams and tributaries of the Skippack Creek in the DRSA and their impairments and causes can be found in Exhibit II-2. These tributaries are shown on the numerous figures throughout this section.

C. SOILS

Soil characteristics, such as depth to rock or redox features and slope, are used to determine suitability for onlot systems. According to the Montgomery County Soil Survey, as well as USDA and NRCS data, two primary soil associations are found in the Hatfield Township Planning area. These associations are the Abbottstown-Readington-Croton association, occupying most of the planning area, and the Reaville-Penn-Klinesville association which makes up the southwestern portion of the planning area including the DRSA. The extent and location of each are also depicted in Figure II-2, the General Soil Map of Montgomery County.

The Abbottstown-Readington-Croton association is characterized by deep, moderately well drained to poorly drained soils underlain by shale and sandstone. The Abbottstown soil group makes up approximately 30% of this association, Readington approximately 30% and Croton approximately 25%. Hydrologic Soil Group (HSG) classifications for these soils are C (Abbottstown and Readington) and D (Croton). HSG ratings describe the physical drainage properties of each soil series, including texture and permeability, as well as certain physiographic properties, such as depth to bedrock and water table. HSG Group A are well drained and highly permeable and HSG Group D are poorly drained and produce much greater runoff. HSG Groups C and D are not ideal soils for the use of conventional on-lot sewage disposal systems, as they are slowly permeable and have a seasonal high water table. While there are number of these systems in the planning area in this soil association the proximity of these systems to the existing collection and conveyance system lends itself to connection in the future should problems arise or development necessitate. All known on-lot systems in the planning area are shown on Plate 3.

The remainder of the planning area, including the largest concentration of on-lots systems is located in the Reaville-Penn-Klinesville soil association. This soil association is characterized by shallow to moderately deep soils that are well drained to somewhat poorly drained. These soils are underlain by shale with bedrock between 10” and 36” below the surface. The Reaville soil group is the predominant group of this association and makes up approximately 35 – 40% of the association. The Reaville soil group is moderately deep with shale fragments, slowly permeable and in HSG Group C. The Penn soil group, making up approximately 25% of the of the association is moderately deep to shallow, well drained and overlays bedrock. The Penn soil

group is in HSG Group C and may be unsuitable for conventional on-lots systems given the depth to bedrock. The Klinesville soil group makes up 15 to 25% of this association and is generally found in areas of steeper slopes, can be droughty and shallow and contains shale. It is also part of HSG C and may be unsuitable for conventional on-lots systems given the depth to bedrock.

While this association comprises much of the southwest portion of the planning area, the DRSA is a combination of both the associations discussed above as shown on Figure II-2. This depiction shows most of the on-lot systems in either the Readington or Penn soil group. These soil groups are considered either very limited or slightly limited for the use of conventional on-lot systems.

Figures II-6 details the general soil suitability with unsuitable areas due to hydric soils, slopes greater than 25%, and soils with limiting characteristics (i.e. depth to rock, depth to water table) based on the Soil Survey of Montgomery County.

These designations, however, only describe general suitability of the soils group. Conditions of suitability may vary within a particular group. Given this a more detailed on-lot needs analysis was conducted in the DRSA and is discussed further later in this document.

Highlighted in Figure II-5 are soils designated as Prime Agricultural Farmland. As shown, some of these soils exist throughout the DRSA. A description of prime farmland and farmland of statewide importance as prepared by the USDA Natural Resource Conservation Service (NRCS) is enclosed in Exhibit II-3.

D. AND E. GEOLOGY AND TOPOGRAPHY

The Hatfield Township planning area is located in the Piedmont physiographic province and is further classified into the Gettysburg-Newark Lowlands also referred to as the Triassic Lowlands. These areas are depicted on PA DCNR Maps 7 and 13 included as Exhibit II-4 and II-5.

The Triassic Lowlands are comprised primarily of non-carbonate sedimentary rocks of red and brown sandstone, shale, siltstone, and conglomerate of the Brunswick Formation. All of the DRSA is located in the Brunswick Formation. This formation is characterized by reddish-brown mudstone, siltstone, and shale, containing a few green and brown shale interbeds with red and dark-gray, interbedded argillites near base. Flow, including any contaminants, within the Brunswick Formation occurs in small fractures or cracks in the rock, and extent of contamination in groundwater sources is related to the depth to rock and permeability of soils overlaying the Brunswick Formation.

Boulder fields are common in the Triassic Lowlands, however none are present in the planning area or the DRSA.

This area is characterized by rolling lowlands, shallow valleys and isolated hills. The Triassic Lowlands are generally described as low to moderate in relief (approximately 300 – 1000 feet in

elevation); however minimum and maximum elevations of 20' and 1355' above MSL can be found.

Carbonate bedrock as limestone and dolomite that has weathered results in karst topography with features such as sinkholes, depressions and caves. Karst features can function as direct recharge to groundwater aquifers causing contamination. In 2003, the PA Geological Survey published a karst density map. Exhibit II-6 shows the Montgomery County area clipped from this map. As shown there are no karst areas of concern in either the planning area or the DRSA. According to DEP's eMap, no sinkholes are catalogued for the planning area.

Planning area and DRSA topography are shown in Plate 2 and Figure II-1. The impact of slope on suitability for on-lot systems is depicted graphically on Figure II-6.

F. POTABLE WATER SUPPLIES

Potable water is supplied by the North Penn Water Authority (NPWA), a ten member municipal authority serving the entire planning area as well as many neighboring municipalities. NPWA owns and operates the Forest Park Water Treatment Plant (FPWTP); PWS permit no. 0997510, in Chalfont, Bucks County. The NPWA serves over 30,000 customers.

Much of the source water treated at the FPWTP is withdrawn from the Neshaminy Creek below Lake Galena in Bucks County. In the summer months, some source water is withdrawn from the Delaware River at Point Pleasant and used to augment the supply in the Lake Galena reservoir. The FPWTP process includes conventional filtration, granular activated carbon, and ozone disinfection prior to distribution. NPWA also operates twenty groundwater wells in the planning area. Water from these sources is chlorinated prior to distribution.

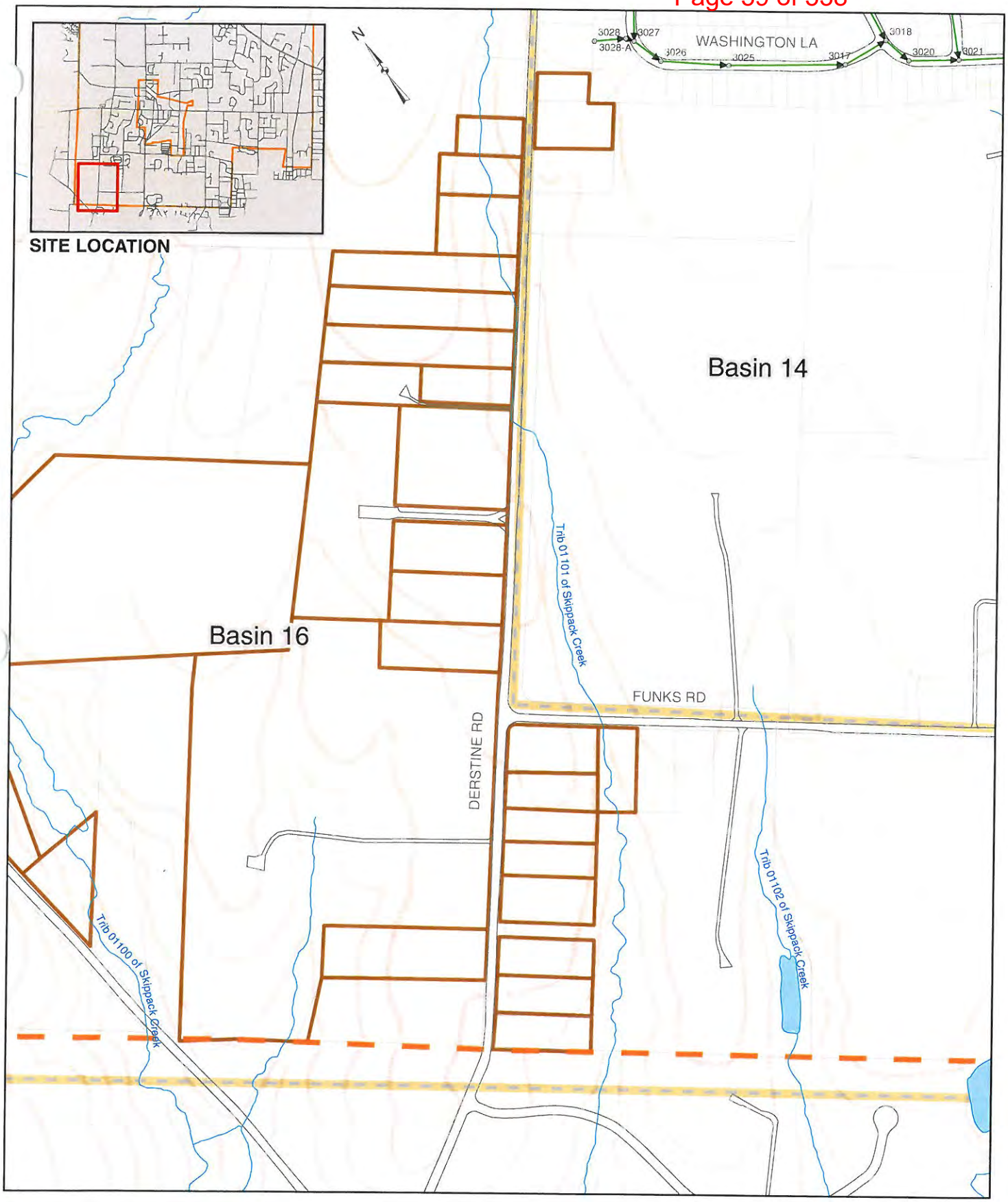
Where public water is not available, property owners rely on groundwater wells. Most of the more productive aquifers are in carbonate rocks, primarily limestone. Although the water-yielding character of the carbonate rocks depends on the degree of fracturing and development of solution cavities in the rock, the limestone formations generally yield moderate to large volumes of water. Well yields in the Piedmont crystalline-rock aquifers are 15 – 20 gpm. Plate 4 includes the NPWA wells and water supply tanks within the planning area. As shown, NPWA does not operate any facilities within the DRSA.

G. WETLANDS AND FLOODPLAINS

Wetland identification focused on the DRSA due to its large concentration of conventional on-lot sewage disposal systems. Wetlands were identified using the National Wetlands Inventory (NWI) mapping[5]. These wetland areas, along with other water resources and hydric soils identified using the Soil Survey of Montgomery County (2003) are shown on Figure II-4. Hydric soils are generally found along watercourses coinciding with wetlands and/or floodplains, although hydric soils are often more extensive than wetland areas. The NWI mapping was compiled by the U.S. Fish and Wildlife Service using color infrared aerial photos indicating soil

[5] http://www.fws.gov/nwi/

moisture content. The quality of the maps varies depending on the quality of the photos, the time the photos were taken, and the type of wetlands being identified. Field confirmation can determine the extent of wetlands within the Township. Wetlands delineated during the preparation of subdivision plans can be added to the Township's GIS database. Any proposed new or replacement facilities would attempt avoid wetlands or potential wetlands.



Survey Results Received
Hatfield Sanitation Basins
Water Body
Stream
Parcels
Township Line

0 200 400 800 Feet

Figure II-1
DERSTINE RD STUDY AREA (DRSA)
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

Edit Date: 3/4/2010 1:25 PM
File: J:\Hatfield Township Municipal Authority (0530)\6600 - Act 537 GIS\Derstine_Study_Area-85x11.mxd

Figure II - 2: General Soil Map of Montgomery County

Figure II-3
DRSA - SOILS
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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Figure II-4
DRSA - WETLANDS & HYDRIC SOILS
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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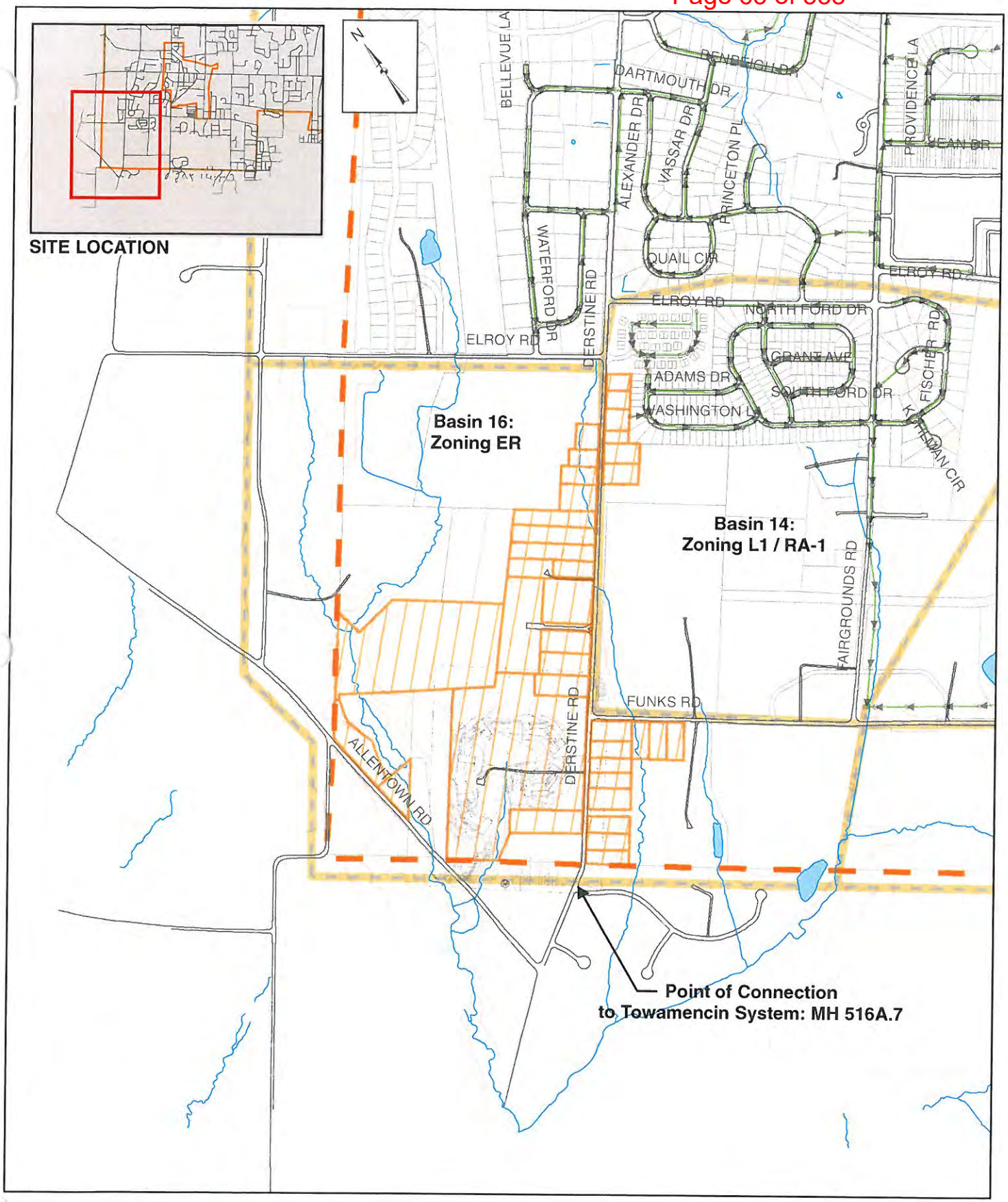

On-Lot System
Hatfield Sanitation Basins
Water Body
Stream
Parcels
Township Line

0 250 500 1,000 Feet

Figure V-1
DERSTINE RD STUDY AREA (DRSA)
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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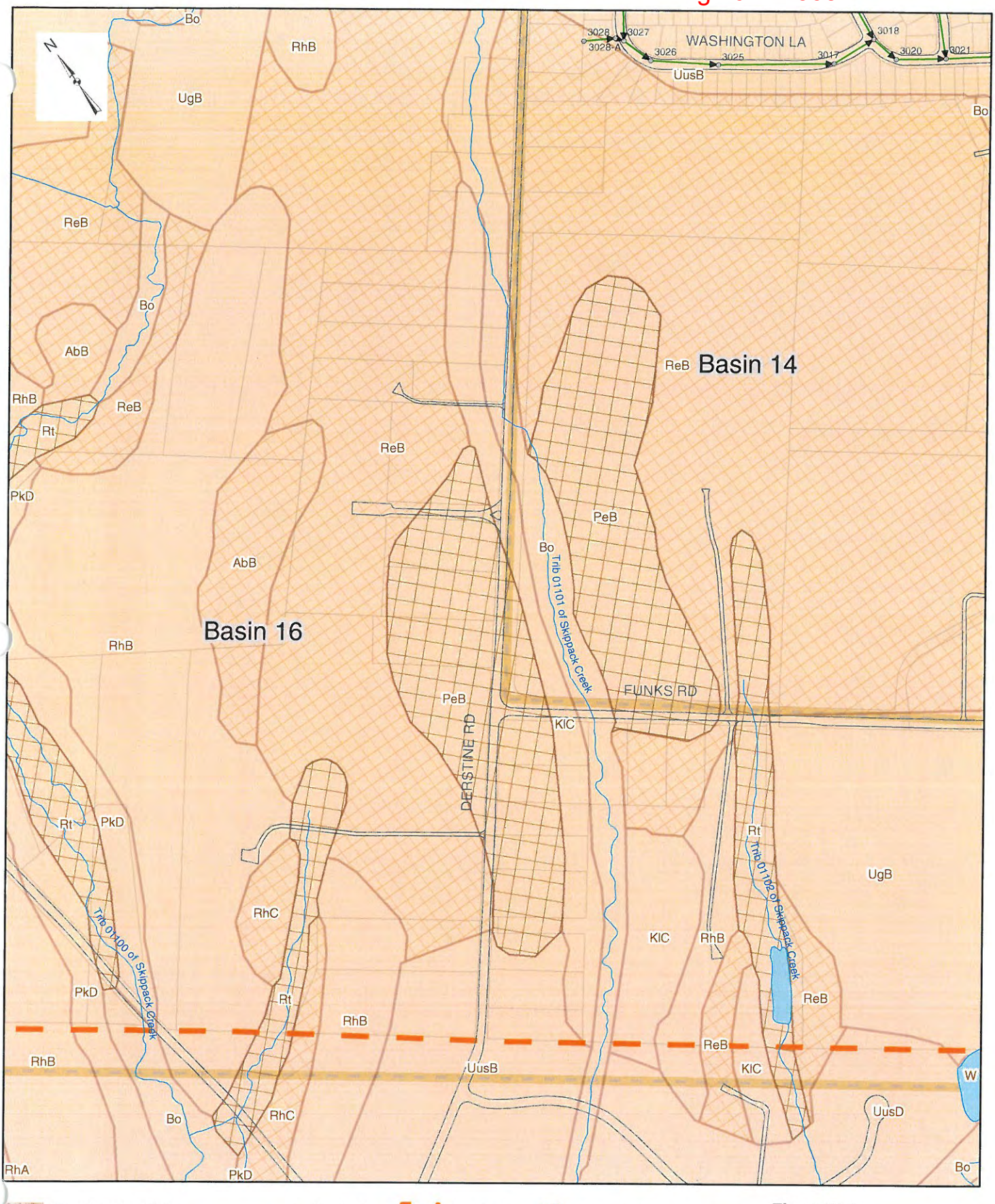

Figure II-5
DRSA - AGRICULTURAL SOILS
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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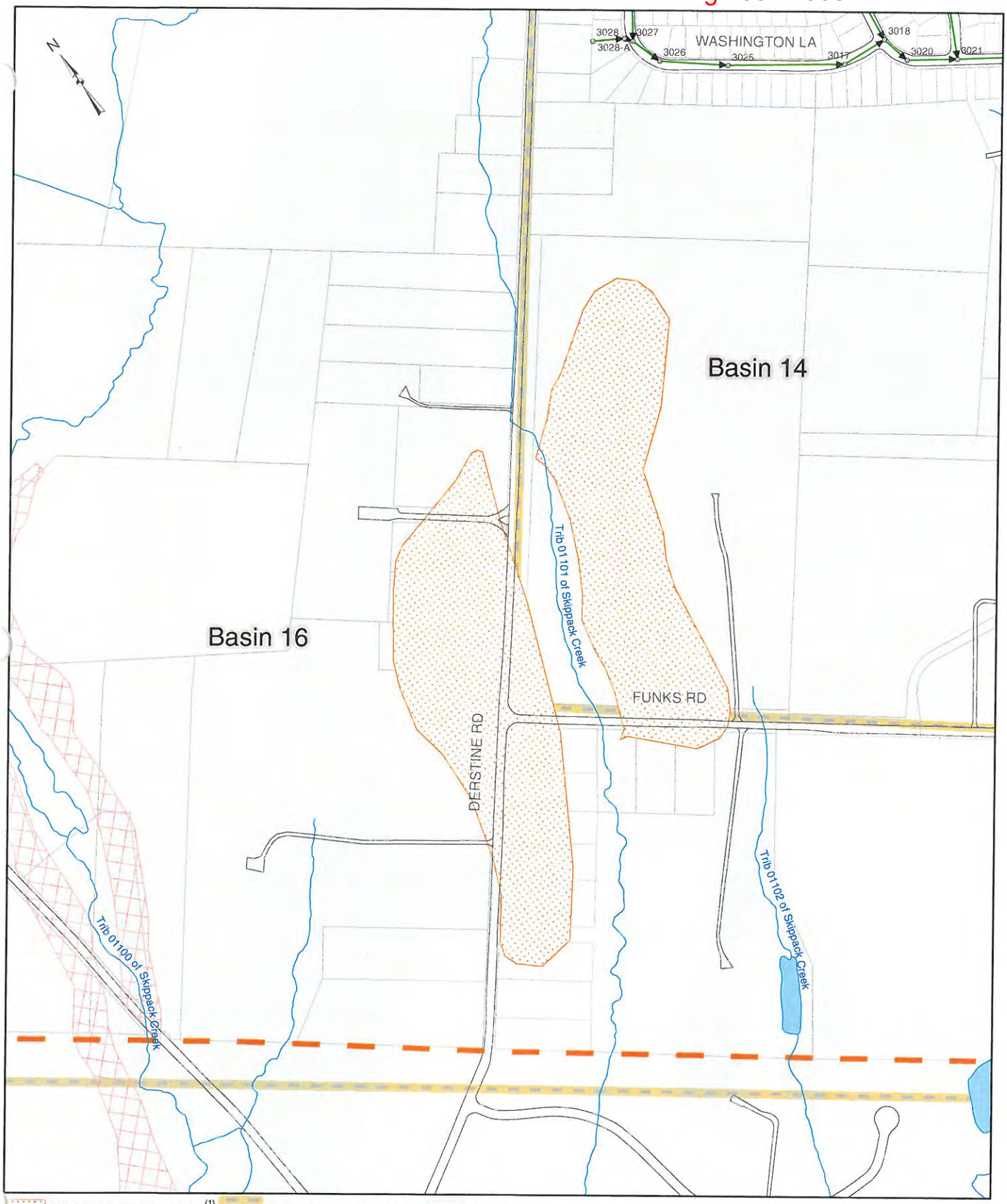

Slightly Limited For Onlot (1)
15-25% Slope (2)
Hydric Soils
Hatfield Sanitation Basins
Gravity Sewer
Manhole
Parcels
Township Line
Water Body
Stream

(1) Slightly Limited for Sand Mound Bed or Trench and Spray Irrigation. All other areas mapped are Very Limited for Onlot.
(2) All other areas mapped are under 15%

0 200 400 800 Feet

Figure II-6
SOIL SUITABILITY FOR ON-LOT SYSTEMS
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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III. EXISTING SEWAGE FACILITIES IN THE PLANNING AREA – IDENTIFYING THE EXISTING NEEDS

A. SEWER SERVICE AREAS

COLLECTION AND CONVEYANCE

Plate 4 shows the location of the Hatfield Township public sewer service system including interceptors, pump stations, force mains and the Township's wastewater treatment plant in the planning area. As described previously in this plan revision, the HTMA sewer system serves a planning area encompassing 16 basins in the Township, all of the Borough of Hatfield, and portions of Montgomery and Franconia Townships

The Hatfield Township Municipal Authority owns and maintains approximately 81 miles of sewer and 1,440 manholes. The majority of the collection sewers are 8-inch PVC, and the size of the interceptors are as large as 36 inches in diameter. The primary HTMA interceptors are the Neshaminy Interceptor (including the South and West Branch), the Montgomery Interceptor, the Lexington Interceptor, the Hilltown Interceptor and the Fairview Road Interceptor. The HTMA collection system includes two (2) HTMA-owned pump stations, Fairgrounds Rd. and Orvilla Rd. These pump stations are discussed in further detail later in this section. The design capacities and current flows of various collection and treatment systems are listed below in Table III-1.

Basins A and B of the Montgomery Township Municipal Sewer Authority's (MTMSA) sewer system is tributary to HTMA. The MTMSA owns and maintains approximately 63 miles of 8" – 24" gravity sewer and two (2) miles of force main ranging from 2" – 12" in Basins A and B. There is an estimated 1,565 precast concrete and / or brick manholes in the MTMSA sewer system that is tributary to HTMA. Major interceptors within MTMSA's collection system include Villa Glen, Line Street, and Route 309/Richardson Road interceptors. There are three (3) MTMSA pumping stations in Basins A and B that pump to the HTMA collection system including two (2) pump stations located on Knapp Road and one (1) located on Montgomery Avenue.

The Hatfield Borough collection system consists of approximately seven (7) miles of gravity sewer, and is maintained by Hatfield Borough staff. There are no sanitary pump stations located in Hatfield Borough. Wastewater flows from Hatfield Borough are discharged via gravity sewers through Hatfield Borough Manhole 1.

A portion of Franconia Township contributes to the HTMA sewer service area via gravity sewers only (no pump station), and enters the HTMA system at MHs 341-5 and 74-158 as shown on Plate 4.

The HTMA owns and operates a 6.98 MGD Wastewater Treatment Plant (WWTP) that discharges treated effluent under NPDES Permit No. 0026247 to the west branch of the

Nesahminy Creek in Watershed 2-F. The HTMA collection system is permitted under Clean Streams Law Permit No. 4600414. A copy of this NPDES permit is available at HTMA.

TREATMENT FACILITY PROCESS

The WWTP has a permitted design capacity of 6.43 MGD annual average flow and 8.37 MGD maximum monthly flow and was constructed in 1986 - 1987. Additionally, it is permitted for 22,300 lb/day of organic loading. In March 3, 2008 the HTMA entered into a Consent Order and Agreement as previously described in this plan revision, adjusting the design flow to 6.98 MGD. A schematic diagram of the plant as well as an aerial view is shown in Figures III-1 and III-2 respectively. A site plan of the plant including current and abandoned process tankage is included in Exhibit III-1.

In addition to wastewater flows generated in the planning area, HTMA also receives domestic holding tank and septic tank waste with a small amount of industrial process waste via tanker truck for treatment at the HTMA pretreatment facilities. Effluent from the pretreatment facility blends with the influent prior to the primary clarifiers and the HTMA treatment process. The acceptance of this waste is at the discretion of HTMA.

The HTMA wastewater treatment plant processes include pretreatment facilities, mechanical screening, grit and grease removal, primary clarification, conventional activated sludge using countercurrent aeration units, final clarification, and ultraviolet disinfection prior to discharge to the west branch of Neshaminy Creek. Waste sludge is dewatered with centrifuges and incinerated with on-site facilities. A more detailed description of each process is included in the following sections.

The influent pumping system consists of two raw sewage pump stations. Each raw sewage pump station includes three (3) 72 inch diameter open flight screw pumps (10,450 gpm each). Currently only one influent pump station is in operation. The existing unutilized pump station will be rehabilitated and placed into operation in an ongoing flow equalization project, discussed in a latter portion of this section. Screening is provided via three (3) coarse screens. Following pumping and screening flow enters a dual channel grit and grease/scum removal system. After the grit and grease system, flow enters two (2), 80’ diameter, primary clarifiers where approximately 50% removal of BOD and TSS occurs.

Secondary treatment consists of two Schreiber countercurrent aeration units with full-diameter diffuser bridges. The units are approximately 170 feet in diameter with a 16 ½ foot side water depth for a total volume of 5.5 million gallons. There are six blowers, each with a capacity of 1,212 scfm. There are two final clarifiers that follow the aeration units with a diameter of 132 feet. Effluent from the clarifiers is then disinfected using ultraviolet light.

The sludge dewatering and processing facilities are designed for a maximum rate of 2,000 dry lb/hr (24 dry tons/day). The average loading is 1,200 dry lb/hr. Two (2) centrifuges are available with a design loading rate of 2,000 dry lb/hr, with one on standby at all times. The

incinerator is permitted for 24 dry tons per day. If the incinerator is not in operation the liquid sludge is hauled off-site via tanker truck.

In general, HTMA balances the amount of sludge it receives from outside sources with the amount of sludge produced at the HTMA facility in order to maintain a continuous operation of the centrifuge and incinerator. However, the amount of sludge accepted from outside sources is limited so that the incinerator typically operates at only 60 to 75% of capacity, which results in maintaining low levels in the sludge storage tanks. This philosophy allows HTMA significant sludge storage capacity in the event of unexpected downtime and for scheduled downtime to perform preventive maintenance tasks and other scheduled work on the equipment.

EXISTING FACILITIES PROBLEMS

Table III-1 below lists primary collection and treatment systems, design capacities and Chapter 94 overload conditions. As shown the 5 year projected maximum month flow is approaching the current maximum month capacity of the WWTP, however at this time there is no projected overload per Chapter 94. Future capacity beyond the 5 year projection will be evaluated further in this section and subsequent sections of the plan. There are no projected overloads in any of the HTMA interceptors.

Table III-1: Collection System and Treatment Capacities and Flows

Element	Design Capacity[1]	Line Size	Chapter 94[2] or Projected Maximum Value[3]	Remaining Capacity
Funks Rd. Pump Station	1.08 MGD	-	180,500 gpd	899,500 gpd
Orvilla Rd. Pump Station	504,000 gpd	-	288,000 gpd	216,000 gpd
Neshaminy Interceptor[4]	25.0 MGD	27”	19.2 MGD[5]	5.8 MGD
South Branch – Neshaminy	4.1 MGD	24”	2.1 MGD	2.1 MGD
West Branch – Neshaminy	4.1 MGD	24”	3.2 MGD	0.9 MGD
Hilltown Interceptor	0.5 MGD	8”	0.07 MGD	0.43 MGD
Lexington Interceptor	2.4 MGD	18”	0.51 MGD	1.89 MGD
Fairview Drive Interceptor	1.1 MGD	12”	0.42 MGD	0.68 MGD
Wastewater Treatment Plant	8.37 MGD[6]	-	8.34[7] MGD	0.03 MGD

In January 2005, HTMA received a Notice of Violation (NOV) for a Sanitary Sewer Overflow (SSO) at three manholes on the Neshaminy Interceptor. This NOV led to development of the

[1] Based on line size and DEP Sewage Facilities Manual minimum slope, unless otherwise noted
[2] Reported in 2008 Chapter 94 Wasteload Management Report
[3] Based on connected EDUs tributary to each line and a projected PHF of 4 x 216 gpd/EDU or 864 gpd/EDU
[4] Refers to the new Neshaminy Interceptor
[5] Based on 5 year average flow of 6.01 MGD x 3.2 AAF:PHF factor
[6] Permitted maximum monthly flow
[7] Projected 5 year 3 month maximum flow as reported in the 2009 Chapter 94 Wasteload Management Report

HTMA CAP previously discussed. Two capital projects related to the CAP will be discussed in the following section.

UPGRADE AND EXPANSION OF TREATMENT FACILITIES

In conjunction with the HTMA CAP, HTMA is in the design, bid, and construction process to two major capital projects:

Construction of new Neshaminy Interceptor

The existing Neshaminy Interceptor consists of two parallel interceptors originally designed to provide additional capacity and reduce surcharging during extreme wet weather events. The HTMA is replacing the older of the two existing parallel interceptors including approximately 11,500 linear feet of existing sanitary sewer with new, larger capacity sanitary sewer. Construction is expected to commence in early 2011.

Construction of Wet Weather Equalization Facility

To mitigate the potential impacts of high wet weather flows on the biological treatment processes, two new 4.0 million gallon tanks for offline storage adjacent to the plant were added. To convey the flow, construction of two diversion structures were accomplished, one for the HTMA sewer and one for the Montgomery Township Municipal Sewer Authority (MTMSA) sewer. These diversion structures will divert flow to a rehabilitated, currently unused pump station at the lower end of the plant. Each diversion structure will have a gate leading to the equalization (EQ) tanks (diversion gate), and a gate leading to the plant (plant gate). The gates will be electric motor operated with a manual hand wheel back-up.

When the combined flow reaches 24 MGD, the diversion gates will begin to open to allow flow to the pump station and maintain a maximum plant influent equal to the current plant flow setpoint. If/when the opening of the diversion gate alone (due to hydraulic considerations) does not send enough flow to the surge tank to maintain 24 MGD, then the slide gate to the plant will begin to close to force more flow to the pump station. Flow to the surge tanks will be monitored and totalized. Once the totalized flow approaches the capacity of the tanks (eight million gallons) then the diversion gates will close and all wastewater will be directed along the normal route to the plant.

The diversions are also being provided to allow for maintenance and repair of the existing first stage screw pumps and plant headworks. If this equipment requires repair, the diversions will allow the EQ pump station to bypass the headworks and pump the wastewater to the secondary treatment stage.

Rehabilitation of the pump station will consist of replacing existing pumps with 3 new vertical dry well centrifugal pumps with a capacity of 4.3 MGD each. New piping, valves, control

equipment, pump starters, and electrical panels will be provided, with pump control based on wet well level. Attached to the EQ pump station building will be a diversion structure with valves to divert flow to the return line. On the return line will be a flow meter, which shall be integrated into the plant SCADA program. Once a high flow event is over and the plant flow drops below the return flow permissive setpoint, the system shall begin to open/modulate valves to maintain the desired inflow to the plant.

The equalization tanks are 191 foot diameter, 20 foot high glass coated, bolted steel. The floors of the tanks is a poured concrete slab, which slopes inward towards the supply line in order to drain when necessary. Floating mixers and aerators will be provided in the EQ tanks to meet the DEP design requirement to maintain a 1.0 mg/l DO in the basins. Each tank will have level monitoring connected to the plant SCADA system. The tanks normally fill one at a time on automatic control, but have the capability to fill both at the same time through manual valve control. The tanks are provided with an overflow pipe that will drain back to the upper portion of the plant.

The tanks have an automatic flushing system to remove solids after each usage. Several non-potable plant water connections and access points will also be placed around the EQ tanks to provide for cleaning. A new, small utility building will be constructed for the water flush pumps and electrical panel boards. Nonpotable water will be pumped from the buried flush water storage tank to the cleaning system as needed. Construction began on this project in early 2010 and is scheduled for final completion in early 2011.

Installation of New Ultraviolet Disinfection System

In 2009, HTMA underwent the piloting, testing and procurement of a new UV disinfection system. This system selected is based non-contact arrangement where clarified effluent flows through tubes and medium pressure UV lamps are located outside of the flow tubes (and not in the water) and is manufactured by Enaqua[8]. This system will have a peak capacity of 28 MGD. Final design is expected to be complete in 2009 with installation of the new system occurring in late 2010 and early 2011.

RESERVE CAPACITY

The permitted hydraulic capacity of the treatment plant is 6.43 MGD, increased to 6.98 MGD by CO&A, with a maximum month design flow of 8.37 MGD. Table III-3 lists the average 2009 hydraulic and organic loadings to the treatment facility compared with the permitted/design values.

[8] http://enaqua.com/enweb/

Table III-3: Current Average vs. Permitted Flow

	2009 Chap. 94	Projected 2014	Permitted
Average Daily Flow (MGD)	6.36	6.70	6.98
Max. 3 Month Average Flow (MGD)	7.52	8.34	8.37
Average BOD Loading (lbs/d)	12,461	12,886	
Max. Month Average BOD Loading (lbs/d)	16,280	15,979	22,300

The average loadings to the treatment plant were well within the allowable loadings in 2009.

As of December 31, 2009 there were 19,214 EDU's connected to the HTMA sewer and flowing to its treatment facility. Dividing the five year annual average flow of 6,110,000 gpd by the total number of units results in an average flow per EDU of approximately 318 gpd/EDU. The five year average flow per EDU is 326 gpd/EDU. Since new connections generally produce less wastewater per day and are less vulnerable to impact of I/I, HTMA and Township staff utilize 216 gpd/EDU for new connections. This is consistent with current tapping fee calculations and the CMP.

The 2009 Chapter 94 Report lists future connections to the system from known developments over the next five years. Based on this report approximately 1,534 additional EDU's will connect over the next 5 years, while the most current CMP (which accounts for connections made to date) lists 1,565 new connections through 2013. At 216 gallons per connection per day annual average flow, these units equate to an additional 0.34 MGD of wastewater flow. By adding this flow to the annual average flow of 6.36 MGD a total of 6.70 MGD results, with 0.28 MGD reserve capacity remaining. Hatfield Township and HTMA do not maintain a reservation system, and reserve capacity is allocated based on a first come, first serve method for approved planning modules only.

Additionally, in preparation of this plan revision, Hatfield Township sent correspondence to all the contributing municipalities in the planning area. Some of these municipalities responded and the flow requirements are currently included in the numbers above, Chapter 94 projections, and future flow projections discussed below. A copy of this correspondence is included in Exhibit IV-8. As shown, responses were received by Montgomery Township and Hilltown Township, but not Franconia Township or Hatfield Borough.

NON-MUNICPAL, INDIVIDUAL, AND COMMUNITY SEWERAGE SYSTEMS

Several non-municipal, community, and individual wastewater facilities permitted by DEP are located in the Township. According to the DEP eFacts website, the facilities listed in Exhibit III-4 are point source discharges in the Township.

SMALL FLOW TREATMENT FACILITY SYSTEMS – O & M REQUIREMENTS

Small flow treatment facilities (SFTF) are defined by the DEP as "individual or community sewerage systems designed to adequately treat sewage flows not greater than 2,000 gpd using a stream discharge or other methods approved by DEP." These facilities are designed by professional engineers and permitted by DEP rather than the SEO. There are no existing Small Flow Treatment Systems in the Township.

DISPOSAL AREAS

No sewerage systems in the Township use any disposal method other than stream discharge.

B. INDIVIDUAL AND COMMUNITY ONLOT SEWAGE DISPOSAL

There are approximately 60 on-lot systems throughout the Township according to staff and Township documentation. These systems are scattered throughout the Township in both planned developments and single parcels. However, the largest density of these systems exists in the Derstine Road Study Area.

In March 2009, the CET and HTMA Staff conducted a Sewage Needs Survey of the on-lot systems. This, coupled with a review of soil type and suitability for on-lot systems, aids in the evaluation of needs for the Township. The Needs Survey consisted of two parts, a mail survey (conducted in October of 2008) which was sent to the address of all the known on-lot sewage disposal systems, as well as a door to door survey and water sample survey (conducted in March 2009) that was accomplished in the Derstine Road Study Area.

This area was selected for a more detailed study due to the number of systems in this area, the relatively small lot size, and the use of individual potable water systems. Additionally, the geographic location and proximity to the existing sanitary sewer system may facilitate an extension should groundwater contamination be found. Other areas were not selected for door to door surveys or well sampling as the numbers of systems were small and many are within a reasonable proximity to an existing sewer line, or have sufficient room to construct / rehab existing systems. Plate 3 and Figure II-1 show all the on-lot systems in the planning area as well as the DRSA.

TYPES OF ON-LOT SYSTEMS IN USE

Conventional on-lot bed or trench systems and elevated sand mounds are used throughout the Township. There does not appear to be a widespread problem with malfunctioning on-lot systems. There may be individuals who are experiencing problems, however, because of the distance of these homes from the existing public sewer, and because the surrounding population is not very dense, it would not be cost effective to construct an extension to serve these individuals. These spot problems are addressed on a case-by-case basis by the County's Sewage Enforcement Officer.

SANITARY SURVEY

To obtain public health needs information, a sanitary survey using DEP's recommended protocol was completed during March of 2009. With approximately 59 systems throughout the township, DEP requires 35% to be surveyed / sampled. A mail survey was mailed to a total of 59 property owners. Of the surveys mailed, 35 or 59% were returned. An example of this survey is included in Exhibit III-2.

Additionally, the DRSA consists of 24 systems, where Township staff elected to accomplish a more detailed sanitary survey and groundwater sampling effort. With 24 systems DEP requires 50% to be surveyed/sampled. In the DRSA, 18 (75%) mail surveys were returned and 14 (58%) door to door survey and well samples were accomplished. The results are tabulated in Exhibit III-3.

Repair permits are issued by the Montgomery County Health Department (MCHD). Systems can repaired and/or upgraded through various methods including septic tank replacement, beds, trenches, elevated sand mounds, spray and drip irrigation and others. In the DRSA, two repair permits are on file, both for construction of new elevated sand mounds. Other on-lot system repairs conducted, as indicated by the property owner, are listed in Exhibit III-3.

ON-LOT SEWAGE SYSTEM COMPARISON

To identify areas with public health needs, on-lot systems are classified into four categories of condition:

a. *Confirmed malfunction* – identified by SEO, BTG repair permits, piped discharges, backups, wet areas.
b. *Suspected malfunction* – identified by greener grass, unsuitable absorption area location – wetlands or rock outcrops, cesspools in high density developments, and pit privies.
c. *Potential malfunction* – identified by systems that appear to be functioning properly but are preregulatory systems (1972), substandard systems by current standards, unsuitable soils, repair permits per Chapter 73.

d. *Properly functioning* – identified by systems operating satisfactorily, constructed in accordance with permit requirements effective at the time.

Tables III-4.a and III-4.b summarizes data collected from the mail and door to door surveys for the Township as a whole and the DRSA. Figure III-3 depicts confirmed, suspected, and potential malfunctions in the DRSA.

Table III-4.a. Survey data (Township)

#	Confirmed					Suspected			Potential		
	Wet	BTG permits	Piped	Backups	Holding tank	Green grass	Unsuitable soils	Privy cesspools	< 72	Soils/ Geo	Repair'd
59	2	1	0	0	3	6	0	1	26	0	8
% of Total	3	2	0	0	5	10	0	2	44	0	14

Table III-4.b. Survey data (DRSA)

#	Confirmed					Suspected			Potential		
	Wet	BTG permits	Piped	Backups	Holding tank	Green grass	Unsuitable soils	Privy cesspools	< 72	Soils/ Geo	Repair'd
24	2	0	0	0	1	6	0	0	15	0	2
% of Total	8	0	0	0	4	25	0	0	63	0	4

Figure II-6 shows soil and topographic limitations to types of on-lot systems that can be installed in the DRSA.

For the Derstine Road Study Area, there appears to be some limitations for the effectiveness of standard in-ground disposal systems (because of the shallowness of limiting zones, hydric soils and some steep slope). Elevated sand mounds may be suitable for homes in this area, but this needs to be investigated on a case-by-case basis. However, because of the relatively small size of many of the lots, siting an on-lot disposal system may not be in accordance with the current regulations for new systems regarding isolation distances from wells, other on-lot disposal areas, homes, etc. Generally it can be difficult to achieve the required isolation distances on lots less than an acre. Because of this, a water supply survey was conducted in this area to determine the extent, if any; groundwater contamination exists in this area.

WATER SUPPLY SURVEY

An individual water supply survey was conducted by the Township in accordance with DEP's Sewage Disposal Needs Identification publication. A well water survey (in areas without public water) of the DRSA was conducted. All well samples were tested for total coliform, fecal coliform and nitrate-nitrogen and of the 24 systems, 14 or 58% were sampled.

EPA's safe drinking water criteria for nitrate in public water supplies is 10 milligrams per liter of sample (10 mg/l). Sources of nitrate-nitrogen include natural decay of organic matter, precipitation, mineral weathering, manure application, chemical fertilizers, and malfunctioning sewage disposal systems. None of the well samples exceeded these criteria.

Of the 14 samples collected, 8, or 33%, had nitrate levels greater than or equal to 5 mg/L and none exceed 10 mg/L. These results are concentrated in the southern portion of Derstine Road. Development sites proposing soil-dependent treatment methods within ¼ mile of a water supply that exceeds 5 mg/L nitrate-nitrogen must conduct a preliminary hydrogeologic study.

Total coliform exists naturally in the soil, on vegetation, and in the intestines of animals. By itself, total coliform does not indicate contamination by a septic system. Total coliform counts greater than or equal to one are considered nonpotable. A high total coliform count may be due to an uncased or improperly cased well (allowing for contamination of the well from the surface). Total coliform was not detected in any of the samples in the DRSA. Some additional, Township-wide sampling did detect total coliform contamination in one system. However, it was not greater than 5 and the presence of fecal coliform was not detected.

Sample results are depicted visually on Figure III-3. A summary of the data for the DRSA is shown in Table III-5.

Table III-5. Water Quality Survey Results

Well Samples	**14**					
	Nitrate	**% of tests**	**TC**	**% of tests**	**FC**	**% of tests**
>0	6	43%	0	0%	0	0%
>5 mg/L	8	57%	0	0%		
>10 mg/L	0	0%	0	0%		

OPERATION AND MAINTENANCE REQUIREMENTS

The HTMA or the Township does not currently require operation and maintenance for individual onlot systems. Montgomery County Health Department staff conducts system inspections for new systems as well as inspections of systems with known problems. Exhibit III-4 contains the MCHD forms required for the construction of a new system or modification of an existing system.

C. SLUDGE AND SEPTAGE GENERATION

Sludge generated at the HTMA WWTP is dewatered in a centrifuge and incinerated. The total quantity of sludge generated at the HTMA WWTP for the calendar year 2008 was approximately 485 dry tons.

Septage is the entire contents – scum, sludge, and wastewater – of a septic tank, aerobic treatment unit tank, holding tank, and composting or chemical toilet. Septage is regulated under 40 CFR Part 503 and PA Chapter 273. Septage from a septic tank is generally stronger than domestic wastewater and holding tank waste. In addition, septage characteristics vary depending on factors such as user habits, tank sizes and design, pumping frequency, climate and seasonal weather conditions, and tributary appliances such as garbage grinders, water softeners, and washing machines.

As reported by HTMA staff, the WWTP received approximately 8.6 MG of septage from local haulers in 2008. The HTMA regulates the haulers through a Hauler's permit. A list of the Township's approved haulers is included in Exhibit III-5. The HTMA also received approximately 21.6 MG and 0.47 MG of holding tank and grease trap waste in 2008, respectively. In addition to domestic septage and holding tank waste, HTMA receives a small quantity of trucked waste from a few industrial sources. These are listed in the Annual Pretreatment Report submitted to DEP with the Annual Chapter 94 report.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
WASTEWATER TREATMENT FACILITY
PROCESS SCHEMATIC

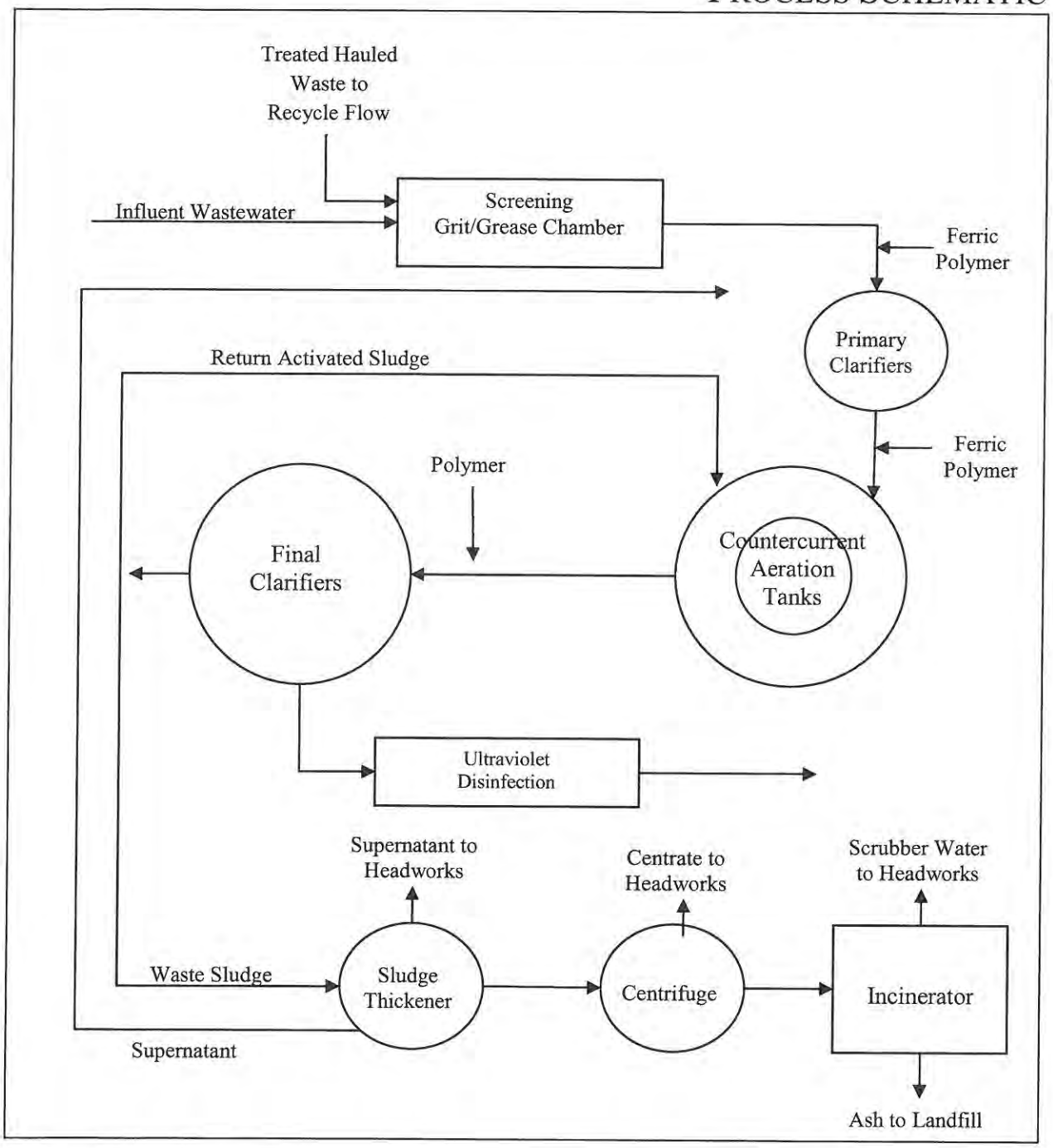
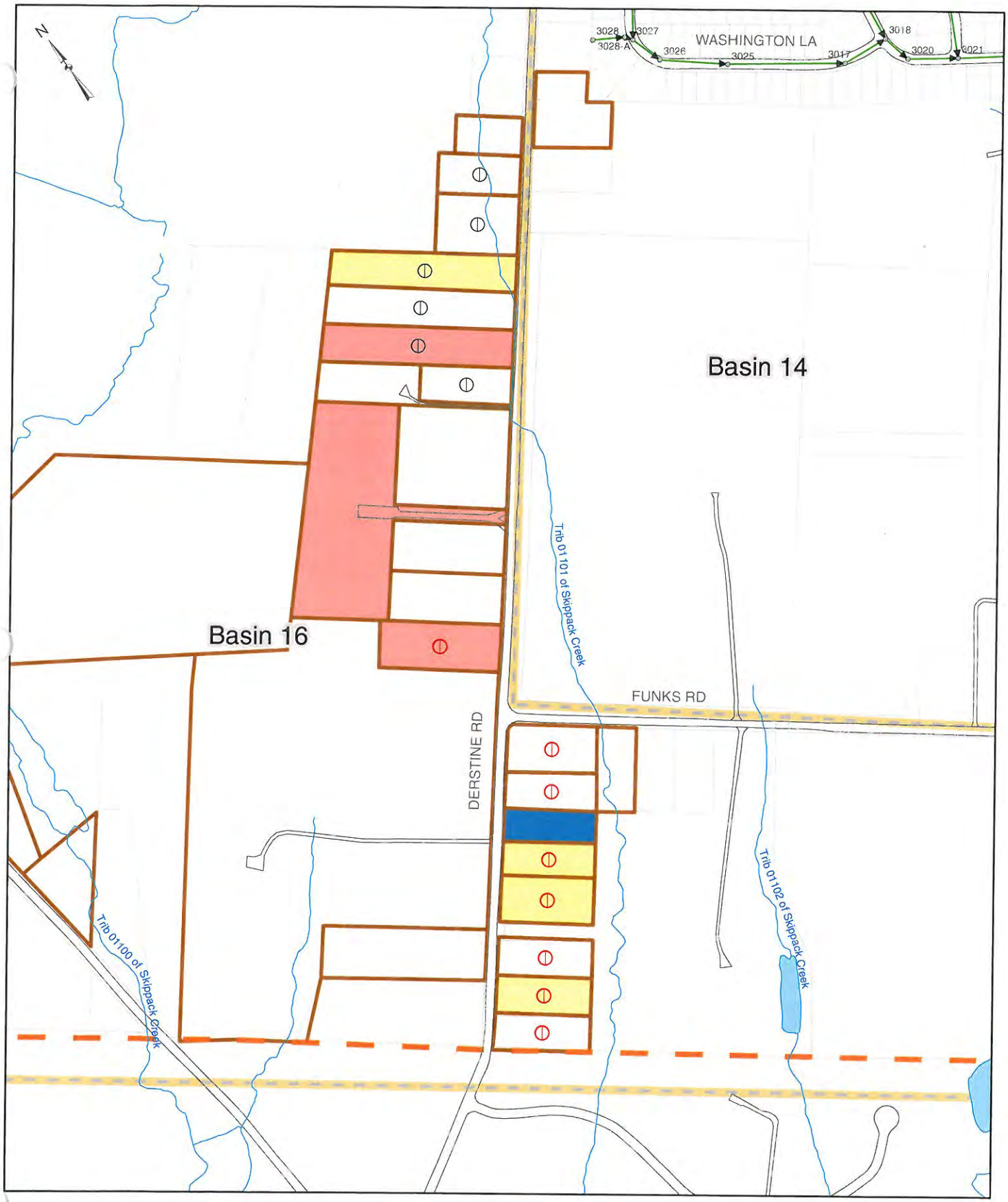


Figure III-1 : HTMA WWTP Process Schematic

Figure III-2: HTMA WWTP Aerial



>5 Mg/L Nitrates
<5 Mg/L Nitrates
Survey Results Received
Confirmed Malfunction
Suspected Malfunction
Potential Malfunction
Water Body
Stream
Parcels
Township Line

* Entire Mapped Area is Brunswick Formation Geology.
** No Total Coliform Contamination was found.

0 200 400 800 Feet

Edit Date: 3/4/2010 1:49 PM
File: J:\Hatfield Township Municipal Authority (0592)\6600 - Act 537\GIS\Results-85x11.mxd

Figure III-3
DRSA - SANITARY SURVEY & WELL SAMPLE RESULTS
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

IV. FUTURE GROWTH AND LAND DEVELOPMENT

A. MUNICIPAL AND COUNTY PLANNING DOCUMENTS

LAND USE AND ZONING PLANS AND REGULATION

The Montgomery County Comprehensive Plan, most recently adopted on September 9, 2004 by the County Board of Commissioners is available online at http://montcopa.org/plancom/comprehesiveplan. This plan, entitled Vision Plan - Shaping Our Future: A Comprehensive Plan for Montgomery County, is intended to provide a vision of the county for the year 2025. This plan is a tool to address land use and recent trends in development projected out through 2025, and proposes alternatives and recommendations to shape how this land use occurs. The "Vision Plan" of the county proposes to:

- Direct new development to logical places, as an extension of existing developed areas or within these areas;
- Preserve critical open space and farmland for future generations;
- Revitalize Main Streets and brownfield industrial sites;
- Tackle traffic congestion effectively, while providing transportation alternatives to the car; and,
- Offer a variety of housing, job, shopping, and recreational choices to county residents.

The overall comprehensive plan was broken into eight separate sections, each focusing on a particular item. These are the Guiding Vision, the Land Use Vision, the Open Space, Natural Features, and Cultural Resource Vision, the Transportation Vision, the Community Facilities Vision, the Water Resources Vision, the Economic Development Vision, and the Housing Vision. Each component of the plan developed goals to attain the proposals listed above. This portion of the Plan Revision will summarize only the Community Facilities and Utilities Vision, Water Resources Vision and Land Use Vision as they pertain to sewage facilities planning in Hatfield Township.

The Land Use Plan, as described above shows how new development can be accommodated in a better way that reduces sprawl, revitalizes older areas, preserves open space, and provides new housing and employment opportunities, while meeting market demand. This plan is aimed at a series of six goals, which can be found in Exhibit IV-1. Of these six goals, the first, "Direct Development in Designated Growth Areas", directly pertains to future facilities planning. The Land Use Plan designates most of Hatfield Township as an Existing Suburban Development. However some portions of the Township, including the western and southwestern areas are Designated Growth Areas. A copy of the Land Use Plan Summary and Growth Areas can be found in Exhibit IV-2. The DRSA is located in the designated growth area as well as a number of other undeveloped areas of the Township. These areas are shown on Plate 5 and will be described in further detail later in this section. Hatfield Township is also designated as a secondary development center, defined as a local community focal point that has a variety of uses.

The Montgomery County Comprehensive Plan addresses sewage facilities and needs through the section entitled "Community Facilities and Utilities Vision". This section identifies three primary goals that affect Hatfield Township sewage facilities planning:

Goal 24: Focus Public Sewer and Water Improvements in Designated Growth Areas
Goal 25: Restrict the Extension of Water and Sewer into Rural Resources Areas
Goal 26: Provide Environmentally-Safe Sewer Facilities

Chapter 2, Sewage Facilities, of the Community Facilities and Utilities Vision, is attached as Exhibit IV-3. This chapter describes the state of the county sewage facilities as well as provides recommendations to meet the goals stated above. These recommendations are listed in Table IV-1 below. This chapter also designates future sewer services areas (Exhibit IV-4) and lists 73 on-lot needs areas, all outside of Hatfield Township.

Table IV-1. County Sewage Facilities Plan Recommendations.

Montgomery County Comprehensive Plan Recommendation
1. Concentrated Sewage Facilities within designated growth areas and existing developed areas.
2. Restrict extension of public sewage into rural resource areas.
3. Provide public sewer and water facilities concurrently, where possible within growth areas.
4. Municipalities with official sewage facilities plans more than 10 years old and those with significant numbers of failing on-lot systems should review and update the documents.
5. Sewage facilities plans should be consistent with regional, county and municipal comprehensive plans, land use plans, zoning ordinances, and open space plans.

The Township Zoning Ordinance and other codified ordinances are available on the website http://www.ecode360.com/?custId=HA2083. A zoning map of the planning area is included as Plate 6.

Sewage facilities and planning in Hatfield Township are governed primarily by the following codified ordinances:

- Chapter 224: Sewers and Sewage Disposal
- Chapter 250: Subdivision and Land Development
- Chapter 282: Zoning

Chapter 224 provides for general sewer use regulations, required connections, holding tank regulations and the Township's waste pre-treatment program. The design of new sanitary sewer facilities and the use of on-lot sewage disposal systems is regulated by the Township's Subdivision and Land Development Ordinance. The Zoning Ordinance provides a standard for lot sizes and arrangements based on zoning and the availability of public sewer and water. All

these documents work together along with the Montgomery County Health Department and HTMA in the siting and construction of sanitary sewer or on-lot sewage disposal systems.

FLOODPLAIN, STORMWATER, AND SPECIAL PROTECTION (CH. 93) PLANS

The 100-year floodplain boundaries shown on Plate 2 were prepared for the National Flood Insurance Program by the Federal Emergency Management Agency (2002).

The Montgomery County Comprehensive Plan outlines numerous best management practices, both structural and non-structural, which municipalities can use to reduce the affect of stormwater discharge. These BMPs are included in the Water Resources Plan Summary which can be found in Exhibit IV-5. As well, the Townships Zoning and Subdivision and Land Development Ordinances regulate development activities in floodplains.

Hatfield Township currently has in place a Stormwater Management Ordinance, Chapter 242 of the Codified Ordinance. This Ordinance places stringent requirements on stormwater facilities and minimizes the need to negotiate size of the stormwater management facilities. Additionally the Township Subdivision and Land Development Ordinance governs the design and construction of new stormwater facilities.

Chapter 93 identifies Special Protection Waters as streams of High Quality (HQ) or Exceptional Value (EV). There are no HQ or EV waters in Hatfield Township.

B. POPULATION

EXISTING AND PLANNED DEVELOPMENT

The 2009 Chapter 94 Report to DEP lists future connections to the collection system from known and anticipated developments projected over the next five years. Per the 2009 Chapter 94 report, total connections to the HTMA system (including contributions from neighboring municipalities) and planned connections over the next six years are shown in Table IV-2. As previously discussed future connections shown below are consistent with correspondence from contributing municipalities.

Table IV-2. Chapter 94 Planned and Projected EDU Connections

		Projected Connections					
Township	Total Connected EDU's	2010	2011	2012	2013	2014	Total Projected and Connected EDU's
Hatfield Twp.	10,589	125	140	140	140	140	11,274
Hatfield Boro	1,550	3	18	8	0	0	1,579
Hilltown Twp.	160	0	0	0	0	0	160
Franconia Twp.	458	0	0	0	0	0	458
Montgomery Twp.	6,457	141	127	97	31	474	7,277
HTMA System	19,214	19,483	19,768	19,963	20,134	20,748	20,748

LAND USE DESIGNATIONS

The County Comprehensive Plan contains a section on existing land use and development patterns. An inventory of land use acreage, updated through 2000, as well as a Land Use Map and Land Use Definitions is contained in Exhibit IV-6.

PAST, PRESENT, AND FUTURE GROWTH TRENDS

The population of Hatfield Township has grown significantly over the past several years. In July 2007, the Delaware Valley Regional Planning Commission developed 2035 population forecasts for Montgomery County. These forecasts, for Hatfield Township and Hatfield Borough are summarized in Table IV-3 below, and the full population forecast can be found in Exhibit IV-7.

Table IV-3. 2035 Population Forecasts

	2000	2005	2010	2015	2020	2025	2030	2035	% Change 00-35
Hatfield Township	16,712	17,577	18,174	18,739	19,273	19,776	20,251	20,689	23.8
Hatfield Borough	2,605	2,889	2,937	2,982	3,025	3,065	3,103	3,138	20.5

The Township growth is comparable to the projected county wide growth with a projected per cent for the Township of 23.8% and the County of 19.4%. Additionally, the County Comprehensive Plan projects approximately 6,500 new connections for the North Penn Area through 2025. This area includes Montgomery Township, Hatfield Township, Upper Gwyned, Towamencin, Hatfield Borough, Lansdale, and North Wales. This area is served by six wastewater treatment plants, including the HTMA WWTP. Utilizing this information, it can be estimated that the projected connection requirement for the HTMA planning area is approximately 25 - 30% of the North Penn projection or approximately 1,600 – 2,000 EDUs by

2025. The county planning information is a useful baseline and with this, the Township and HTMA underwent a more detailed analysis of future projected loadings. This information is provided in the following portion of the plan revision.

C. PROJECTED WASTEWATER LOADINGS

PROJECTED HYDRAULIC LOADING

Projected hydraulic loadings were determined by first making an assessment of the current flow in the Hatfield Township system by the EDU's already connected. Based on the 2009 Chapter 94 report there are currently 19,214 EDU's connected to the system and the five-year average flow per EDU is 327 gpd. This yields a current average flow of 6.28 MGD.

In addition to the current flow there are an additional 1,534 EDU's that are projected to connect in next five years as reported in the 2009 Chapter 94. For purposes of this projection future connections are assumed to contribute **250 gpd/EDU**. This results in a projected flow **0.384 MGD.**

In order to further project flows, a build-out analysis was conducted by Hatfield Township staff. This analysis gave the approximate acreage available for development in each type of zoning classification. By applying an estimate of the potential number of EDU's per acre in each type of zoning the approximate number of future connections can be made. A summary of this analysis is shown below in Table IV-4.

Table IV-4. Projected EDU Connections from Future Growth.

Zoning		Acreage Available	EDU / Acre	Total EDUs	Flow Contribution (GPD)
Residential	RA-1	404	2.0	808	**202,000**
Light Industrial	LI	567	4.5	2,552	**638,000**
	Totals	971		3,360	**840,000**

As shown above this analysis results in an expected additional **0.840 MGD** of flow from build-out of the Township.

Table IV-5 tabulates the above data and includes a sewage contribution from approximately 60 EDU's, assuming all on-lot sewage disposal systems are eventually connected to public sewer.

Table IV-5. Total Projected Future Flow.

Current Flow (MGD)	6.280
Chapter 94 Projected Connections (MGD)	**0.384**
On-Lot Contribution (MGD)	**0.013**
Undeveloped Area Contribution (MGD)	**0.840**
Total Estimated Average Daily Flow (MGD)	**7.517**
Estimated 3 month Maximum Flow (MGD)	**9.246**

As shown above, the average total flow resulting is **7.52 MGD, 0.54 MGD above the 6.98 MGD design capacity of the plant.** When the 5-year average 3-month maximum to annual average flow ratio of 1.23 (per the 2009 Chapter 94 report) is applied, a 3 month maximum flow of **9.25 MGD** results. Given this information, alternatives will be presented in this plan to meet the potential future hydraulic capacity shortfall.

PROJECTED ORGANIC LOADING

Similarly, organic loading is projected below in Table IV-6. A contribution of 0.65 lbs BOD / EDU was used for existing connections as shown in the 2009 Chapter 94 report, while a contribution of 0.41 lbs BOD / EDU was used for future connections.

Table IV-6. Total Projected Organic Load.

	EDU's	BOD Load (lbs/day)
Current Connections	19,214	12,461
Chapter 94 Projected Connections (MGD)	1,534	628
On-Lot Contribution	60	25
Undeveloped Area Contribution (MGD)	3,360	1,378
Totals	24,168	14,492

The projected average BOD load is 14,492 lbs BOD/day. When the 5-year average 1-month maximum to annual average BOD ratio of 1.24 (per the 2009 Chapter 94 report) is applied, a maximum month BOD load of 17,971 lbs BOD/day results, well within the 22,300 lbs/day design capacity.

V. EVALUATE ALTERNATIVES TO PROVIDE NEW OR IMPROVED WASTEWATER DISPOSAL FACILITIES

IDENTIFIED NEEDS

Population and wastewater flow projections were developed in Section IV for a buildout scenario. Based on this analysis it is anticipated that Hatfield Township could require an additional approximately **540,000 gpd** hydraulic treatment capacity.

While there are a relatively few on-lot systems throughout Hatfield Township, a small concentration exists in the Derstine Road Study Area. Sanitary and water sampling results indicates some contamination in the DRSA and other on-lot systems throughout the Township. However, this contamination is not at the level to require an immediate land based solution or extension to existing facilities. Improvements to the operation, maintenance and oversight of these systems are necessary to keep them operating effectively, and prevent further contamination. Currently, the permitting, and inspection of these systems is managed at the county level at the Montgomery County Health Department. Well-water sampling in the DRSA as part of this update indicated some pollution concerns from nitrates.

Alternatives to satisfy the projected wastewater facility capacity needs, and the effective long-term operation of on-lot sewage disposal systems are developed in the remainder of Section V.

A. CONVENTIONAL ALTERNATIVES

REGIONAL WASTEWATER TREATMENT

The HTMA owned wastewater treatment plant currently provides regional wastewater treatment for Hatfield Township and portions of surrounding and adjacent communities. On-lot systems taken offline within the planning area, will also follow this regional approach. The DRSA, located in Drainage Basins 14 and 16, could be served by an extension to the existing sewage facilities in Towamencin Township. This alternative is discussed further in the following section.

EXTENSION OF EXISTING FACILITIES TO AREAS WITH NEEDS

While DRSA is not in immediate need for an extension to existing facilities, should contamination increase, or development necessitate, it may be cost effective to construct facilities to serve this area.

Initial sewage planning and design is underway for the development of the 26-acre parcel currently at 82 Derstine Road. The intended development is to be a 240 unit assisted living development housing area, named Derstine Run. The location of this parcel, Hatfield Township drainage basins, and approximate location of possible connection is shown on Figure V-1. Advanced Living and Management, the developer, is submitting sewage planning requirements

and initial design to Towamencin Township for service. The May 19, 2009 overall preliminary grading and utility plan for this development is located in Exhibit V-1. As shown, sanitary sewer from Derstine Run would flow to an existing manhole south of the Hatfield Township line, and would require the construction of a gravity interceptor in Derstine Road in both Hatfield Township and Towamencin Township. Sanitary sewer laterals are also shown extending from the five (5) southernmost parcels in the DRSA. Of these parcels, water samples taken at three all indicated nitrate levels greater than 5 mg/L.

Additional sewer layout and design, conducted as part of this plan revision, show that modifications to the current developers plan could facilitate the service of most of the homes on Derstine Road, south of Funks Road. Additionally, an extension to these facilities, constructed by Hatfield Township, could facilitate the service of the remainder of the properties in the DRSA.

Hatfield Township is currently in discussions with Towamencin Township in developing an agreement for the release of these units. Additionally, by constructing this extension to serve the DRSA and Derstine Run, other undeveloped areas in Drainage Basins 14 and 16 could be served by this extension. This would in turn decrease the required additional treatment capacity at the HTMA WWTP. Correspondence to this effect was sent to Towamencin Township and is included in Exhibit V-3. This change is shown below in Table V-1.

Table V-1. Total Projected Future Flow

Current Flow (MGD)	6.280
Chapter 94 Projected Connections (MGD)	**0.384**
On-Lot Contribution (MGD)	0.013
Undeveloped Area Contribution (MGD)	**0.840**
Flow deduct for Basins 14 and 16 (MGD)	0.050
Total Required Flow (MGD)	**7.467**

Should Hatfield Township extend its own existing facilities to DRSA, for treatment at the HTMA it would require the construction of a gravity sewer system along with a new pump station and force main. This pump station and force main would convey flows from DRSA and Basins 14 and 16 to the new Funks Road Pump Station. Due to the location and topography of this area, double pumping is required.

USE OF EXISTING FACILITIES THROUGH REPAIR, UPGRADE, LOADING REDUCTION AND IMPROVED OPERATION AND MAINTENANCE

In order to meet the future capacity needs of the Township, alternatives must be explored to increase capacity at the WWTP. Alternatives that should be examined under this section, according to DEP planning guidance, are those involving the continued use of existing municipal sewage facilities through one or more of the following:

- Repair
- Upgrading
- Reduction of hydraulic or organic loading to existing facilities.
- Improved operation and maintenance
- Other applicable actions

This alternative will examine the potential for both upgrading existing facilities and increasing the hydraulic loading capacity of the facility via a hydraulic re-rate.

In June 1991, Tracy Engineers prepared, but did not submit, a re-rate application to Pa DER. This application, contained in full in Exhibit V-4, requested the following capacities be increased for the HTMA AWTF above their 1987 design values:

Table V-4. 1991 Re-rate Capacity Adjustments

Parameter	1987 Design Basis	1991 Re-rate Recommendation
Average Daily Flow (MGD)	6.43	8.25
Maximum Monthly Flow (MGD)	-	11.55
Peak Daily Flow (MGD)	13.65	18.00
Peak Hourly Flow (MGD)	20.80	27.00
Raw Influent BOD_5 (lb/d)	11,832	16,513
Raw Influent TSS (lb/d)	11,832	19,265
Raw Influent TKN (lb/d)	2,622	2,752
Raw Influent NH_3-N (lb/d)	1,929	1,514
Raw Influent NO_x (lb/d)	62	207
Raw Influent TP (lb/d)	462	550
Primary Effluent BOD_5 (lb/d)	8,283	10,899
Primary Effluent TSS (lb/d)	4,732	9,247
Primary Effluent TKN (lb/d)	2,622	2,339
Primary Effluent NH_3-N (lb/d)	1,929	1,445
Primary Effluent NO_x (lb/d)	62	330
Primary Effluent TP (lb/d)	462	414

Tracy's analysis was based on both hydraulic and organic capacities of the treatment units based on plant operating data. This analysis showed that the headworks area was a significant hydraulic bottleneck in the plant, and based on their calculations, limited to a peak hourly flow of 27 MGD due to pipe capacity between the grit/grease chamber and pump station two. Additionally, on an average daily flow basis, calculations showed that the limiting treatment units were the aeration tanks, at an ADF of 8.44 MGD. This was based on a minimum 16 hour detention time. Tracy then selected 8.25 MGD as the potential re-rated ADF and set the other flows based on historical peaking factors. Other parameters were then set based on average and expected loadings. These flows and loadings were then examined to determine what if any modifications may be required. CET has reviewed Tracey's findings and recommendations and finds them to still be relevant at this time.

In order to achieve the higher capacity, a number of upgrades to the AWTF were recommended. These upgrades, along with their status are listed in Table V-5 below:

Table V-5. 1991 Hydraulic Re-rate Recommendations

Recommendation	Status
Increase pumping capacity at Pump Station 1 to 27 MGD	Complete
Install higher curbing and grating at influent channel to mechanical screens	Not Complete
Install higher curbing and grating at mechanical screens	Not Complete
Install higher curbing and grating at effluent channel to mechanical screens	Not Complete
Increase pumping capacity at Pump Station 2 to 27 MGD	Complete
Install additional 160 diffusers in aeration reactors	Complete
Install standby return sludge pumping	Not Complete

Based on this re-rate analysis, an ADF of 8.25 MGD, a MMF of 11.55, a PDF of 18.00 MGD, and a PHF of 27.00 MGD is achievable with the completion of the above recommendations or other hydraulic adjustments to the headworks area. Preliminary hydraulic calculations, conducted by CET as a check of the Tracey data, show that the existing arrangement is sufficient for peak flows up to approximately 24 MGD, and are included in Ex. V-5. This alternative would seek to establish the ADF and permitted capacity of the AWTF at 7.55 MGD based on planning in Section IV, and establish the MMF, PDF, at the flows established by Tracy (11.55, 18.0 MGD, respectively) and a PHF of 24 MGD to match the calculated hydraulic capacity. However, in order to facilitate a 27.0 MGD PHF an upgrade to the headworks must be completed. This can be accomplished as stated above, or with a physical re-routing of peak flows around the existing hydraulic bottlenecks. A more detailed analysis and design of these modifications will be accomplished as existing peak hourly flows increase and following the completion of the ongoing flow equalization project (Section III).

Repair or Replacement of Existing Collection System Components

As previously discussed, Hatfield Township and HTMA have an aggressive maintenance program to repair and replace portions of the collection system that contribute to high I/I. This program is conducted on an as-needed, case by case basis. Additionally as discussed in Section IV, the construction of the new Neshaminy Interceptor will alleviate a hydraulic overload and provide for reserve capacity in the Township's main interceptor sewer.

New Community Sewerage Systems

The Township does not currently require or anticipate the need for new community treatment systems. Given the site constraints and soil conditions in DRSA this is not considered a viable

alternative. Additionally, the dispersion of the other on lot systems throughout the Township does not lend itself to community treatment.

INNOVATIVE/ALTERNATIVE METHODS OF COLLECTION/CONVEYENCE

DEP's Guide includes the following "partial listing of innovative and alternative technologies" available to provide individual and system-wide collection technologies:

- Cluster Systems
- Septage Treatment
- Small Diameter Gravity Sewers
- Vacuum Sewers
- Variable Grade Sewers
- Septic Tank Effluent Pump with Pressure Sewers (STEP)

The Township does not anticipate the need to use innovative or alternative methods of collection or conveyance to serve the DRSA. Should these systems be proposed as part of new development, they will be addressed on a case by case basis.

B. INDIVIDUAL SEWAGE DISPOSAL ALTERNATIVES

Individual sewage disposal systems may be permitted for new land development where conditions are suitable as established by the Montgomery County Health Department Sewage Enforcement Officer (SEO), and where the Township assures their proper operation and maintenance as required by Chapter 71.62. The technical solutions available for onlot repair and placement of onlot replacement systems are limited by soil and site conditions. If the soils are suitable in the area of the repair, standard in-ground systems may be used; if the soils are marginal, elevated sand mounds, oversized systems, or shallow placement systems can be considered for use, as is the case in much of the DRSA. The plan should closely evaluate the advantages of testing for and protecting a second suitable site on each lot for future replacement systems. The system design must include provisions for access to system components for maintenance requirements.

As per DEP Planning Module Component 3, a preliminary hydrogeologic evaluation of the proposed development site is required by DEP when a water supply within ¼ mile of the development site exceeds 5 mg/L of nitrate-nitrogen, or DEP has determined that known geologic conditions may contribute to the potential for groundwater pollution.

A sewage management program is recommended to comply with Chapter 71.71, which states that municipalities are required to "assure the proper operation and maintenance of sewage facilities."

The Township can establish a workable comprehensive management program in conjunction with systems already in place with MCHD that ensure proper design and operation. The

Township's program will address the continued use of onlot systems throughout the Township and protect and improve water quality and public health by providing public sewerage where appropriate and by enhancing the performance and reliability of the decentralized systems. In turn, with adequate management, the homeowner's investment is protected, the service life of the system increases which saves on replacement costs, the groundwater is conserved and replenished, and the community eliminates the need to finance extensive collection system sewers. The management program will detail recommended approaches for public education and participation, planning, siting, design, performance, installation, operation, maintenance, inspections/monitoring, corrective actions, record keeping and reporting, and financial assistance and funding of wastewater systems.

In implementing this Sewage Facilities Plan Revision, the Township has adopted an On-Lot Management Ordinance, included in Exhibit V-6. The ordinance requires that each onlot system be inspected and pumped on a regular schedule. The Township's Sewage Management Plan will be managed by theirs and HTMA staff. Coordination will be made with the MCHD SEO in the event a system problem is identified. Qualified haulers shall inspect the onlot system each time the system is pumped and complete the septage manifest report form. Septage will be hauled to the wastewater treatment facility.

The ordinance also provides for the intervention and enforcement capabilities to correct a suspected onlot system problem. System repair, rehabilitation or replacement will be required for those systems that are confirmed as a malfunction.

When evidence of nitrate and fecal coliform contamination is found within the Township, it may be surmised that there are problems with some individual OLDS, as is the case in much of the DRSA. These problems can be addressed in a variety of ways within the tenants of the Sewage Management Plan. These approaches include replacement systems, should site conditions be adequate, and investigation of sources and remedies for contamination, which include but are not limited to well placement, well casing, new well drilling, and well disinfection or ultraviolet disinfection on the service line.

The use of water conservation devices in the home is not mandated by Township ordinance. Although generally accepted as being a good idea, water conservation devices tend to play a negligible role in rural wastewater planning and design. However, where systems are deemed to be overloaded or malfunctioning, water conservation devices may be required to be installed to lessen the hydraulic loading to the existing system.

Each of the systems will be inspected initially per the Township's Onlot Management Program Ordinance. Where necessary, an attempt to replace a failing system with an individual or small flow treatment system will be the initial consideration.

C. SMALL FLOW TREATMENT FACILITIES

Small flow treatment facilities as detailed in DEP's *Small Flow Treatment Facilities Manual,* (November 23, 2003), are restricted to use as a replacement or repair system for onlot system malfunctions as determined by the local agency. While no specific application of these systems have been identified by the needs analysis, this plan allows the local agency and the Township to use a small flow sewage treatment facility when deemed necessary and in compliance with the regulations regarding design, installation, operation, maintenance, and the Township's Sewage Management Program.

D. COMMUNITY LAND DISPOSAL ALTERNATIVES

While no specific application of community land disposal alternatives has been identified in the needs analysis, this plan allows the use of these systems in compliance with Chapter 71.64 of DEP's regulations regarding site and soil suitability, and a hydrogeologic evaluation, and in accordance with the Township's Sewage Management Program.

E. RETAINING TANK ALTERNATIVES

This section has been prepared in compliance with Chapter 71.63. Retaining tanks (defined in Chapter 71.1) may be used with specific restrictions. Any retaining tank waste generated in the Township may be disposed of at the wastewater treatment facility. Requirements for regular service and maintenance of tanks would be enforced through existing Sewer Use Ordinance, Chapter 224, Article 1.

F. SEWAGE MANAGEMENT PROGRAMS

Municipalities are required to assure the proper operation and maintenance of sewage facilities within their borders. The Township intends to institute a Sewage Management Program (SMP) that provides the method to identify, evaluate and implement the operation and maintenance needs of existing and proposed sewage facilities in the Township. This program will assure the future operation and maintenance of existing and proposed sewage facilities, which protects the water resources, public health and homeowner investment. The SMP will be managed and administered by the Township. The Township will coordinate with the MCHD SEO as necessary. This plan revision was sent to MCHD for review. This correspondence, along with MCHD comments is included in Appendix B.

DEP's minimum requirements for a Sewage Management Program in accordance with Chapter 71.73 include:

- ❑ The adoption of the legal authority allowing access for inspections; and the development of a policy for scheduling inspections, and providing a method to notify owners of the policy.
- ❑ Standards for operation, maintenance, repair or replacement of sewage facilities:
  - o Scheduled removal of septage

- Protection of treatment and absorption areas from stormwater impacts and physical damage.
- Reduced hydraulic loading through water conservation devices.
- Maintenance of a systems mechanical and electrical components
- Septage hauler requirements consistent with the Solid Waste Management Act.

- ❑ Establish a fee schedule
- ❑ Enforcement provisions
- ❑ Penalty provisions
- ❑ Ordinances, regulations or policies

In instituting this program the Township has adopted an Onlot Management Ordinance as previously discussed. While the adoption of a management ordinance provides the regulatory framework and grants access for the Township, other key elements of the SMP are discussed in the following section.

Repair, Replacement, or Upgrading of Malfunctioning Onlot Sewage Systems

System rehabilitation will be required for confirmed system malfunctions or for inadequate systems. Repair or replacement of a malfunctioning system will be by a permit issued by the Sewage Enforcement Officer according to the provisions of Act 537 and Chapter 73 Rules and Regulations.

To determine if a system is malfunctioning, any or all of the following inspection tasks may be used, accomplished by HTMA and Township staff and in coordination with the MCHD SEO:

- ❑ Reviewing records of the system.
- ❑ Pumping of the septic tank and checking the tank for water tightness and structural integrity.
- ❑ Checking the balance of the system for integrity—e.g., broken pipes, alarms on pump systems.
- ❑ Probing or excavation to confirm field location.
- ❑ Excavation to determine construction of the field—for proper construction and/or for depth between bottom of trench and rock, groundwater or impermeable layer.
- ❑ Walkover inspection of field area, checking for signs of surfacing effluent.
- ❑ Investigation of nearby slope breaks for evidence of seeping effluent, or to find straight pipes.
- ❑ Dye testing to confirm that seeps do include effluent from the system in question.
- ❑ Flow testing to confirm that a straight pipe emanates from the system in question.
- ❑ Determining proximity of the field to wells.

Public Education

To assure the proper operation and maintenance of the onlot systems in Hatfield Township a public education program would be established. Informational brochures describing how septic

systems work, how to take care of a septic system, water conservation and system record keeping will be made available. This information will be provided by the Township at notification of pump out. Examples of handouts and flyers are included in Exhibit V-7.

EXPANSION AND CONTINUED USE OF EXISTING AND NON-MUNICIPAL SEWAGE FACILITIES

The improved maintenance of existing systems and a method of monitoring performance should allow the continued use of on lot systems throughout the Township. However, repairs and replacement of existing systems, should they malfunction or be found to be substandard, may be challenging on some lots.

It is possible that the Township and the MCHD SEO will have to consider the use of Best Technical Guidance as defined in Chapter 73 of the Pennsylvania Code, or recommend an individual sewage system. Systems suspected of not operating properly shall be inspected by the SEO and if necessary, in accordance with DEP regulations and the Ordinance, be upgraded and improved. Those not upgraded and improved, because it is not feasible to do so, may be replaced by a holding tank. The Onlot Management Ordinance permits the Township to make the changes at the owner's expense if necessary.

To assist municipalities in helping homeowners maintain their systems with the goals of protecting public health and environmental quality, the EPA developed five models for management programs. See Exhibit V-8 for a summary of these models. All models include proper siting and construction of systems, and a systems inventory.

G. COMPREHENSIVE PLANNING

Montgomery County's Comprehensive Plan was developed to allow for land development and economic growth while maintaining the character of the County. Township zoning and land development ordinances are in place to assist in the controlled, orderly development of the Township.

The rules and regulations related to planning within the Township, as outlined in the Township's existing Zoning and Subdivision and Land Development Ordinance appear adequate to manage the proposed technical alternatives. Therefore, no new non-structural comprehensive planning activities are required at this time.

H. NO-ACTION ALTERNATIVE

As shown in Section III and IV, a projected hydraulic overload could occur at HTMA's WWTP during the planning period without addressing the alternatives previously described. Based on this, the no-action alternative is not a viable one at this time as it relates to the WWTP.

In regard to the service of on-lot systems in the Township, specifically the DRSA, a no action approach could be taken. DEP planning guidance requires the no-action alternative include a discussion of the impacts on several items. These items and associated impacts are listed below:

- Water Quality / Public Health: Nitrate contamination already present in the well samples in the DRSA could increase above acceptable levels over time.
- Growth Potential: Lack of public sewerage facilities is generally a hindrance to growth, and any new development proposing land based treatment would require a preliminary hydrogeologic study.
- Community Economic Conditions: These conditions would likely not change with the no-action alternative.
- Recreational Opportunities: These conditions would likely not change with the no-action alternative.
- Drinking Water Sources: As previously stated, current groundwater nitrate could rise above acceptable levels in private wells, leading to potential health hazards.

I. SELECTION OF WASTEWATER TREATMENT ALTERNATIVES

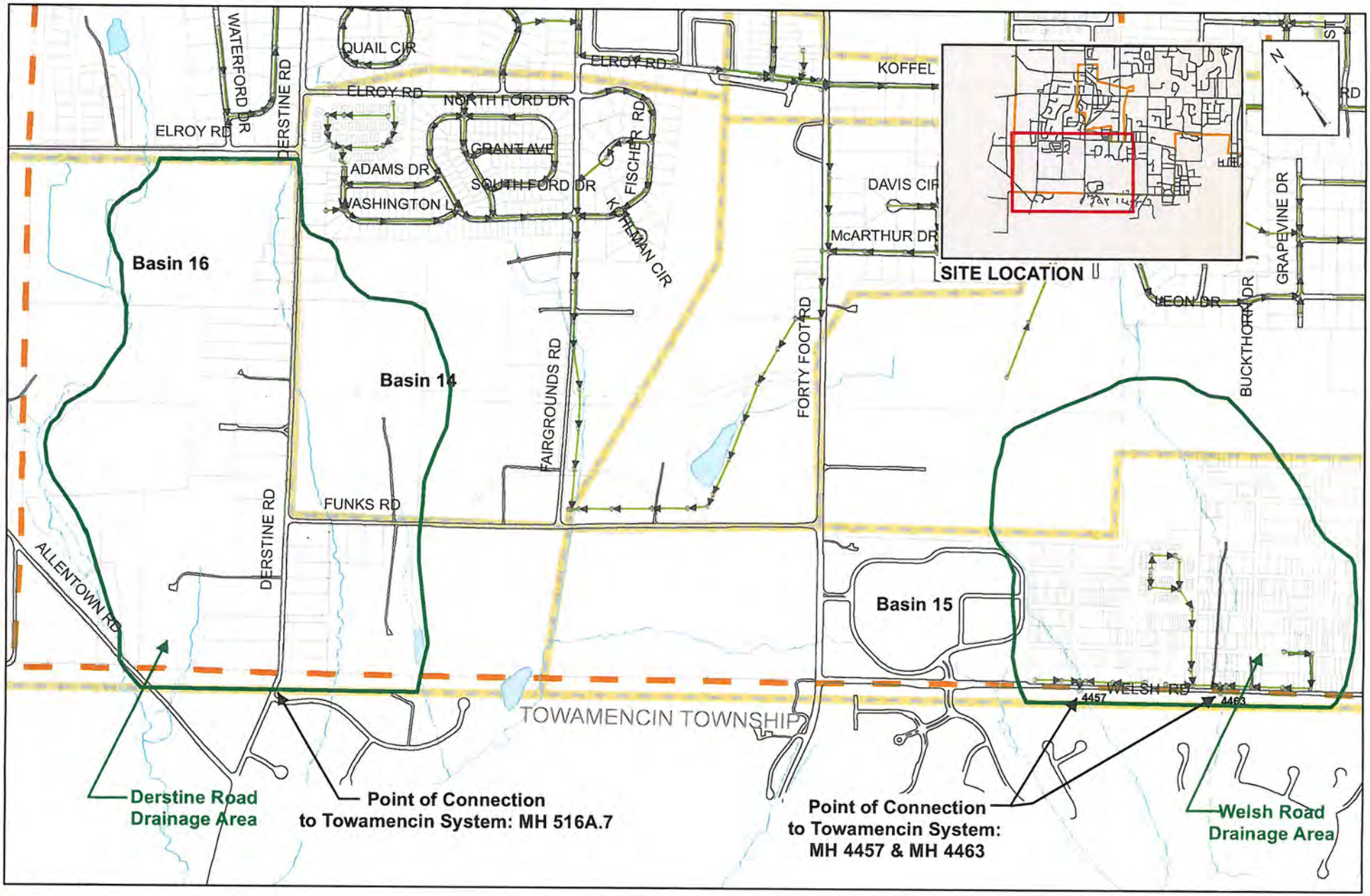
The following wastewater treatment alternatives were selected for further evaluation.

1. Provide additional permitted capacity in the HTMA AWTF via a hydraulic re-rate up to 24 MGD.

2. Develop and implement a sewage management program to ensure the long-term efficacy of on-lot septic systems.

3. Continue negotiations and coordination with Towamencin Township in order to enter into an agreement for the sanitary sewer service for DRSA, portions of Basins 14 and 16 and the Derstine Run development.

4. No-action alternative in regard to service of DRSA area.



Hatfield Sanitation Basins | Manhole | Water Body | Parcels
Gravity Sewer | Stream | Township Line

0 250 500 1,000 Feet

Figure V-1: Basins 14 & 16 Derstine Run Development

Date: 1/5/2011
Path: J:\Hatfield Township Municipal Authority (0532)\6600 - Act 537\GIS\Derstine and Welsh Rd.mxd

DERSTINE & WELSH RD DRAINAGE AREA
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

VI. EVALUATION OF ALTERNATIVES

A. CONSISTENCY ANALYSIS

Wastewater management alternatives developed as part of the Act 537 planning process are evaluated in terms of their relationship to the goals and objectives of various planning, environmental, and natural resource laws and policies of the Commonwealth of Pennsylvania. Title 25, § 71.21.a of the Pennsylvania Code requires the Act 537 plan to address the consistency of each wastewater management alternative with eleven of the Commonwealth's goals and policies. If there is a conflict between the recommended alternative and one of the goals and objectives, the conflict must be resolved in order to obtain regulatory approval.

The following sections discuss the eleven evaluation categories as outlined in the PA DEP Act 537 Plan Content and Environmental Assessment Checklist and the consistency determination as they relate to the alternatives presented in Section V.

CLEAN WATER MANAGEMENT PLANS PER SECTIONS 4 AND 5 OF CLEAN STREAMS LAW

Section 4 of the Pennsylvania Clean Streams Law stresses the importance to maintain clean, unpolluted streams so as to attract industry and provide for outdoor recreational activities, prevent further pollution to streams, and restore polluted streams. Each of the aforementioned factors has direct impacts related to the economic prosperity of Pennsylvania. In regards to wastewater treatment and disposal, Section 5 of the Clean Streams Law recommends a regional approach to wastewater management in part to accomplish the points raised in Section 4.

Both Alternatives 1 and 2 represent an increase in the total organic and hydraulic load on the Neshaminy Creek. However, through continued process optimization and monitoring it is expected that both these alternatives would continue to meet discharge permit limits and maintain the health of the stream. Alternative 3 eliminates local stream contamination by removing on-lot systems from service. Additionally, this alternative represents a regional approach to treatment. The HTMA AWTF is already a regional facility, and as such is consistent with the Clean Streams Law.

MUNICIPAL WASTELOAD MANAGEMENT (CHAPTER 94)

The HTMA annually prepares Chapter 94 Reports on behalf of the Township and is responsible for submission of these reports to DEP. The projections used in this plan are consistent with those included in the Chapter 94 Reports. The alternatives developed for this plan are consistent with the recommendations and findings of the Chapter 94 Reports.

TITLE II CLEAN WATER ACT PLANS

Title II, Section 210 of the Clean Water Act calls for wastewater treatment practices to utilize the best practicable wastewater treatment technologies available to prevent water and other

environmental pollution. It encourages a regional approach to wastewater treatment and disposal, and the control of all point and nonpoint sources of pollution. As shown in Section V, any increase in sewage flow as discussed in Alternate 1 will continue to be treated to within in NPDES permit limits. Additionally, since the treatment facility and conveyance system currently follow the regional approach, these Alternatives are consistent with Title II of the Clean Water Act. Alternative 2 has no impact on regional wastewater treatment.

COMPREHENSIVE PLANS

Montgomery County's Comprehensive Plan goal is to allow for land development and economic growth while maintaining the character of the County. The objectives of the Comprehensive Plan related to sewerage facilities are:

- Concentrate facilities in designated growth areas.
- Restrict extension of public sewage to rural resource areas.
- Provide public sewer and water services concurrently, where possible within growth areas.
- Municipalities with official sewage facility plans more than 10 years old should review and update.

All listed alternatives are consistent with these goals.

ANTIDEGRADATION REQUIREMENTS

To implement federal antidegradation requirements, streams are designated by DEP as High Quality or Exceptional Value waters. No HQ or EV streams exist in the planning area.

STATE WATER PLAN

The current State Water Plan replaces an outdated plan that was completed in 1983. The obsolescence of the current State Water Plan led the Department of Environmental Protection (DEP) to conduct a series of sixteen water forums in the spring of 2001 that sought opinions from the public about water resource management. The forums helped DEP set its strategic water resources management agenda, and generated grass roots support for legislation to require adoption of a new State Water Plan. The Water Resources Planning Act, signed into law on December 16, 2002, established a Statewide Water Resources Committee and six Regional Water Resources Committees that are charged with guiding DEP through the development of a new State Water Plan and updating it at five year intervals. This new updated State Water Plan was adopted in January of 2009.

The updated State Water Plan seeks answers to the following questions: How much water do we have? How much water do we use? How much water do we need? As a functional planning tool, this updated water plan provides Pennsylvanians with a vision, goals and recommendations for meeting the challenges of sustainable water use over a fifteen year planning horizon.

Alternatives presented in this plan are consistent with the goals of the new state water plan. Currently, DEP is identifying critical water planning areas where demand exceeds or is projected to exceed supply, create critical area resource plans or "water budgets", and establish voluntary water conservation programs. As part of the updated plan, DEP projects a potential growth of 20% in the Delaware River Basin. This is consistent with population projections listed in this Plan Revision. A full copy of the plan is located at Pa DEP's new State Water Plan website.[1]

PENNSYLVANIA PRIME AGRICULTURAL LAND POLICY

The Pennsylvania Prime Agricultural Land Policy was established to protect prime agricultural land from irreversible conversions to uses that result in the loss of land as an environmental or essential food production resource. An Agricultural Security Area is a unit of land used for agricultural production. This designation prevents municipalities from enacting ordinances that restrict normal farming practices on existing farms, discourages condemnation of lands by eminent domain by any governmental agency, and make the lands eligible to participate in the State's $100 million Agricultural Easement program where development rights to lands are purchased by a local body to preserve farmlands. Inclusion of property in an Agricultural Security Area does not prevent a landowner from developing the land. These security areas affect the enforcement of ordinances developed under Act 247. The proposed alternatives do not impact Agricultural Security Areas.

COUNTY STORMWATER MANAGEMENT PLANS

The Montgomery County Stormwater planning by PA DEP as part of the Act 167 program is conducted on a watershed basis. The planning associated with the watersheds relating to the Township is not complete. All stormwater management plans associated with the implementation of the alternatives discussed in this report will follow the criteria and planning goals of both the Hatfield Township Zoning Ordinance. Implementation of any of the alternatives discussed will be consistent with the most up to date Montgomery County Stormwater Planning objectives.

WETLAND PROTECTION

Areas classified as wetlands per the US Fish and Wildlife Service's National Wetlands Inventory (NWI) are identified in the DRSA in Figure II-4. The proposed alternatives will not impact any wetlands as identified by the NWI mapping. There do exist, however, several soils types that are identified as having hydric inclusions. A wetland field investigation will be performed in project areas that contain hydric soils. The wetland delineation will take place during the planning stage. Subsequent placement of the sewerage facilities in or through wetlands and/or streams will be minimized. If wetland encroachment cannot be avoided, DEP and US Army Corps of Engineers' approval will be required. Construction through wetlands, if permitted, may require the use of a U.S. Army Corps of Engineer's Nationwide Permit 12 and/or a DEP General Permit BDWM-

[1] http://www.pawaterplan.dep.state.pa.us/StateWaterPlan/docroot/Default.aspx

GP-5. Temporary road crossings through wetlands or streams may require a DEP General Permit BDWM-GP-5.

SPECIES PROTECTION

Pennsylvania Natural Diversity Inventory (PNDI) maintains a database containing site information on regulated plant and animal species, outstanding geological features, and significant natural communities. None of the alternatives listed in Section V include construction projects and therefore do not necessitate PNDI searches.

HISTORICAL AND ARCHAEOLOGICAL RESOURCE PROTECTION

Pennsylvania Title 37, Section 507 requires cooperation between public officials and the Pennsylvania Historical and Museum Commission. None of the alternatives listed in Section V include construction projects and therefore do not require a cultural resource notice.

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B. RESOLUTION OF INCONSISTENCIES

No inconsistencies or conflicts have been identified.

C. WATER QUALITY STANDARDS AND EFFLUENT LIMITATIONS

While the alternatives do represent additional sewage discharge, no significant impacts to the current water quality standards and effluent limitations are expected.

D. COST ESTIMATES FOR PLAN IMPLEMENTATION

"Present Worth" is the sum, which, if invested at the present time at a given fixed rate, would provide the funds for present capital costs, future capital costs and annual operating/maintenance costs for the planning period. By using a "present worth" method, dollars spent on construction at the beginning of the planning period can be compared to dollars spent on operating costs throughout the planning period.

In regards to Alternative 2, the administrative cost to implement the SMP is estimated at $150 per lot or $8,850. Annual costs to administer the SMP through mail reminders and data tabulation are estimated at $1,500 per year, resulting in a Present Worth of $36,000.

The administrative cost to develop a public education program is estimated at $10,000, include handouts and mass mailings.

E. FUNDING METHODS

Alternatives presented in this plan may be funded out of either existing Township funds or through Sewer Revenue Bond issues. The Township may fund the SMP out of its existing sewer

use funds, or through the collection of a program fee assessed per EDU estimated at $50 per year.

To repair onlot systems, property owners may apply for low-interest loans from $1,500 to $25,000 available through PA Infrastructure Investment Authority and PA Housing Finance Authority. Contact 717-783-4487, or search www.pennvest.state.pa.us

F. IMMEDIATE AND PHASED IMPLEMENTATION

None of the alternatives require immediate or phased implementation.

G. PLAN IMPLEMENTATION

No new municipal departments or municipal authorities are required to implement the proposed plan. The Township and Authority's existing administrative personnel are adequate to implement the proposed alternatives.

VII. INSTITUTIONAL EVALUATION

A. EXISTING WASTEWATER AUTHORITIES

The Hatfield Township Municipal Authority owns and operates the existing collection and conveyance and wastewater treatment facilities. HTMA provides maintenance services for the entire system including collection and conveyance, pump stations, and the treatment facility. Additionally, the Township and HTMA will manage the on-lot systems and will administer the Sewage Management Program.

FINANCIAL AND DEBT STATUS

HTMA's Sewer Revenue Fund Budget is prepared annually and presented to the Authority for review. HTMA projects sufficient revenues from sewer rentals, tapping fees, and other sources to cover yearly expenditures as well as any expenditures relating to the alternatives in this Plan Revision. HTMA is not currently carrying any debt.

Expenditures include costs to operate and maintain the collection system and pumping stations, administer the sewer system, and treatment and maintenance costs associated with the wastewater treatment plant.

STAFF AND ADMINISTRATIVE RESOURCES

As a First Class Township, the Board of Commissioners consists of a five member board who are elected to a 4-year term. The Board of Commissioners meets on a monthly basis, and additionally as required, to review and set policy and to consider and act on other matters as appropriate. Additionally, numerous committees are established to provide recommendations and reports to the Board of Commissioners. These committees include the Civil Service Commission, Environmental Advisory Committee, Health, Hospital, and Education Authority, Industrial Development Authority, HTMA, Parks and Recreation Board, Planning Commission, Pool Advisory Board, Shade Tree Commission, and the Zoning Hearing Board.

The HTMA also consists of a five member board elected to five year, staggered terms. The Authority board meets on a monthly basis and additionally as required. HTMA is staffed by an Executive Director, AWTF Superintendent, Collection System Manager, and also retains a solicitor and consulting engineer.

LEGAL AUTHORITY

The Township currently has established Chapter 224 of its codified ordinances which regulates the use of its sanitary sewer system. The Township has the legal authority to implement selected wastewater management alternatives, and is fully empowered to enforce all ordinances, set user fees and take purchasing actions, raise capital for construction and operation and maintenance of facilities, and negotiate inter-municipal agreements.

Regarding onlot system management, the Township will adopt the Onlot Management Program Ordinance. Upon approval of this plan by DEP, the Township expects to implement, conduct and enforce the Onlot Management Program and Ordinance.

B. INSTITUTIONAL ACTIVITIES NECESSARY TO IMPLEMENT PLAN

NEED FOR NEW MUNICIPAL DEPARTMENTS OR AUTHORITIES

No new municipal departments or authorities are necessary to implement the Plan.

FUNCTIONS OF EXISTING AND PROPOSED ORGANIZATIONS

The HTMA owns and operates the collection, conveyance, and treatment facilities. As such, it is responsible for the maintenance, inspection, and operation of the collection system improvements proposed as alternatives in this Plan.

Upon approval of the Plan, the Township will administer the management (maintenance) of onlot sewage facilities in accordance with the Onlot Management Ordinance.

COST OF ADMINISTRATION AND THE CAPABILITY OF THE AUTHORITY TO REACT TO FUTURE NEEDS

The cost to administer the implementation of the Plan will be incurred by HTMA through their sewer revenue fund sources, tapping fees, and user rates. The Township may enact registration and management fees for the onlot management program administration. Therefore, Township property owners will directly and indirectly incur the majority of the costs to implement the SMP alternative of the Plan.

C. ADMINISTRATIVE AND LEGAL ACTIVITIES NECESSARY TO IMPLEMENT THE PLAN

INCORPORATION OF AUTHORITIES / AGENCIES

Current institutions, embodied as the Township are considered adequate to implement the proposed Plan.

ORDINANCE DEVELOPMENT, REGULATIONS, INTERMUNICIPAL AGREEMENTS

All legal activities currently identified as necessary to implement the Plan are included herein. The Township has in place, refers to, or recently adopted the following documents required to implement the recommendations in this Plan:

1. Hatfield Township Sewer Use Ordinance Chapter 224
2. Hatfield Township Zoning Ordinance Chapter 282
3. Onlot Management Ordinance No. 608

ACTIVITIES REQUIRED TO PROVIDE ROW, EASEMENTS, AND LAND TRANSFERS

This Act 537 Sewage Facilities Plan was advertised for public comment with none received. The County Planning Commission was sent a copy of the 537 Plan for review. Comments received, and responses to the comments received are included in Appendix D. To implement the recommendations of this plan, the Township has formally adopt this Act 537 Sewage Facilities Plan by resolution after the public comment period. A signed and sealed Resolution will be included in Appendix A. Additionally, a preliminary agreement has been reached between Hatfield Township and Towamencin Township to serve the DRSA and portions of Basins 14 and 16.

ADOPTION OF OTHER MUNICIPAL SEWAGE FACILITIES (ACT 537) PLANS

The adoption of other municipal Act 537 plans is not necessary to implement the proposed alternative.

OTHER LEGAL DOCUMENTS

It is not anticipated that any other legal documents, besides those already discussed in this Plan, are required to implement the proposed alternative.

DATES ON IMPLEMENTATION SCHEDULE

All administrative and legal activities necessary to implement the proposed alternative are currently in place. Therefore, the Township is prepared to implement the Plan upon DEP approval.

D. PROPOSED INSTITUTIONAL ALTERNATIVE IDENTIFICATION

The Township intends to implement this Plan by enforcing an Onlot Management Ordinance.

VIII. JUSTIFICATION FOR SELECTED TECHNICAL AND INSTITUTIONAL ALTERNATIVES

A. IDENTIFICATION AND JUSTIFICATION OF CHOSEN TECHNICAL WASTEWATER ALTERNATIVES

Alternatives 1 and 2 are considered the best municipal wastewater collection, conveyance, and treatment alternatives to meet the needs of the Township.

EXISTING NEEDS

Implementation of Alternative 2 meets the existing needs of the Township by providing adequate oversight on both the DRSA and other on-lot systems throughout the Township. This alternative, in conjunction with the programs currently in place with the Montgomery County Health Department, will ensure ground and surface water protection.

Hatfield Township and HTMA will continue to explore with Alternative 3; however, since this alternative is somewhat dependant on development in the DRSA, a definitive implementation schedule cannot be established.

Existing capacity needs are currently being met by the ongoing Neshaminy Interceptor and Flow Equalization projects.

FUTURE NEEDS

Implementation of Alternative 1 will provide the Township and HTMA additional hydraulic and treatment capacity at its Advanced Wastewater Treatment Facility. This alternative, via a re-rate, would bring the AWTF flows up to 7.55 MGD ADF and 11.55 MGD MMF, and eliminate the possible Chapter 94 hydraulic overload.

Additionally, calculations included in Alternative 1 provide for a peak hourly flow capacity of up to 24 MGD. This flow is adequate to meet future need at this time, however ongoing flow analysis by HTMA will monitor peak flows and should it be necessary develop possible modifications for increased peak flow capacity.

OPERATION AND MAINTENANCE

The Township and HTMA is prepared to invest in additional O & M related resources, to meet future flow needs and administer the SMP.

COST EFFECTIVENESS

Implementation of Alternatives 1 and 2 were determined to be cost effective as neither alternative requires a capital upgrade.

MANAGEMENT AND ADMINISTRATIVE SYSTEMS

Existing staffing and resources available to the Township and HTMA are adequate to support all management and administrative duties associated with the implementation of Alternative 1 and 2 with minimal additional costs.

AVAILABLE FINANCING METHODS

As discussed in Section VII, due to the low capital expenditure required for these options, financing is not expected to be necessary

ENVIRONMENTAL SOUNDNESS / COMPLIANCE

Although no capital construction is required, Alternative 1 allows for additional permitted flow discharging to the West Branch of Neshaminy Creek on an annual average basis. As shown, this discharge will be treated to the current NPDES discharge limits. Should additional, future, more stringent regulation arise, HTMA and it's consulting engineer would be conduct further evaluation to determine impacts on the facility.

By instituting an SMP, the Township will be taking a proactive role in ensuring on-lot systems are functioning within published standards.

B. IDENTIFICATION OF CHOSEN CAPITAL FINANCING PLAN

The Township intends to fund Alternatives 1 and 2 through the current sewer budget and revenues.

C. IMPLEMENTATION SCHEDULE

The Township intends to implement both selected alternatives upon approval of this plan revision by DEP. The anticipated schedule is listed below:

- Act 537 Plan Comment and External Review Period: March – April 2010
- Address Comments as necessary: April 2010
- Draft On-lot Management Ordinance: April – August 2010
- Adoption of On-lot Management Ordinance: September 2010
- Adoption of Act 537 Plan Revision: October 2010
- Submission of Act 537 Plan Revision to DEP November 2010
- Receipt of DEP Comments to Act 537 Revision: January 2011 – **August 2013**
- Submission of Revisions to Act 537 Plan Revision: May 2011 – **October 2013**
- Receipt of DEP Approval to Act 537 Revision: Time Zero (T)
- Implementation of Alternative 2: T+3 months
- Submission of Water Quality Management (WQM) Permit Pt. I Application: T+9 months[1]
- Submission of WQM Pt. II Application: 1 to 6 months following DEP approval of Pt. I Application[2][3]
- Implementation of Alternative 1: 1 to 6 months following DEP approval of Pt. II Application[4]

[1] **Pending review of current plant and most recent Chapter 94 data, HTMA will proceed with an incremental re-rate less than 7.55 MGD.**
[2] Based on DEP timing for review, approval, and issuance of new limits. Required to determine actual toxic limits since they are not available through the PTR process
[3] Timing of this submission is dependent on final limits received and the scope of the application. This could range from a Design Engineers report only to a preliminary design for a process upgrade (necessitated by lower limits)
[4] Depends on (2) and the scope of any required project

Exhibits

Hatfield Township, Montgomery County

Exhibit PS-1

Sewage Management Program Fact Sheet

Hatfield Township, Montgomery County

Fact Sheet

Commonwealth of Pennsylvania • Department of Environmental Protection **Act 537 #3**

SEWAGE MANAGEMENT PROGRAMS
Ensuring Long-Term Use of Onlot Systems Through Proper Operation and Maintenance

The Pennsylvania Sewage Facilities Act (Act 537) requires all municipalities to develop and maintain an up-to-date sewage facilities official plan to protect public health from diseases, prevent future sewage treatment problems and protect the quality of the state's surface water and groundwater. As part of an official plan update, the municipality should consider developing a sewage management program. Such a program to ensure the operation and maintenance of onlot sewage systems should be established before malfunctions are widespread in an area. Malfunctioning onlot treatment systems can endanger public health, degrade the environment and reduce property and community value by discharging onto public areas, private property or contaminating receiving waters including drinking water supplies.

Properly designed and installed onlot treatment systems function better and longer with regular maintenance. Sewage management programs ensure that onlot sewage treatment systems are properly operated and maintained. If operation and maintenance activities are neglected, systems can either fail completely or may function well below their capabilities. This can quickly negate the efforts of a municipality in assuring public health protection through requirements for proper design and installation of these systems.

Municipal sewage management programs can be as simple or as comprehensive as needed and may be based on each municipality's particular needs and resources. This fact sheet explains the importance of municipal sewage management programs and how they are developed by municipalities to meet their needs for individual and community onlot sewage systems.

Why should my municipality manage onlot systems?

Most municipalities have areas that can never be physically or cost-effectively served by public sewer facilities. Areas may contain suitable soils but have scattered malfunctioning onlot treatment systems that can cause public health and other hazards. Malfunctioning individual onlot systems will also often be found in areas that have poor soils and/or small lot sizes. It may become impossible to repair or replace these systems on an individual lot-by-lot basis. If your municipality is faced with this latter situation, you can assess your options for using community onlot systems to meet your long-term needs. In any case, repairing onlot systems as they malfunction typically will not solve the problem permanently until regular management and maintenance of onlot systems is established to help keep the problems that lead to malfunctions from recurring.

What options are available for establishing a Sewage Management Program?

Municipalities have established numerous approaches to sewage management in Pennsylvania. While existing management maintenance permit programs to more complex municipal inspection programs, you should base your sewage management program on the specific needs and resources in your municipality.

In developing a sewage management program for your municipality, you may choose from a variety of possible management service options and administrative alternatives. Management options for onlot systems may include such services as:

- Public and homeowner education;
- Regular pumping of tanks;
- Operation and maintenance activities tailored to specific onlot systems or treatment components;
- Testing and monitoring procedures to assess the quality of effluent treatment; and/or
- Periodic inspections to determine system integrity and operational performance and more.

Administrative alternatives for delivering or ensuring your program's management services can range from:

- Maintenance contracts established between a homeowner and the manufacturer or a third-party maintenance provider;
- Operating permits issued by the municipality based on the system's compliance with particular quality or operating standards;
- Direct provision of management services by the municipality or an established service utility; or
- Direct ownership and management of onlot systems by the municipality or an established utility.

There are many examples and variations of these management service options and administrative alternatives in use in municipalities across Pennsylvania. Your local DEP representative can help you learn more about existing sewage management programs.

How can my municipality begin managing onlot systems?

The first step in the process is for your municipality to assess available administrative, technical, financial and management options by preparing an update revision to its Act 537 official plan. The update revision should provide for identification of all onlot systems and a determination of their operational status. Such factors as the suitability of soils, underlying geology and any peculiar environmental conditions that could impact the continued long-term use of onlot systems are also examined.

Using this information, the various options to ensure performance of routine operation and maintenance for new and existing onlot systems are identified and compared.

Ultimately, the specific options and alternatives for a sewage management program that best fits with your municipality's resources and needs are selected for implementation. In connection with the management program, the plan should also evaluate required needs for septage handling (septage haulers, septage disposal options, etc.) and develop appropriate administrative and legal procedures.

Finally, to allow implementation, your official plan must establish an ordinance that legally authorizes the municipality's program to manage onlot systems.

What other steps are there to developing a Sewage Management Program?

There are several additional steps that should occur together with sewage facilities planning in considering and developing the service options, administrative alternatives, legal procedures, ordinances and other pieces that will make up your municipality's sewage management program. These steps primarily involve gaining understanding and consensus from the residents in your municipality who will be impacted by the proposed management program.

It is important that opportunities be afforded for homeowners and the public to learn what onlot systems are, how they work and why management and maintenance of these systems is so important. Public education meetings, civic events or programs provided at local schools can be excellent ways to get the word out.

The citizens in your municipality will better accept the management program if they have a voice in its planning and development. Surveys or questionnaires, public forums for exchanging questions and opinions, as well as citizen representation on advisory or planning groups can all be very helpful.

Residents need to be informed about the details of the proposed program, how it will affect them and what actions they need to take. Mailings, newsletters, articles or announcements in the local media, websites and public information sessions are just some of the ways Pennsylvania municipalities have educated and involved their citizens.

Are there minimum requirements for Sewage Management Programs?

There are minimum requirements only if a sewage management program is required by regulation. Maintenance standards are listed in Title 25 of the Pennsylvania Code, Chapter 71 §71.73 to make sure that management programs carry out at least the minimum activities necessary to maintain onlot systems (this DEP regulation, as well as others, can be found on-line at www.pacode.com).

Minimum standards include:

- Removal of septage from the treatment tanks once every three years or following a tank inspection that reveals the need for septage removal (when the tank is determined to be more than 1/3 full);

- Maintenance of surface contouring around the system to divert stormwater and to protect the system from damage;
- Water conservation requirements;
- Provisions for septage pumping and disposal; and
- Requirements for holding tank maintenance.

Can municipalities work together through Sewage Management Programs?

Yes. Municipalities in many parts of the state have banded together to form "joint local agencies." These agencies then implement sewage management programs consistently throughout the service areas of their member municipalities.

Can sewage management be administered through existing municipal structures?

Yes. Some municipal governments are already involved in the permitting of onlot sewage systems through programs administered by agencies such as joint sewage committees, county health departments, etc. These existing onlot permitting programs involve testing proposed sites, reviewing designs and addressing adequate system construction through final inspections of installed onlot systems. Unfortunately, in many cases, system installation marks the boundary of the permitting program.

Sewage management programs, administered by joint local agencies, or even municipal sewer authorities, can extend municipal oversight for these permitted systems to include regular operation, maintenance, testing and/or inspection. Such actions assure that the special care and attention taken to properly design and install onlot systems is not negated by the lack of system management and oversight.

Is management of onlot treatment systems cost-effective?

Yes. Maintaining properly installed sewage systems can extend the life of these systems and may save the homeowner the cost of repairing or replacing an abused, malfunctioning onlot system. Sewage management programs can also help prevent future problems from occurring with systems that have been repaired following malfunction.

Municipalities confronting areas with numerous malfunctioning systems often opt to extend sewer lines for great distances. This action may solve the problem, but can be very costly to the municipality and the affected property owners. Sewer lines can inadvertently promote unwanted development. Municipalities might also attempt to deal with areas of malfunctioning individual onlot systems by connecting the affected homes to a single immediate problem; however, there is still the potential for future malfunctioning of the resulting community systems unless the municipality has a management program that commits it to oversee proper operation and maintenance of these larger systems.

Is financial and technical assistance available for my municipality to develop or update its sewage facilities official plan?

Yes. Municipalities can apply to DEP for a planning grant to reimburse up to 50 percent of the cost of preparing a sewage facilities official plan.

Additionally, to assist municipalities in the development of their sewage management programs, DEP has several model ordinances that reflect the requirements typical of the different programs. The "pump" model ordinance reflects the simplest approach to a sewage management program, while the ordinance for a municipal inspection program is the most complex approach. You should keep your municipality's management program as simple and effective as possible to meet your special needs.

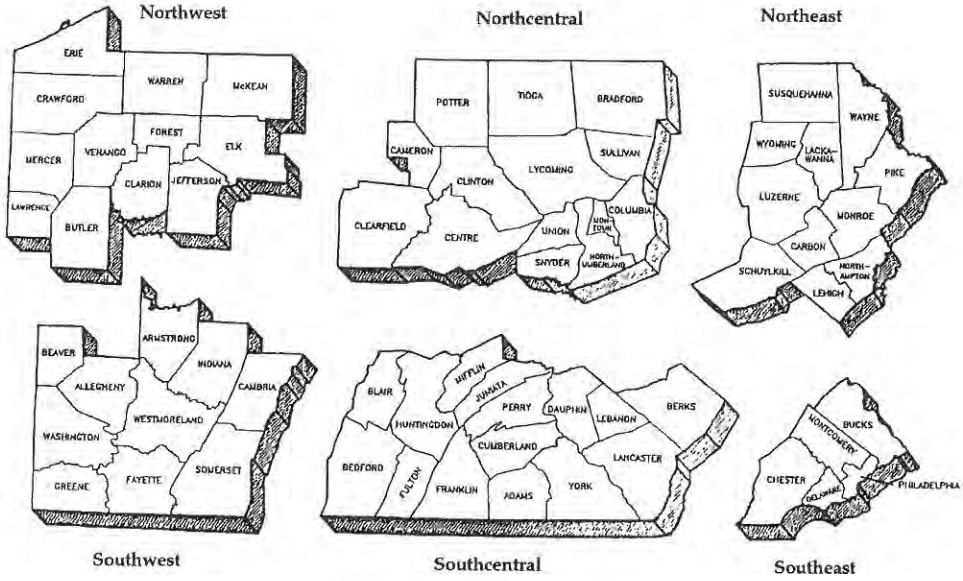
Is there financial assistance available to my municipality to establish and administer a Sewage Management Program?

Yes. Sewage management program costs of staffing and administration are eligible costs of the sewage enforcement reimbursement program. Your management program is expected to charge reasonable fees to cover the costs of the activities you conduct. If revenue does not adequately cover all these costs, your municipality may recover monies from the state to eliminate this deficit amount, up to 50 percent of the total cost of the enforcement program. Local agencies qualifying for 85 percent sewage permitting enforcement reimbursement also qualify for the same method of calculating reimbursement for their sewage management program's activities.

For more information, visit DEP's Web site at www.depweb.state.pa.us, Keyword: "Wastewater."

For more information,
call the DEP regional office in your area or contact:

Department of Environmental Protection
Bureau of Water Standards and Facility Regulation
Division of Planning and Permits
P.O. Box 8774
Harrisburg, PA 17105-8774
(717) 787-8184



DEP Regional Offices

Southeast Region
2 E. Main St.
Norristown, PA 19401
Main Telephone: 484-250-5900
24-Hour Emergency: 484-250-5900

Counties: *Bucks, Chester, Delaware, Montgomery and Philadelphia*

Southwest Region
400 Waterfront Drive
Pittsburgh, PA 15222-4745
Main Telephone: 412-442-4000
24-Hour Emergency: 412-442-4000

Counties: *Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington and Westmoreland*

Southcentral Region
909 Elmerton Ave.
Harrisburg, PA 17110
Main Telephone: 717-705-4700
24-Hour Emergency: 1-877-333-1904

Counties: *Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry and York*

Northwest Region
230 Chestnut St.
Meadville, PA 16335-3481
Main Telephone: 814-332-6945
24-Hour Emergency: 1-800-373-3398

Counties: *Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Venango and Warren*

Northeast Region
2 Public Square
Wilkes-Barre, PA 18711-0790
Main Telephone: 570-826-2511
24-Hour Emergency: 570-826-2511

Counties: *Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne and Wyoming*

Northcentral Region
208 W. Third St., Suite 101
Williamsport, PA 17701
Main Telephone: 570-327-3636
24-Hour Emergency: 570-327-3636

Counties: *Bradford, Cameron, Clearfield, Centre, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga and Union*

Commonwealth of Pennsylvania
Edward G. Rendell, Governor

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Department of Environmental Protection
Kathleen A. McGinty, Secretary
3800-FS-DEP1587 Rev. 6/2006

Exhibit I-1

1984 Hatfield Township Act 537 Plan
DEP Approval Letter

Hatfield Township, Montgomery County

Department of Environmental Resources

1875 New Hope Street
Norristown, PA 19401
215 270-1975

January 11, 1965

Hatfield Township
Board of Supervisors
School Road and Chestnut Street
Hatfield, PA 19440

Re: Sewage Facilities Plan Update
Hatfield Township
Montgomery County

Gentlemen:

A review has been made and completed of your municipality's updated official sewage facilities plan entitled 537 Plan Update, dated July 1964, as prepared by Tracy Engineers, Inc. The review was conducted in accordance with the provisions of the Pennsylvania Sewage Facilities Act.

Approval of the study is hereby granted.

If you have any questions regarding this matter, please feel free to contact me at the above number.

Very truly yours,

CLIFF C. STINSON, S.S.
Sewage Facilities Consultant

cc: Montgomery County Planning Commission
Tracy Engineers, Inc.
Hatfield Township Municipal Authority
Division of Local Environmental Services
Re 30 2011.G

Exhibit I-2

Plan of Study, Task Activity Report and Approval

Hatfield Township, Montgomery County

Pennsylvania Department of Environmental Protection

2 East Main Street
Norristown, PA 19401

August 12, 2008

Southeast Regional Office

Phone: 484-250-5970
Fax: 484-250-5971

Ms. Stephanie Teoli, Manager
Hatfield Township
1950 School Road
Hatfield, PA 19440

Re: Act 537 - Plan of Study
Hatfield Township Act 537 Plan Update
Hatfield Township
Montgomery County

Dear Ms. Teoli:

We have completed our review of your municipality's proposed Plan of Study, as prepared by CET Engineering Services dated April 17, 2008. The Plan of Study proposes a comprehensive, area-wide update of Hatfield Township's Act 537 Official Sewage Facilities Plan.

Approval of the proposed Plan of Study for Hatfield Township is hereby granted. The estimated cost of the plan is $107,835.

By copy of this letter, we are advising Hatfield Borough and Montgomery, Hilltown, and Franconia Townships that specific authorization is needed from the governing body of each municipality for the Hatfield Township Municipal Authority (Authority) to complete sewage facilities planning under Act 537 on their behalf. Each of these municipalities is served by the Hatfield Township Municipal Authority's Wastewater Treatment Facility, and all of the municipalities in the service area may be affected by the Act 537 Plan Update for the proposed plant expansion. Consistent with Chapter 71, Section 71.12(b), the affected municipalities may jointly submit a single plan. Also, consistent with Section 71.41, reimbursement grants may be paid directly to the Authority for the individual municipal costs related to the plan update if each municipality authorizes the Authority in writing to complete planning on their behalf. If the submitted Task Activity Report (TAR) does not cover all of the anticipated planning costs for the municipalities in the service area, the TAR should be revised to include those costs.

Alternately, each municipality may submit a separate Act 537 Plan Update that evaluates the individual municipal needs both within the plant's current service area and for any needed future sewer service area expansion. In order to qualify an individual Plan Update for reimbursement, any municipality proposing to complete their own plan must submit a separate Plan of Study and associated task activity report.

We urge Hatfield Township and the Authority to coordinate with Hatfield Borough and Montgomery, Hilltown, and Franconia Townships early in the planning process in order to facilitate the review of your plan. The Plan Update for the expansion cannot be approved unless it addresses future needs throughout the sewer service area. Please see our letter of June 26, 2007 (copy enclosed), regarding this issue.

Please note, however, that this Plan of Study approval does not constitute a final action by the Department of Environmental Protection (Department). When a completed plan is submitted to us, we will act upon it consistent with Pa. Code Title 25, Chapter 71.

Your municipality's Act 537 Official Plan Update is to be formatted as suggested in "A Guide for Preparing Act 537 Update Revisions," including the necessary items listed in the "Act 537 Plan Content and Environmental Assessment Checklist." All necessary items must be included, and a copy of the completed checklist must be included with your Act 537 Plan. This form is available on our website at http://www.dep.state.pa.us/dep/deputate/watermgt/wqp/Forms/Act537/Forms_537Plan.htm .

Also, please be advised that the Department will not pay grants under the act for planning costs incurred prior to the date of this Plan of Study approval or for information that has been completed previously under local, state, or federal funding programs.

If you have any questions, please contact me at the above phone number.

Sincerely,

John M. Veneziale
Sewage Planning Specialist 2
Water Management

Enclosure: June 26, 2007, letter

cc: Montgomery County Planning Commission
Montgomery County Health Department
CET Engineering Services
Mr. Nagel - Montgomery Township
Mr. Elien - Hatfield Borough
Mr. Lippincott - Hilltown Township
Mr. Baver - Franconia Township
Mr. McHale, RCSOB
Planning Section
Re 30 (joh08wqm)224-18

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

TASK/ACTIVITY REPORT

Hatfield Township — Municipality
Montgomery — County
Hatfield Township — Proposed Planning Area (Attach Map)
Date of Report

Date Completed plan will be submitted to DEP March 2009
Estimated Cost of Plan $107,835.00

Column Headings May Be Changed To Suit The Needs of the Planning Effort Use Additional Sheets if Necessary

Sheet 1 of 1

TASK ACTIVITY NUMBER FROM APPENDIX I	SR. PROJECT MANAGER		STAFF ENGINEER III		STAFF ENV. SCIENTIST		CAD DRAFTER III		CLERICAL		TOWNSHIP MANGER		TOWNSHIP ZONING OFFICER		EXPENSES		SUB TOTAL
	HR/ RATE	$99.00	HR/ RATE	$71.00	HR/ RATE	$63.00	HR/ RATE	$58.00	HR/ RATE	$34.00	HR/ RATE	$90.00	HR/ RATE	$75.00			
	HRS.	COST	HRS.	COST	HRS.	COST	HRS.	COST	HRS.	COST	HRS.	COST	HRS.	COST		COST	
I	8	$792	10	$710	10	$630	12	$696	8	$272	0	$0	0	$0		$20	$3,120
II	3	$297	13	$923	60	$3,780	35	$2,030	5	$170	12	$1,080	9	$675		$50	$9,005
III	5	$495	41	$2,911	115	$7,245	0	$0	10	$340	0	$0	7	$525		$125	$11,641
IV	4	$396	16	$1,136	45	$2,835	0	$0	10	$340	4	$360	49	$3,675		$30	$8,772
V	29	$2,871	135	$9,585	160	$10,080	60	$3,480	10	$340	2	$180	0	$0		$8,500	$34,856
VI	64	$6,336	90	$6,390	110	$6,930	0	$0	10	$340	0	$0	0	$0		$200	$20,376
VII	42	$4,158	12	$852	0	$0	0	$0	5	$170	0	$0	0	$0		$50	$5,230
VIII	45	$4,455	40	$2,840	90	$5,670	20	$1,160	15	$510	0	$0	0	$0		$200	$14,835

JOEL KOSTELAC
Name of Person Completing Report

Signature

STAFF ENGINEER
Title

Authorized Representative Signature

Exhibit I-3

2007 Corrective Action Plan and DEP Approval

Hatfield Township, Montgomery County

Pennsylvania Department of Environmental Protection

2 East Main Street
Norristown, PA 19401
September 25, 2007

Southeast Regional Office

Phone: 484-250-5970
Fax: 484-250-5971

Mr. Peter Dorney
Executive Director
Hatfield Township Municipal Authority
3200 Advance Lane
Colmar, PA 18915

Re: Collection System Corrective Action Plan
Hatfield Township Municipal Authority
Montgomery County

Dear Mr. Dorney:

The Department of Environmental Protection (Department) has completed the review of the Hatfield Township Municipal Authority (HTMA) Correction Action Plan (CAP), dated July 30, 2007, and submitted to the Department August 7, 2007. Based on the information the Department has to date, y means of this letter, the HTMA CAP is approved. HTMA's connections are limited to the capacity detailed in our June 29, 2007, letter.

If you should have any questions regarding the Chapter 94 program, please contact Mr. Jim McTish at 484-250-5180 or by e-mail at jmctish@state.pa.us .

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Water Management

cc: Ms. Nowicki – CET Engineering Services
Ms. Teoli – Hatfield Township
Re 30 (GJE07WQ)267-10

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

COLLECTION SYSTEM CORRECTIVE ACTION PLAN

JULY 30, 2007

Prepared by:

CET Engineering Services
1240 North Mountain Road
Harrisburg, PA 17112
Ph: 717-541-0622
Fax: 717-541-8004

A. HATFIELD TOWNSHIP SEWER SYSTEM

1. Service Area Description

Hatfield Township is located in the northeastern portion of Montgomery County, Pennsylvania, near the Montgomery – Bucks County boundary. Hatfield Township surrounds the Borough of Hatfield and borders Lansdale to the south. The Township is approximately 20 miles north of Norristown, Pennsylvania.

The Hatfield Township Municipal Authority (HTMA) Wastewater Treatment Plant (WWTP) processes wastewater flows generated by Hatfield Township, the Borough of Hatfield, Fanconia Township, and Montgomery Township. The HTMA wastewater treatment facility also receives domestic and industrial wastewater via tanker truck for treatment at the HTMA pretreatment facilities, and accepts outside sludges for final processing. Historic and projected EDUs for the HTMA service area, as well as the associated flows anticipated from projected development are shown in Table 1.

Table 1. Historic and projected EDUs per 2006 Chapter 94 data.

	Historic EDUs					Projected EDUs				
YEAR	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Hatfield Twp	9,946	10,029	10,150	10,308	10,350	109	109	109	109	109
Hatfield Boro	1,522	1,533	1,535	1,535	1,541	10	11	0	0	0
Franconia Twp.	441	441	441	441**	441**	0	0	0	0	0
Montgomery Twp.	6,883	6,893	5,977	6,029	6,057	178	114	38	27	16
Subtotal	---	---	---	---	---	297	234	147	136	125
Total EDUs	18,792	18,896	18,103	18,313	18,389	18,686	18,920	19,067	19,203	19,328
Total Flows, MGD[1]	---	---	---	---	5.98	6.08	6.16	6.21	6.25	6.29

2. Wastewater Facilities

The HTMA owns and operates all wastewater collection, conveyance, and treatment facilities within the Township. The wastewater treatment plant (WWTP) has a permitted annual average design flow of 6.43 MGD and a maximum monthly design flow of 8.37 MGD. An organic rerate of the treatment facility in 2005 increased the permitted organic capacity to 22,300 lbs BOD/day. The HTMA WWTP is permitted under NPDES Permit No. PA 0026247.

3. Collection System

The HTMA owns and maintains approximately 73 miles of sewer and 1,440 manholes. The majority of the collection sewers are 8-inch PVC, and the size of the interceptors are as large as 36 inches in diameter.

Basins A and B of the Montgomery Township Municipal Sewer Authority's (MTMSA) sewer system is tributary to HTMA. The MTMSA owns and maintains approximately 63 miles of 8" - 24" gravity sewer and two (2) miles of forcemain ranging from 2" - 12" in Basins A and B. There is an estimated 1,565 precast concrete and/or brick manholes in the MTMSA sewer system that is tributary to HTMA. Major interceptors within MTMSA's collection system include the Villa Glen, Line Street, and Route

[1] Based on the Chapter 94 report 5-year average of 325 GPD/EDU, and the 2006 total EDUs.

309/Richardson Road interceptors. There are three (3) MTMSA pumping stations in Basins A and B that pump to the HTMA collection system including the two (2) pump stations located on Knapp Road and one (1) located on Montgomery Avenue.

The Hatfield Borough collection system consists of approximately 40,325 feet of gravity sewer, and is maintained by Hatfield Borough staff. There are no sanitary pump stations located in Hatfield Borough. Wastewater flows from Hatfield Borough are discharged via gravity sewers through Hatfield Borough Manhole 1 to a HMTA interceptor.

A portion of Franconia Township contributes to the HTMA sewer service area via gravity sewers only (no pump stations).

The HTMA sewer system collects wastewater from 16 basins encompassing all of the Borough of Hatfield and Hatfield Township, and portions of Montgomery and Franconia Townships. A sewer system map with each drainage basin identified is included in Exhibit A.

4. Neshaminy Interceptor

The Neshaminy Interceptor, which runs parallel to Neshaminy Creek, transports the majority of the wastewater flows from within the HTMA service area to the WWTP. The Interceptor runs approximately 4.4 miles from Manhole 2297 to the WWTP. A relief interceptor was added along side of the original interceptor such that throughout most of the interceptor there are parallel sewers with interconnections. Pipe sizes in the Neshaminy Interceptor range from 18" to 36" in diameter, and the majority of the pipe is made out of clay, concrete, or PVC.

B. CORRECTIVE ACTION PLAN (CAP)

The long term goal of the CAP is to reduce, as much as possible, surcharging and overflows within HTMA's collection system caused by I/I. The HTMA strives to accomplish this goal through collection system maintenance, rehabilitation, replacement, and repair. In the shorter term, it is necessary to expand the capacity of the Neshaminy Interceptor to reduce surcharging during extreme wet weather events. Modeling of the Interceptor will provide for the analysis of interceptor expansion alternatives. The following sections provide a description of actions executed and planned by the HTMA to date to reduce inflow and infiltration.

1. Resources for Inflow/Infiltration (I/I) Rehabilitation

The Authority allocates considerable resources to monitor and maintain the collection system. Manpower for collection system maintenance includes a manager, four operators and an inspector. The Authority owns, operates and maintains the following equipment for sewer maintenance: a) two (2) jet/vac trucks; b) one (1) TV/grouting truck (Telespector Inc.); c) one (1) utility truck; d) one (1) TV Ferret sewer main line camera; e) one (1) portable lateral camera; f) one (1) Quick View main line inspection camera; g) two (2) jeeps and one (1) pick-up truck dedicated to road crew.

In addition, funds are allocated for the 2007 purchase of an IBAK sewer main and lateral launch camera for approximately $260,000. In February 2007, the purchase order was issued for this equipment.

2. I/I Monitoring Program

HTMA personnel performed a system-wide flow monitoring test to separate the system into eleven (11) basins. This data is used as a baseline to prioritize future I/I rehabilitation projects. In addition, $150,000 was allocated in 2006 to perform a more intensive flow study, concentrating on the main interceptors in the Township. The flow study was performed by HTMA's engineer, CET Engineering Services (CET), and split the HTMA service area into 16 basins (Exhibit A). The main purpose of this study is to model the sewer interceptor system to determine the hydraulic capabilities and deficiencies of the existing interceptor. Flow monitoring was completed in 2006, and CET is currently conducting the modeling which will be used to develop recommendations for improvements to the interceptor system. HTMA has allocated funds for the improvements.

HTMA regularly televises homeowner's laterals for infiltration. In 2006, three hundred four (304) laterals were televised, comprising of 6,301 ft. of pipe. Findings continue to indicate that the homeowner's cast iron lateral pipe is in good condition. Most problems appear to begin at the connection between the homeowner's 4" cast iron lateral and the 6" clay lateral leading to the main line.

3. Maintenance Programs

Beginning in 2000, HTMA has had an aggressive program of I/I removal. Each year since, contracts have been let to address areas of need based on flow metering results and pending Township road paving activity. HTMA concentrates its efforts on those areas where clay pipe exists, as opposed to those areas with newer PVC pipe. Virtually all of the contracts include the installation of an observation tee, or clean-out on the lateral in the area of the existing 4" to 6" connection point. On laterals where the existing connection point cannot be replaced by the minimal excavation involved in installing an observation tee due to sidewalk or curb location, HTMA utilizes the observation tee to install a liner in the transition, and in any other section of the clay lateral that may be problematic.

In 2006 HTMA awarded three separate maintenance contracts for rehabilitation, and has begun rehabilitation efforts year round. Contracts exist for excavation of laterals and other sewer lines and manholes, trenchless lining of laterals and main lines, and lining of manholes.

One hundred eighteen (118) observation tees were installed on homeowner's laterals in 2006. Twenty four (24) 4" to 6" connections were repaired at the time of excavation, and the remaining connections are in the process of being lined. Approximately 130 observation tees will be installed in 2007, with those connections also planned for replacement of lining. The benefits of the observation tees are two-fold. First, the installation of the tee replaces the problematic 4" to 6" connection point which has shown to be one of the largest sources of I/I. Secondly, the observation tees can be used during heavy rain events to identify excess flows coming from the house which could be the result of a sump pump, floor drains, roof drains, or leaking pipe.

In 2006 HTMA inspected 217 manholes, replacing the chimney sections, frames and lids on 57. Manhole inserts are being placed in manholes throughout the system. Seven (7) badly leaking manholes were lined in 2006.

As of December 31, 2006, HTMA has rehabilitated a total of 699 lateral connections in the six (6) years since beginning this work. A summary of I/I rehabilitation projects that are complete to date, as well as the total project cost (rounded to the nearest hundred dollar) is shown in Table 3.

Emergency maintenance and repairs are performed as soon as possible. When possible, advantage is taken of emergency excavation to incorporate rehabilitative repairs beyond that which is needed to fix the original problem.

Table 3. I/I Project Summary To Date

Year	Project	Total Cost
1998	Flow Study	$40,000
1998-1999	Neshaminy Interceptor Replacement, Phases I & II	$1,098,000
2000	Lateral Repair	$481,900
2001	Lateral Repair	$548,700
2002	Lateral Repair	$386,100
	Interceptor Repair, Liner	$104,900
2003	Lateral Repair	$680,500
2004	Lateral Repair	$164,900
2005	Lateral Repair	$146,800
	Interceptor Flow Study	$17,800
	Equalization Tank Study	$9,500
2006	Lateral Repair	$357,500
	Interceptor Flow Study	$48,400
	Equalization Tank Design	$24,600
	Interceptor Upgrade, Survey	$34,400
	Sewer Lateral Maintenance Contract	$253,300
	Property Purchase, Equalization Tank	$350,000
2007	Sewer Lateral Maintenance Contract	Ongoing
	Interceptor Flow Study	Ongoing
	Equalization Tank Design	Budgeted
	Interceptor Upgrade	Budgeted
Total		**$4,747,300**

All data with regard to the corrective maintenance of the repair system is stored in a format compatible with the computerized Geographical Information System (GIS) program for organizational and reference purposes.

The HTMA continues to commit significant resources toward the rehabilitation of sewer systems throughout the Township, and it has also allocated funds for the construction of one or two surge storage tanks that can be utilized during heavy rain events. Purchase of an adjoining piece of property for the tank(s) was completed in April 2007. Design and geotechnical have been initiated. Part II permit submittals to DEP are anticipated during mid-2007. It is the opinion of HTMA and its engineer that even with continuous rehabilitation of sewer lines and laterals, I/I will always be an issue, and a combination of maintenance efforts in the collection system and surge tanks at the plant are needed to address wet weather flows.

4. Neshaminy Interceptor Improvements

The CAP will provide for an upgrade to the Neshaminy Interceptor. The alternatives to increase the capacity of the Neshaminy interceptor are currently being evaluated by HTMA's engineer, CET Engineering Services, Inc. In October 2005, CET presented a proposal to HTMA to conduct a Hydraulic Study to evaluate the severity and impact I/I has on the Neshaminy Interceptor. The project involved installation of 16 meters that are strategically placed in the Neshaminy Interceptor basin to identify areas

of I/I. The SewerCAD model will then be used to analyze and identify restricting sections, potential discrepancies, and system reactions. These results will be used in the design of the Neshaminy Interceptor improvements.

a. *Neshaminy Interceptor Metering*

HTMA installed 16 flow meters during November and December 2005 to collect flow data from the Neshaminy Interceptor and its primary tributaries. The locations of the monitoring sites and the corresponding drainage basins are listed in Table 4, and are shown in Exhibit A.

Table 4. Meter locations in the HTMA service area.

Manhole	Drainage Basin
2206	7
2702	3
74-9	1
606	1
1230	5
74-56	5
1106	6
74-60A	6
74-25A	5
1252	4
85-4	10
1022	10
74-124	11
74-67C	6
1136	6
202-E	2

Flow monitoring was performed for a period of six (6) months. Rainfall data was collected in conjunction with the sewer metering to correlate with the flow data. The data collected from these meters will be used to 1) calibrate the hydraulic model with actual flows to effectively account for roughness coefficients and validate record drawing information; 2) analyze discrepancies between modeled capacities and measured flows to identify any potential flow restrictions, poor hydraulics and significant system losses. SewerCAD will be used to evaluate existing system capacities and to identify restricting sections in the interceptor. New interceptor design decisions and pipe sizing alternatives will be evaluated using the model to account for other factors such as future growth, flow diversions, and system rehabilitation.

Collection system surveying work needed to complete the model was completed in April 2007. The data analysis and modeling of the Neshaminy Interceptor was completed in June 2007. By August 2007 it is anticipated that the scope of the Neshaminy Interceptor project will be finalized.

5. Corrective Action Plan Schedule

Table 5 summarizes anticipated milestones for the CAP. All dates are tentative pending the actual date of permit(s) approval. For example, should the date of permit approval occur two (2) months after the estimated milestone date listed, all components thereafter shall be adjusted to reflect the two (2) month setback.

Table 5. Corrective Action Plan schedule (tentative).

Collection System Component	Estimated Milestone Date	
Finalize Neshaminy Interceptor Scope	August 2007	
Neshaminy Interceptor Improvement Project		
Preliminary Design	October 2007	
Submit Part II Permit Application	December 2007	
Part II Permit Approval	April 2008	
Advertise for Bids	May 2008	or 2 months after all permits are approved
Contract Award	June 2008	
Construction Start	August 2008	or 2 months after Contract Award
Construction End	May 2009	
Equalization Tank Project		
Preliminary Design	July 2007	
Submit Part II Permit Application	October 2007	
Part II Permit Approval	February 2008	
Advertise for Bids	March 2008	or 2 months after all permits are approved
Contract Award	April 2008	
Construction Start	June 2008	or 2 months after Contract Award
Construction End	February 2009	

6. Connections

When the acceptable CAP is submitted and approved by the DEP, there will be no restrictions on new connections for the remaining capacity of the treatment facility as per Chapter 94, §94.21. The Authority will maintain a chart providing a running tabulation of gallons of capacity allocated for new connections as they are approved by the Authority.

Exhibit I-4

2008 Connection Management Plan and Consent Order and Agreement

Hatfield Township, Montgomery County

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the Matter of:

Hatfield Township Municipal Authority 3200 Advance Lane Colmar, Pennsylvania 18915	: : : : : : : :	Water Management NPDES Permit No. PA0026247 Annual Average Flow Increase Hatfield Township Municipal Authority Hatfield Township, Montgomery County

CONSENT ORDER AND AGREEMENT

This Consent Order and Agreement is entered into this _____ day of _____2008, by and between the Commonwealth of Pennsylvania, Department of Environmental Protection ("Department"), and the Hatfield Township Municipal Authority ("HTMA").

The Department has found and determined the following:

A. The Department is the agency with the duty and authority to administer and enforce the Clean Streams Law, Act of June 22, 1937, P.L. 1987, *as amended,* 35 P.S. § 691.1 et seq. ("Clean Streams Law"); The Pennsylvania Sewage Facilities Act, Act of January 24, 1966, P.L. 1535, *as amended,* 35 P.S. §§ 750.1-750.20a ("Sewage Facilities Act"); Section 1917-A of the Administrative Code of 1929, Act of April 9, 1929, P.L. 177, *as amended,* 71 P.S. § 510-17 ("Administrative Code") and the rules and regulations promulgated thereunder.

B. HTMA exists under the laws of the Commonwealth of Pennsylvania with offices located in Hatfield Township, Montgomery County. The mailing address is 3200 Advance Lane, Colmar, Pennsylvania 18915. The Authority is considered a "municipality" as that term is defined in Section 1 of the Clean Streams Law, 35 P.S. § 691.1.

C. HTMA owns and operates a sewage treatment plant ("Plant"), located in Hatfield Township, Montgomery County, which discharges into the West Branch Neshaminy Creek.

D. The HTMA Plant is currently permitted by a NPDES Permit No. PA0026247, to discharge an annual average flow of 6.43 million gallons per day ("MGD") to the West Branch Neshaminy Creek. A requirement of the NPDES permit is the submission of a monthly Discharge Monitoring Report ("DMR").

E. On June 26, 2007, the Department sent a letter to Hatfield Township and copied the other municipalities tributary to the HTMA Plant, outlining the Department's concerns with the capacity at the HTMA Plant, and requesting that tributary municipalities begin an Act 537 Official Plan Update.

F. On June 29, 2007 the Department sent a letter to Mr. Peter Dorney, Executive Director of the HTMA, that summarized HTMA's current capacity connection needs, including projects that had already received planning approval but were not yet connected, as well as projects with planning pending before the Department. In the June 29, 2007 letter the Department calculated HTMA's remaining available connection capacity to be 70,000 gallons per day.

G. On August 7, 2007 the HTMA submitted to the Department a Collection System Corrective Action Plan ("CAP") dated July 30, 2007 to address a surcharging interceptor identified in HTMA's conveyance system.

H. On September 25, 2007 the Department sent a letter to Mr. Peter Dorney approving the HTMA CAP.

I. On October 25, 2007 the HTMA filed an appeal to the Environmental Hearing Board ("EHB") of the Department's CAP approval letter dated September 25, 2007 challenging only the portion of the Department's September 25, 2007 CAP letter that referenced the June 29, 2007 letter's capacity calculation. *Hatfield Township Municipal Authority v. Commonwealth of Pennsylvania, Department of Environmental Protection, EHB Docket No. 2007-238-MG, 9-25-07 Letter.*

J. On November 1, 2007 the HTMA submitted a request for Preliminary Treatment Requirements ("PTR") for the Plant to discharge an annual average flow of 6.98 MGD to the West Branch Neshaminy Creek.

K. Section 691.402(b) of the Clean Streams Law, 35 P.S. § 691.402(b), states that whenever a permit is required by rules and regulations issued pursuant to this section, it shall be unlawful for a person or municipality to conduct the activity regulated except pursuant to a permit issued by the Department. Conducting such activity without a permit, or contrary to the terms or conditions of a permit or conducting an activity contrary to the rules and regulations of the Department or conducting an activity contrary to an order issued by the Department, is thereby declared to be a nuisance.

L. 25 Pa. Code § 92.7 states that new or increased discharges, or changes of wastestreams, facility expansions, production increases or process modifications, which result in new or increased discharges of pollutants, which discharges do not violate effluent limitations specified in the NPDES permit, shall be reported by submission to the Department of notice of the new or increased discharges. However, a new permit application shall be submitted and a new permit obtained before commencing a new or increased discharge, or change of the wastestream, which would violate effluent limitations in the NPDES permit or which would include any new or increased pollutant not identified in a previous permit application.

M. A treatment facility permittee is required to sign Component 3, Subchapter J, Section 4 of the Department's Sewage Facility Planning Module certifying that the treatment facility does or does not have adequate treatment capacity and is able to provide wastewater services for a proposed development in accordance with both 25 Pa. Code § 71.53(d)(3) and Title 25 Chapter 94 of the Pennsylvania Code.

N. A statutory nuisance pursuant to Section 691.402(b) and a violation of 25 Pa. Code § 92.7 constitutes unlawful conduct under section 611 of the Clean Streams Law, 35 P.S. § 691.611; and subjects a liable party to a claim for civil penalties under Section 605 of the Clean Streams Law, 35 P.S. § 691.605.

O. If a treatment facility permittee signs Component 3, Subchapter J, Section 4 of the Department's Sewage Facility Planning Module certifying that the treatment facility does have adequate treatment capacity and is able to provide wastewater services for a proposed development in accordance with both 25 Pa. Code § 71.53(d)(3) and 25 Pa. Code Chapter 94, but that statement is inconsistent with the treatment facility's allocated sewage facility planning capacity, then the treatment facility permittee has violated 18 Pa. C. S. A. § 4904, as stated in Component 3, Subchapter Q.

P. To date, the HTMA is not in violation of 35 P.S. §§ 691.402(b) and 691.611, 25 Pa. Code § 92.7 and 18 Pa. C. S. A. § 4904.

After full and complete negotiation of all matters set forth in this Consent Order and Agreement ("CO&A") and upon mutual exchange of covenants contained herein, the parties desiring to avoid litigation and intending to be legally bound, it is hereby **ORDERED** by the Department and **AGREED** to by HTMA as follows:

1. **Authority**. This CO&A is an Order of the Department authorized and issued pursuant to Section 5 of the Clean Streams Law, 35 P.S. § 691.5; and Section 1917-A of the Administrative Code, supra.

2. **Findings**.

a. HTMA agrees that the findings in paragraphs A through P are true and correct and, in any matter or proceeding involving HTMA and the Department, HTMA shall not challenge the accuracy or validity of these findings.

b. The parties do not authorize any other persons to use the findings in this CO&A in any matter or proceeding.

3. **Corrective Action.**

a. The HTMA agrees to perform and complete Milestone Actions 1 through 6, below, and the Department agrees to release connection capacity credit incrementally up to an annual average flow of 6.98 MGD, consistent with HTMA's most recently approved Connection Management Plan ("CMP") or Quarterly Plan Update:

#	Milestone Action	Milestone Date
1	Meet a Total Phosphorus (TP) effluent concentration of 0.5 mg/l, or less, as a rolling annual average, reported monthly.	12 months from the execution date of this CO&A.
2	Meet a TP effluent concentration of 1.0 mg/l, or less, as a monthly average.	Within 30 days from the execution date of this CO&A.
3	Meet a TP effluent load of 29.1 lbs/day, or less, as a rolling annual average, reported monthly.	12 months from the execution date of this CO&A.
4	Meet a TP effluent load of 58.2 lbs/day, or less, as a monthly average.	Within 30 days from the execution date of this CO&A.
5	Submit a CMP identifying how HTMA will allocate capacity up to an annual average flow of 6.98 MGD.	Within 30 days from the execution date of this CO&A.
6	Submit a quarterly Plan Update which will indicate the progress made towards achieving the milestones contained in this CO&A.	March 28, June 28, September 28 and December 28 of each year.

b. HTMA's CMP shall, at a minimum, contain:

i. A narrative identifying any instances of HTMA's noncompliance.
ii. A table of all proposed projects that require capacity.
iii. The flows associated with each proposed project in paragraph 3bii.
iv. A proposed timeline for connecting the aforementioned projects.
v. A chart listing plant influent flows for the preceding 12 months.

4. **Stipulated Penalties.**

a. In the event the HTMA fails to comply with Milestone Actions and Milestone Dates #1 - #4 of paragraph 3a of this CO&A, the HTMA shall be in violation of this CO&A and, in addition to other applicable remedies, the HTMA shall make a payment to the Clean Water Fund for an amount determined under the following matrix for each Monthly Average or Rolling Annual Average incident of noncompliance:

VIOLATIONS FOR TOTAL PHOSPHORUS (TP)			
Percent Over Limits (%)	Type of Limit	Penalty Amount ($)	
		Monthly Average	Rolling Annual Average per Month
> 0-25	mg/l or lbs/day	500	500
> 25-50	mg/l or lbs/day	750	750
> 50-75	mg/l or lbs/day	1000	1000
> 75-100	mg/l or lbs/day	1250	1250
> 100	mg/l or lbs/day	1500	1500

b. Stipulated penalty payments for effluent violations shall be accompanied by a copy of the DMR for that month.

c. The Department reserves the right to assess additional civil penalties and/or to bring any action at law or equity, for pollution incidents at or from the Plant which result from actions of the HTMA or its agents whether or not the violation was willful, and any pollution incidents which have an adverse impact on the receiving stream or which adversely affect public health, safety, and welfare.

d. In the event the HTMA fails to comply in a timely manner with Milestone Actions #5 and #6 of paragraph 3a. of this CO&A, the HTMA shall be in violation of this CO&A and, in addition to other applicable remedies, the HTMA shall make a payment to the Clean Water Fund in the amount of ONE HUNDRED DOLLARS ($100.00) per day for each day of noncompliance.

e. Stipulated penalty payments for violations of Milestone Actions and Milestone Dates shall be payable monthly on or before the twenty-eighth day of each succeeding month.

f. Payments for these violations shall be made by corporate check or the like made payable to the Clean Water Fund, and be forwarded to Ms. Dana Walker, Pennsylvania Department of Environmental Protection, 2 East Main Street, Norristown, PA 19401.

g. Any payment under this paragraph shall neither waive the HTMA's duty to meet its obligations under this CO&A, nor preclude the Department from commencing an action to compel the HTMA's compliance with the terms and conditions of this CO&A.

h. Stipulated civil penalty payments for violations of Milestone Actions and Milestone Dates #1 - #6 of paragraph 3a of this CO&A resolves the HTMA's liability for civil penalties arising from the violation of Milestone Actions and Milestone Dates #1 - #6 of paragraph 3a of this CO&A for which the payment is made and only resolves the HTMA's liability for civil penalties arising from the violation of Milestone Actions and Milestone Dates #1 - #6 of paragraph 3a of this CO&A for which the payment is made.

i. Stipulated civil penalties shall be due automatically and without notice.

5. **Additional Remedies**

a. In the event that the HTMA fails to comply with any provision of this CO&A, the Department may, in addition to the remedies prescribed herein, pursue any remedy available for a violation of an order of the Department, including an action to enforce this CO&A.

b. The remedies provided by this paragraph are cumulative and the exercise of one does not preclude the exercise of any other. The failure of the Department to pursue any remedy shall not be deemed to be a waiver of that remedy.

7. **Reservation of Rights.** The Department reserves the right to require additional measures to achieve compliance with applicable law. The HTMA reserves the right to challenge any action which the Department may take to require those measures.

8. **Transfer of Site.**

a. The duties and obligations under this CO&A shall not be modified, diminished, terminated, or otherwise altered by the transfer of any legal or equitable interest in the Plant or any part thereof.

b. If the HTMA intends to transfer any legal or equitable interest in the Plant which is affected by this CO&A, the HTMA shall serve a copy of this CO&A upon the prospective transferee of the legal and equitable interest at least thirty (30) days prior to the contemplated transfer and shall simultaneously inform the Department official named in paragraph 9.

c. The Department may agree to modify or terminate the HTMA's duties and obligations under this CO&A upon transfer of the Plant.

9. **Correspondence with Department.** All correspondence with the Department concerning this CO&A shall be addressed to:

Ms. Dana Walker, Compliance Specialist
Department of Environmental Protection
2 East Main Street
Norristown, PA 19401
Direct: 484-250-5970 - Facsimile: 484-250-5971

10. **Correspondence with HTMA.** All correspondence with HTMA concerning this CO&A shall be addressed to:

Steven A. Hann, Esquire
Hamburg, Rubin, Mullin, Maxwell & Lupin
375 Morris Road
P.O. Box 1479
Lansdale, Pennsylvania 19446-0773
Direct: 215-257-3666 - Facsimile: 215-661-0315

The HTMA shall notify the Department whenever there is a change in the contact person's name, title, or address. Service of any notice or any legal process for any purpose under this Consent Order and Agreement, including its enforcement, may be made by mailing a copy by first class mail to the above address.

11. **Force Majeure**.

a. In the event that the HTMA is prevented from complying in a timely manner with any time limit imposed in this CO&A solely because of a strike, fire, flood, act of God, or other circumstances beyond the HTMA's control and which the HTMA, by the exercise of all reasonable diligence, is unable to prevent, then the HTMA may petition the Department for an extension of time.

b. The HTMA shall only be entitled to the benefits of this paragraph if it notifies the Department within five (5) working days by telephone and within ten (10) working days in writing of the date it becomes aware or reasonably should have become aware of the event impeding performance. The written submission shall include all necessary documentation, the expected duration of the delay, and the efforts which have been made and are being made by the HTMA to mitigate the effects of the event and to minimize the length of the delay. The initial written submission may be supplemented within 10 days of its submission. In the event that the HTMA fails to comply with the requirements of this paragraph specifically and in a timely fashion, the Department may render this paragraph null and of no effect as to the particular incident involved.

c. The Department will decide whether to grant all or part of the extension requested on the basis of all documentation submitted by the HTMA and other information available to the Department. In any subsequent litigation, the HTMA shall have the burden of proving that the Department's refusal to grant the requested extension was an abuse of discretion based upon the information then available to it.

12. **Severability**. The paragraphs of this CO&A shall be severable and should any part hereof be declared invalid or unenforceable, the remainder shall continue in full force and effect between the parties.

13. **Entire Agreement**. This CO&A shall constitute the entire integrated agreement of the parties. No prior or contemporaneous communications or prior drafts shall be relevant or admissible for purposes of determining the meaning or intent of any provisions herein in any litigation or any other proceeding.

14. **Attorney Fees**. The parties agree to bear their respective attorney fees, expenses, and other costs in the prosecution or defense of this matter or any related matters, arising prior to execution of this CO&A.

15. **Modifications**. No changes, additions, modifications, or amendments of this Consent Order and Agreement shall be effective unless they are set out in writing and signed by the parties hereto.

16. **Titles**. A title used at the beginning of any paragraph of this CO&A may be used to aid in the construction of that paragraph, but shall not be treated as controlling.

17. **Decisions under Consent Order**. Any decision which the Department makes under the provisions of this CO&A is intended to be neither a final action under 25 Pa. Code Section 1021.2, nor an adjudication under 2 Pa.C.S. Section 101. Any objection which the HTMA may have to the decision will be preserved until the Department enforces this CO&A.

18. **NPDES Permit.** Should HTMA receive an NPDES permit with TP limits more stringent than this CO&A, then the TP limits of the NPDES permit will supersede the TP limits in this CO&A.

19. **Termination.** The terms and conditions of this CO&A shall terminate on the date that the HTMA, following planning, permitting and construction (if necessary) at the HTMA Plant, has sufficient capacity to handle current and future flows to the HTMA Plant as detailed in an updated Act 537 plan.

IN WITNESS WHEREOF, the parties hereto have caused this Consent Order and Agreement to be executed by their duly authorized representatives. The undersigned representatives of the HTMA certify that they are authorized to execute this Consent Order and Agreement on behalf of the HTMA; that the HTMA consents to the entry of this Consent Order and Agreement as a final **ORDER** of the Department; and that the HTMA hereby knowingly waives its right to appeal this Consent Order and Agreement and to challenge its content or validity, which rights may be available under Section 4 of the Environmental Hearing Board Act, the Act of July 13, 1988, P.L. 530, No. 1988-94, 35 P.S. § 7514; the Administrative Agency Law, 2 Pa. C.S. § 103(a); and Chapters 5A and 7A, or any other provision of law. Signature by the HTMA's attorney certifies only that the agreement has been signed after consulting with counsel.

FOR:
Hatfield Township Municipal Authority

Name Date

Title

FOR:
Hatfield Township Municipal Authority

Steven A. Hann, Esquire Date
Hatfield Township Municipal Authority

FOR:
Commonwealth of Pennsylvania
Department of Environmental Protection

Jenifer Fields, P.E. Date
Regional Manager
Water Management

FOR:
Commonwealth of Pennsylvania
Department of Environmental Protection

Lauren G. Rosen Date
Assistant Counsel
Southeast Regional Office

Updated 2/25/08

HTMA WWTP	Connection Status				
Tributary Municipality	EDUs	Connected	Remaining		Time
Name of Subdivision	#	edus	edus	gpd	
Hatfield Township					
Country Fresh	100.0	0.0	100.0	21,600	Within 1 year
Westport Farms Subdivision	86.0	62.0	24.0	5,184	Within 1 year
Cameron	4.0	2.0	2.0	432	Within 1 year
R & L Carriers	7.5	0.0	8.0	1,728	Within 1 year
Snyder Square Shopping Center	61.0	54.0	7.0	1,512	Within 1 year
Loh Hagey, Temporary	126.0	100.0	26.0	5,616	Within 1 year
Patel Minor Subdivision, 529 Cowpath Road	1.0	0.0	1.0	216	Within 1 year
Wurzco Tract	3.0	0.0	3.0	648	Within 1 year
Hatfield Auto Aucton	9.3	0.0	9.0	1,998	Within 1 year
McCallum Minor Subdivision	1.0	0.0	1.0	216	Within 1 year
Hatfield Pointe	48.0	0.0	48.0	10,368	Within 1 year
Firefox	33.0	0.0	33.0	7,128	Within 1 year
Arbors Commercial	10.0	0.0	10.0	2,160	Within 1 year
Cavalier Construction	3.0	0.0	3.0	648	Within 1 year
Interstates Fleets	2.0	0.0	2.0	432	Within 1 year
Evans Builders, Oak Park Road	4.0	0.0	4.0	864	Within 1 year
Saligman Tract	3.0	0.0	3.0	648	Within 1 year
ProTract Engineering	1.0	0.0	1.0	216	Within 1 year
Monaravi Office, Pratful Patel	4.0	0.0	4.0	864	Within 1 year
North Penn Community Health	12.5	0.0	12.5	2,700	Within 1 year
Miscellaneous	25.0	0.0	25.0	5,400	Within 1 year
			326.5		
Snyder Tract Subdivision	89.0	0.0	89.0	19,224	Within 2 year
Barclay Road Subdivision, Temporary	27.0	0.0	27.0	5,832	Within 2 year
Amendola	5.0	0.0	5.0	1,080	Within 2 year
Altemose Oak Tree Associates	20.0	0.0	20.0	4,320	Within 2 year
Hi Arc Reality, Koffel Road	6.0	0.0	6.0	1,296	Within 2 year
Godman Subdivision	2.0	0.0	2.0	532	Within 2 year
Altemose Flex Building	5.0	0.0	5.0	1,080	Within 2 year
Line Lexington Ind. Park, Lot B1	10.0	0.0	10.0	2,160	Within 2 year
Line Lexington Ind. Park, Detail Center	5.5	0.0	5.5	1,188	Within 2 year

Country Fresh	100.0	0.0	100.0	21,600	Within 2 year
			269.5		
Sub-Total		**218.0**	**596.0**	**128,890**	
Montgomery Township					
Montgomery Office Development	3.0		0.0	1,800	Completed
Manor Tract	10.0	10.0	0.0	0	Completed
675 Bethlehem Pike (restaurant and 2 retail)	10.0	10.0	0.0	0	Completed
Dick's Sporting Goods	9.0	9.0	0.0	0	Completed
Heckler Tract	36.0	0.0	36.0	9,000	Within 1 year
Firefox	115.0		115.0	34,500	Within 1 year
Taco Bell Restaurant	11.0	0.0	11.0	3,300	Within 1 year
Indian Lake Farm Subdivision	20.0	19.0	1.0	5,700	Within 1 year
Vacchiano Tract	2.0	0.0	2.0	600	Within 1 year
Connelly Tract	4.0	0.0	4.0	1,200	Within 1 year
			169.0		
Logo's Group Development	36.0	0.0	36.0	10,800	Within 5 year
Montgomery Babtist Church	21.0	0.0	21.0	5,250	Within 5 year
Trefoil Properties, Inc. Development	10.0	0.0	10.0	3,000	Within 5 year
Calhoun Tract	7.0	0.0	7.0	2,100	Within 5 year
Best Western Hotel	77.0	0.0	77.0	23,100	Within 5 year
Longhorn Steakhouse	17.0	0.0	17.0	3,062	Within 5 year
Montgomery Avenue, 15 properties	34.0	2.0	32.0	9,600	Within 5 year
Miscellaneous	45.0	25.0	20.0	6,000	Within 5 year
Arbors Commercial	7.0	0.0	7.0	2,100	Within 5 year
Montgomery Mall Expansion, Housing	500.0	0.0	500.0	125,000	Within 5 year
			727.0		
Parcel # 46-00-00853-001	1.0	0.0	1.0	300	Within 3-5 years
Parcel # 46-00-00841-004	2.0	0.0	2.0	600	Within 3-5 years
Parcel # 46-00-00844-004	1.0	0.0	1.0	300	Within 3-5 years
Parcel # 46-00-00850-004	1.0	0.0	1.0	300	Within 3-5 years
Parcel # 46-00-00847-007	1.0	0.0	1.0	300	Within 3-5 years
Parcel # 46-00-00253-007	4.0	0.0	4.0	1,200	Within 3-5 years
Parcel # 46-00-03103-001	2.0	0.0	2.0	600	Within 3-5 years
Parcel # 46-00-03124-007	4.0	0.0	4.0	1,200	Within 3-5 years

Parcel # 46-00-00679-007	2.0	0.0	2.0	600	Within 3-5 years
Parcel # 46-00-00673-001	1.0	0.0	1.0	300	Within 3-5 years
Parcel # 46-00-03127-007	8.0	0.0	8.0	2,400	Within 3-5 years
Parcel #46-00-00835-001	20.0	0.0	20.0	6,000	Within 3-5 years
Parcel # 46-00-00910-007	30.0	0.0	30.0	9,000	Within 3-5 years
			77.0		
Sub-Total		**75.0**	**973.0**	**269,212**	
Hatfield Borough					
Lapio-Hatfield Subdivision	8.0	8.0	0.0	0	Completed
Bethany Bible	2.0	2.0	0.0	0	Completed
Cameron Subdivision	4.0	4.0	0.0	0	Within 1 year
McCormick	1.0	0.0	1.0	300	Within 1 year
Penn Street	3.0	0.0	3.0	900	Within 1 year
McGrath	3.0	0.0	3.0	900	Within 1 year
Clegg Tract	3.0	0.0	3.0	648	Within 1 year
			10.0		
Snyder Tract Subdivision	12.0	0.0	12.0	2,592	Within 2 year
Sub-Total		**14.0**	**22.0**	**2,748**	
Hilltown Township					
Hilltown Pub	15.0	0.0	15.0	3,240	Within 2 year
Sub-Total		**0.0**	**15**	**3,240**	
Grand Total			**1606.0**	**404,090**	

Note: HTMA flow per EDU for new units = 216 gallons

Exhibit II-1

DEP Integrated Waters List for West Branch Neshaminy Creek

Hatfield Township, Montgomery County

2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report - Streams, Category 5 Waterbodies, Pollutants Requiring a TMDL

Stream Name / *Use Designation (Assessment ID)* / *Source*	*Cause*	*Date Listed*	*TMDL Date*
Rock Run			
HUC: 02040201			
Aquatic Life (2813) - 5.48 miles			
Urban Runoff/Storm Sewers	Siltation	2002	2015
Rock Run (Unt 02923)			
HUC: 02040201			
Aquatic Life (2813) - 4.82 miles			
Urban Runoff/Storm Sewers	Siltation	2002	2015
Scotts Creek			
HUC: 02040201			
Fish Consumption (13080) - 0.21 miles			
Source Unknown	PCB	2006	2019
West Branch Neshaminy Creek			
HUC: 02040201			
Aquatic Life (8841) - 1.13 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
Aquatic Life (8842) - 7.1 miles			
Agriculture	Excessive Algal Growth	2002	2015
Municipal Point Source	Cause Unknown	1998	2011
	Excessive Algal Growth	2002	2015
	Metals	1998	2011
	Nutrients	1996	2008
	Organic Enrichment/Low D.O.	1996	2008
Aquatic Life (13861) - 1.1 miles			
Small Residential Runoff	Siltation	2008	2021
West Branch Neshaminy Creek (Unt 02869)			
HUC: 02040201			
Aquatic Life (8841) - 0.09 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02870)			
HUC: 02040201			
Aquatic Life (8841) - 0.42 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02871)			
HUC: 02040201			
Aquatic Life (8841) - 0.77 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02872)			
HUC: 02040201			
Aquatic Life (8841) - 0.28 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015

2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report - Streams, Category 5 Waterbodies, Pollutants Requiring a TMDL

Stream Name / Use Designation (Assessment ID) / Source	Cause	Date Listed	TMDL Date
West Branch Neshaminy Creek (Unt 02873)			
HUC: 02040201			
Aquatic Life (8841) - 0.19 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02874)			
HUC: 02040201			
Aquatic Life (8841) - 0.26 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02875)			
HUC: 02040201			
Aquatic Life (8841) - 0.52 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02876)			
HUC: 02040201			
Aquatic Life (8841) - 0.84 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02877)			
HUC: 02040201			
Aquatic Life (8841) - 0.48 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02878)			
HUC: 02040201			
Aquatic Life (8844) - 2.32 miles			
Land Development	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02879)			
HUC: 02040201			
Aquatic Life (8844) - 1.51 miles			
Land Development	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02880)			
HUC: 02040201			
Aquatic Life (8844) - 0.39 miles			
Land Development	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02881)			
HUC: 02040201			
Aquatic Life (8844) - 0.51 miles			
Land Development	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02882)			
HUC: 02040201			
Aquatic Life (8844) - 0.39 miles			
Land Development	Siltation	2002	2015

2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report - Streams, Category 5 Waterbodies, Pollutants Requiring a TMDL

Stream Name / Use Designation (Assessment ID) / Source	Cause	Date Listed	TMDL Date
West Branch Neshaminy Creek (Unt 02883)			
HUC: 02040201			
Aquatic Life (8841) - 0.61 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02884)			
HUC: 02040201			
Aquatic Life (8848) - 3.46 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02885)			
HUC: 02040201			
Aquatic Life (8848) - 0.38 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02886)			
HUC: 02040201			
Aquatic Life (8848) - 1.76 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02889)			
HUC: 02040201			
Aquatic Life (7620) - 0.58 miles			
Municipal Point Source	Nutrients	1996	2008
	Pathogens	1996	2008
Aquatic Life (8846) - 0.65 miles			
Municipal Point Source	Nutrients	2002	2015
Urban Runoff/Storm Sewers	Siltation	2002	2015
Aquatic Life (8847) - 1.18 miles			
Urban Runoff/Storm Sewers	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02890)			
HUC: 02040201			
Aquatic Life (8846) - 0.36 miles			
Municipal Point Source	Nutrients	2002	2015
Urban Runoff/Storm Sewers	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02891)			
HUC: 02040201			
Aquatic Life (8846) - 0.65 miles			
Municipal Point Source	Nutrients	2002	2015
Urban Runoff/Storm Sewers	Siltation	2002	2015
Aquatic Life (8847) - 0.95 miles			
Urban Runoff/Storm Sewers	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02892)			
HUC: 02040201			
Aquatic Life (8846) - 0.64 miles			
Municipal Point Source	Nutrients	2002	2015
Urban Runoff/Storm Sewers	Siltation	2002	2015

2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report - Streams, Category 5 Waterbodies, Pollutants Requiring a TMDL

Stream Name / Use Designation (Assessment ID) / Source	Cause	Date Listed	TMDL Date
West Branch Neshaminy Creek (Unt 02893)			
HUC: 02040201			
Aquatic Life (8841) - 0.39 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02894)			
HUC: 02040201			
Aquatic Life (13861) - 3.16 miles			
Small Residential Runoff	Siltation	2008	2021
West Branch Neshaminy Creek (Unt 02895)			
HUC: 02040201			
Aquatic Life (13861) - 1.1 miles			
Small Residential Runoff	Siltation	2008	2021
West Branch Neshaminy Creek (Unt 02896)			
HUC: 02040201			
Aquatic Life (8841) - 1.01 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02897)			
HUC: 02040201			
Aquatic Life (8841) - 0.41 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02898)			
HUC: 02040201			
Aquatic Life (8841) - 0.32 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02899)			
HUC: 02040201			
Aquatic Life (8841) - 1.13 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015

Exhibit II-2

DEP Integrated Waters List for Skippack Creek

Hatfield Township, Montgomery County

2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report - Streams, Category 4c Waterbodies, Pollution not Requiring a TMDL

Stream Name Use Designation (Assessment ID) Source	Cause	Date Listed
Skippack Creek (Unt 01096) HUC: 02040203 Aquatic Life (13862) - 0.97 miles Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01097) HUC: 02040203 Aquatic Life (13862) - 2.86 miles Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01098) HUC: 02040203 Aquatic Life (13862) - 0.65 miles Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01099) HUC: 02040203 Aquatic Life (13862) - 1.08 miles Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01100) HUC: 02040203 Aquatic Life (13862) - 1.5 miles Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01101) HUC: 02040203 Aquatic Life (13862) - 0.98 miles Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01102) HUC: 02040203 Aquatic Life (13862) - 0.49 miles Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01103) HUC: 02040203 Aquatic Life (13862) - 2.6 miles Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01104) HUC: 02040203 Aquatic Life (13862) - 0.64 miles Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01105) HUC: 02040203 Aquatic Life (13862) - 0.64 miles Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01106) HUC: 02040203 Aquatic Life (13862) - 0.7 miles Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01107) HUC: 02040203 Aquatic Life (13862) - 0.66 miles Small Residential Runoff	Water/Flow Variability	2008

Exhibit II-3

Description of Prime Agricultural Farmland

Prime and other Important Farmlands

Soil Map Units considered important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. The listing of these soils does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

"Prime farmland" is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent.

More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

"Unique farmland" is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be **"farmland of statewide importance"** for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be **"farmland of local importance"** for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Exhibit II-4

DCNR Map 7 - PA Geologic Map

MAP 7

DCNR

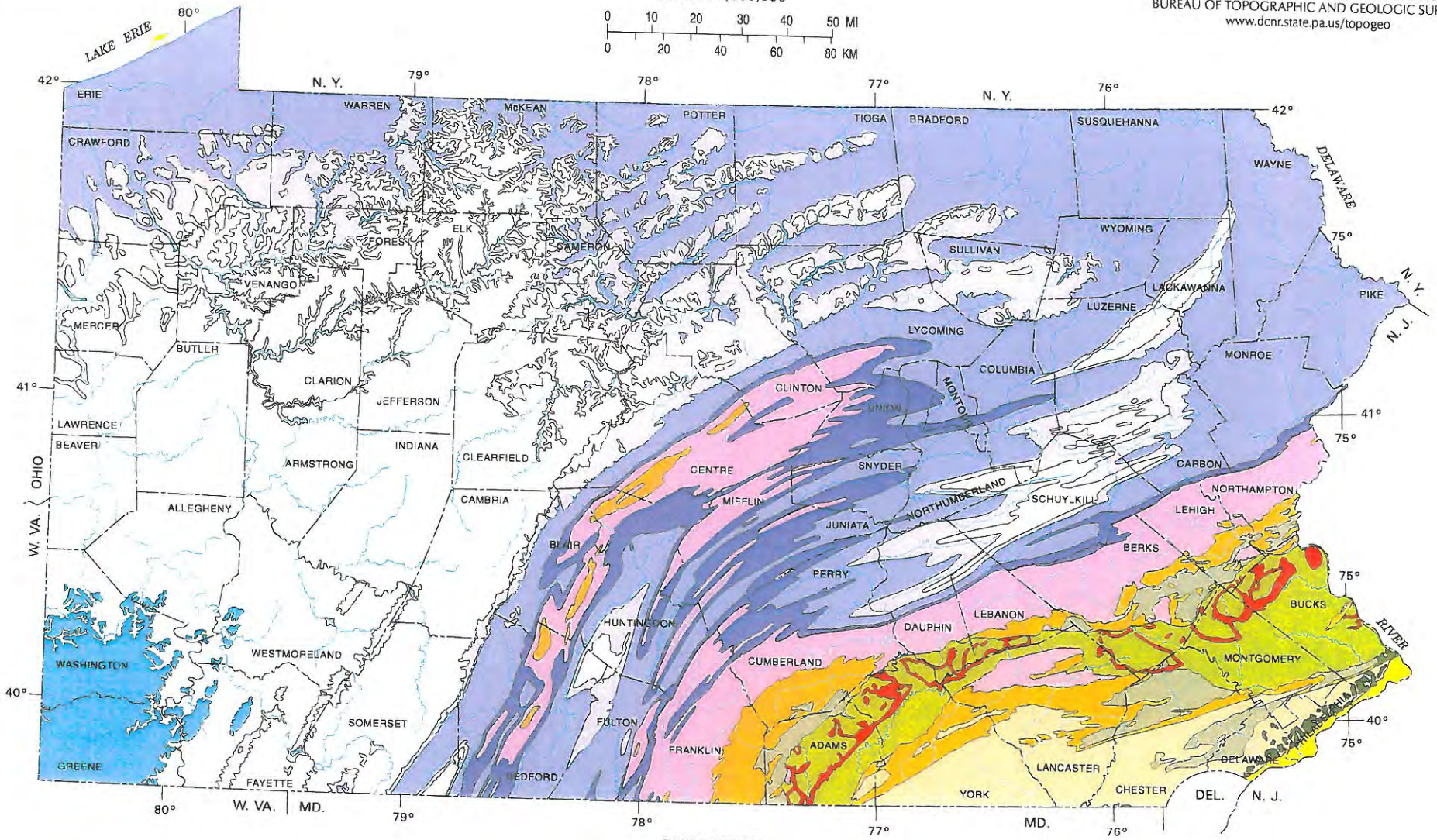
GEOLOGIC MAP OF PENNSYLVANIA

SCALE 1:2,000,000

0 10 20 30 40 50 MI

0 20 40 60 80 KM

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

QUATERNARY (0–1.8 mil. yrs.)
Sand, gravel, and silt.
Sand and gravel.

TERTIARY (1.8–65 mil. yrs.)
Sand, gravel, silt, and clay.
Sand and gravel.

* **JURASSIC AND TRIASSIC** (144–248 mil. yrs.)
Red sandstone, shale, and conglomerate (green), intruded by diabase (red).
Building stone, iron.

PERMIAN (248–290 mil. yrs.)
Cyclic sequences of shale, sandstone, limestone, and coal.
Lime, clay.

PENNSYLVANIAN (290–323 mil. yrs.)
Cyclic sequences of sandstone, red and gray shale, conglomerate, clay, coal, and limestone.
Coal, clay, lime, building stone.

MISSISSIPPIAN (323–354 mil. yrs.)
Red and gray sandstone, shale, and limestone.
Flagstone, limestone, clay.

DEVONIAN (354–417 mil. yrs.)
Red sandstone, gray shale, black shale, limestone, and chert.
Flagstone, silica sand, clay, lime.

SILURIAN (417–443 mil. yrs.)
Red and gray sandstone, conglomerate, shale, and limestone.
Lime, building stone.

ORDOVICIAN (443–490 mil. yrs.)
Shale, limestone, dolomite, and sandstone.
Slate, limestone, zinc, clay.

CAMBRIAN (490–570 mil. yrs.)
Limestone, dolomite, sandstone, shale, quartzite, and phyllite.
Lime, building stone.

LOWER PALEOZOIC (443–570 mil. yrs.)
Metamorphic rocks (metasedimentary and meta-igneous); schist, gneiss, quartzite, serpentine, slate, and marble.
Building stone, talc.

PRECAMBRIAN (older than 570 mil. yrs.)
Gneiss, granite, anorthosite, metadiabase, metabasalt, metarhyolite, and marble.
Building stone, graphite, sericite.

*Cretaceous rocks, which are present in small areas of southern Montgomery County, cannot be shown at the scale of this map.

Prepared by Bureau of Topographic and Geologic Survey. Third Edition, 1990; Fourth Printing, Slightly Revised, 2007.

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Exhibit II-5

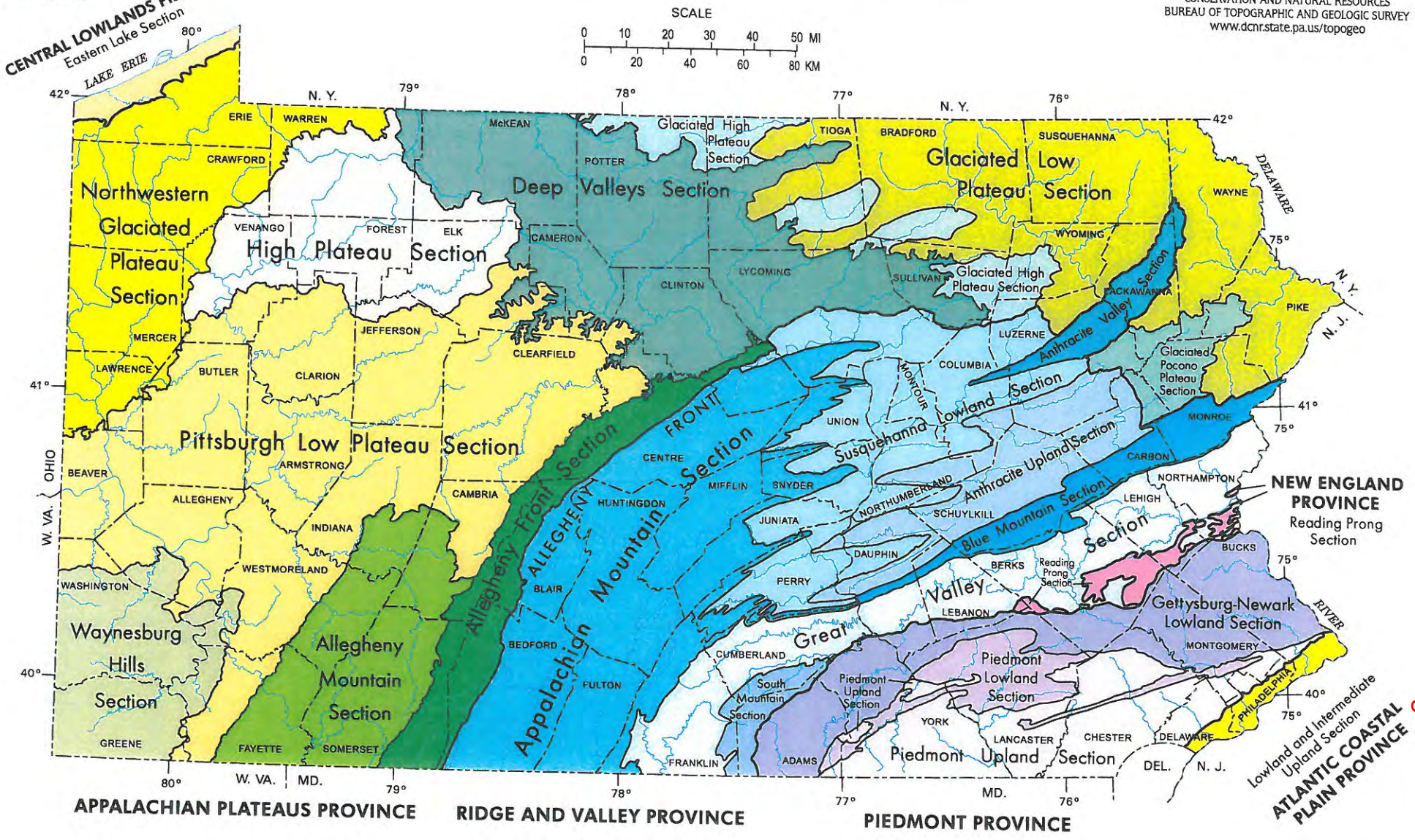
DCNR Map 13 - PA Physiographic Provinces Map

MAP 13

DCNR

PHYSIOGRAPHIC PROVINCES OF PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

CENTRAL LOWLANDS PROVINCE: Eastern Lake Section

APPALACHIAN PLATEAUS PROVINCE: Northwestern Glaciated Plateau Section; High Plateau Section; Pittsburgh Low Plateau Section; Waynesburg Hills Section; Allegheny Mountain Section; Allegheny Front Section; Deep Valleys Section; Glaciated High Plateau Section; Glaciated Low Plateau Section; Glaciated Pocono Plateau Section

RIDGE AND VALLEY PROVINCE: Appalachian Mountain Section; Susquehanna Lowland Section; Anthracite Valley Section; Anthracite Upland Section; Blue Mountain Section; Great Valley Section; South Mountain Section

NEW ENGLAND PROVINCE: Reading Prong Section

PIEDMONT PROVINCE: Gettysburg-Newark Lowland Section; Piedmont Lowland Section; Piedmont Upland Section

ATLANTIC COASTAL PLAIN PROVINCE: Lowland and Intermediate Upland Section

SYMBOLS
- Approximate boundary between physiographic provinces
- Approximate boundary between physiographic sections

Compiled by W. D. Sevon. Fourth Edition, 2000.

PHYSIOGRAPHIC PROVINCES OF PENNSYLVANIA

PHYSIOGRAPHIC PROVINCE	PHYSIOGRAPHIC SECTION	DOMINANT TOPOGRAPHIC FORM	LOCAL RELIEF[1]	UNDERLYING ROCK TYPE	GEOLOGIC STRUCTURE	APPROXIMATE ELEVATION[2] Min.	Max.	DRAINAGE PATTERN	BOUNDARIES	ORIGIN
CENTRAL LOWLANDS	Eastern Lake	Northwest-sloping, lake-parallel, low-relief ridges.	Very low to low.	Shale and siltstone.	Beds either horizontal or having low south dip.	570	1,000	Parallel.	*Northwest:* Lake Erie. *Southeast:* Base of escarpment.	Glacial, lake, and fluvial deposition and erosion.
APPALACHIAN PLATEAUS	Northwestern Glaciated Plateau	Broad, rounded upland and deep, steep-sided, linear valleys partly filled with glacial deposits.	Very low to moderate.	Shale, siltstone, and sandstone.	Subhorizontal beds.	900	2,200	Dendritic.	*Northwest:* Base of escarpment. *Southeast:* Glacial border.	Fluvial and glacial erosion; glacial deposition.
	High Plateau	Broad, rounded to flat uplands having deep, angular valleys.	Moderate to high.	Sandstone, siltstone, shale, and conglomerate; some coal.	Low-amplitude, open folds.	980	2,360	Dendritic.	*Northwest:* Glacial border. *Northeast:* Margins of deep valleys. *South:* Arbitrary along drainage divides between coal and noncoal areas.	Fluvial erosion; periglacial mass wasting.
	Pittsburgh Low Plateau	Smooth to irregular, undulating surface; narrow, relatively shallow valleys; strip mines and reclaimed land.	Low to moderate.	Shale, siltstone, sandstone, limestone, and coal.	Moderate- to low-amplitude, open folds, decreasing in occurrence northwestward.	660	2,340	Dendritic.	*Northwest:* Glacial border. *Elsewhere:* Arbitrary at topographic changes with adjacent sections.	Fluvial erosion; periglacial mass wasting; strip mining.
	Waynesburg Hills	Very hilly with narrow hilltops and steep-sloped, narrow valleys.	Moderate.	Sandstone, shale, red beds, and limestone.	Horizontal beds.	848	1,638	Dendritic.	Arbitrary at change of topography.	Fluvial erosion and landslides.
	Allegheny Mountain	Wide ridges separated by broad valleys; ridge elevations decrease to north.	Moderate to high.	Sandstone, siltstone, shale, and conglomerate; some limestone and coal.	Large-amplitude, open folds.	775	3,210	Dendritic.	*East:* Arbitrary between coal and noncoal areas. *West:* Base of west flank of Chestnut Ridge. *North:* Approximates northeast terminus of large-amplitude, open folds.	Fluvial erosion; some periglacial mass wasting.
	Allegheny Front	*East:* Rounded to linear hills rising by steps to an escarpment; hills cut by narrow valleys. *West:* Undulating hills sloping away from escarpment.	Moderate to high.	Shale, siltstone, and sandstone.	*South:* Broad fold. *Elsewhere:* Beds having low northwest dip; some faults.	540	2,980	Parallel and trellis.	*East:* Stream at base of hills below escarpment. *West:* Arbitrary between coal and noncoal areas.	Fluvial erosion; periglacial mass wasting.
	Deep Valleys	Very deep, angular valleys; some broad to narrow uplands.	Moderate to very high.	Sandstone, siltstone, shale, and conglomerate.	Moderate-amplitude, open folds that control valley orientations.	560	2,560	Angulate and rectangular.	Arbitrary at margins of deep valleys, either at top of valley slope or along drainage divide.	Fluvial erosion; periglacial mass wasting.
	Glaciated High Plateau	Broad to narrow, rounded to flat, elongate uplands and shallow valleys.	Low to high.	Sandstone, siltstone, shale, and conglomerate; some coal.	Moderate-amplitude, open folds.	620	2,560	Angulate and dendritic.	*East:* Base of escarpment. *Elsewhere:* Arbitrary with margins of deep valleys.	Fluvial and glacial erosion; glacial deposition.
	Glaciated Low Plateau	Rounded hills and valleys.	Low to moderate.	Sandstone, siltstone, and shale.	Low-amplitude folds.	440	2,690	Dendritic.	Base of escarpments of adjacent uplands; base of Pocono escarpment. *Elsewhere:* Arbitrary.	Fluvial and glacial erosion; glacial deposition.
	Glaciated Pocono Plateau	Broad, undulatory upland surface having dissected margins.	Low to moderate.	Sandstone, siltstone, and shale; some conglomerate.	Beds having low north dip; some small folds.	1,200	2,320	Deranged.	*South and east:* Base of Pocono escarpment. *North:* Crest of drainage divide. *West:* Arbitrary.	Fluvial and glacial erosion; glacial deposition.
RIDGE AND VALLEY	Appalachian Mountain	Long, narrow ridges and broad to narrow valleys; some karst.	Moderate to very high.	Sandstone, siltstone, shale, conglomerate, limestone, and dolomite.	Open and closed plunging folds having narrow hinges and planar limbs; variety of faults.	440	2,775	Trellis, angulate, and some karst.	*Southeast:* Base of slope change on southeast side of Blue Mountain. *West and northwest:* Center of valley bottom west of westernmost linear ridge. *Elsewhere:* Base of slope change of eastern ridges; arbitrary between ridges.	Fluvial erosion; solution of carbonate rocks; periglacial mass wasting.
	Susquehanna Lowland	Low to moderately high, linear ridges; linear valleys; Susquehanna River valley.	Low to moderate.	Sandstone, siltstone, shale, conglomerate, limestone, and dolomite.	Open and closed plunging folds having narrow hinges and planar limbs.	260	1,715	Trellis and angulate.	Base of slope change to higher ridges of all surrounding areas; arbitrary in valley areas.	Fluvial erosion; some glacial erosion and deposition in northeast.
	Anthracite Valley	Narrow to wide, canoe-shaped valley having irregular to linear hills; valley enclosed by steep-sloped mountain rim.	Low to moderate.	Sandstone, siltstone, conglomerate, and anthracite.	Broad, doubly-plunging syncline; faults and smaller folds.	500	2,368	Trellis and parallel.	Outer base of surrounding mountain.	Fluvial and glacial erosion; some glacial deposition.
	Anthracite Upland	Upland surface having low, linear to rounded hills, strip mines, and waste piles; upland surrounded by an escarpment, a valley, and a mountain rim.	Low to high.	Sandstone, shale, conglomerate, and anthracite.	Many narrow folds having steep limbs; many faults.	320	2,094	Trellis.	*Northeast:* Arbitrary between coal and noncoal areas. *Elsewhere:* Outer base of surrounding mountain.	Fluvial erosion; some glacial erosion and periglacial mass wasting.
	Blue Mountain	Linear ridge to south and valley to north; valley widens eastward and includes low linear ridges and shallow valleys.	Moderate to high.	Sandstone, siltstone, and shale; some limestone and conglomerate.	*Southwest:* South limb of broad fold. *Northeast:* Small folds north of Blue Mountain.	300	1,680	Trellis.	*Southeast:* Base of slope change on southeast side of Blue Mountain. *Northwest:* Base of mountain; base of Pocono escarpment. *Northeast:* Arbitrary.	Fluvial erosion; some glacial erosion and deposition in northeast.
	Great Valley	Very broad valley. *Northwest half:* Dissected upland. *Southeast half:* Low karst terrain.	Low to moderate.	*Northwest:* Shale and sandstone; slate at east end. *Southeast:* Limestone and dolomite.	Thrust sheets, nappes, overturned folds, and steep faults; many third- and fourth-order folds.	140	1,100	Dendritic and karst.	*North:* Base of slope change on southeast side of Blue Mountain. *South:* Base of slope change to adjacent uplands.	Fluvial erosion; solution of carbonate rocks; some periglacial mass wasting.
	South Mountain	Linear ridges, deep valleys, and flat uplands.	Moderate to high.	Metavolcanic rocks, quartzite, and some dolomite.	Major anticlinorium having many second- and third-order folds.	450	2,080	Dendritic.	Base of slope change to adjacent lowlands.	Fluvial erosion of highly variable rocks; some periglacial mass wasting.
NEW ENGLAND	Reading Prong	Circular to linear, rounded hills and ridges.	Moderate.	Granitic gneiss, granodiorite, and quartzite.	Multiple nappes.	140	1,364	Dendritic.	Base of slope change to adjacent lowlands.	Fluvial erosion; some periglacial mass wasting.
PIEDMONT	Gettysburg-Newark Lowland	Rolling lowlands, shallow valleys, and isolated hills.	Low to moderate.	Mainly red shale, siltstone, and sandstone; some conglomerate and diabase.	Half-graben having low, monoclinal, northwest-dipping beds.	20	1,355	Dendritic and trellis.	Base of slope changes with adjacent uplands and lowlands. *Elsewhere:* Arbitrary.	Fluvial erosion of rocks of variable resistance.
	Piedmont Lowland	Broad, moderately dissected, karst valleys separated by broad, low hills.	Low.	Dominantly limestone and dolomite; some phyllitic shale and sandstone.	Complexly folded and faulted.	60	700	Dendritic and karst.	*South:* Base of slope change to adjacent upland. *North:* Mesozoic red rocks.	Fluvial erosion; some periglacial mass wasting.
	Piedmont Upland	Broad, rounded to flat-topped hills and shallow valleys.	Low to moderate.	Mainly schist, gneiss, and quartzite; some saprolite.	Extremely complexly folded and faulted.	100	1,220	Dendritic.	*East:* Base of low to vague Fall Line escarpment. *North:* Base of slope change to adjacent lowlands.	Fluvial erosion; some periglacial mass wasting.
ATLANTIC COASTAL PLAIN	Lowland and Intermediate Upland	Flat upper terrace surface cut by shallow valleys; Delaware River floodplain.	Very low.	Unconsolidated to poorly consolidated sand and gravel; underlain by schist, gneiss, and other metamorphic rocks.	Unconsolidated deposits underlain by complexly folded and faulted rocks.	0	200	Dendritic.	*Northwest:* Base of low to vague Fall Line escarpment. *East:* Arbitrary.	Fluvial erosion and deposition.

[1]Local relief: 0 to 100 feet, very low; 101 to 300 feet, low; 301 to 600 feet, moderate; 601 to 1,000 feet, high; >1,000 feet, very high.
(Relief categories listed here for Pennsylvania do not necessarily apply to other states or countries.)
[2]Elevations are in feet.

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Exhibit II-6

Montgomery County USGS Quad and Karst Density

Hatfield Township, Montgomery County

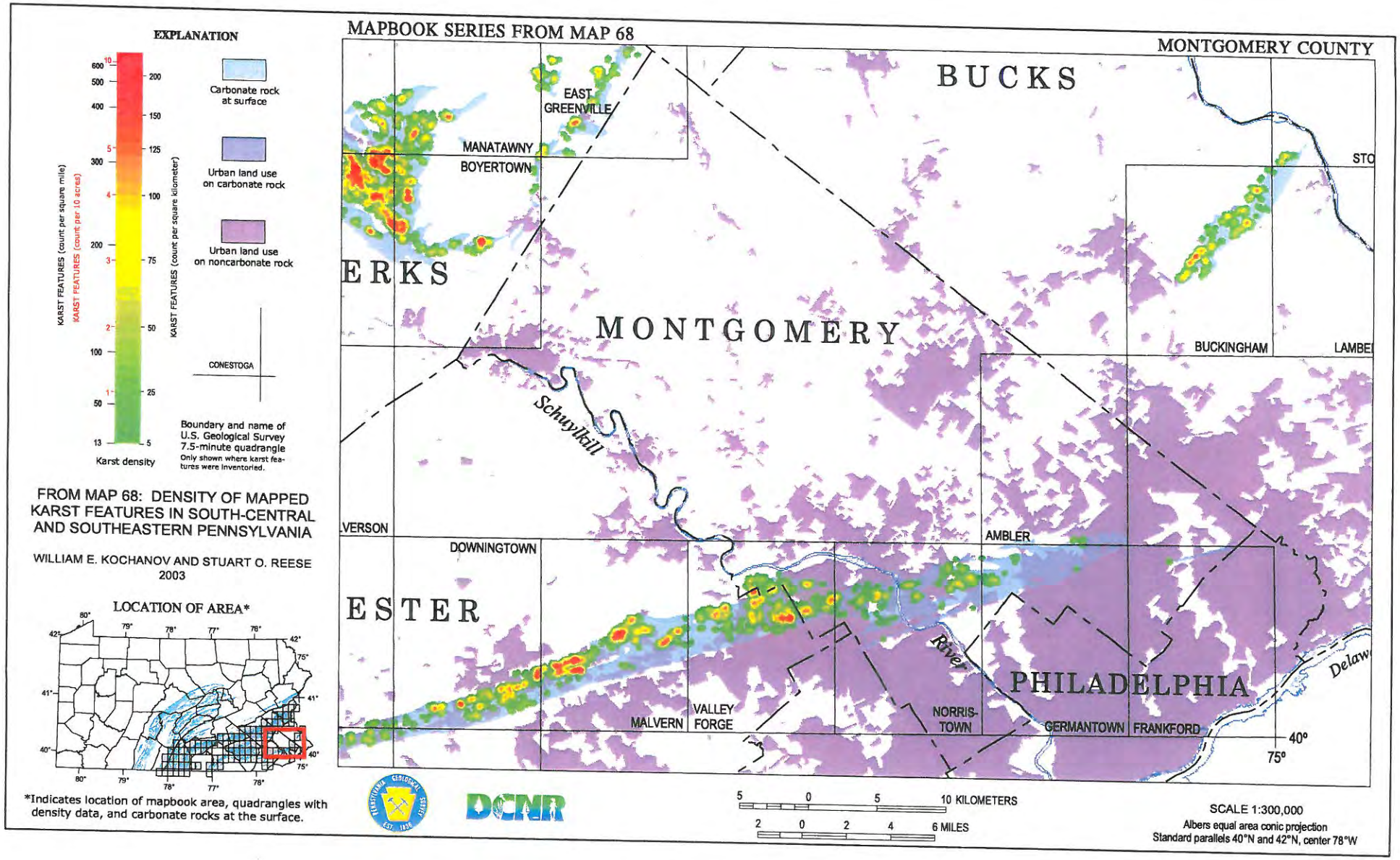


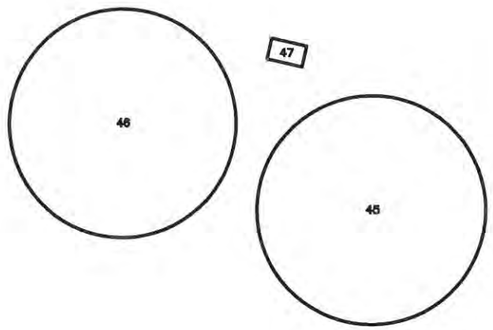
Exhibit III-1

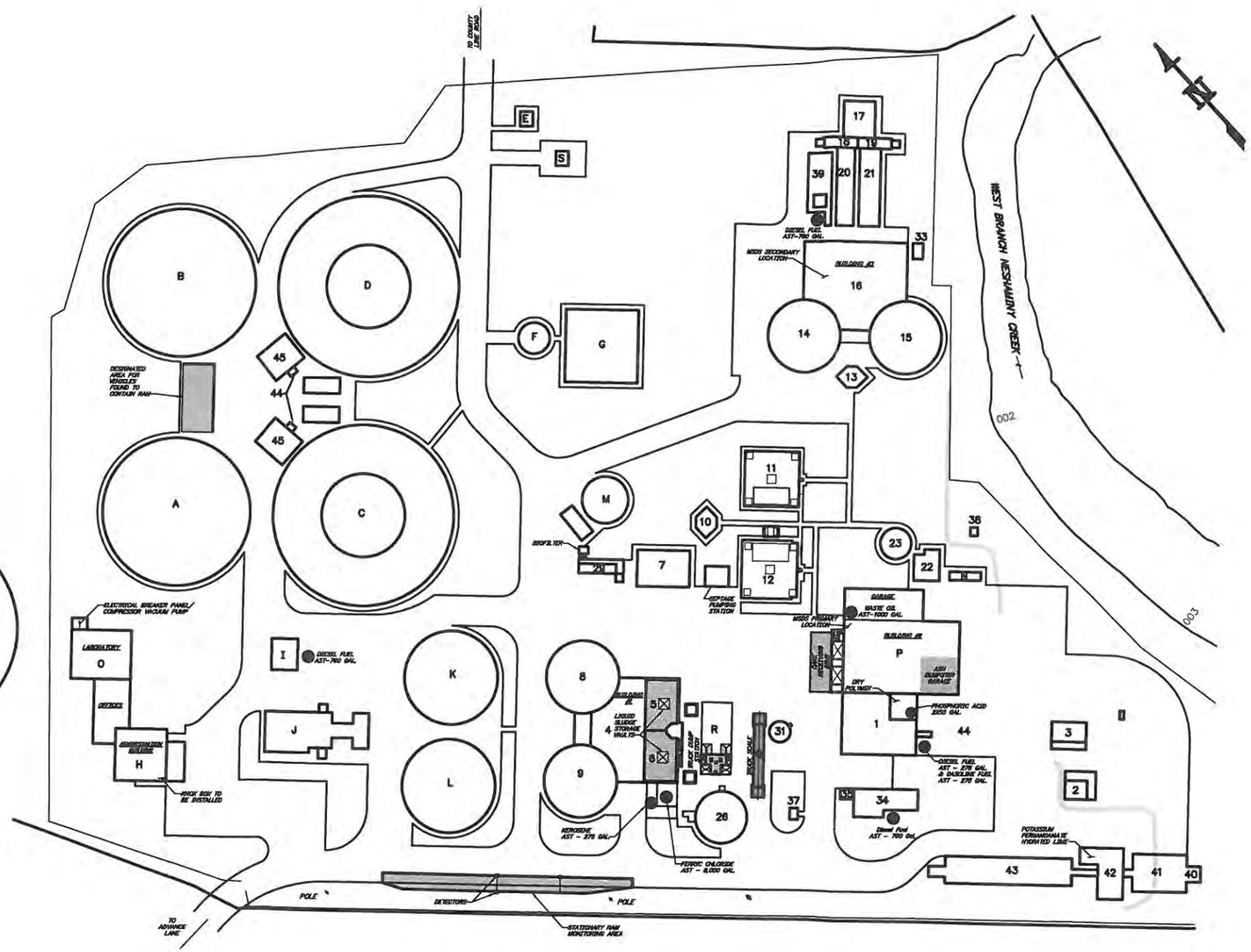
WWTP Site Plan

Hatfield Township, Montgomery County

EXISTING FACILITIES:

ITEM NO.	DESCRIPTION
1.	CONTROL BUILDING
2.	PUMP STATION NO. 1 (ABANDON)
3.	PUMP STATION NO. 2 (ABANDON)
4.	CHEMICAL FEED BUILDING (BUILDING #1)
5.	LIQUID SLUDGE STORAGE TANK NO. 1
6.	LIQUID SLUDGE STORAGE TANK NO. 2
7.	AUXILIARY SURGE STORAGE TANK (ABANDON)
8.	PRIMARY CLARIFIER NO. 1 (ABANDON)
9.	PRIMARY CLARIFIER NO. 2 (ABANDON)
10.	AERATION BASINS HEADBOX (ABANDON)
11.	TRUCK WASTE AERATION BASIN NO. 1
12.	TRUCK WASTE AERATION BASIN NO. 2
13.	SECONDARY CLARIFIER TANKS NO'S. 1 AND 2 HEADBOX (ABANDON)
14.	SECONDARY CLARIFIER NO. 1 (ABANDON)
15.	SECONDARY CLARIFIER NO. 2 (ABANDON)
16.	MAINTENANCE BUILDING (BUILDING #3, MSDS SECONDARY LOCATION)
17.	CHEMICAL WASTE SLUDGE PUMP VAULT NO. 1 (ABANDON)
18.	FLOCCULATOR TANK NO. 1 (ABANDON)
19.	FLOCCULATOR TANK NO. 2 (ABANDON)
20.	TUBE CLARIFIER NO. 1 (ABANDON)
21.	TUBE CLARIFIER NO. 2 (ABANDON)
22.	BACKWASH PUMP VAULT (NOT USED)
23.	BACKWASH STORAGE TANK
28.	SLUDGE THICKENER TANK
30.	SLUDGE CONTROL HEADBOX (ABANDON)
31.	SLUDGE BLEND TANK
33.	POWER TRANSFORMER
34.	ELECRICAL EQUIPMENT AREA
35.	DEEP WELL NO. 1
36.	SCREENING CHAMBER (ABANDON)
37.	DEEP WELL NO. 2
38.	ELECTRICAL AND TELEPHONE MANHOLE NO. 2
39.	CHEMICAL PUMPING BUILDING (ABANDON)
40.	METERING FLUMES
41.	SCREW PUMP STATION NO. 1
42.	SCREENINGS BUILDING
43.	GRIT AND GREASE REMOVAL UNIT
44.	6 x 8 POLYMER SHEDS
45.	EQUALIZATION TANK NO. 1
46.	EQUALIZATION TANK NO. 2
47.	UTILITY BUILDING
A.	SECONDARY CLARIFIER NO. 1
B.	SECONDARY CLARIFIER NO. 2
C.	AERATION REACTOR NO. 1
D.	AERATION REACTOR NO. 2
E.	SECONDARY CLARIFIER EFFLUENT SPLITTER BOX
F.	ELEVATED UTILITY WATER STORAGE TANK
G.	ULTRAVIOLET DISINFECTION TANK
H.	ADMINISTRATION BUILDING
I.	ELECTRICAL BUILDING
J.	SCREW PUMP STATION NO. 2
K.	PRIMARY CLARIFIER NO. 1
L.	PRIMARY CLARIFIER NO. 2
M.	SLUDGE STORAGE SILO
N.	EFFLUENT METERING FLUME PIT
O.	LABORATORY BUILDING
P.	INCINERATOR BUILDING (BUILDING #2, MSDS PRIMARY LOCATION
Q.	TRUCK SCALE
R.	TRUCK DUMP STATION
S.	MORTON GARAGE





SITE PLAN

LEGEND:

- Permitted Facility – Incinerator
- 100 YR Floodplain
- Fence
- Solid Waste Storage Or Loading & Unloading Areas
- Scales & Weigh Stations
- Storage Tanks

0 60 120 180 240 300

SCALE: 1"=60'

DESIGNED BY TEW	HATFIELD TOWNSHIP MUNICIPAL AUTHORITY	DATE SEPT. 2007
DRAWN BY BAA	SITE PLAN	JOB NO. 0592.12
CHECKED BY JFM	HATFIELD TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA	FILE NPDES.DWG
APPROVED BY TEW	CET Engineering Services Harrisburg, Pennsylvania	DRAWING NO. NPDES
SCALE 1" = 60'		SHEET 1 OF 1

Exhibit III-2

Mail and Door to Door Survey Example

Hatfield Township, Montgomery County

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
CLEAN WATER

October 10, 2008

Advanced Living Management & Devel.
1392 Allentown Road
Lansdale, PA 19446

Re: Hatfield Township
Act 537 Sewage Facilities Planning
Field Survey

Dear Resident and/or Property Owner:

This letter is being sent regarding a property you reside on, or may just own in Hatfield Township. In accordance with the Pennsylvania Department of Environmental Protection (PA DEP)'s Act 537 Sewage Facilities Plan requirements, Hatfield Township and the Hatfield Township Municipal Authority are conducting a sewage facilities needs analysis in your area. Part of the Plan is to evaluate current methods of sewage disposal in your area to assure that these do not affect current or future water quality.

In order to gather this information with the least cost while still respecting your privacy, we ask that you fill out and return the attached survey concerning water supply and waste disposal as soon as possible.

The survey will be used in a variety of ways. For instance:

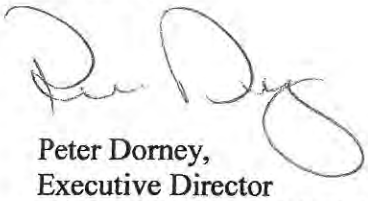
1. It will be used to plan a sampling and testing of existing wells, if wells are used in your area. If your well is selected for sampling, please allow the person collecting the sample to collect it as close to the well as possible. Not every well must be tested, but if you wish to have your well sampled, please indicate this on your response;
2. It will be used to identify where we must actually send a person to verify facts. This is part of the process called "validating the survey". If your property is selected for such a visit, we ask your cooperation.
3. It may provide information which will require us to look at certain areas in more detail, possibly surveying for information door-to-door in a few selected areas.

Please return the survey form to us not later than November 14, 2008. Your answers are very important. With this survey we hope to obtain data which meets part of the minimum legal standards on which to base future public decisions concerning questions on local water supply safety and wastewater disposal.

If you have any questions, please contact the Hatfield Township Municipal Authority at (215) 822-9300. Please mail or deliver the survey form and request for your well to be sampled to: Hatfield Township Municipal Authority, 3200 Advance Lane, Colmar, PA 18915.

Thank you for your help in this survey effort.

Sincerely,



Peter Dorney,
Executive Director
Hatfield Township Municipal Authority

SEWAGE NEEDS
MAIL SURVEY

October 10, 2008

Hatfield Township and HTMA are conducting a survey to determine what sewage problems may exist in this area. The survey results will be used to determine if sewage problems exist, and the best and most economical way of correcting the problems. Please complete the form to the best of your ability, and return it by: November 14, 2008 to the HTMA office at 3200 Advance Lane, Colmar, PA 18915

If you have any questions please contact Peter Dorney, Executive Director, HTMA, at 215-822-9300.
Please note: this survey may be followed by a partial or whole door to door survey.

(CIRCLE OR FILL IN AS APPROPRIATE; ADD COMMENTS AS NEEDED)

NAME: _____ PHONE: (_____) -_____
ADDRESS: _____

1. How many people live in your house? _____ SEASONAL / ALL YEAR?
2. How large is your lot? _____
3. Do you have more than one sewage system on your lot? Y/N
   If yes, explain: _____
4. What kind of water system do you have? WELL? SPRING? PUBLIC? OTHER? _____
   Do you treat your water? Y/N If yes, how? _____
   If you have a well: Is it DUG or DRILLED ? How Deep? _____ ft. Cased? Y/N
5. How far is the well or spring from the drain field _____ ft. Is well UP/DOWN SLOPE ___
   Have you every had your water tested? Y/N When? _____
   What were the results? _____
   _____
7. What kind of sewage system of you have? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
PUBLIC SEWER	OTHER _____	

8. Where does your laundry and/or sink water go? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
PUBLIC SEWER	OTHER _____	

9. How old is your system? _____ Was it permitted? Y/N When? _____
10. Have you every noticed any of the following near your septic system?

GREEN LUSH GRASS	WETNESS OR SPONGY AREAS
ODORS	WATER PONDING OR SURFACING
SLUGGISH DRAINS	WASTEWATER BACKING INTO THE HOME
SYSTEM OVERFLOW	OTHER _____

11. Was your system every pumped out? Y/N How often? _____ Last time? _____
    If it was pumped, was it inspected for cracks or broken baffles? _____
12. Was your system ever repaired? Y/N When? _____ By permit? Y/N
    What part was repaired or replaced?
    TANK REPAIRED/REPLACED
    LINE: REPAIRED/REPLACED
    DRAIN FIELD: REPAIRED/REPLACED
13. Are you aware of any other sewage problems?
14. COMMENTS:

DOOR TO DOOR
NEEDS SURVEY

Munic.: Hatfield Township Co.: Montgomery Study Area: HTMA Date: _____
General weather conditions: _____

A survey is being conducted to determine if there are any sewage problems in this area. This is a general survey and the results are intended to be used in evaluating the need for community wide solutions.

(CIRCLE OR FILL IN AS APPROPRIATE; ADD COMMENTS AS NEEDED)

NAME: _____ STREET: _____ CITY: _____
ZIP: _____ PHONE #: _____ OWNER OR RENTER? NUMBER OF RESIDENTS: ___
What kind of water system do you have? WELL? SPRING? CISTERN? PUBLIC? OTHER?
If you have a well: Is it DUG or DRILLED ? HOW DEEP? _____ ft. Cased? Y / N
How far is the well or spring from the drain field _____ ft. Is well UP/DOWNHILL _____
Do you treat your water? Y / N How? CL/UV DISINFECTION, SOFTENER, ION, OTHER _____
Was the water ever tested? Y / N When? _____
Any contamination? Y / N What (TC, FC, N, etc.) _____

How large is your lot? _____ No. of dwelling units? _____
One or more sewage systems? _____ COMMERCIAL/RESIDENTIAL?

What kind of sewage system do you have? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE

OTHER _____

Where does your laundry and/or sink water go? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
OTHER		

How old is your system? _____ Was it permitted? Y / N When? ___
Have you every noticed any of the following near your septic system? _____

GREEN LUSH GRASS	WETNESS OR SPONGY AREAS	ODORS
WATER PONDING OR SURFACING	SYSTEM OVERFLOW	
SLUGGISH DRAINS	WASTEWATER BACKING INTO THE HOME	

OTHER _____

If you noticed any of the above, are they seasonal or year-round? _____

Have you ever had your system pumped out? Y / N How often? _____ Last time? _____
If it was pumped, was it inspected for cracks or broken baffles? Y / N What part? _____

Has the system every been repaired? Y / N When? _____ By permit? Y / N What part? _____
TANK REPAIRED/REPLACED LINE: REPAIRED/REPLACED DRAIN FIELD: REPAIRED/REPLACED
COMMENTS: _____

DO I/WE HAVE YOUR PERMISSION TO CONFIRM THIS INFORMATION BY LOOKING AROUND? Y / N

SEWAGE NEEDS
MAIL SURVEY

October 10, 2002

Hatfield Township and Hatfield Township Municipal Authority (HTMA) are conducting a survey to determine what sewage problems may exist in this area. The survey results will be used to determine if sewage problems exist, and the best and most economical way of correcting the problems. Please complete the form to the best of your ability, and return it by: November 14, 2008 to the HTMA office at 3200 Advance Lane, Colmar, PA 18915

If you have any questions please contact Peter Dorney, Executive Director, HTMA, at 215-822-9300.
Please note: this survey may be followed by a partial or whole door-to-door survey.

(CIRCLE OR FILL IN AS APPROPRIATE; ADD COMMENTS AS NEEDED)

NAME: _____ PHONE: _____
ADDRESS: 470 Derstine Rd. Hatfield PA 19440

1. How many people live in your house? 3 SEASONAL (ALL YEAR?)
2. How large is your lot? 1.3 acre
3. Do you have more than one sewage system on your lot? Y(N)
   If yes, explain: _____
4. What kind of water system do you have? (WELL?) SPRING? PUBLIC? OTHER? _____
   Do you treat your water? (Y)N If yes, how? Water Softener
   If you have a well: Is it DUG or DRILLED? How Deep? _____ ft. Cased? Y/N
5. How far is the well or spring from the drain field _____ ft. Is well UP/DOWN SLOPE ___
   Have you every had your water tested? (Y)N When? 5/2004
   What were the results? (attach copy if possible) _____

7. What kind of sewage system of you have? (CIRCLE ALL THAT APPLY)

(SEPTIC TANK)	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
PUBLIC SEWER	OTHER _____	

8. Where does your laundry and/or sink water go? (CIRCLE ALL THAT APPLY)

(SEPTIC TANK)	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
PUBLIC SEWER	OTHER _____	

9. How old is your system? 7 Was it permitted? Y/N When? _____
10. Have you every noticed any of the following near your septic system?

GREEN LUSH GRASS	WETNESS OR SPONGY AREAS
ODORS	WATER PONDING OR SURFACING
SLUGGISH DRAINS	WASTEWATER BACKING INTO THE HOME
SYSTEM OVERFLOW	OTHER _____

11. Was your system every pumped out? (Y)N How often? _____ Last time? 6/2007
    If it was pumped, was it inspected for cracks or broken baffles? yes
12. Was your system ever repaired? Y(N) When? _____ By permit? Y/N
    What part was repaired or replaced?
    TANK REPAIRED/REPLACED
    LINE: REPAIRED/REPLACED
    DRAIN FIELD: REPAIRED/REPLACED
13. Are you aware of any other sewage problems? No
14. COMMENTS:
    Bought house in July 2004
    Well pump was replaced May 2007

DOOR TO DOOR
NEEDS SURVEY

Munic.: Hatfield Township Co.: Montgomery Study Area: HTMA Date: 8-3-09
General weather conditions: CLEAR/COLD

A survey is being conducted to determine if there are any sewage problems in this area. This is a general survey and the results are intended to be used in evaluating the need for community wide solutions.

(CIRCLE OR FILL IN AS APPROPRIATE; ADD COMMENTS AS NEEDED)

NAME: _____ STREET: _____ CITY: _____
ZIP: _____ PHONE #: _____ OWNER OR RENTER? NUMBER OF RESIDENTS: 3-5
What kind of water system do you have? WELL? SPRING? CISTERN? PUBLIC? OTHER?
If you have a well: Is it DUG or DRILLED ? HOW DEEP? 180' ft. Cased? Y / N
How far is the well or spring from the drain field _____ ft. Is well UP/DOWNHILL _____
Do you treat your water? Y / N How? CL/UV DISINFECTION, SOFTENER, ION, OTHER _____
Was the water ever tested? Y / N When? ≥ 2000
Any contamination? Y / N What (TC, FC, N, etc.) _____

How large is your lot? ≥ 1 ACRE No. of dwelling units? 1
One or more sewage systems? 1 COMMERCIAL/RESIDENTIAL?

What kind of sewage system do you have? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
OTHER _____		

Where does your laundry and/or sink water go? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
OTHER		

How old is your system? 30+ years Was it permitted? Y / N When? —
Have you every noticed any of the following near your septic system? NO

GREEN LUSH GRASS	WETNESS OR SPONGY AREAS	ODORS
WATER PONDING OR SURFACING	SYSTEM OVERFLOW	
SLUGGISH DRAINS	WASTEWATER BACKING INTO THE HOME	
OTHER _____		

If you noticed any of the above, are they seasonal or year-round? _____

Have you ever had your system pumped out? Y / N How often? ≥ 5YRS Last time? ≥ 2002-03
If it was pumped, was it inspected for cracks or broken baffles? Y / N What part? _____

Has the system every been repaired? Y / N When? _____ By permit? Y / N What part? _____
TANK REPAIRED/REPLACED LINE: REPAIRED/REPLACED DRAIN FIELD: REPAIRED/REPLACED
COMMENTS: _____

DO I/WE HAVE YOUR PERMISSION TO CONFIRM THIS INFORMATION BY LOOKING AROUND? Y / N

Exhibit III-3

Survey Tabular Results

Hatfield Township, Montgomery County

Hatfield Township, Montgomery County PA
Sewage Needs Survey
HTMA 537 Plan (0592.66)

Act 537 Plan Needs Analysis
11/22/10 3:22 PM

	Property Address								Test Results			Confirmed					Suspected			Potential			Other
	Owner	No.	Street	Town	Zip	Mail Surv. Resp	Well?	Age	DTD Surv.	NO_3	TC	FC	Wet	BTG permits	Piped	Backups	Holding tank	Green grass	Unsuitable soils	Privy cesspools	< 72	Soils/ Geo	Repair'd	
1	Lillian Moyer	13	Allentown Road	Hatfield, PA	19440																			
2	Franklin and Georgette Koehler	3501	Allentown Road	Hatfield, PA	19440																			
3	John and Bonnie Hercolini	3579	Allentown Road	Hatfield, PA	19440																			
4	Hatfield Bergey LP	3016	Bethlehem Pike	Hatfield, PA	19440																			
5	Benjamin and Janet Brower	3020	Bethlehem Pike	Hatfield, PA	19440	Y	Y	5									Y							pumped 10/08
6	Charles Chevrolet Inc	3100	Bethlehem Pike	Hatfield, PA	19440	Y	Y	37									Y				X			Pumped mnthly
7	Hatfield Recon Center Inc	3150	Bethlehem Pike	Hatfield, PA	19440																			
8	Charles Chevrolet Inc	3200	Bethlehem Pike	Hatfield, PA	19440																			
9	Philip Leber	3224	Bethlehem Pike	Hatfield, PA	19440	Y	Y	15	Y	ND	NEG	NEG												Pumped every 4 to 5 years
10	Resident	3266	Bethlehem Pike	Hatfield, PA	19440																			
11	North Penn Reality LLC	3436	Bethlehem Pike	Hatfield, PA	19440																			
12	Fred Crist	3528	Bethlehem Pike	Hatfield, PA	19440									X									Y	MCHD repair permit - BTG
13	Fred Crist	3544	Bethlehem Pike	Hatfield, PA	19440																			
14	Kema Reality	90	County Line Road	Hatfield, PA	19440																			
15	Robert and Sina Cristinzio	276	County Line Road	Hatfield, PA	19440																			
16	Paul and Shiela Roth, Trustees	17	Derstine Road	Hatfield, PA	19440	Y	Y	40	Y	5.06	NEG	NEG									X			Pump every 5 yrs, 2005, clean test report
17	Chester and Evelyn Jandzio	33	Derstine Road	Hatfield, PA	19440	Y	Y	47	Y	6.24	NEG	NEG						Y			X		Y-1988	Pump 1999, DF replaced 88 (permit), green at DF
18	Harold and Margaret Thomas	48	Derstine Road	Hatfield, PA	19440																			
19	Stanley Sine	49	Derstine Road	Hatfield, PA	19440	Y	Y	34	Y	6.62	NEG	NEG												Pump twice / yr, 3/08 (rental property)
20	Edward and Christine Richhart	65	Derstine Road	Hatfield, PA	19440	Y	Y	42	Y	7.43	NEG	NEG						Y			X			Pump 2003, clean test report
21	Ronald and Diane Miller	81	Derstine Road	Hatfield, PA	19440	Y	Y	44	Y	5.96	NEG	NEG						Y			X		Y-2000	Pump every 3 yrs, 2005, DF-00 (no permit)
22	Advanced Living Management & Dev	82	Derstine Road	Hatfield, PA	19440	Y	Y																	Pump yearly, 2007
23	Paul and Lois Christman	97	Derstine Road	Hatfield, PA	19440	Y	Y	42													X		Y-2008	DF flushed 08, no permit, pump 3/08
24	Ruth Hopf	113	Derstine Road	Hatfield, PA	19440		Y	40	Y	6.31	NEG	NEG									X			
25	Donald and Carolyn Kratz	355	Derstine Road	Hatfield, PA	19440	Y	Y	41	Y	7.89	NEG	NEG									X			Every 5, 2007; septic w/ French drain
26	Brian and Cheryl Martin	416	Derstine Road	Hatfield, PA	19440	Y	Y	48	Y	5.50	NEG	NEG	Y					Y			X			Pump 3/08; Undersize for 7 person household
27	Marlin and Charlene Bergey	424	Derstine Road	Hatfield, PA	19440	Y	Y	20																
28	Vernon and Miriam Derstine	438	Derstine Road	Hatfield, PA	19440	Y	Y	48													X			Pump 2005
29	Vernon and James Derstine	444	Derstine Road	Hatfield, PA	19440	Y	Y	48									Y				X		Y -2003	Pump monthly, MCHD repair permit - 03
30	James and Darlene Derstine	450	Derstine Road	Hatfield, PA	19440	Y	Y	40													X			Pump yearly 5/08
31	Kevin and Jo Ann Goettner	462	Derstine Road	Hatfield, PA	19440																			
32	Raymond and Barbara McKnight	470	Derstine Road	Hatfield, PA	19440	Y	Y		Y	3.73	NEG	NEG												
33	Abram and Mary Anne Kratz	478	Derstine Road	Hatfield, PA	19440	Y	Y	7	Y	3.38	NEG	NEG	Y					Y					Y-2003	Pump 8/01; ESM w/ 1500 gal ST (MCHD - permit)
34	John and Frances Hunsberger	486	Derstine Road	Hatfield, PA	19440	Y	Y	40	Y	3.12	NEG	NEG									X			
35	Vicki Scott and Joseph Gallagher	494	Derstine Road	Hatfield, PA	19440	Y	Y	40	Y	3.07	NEG	NEG						Y			X			Pump every 3 yrs, 2004, Notify in adv. of visit
36	Curtis Reid and Connie Nace	510	Derstine Road	Hatfield, PA	19440		Y	50	Y	2.75	NEG	NEG									X			
37	William and Edith Sayers	524	Derstine Road	Hatfield, PA	19440	Y	Y	36	Y	4.90	NEG	NEG												Pump every 4, 2004
38	Mark and Margaret Flaherty	636	Derstine Road	Hatfield, PA	19440																			
39	Virginia Metz	639	Derstine Road	Hatfield, PA	19440	Y		50													X			Pump every 2 years, 2007
40	Norman Moyer	1426	Derstine Road	Hatfield, PA	19440	Y	Y	75												Y?	X			Clean test, pumped 10/08 (every 10)
41	Gerald and Sherry Moyer	1660	Derstine Road	Hatfield, PA	19440	Y	Y	40													X			Every 3-4 yrs, pump 10/08, clean test 11/08
42	Resident	1700	Derstine Road	Hatfield, PA	19440																			
43	Matthew Young and Karen Hoffman	1750	Derstine Road	Hatfield, PA	19440	Y	Y	38	Y	1.33	NEG	NEG									X			Pump yearly
44	Michael and Carolann Saylor	1832	Derstine Road	Hatfield, PA	19440																			
45	Richard and Ellen Baum	491	Forty Foot Rd.	Hatfield, PA	19440	Y	Y	?													X		Y-99	New tank - 1999 (permit?)
46	Vincent and Jennifer Diantonio	1043	Koffel	Hatfield, PA	19440	Y		?													X			Pump every 2, 2007, req. no field confirm.
47	Richard Lewis	2124	Lenhart	Hatfield, PA	19440	Y	Y	100													X		Y-??	Septic/Seepage, well not domestic water, pumped 30+ years, pipes replaced
48	Thomas Pennise	2522	Lenhart	Hatfield, PA	19440																			
49	James and Dorothy Mease	2528	Lenhart	Hatfield, PA	19440	Y	Y	?													X			Pump 2/08, every other year
50	Charlotte Dubroff	2505	E. Orvilla	Hatfield, PA	19440	Y		22 / 34																Two systems, pumped every 2 yrs
51	Kathryn Grazel	2909	E. Orvilla	Hatfield, PA	19440	Y	Y	9																Tank and pumped to sewer system
52	Resident	3100	E. Orvilla	Hatfield, PA	19440																			
53	Forst Family Partnership	3226	Penn St.	Hatfield, PA	19440	Y	Y	??													X			Pump every 2 yrs
54	Leroy and Mary Walter	2041	Township Line Rd.	Hatfield, PA	19440	Y	Y	36	Y	1.37	NEG	NEG												Pump 2006
55	Daniel and Wendy Walter	2051	Township Line Rd.	Hatfield, PA	19440	Y		16																Every 3-4 yrs, 2008
56	Alfred and Gail Walter	2071	Township Line Rd.	Hatfield, PA	19440	Y	Y	43													X			Every 4-5 yrs, 2008
57	Keith and Katherine Oldham	2437	Unionville Pike	Hatfield, PA	19440																			
58	Peter and Beth Gower	2445	Unionville Pike	Hatfield, PA	19440																			
59	Paul Landis	2709	Unionville Pike	Hatfield, PA	19440	Y	Y	??	Y	5.24	3	NEG									X			Last pump approx. 3 yrs.
60										5.74	4	NEG												
	Total =	59				36	34		18				2	1	0	0	3	6	0	1	26		8	
						% of Total	61	58		31			3.4	1.7	0.0	0.0	5.1	10.2	0.0	1.7	44.1		13.6	
						Req'd %	35			35														
						No. Req'd	21			21														
	Derstine Rd. Needs Area =	24				Rcv'd	19			14														
	Surveys Req'd (50%) =	12				% of Total	79.1667			58														

Exhibit III-4

Montgomery County Health Department
Sewage Management Forms

Hatfield Township, Montgomery County

MONTGOMERY COUNTY HEALTH DEPARTMENT

Norristown Health Center
1430 DeKalb Street, PO Box 311
Norristown, PA 19404-0311
610-278-5117
Fax: 610-278-5167

Pottstown Health Center
364 King Street
Pottstown, PA 19464
610-970-5040
Fax: 610-970-5048

Eastern Court House Annex
102 York Road, Suite 401
Willow Grove, PA 19090
215-784-5415
Fax: 215-784-5524

CHECKLIST FOR SEWAGE SYSTEM DESIGN

The following items must be provided to constitute a **COMPLETE** application submittal:

SYSTEM LOCATION AND PROTECTION

All referenced corner elevations denoting the absorption area, including the tanks, shall be staked in the field and protected from disturbance.

APPLICATION FOR AN ON-LOT SEWAGE DISPOSAL SYSTEM PERMIT (Form 290) must be completed by the applicant and/or authorized agent. **All** information in Parts I and III shall be provided by the applicant and/or authorized agent and signed under Part IV. Part II is for **Local Agency** Use Only.

1. Part III, the **Plot Plan** must include at minimum the following items and be drawn **TO SCALE:**
   a. Lot dimensions (in feet) with precise property lines
   b. **Exact** location of the following:
      I. **All** existing & proposed water supplies (including adjacent properties)
      II. Existing & proposed buildings
      III. **All** observation test probes (with identification) and percolation tests.
      IV. Proposed treatment tanks
      V. Proposed absorption area (including distance in feet from property corners and/or two non-parallel property lines)
   c. Reference to north
   d. Bench mark location and elevation
   e. Direction and percentage of slope **(AS MEASURED ON SITE)**
   f. Distance to nearest stream, floodway or wetland
   g. **Exact** isolation distances as set forth in PA Code Title 25, Chapter 73, Section 73.13 *A/B bed's 50 foot down-slope no construction zone*
   h. Provide for diversion of surface runoff waters around the proposed sewage system.
   i. **All** right-of-ways or easements
   j. Detention/retention basins and storm water seepage beds
   k. Other information as required by Montgomery County Health Department.

SITE INVESTIGATION AND PERCOLATION TEST REPORT (Form 290 Appendix A) shall be completed in its entirety by the authorized agent and/or project consultant.

DESIGN CALCULATIONS (showing required computations)

1. Minimum absorption area
2. Septic tank capacity
3. Design flow
4. Friction loss
5. Total dynamic head

6. Minimum dosing volume
7. Dosing or siphon tank capacity
8. Pump curve and specified pump or siphon

TREATMENT TANK DETAIL (side profile with all dimensions)

1. Indicate type of treatment tank to be used
2. Building sewer showing required slope of last ten (10) feet and clean-out
3. Inlet & outlet elevation
4. Baffles (inlet & outlet)
5. Inspection port
6. Manhole cover
7. Elevation of existing grade at septic tank

DOSE/SIPHON/LIFT TANK DETAIL (side profile with all dimensions)

1. Elevation of existing grade at tank
2. Inlet & outlet elevation
3. Pump/siphon elevation
4. Elevation of OFF, ON & ALARM floats
5. Profile of all piping, fittings & electrical connections from pump/siphon to manifold
6. Conduit protection for electrical lines

ABSORPTION AREA DETAIL

1. Top view must be drawn **TO SCALE**
   a. Dimensions in feet
   b. Ground elevations for **All** corners of the absorption area; **All** corner elevations of individual trenches must be provided (and extremities of the berm for elevated sand mound systems)
   c. Laterals, hole spacing, manifold & bed layout

2. End view must be drawn **TO SCALE**
   a. Ground elevation at highest & lowest sides
   b. Depth of sand or excavation at highest & lowest sides
   c. Slope of sand & soil berm
   d. Depth of stone below and above piping
   e. Depth of hay/straw/building paper over stone
   f. Depth of top cover
   g. Manifold & spacing of piping
   h. Seeding or sodding

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Site Evaluation Application Procedure

The applicant (owner, owner in equity or authorized agent) shall complete the Observation Test Probe Application and Percolation Test Application. The Agent Authorization Form shall be completed and notarized if someone other than the property owner(s) will be filing the application, conducting tests, attending meetings or receiving notices and other communication concerning the permitting and installation of the system.

The applicant must submit the Observation Test Probe Application, Percolation Test Application and Agent Authorization Form, if applicable, along with a check or money order **(DO NOT SEND CASH)**, made payable to the "Montgomery County Treasurer", for the required fee. Please note that a separate application must be completed for each individual lot to be tested.

The applicant or his authorized agent is responsible for preparing the observation test probe excavations and performing the percolation tests. The site testing must be performed in accordance with MCHD requirements which shall be sent to the applicant upon scheduling a site evaluation. An appropriate agent of the MCHD must be present for **ALL** site testing.

A PA ONE CALL System serial number must be obtained by the applicant, authorized agent or contractor performing the excavation. This number must be obtained no less than three and no more than ten working days prior to the scheduled observation test probes, and given to MCHD 24 hours prior to the scheduled appointment.

Upon completion of a satisfactory site evaluation, the applicant may submit a design of the proposed sewage system (which shall be completed by a competent designer) for MCHD review.

SITE EVALUATION PREPARATION

A site evaluation is conducted as part of the procedure for determining suitability for the on-lot disposal of sewage. The evaluation is conducted in two (2) phases; observation test probes and percolation testing. Observation test probes are conducted to determine the capability of the soil to effectively renovate sewage effluent prior to it entering the groundwater. The probes are excavated adjacent to the proposed absorption area and evaluated to determine the present of a limiting zone. A limiting zone is a condition of the soil which affects its renovative capability and may include seasonal high water table, bedrock, open jointed or fractured rock, or insufficient soil fines.

Percolation testing is conducted to determine the rate at which sewage effluent can be expected to seep into the soil. This rate and the anticipated sewage flow of the structure are calculated to provide minimum absorption area size requirements.

The following instructions are provided for the applicant to prepare the site in a manner consistent with Montgomery County Health Department (MCHD) Operational Procedures. MCHD STRONGLY RECOMMENDS A COMPETENT SEWAGE FACILITIES CONSULTANT BE RETAINED TO ASSIST THE APPLICANT WITH THE SITE EVALUATION.

A. OBSERVATION TEST PROBES

1) A Pennsylvania One Call System Serial Number must be obtained 3 to 10 days prior to the Sewage Enforcement Officer (SEO) witnessing the test probes. This serial number should be obtained by the excavator and must be given to MCHD at least 24 hours prior to the scheduled test probes.

2) A minimum of two (2) test probes shall be excavated with a backhoe at opposite ends of the proposed absorption area. Both the upslope and downslope probes shall be within ten (10) feet of the perimeter of the proposed absorption are.

3) The excavation shall be to the depth of the limiting zone or a maximum of eight (8) feet where no limiting zone is encountered. Access steps or a ramp must be provided at one end of the test probe.

4) All test probes shall be evaluated by a MCHD SEO with a written profile report provided to the applicant/authorized agent.

5) MCHD requires the backhoe be on-site at the time of the evaluation in the event that further test probes are required.

6) All observation test probe excavations shall be backfilled within five (5) days of the SEO's evaluations.

B. PERCOLATION TESTING

1) The applicant/authorized agent shall submit a scalar pre-percolation test plot plan containing the following items:

a) Percolation test area showing all test holes
b) Depth of all percolation test holes
c) Precise property lines
d) Lot dimensions

e) Location of applicant well(s) and neighboring well(s) within 100 feet or public water lines within 10 feet of the proposed absorption area
f) All observation test probes and limiting zones
g) Percentage and direction of slope
h) Reference to north.
i) Location and size of existing septic system (if applicable)
j) Location of all streams, lakes or other surface waters within fifty (50) feet of the proposed absorption area on the applicant property or on any adjacent property

2) All percolation holes must be located in the proposed absorption area for all system types.

3) A minimum of six (6) percolation test holes (6 – 10 inches diameter) shall be dug on contour and uniformly spaced over the proposed absorption area.

4) The inside of each hole shall be scarified with a sharp instrument to remove any smeared soil surfaces and filled with two (2) inches of coarse sand or fine gravel.

5) The initial presoak shall be conducted 8 to 24 hours prior to the percolation test, at which time a minimum of 12 inches of water shall be placed in all holes and left undisturbed.

6) The final presoak shall be conducted 60 minutes prior to the percolation test. A minimum of 6 inches of water shall be placed in all holes and a fixed point of reference shall be recorded from the stationary float. The water level shall be readjusted to this point every 30 minutes for 1 hour.

7) A measurement shall be taken at the end of the hour and the following time intervals shall be used to read each test hole:

a) Water remaining in hole: 30 minute interval readings
b) No water remaining in hole: 10 minute interval readings

8) The water shall be readjusted to the fixed reference point (approximately 6 inches over the gravel) after each reading.

9) The test readings for each individual test hole shall continue until a stabilized rate is obtained or a minimum of 8 readings has been completed. A stabilized rate is obtained when there is a ¼ inch or less difference between the highest and lowest of four consecutive readings.

10) The drop that occurs in the final period for each individual hole, expressed as minutes per inch, shall be used to calculate the arithmetic average percolation rate.

Upon completion of satisfactory test probes and percolation test, the applicant/authorized agent may submit a complete Application for An On-Lot Sewage Disposal System Permit and design based on the site evaluation for MCHD review. Proposed subdivisions must receive final approval from the Pennsylvania Department of Environmental Protection prior to issuance of an on-lot sewage disposal system permit.

MONTGOMERY COUNTY HEALTH DEPARTMENT

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Fax: 610-278-5167

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Pottstown, PA 19464
610-970-5040
Fax: 610-970-5048

Eastern Court House Annex
102 York Road, Suite 401
Willow Grove, PA 19090
215-784-5415
Fax: 215-784-5524

AGENT AUTHORIZATION

_____, 20_____ Application No. _____

I, We, _____ owner(s) of the real property located in the

Township of _____, County of Montgomery and Commonwealth of

Pennsylvania more specifically described as follows:

_____

_____

do hereby authorize, empower and appoint _____ as my lawful agent exclusively and specifically with reference to acquisition of a **PERMIT FOR INSTALLATION OF AN ON-LOT SEWAGE DISPOSAL SYSTEM(S)** on the property described above. My agent herein named is authorized to file applications, conduct tests, attend meetings, receive notices and to do any and all other acts necessary for the permitting of said system(s). My agent is specifically authorized, in my absence, to receive the notice required by 35 P.S. 750.7 et. seq.

IN WITNESS WHEREOF, I, WE, hereunto place our hand(s) and seal(s).

_____ _____

Signature/Property Owner Agent Signature

COMMONWEALTH OF PENNSYLVANIA

COUNTY OF _____

On the _____ day of _____, A.D., 20____, before me, the undersigned Officer, personally appeared known to (satisfactorily proven) be the person(s) whose name(s) subscribed to the within instrument, and acknowledged that he/she executed the same for the purposes therein contained.

Witness my hand and Notarial Seal, the day and year aforesaid.

THIS FORM MUST BE NOTARIZED
AND HAVE A COMPLETE ACKNOWLEDGMENT
IF AN AGENT IS APPOINTED

Form: Agent Authorization

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SITE EVALUATION
OBSERVATION TEST PROBE APPLICATION

Sewage Application No. _____

Name of Applicant _____ Telephone Number _____

Address of Applicant _____ Zip Code _____

Site Address _____ Subdivision Name _____

Municipality _____ County _____

Tax Parcel No. (12 Digits) _____ Block No. _____ Unit No. _____

Signature/Property Owner _____ Signature/Property Owner _____

Name of Agent _____ Telephone Number _____

RESIDENTIAL __ COMMERICIAL __ REPAIR __ RELOCATION __ COMMUNITY __

Estimate Flow: _____ gallons/day

Location of site (draw map or provide clear narrative directions)

All of the above information is to be supplied by the applicant. At the time you complete this form, also complete Part I of the Application for Sewage Disposal so that the same information is supplied on both forms. Return ONLY this form with the appropriate Fee. The Application for Sewage Disposal must be submitted with all test results and the system design.

Form: Probe Application

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215-784-5415
Fax: 215-784-5524

SITE EVALUATION
PERCOLATION TEST APPLICATION

Sewage Application No. _____

Name of Applicant _____ Telephone Number _____

Address of Applicant _____ Zip Code _____

Site Address _____ Subdivision Name _____

Municipality _____ County _____

Tax Parcel No. (12 Digits) _____ Block No. _____ Unit No. _____

Signature/Property Owner _____ Signature/Property Owner _____

Name of Agent _____ Telephone Number _____

RESIDENTIAL __ COMMERICIAL __ REPAIR __ RELOCATION __ COMMUNITY __

Estimate Flow: _____ gallons/day

Location of site (draw map or provide clear narrative directions)

All of the above information is to be supplied by the applicant. At the time you complete this form, also complete Part I of the Application for Sewage Disposal so that the same information is supplied on both forms. Return ONLY this form with the appropriate Fee. The Application for Sewage Disposal must be submitted with all test results and the system design.

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DIVISION OF WATER QUALITY MANAGEMENT
ON-LOT SEWAGE DISPOSAL
FEE & PERMIT SCHEDULE
EFFECTIVE JANUARY 1, 2005

I.	**RESIDENTIAL & COMMERCIAL SEWAGE DISPOSAL SYSTEMS**		
	A. NEW INDIVIDUAL on-lot system or relocation of absorption area		
*	1. Site Evaluation (Test Pits)		$190.00
*	2. Site Evaluation (Perc Test)		$190.00
	3. Application review & installation inspection		$175.00/EDU
	B. COMMUNITY on-lot system		
*	1. Site Evaluation (Test Pits)		$190.00
	2. Site Evaluation (Perc Test)		$190.00
			$115.00 for each additional EDU
	3. Application review & installation inspection		$175.00/EDU
	C. ALTERNATE & EXPERIMENTAL on-lot system		
*	1. Site Evaluation (Test Pits)		$190.00
*	2. Site Evaluation (Perc Test)		$190.00
	3. Application review & installation inspection		$210.00/EDU
	D. REPAIR and/or RE-USE of an existing on-lot system		
*	1. Application review & installation inspection	Major	$90.00/EDU
		Minor	$20.00/EDU
	(Consult your SEO for repair policy prior to submitting an application)		
	E. REDESIGN of on-lot system		
	Application Review		$90.00/EDU
	F. TRANSFER of Permit		$25.00
	G. VERIFICATION for permit exemption		$30.00
II.	**ON-LOT SUBDIVISION**		
	***A.** Site Evaluation (Test Pits)		$190.00/EDU
	***B.** Site Evaluation (Perc Test)		$190.00/EDU
	C. Plan Review & Exemptions	< Ten (10) EDUs	$115.00
		> Ten (10) EDUs	$115.00 + $12.00/EDU over 10
III.	**PUBLIC SEWER PLAN REVIEW**		
	A. Ten (10) EDUs & below		$115.00
	B. Above Ten (10) EDUs		$230.00

One Equivalent Dwelling Unit (EDU) corresponds to flow of 400 gallons per day (gpd). Any single-family residence located independently on an approved lot will be considered to have one (1) EDU regardless of the estimated sewage flow.

Use of the MCHD consultant requires additional fees for time and mileage.

$25.00 for Duplicate Permits.

*New fees will be required when an appointment is cancelled by an applicant/agent after MCHD arrival on-site or upon any site evaluation requiring additional appointments.

Revised 1/1/2005

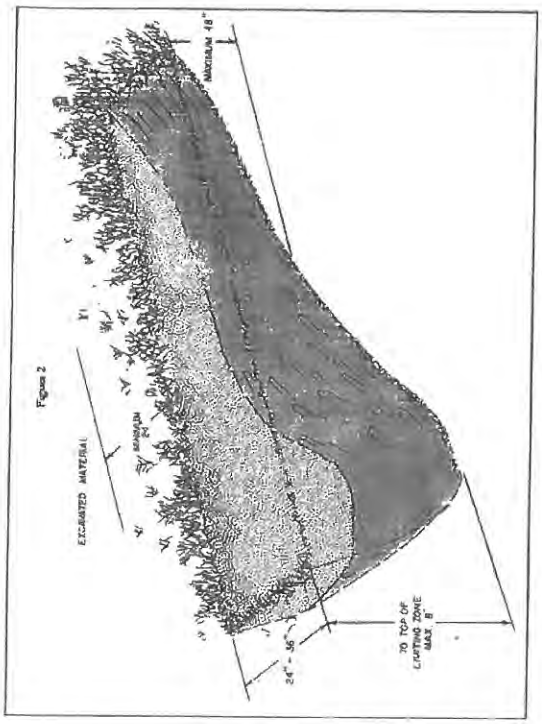
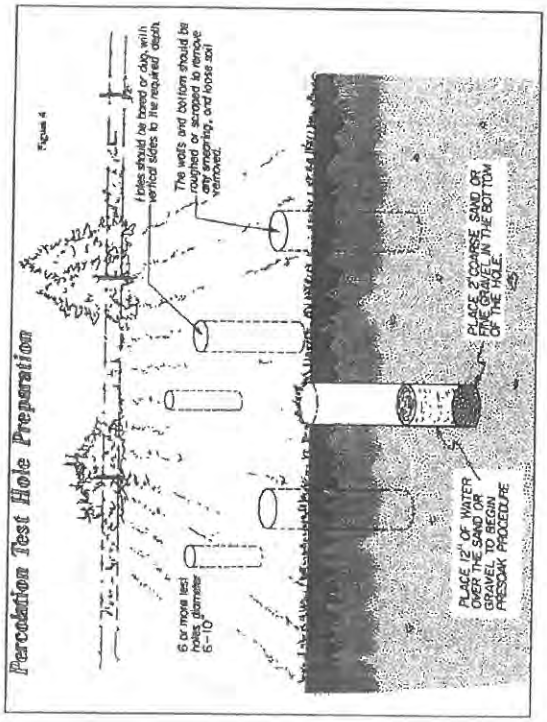


Figure 2
EXCAVATED MATERIAL
MINIMUM 48"
24" - 36"
TO TOP OF LIFTING ZONE MAX. 8'


Percolation Test Hole Preparation
Figure 4
6 or more test holes, diameter 6–10"
Holes should be bored or dug, with vertical sides to the required depth.
The walls and bottom should be roughned or scraped to remove any smearing, and loose soil removed.
PLACE 2" COARSE SAND OR GRAVEL IN THE BOTTOM OF THE HOLE
PLACE 12" OF WATER OVER THE SAND OR GRAVEL, TO BEGIN PRESOAK PROCEDURE

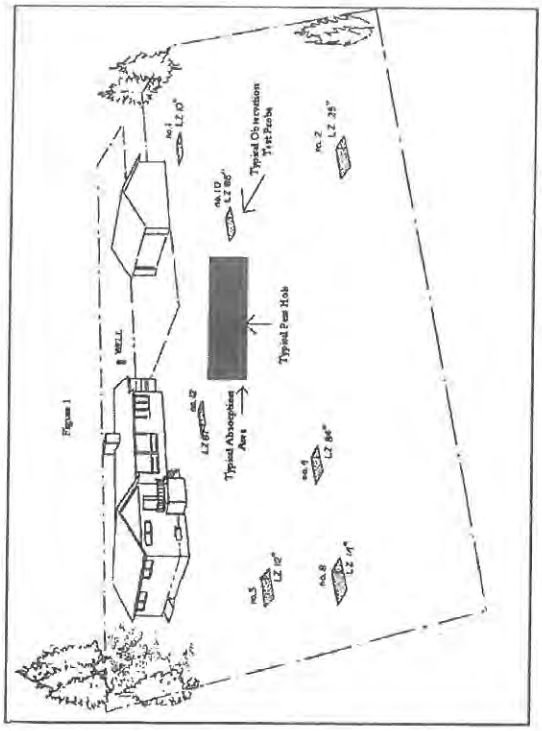


Figure 1
WELL
Typical Observation Pit Probe
Typical Absorption Area
Typical Perc Hole
No. 1 L2 10'
No. 2 L2 25'
No. 10 L2 80'
No. 12 L2 60'
No. 9 L2 84'
No. 3 L2 10'
No. 8 L2 41'

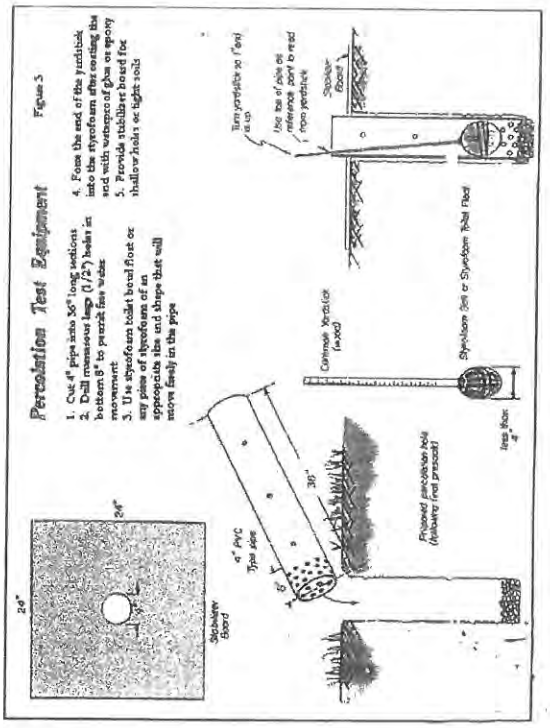

Percolation Test Equipment
Figure 5
1. Cut 4" pipe into 36" long sections
2. Drill measeur lengs (1/2") holes in bottom 8" to permit free water movement
3. Use styrofoam toilet bowl float or any piece of styrofoam of an appropriate size and shape that will move freely in the pipe
4. Force the end of the yardstick into the styrofoam after coating the end with waterproof glue or epoxy
5. Provide stabilizer board for shallow holes or light soils
24"
Stabilizer Board
4" PVC Test Hole
6"
30"
Proposed percolation hole (following final presoak)
Common Yardstick (wood)
Styrofoam Ball or Styrofoam Toilet Float
Tape yardstick to float as up
Use top of hole as reference point to read from yardstick
Stabilizer Board
Iron Rod

Exhibit III-5

Approved List of Haulers

Hatfield Township, Montgomery County

Ace Disposal Corp.	1133 W. Valley Hill Rd.	Malverne, PA 19355
Allen, George C. and Son	4375 County Line Road	Colmar, PA 18915
Aqua Wastewater Services	60 Schoolhouse Road	Souderton, PA 18964
Borger Septic Tank Cleaning	RD#1, Box 1473	Saylorsburg, PA 18353
B&C Septic Service	305 Three Mile Run Rd.	Sellersville, PA 18960
Clemens Septic Service	673 Keller Creamery Road	Telford, PA 18969
D & K Disposal, Inc./John Larson	898 Gravel Pk.	Palm, PA 18070
Franc Environmental	P.O. Box 5098	New Britain, PA 18901
Free Flow	P.O. Box 98	Hatboro, PA 19040
Gary's Septic Service, Inc.	P.O. Box 333	Pipersville, PA 18947
Gray Brothers, Inc.	1696 E. Lancaster Ave.	Paoli, PA 19301
GSP Management	Box 677	Morgantown, PA 19543
Heckler, Preston	400 General Hancock Blvd.	North Wales, PA 19454
Heckman, C.F. & Son	2668 Leiscz's Bridge Road	Leesport, PA 19533
Hill, Clifford Sanitation	P.O. Box 265	Kutztown, PA 19530
Kiriposki and Sons, Inc.	5447 Blue Church Rd.	Coopersburg, PA 18036
Lansdale Borough WWTP	One Vine Street	Lansdale, PA 19446
Lower Salford Twp. Authority	P.O. Box 243	Harleysville, PA 19438
Lukens	2412 Hill Road	Sellersville, PA 18960
Montgomery Twp. Sewer Auth.	1001 Stump Road	Montgomeryville, PA 18936
Nauman, B & R Inc.	75 Pocono Heights Rd.	Tobyhanna, PA 18466
Newhart, B. and Sons	RD#3, Box 3566	Stroudsburg, PA 18360
Norbill Disposal	5610 Haring Road	Doylestown, PA 18901
Pursell Septic Tank Cleaning	1219 River Road	Upper Black Eddy, PA 18972
Roberson, Donald	3163 Bedminster Road	Ottsville, PA 18942
U.S. Environmental	409 Boot Road	Downingtown, PA 19335
Ziegler, Ron	P.O. Box 263	Pipersville, PA 18947

Exhibit IV-1

Montgomery County Comprehensive Plan
Land Use Goals

List of Vision Plan Goals

Detailed actions for each of these 48 goals are listed in the pages following this list.

Guiding Vision (page 58)

Goal 1: Support Smart Growth and Preservation Efforts both Regionally and Locally

Goal 2: Work Together to Identify and Resolve Problems and Concerns

Goal 3: Implement Plans Effectively and Cooperatively

Goal 4: Identify and Address Problems at the Most Appropriate Level – Local, Regional, Watershed, etc.

Land Use (page 60)

Goal 5: Direct Development to Designated Growth Areas

Goal 6: Enhance Older Developed Areas

Goal 7: Preserve Rural Resource Areas

Goal 8: Encourage Sound Land Use Planning and Design

Goal 9: Ensure Compatible Development in Residential Neighborhoods

Goal 10: Preserve and Create Community Identity and a Sense of Place

Open Space, Natural Features, and Cultural Resources (page 68)

Goal 11: Preserve Large Interconnected Areas of Significant Open Space

Goal 12: Protect and Manage Wetlands, Streams, Steep Slopes, Woodlands, and Natural Habitats

Goal 13: Create a Greenway System along Rivers, Creeks, and Other Sensitive Natural and Historic Features

Goal 14: Develop a Countywide Network of Interconnected Trails

Goal 15: Provide Park Facilities to Meet the Public's Recreation Needs

Goal 16: Preserve Farmland and Farming

Goal 17: Protect Scenic Roads, Vistas, and Viewsheds

Goal 18: Protect Historic Resources and Cultural Landscapes

Transportation (page 74)

Goal 19: Manage Traffic Congestion

Goal 20: Improve Transportation Safety

Goal 21: Increase Opportunities to Take Public Transit, Walk, Ride a Bike, or Other Nonautomotive Transportation Means

Goal 22: Move Goods Efficiently and Considerately

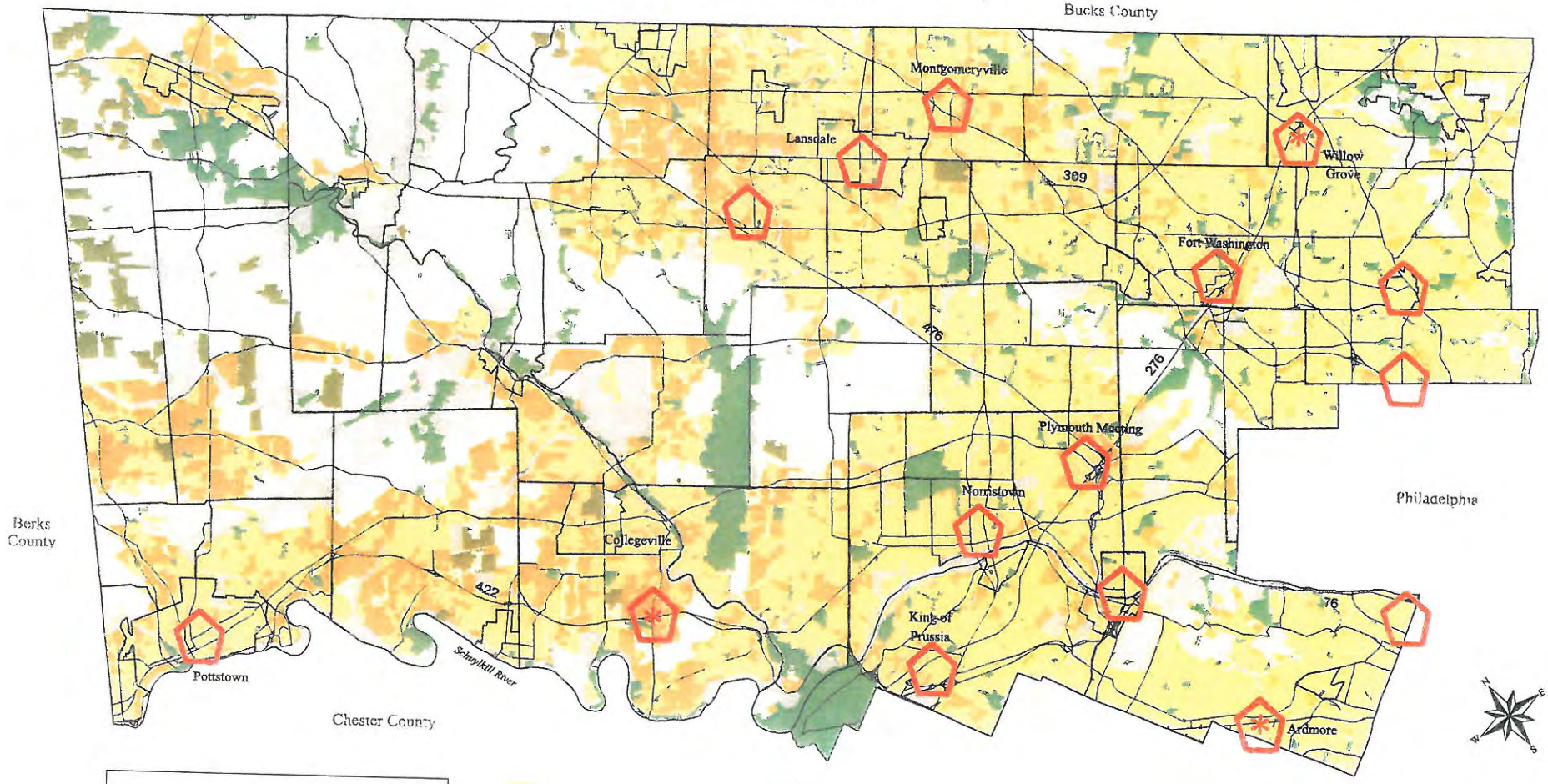
Goal 23: Maintain Air Travel as a Transportation Option

Exhibit IV-2

MC Comprehensive Plan Growth Map and Land Use Plan Summary

Hatfield Township, Montgomery County

2025 Growth and Preservation Plan - Montgomery County



The designated growth areas include approximately 35,000 acres of land. Under this plan, between 20,000 and 25,000 acres would be developed, with the remainder providing market flexibility. This acreage would provide enough room for 49,000 new homes and 77,000 new jobs.

- Existing Suburban Development
- Existing Rural Development
- Designated Growth Areas
- Major Development Center *
- Existing Preserved Open Space
- Existing Preserved Farmland
- Proposed Open Space
- Rural Resource Areas

Growth and Preservation categories valid as of 2000.

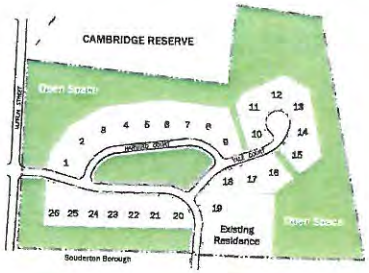
* Development centers are graphically represented by a pentagon but the size and shape of these centers will vary significantly from the pentagon, with some being fairly distinct compact concentrations of activity, others having elongated shapes along road corridors, and some being more free-form configurations encompassing portions of several municipalities. The development centers containing the asterisk, while graphically showing the pentagon symbol at a particular location, are really comprised of several somewhat separated centers of activity which together form the development center.

This map is based on 2000 ortho photographs, Montgomery County Board of Assessment Appeals tax maps, Municipal Officials, and field surveys conducted by the County Planning Commission. All attempts were made to maintain relative accuracy, however, this map should not be used for engineering purposes.

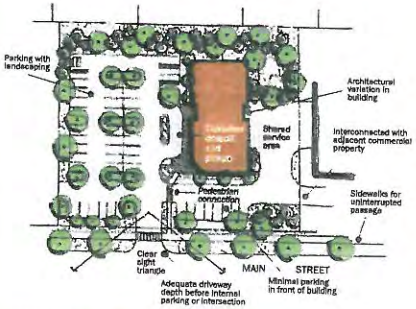
Accomplishing the Vision

To achieve the best development possible, municipalities must plan for the future by using county and local comprehensive plans as a foundation. But planning alone won't do it. This planning must be followed by innovative zoning and flexible site design. The *Land Use Plan* identifies many of these innovative methods; a few of these are described below.

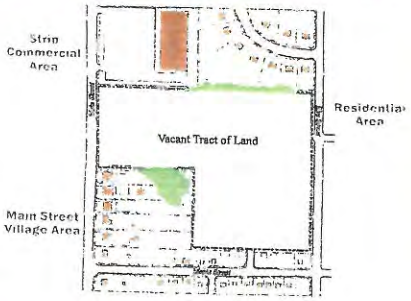
Residential cluster zoning is one innovative technique that can preserve important natural or historic features on a site. With cluster zoning, homes are placed on smaller lots so 60 percent or more of a site can be preserved as open space.



Through zoning and the plan review process, retail development can be improved with interconnected parking lots, better pedestrian access, extensive landscaping, and appropriate building design. Retail uses should be concentrated in nodes and never stripped out along roads and highways.



Another innovative zoning technique is mixed-use development. This development contains a variety of interconnected residential, commercial, institutional, and open space uses. Mixed-use development can function as a transition from intensely used areas, such as highways and retail centers, to less intense areas such as residential neighborhoods and parks.



To view this plan online visit:

www.montcopa.org/plancom/comprehensiveplan

For additional information, contact the Montgomery County Planning Commission at 610.278.3722 or mcpowebmaster@mail.montcopa.org.

Land Use Plan Summary

Shap

A Comprehensive Plan for Montgomery County

Adopted by the county commissioners in 2005

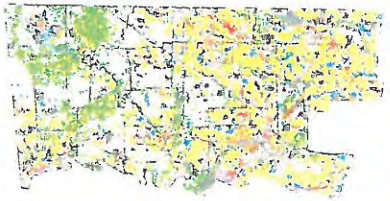
Current Trends

From 1970 to 2000, developed land in the county increased from under 32 percent of the total county area to nearly 54 percent. Over these 30 years, Montgomery County experienced rapid suburbanization and became a major employment and retail center for the region.

This growth has satisfied market demand but has too often been poorly designed, disconnected from the community, and inadequately served by existing roads and infrastructure. The cumulative impact has been a sprawling and inefficient land use pattern. If this land use pattern continues, it will consume most of our remaining open space, increase government expenses, and lead to a more fragmented landscape.

1970 Existing Land Use

2000 Existing Land Use



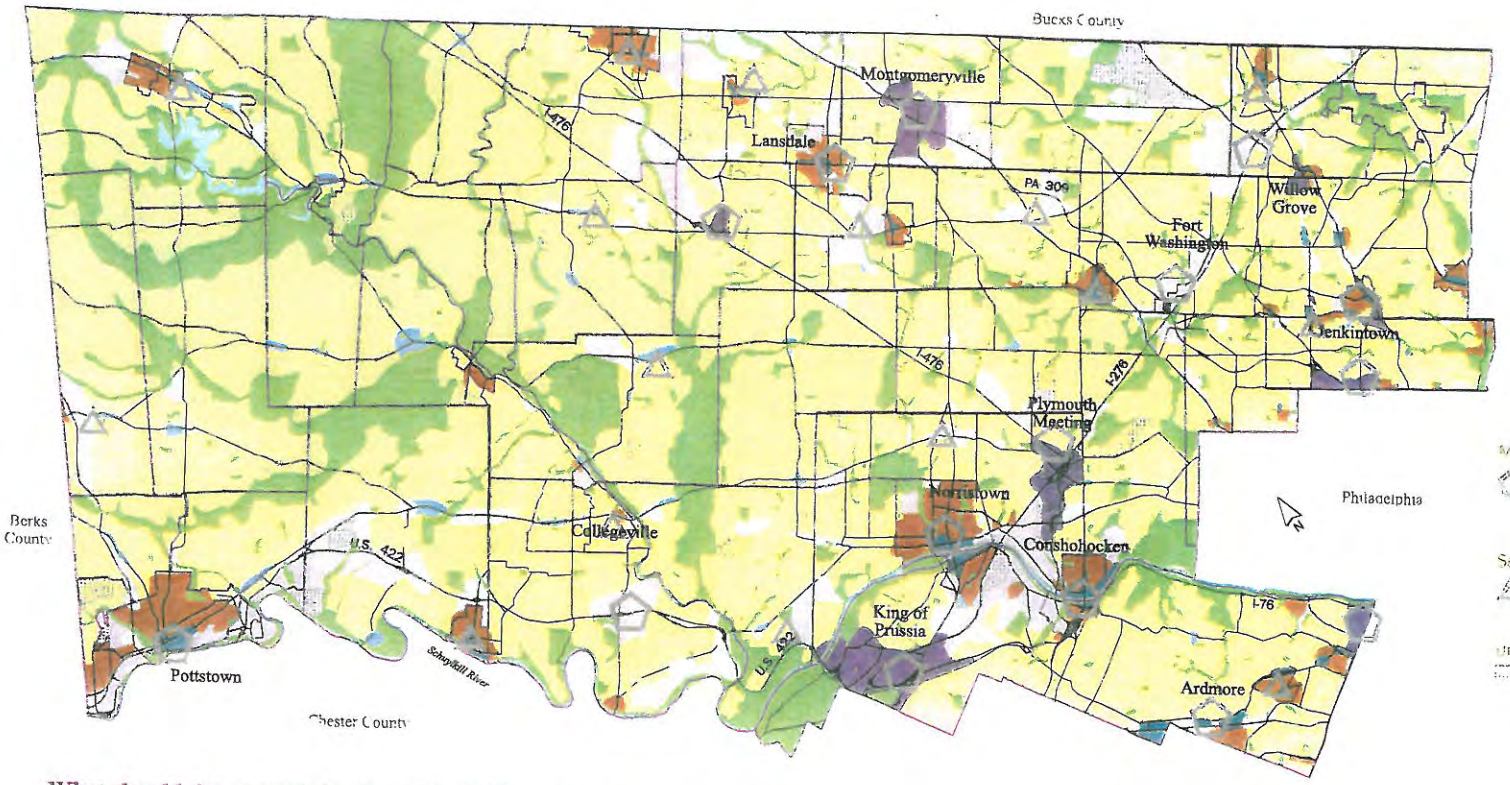
Vision for the Future

The county's Land Use Plan shows how new development can be accommodated in a better way that reduces sprawl, revitalizes older areas, preserves open space, and provides new housing and employment opportunities while meeting market demand.

Using the Land Use Plan as a guide, new development will be directed to logical locations. New suburban residential areas, for example, should be a logical extension of existing development and should be located near shopping, schools, and utilities.

Under the Land Use Plan, rural areas and open space would retain their unique character through the purchase of land and development rights and the use of innovative zoning.

With the Land Use Plan, new infill development will be compatible with existing developed areas, reinforcing a sense of community and place.



Over time, the county's landscape will evolve as many individual land use decisions are made. New development should match the overall character and intensity of the area in which it is located.

Major Development Center

Major development centers are existing regional focal points that are expected to intensify and contain a broader mix of uses over time.

Secondary Development Center

Secondary development centers are local community focal points that have a variety of uses.

Unique County-Wide Land Use

Unique county-wide land uses include airports, quarries, power plants, landfills, and similar uses. These are expected to remain in their current locations.

What should the county's landscape look like in the future? The illustrations and descriptions of land use categories shown below provide a glimpse of the future.

Suburban Center | Employment Center | Community Mixed-Use and Services | Town Center | Village Center | Town Residential Area | Suburban Residential Area | Rural Area | Open Space

Suburban Centers have a mix of major retail, employment, entertainment, and residential uses. Although designed for autos, these centers are evolving to become more walkable and transit-friendly.

Employment Centers typically contain offices, industry, and supporting uses such as limited retail or residential. They should be designed for good road access and pedestrian mobility.

Community Mixed-Use and Services have retail areas that meet local shopping needs, but also include institutional uses, offices, and homes. These areas should connect to neighborhoods and include attractive landscaping.

Town Centers have a traditional downtown mix of retail, office residential, entertainment, and institutional uses. Buildings are close to sidewalks, and store fronts contain front doors and ground-level windows.

Village Centers have a traditional village mix of residential and retail, with some offices and institutions. Small-scale buildings are historic in character, with parking to the rear.

Town Residential Areas have a mix of residential housing types, generally at a relatively high density. These areas may also contain institutional and minor commercial uses. Small-scale buildings are built near sidewalks with parking to the rear.

Suburban Residential Areas have a variety of residential housing types and densities. They may also have other supporting uses. Natural areas are preserved while homes easily accommodate cars and pedestrians.

Rural Areas have preserved farmland and woodlands. Any new development should be clustered and designed to blend into the rural landscape.

Open Space areas are generally undeveloped natural areas that should be preserved.

Exhibit IV-3

Chapter 2, Sewage Facilities, MC Community Facilities and Utilities Vision

Sewage Facilities

This chapter does not constitute an official update of the Montgomery County Act 537 Sewage Facilities Plan of 1972, and therefore will not supercede any municipal sewage facilities planning undertaken since that time. Instead, this chapter will provide background information on sewage facilities planning, review the status of public and private sewage facilities within the county, and provide policies for ongoing sewage facilities planning.

Sewage facilities are one of the most important and expensive public services that a community provides for the health of its residents and the protection of the environment. All developments rely on some type of sewage facilities, such as an individual on-lot septic system or a public sewage treatment system. These facilities ensure that domestic waste is properly collected, treated and disposed. However, if not operated and maintained properly, negative health and water quality impacts can result.

All developments rely on some type of sewage facility.

Existing Conditions

The first half of this chapter provides background information on sewage facilities options and briefly describes the roles of the various agencies involved in the planning and permitting processes of sewage facilities. In addition, it attempts to summarize the status of sewage facilities within Montgomery County—from the large, centralized public systems to the individual on-lot septic systems serving one home.

History and the Regulatory Environment

The planning, permitting, construction, and operation of wastewater facilities is regulated by numerous federal, regional, state, and local requirements. The most significant federal legislation pertaining to water quality issues of wastewater is the Clean Water Act. The various titles of the Clean Water Act establish procedures for federal assistance for public wastewater facilities, establish effluent limitations for dischargers, require states to set water quality standards for all streams, and establish the National Pollution Discharge Elimination System (NPDES) program. Section 208 of Title II directs the

states to develop areawide wastewater management plans for areas identified as having water quality problems. In 1980, the Delaware Valley Regional Planning Commission completed such a plan for southeastern Pennsylvania titled *COWAMP/208; Water Quality Management Plan, Southeastern Pennsylvania.*

The Pennsylvania Sewage Facilities Act (Act 537) became law in 1966 (revised in 1974) and became one of the first statewide laws to govern sewage facilities planning. This Act requires municipalities to develop and implement Official Sewage Facilities Plans to ensure adequate sewage service for existing needs and new growth. The Act established an on-lot system permitting program and standards for on-lot sewage disposal systems. These regulations also established the planning module process for revising the Official Sewage Facilities Plans. Regulations written to implement the Act took effect in 1972.

Additionally, Chapters 71, 72, and 73 of the Pennsylvania Code describe the regulations required to administer the sewage facilities planning program and provide standards for sewage disposal systems.

There are a number of groups that exercise separate, but closely interrelated, roles concerning wastewater management within Montgomery County. Municipal sewer authorities and local sewer departments are mainly responsible for the daily operation and maintenance of the public sewage treatment plants and conveyance facilities. Municipal governing bodies are charged with developing official sewage facilities plans, adopting the plans, and implementing the recommendations of the plans. A number of regulatory agencies also play a role in the overall sewage facilities treatment process:

- The Department of Environmental Protection (DEP) and the Delaware River Basin Commission (DRBC) each exercise oversight responsibilities and set water quality objectives. Specifically, DEP reviews and approves official sewage facilities plans and revisions, awards planning grants for official plan development, trains and certifies local sewage enforcement officers, and provides technical assistance. DEP also administers the National Pollutant Discharge Elimination System (NPDES) program and other aspects of the Clean Water Act.
- The Montgomery County Planning Commission fills an advisory role in reviewing revisions and

Purposes of Official Sewage Facilities Plans:

- ***To provide for the safe and efficient collection, treatment and disposal of existing and future sewage flows generated within the service area.***
- ***To protect the health safety and welfare of citizens.***
- ***To prevent future sewage disposal problems.***
- ***To provide protection for both the groundwater and surface waters of the Commonwealth.***

amendments to municipal official sewage facilities plans and planning module applications for individual developments.

- The Montgomery County Health Department oversees the bulk of the on-lot sewage system program, including conducting site evaluations, issuing permits, and conducting inspections. They also review municipal official Act 537 plans and planning module submissions for on-lot sewage systems.

The Montgomery County Official Sewage Facilities Plan was the first attempt at a coordinated document for long-range sewage planning in Montgomery County. It was adopted in 1972 and updated in 1978. This plan was adopted by 60 of the 62 county municipalities and served as their official sewage facilities plan. Since that time, most Montgomery County municipalities have written their own official plans and updated them periodically through the planning module and plan revision

1972 Montgomery County Official Sewage Facilities Plan:

- ***Provided a status report on disposition of sewage treatment plants existing at that time.***
- ***Made recommendations on future development of public sewers.***
- ***Identified on-lot sewage disposal problem areas.***
- ***Was adopted by 60 of 62 municipalities as their own official plan.***

Figure 1
1972 Montgomery County Offical Sewage Facilities Plan

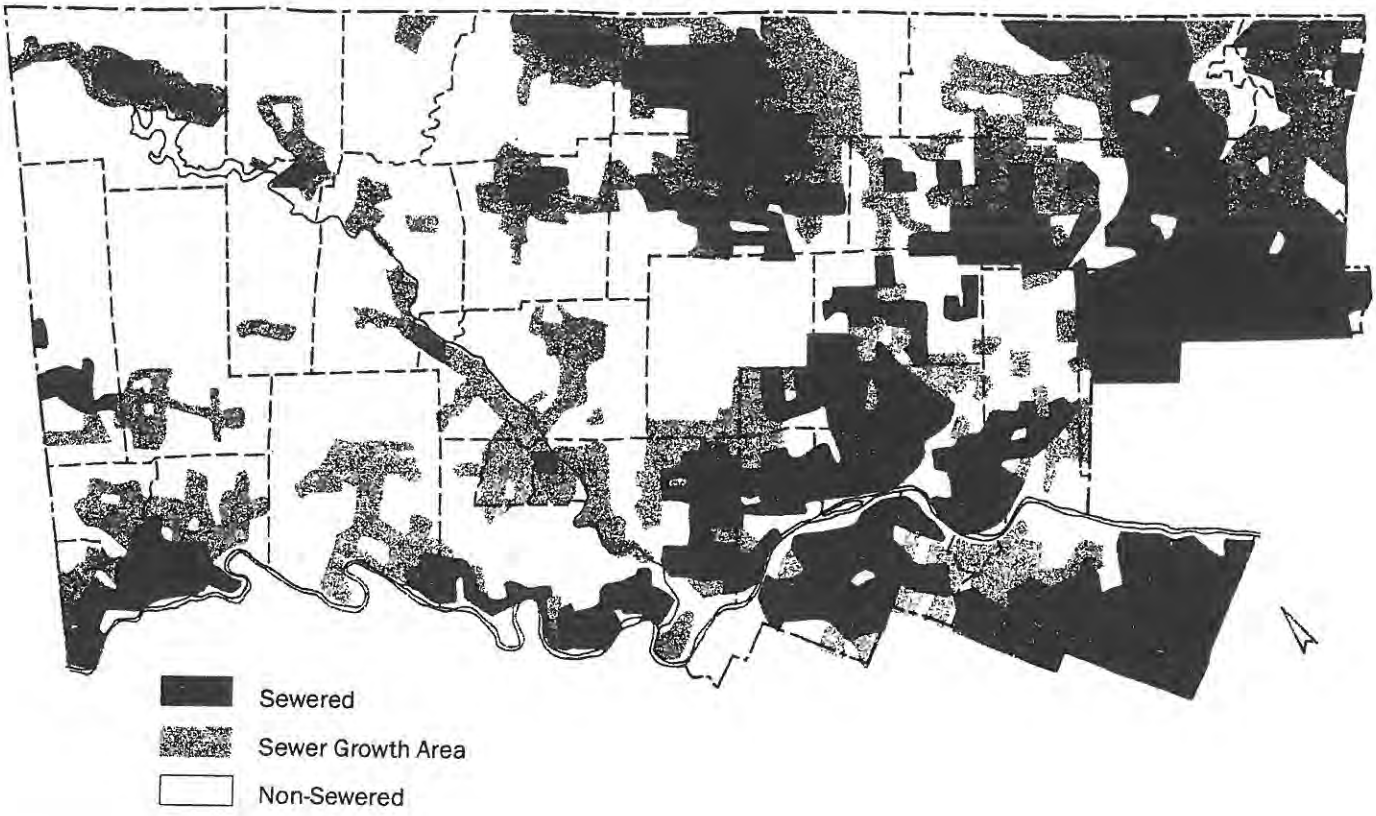


Figure 2
Act 537 Plan Dates–Municipal Official Sewage Facility Plans

Municipal Official Plan				Montgomery County Plan or Other
Municipality	Year	Municipality	Year	Municipality
Abington Township	(1999)	Perkiomen Township	(1998)	Ambler Borough
Bryn Athyn Borough	(1998)	Plymouth Township	(1994)	Bridgeport Borough
Collegeville Borough	(1986, 1997 submittal)	Pottstown Borough	(1995)	Cheltenham Township
Conshohocken Borough	(1997)	Red Hill Borough	(1984)	Green Lane Borough (1974 201 Study)
Douglass Township	(2002)	Royersford Borough	(1987)	Jenkintown Borough
East Greenville Borough	(1984)	Schwenksville Borough	(1998)	Marlborough Township
East Norriton Township	(1994)	Skippack Township	(2003)	Narberth Borough
Franconia Township	(1988, 2003 submittal)	Souderton Borough	(1988)	Norristown Borough
Hatboro Borough	(1998)	Telford Borough	(1990, 1999 submittal)	Rockledge Borough
Hatfield Borough	(1988)	Towamencin Township	(1997)	Salford Township (1978 201 Study)
Hatfield Township	(1987)	Trappe Borough	(1986, 1997 submittal)	Springfield Township
Horsham Township	(2002)	Upper Dublin Township	(1998)	Upper Salford Township (1978 201 Study)
Lansdale Borough	(1996)	Upper Frederick Township	(2000)	
Limerick Township	(2001)	Upper Gwynedd Township	(1990, 2001 submittal)	
Lower Frederick Township	(2002)	Upper Hanover Township	(2002)	
Lower Gwynedd Township	(1982, 2001 submittal)	Upper Merion Township	(1991)	
Lower Merion Township	(1998)	Upper Moreland Township	(1998)	
Lower Moreland Township	(2003)	Upper Pottsgrove Township	(2002)	
Lower Pottsgrove Township	(2000)	Upper Providence Township	(2000)	
Lower Providence Township	(2003)	West Conshohocken Borough	(1997)	
Lower Salford Township	(2001)	West Norriton Township	(1991)	
Montgomery Township	(2003)	West Pottsgrove Township	(1991)	
New Hanover Township	(2003)	Whitemarsh Township	(2000)	
North Wales Borough	(1985)	Whitpain Township	(2000)	
Pennsburg Borough	(1984)	Worcester Township	(2003)	

Note (0000) = Date approved by DEP

processes. However, a few municipalities still fall under the jurisdiction of the 1972/1978 Montgomery County Official Sewage Facilities Plan.

Municipal official Act 537 Plans are just one tool used by local officials to determine where development is located and the type of development permitted. Municipal zoning ordinances and comprehensive plans are the other critical elements in determining the pace of growth. Coordination between municipal zoning ordinances, land use policies found within municipal comprehensive plans, and sewage facilities planning ensures that development is directed in an orderly fashion and not solely based upon market factors.

Description of Existing Sewage Facilities

In the past, large municipally owned sewage treatment plants and public sewer conveyance systems have been constructed to service new development, address on-lot problem areas, and

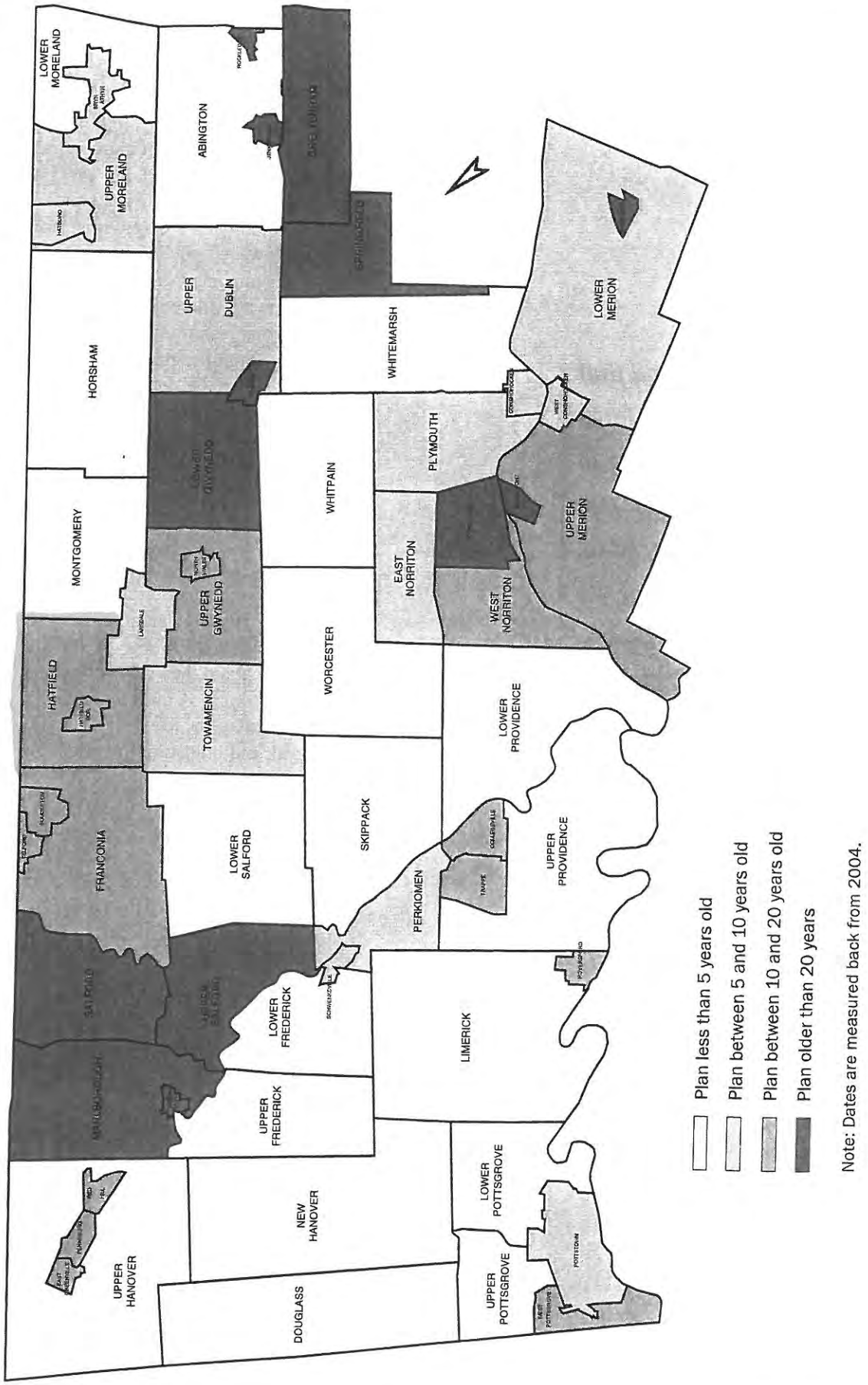


Figure 3
Age of Municipal Act 537 Offical Plan
Montgomery County

meet the regulations of Act 537. In addition to these systems, various forms of on-lot sewage disposal systems and a few package treatment plants have become an integral part of many municipal official sewage facility plans. Yet, not every municipality within Montgomery County operates a sewage treatment facility or even provides access to public sewers. However, public sewage facilities are an important component of the overall infrastructure necessary to accommodate growth while protecting environmental resources.

Today, it is estimated that 88% of all county residents are served by some form of centralized collection and treatment system, while approximately 60% of the county land area has access to public sewers.

Sewage facilities have changed dramatically since 1904 when the first sewage collection system was constructed in Montgomery County by Lower Merion Township - with treatment provided by the Southwest Philadelphia Sewer Plant.

Since the adoption of the Montgomery County Official Sewage Facilities Plan in 1972 and its update in 1978, the Montgomery County Planning Commission has periodically published status reports on the disposition of sewage facilities within the county. This document, *Sewage Facilities Inventory*, summarizes sewage facilities trends and information about the various treatment plants within the county. A map accompanies the inventory, delineating the location of municipal, non-municipal, and industrial treatment plants, as well as pump stations and sewer lines. The most recent inventory report was completed in 1998.

There are currently 41 municipally owned and operated treatment plants within Montgomery County. The most recent plant, Limerick Township's Possum Hollow Sewage Treatment Plant, was completed in 2003. Portions of eastern Montgomery County continue to be served by Philadelphia's sewage treatment system. In some cases, several municipalities are entirely served by one or more treatment facility. In other cases, the municipal system only serves a small portion of the municipality.

Montgomery County is diverse. It contains urban, developing, and rural areas. Historically, development has occurred in the east and spread westward across Montgomery County. The municipally owned sewage facilities in the eastern part of the county seem to be most often concerned with operation and maintenance activities. The western part of the North Penn Area and the Route 113, the Route 422, and Route 100 corridors currently appear to be experiencing the most

development pressure. Many of the sewage facilities in these areas are planning upgrades and expansions to deal with the new development. Rural areas are interspersed between the North Penn Area and the northern and western borders of the county. Most municipalities in these western communities are also anticipating some growth. Some are taking steps to upgrade, expand, or build new facilities. However, a few municipalities have taken a bold position and are holding firm to their limited or complete lack of public sewage systems as a growth management tool.

In the 1998 *Sewage Facilities Inventory,* seven sewage planning areas were developed based on similarities regarding sewage facilities (i.e., shared service areas to a plant) and development characteristics (rural, urban, suburban). However, for this plan it was decided that discussions and evaluations of sewage facilities planning should be more consistent with the planning regions described in the *Land Use Plan.* The following map and table depict the various public sewage facilities found within the twelve Montgomery County regional planning areas.

Nonmunicipal Plants

There are approximately 27 nonmunicipal, nonindustrial waste treatment plants operating in the county. These plants accommodate a wide variety of uses including apartment complexes, military installations, hospitals, nursing homes, mobile home parks, campsites, commercial establishments, schools, residential subdivisions, and a correctional institution. These privately owned facilities are often not well coordinated with nearby municipal systems.

Interestingly, there were 35 nonmunicipal treatment plants in the county in 1972 when the first County Sewage Facilities Plan was written. The decrease in the number of non-municipal treatment plants fulfills one of the stated goals of the original Montgomery County Sewage Facilities Plan (1972/1978). Although this update to the County Sewage Facilities Plan does not specifically recommend the elimination of specific treatment plants, their closure or connection to public systems would reduce the number of stream dischargers within the county, which is a stated goal. We do recommend that where these private facilities will continue to exist, that they be properly operated and maintained.

In addition, many industrial properties in the county have specialized sewage treatment facilities.

According to the Montgomery County Health Department (MCHD), there are approximately 30,000 on-lot septic systems in Montgomery County serving the needs of approximately 91,000 users (which represents approximately 12% of the county population).

Figure 4
Montgomery County Municipal Sewage Treatment Plants by Region

Sewage Treatment Plants by Region			
Planning Region	Municipalities	STPs Serving the Region	Comments
Upper Perkiomen	Marlborough, Upper Hanover, Red Hill, East Greenville, Pennsburg, Green Lane.	Green-Lane Marlborough STP, Upper Hanover STP, Upper Montgomery (UMJA) STP.	
Indian Valley	Lower Salford, Upper Salford, Franconia, Salford, Souderton, Telford.	Lower Salford-Harleysville STP, Lower Salford-Mainland STP Souderton Borough STP, Telford Borough STP, Upper Gwynedd-Towamencin STP, Hatfield Township STP.	Salford and Upper Salford Townships are not served by public sewers. Lower Salford Township contains another public STP (Indian Hills). It is a package type plant that currently only serves one residential development.
Pottstown Area	New Hanover, Douglass, Upper Pottsgrove, Lower Pottsgrove, West Pottsgrove, Pottstown.	New Hanover Township STP, Berks-Montgomery (BMMA) STP, Pottstown Borough STP.	A new municipal treatment plant was constructed in New Hanover Township in 2002. It replaces the old plant and spray discharge fields. The new plant has a stream discharge to Swamp Creek.
Central Perkiomen Valley	Skippack, Perkiomen, Lower Frederick, Upper Frederick, Trappe, Collegeville, Schwenksville.	LPVRSA-Oaks STP, Lower Frederick Township STP, Upper Frederick Township STP, Schwenksville Borough STP.	
Spring-Ford Area	Lower Providence, Royersford, Limerick.	LPVRSA-Oaks STP, Royersford Borough STP, Limerick-King Road STP, Limerick-Possum Hollow STP.	Limerick Township finished completion of a second STP (Possum Hollow) in 2003, rated at 0.700 MGD. It is expected to be on-line by the end of 2003.
North Penn	Montgomery, Hatfield Township, Upper Gwynedd, Towamencin, Hatfield Borough, Lansdale, North Wales.	Montgomery-Eureka STP, Hatfield Township STP, Upper Gwynedd Township STP, Upper Gwynedd-Towamencin STP, Lansdale Borough STP, North Wales Borough STP.	
Norristown Area	Norristown, East Norriton, West Norriton, Worcester, Upper Providence.	Norristown Borough STP, ENPW JSA STP, Upper Gwynedd Township STP, Upper Gwynedd-Towamencin STP, Worcester-Berwick Place STP, Worcester-Valley Green STP, Royersford Borough STP, LPVRSA-Oaks STP.	One small drainage area to the Norristown plant contains combined sewers. The Berwick Place STP primarily serves properties in the Fairview Village area of Worcester while the Valley Green STP serves properties in Center Point Village.
Main Line-King of Prussia	Lower Merion, Upper Merion, Narberth, West Conshohocken, Bridgeport.	Upper Merion-Matsunk STP, Upper Merion-Trout Run STP, Conshohocken Borough STP, Bridgeport Borough STP, Philadelphia WWTC.	Upper Merion Township can shift flows between the two plants through the Abrams Run Pump Station.
Horsham-Willow Grove	Horsham, Upper Moreland, Lower Moreland, Hatboro, Bryn Athyn.	Horsham-Park Creek STP, Upper Moreland-Hatboro JSA STP, Lower Moreland-Chapel Hill STP, Bryn Athyn-Mason's Mill STP, Abington-Sandy Run STP, Philadelphia WWTC.	Bryn Athyn Borough is planning to purchase a second plant (Academy of the New Church) to service some failing on-lot systems in the southeast corner of the borough.
Ambler Area	Upper Dublin, Lower Gwynedd, Whitpain, Ambler.	Upper Dublin/BCWSA STP, ENPWJSA STP, Ambler Borough STP, Upper Gwynedd Township STP, Whitemarsh Township STP.	The Upper Dublin STP was recently purchased by the Bucks County Sewer & Water Authority - the first privately held municipal plant in the county serving several developments.
Conshohocken-Plymouth Meeting	Whitemarsh, Plymouth, Conshohocken.	Whitemarsh Township WWTC, ENPWJSA STP, Conshohocken Borough STP, Ambler Borough STP.	
Eastern Montgomery County	Abington, Cheltenham, Springfield, Jenkintown, Rockledge.	Abington-Sandy Run STP, Philadelphia WWTC.	

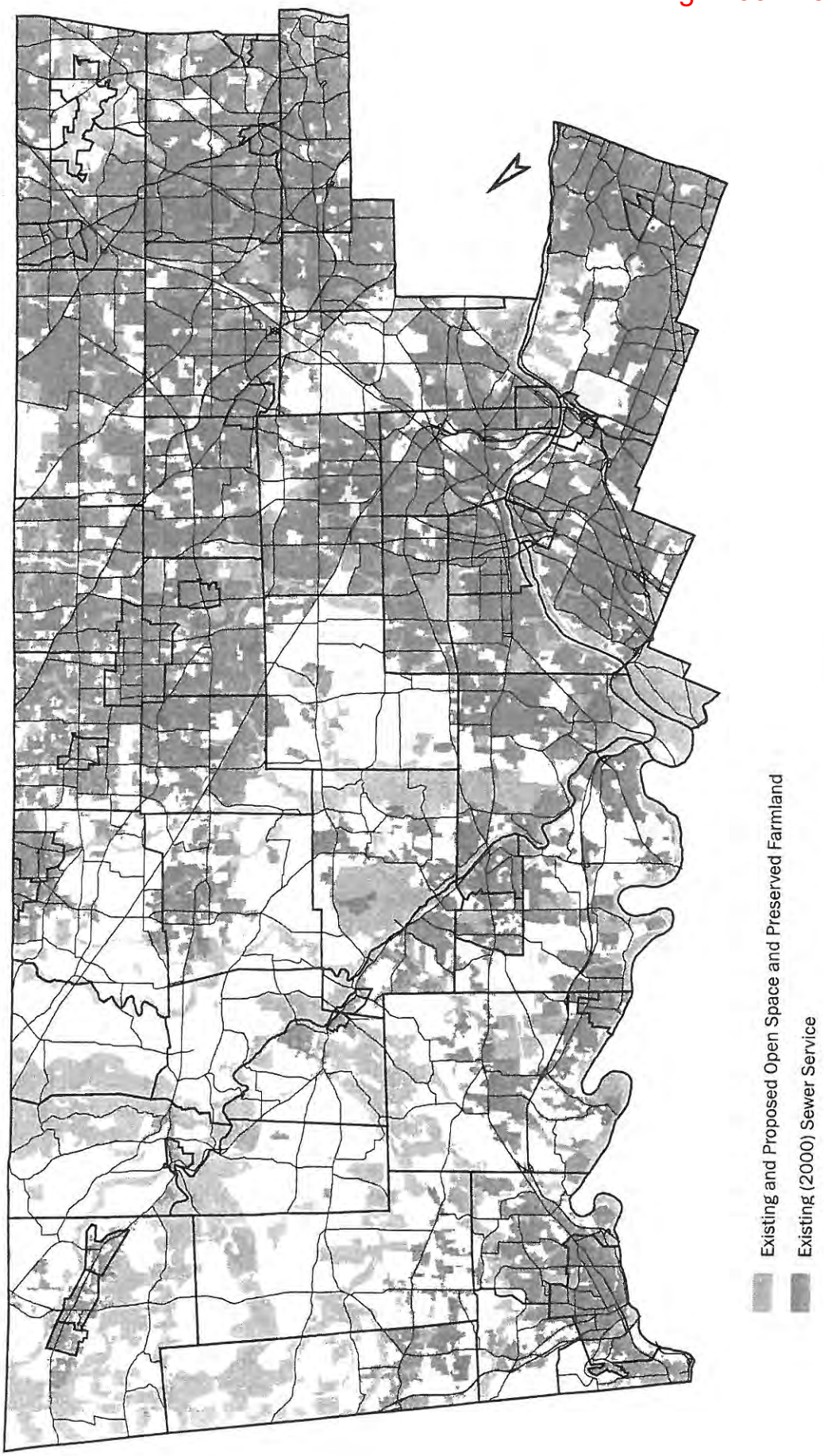


Figure 5
MONTGOMERY COUNTY EXISTING SEWER SERVICE AREAS

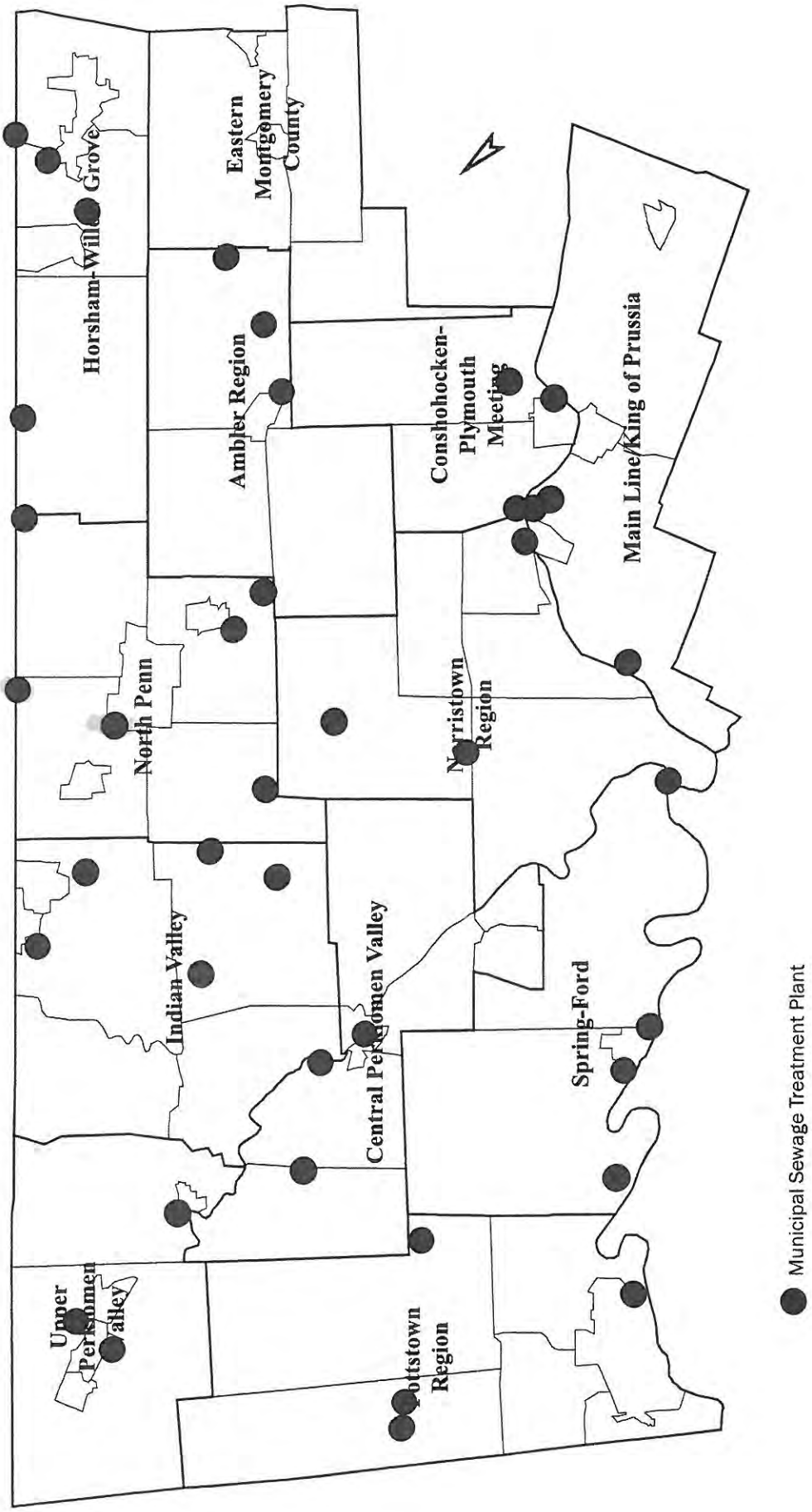
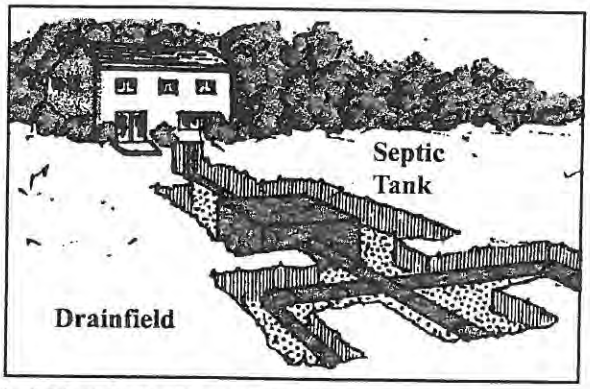


Figure 6
Montgomery County Municipal Sewage Treatment Plants by Region

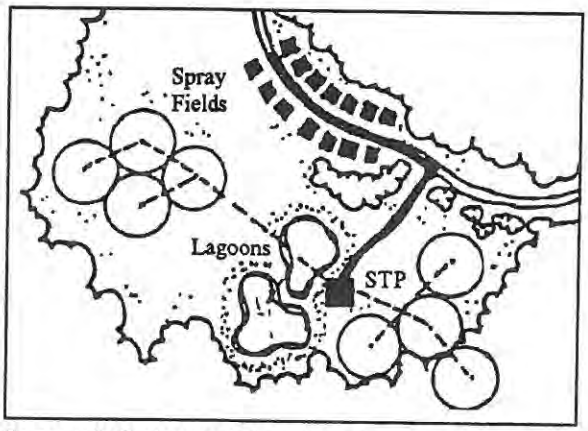
On-Lot Sewage Facilities within the County

Many of Pennsylvania's and Montgomery County's rural areas rely on on-lot wastewater systems. On-lot systems are sewage systems on the property of the homeowner that treat and dispose of domestic waste through natural processes. Approximately one-third of Pennsylvania residents depend on on-lot septic systems to treat their sewage (PADEP Fact Sheet, 1998). The majority of these systems are installed in rural and semi-rural areas because of the isolation of the property they serve or because of the lack of available public sewerage.

A few Montgomery County municipalities, such as Salford and Upper Salford Townships, do not contain any public sewage systems at all. These municipalities rely solely on community and individual on-lot sewage disposal systems to meet the needs of their residents.



Individual On-Lot System: collects, treats, and disposes of sewage generated by a single residetial unit.



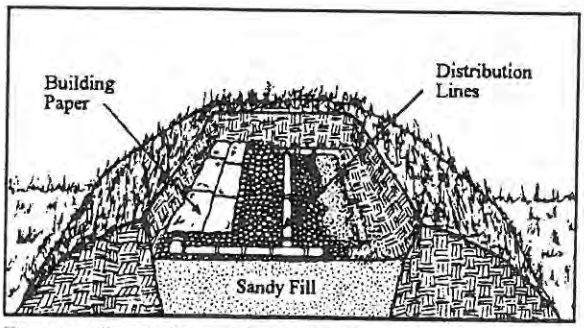
Community System: collects and treats sewage from several residential units; usually located on the site.

Sewage Facilities Choices/New Technology

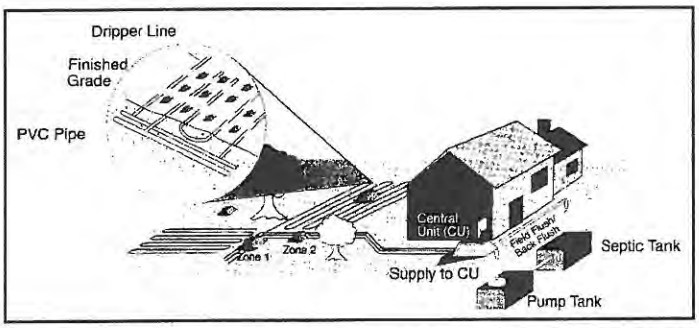
Sewage facilities planning options have expanded beyond the conventional septic system and municipal sewage treatment facility. Development is occurring in areas previously inaccessible to sewage facilities with the aid of new treatment technology. Individual on-lot and community systems are being proposed where there are no public sewers or excess capacity is unavailable. Municipalities reviewing sewage facilities proposals are looking at alternatives considered to be experimental a few years ago.

Proper sewage facilities planning involves a systematic comparison of all feasible alternatives for wastewater collection, conveyance, treatment, and disposal. The selection of alternatives should be based on the ability to meet mandated requirements as well as consistency with local wastewater facility objectives. Costs of all sorts (monetary, socioeconomic, and environmental) must also be considered.

In 1992, MCPC developed a booklet titled *Sewage Facilities: Understanding the Alternatives* that summarized the numerous public and private sewage facilities planning options available. Figures 7 and 8 summarize some of the information found in that booklet. It should be noted that some methods of sewage collection, treatment, and disposal can be used with more than one type of system. While the interchangeable nature of sewage system components makes it difficult to address all the possible



Elevated Sand Mound Systems are common throughout Montgomery County.



Drip irrigation or trickle systems apply treated wastewater to soil slowly and uniformly through a network of thin, flexible tubing placed at shallow depths in the soil. This type of on-lot system, once experimental, is now considered an approved alternative system by DEP.

Diagram courtesy of National Small Flows Clearinghouse.

Example sewage treatment plant.

combinations of alternatives in this report, the flexibility of sewage components means greater applicability for systems and a wider range of choices for municipalities.

The list of viable sewage system alternatives represents a flexible menu of sorts. Using this menu, the municipality can develop a prioritized list of alternatives that reflect municipal goals. This list can be incorporated into the municipality's Official Sewage Facilities Plan. New development proposals then would be required to consider the alternatives in the order listed in the municipal plan.

New and Alternative Public Sewer Options

Traditional wastewater facilities planning has focused on conventional, centralized wastewater technology (i.e. central treatment facilities with gravity sewers, pump stations and force mains). Most governmental authorities and engineers have preferred this technology because it has a tried and proven record. In fact, this philosophy of centralization was emphasized in the 1972 *Montgomery County Sewage Facilities Plan* where large regional treatment plants and expansive interceptors were proposed to serve most of the county.

The emphasis on traditional technology can however discourage consideration of many worthy alternatives. The latest developments in wastewater technology are dynamic and constantly being proposed and/or improved. Low pressure collection systems, grinder pumps, effluent pump sewer systems, vacuum sewer systems, and small diameter systems are just a few forms of collection and conveyance alternatives to traditional public systems. Some of these technologies have even been used successfully in Montgomery County. For example, Bryn Athyn Borough has initiated a plan to utilize a combination of small diameter public sewer lines to convey liquid wastes to a treatment plant and existing septic tanks on lots to treat the solid components. Often these unique systems can have lower cost per unit and lower installation costs than traditional systems. However, the trade-off is that these systems can have higher operation and maintenance costs.

Almost all public sewage systems constructed in the county rely on surface waters to receive the discharge from treated wastewater. In fact, 40 of the 41 public treatment plants within the county discharge their effluent directly to a waterway.

Figure 7
Sewage System Components

Systems	Collection	Treatment	Disposal
On-lot Disposal Systems	Collection lines minimal; a lateral and possibly some type of pump.	Septic or aerobic tank, sand filter or rotating media; drip irrigation; single unit package treatment plants are available.	Absorption field or a sand mound; spray, or stream discharge.
Community Systems	Collection line or force main, small diameter sewers, vacuum sewers, pressure sewers or individual septic tanks with effluent collection. May need lift stations and grinder pumps.	Septic or aerobic tank, sand filter, rotating media, lagoons, centralized community plant.	Absorbtion field or sand mound; spray or stream discharge.
Public or Centralized Systems	Collection line or force main, pressure or vacuum sewers, small diameter pipe.	Sewage treatment plant.	Stream discharge or spray irrigation.

Figure 8
Dispersal Options for On-Lot Sewage Facilities

Name	Description	Advantatges	Disadvantages
Bed/Trench	Effluent from the septic or areobic tank is treated in the bed/trench media and the surrounding soil.	Commonly used, minimal maintenance.	Requires a relatively deep limiting zone.
Contour System	Effluent is spread over a broad area of buried pipe in a shallow trench that follows the contour of the land.	Larger area for effluent dispersal than most systems.	Systems that are too long may require pressurization, requires a level bottom of the trench.
Drip Irrigation/Trickle Systems	Applies pretreated wastewater to soil slowly and uniformly through a network of thin, flexible tubing placed at shallow depths in the soil.	Minimal site disturbance, flexible tubing can be placed around trees and shrubs, and complex terrain.	Possibility of clogging.
Gravelless and Chamber Systems	Vaulted cross-section, flat, uncontained bottom, uses a material other than gravel in the trench, provide some capacity to store effluent until it can be absorbed into the soil.	Faster installation and increased volume of void space per unit length compared to conventional trenches.	Cost.
Elevated Sand Mound	Mound consists of a raised drainfield, sandfill on top of a gravel-filled bed.	Overcomes site restrictions (limiting zones due to unsuitable soils).	Aesthetics, cost.
Vapotranspiration	Employ the combined effects of evaporation from soil and transpiration from plants to dispose of wastewater effluent.	Can be used on sites with very porous soils and in close proximity to water wells (50 feet).	Not as effective in areas with high rainfalls, high humidity, low average daily temperatures and low levels of solar radiation.
Pressure/Low Pressure	Shallow, dosed soil absorption systems.	Can be especially designed to overcome the site constraints such as high water table, can be located on sloping ground or on uneven terrain.	Cost.
Recirculating Sand Filter	Septic or areobic tank to remove solids, effluent is pumped to a sand filter tank, effluent can be recirculated through the filter mulitiple times.	Higher quality effluent due to the recirculation.	

Special Protection Waterways in Montgomery County:

- ***High Quality Streams: entire Unami Creek Watershed, Valley Creek.***
- ***Exceptional Value Streams: none.***

Federal rules regulate maximum pollutant loads from sewage treatment plants. Alternatives to stream discharge should be explored where small order streams or high quality streams exist.

Stream discharge systems have to meet strict requirements under the National Discharge Elimination System (NPDES) permitting program. However, unexpected problems and a lack of maintenance can result in deleterious impacts to our streams. This concern is even greater with individual residential treatment systems and non-municipal systems that are privately operated and maintained. When treatment plants discharge to small streams or headwater areas, these impacts can be exacerbated, especially since streams experience broad fluctuations in flow in our area and are often low. The assimilative capacity of these streams can be overtaxed by excessive or improper waste discharges. In fact, a number of Montgomery County sewage treatment plants have recently applied to DEP to relocate their outlet pipes away from small tributaries and into the main stem of a local waterway due to this concern and as a result of some recent revisions to the NPDES permitting requiring stricter effluent limitations. Thus, alternatives to stream discharge should be evaluated in areas where only small order streams or High Quality and Exceptional Value streams are available.

Another recent federal regulatory tool aimed at reducing pollutant loads to our streams and rivers that will likely affect pipe-discharge type wastewater treatment plants is the TMDL or Total Maximum Daily Load requirement. The TMDL is a requirement of the Clean Water Act that involves assessing the health of a waterway and developing a strategy for impaired waterways to meet the state's water quality standards. After a thorough study of all the potential pollution sources to a waterway a maximum limit for each of the pollutants is established. This limit represents how much pollution the waterbody can receive and absorb while still meeting the water quality requirements. DEP is currently overseeing the creation of TMDLs for a few watersheds in Montgomery County, particularly the Schuylkill River and the Wissahickon Creek. And since there are numerous wastewater treatment plants discharging to these watersheds, often times providing the majority of the base flow during low flow conditions, the results of the TMDL process could lead to additional pollution prevention requirements for these treatment plants.

Land disposal of wastewater can be an appropriate alternative to stream discharge systems. How-

ever, due to the large land area required for these systems, this alternative might be most appropriate for individual residential, non-municipal systems, and small municipal systems – or possibly in rural areas with a group of failing on-lot systems or in cluster-type developments in rural resource areas. Spray irrigation and drip irrigation systems are the two most common forms of land disposal options. These systems permit advanced levels of treatment in addition to groundwater recharge. The operation and maintenance costs also tend to be lower for these systems as well. Up until 2003, New Hanover Township utilized a spray irrigation system to disperse its municipal waste. Currently, the Mason's Mill Sewage Treatment Plant in Bryn Athyn Borough is the only publicly owned treatment plant using spray irrigation for its discharge. This is a small municipal system.

Treated effluent can be used to irrigate nursery crops.

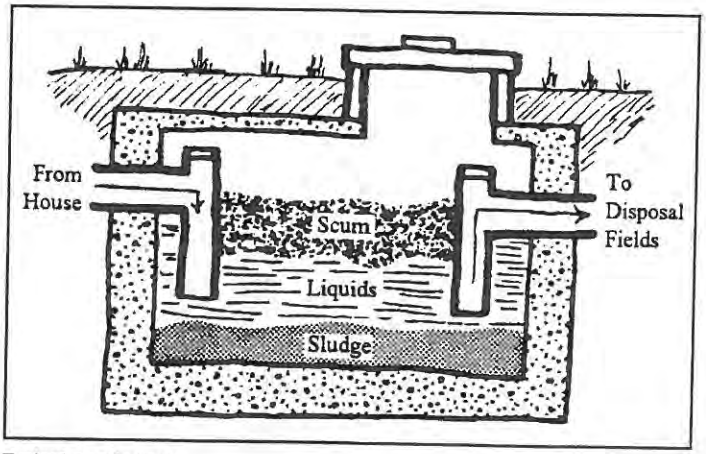
New and Alternative On-Lot Sewage Options

While soil types are generally not a significant limiting factor when planning public sewer service, soil is the foundation of conventional onsite wastewater treatment. Soil type and characteristics have traditionally been the most important factor in determining if an on-lot sewage system can be installed and which type of system will function best on a site.

Individual on-lot systems are located on the developed lot and involve either subsurface or surface disposal of the treated effluent. Septic systems are one of the most common types of on-lot sewage facilities. They employ a treatment tank that allows for liquid waste to percolate through the soil where it is neutralized and broken down further.

There are several variations to the standard septic system depending on soil, site, and operational conditions. The greatest variety exists in the choices of effluent dispersal. There are standard trenches, seepage bed systems, subsurface sand filters, elevated sand mounds, and individual residential spray irrigation systems (IRSIS). The selection of which of these variations to use on any one site is influenced by certain site conditions and constraints. The four most influential are: slope, setbacks, soil characteristics, and permeability (the ability of water to move through spaces in the soil).

Other restricting site parameters for on-lot sewage systems include topography, separation distances/setbacks, existing water sources, depth to limiting zones, and position in the landscape.



Typical septic tank.

Figure 9
SEWAGE TREATMENT PLANTS BY WATERSHED

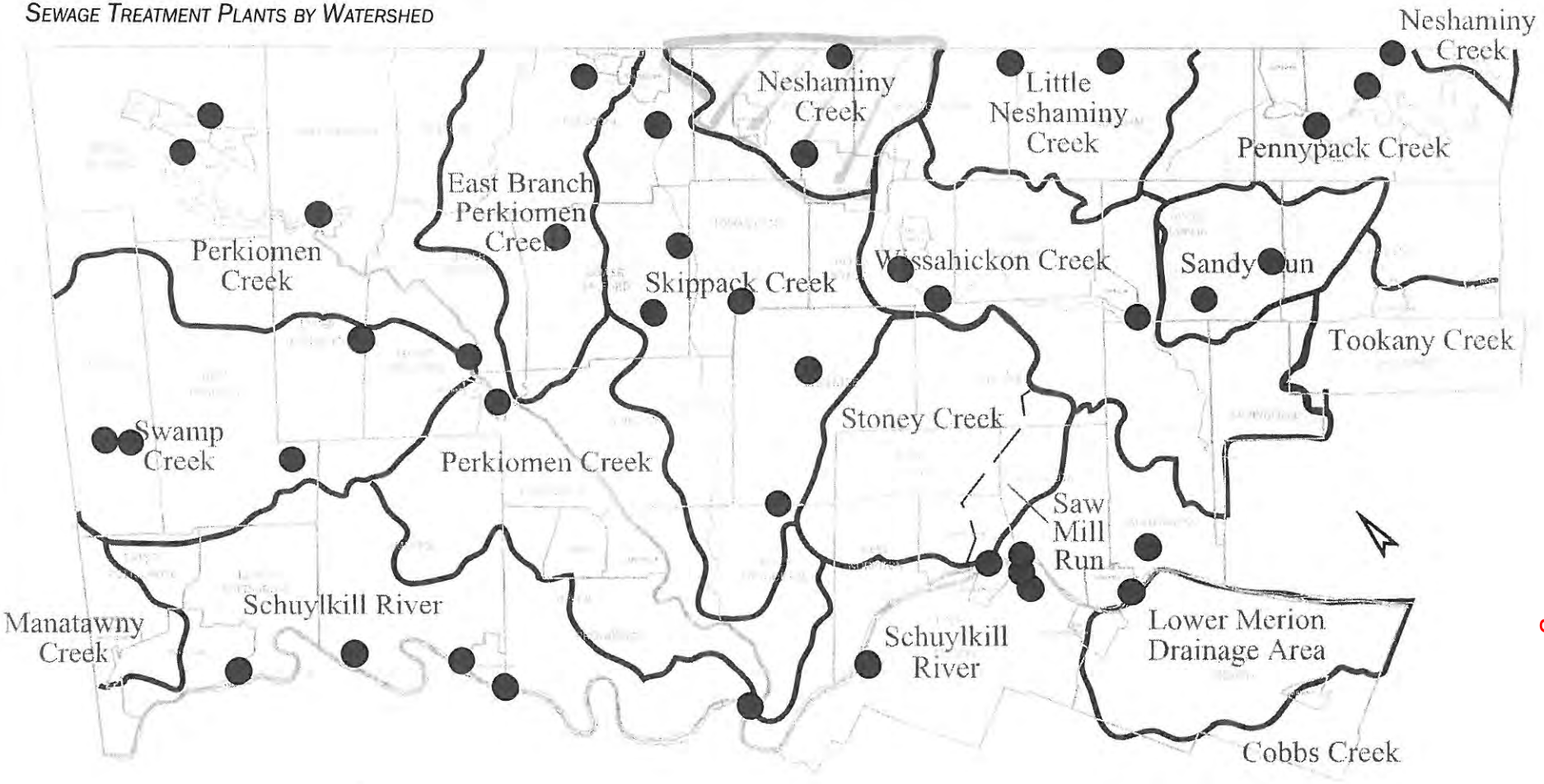


Figure 10
Montgomery County Municipal Sewage Treatment Plants by Watershed

Watershed	Municipal Plants	Discharge	Nonmunicipal Plants	Discharge
Cobbs Creek				
East Branch Perkiomen Creek	Lower Salford Township (Harleysville STP) Telford Borough STP	Tributary to Indian Creek Indian Creek	New Life Boys Ranch	East Branch Perkiomen Creek
Little Neshaminy Creek	Horsham Township STP	Park Creek	English Village Apartments US Naval Air Station The Orchard	Park Creek Park Creek Little Neshaminy Creek
Lower Merion Drainage Area			Philadelphia Country Club	Saw Mill Run
Manatawny Creek				
Neshaminy Creek	Hatfield Township STP Lansdale Borough STP Montgomery Township STP	West Branch Neshaminy Creek West Branch Neshaminy Creek Neshaminy Creek		
Pennypack Creek	Bryn Athyn Borough STP (Mason's Mill) Lower Moreland Township STP (Chapel Hill) Upper Moreland-Hatboro STP	Pennypack Creek Tributary of Southampton Creek Pennypack Creek	Abington Memorial Hospital Holy Redeemer Hospital Meadowbrook Apartments Academy of the New Church	Tributary to Meadow Brook Meadow Brook Meadow Brook Huntingdon Valley Creek
Perkiomen Creek	Green Lane-Marlborough STP Lower Frederick Township STP LPVRSA, Oaks STP Schwenksville Borough STP Upper Hanover Township STP Upper Motgomery Joint Authority	Perkiomen Creek Perkiomen Creek Perkiomen Creek Perkiomen Creek Macoby Creek Green Lane Reservior	Limerick Trailer Park West Montco Vo-Tech School St. Gabriel's Hall Green Hill Mobile Home Park Marlborough Elementary School Camp Green Lane Graterford Prison YMCA of Pottstown & Upper Perkiomen Valley Upper Salford Township Building	Lodal Creek Lodal Creek Perkiomen Creek Green Lane Reservior Green Lane Reservior Ridge Valley Creek Tributary to Perkiomen Creek Macoby Creek Perkiomen Creek
Sandy Run	Abington Township STP Upper Dublin Township STP	Sandy Run Sandy Run		
Schuylkill River	Bridgeport Borough STP Conshohocken Borough STP E. Norriton/Plymouth/ Whitpain JSA Limerick Township STP Norristown Borough STP Pottstown Borough STP Royersford Borough STP Upper Merion Township (Matsunk STP) Upper Merion Township (Trout Run STP) Whitemarsh Township STP	Schuylkill River Schuylkill River Schuylkill River Schuylkill River Schuylkill River Schuylkill River Schuylkill River Frog Run Schuylkill River Tributary to Schuylkill River	Valley Forge Trailer Park Regal Oaks Development River Park	Schuylkill River Sprogels Run Schuylkill River
Skippack Creek	Lower Salford Township (Indian Hills STP) Lower Salford Township (Mainland STP) Souderton Borough STP Upper Gwynedd-Towamencin STP Worcester Township (Berwick Place STP) Worcester Township (Valley Green STP)	Tributary to Skippack Creek Skippack Creek Little Skippack Creek Towamencin Creek Tributary to Skippack Creek Zacharias Creek	Methacton School District	Tributary to Skippack Creek
Stony Creek/Saw Mill Run				
Swamp Creek	Berks-Montgomery Municipal (BMMA) Boyertown Borough STP Upper Frederick STP	West Branch Swamp Creek West Branch Swamp Creek Goschenhoppen Creek	New Hanover/Upper Frederick Joint Elementary School Camp Laughing Waters Montgomery County SPCA	Tributary to Swamp Creek West Branch Swamp Creek Goschenhoppen Creek
Tookany Creek				
Wissahickon Creek	Ambler Borough STP North Wales Borough STP Upper Gwyedd Township STP	Wissahickon Creek Wissahickon Creek Wissahickon Creek		

This home in Upper Salford Township uses a sand mound for sewage collection treatment and disposal.

Good soil for on-lot sewage treatment is relatively free of rock and not saturated with water. The soil structure must allow the liquid waste to pass through at a suitable rate—slow enough to allow microorganisms time to feed on the harmful material, yet fast enough to dispose of the amount of liquid waste entering the absorption area.

An overwhelming predominance of the county's soils are classified as having severe limitations for on-site disposal systems due to shallow depth to groundwater. Therefore, very few new conventional on-lot septic tank systems are installed today in the county. Instead, mound-type on-lot systems, which include a sand and gravel bed raised above the ground surface, are more common.

The elevated sand mound makes up for the lack of natural suitable soil by using a special blend of sandy fill material placed on top of the natural soil. This type of on-lot facility is common throughout Montgomery County. However, no on-lot sewage system, including the sand mound, is maintenance free. They all require some form of regular maintenance and the marginal soils in many areas of the County make maintenance even more critical. On-lot sewage management programs are discussed later in this chapter.

More recently, development is occurring in areas previously inaccessible to sewage facilities with the aid of new treatment technologies. DEP has entered into a multi-year contract with Delaware Valley College to do a worldwide search for new, low-cost on-lot technologies that could be used in the climate and soil conditions prevalent within Pennsylvania. The project initially involved monitoring six new or modified technologies for a wide range of soil conditions across the Commonwealth. One of the first systems approved for use as a result of this study was a drip irrigation system. In addition, DEP and the Department of Conservation and Natural Resources have begun a joint project to demonstrate experimental/innovative on-lot disposal technologies in a number of Pennsylvania State Parks. Recent regulatory changes have classified nine previously experimental systems as standard technology.

Sewage treatment technology has progressed to the point where environmental constraints such as poor soil types or steep slopes or the lack of sewage treatment capacity in municipal systems may no longer preclude growth. While the absence of centralized sewers can no longer be used to deter

growth, municipalities can effectively guide development by providing for sewage treatment systems in areas that are appropriate for growth from a land use policy and environmental perspective.

Sewage Facilities Plan

This half of the Sewage Facilities Chapter includes specific recommendations developed for both centralized and on-lot systems that will act as county policy through 2025. It includes a county sewage growth area map, an analysis of existing sewage capacity at the various public treatment plants within each planning region, a look at on-lot sewage problem areas and some ideas on how to provide effective sewage facilities to those problem areas in the rural sections of the county without inducing sprawl and large-scale growth.

Central and Public Facilities

Providing adequate sewage facilities and other infrastructure, such as public water facilities or roadways, can support growth management efforts. An Act 537 Plan, when closely linked with zoning and land use ordinances, provides a roadmap portraying the future of the municipality in terms of anticipated development and needed infrastructure.

Most large-scale residential and nonresidential developments rely on centralized sewage facilities to convey, treat, and dispose of sewage. A municipality can therefore direct growth to designated areas by coordinating the provision of public sewage facilities with land use planning, zoning, and other infrastructure.

Providing for public sewage service in areas where zoning allows growth can therefore direct growth to these appropriate areas or away from environmentally sensitive areas. Coordinating sewage facilities with land use planning, zoning, and other infrastructure is one of a municipality's strongest tools for influencing development.

Past wastewater facilities planning, including the 1972 *Montgomery County Sewage Facilities Plan* emphasized large, extensive regional wastewater facilities, conforming to the notion that these facilities would provide more cost-effective (economies of scale) construction and greater assurance of proper management. For example, the 1972 *Montgomery County Sewage Facilities Plan* recommended a municipal sewage treatment plant in Schwenksville

Central and public sewer facilities should generally be targeted towards designated growth areas.

Rural resource areas generally should not be served by central and public sewer facilities.

Borough to serve the borough, sections of Lower Frederick Township, and Upper Salford Township. This regional approach has for the most part been utilized in Lower Montgomery County on a subregional level and regionally only in the Lower Perkiomen Valley. The regional approach will most likely continue to be the most feasible alternative for these areas. However, this type of wastewater planning may not necessarily be appropriate for the newly specified growth areas of the county.

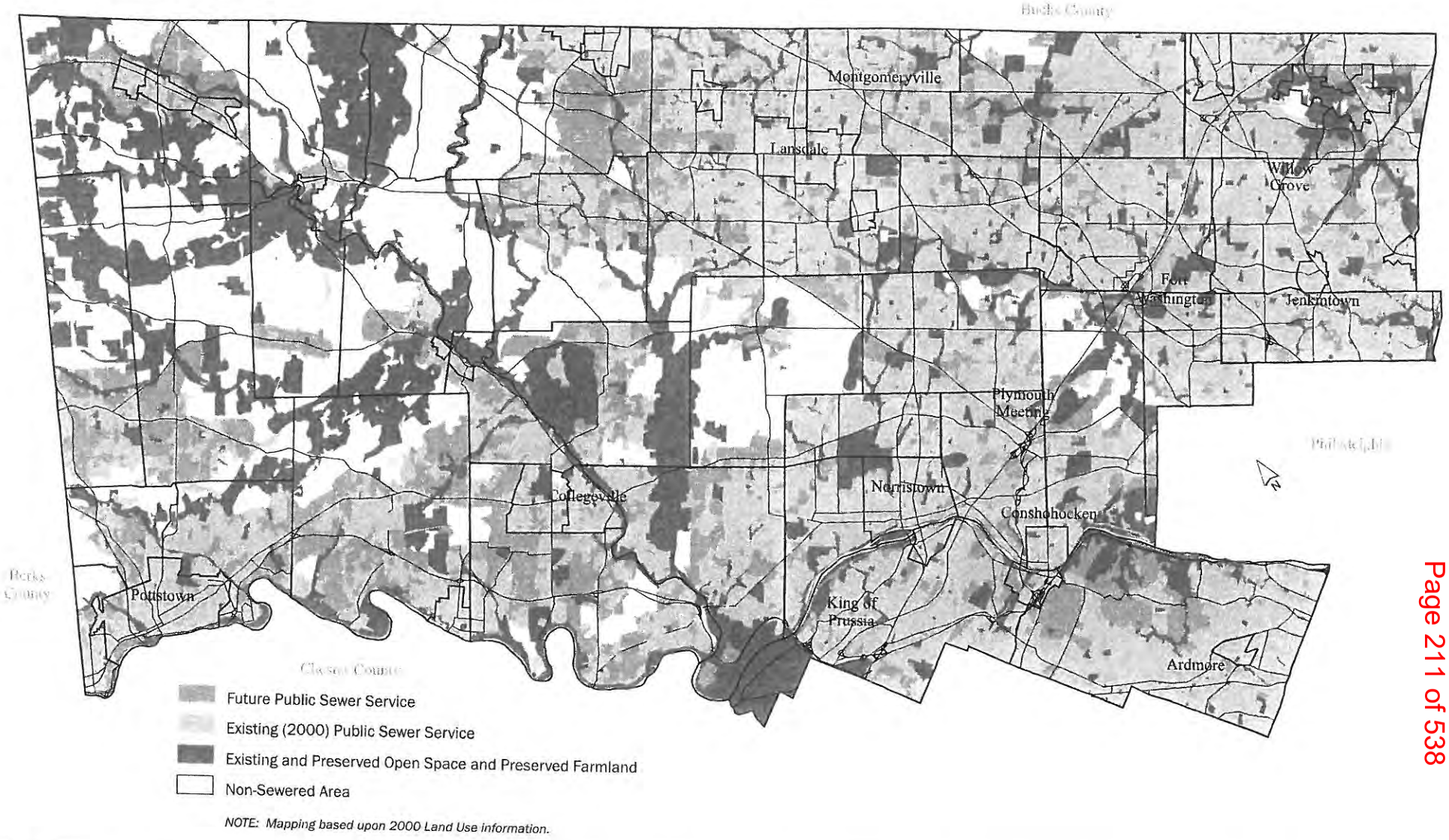
Extensions to the municipal sewage system are often made to accommodate growth. As long as adequate capacity exists at the treatment facility, the costs are reasonable and serving the area conforms to local zoning and land use policies, sewer line extensions are often the most appropriate alternative. However, extending public sewers may itself encourage growth. Extending municipal sewers to rural, low-density areas can strain municipal resources and create a system with high user fees. In order to balance the provision of public sewers with the desire to not encourage unnecessary growth, most municipalities have been developing sewage growth areas.

Sewer growth areas are required as part of a municipality's official Act 537 plan. The sewer growth maps indicate locations within the municipality where public sewer service is expected to expand within a five, ten, and possibly even twenty year period. The maps also delineate what sections of a municipality, if any, are to remain rural in nature and utilize on-lot sewage facilities for the same planning periods.

In order to accommodate anticipated growth without encouraging sprawl-type development, it is imperative that sewer growth area maps closely mirror municipal land use plans. It is equally important that zoning regulations for density, lot sizes and community facilities be consistent with the sewer growth area map. It is in this context that we have developed the Montgomery County Sewer Growth Area Map.

The Sewer Growth Area Map shows those areas of the county where centralized sewer service is currently available and those areas projected to have centralized sewers by 2025. The areas designated for future sewer service closely mirror the future land use growth area map in the *Vision Plan*. Individual municipal Act 537 future growth area maps, DVRPC growth projections, concentrations of failing on-lot systems, and the County Water Service Map were also consulted to develop the future growth area boundary. The white

Figure 11
EXISTING AND FUTURE SEWER SERVICE AREAS



NOTE: Mapping based upon 2000 Land Use information.

areas of the map are considered rural resource areas and it is in these areas that centralized sewage systems should be avoided.

The extent to which sewer service can be extended to new and existing development is often also constrained by the lack of treatment capacity or distance to sewer lines. On the other hand, excessive capacity can stimulate rapid growth, which can place a burden on a municipality in terms of its ability to provide services and to plan for smart growth. It also precludes using sewage facilities to phase development or guide development to suitable locations.

Since the availability of sewage capacity can be such an important factor in determining the type, pace, and intensity of development within the county, we conducted an exercise to examine the existing sewage capacity available within each of the twelve regional areas and estimated a future demand for capacity in each region.

A tabulation of excess capacity within each region has been calculated and listed on Figure 12. The projected sewage capacity needs for 2025, based on 2025 growth projections developed for this plan, (Total 2025 Capacity Demand) was then compared to existing excess capacity in the regions to determine if sufficient sewage capacity currently exists to meet the projected demands.

Possible reasons for large capacity excesses in the Pottstown, Main Line/King of Prussia and Eastern Montgomery County regions:

- ***Industries leaving the boroughs, i.e. Mrs. Smith's leaving Pottstown Borough.***
- ***Large reserved capacity agreements with the City of Philadelphia (Eastern Montgomery County and Main Line/King of Prussia regions).***

Figure 12
Estimated Montgomery County Sewer Capacity Needs for 2025

Regional Planning Areas	2025 New Units Designated Growth Area	2025 New Units Infill Development	Existing Units Currently Served by Water Only That Will be Served by Sewers	2025 Total Residental Capacity Demand (gpd)*	2025 New Employment	2025 Employment Capacity Demand (gpd)	Total 2025 New Capacity Demand (gpd)
Upper Perkiomen Valley	1,440	140	125	468,875	2,550	12,750	481,625
Indian Valley	4,813	610	644	1,668,425	3,900	19,500	1,687,925
Pottstown	6,540	507	223	1,999,250	2,800	14,000	2,013,250
Central Perkiomen Valley	5,479	814	129	1,766,050	2,100	10,500	1,776,550
Spring-Ford	5,456	864	10	1,740,750	6,300	31,500	1,772,250
North Penn	5,099	1,400	73	1,807,300	22,650	113,250	1,920,550
Norristown	4,329	369	701	1,484,725	7,800	39,000	1,523,725
Main Line/King of Prussia	612	290	1,673	708,125	10,450	52,250	760,375
Horsham/Willow Grove	2,508	392	617	967,175	5,400	27,000	994,175
Ambler	2,219	923	297	945,725	6,050	30,250	975,975
Conshohocken/Plymouth Meeting	436	345	469	343,750	14,050	70,250	414,000
Eastern Montgomery County	213	688	271	322,300	600	3,000	325,300
TOTAL	**39,144**	**7,342**	**5,232**	**14,222,450**	**84,650**	**423,250**	**14,645,700**

Information generated based on US Census data, Delaware Valley Regional Planning Commission sewer inventory and employment forecasts data, and information MCPC obtained for the 1998 Sewer Status Report.

* Total residential capacity demand is derived by multiplying total units newly served by sewers by 275 gallons per day per unit.

As can be seen in the Deficiency Analysis table (Figure 13), it is projected that only one region, the Central Perkiomen Valley Region, does not currently have sufficient capacity to meet the 2025 projected demand. Flows from four of the municipalities within this region (Skippack, Perkiomen, Collegeville & Trappe) are sent to the Oaks Regional wastewater treatment plant. Capacity deficiencies have been a common problem for these and the other municipalities served by this plant for a number of years. However, the Lower Perkiomen Valley Regional Sewer Authority and the Montgomery County Sewer Authority have begun planning a plant expansion that should meet capacity projections to 2020.

The three other municipalities within the Central Perkiomen Region are Schwenksville Borough, and Upper and Lower Frederick Townships. The residential projections for Lower Frederick Township in 2025 show significant increases. Public sewage service is provided to Lower Frederick Township by the Schwenksville Borough STP (in the southeastern corner) and via the Lower Frederick Township STP, a small facility located near Spring Mount. There may not be sufficient capacity at this facility to handle the residential projections. So, this could also factor into the deficiency.

These charts do not include the capacity required to serve the on-lot problem areas outside the proposed sewer growth area, mapped by numbers in Figure 16. It is anticipated that these problem areas will primarily be resolved without the extension of public sewer systems. There are also some important limitations to the Deficiency Analysis chart since sewage plant service areas often cross the regional areas defined in the Comprehensive Plan. For example, the six municipalities served by the Oaks Regional Wastewater Plant in Upper Providence Township are bound by a legal service and allocation agreement. However, four of these municipalities lie within the Central Perkiomen Valley planning region while one lies within the Spring-Ford planning area and another lies in the Norristown planning area.

Another important discovery of this exercise was that despite sufficient capacity within most of the regions to support projected needs through 2025, many municipalities and authorities are planning expansions to existing plants. However, dispersing

Figure 13
Estimated Montgomery County Sewer Capacity Needs for 2025

Regional Planning Area	Existing Total Capacity (MGD)	Existing Allocated Capacity (MGD)	Existing Available Capacity (MGD)	2025 Capacity Demand (MGD)	2025 Available Capacity (MGD)**
Upper Perkiomen Valley Region	2.350	1.337	1.013	0.482	0.531
Indian Valley Region	4.740	2.654	2.086	1.688	0.398
Pottstown Region	18.725	7.755	10.970	2.013	8.957
The Pottstown STP has significant amounts of excess capacity, however allocation agreements between the servicing municipalities and the borough authority are currently limiting the availability of this excess. Industries leaving the borough (i.e. Mrs. Smiths) may have also contributed to the excess.					
Central Perkiomen Valley Region	3.460	3.302	0.158	1.777	-1.619
4 of the 7 municipalities in this region send flows to the Oaks regional plant. It is currently experiencing a capacity deficiency. A plant expansion is in design stages. Additionally, Upper Frederick Township has a projected employment increase and Lower Frederick Township has a significant projected residential housing unit increase that may overtax the treatment plants serving those municipalities.					
Spring-Ford Region	7.075	4.231	2.844	1.772	1.072
Limerick Township finished construction of a new STP in 2002 (Possum Hollow STP) rated at 0.7 MGD. This design flow amount is included above in the available capacity column. However, since the plant has yet to receive any flows, no amount from this plant was attributed to the existing flows column.					
North Penn Region	24.231	15.886	8.345	1.920	6.425
Most of the excess capacity is available at the Hatfield, Upper Gwynedd and Upper Gwynedd-Towamencin plants.					
Norristown Region	14.769	8.888	5.881	1.524	4.357
Although the Norristown plant has the most available capacity in this region, the age of this plant makes the actual amount of excess uncertain.					
Main Line/King of Prussia Region	27.870	13.797	14.073	0.760	13.313
Philadelphia and the 2 Upper Merion STPs have municipal allocations more than double current demand. Industries leaving the region may also contribute to the excess.					
Horsham/Willow Grove Region	9.409	7.193	2.216	0.994	1.222
Ambler Region	10.611	6.478	4.133	0.976	3.157
Conshohocken/Plymouth Meeting Region	6.795	4.473	2.322	0.414	1.908
Eastern Montgomery County Region	25.678	13.132	12.546	0.325	12.221
Approximately twice as much capacity is allocated at the Philadelphia STP than currently being used, or anticipated to be needed, thereby contributing to the large 2025 excess. Industries leaving the region may also contribute to the excess.					
TOTAL	155.713	89.126	66.587	14.645	51.942

** All 2025 available capacity may not be immediately available to every municipality within each region due to service agreements and physical limitations, i.e. topography, distance between development and plant in a region. Information in this chart compiled from municipal Act 537 Plans, 1998 MCPC Sewer Status Report, and correspondence with some of the sewer authorities.

Expansions/Re-rates planned, but not yet approved, and not included in available capacity amounts above:

- *Conshohocken Borough submitted an application for a re-rate to 2.35 MGD (from 2.3 MGD) in 2002.*
- *Montgomery Township has submitted an application to expand the Eureka plant to 2.4 MGD, more than 3 times its current capacity.*
- *A request to re-rate the Telford Borough STP to a capacity of 1.23MGD has been submitted to DEP.*
- *A planned expansion of the LPVRSA-Oaks STP to 14.25 MGD is in the design stages. This is a 4.75 MGD increase.*
- *Lower Moreland Township is planning an expansion of the Chapel Hill STP to 0.267 MGD, an increase of 47,650 gpd.*
- *New Hanover Township has submitted a proposal to increase the capacity of its plant by 0.885 MGD to 1.71 MGD.*
- *An application to expand the Telford Borough STP from 1.1 MGD to 1.23 MGD has been submitted to DEP.*
- *Upper Gwynedd/Towamencin STP has submitted an application to expand to 7.3 MGD from 6.5 MGD.*

the existing excess capacity throughout the regions is not a simple task. Legal service and allocation agreements, politics and topography all play a role in keeping sewage facilities planning primarily a local, instead of regional, endeavor.

Clusters on the Edge of Designated Growth Areas

The Montgomery County Planning Commission encourages all future public sewer systems to be located within the designated growth area, as discussed above. And as can be seen in the accompanying tables, sufficient capacity should exist in each of the regions to allow for the increase in sewer demand. However, we realize that there may be some instances, particularly with cluster-type developments, where a centralized sewage system could be the most logical solution for new development in rural resource areas. With that being said, we have developed the following criteria to determine the most appropriate sewage facilities systems for cluster development outside sewer growth areas.

Criteria for Serving Clusters on the Edge of Designated Growth Areas.

In order to consider a centralized sewer system in the rural resource area, a development should be designed as a rural cluster with:

1. *A minimum of 60% open space (ideally 75%).*
2. *A proposed density less than 1 dwelling unit per acre.*

Only if a cluster development fits the above two criteria and is located less than ½ mile from an existing public sewer system, should this cluster tie into the public facilities.

If the cluster-type development meets the above criteria and is located greater than ½ mile away from a public sewer system, on-lot sewage facilities systems should be considered as the primary means to service the lots (i.e. on-lot systems within the open space).

A hierarchy of sewage facilities choices for rural resource areas can be found later in this chapter. It can be used as a guide should soils based on-lot systems prove unfeasible.

Concentrations of Failing On-Lot Systems

As discussed earlier in this chapter, failing on-lot sewage systems can pose both health and environmental concerns to a community. Most known areas of concentrated failing on-lot systems in Montgomery County today are in the western, village areas of the county. However, there are still a few locations in the eastern part

of the county where on-lot system problems have not been fully addressed. For instance, in 2001, the Horsham Township Sewer and Water Authority submitted a revised Act 537 plan that proposed the extension of public sewers and the construction of a pump station to serve various existing commercial and industrial facilities along Easton Road (Route 611). These facilities are currently served by failing on-lot systems and holding tanks requiring constant pumping and transport to off-site disposal areas. The extension will direct flows to the Upper Moreland/Hatboro STP. In addition, Lower Moreland Township has been working for the last 12 years to hook up every home in the municipality to the public system. Twelve years ago there were 1,600 homes in the township with on-lot systems. In 2002, the second-to-last phase of the project was underway to connect 200 residents with on-lot systems. As of Summer 2003, there are still 65 on-lot systems planned for a future connection.

The 1972 *County Sewage Facilities Plan* identified 73 areas where clusters of on-site systems were malfunctioning or where problems could be expected due to the existence of one or more unfavorable conditions (high density, poor soils, etc.). Fifty-four (54) of these areas (75%) were located in areas delineated as 10-year sewer growth areas in the County Sewage Facilities Plan and would be eliminated if all of the recommendations of the plan were implemented.

Of the original 73 problem areas identified in the 1972 Plan, only 14 have yet to be eliminated. However, 40 new on-lot problem areas have been identified in Montgomery County since then and are listed in the following figures. Some of these new problem areas are located in sewer growth areas and are planned for connection to the public system in the near future. However, approximately 22 of the 40 new sites are located in non-growth areas. Solutions to these problem areas will require more creative planning.

As can be seen in Figures 14, 15, and 16, there are a total of 54 areas of concentrated on-lot sewage problems within the county today. Twenty-three of those problem areas are located in either existing sewered areas or proposed sewer growth areas (designated by code letters). The 31 problem areas identified by number and shown on Figure 16 represent those problem areas located in rural resource areas. For the purposes of this plan, an area

Vernfield is one of the many on-site sewer problem areas that have been corrected since 1972.

- ***Only 14 of the 54 on-lot problem areas listed and mapped in Figures 14 through 16 were also identified in the 1972 County Act 537 Plan.***

- ***The remaining 40 are new on-lot problem areas, discovered since the previous county update.***

Figure 14

Montgomery County On-Lot Problem Areas Located in Existing Sewered or Designated Growth Areas

Map	Problem Area Name	Municipality	Description	Status/Recommendation
A	Short Lane Area	Lower Moreland	Residential properties with malfunctioning systems on small lots, identified by sewage enforcement officers based on complaints and/or inspections.	Located in proposed growth area on County Sewer Service Area map.
B	Pioneer Road Area	Upper Moreland	Industrial area, many lots with holding tanks, identified by sewage enforcement officers based on complaints and/or inspections.	
C	Sampson Road Area	Upper Moreland	Residential properties, many with cesspools on small lots, identified by sewage enforcement officers based on complaints and/or inspections.	Located in proposed growth area on County Sewer Service Area map.
D	Pardee Lane, Serpentine Lane, and Church Road	Cheltenham	Approximately 250 single-family dwellings with old on-lot systems.	The Township has been discussing the feasibility of connecting to the public system and also adopted an on-lot maintenance ordinance that requires yearly inspections.
E	Fairwood Lane/ Pennsylvania Ave	Whitemarsh	13 residential properties identified in Municipal Act 537 Plan.	Planned for public sewer connection by the township within 10 years, in proposed growth area on County Sewer Service Area map.
F	West Valley Green Road/ Bethlehem Pike	Whitemarsh	11 residential and 5 commercial properties identified in Municipal Act 537 Plan, also identified in the County 1972 Act 537 Plan.	Planned for public sewer connection by the township within 10 years, in proposed growth area on County Sewer Service Area map.
G	Germantown Pike/ Andorra Road/Andorra Hill Road	Whitemarsh	45 residential properties identified in Municipal Act 537 Plan.	Planned for public sewer connection by the township within 10 years, in proposed growth area on County Sewer Service Area map.
H	River Road Area	Lower Merion	Older homes/cottages immediately adjacent to the Schuykill River, most with sewage systems over 40 years old.	Located in proposed growth area on County Sewer Service Area map.
I	Youngsford Rd/Black Rock Road/Merion Square Road/Williamson Road Area	Lower Merion	Approximately 80 homes in the central part of the township, below Gladwyne.	Lower Merion Township is conducting a study to consider the extension of public sewer systems to these homes, located in proposed growth area on County Sewer Service Area Map.
J	Bittersweet Circle	Lower Providence	Indentified by sewage enforcement officers based on complaints and/or inspections, unique area of relatively new development where determination of the source of mal-functioning units has been difficult.	Located in proposed growth area on County Sewer Service Area map.
K	Fairview Village	Worcester	Numerous lots in the Eastern and Western ends of the Fairview Village Service Area, identified in the 1972 County Act 537 Plan and a 1995 Worcester Township Act 537 Plan.	2002 Municipal Act 537 Special Study proposes to connect these properties to the Berwick Place STP.
L	Collegeville Road/ Landis Road Area	Skippack	Identified as Area B in Skippack Township 2003 Act 537 Plan Update.	Located in proposed growth area on County Sewer Service Area map.
M	Lywiski Road & Evansburg Road Area	Skippack	Identified as Area A in Skippack Township 2003 Act 537 Plan Update.	Located in proposed growth area on County Sewer Service Area map.
N	Schoolhouse Road near Souder Road	Franconia	Identified in 2003 Municipal Act 537 Plan Update.	Located in proposed growth area on County Sewer Service Area map and draft Indian Valley Regional Planning Commission Comprehensive Plan.
O	Lower Road between Meetinghouse and Schoolhouse Roads	Franconia	Identified in 2003 Municipal Act 537 Plan Update.	Located in proposed growth area on County Sewer Service Area map and draft Indian Valley Regional Planning Commission Comprehensive Plan.
P	Bavington Road Area	Lower Frederick	Identified by sewage enforcement officers based on complaints and/or inspections.	Located in proposed growth area on County Sewer Service Area map.
Q	Fulmer Road Area	Lower Frederick	Area of small residential lots,identified by sewage enforcement officers based on complaints and/or inspections.	
R	Schwenk Road Area	Lower Frederick	Identified by sewage enforcement officers based on complaints and/or inspections.	Located in proposed growth area on County Sewer Service Area map.

Continued:

Map	Problem Area Name	Municipality	Description	Status/Recommendation
S	Zieglerville Road Area	Lower Frederick	Identified by sewage enforcement officers based on complaints and/or inspections.	Located in proposed growth area on County Sewer Service Area map.
T	Wagner Rd/Faust Road Area	New Hanover	Identified in 2003 Municipal Act 537 Plan Update.	Located within proposed municipal sewer growth area according to 2003 537 Act Plan Update.
U	Palm	Upper Hanover	This isolated village contains 80 residences, 10 commercial properties and a church. All use on-lot sewage facilities systems, many installed prior to 1960. Also identified in the 1972 County Act 537 Plan.	A 2001 Municipal Act 537 Plan has been approved to connect these lots and other nearby commercial and industrial properties to public sewers at a new municipally owned treatment plant (formerly a TTT Realty treatment plant). Aquisition and upgrading of the plant has been completed and currently being implemented.
V	Tylersport	Salford	Village area identified by sewage enforcement officers and in 1972 County Act 537 Plan Update.	Located in proposed growth area on County Sewer Service Area map.
W	Frederick/Obelisk	Upper Frederick	1999 Municipal Act 537 Plan designated this area as a future sewer growth area, on-lot problems were not found to be serious; 1978 County Act 537 Plan Update identified.	Located in proposed growth area on County Sewer Service Area map.

Figure 15

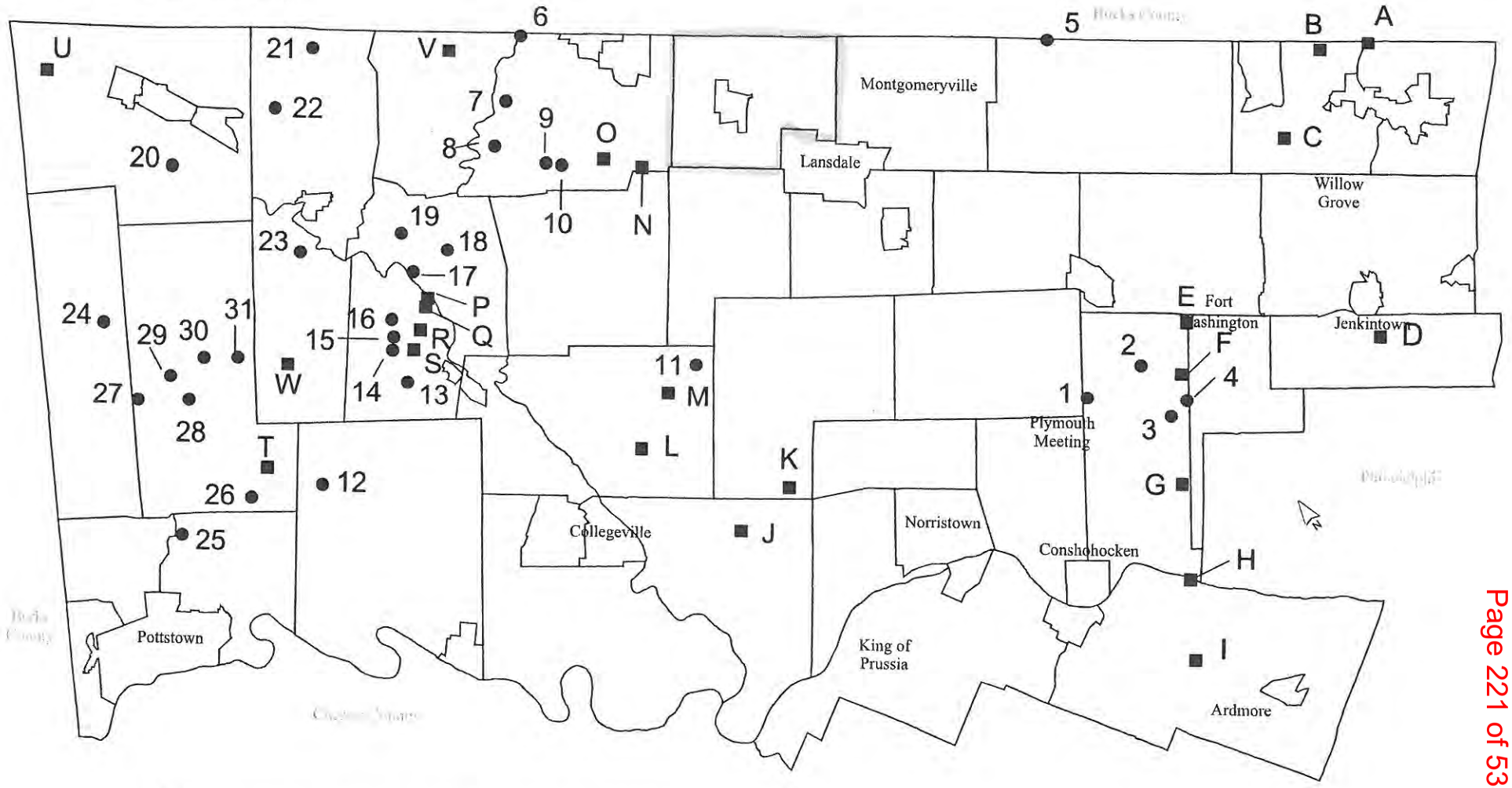
Montgomery County On-Lot Problem Areas in Rural Resource Areas

Map	Problem Area Name	Municipality	Description	Status/Recommendation
1	Stenton Ave/Sheaff Lane	Whitemarsh	23 residential properties identified in Municipal Act 537 Plan.	Planned for connection within 5 years (2003 Act 537 Plan).
2	Toland Drive Area	Whitemarsh	49 residential properties identified in Municipal Act 537 Plan.	Planned for connection within 5 years (2003 Act 537 Plan).
3	Cricket Road/W. Valley Green Road	Whitemarsh	30 residential properties and 1 golf course identified in Municipal Act 537 Plan.	Planned for connection within 10 years (2003 Act 537 Plan).
4	Valley View Road Area	Whitemarsh	43 residential properites identified in Municipal Act 537 Plan.	Planned for connection within 5 years (2003 Act 537 Plan).
5	County Line Road/ Park Road	Horsham	Residential area, identified by sewage enforcement officers based on complaints and/or inspections.	Recent land development plans propose bringing public sewers to this area.
6	County Line and Hollow Roads	Franconia	12 residential lots, identified in 1988 Draft Municipal Act 537 Plan.	Further investigation is needed to determine if on-lot problems still exist.
7	Earlington Area	Franconia	Approximately 87 residential lots with potential on-lot problems, area identified in 1998 Draft Municipal Act 537 Plan, 2003 Franconia Township Act 537 Update, and the County 1972 Plan.	2003 Act 537 Plan Update recommends the implementation of an on-lot disposal management program to address this area.
8	Morwood Area	Franconia	Approximately 50 residential lots with potential on-lot problems, area identified in 1988 Municipal Draft Act 537 Plan and 2003 Franconia Township Act 537 Update.	2003 Act 537 Plan Update recommends the implementation of an on-lot disposal management program to address this area.
9	Clemens and Indian Creek Road	Franconia	7 lots identified in 1988 Municipal Draft Act 537 plan.	Further investigation is needed to determine if on-lot problems still exist.
10	Schoolhouse Road and Rte. 113	Franconia	7 lots near Rte. 113 identified in 1988 Municipal Draft Act 537 Plan.	Further investigation is needed to determine if on-lot problems still exist.
11	Christine Drive/Barbara Road/Legat Lane Area	Skippack	Identified as Area D in Skippack Township 2003 Act 537 Plan Update.	
12	Fruitville Area	Limerick	Identified by 1998 sewer feasibility study and by sewage enforcement officers based on complaints and/or inspections.	Sewer feasibility study looked at serving a portion of Fruitville Road south of Fruitville Road south of Hartenstine Creek, to the intersection of Ridge Pike, as well as the businesses along Ridge Pike at or near this intersection with public sewers, due to other sewer related obligations (Possum Hollow STP). It was recommended that any project be pursued at a later date.

Continued:

Map	Problem Area Name	Municipality	Description	Status/Recommendation
16	Cepp Road Area	Lower Frederick	Identified by sewage enforcement officers based on complaints and/or inspections and in the 1972 County Act 537 Plan.	
17	Salford	Upper Salford	Village area identified by sewage enforcement officers and in 1972 County Act 537 Plan Update.	Further investigation is needed to determine extent of on-lot problems.
18	Salfordville	Upper Salford	Village area identified by sewage enforcement officers and in 1972 County Act 537 Plan Update.	Further investigation is needed to determine extent of on-lot problems.
19	Woxall	Upper Salford	Village area identified by sewage enforcement officers and in 1972 County Act 537 Plan Update.	Further investigation is needed to determine extent of on-lot problems.
20	Lakeshore Drive/Lloyd Lane Area	Upper Hanover	Identified by sewage enforcement officers based on complaints and/or inspections and in 1972 Montgomery County Act 537 Update.	
21	Ziegler Rd Area	Marlborough	Identified by sewage enforcement officers based on complaints and/or inspections.	
22	Geryville Pike Area	Marlborough	Identified by sewage enforcement officers based on complaints and/or inspections.	
23	Perkiomenville	Upper Frederick	Municipal Act 537 (1999) identified this as a potential future growth area, but did not specifically indicate that there was a on-lot problem here; County Act 537 Plan Update identified this area as well.	
24	Congo/Sassmansville	Douglass/ New Hanover	Numerous residential units in the villages of Congo and Sassmansville and between the two villages along Hoffmansville Road, identified in the 1972 County 537 Plan Update and both New Hanover Township and Douglass Township Act 537 Plan Updates.	A plan has been developed to provide public sewers with ultimate treatment at BMMA to 129 lots in this problem areas within a 20 year planning period.
25	Ringing Rocks Area (Kiem Street and Route 663 to the park)	Lower Pottsgrove	Residential area identified by sewage enforcement officers based on complaints and/or inspections.	
26	Sanatoga Road Area	New Hanover	Identified in 2003 Municipal Act 537 Plan Update.	
27	Middle Creek Road Area	New Hanover	Properties along Middle Creek Road, between Big Road and Ludwig Road, identified in 2003 Municipal Act 537 Plan Update.	
28	Miles Road Area	New Hanover	Identified in 2003 Municipal Act 537 Plan Update.	Some, but not all properties lie within municipal proposed sewer growth area.
29	Layfield Area	New Hanover	Identified in 2003 Municipal Act 537 Plan Update.	Approximately half the parcels (south side of Big Road) are within a proposed sewer growth area.
30	Church Road Area	New Hanover	Church Road properties between Big Road and Hoffmansville Road identified in 2003 Muncipal Act 537 Plan Update.	
31	New Hanover Square	New Hanover	Village area identified in both the 1972 County Act 537 Plan Update and the 2003 Municipal Act 537 Plan Update.	

Figure 16
On-Lot Problem Areas in Montgomery County

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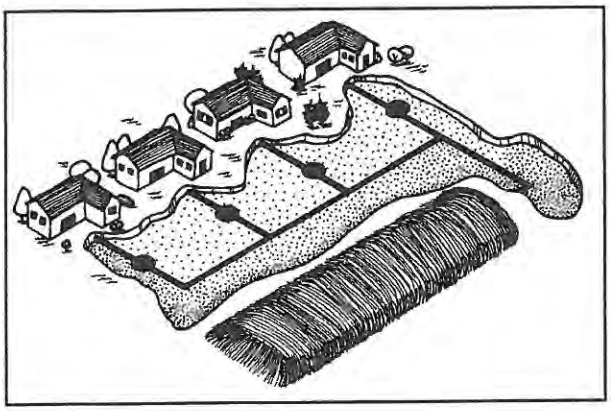
of concentrated on-lot sewage problems was considered an area that contained approximately ten dwelling units or more, in close proximity, where there are units known to be failing or malfunctioning. These areas were identified through municipal official Act 537 plans, the 1972 Montgomery County Act 537 Plan, and information provided by the Montgomery County Health Department. Most areas of on-lot problems within the growth area are isolated and/or planned for corrective measures within the next 10 years. They were mapped in part to help justify the extent of the growth area. However, the location of these on-lot problem areas within the Montgomery County proposed sewer growth area is not a guarantee that the municipality or municipal authority will definitely extend public sewers to those areas within the near future.

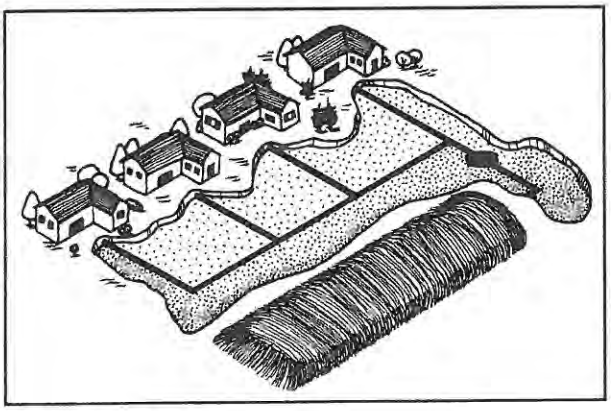
Most of the on-lot problem areas located outside the existing served and growth areas represent villages or small communities in the western section of the county where public sewers are not available. Because these problem areas are not located in sewer growth areas, solutions will require more creativity and planning.

While it's imperative for health and environmental reasons to eventually eliminate malfunctioning on-lot sewage facilities within these rural village areas, extending large diameter sewer interceptors from the closest treatment plant is not, and should not be, considered the only solution. Instead, each on-lot problem area should be studied, on a case-by-case basis, to determine the best corrective method. These studies should include a detailed analysis of other areas within Montgomery County and the Southeastern PA region where similar problems have been solved. Innovative solutions should be examined in addition to more traditional means. For instance, in order to bring public sewage service to the village of Palm, Upper Hanover Township has purchased an existing treatment plant that formerly served an industrial/manufacturing company near the village. This plant is currently being updated to accept domestic flows from the village. This unique solution provides public sewer service to homes with malfunctioning systems without the need to extend large interceptors from the township's main plant (Macoby STP). And by acquiring and upgrading a vacant, former industrial plant, the municipality will achieve multiple goals: providing sewers to an area of critical need without inducing growth and reducing pollution potential to the environment by

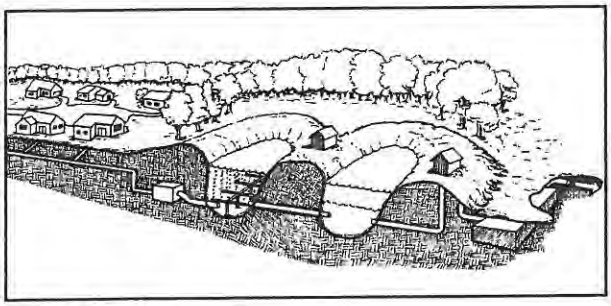
The county still has many rural villages that may periodically have on-site sewage problems.



Common Absorption Field.



Community System.



Lagoon System.

eliminating an industrial discharger and upgrading a vacant STP for domestic flows only. It is strongly recommended that the municipalities listed in Figure 15 with on-lot problem areas begin an Act 537 Plan revision specifically intended to address these on-lot problem areas.

In the 1992 document *Guidelines for Design, Installation & Operation of Small Flow Treatment Facilities,* DEP established a hierarchy of sewage disposal alternatives for small flow situations that must be evaluated prior to plan submittal. This guidance begins with the consideration of connection to public sewers and progresses to a treatment facility with dry stream discharge, only as a last resort. Following these similar principles, MCPC has developed a hierarchy of sewage facilities planning for use by municipalities in rural resource areas to resolve on-lot problem areas.

As a guide to the municipalities identified in Figures 15 and 16, and any future locations where on-lot problem areas may arise within the county, this hierarchy of preferred sewage facilities options has been developed. The hierarchy was developed with the goal in mind to allow for a solution that produces the least amount of growth pressure and minimizes environmental impacts in these rural areas, while still addressing the sewage problem. The alternatives should be considered in the prioritized order provided here.

Prioritized recommendations for correcting on-lot problem areas outside sewer growth area:

1. Repair/replace failing on-lot systems with newer on-lot systems such as mound systems, small flow treatment facilities, and alternative systems.
2. Build a community lagoon systems with spray or drip irrigation for effluent disposal.
3. Build a mechanized community disposal systems (package plants). Effluent disposal options should consider spray or drip methods over stream discharge.
4. Install small diameter/low pressure piping system and connect into existing public system.
5. Extend public sewers only after all other options have been exhausted, and size system to limit further growth.

Providing permanent solutions to malfunctioning on-lot sewage facilities can be very costly. Since many times these malfunctions occur in rural areas

where family incomes are low to moderate, funding sources should be sought to lower the cost to homeowners for correcting malfunctions.

Hierarchy of Sewage Facilities Choices for Rural Resource Areas

The intent of this hierarchy is to provide new, low-density development in rural resource areas with an effective sewage treatment and disposal method that has the least growth inducing impact. The list includes commonly used methods of treatment and disposal; DEP designated alternate and experimental systems are not included. Holding tanks are only an interim method of managing sewage, and also are not included in this list.

A hierarchy for cluster development is included in the section titled, "Clusters on the Edge of Designated Growth Areas." A separate hierarchy for correcting malfunctioning on-lot sewers is provided in the section titled, "Concentrations of Failing On-lot Systems." The following hierarchy should be applied to standard lot residential or nonresidential development in the rural resource area.

The alternatives should be considered in the prioritized order in which they are presented. Factors other than the cost of the system or availability of open land must be considered. The size of building lots may need to be increased to find an adequate percolation site for the on-lot system and accommodate a more desirable alternative.

1. On-lot systems with subsurface disposal (the on-lot system could include one or more septic or aerobic tanks, and a sand filter. Subsurface disposal methods include sand mounds, drip, and trench systems).
2. Individual Residential Spray Irrigation Systems (IRSIS).
3. Community lagoon system with spray discharge.
4. Community lagoon system with subsurface discharge (for small developments).
5. Community sand mound (with either individual or community septic tank(s).
6. Mechanical treatment system with spray discharge.
7. Mechanical treatment system with subsurface discharge (for small developments).

8. Community lagoon system with stream discharge.
9. Mechanical treatment with stream discharge.
10. Individual low flow treatment systems with stream discharge.

Connection of new, standard lot style (non-cluster) development to public sewers is not consistent with the recommendations of this plan.

Sewage Management Programs

Most on-lot sewage disposal systems are not interim facilities but are the permanent means of treatment and disposal of sewage. As stated earlier, an overwhelming predominance of the county's soils are classified as having severe limitations for on-site disposal systems. Based on annual complaint response statistics compiled since 1992, the Montgomery County Health Department estimates that between 5% and 10% of the 30,000 existing on-lot systems in the county may not be functioning properly. Malfunctioning on-site disposal systems can lead to ground and surface water pollution. Problems produced by malfunctioning systems include groundwater pollution, surface seepage and/or stream pollution. Long-term maintenance and inspection is critical to keep these systems operating properly. Therefore, an important component of a municipal sewage facilities plan is its on-lot disposal system (OLDS) management program.

The main goal of a management program is to ensure that these on-lot sewage systems are properly operated and maintained. Without operation and maintenance these systems can fail completely or function well below their capacities. A sewage management plan establishes the legal, administrative, and financial mechanisms needed for long-term operation and maintenance.

Sewage management plans are developed based on the specific needs and resources of the municipality in mind, and can therefore be as simple or comprehensive as warranted. However, Chapter 71 of the PA Code does specify some minimal maintenance standards that all sewage management plans must include. A simple management plan might encompass a pumping and maintenance education campaign and/or permit program. A more comprehensive sewage management program would include periodic inspections of on-lot systems by a municipal employee or contractor. Regardless of the extent of the sewage management

program, municipalities should attempt to convey to homeowners that properly installed and maintained sewage systems can extend the life of the system and reduce future repair costs.

Water Quality Issues

Treatment and disposal of wastewater has a direct bearing on groundwater and surface water resources. Both are utilized in the county as a source of drinking water supply. Insufficiently treated wastewater can cause surface water pollution and contribute to the contamination of ground water supplies. Although water quality discharge requirements and monitoring for sewage treatment plants (STPs) has increased dramatically in the past few decades due to programs such as the National Pollution Discharge Elimination System (NPDES) permitting program, most types of sewage systems still pose potential water quality concerns to our streams. Hydraulic and/or biologic overloads, plant malfunctions, as well as inflow and infiltration problems have been experienced at nearly all-municipal facilities at some time in the past.

One of the biggest concerns with the discharge of sewage effluent to our streams is the decrease in base flow found within the regional waterways. The reduced amount of water found within a stream between storm events (base flow) is directly linked to another common trend in regional development, sprawl. Sprawl development typically results in significantly reduced groundwater infiltration. As we pave over the soil or cover it with buildings, less rainfall and runoff is able to reach into groundwater supplies. Since groundwater supplies help to maintain stream base flow, land development practices have contributed to a decrease in the ability of streams to assimilate nutrients and pollutants discharged into them via treatment plants.

This concern of a waterway's ability to assimilate effluent from treatment plant discharges also applies to community and private sewage treatment plants, as well as small flow treatment facilities (SFTF). Small flow treatment facilities are an on-lot sewage system technology being proposed more frequently in recent years within Montgomery County. These facilities are a small-scale treatment plant designed to process flows from a single residence. They are typically only approved as an

The county's waterways are a vulnerable resource that must be protected.

on-lot sewage facilities system in areas where access to public sewers is not feasible and all other on-lot systems are not viable.

Despite the stringent permitting and design requirements for these devices, approximately 15 proposals for SFTFs within Montgomery County have received planning approval within the last 3 years (2000 through 2002). Homeowners should be made aware of the more complicated maintenance requirements of these facilities and the cumulative water quality effect that multiple SFTFs could have on a single waterway.

Another water quality concern related to sewage facilities planning relates to the issue of groundwater mining. This phenomenon can result when public sewage facilities and public water facilities are not installed in an area in tandem. If a municipality extends public sewer lines into areas where individual wells are used for potable water supplies, a loss of groundwater recharge can result. In effect water is often withdrawn from one watershed for potable sources and then discharged into a separate watershed via discharge from a municipal sewage treatment plant.

Groundwater mining, where wells extract water that is discharged to a stream through a public sewer system, should be avoided by providing public sewer and water in tandem.

Recommendations

In order to implement the sewage facilities planning policies discussed in the second half of this chapter, the county has established the following recommendations.

- Municipalities should concentrate sewage facilities within designated growth areas and existing developed areas.
- Municipalities are encouraged to restrict extension of public sewage into rural resource areas.
- Attempts should be made to provide public sewer and water facilities concurrently, where possible within growth areas.
- All municipalities with official sewage facilities plans more than 10 years old and those with significant numbers of failing on-lot systems should review and update the documents.
- Sewage facilities plans should be consistent with regional, county, and municipal comprehensive plans, land use plans, zoning ordinances, and open space plans.

- All municipalities in which on-lot sewage systems exist should develop sewage management programs that help local property owners maintain their systems.
- When cluster-type developments are proposed outside sewer growth areas, centralized sewers should only be extended if the development meets the standards described earlier in this chapter.
- Municipalities are encouraged to use the provided hierachy of sewage treatment alternatives for development within rural resource areas or develop their own similar list for sewage planning purposes.
- Municipalities should encourage the proper oversight and maintenance of private sewage treatment plants (package plants) and industrial plants. For those private and industrial plants that are not being properly maintained and exist within a proposed sewer growth area, municipalities should consider their elimination and connection into the public system.
- The proliferation of stream discharge systems (municipal, private, and small flow treatment facilities) on High Quality or Exceptional Value waterways or other streams with sensitive assimilative capacities (headwaters, Karst) should be avoided.

Exhibit IV-4

MC Future Sewer Service Areas

Hatfield Township, Montgomery County

Figure 11
Existing and Future Sewer Service Areas

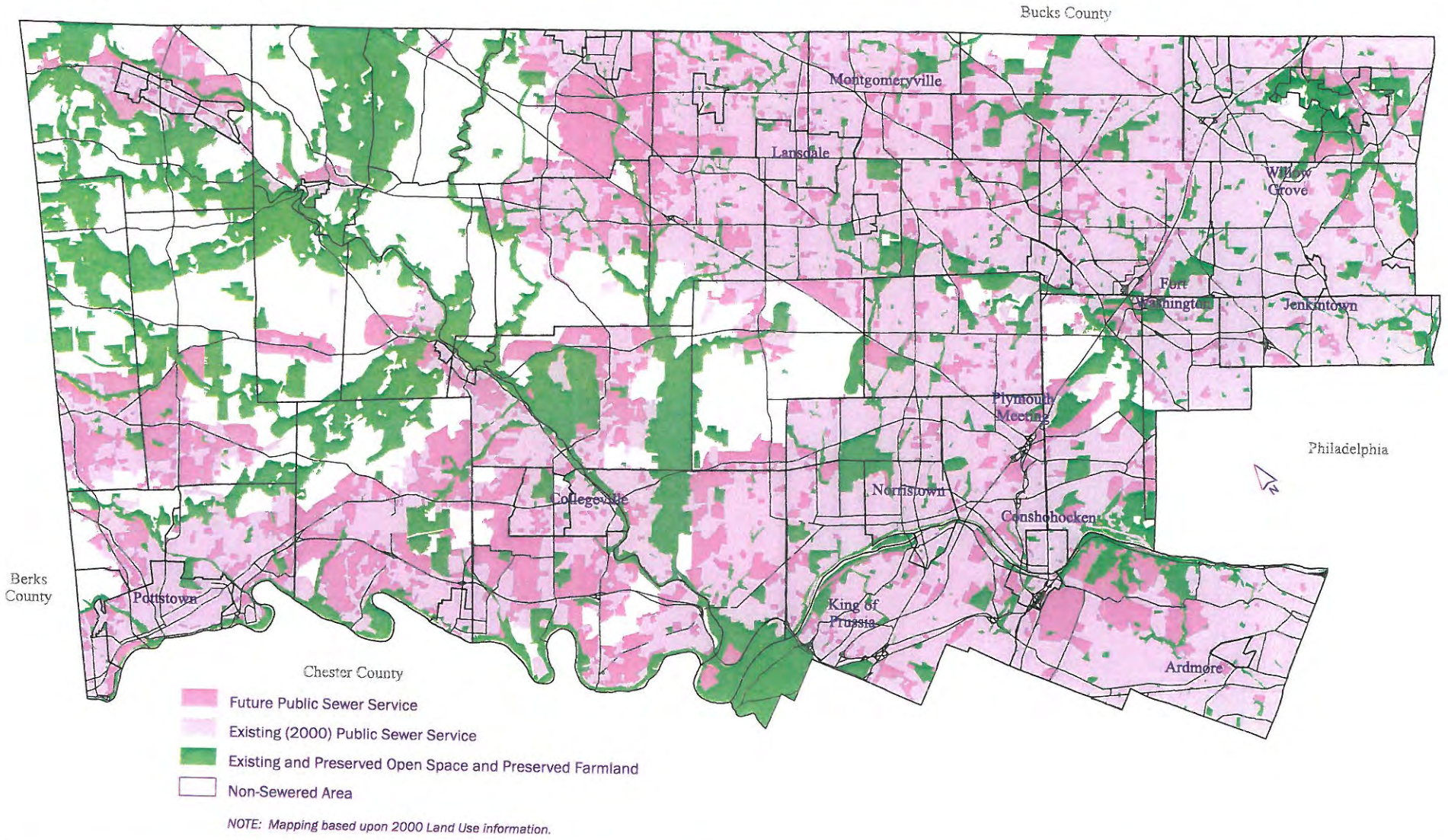


Exhibit IV-5

MC Comprehensive Plan: Water Resources Summary

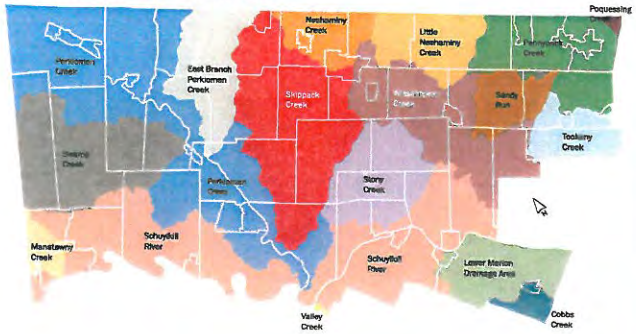
Hatfield Township, Montgomery County

Accomplishing the Vision

Stormwater Management

Stormwater ignores government boundaries and can have a cumulative impact on a watershed. In fact, the quantity of stormwater produced in a developing watershed can increase rapidly even when individual stormwater control facilities are built. To address this impact and determine the best design of future stormwater facilities, Montgomery County is preparing stormwater management plans (Act 167 plans) for each designated watershed. These plans outline release rate requirements and other regulations local municipalities must adopt for their stormwater control ordinances.

Designated Act 167 Watersheds



Best Management Practices (BMP)

Best management practices can dramatically improve stormwater control. These practices include:

- Naturalized basins.
- Vegetated swales.
- Reduced or disconnected impervious surfaces.
- Rain gardens.
- Bioretention areas or bioswales.
- Porous pavement.
- Infiltration basins.
- Sediment forebays.
- Stormwater extended detention ponds.
- Stormwater ponds.
- Constructed wetlands.
- Existing basin enhancements.

This bioswale protects water quality and makes the parking lot more attractive.

This naturalized basin filters stormwater by removing pollutants and allowing water to infiltrate into the soil.

To view this plan online visit:
www.montcopa.org/plancom/comprehensiveplan

For additional information, contact the Montgomery County Planning Commission at 610.278.3722 or mcpcwebmaster@mail.montcopa.org.

This brochure is a summary of the 2025 county *Water Resources Plan*, an element of the Montgomery County comprehensive plan. Other elements of this comprehensive plan include the *Vision Plan*, the *Land Use Plan*, the *Transportation Plan*, the *Economic Development Plan*, the *Open Space, Natural Features, and Cultural Resources Plan*, the *Housing Plan*, and the *Community Facilities Plan*.

These plans were financed in part by a grant from the Commonwealth of Pennsylvania, Department of Community and Economic Development.

Water Resources Plan Summary

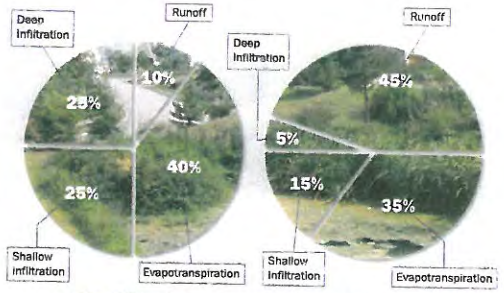
Shaping Our Future

A Comprehensive Plan for Montgomery County

Adopted by the county commissioners in 2005

Current Trends

The water cycle is a natural process that is profoundly affected by people and development. Over the past few decades, the human impact on water has been recognized and addressed with various regulations, including requirements for stormwater control, discharges into streams, and withdrawals from groundwater supplies. In addition, substantial public and private investment has successfully been made to improve water. Nevertheless, the county still experiences flooding, water shortages, and pollution in some locations.



Runoff increases dramatically when development occurs.

Under the Water Resources Plan, the county will have an adequate supply of water in all areas and for all purposes, both consumption and natural habitat.

With the Water Resources Plan, the county's water will be safe and clean.

Vision for the Future

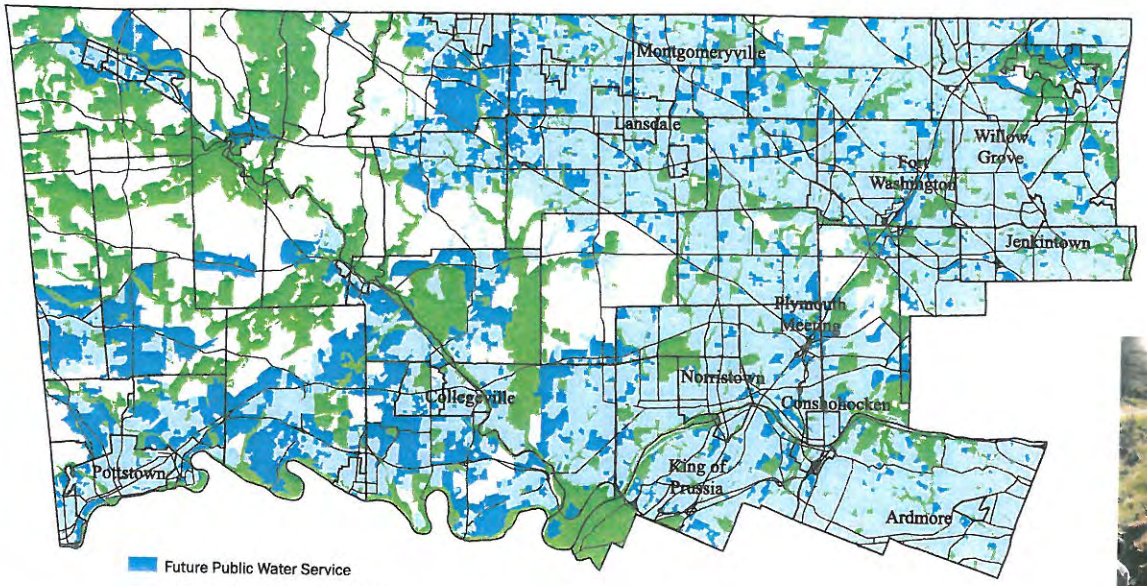
The county's Water Resources Plan shows how government, developers, businesses, and residents can work together to better manage water resources.

As shown in the Water Resources Plan, the impact of flooding on people and properties will be mitigated.

Using the Water Resources Plan as a guide, stormwater facilities will be improved by mimicking the natural water cycle.

Existing and Future Public Water Service
Montgomery County in 2025

Accomplishing the Vision



Future Public Water Service

Existing (2000) Public Water Service

Existing and Preserved Open Space and Preserved Farmland

Areas without Future Public Water Service

Note: Mapping based upon 2000 Land Use information.

Volunteers help with a streambank stabilization project that will reduce erosion and improve water quality.

Water Supply

Most of the county's new homes and businesses will be served by public water, either through existing lines or through extensions into future public water service areas. These future service areas generally correspond to the designated growth areas in the *Vision Plan*, although water service sometimes extends into rural areas where there are concentrations of failing wells or into existing developed areas already served by public sewers.

New development should be limited in areas not expected to be served by public water. Local municipalities with large numbers of failing wells should prepare local water resource plans to help mitigate the impact of new rural development.

All county water users, whether they are served by public water or wells, should adopt and promote strong water conservation measures, including low-flow fixtures, drought-tolerant landscaping, and reuse of water.

Water Quality

Over the past few decades, the quality of the water flowing through Montgomery County has improved significantly. This is due mostly to government regulation of discharges from sewer plants and industrial operations combined with public funding for plant upgrades.

Despite these improvements in water quality, pollution still exists. Much of this pollution comes from nonpoint sources such as runoff from parking lots, roads, farms, golf courses, suburban lawns, construction sites, animal concentrations, and other sources.

The effects of this runoff can be mitigated with stormwater best management practices (see back page), better erosion and sediment control on construction sites, less impervious surface, better farm practices, and more protection of natural areas, including steep slopes, wetlands, riparian corridors, floodplains, and woodlands.

Flooding

Despite everyone's best efforts, flooding is a natural occurrence that will continue in the future. The following actions will help reduce the impact of future floods, especially where natural floodplains have already been developed.

- Improve the flood warning system for the public and emergency services.
- Keep new buildings out of floodplains or, when old brownfield sites in revitalizing towns are being rebuilt, require new buildings to be elevated above flood levels.
- Maintain the drainage system and make sure debris does not block inlets, outlets, and bridge underpasses.
- Identify man-made constriction points on local streams and, over time, widen these constriction points.
- In places that have flooded repeatedly, potentially acquire properties and relocate the occupants.
- Effectively enforce floodplain regulations.
- Adopt natural resource protection ordinances, including riparian corridor and wetland ordinances.
- Inform the public about the real dangers of flooding.

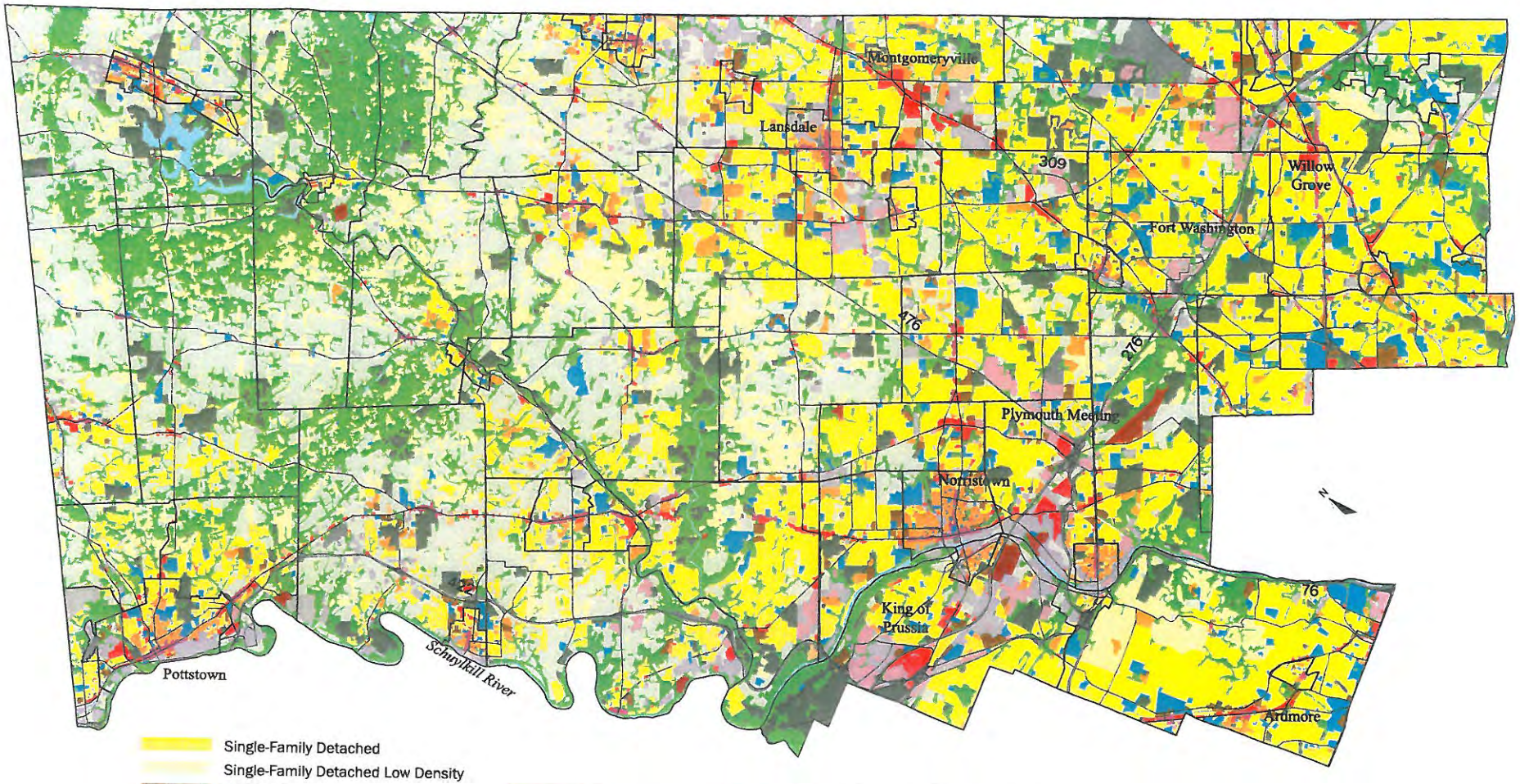
New development on existing developed land in floodplains should be elevated and floodproofed.

Exhibit IV-6

MC Existing Land Use Designations and Map

Hatfield Township, Montgomery County

Figure 1
2000 Existing Land Use in Montgomery County



This map is based on 2000 ortho photographs, Montgomery County Board of Assessment Appeals tax maps, Planning Commission staff review, and field surveys conducted by the County Planning Commission. All attempts were made to maintain relative accuracy, however, this map should not be used for engineering purposes.

Exhibit IV-7

Delaware Valley Regional Planning Commission Population Forecasts

Hatfield Township, Montgomery County

Appendix — Population by municipality, 2000 through 2035

Jurisdiction	2000 Census	2005 Estimate	2010 Forecast	2015 Forecast	2020 Forecast	2025 Forecast	2030 Forecast	2035 Forecast	Absolute change 2005-2035	Percent change 2005-2035
Montgomery County	**748,978**	**780,544**	**802,340**	**822,952**	**842,452**	**860,816**	**878,158**	**894,136**	**113,592**	**15%**
Franconia Township	11,525	12,200	13,505	14,739	15,906	17,005	18,044	19,000	6,800	56%
Hatboro Borough	7,390	7,332	7,392	7,448	7,501	7,552	7,599	7,643	311	4%
Hatfield Borough	2,605	2,889	2,937	2,982	3,025	3,065	3,103	3,138	249	9%
Hatfield Township	16,712	17,577	18,174	18,739	19,273	19,776	20,251	20,689	3,112	18%
Montgomery Township	22,025	24,358	24,961	25,531	26,071	26,579	27,058	27,500	3,142	13%

Sources: U.S. Census Bureau (2000 data); Delaware Valley Regional Planning Commission, incorporating comments from the planning staffs of the Commission's nine member counties (2005 estimates and 2010-2035 forecasts). The DVRPC Board formally adopted these forecasts on July 26, 2007, with affirmative votes from all voting members except Bucks County.

Exhibit IV-8

Contributing Municipality Future Flow Requirement Correspondence

Hatfield Township, Montgomery County

CET ENGINEERING SERVICES

April 7, 2008

Mr. John Nagel, Township Manager
Montgomery Township
1001 Stump Road
Montgomeryville, PA 18936

CERTIFIED MAIL NO. 7007 0710 0002 4083 8649
RETURN RECEIPT REQUESTED

RE: Act 537 Planning – Hatfield Township

Dear John,

In February 2008, Hatfield Township requested the Hatfield Township Municipal Authority (HTMA) take the lead in planning and developing the Township Act 537 Plan Revision. This Plan Revision will address planning periods of 10 years, 20 years, and final buildout of the Township. As you may recall, planning was initiated on this project in September of last year. Since that time a draft Plan of Study and Task Activity Report has been developed.

In order to begin the Plan Revision Process, HTMA is contacting all municipal entities currently sending flows to the its wastewater treatment plant in an effort to establish overall future demands.

According to the current capacity agreement, Montgomery Township owns 1/3 of the current plant design capacity or 2.14 million gallons per day (MGD). Please provide a projection of additional capacity that may be required in the next 10 years, 20 years, and final buildout of the township. Additional capacity above the current level may require an expansion project at the expense of contributing municipalities of the Authority.

Due to DEP submission requirements, we request a response not later than May 9, 2008. Planning will proceed as if no additional flow is anticipated should a response not be received by that time. Thank you in advance for your assistance in this matter.

Sincerely,

CET Engineering Services

Jodi Reese

Jodi Reese, P.E.
Principal Engineer

xc: Pete Dorney, HTMA
Stephanie Teoli, Hatfield Township Manager

MONTGOMERY TOWNSHIP MUNICIPAL SEWER AUTHORITY
1001 STUMP ROAD, MONTGOMERYVILLE, PA 18936-9605
TELEPHONE (215) 393-6930
FAX (215) 362-8711

May 15, 2008

Ms. Jodi Reese, P.E.
CET Engineering Services
1240 Mountain Road
Harrisburg, PA 17112

RE: Act 537 Planning – Hatfield Township

Dear Ms. Reese:

I am replying to your April 7, 2008 letter to John Nagel, Manager of Montgomery Township. Act 537 Planning has been delegated by the Township to the Montgomery Township Municipal Sewer Authority.

On behalf of the Township, I am confirming that Montgomery Township Municipal Sewer Authority currently owns 2.14 (minimum) MGD capacity in the Hatfield Township Municipal Authority Wastewater Treatment Plant and needs all of that capacity. Montgomery Township flow now approximates 1.8 MGD and the attached chart shows that we will need an additional available flow of 267,000 GPD through final build-out of the Township. This means that we believe that our current flows plus our future needs are within the capacity to which we are already entitled. We do not currently desire additional capacity and it is the Township's intention to remain within our purchased capacity of 2.14 (minimum) MGD.

Sincerely,

Beverly Brown

Beverly Brown
Manager

Cc: Pete Dorney, HTMA
John Nagel, Montgomery Township Manager
Stephanie Teoli, Hatfield Township Manager

Montgomery Township	Dep Code	Dep Approved	Flow GPD	Flow EDU	Connected	Remaining	GPD	Time Frame
Heckler Tract		NO	9,000	36	0	36	9,000	Within 1 year
Firefox		NO	34,500	115	0	115	34,500	Within 1 year
Manor View		YES	2,500	10	10	0	0	Connected
Montgomery Baptist Church		NO	5,250	21	0	21	5,250	Within 5 years
Logo's Group Development	1-46940-185-3H	YES	10,800	36	0	36	10,800	Within 5 years
Taco Bell Restaurant	1-46940-225-E	YES	3,300	11	0	11	3,300	Within 1 year
Indian Lake Farm Subdivision	1-46940-238-E	YES	6,000	20	19	1	300	Within 1 year
Trefoil Properties, Inc. Development	1-46940-251-E	YES	3,000	10	0	10	3,000	Within 5 years
Calhoun Tract	1-48940-278-3J	YES	2,100	7	0	7	2,100	Within 5 years
675 Bethlehem Pike (restaurant and 2 retail)	1-46940-286-E	YES	3,000	10	10	0	0	Connected
Best Western Hotel	1-46940-290-E	YES	23,100	77	0	77	23,100	Within 5 years
Longhorn Steakhouse	1-46940-294-E	YES	5,100	17	0	17	5,100	Within 5 years
Montgomery Avenue, 15 properties	1-46940-301E	YES	11,900	34	2	32	9,600	Within 5 years
Dick's Sporting Goods	1-46940-299-E	YES	2,700	9	9	0	2,700	Connected
Arbors Commercial		NO	2,100	7		7	2,100	Within 5 years
Vacchiano Tract	1-46940-301E	YES	600	2	0	2	600	Within 1 year
Connelly Tract	1-46940-285E	YES	1,200	4	0	4	1,200	Within 1 year
Miscellaneous		NO	13,500	45	25	20	6,000	Within 5 years
Montgomery Mall Expansion		NO	125,000	500	0	500	125,000	Within 5 years
Parcel # 46-00-00853-001		NO	300	1	0	1	300	Within 5 years
Parcel # 46-00-00841-004		NO	600	2	0	2	600	Within 5 years
Parcel # 46-00-00844-001		NO	300	1	0	1	300	Within 5 years
Parcel # 46-00-00850-004		NO	300	1	0	1	300	Within 5 years
Parcel # 46-00-00847-007		NO	300	1	0	1	300	Within 5 years
Parcel # 46-00-00253-007		NO	1,200	4	0	4	1,200	Within 5 years
Parcel # 46-00-03103-001		NO	600	2	0	2	600	Within 5 years
Parcel # 46-00-03124-007		NO	1,200	4	0	4	1,200	Within 5 years
Parcel # 46-00-00679-007		NO	600	2	0	2	600	Within 5 years
Parcel # 46-00-00673-001		NO	300	1	0	1	300	Within 5 years
Parcel # 46-00-03127-007		NO	2,400	8	0	8	2,400	Within 5 years
Parcel # 46-00-00835-001		NO	6,000	20	0	20	6,000	Within 5 years
Parcel # 46-00-00910-007		NO	9,000	30	0	30	9,000	Within 5 years
Totals			287,750	1,048	75	973	266,750	

CET ENGINEERING SERVICES

April 7, 2008

Mr. William McCauley, Acting Manager
Hatfield Borough
401 South Main Street
Hatfield, PA 19440

CERTIFIED MAIL NO. 7007 0710 0002 4083 8656
RETURN RECEIPT REQUESTED

RE: Act 537 Planning – Hatfield Township

Dear Mr. McCauley,

In February 2008 Hatfield Township requested the Hatfield Township Municipal Authority (HTMA) take the lead in planning and developing the Township Act 537 Plan Revision. This Plan Revision will address planning periods of 10 years, 20 years, and final buildout of the Township. As you may recall, planning was initiated on this project in September of last year. Since that time a draft Plan of Study and Task Activity Report has been developed.

In order to begin the Plan Revision Process, HTMA is contacting all municipal entities currently sending flows to the HTMA wastewater treatment plant in an effort to establish overall future demands.

According to the 2007 Hatfield Township Chapter 94 Wasteload Management Report, Hatfield Borough's current contribution to the system is 1,546 EDU's. Please provide a projection of additional EDU's that may be committed to the system in the next 10 years, 20 years, and final buildout of the borough. Additional capacity above the current level may require an expansion project at the expense of contributing municipalities of the Authority.

Due to DEP submission requirements, we request a response not later than May 9, 2008. Planning will proceed as if no additional flow is anticipated should a response not be received by that time. Thank you in advance for your assistance in this matter.

Sincerely,

CET Engineering Services

Jodi Reese, P.E.
Principal Engineer

xc: Pete Dorney, HTMA
Stephanie Teoli, Hatfield Township Manager

CET ENGINEERING SERVICES

April 7, 2008

Mr. Kevin Baver, Manager
Franconia Township
671 Allentown Road
PO Box 128
Franconia, PA 18924

CERTIFIED MAIL NO. 7007 0710 0002 4083 8625
RETURN RECEIPT REQUESTED

RE: Act 537 Planning – Hatfield Township

Dear Kevin,

In February 2008, Hatfield Township requested the Hatfield Township Municipal Authority (HTMA) take the lead in planning and developing the Township Act 537 Plan Revision. This Plan Revision will address planning periods of 10 years, 20 years, and final buildout of the Township. As you may recall, planning was initiated on this project in September of last year. Since that time a draft Plan of Study and Task Activity Report has been developed.

In order to continue the Plan Revision Process, HTMA is contacting all municipal entities currently sending flows to the HTMA wastewater treatment plant in an effort to establish overall future demands.

According to the 2007 Chapter 94 Wasteload Management Report, Franconia Township's current contribution to the system is 441 EDU's. Please provide a projection of additional EDU's that may be committed to the system in the next 10 years, 20 years, and final buildout of the township. Additional capacity above the current level may require an expansion project at the expense of contributing municipalities of the Authority.

Due to DEP submission requirements, we request a response not later than May 9, 2008. Planning will proceed as if no additional flow is anticipated should a response not be received by that time. Thank you in advance for your assistance in this matter.

Sincerely,

CET Engineering Services

Jodi Reese, P.E.
Principal Engineer

xc: Pete Dorney, HTMA
Stephanie Teoli, Hatfield Township Manager

CET ENGINEERING SERVICES

April 7, 2008

Mr. Chistopher S. Christman, Township Manager
Hilltown Township
13 West Creamery Rd.
P.O. Box 260
Hilltown, PA 18927

CERTIFIED MAIL NO. 7007 0710 0002 4083 8632
RETURN RECEIPT REQUESTED

RE: Act 537 Planning – Hatfield Township

Dear Mr. Christman,

In February 2008, Hatfield Township requested the Hatfield Township Municipal Authority (HTMA) take the lead in planning and developing the Township Act 537 Plan Revision. This Plan Revision will address planning periods of 10 years, 20 years, and final buildout of the Township. Planning was initiated on this project in September of last year and since that time a draft Plan of Study and Task Activity Report has been developed.

In order to begin the Plan Revision Process, HTMA is contacting all municipal entities currently sending flows to the HTMA wastewater treatment plant in an effort to establish overall future demands.

According to HTMA records, Hilltown Township's current contribution to the system is 160 EDU's. Please provide a projection of additional EDU's that may be committed to the system in the next 10 years, 20 years, and final buildout of the township. Additional capacity above the current level may require an expansion project at the expense of contributing municipalities of the Authority.

Due to DEP submission requirements, we request a response not later than May 9, 2008. Planning will proceed as if no additional flow is anticipated should a response not be received by that time. Thank you in advance for your assistance in this matter.

Sincerely,

CET Engineering Services

Jodi Reese, P.E.
Principal Engineer

xc: Pete Dorney, HTMA
Stephanie Teoli, Hatfield Township Manager
C. Robert Wynn Associates, Inc., 211 West Broad St., Quakertown, PA 18951

HILLTOWN TOWNSHIP
13 West Creamery Road
P.O. Box 260
Hilltown, PA 18927
(215) 453-6000 Fax (215) 453-1024
www.hilltown.org

May 5, 2008

Ms. Jodi Reese, P.E.
Principal Engineer
CET Engineering Services
1240 North Mountain Road
Harrisburg, PA 17112

RE: Act 537 Planning – Hatfield Township & Hilltown Township

Dear Ms. Reese:

Hilltown Township is in receipt of your letter dated April 07, 2008 requesting information pertaining to an Act 537 Plan Revision being created by Hatfield Township Municipal Authority (HTMA) on behalf of Hatfield Township.

Hilltown Township is requesting a time extension on the information requested, as it is difficult to gather the appropriate data. As you are aware, Act 537 planning is strictly a municipal function. We would like to request copies of any "Scope of Work" that was authorized by PA DEP without Hilltown's review or input, since this question potentially involves a revision to the DEP approved Act 537 Plan for Hilltown Township.

Moreover, your request indicates that there are currently 160 EDUs connected to the HTMA wastewater treatment plant. Please provide information on all of the parcels that have reserved capacity and/or are currently served by the HTMA.

As you may or may not be aware, Hilltown Township Resolution 1999-33, which is enclosed for your review, adopted the Act 537 Plan for Hilltown Township, identified six items to be implemented for the various study areas within the Township. Specifically, item three included "Extension of Hatfield Township Municipal Authority public sewer collection system to serve businesses and residential properties along Route 309 with the Route 309 Corridor Study Area. This will involve the execution of a service area agreement between Hilltown Township and the Hatfield Township Municipal Authority. Treatment of effluent will occur at the Hatfield Township Municipal Authority Treatment plant." This service area agreement has not been executed.

Furthermore, your correspondence indicates that additional capacity above the current level may require an expansion project at the expense of the contributing municipalities of the Authority. Is this same requirement being imposed on Hatfield Township? This is an unusual provision and has not been required previously by the HTMA or by any other Authorities serving Hilltown Township. Typically, when a servicing authority increases capacity at a treatment plant for future connections, the cost of that plant expansion is borne by the Authority with the cost recovered by those future connections.

We are aware that Hatfield Township Officials met privately with PA DEP and we are requesting the same opportunity be afforded to Hilltown Township.

Similarly, it is our hope that we can schedule a joint meeting with representatives from the Department, HTMA, and Hatfield Township to come to a resolution of this issue. Please contact me at your earliest convenience to set a date for this joint meeting. Hilltown Township would certainly offer to host the meeting.

Sincerely,
Hilltown Township

Christopher S. Christman
Township Manager

Cc: Supervisor Richard J. Manfredi – Chair
Supervisor John B. McIlhinney – Vice Chair
Supervisor Barbara Salvadore – Secretary/Treasurer
Joseph A. Feola – SE Regional Director – PA DEP
Clinton Cleaver – Sewage Planning Supervisor - PA DEP
Elizabeth Mahoney – Sewage Planning Supervisor - PA DEP
C. Robert Wynn – Township Engineer
Francis X. Grabowski, Esq. – Township Solicitor
Stephanie Teoli – Hatfield Township Manager
Pete Dorney – HTMA
James Groff - HTWSA
File

RESOLUTION No. 99 - 33

A RESOLUTION FOR 537 WASTEWATER FACILITIES PLAN REVISION

WHEREAS Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as Amended, and the Rules and Regulations of the Pennsylvania Department of Environmental Protection, The Department adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, requiring Hilltown Township to adopt an Official Sewage Facilities Plan for the provision of adequate sewage systems and to revise said plan from time to time as may be necessary, and

WHEREAS Hilltown Township has prepared the said plan and has found it adequate for the wastewater disposal and management needs of the entire Township.

NOW, THEREFORE, BE IT RESOLVED that Hilltown Township hereby adopts the plan known as the Hilltown Township Wastewater Facilities Plan for the wastewater and management needs as the Official Plan of the municipality. The Township hereby assures the Department of the proper and timely implementation of the said plan as set forth therein:

The alternatives of choice to be implemented for the six study areas in the Township are as follows:

1. Implementation of a collection and conveyance system and construction of a sewage treatment plant to provide additional treatment plant capacity to serve that portion of the development district within the jurisdictional limits of the Hilltown Township Water and Sewer Authority (HTWSA study area).

2. Continued reliance on treatment facilities of the Pennridge Wastewater Treatment Authority to provide public sewer service within the Telford Borough Authority area of jurisdiction (Mill Creek basin study area) and Perkasie Borough Authority study area. This includes Telford Borough Authority participation in a PWTA plant expansion and purchase of additional capacity within the expanded plant; and execution of a service area agreement between Hilltown Township and Perkasie Borough Authority.

3. Extension of Hatfield Township Municipal Authority public sewer collection system to serve businesses and residential properties along Route 309 within the Route 309 corridor study area. This will involve the execution of a service area agreement between Hilltown Township and Hatfield Township Municipal Authority. Treatment of effluent will occur at the Hatfield Township Municipal Authority (HTMA) treatment plant.

4. Increased level of municipal involvement in wastewater facility planning and maintenance through implementation of a public education program.

5. Implementation of an inspection/monitoring program of the operation and maintenance of holding tanks, small flow treatment facilities, and individual residential spray irrigation systems within the Township.

6. Implementation of a wastewater alternative selection process for all developments to ensure utilization of the most cost effective and environmentally sensitive disposal/treatment facilities.

SO RESOLVED this 22 day of Nov, A.D., 1999, by the Board of Supervisors of Hilltown Township, Bucks County, PA.

ATTEST:

Lynda Serman

HILLTOWN TOWNSHIP
BOARD OF SUPERVISORS

Wm H. Bennett
Chairman

Vice Chairman

John S. Bender
Supervisor

Exhibit V-1

Derstine Run Grading and Utility Plans

Hatfield Township, Montgomery County

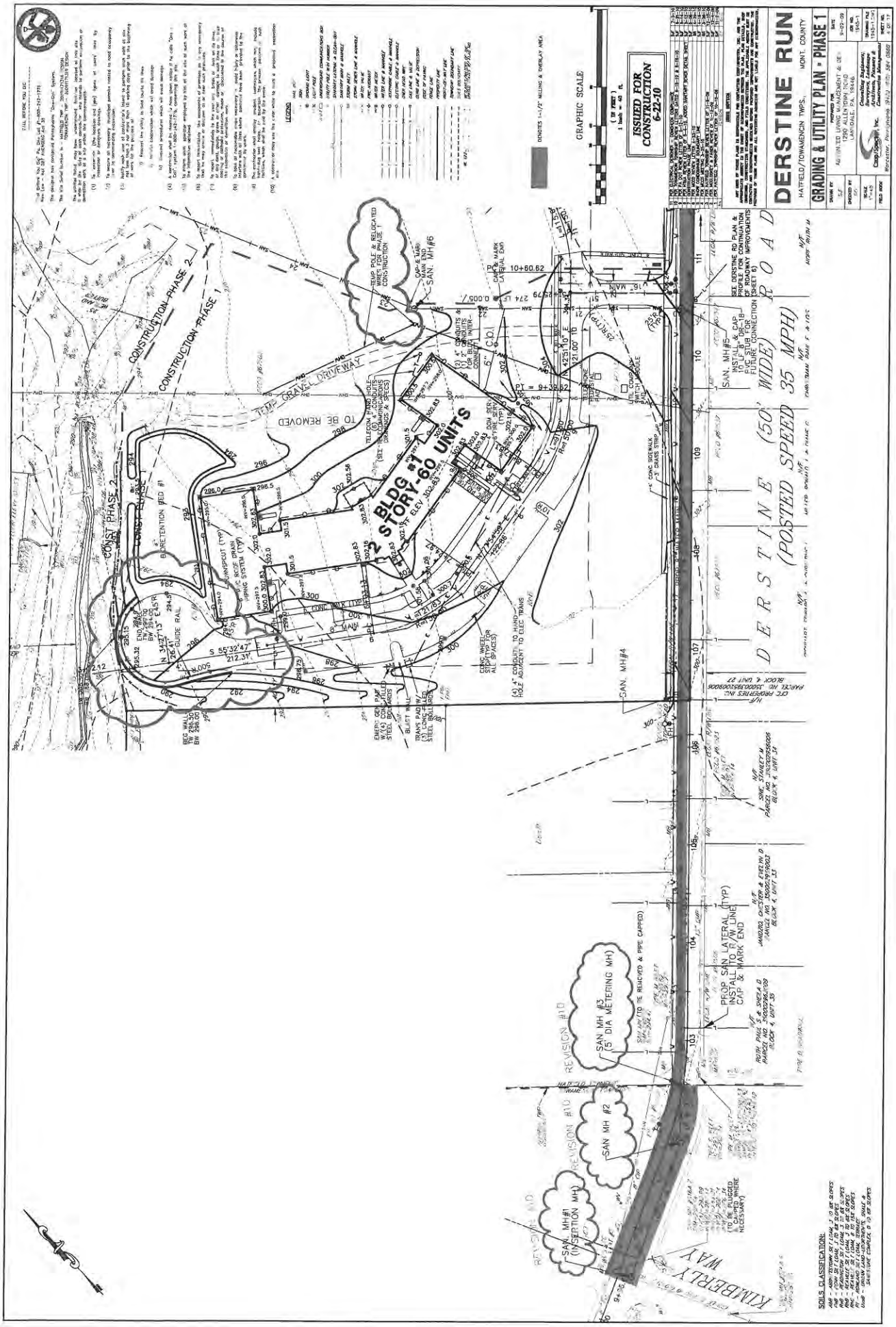

DERSTINE RUN
HATFIELD/TOWAMENCIN TWPS., MONT. COUNTY
GRADING & UTILITY PLAN - PHASE 1
ISSUED FOR CONSTRUCTION 6-22-10
GRAPHIC SCALE
DERSTINE ROAD (50' WIDE) (POSTED SPEED 35 MPH)
2 STORY-60 UNITS BLDG #1
CONSTRUCTION PHASE 1
CONSTRUCTION PHASE 2
TEMP GRAVEL DRIVEWAY
TO BE REMOVED
BIORETENTION BED #1
SAN MH #1 (INSERTION MH)
SAN MH #2
SAN MH #3 (5' DIA METERING MH)
SAN MH #4
SAN MH #5
PROP SAN LATERAL (TYP) INSTALL TO R/W LINE CAP & MARK END
REVISION #10
KIMBERLY WAY
SOILS CLASSIFICATION:

Exhibit V-2

DRSA Preliminary Sanitary Sewer Layout

Hatfield Township, Montgomery County

Exhibit V-3

Correspondence to Towamencin Township And Agreement

Hatfield Township, Montgomery County

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
CLEAN WATER

February 8, 2010

Robert A. Ford
Township Manager
Towamencin Township
P.O. Box 303
Kulpsville, PA 19443

Re: Derstine Road Area and HTMA Basins 14 and 16

Dear Mr. Ford,

As part of Hatfield Township's ongoing Act 537 planning and revision process, CET Engineering Services conducted an On-Lot Sewage Disposal System Needs Analysis throughout Hatfield Township. The attached figure depicts an area of the Township referred to in the current Draft Act 537 Plan Revision as the Derstine Road Study Area (DRSA). This area is comprised of HTMA Sewage Drainage Basin 16 and a portion of Drainage Basin 14. There are approximately 30 on-lot sewage disposal systems in this area primarily situated in the parcels adjacent to Derstine Road. Sanitary and well sampling in this area indicated increased levels of nitrate contamination, but no coliform contamination at this time. As such, the Act 537 planning and Needs Analysis process requires the development of alternatives to provide sewage treatment, either via conventional collection and conveyance or other land based methods, to this area.

Additionally, HTMA and Hatfield Township have been made aware of development plans for a 26 acre parcel in the DRSA, adjacent to Derstine Road. Development plans indicate the construction of an assisted living facility requiring 240 EDUs of sewage capacity. These plans also indicate that the developer intends to construct a conventional collection system which would serve the facility via a collector sewer constructed along Derstine Road to the south, connecting to a Manhole 516A.7 in Towamencin Township.

The timing of this submission is such that Towamencin Township could be considered in Hatfield Township's Act 537 planning process as a potential alternative for providing sewage collection and treatment not only for the planned development but also for the remainder of the on-lot systems in the DRSA and other potential future development. In order to do so, an extension to the developers proposed line in Derstine Road could be constructed. This line would run north to approximately Elroy Road to serve the on-lot systems and future undeveloped areas along Derstine Road. Initially, however, approximately 10 on-lot systems along Derstine could potentially be served via the developer's collector sewer, resulting in approximately 250 new EDUs (including 240 EDU's from Derstine Run).

Should HTMA construct a further extension to this line, north along Derstine Road, approximately 20 more on-lot systems could be served. Additionally, approximately 70 acres exist in these basins that are not yet fully developed. The areas east of Derstine Road are currently zoned Light Industrial (LI) and Residential (RA-1), with much of the not fully developed area in the LI zoning classification. Areas west of Derstine Road are zoned Estate Residential (ER). It is estimated that an additional approximately 200 EDUs could result should this land be fully developed at the current zoning. Based on this, a future potential connection of another 220 EDUs for a total of 470 EDUs could occur.

A detailed review of the developers plans as well as further coordination with residents in the DRSA is required to ensure the collector line in Derstine Road could pick up the associated on lot systems, or if individual grinder pumps are necessary.

Therefore at this time, Hatfield Township and Hatfield Township Municipal Authority are requesting that Towamencin Township and the Upper Gwynedd Towamencin Municipal Authority consider the acceptance of the basins as described herein. HTMA's analysis has concluded that it would be more prudent and cost effective to service this area by gravity to Towamencin Township than to install a new pump station. Primarily, since the plans for the assisted living facility are moving forward, HTMA requests that Towamencin Township evaluate its existing collection, conveyance and treatment facilities for the ability to accept and include 250 EDUs into its system in the near future, with the potential for an additional 220 EDUS in the more distant future.

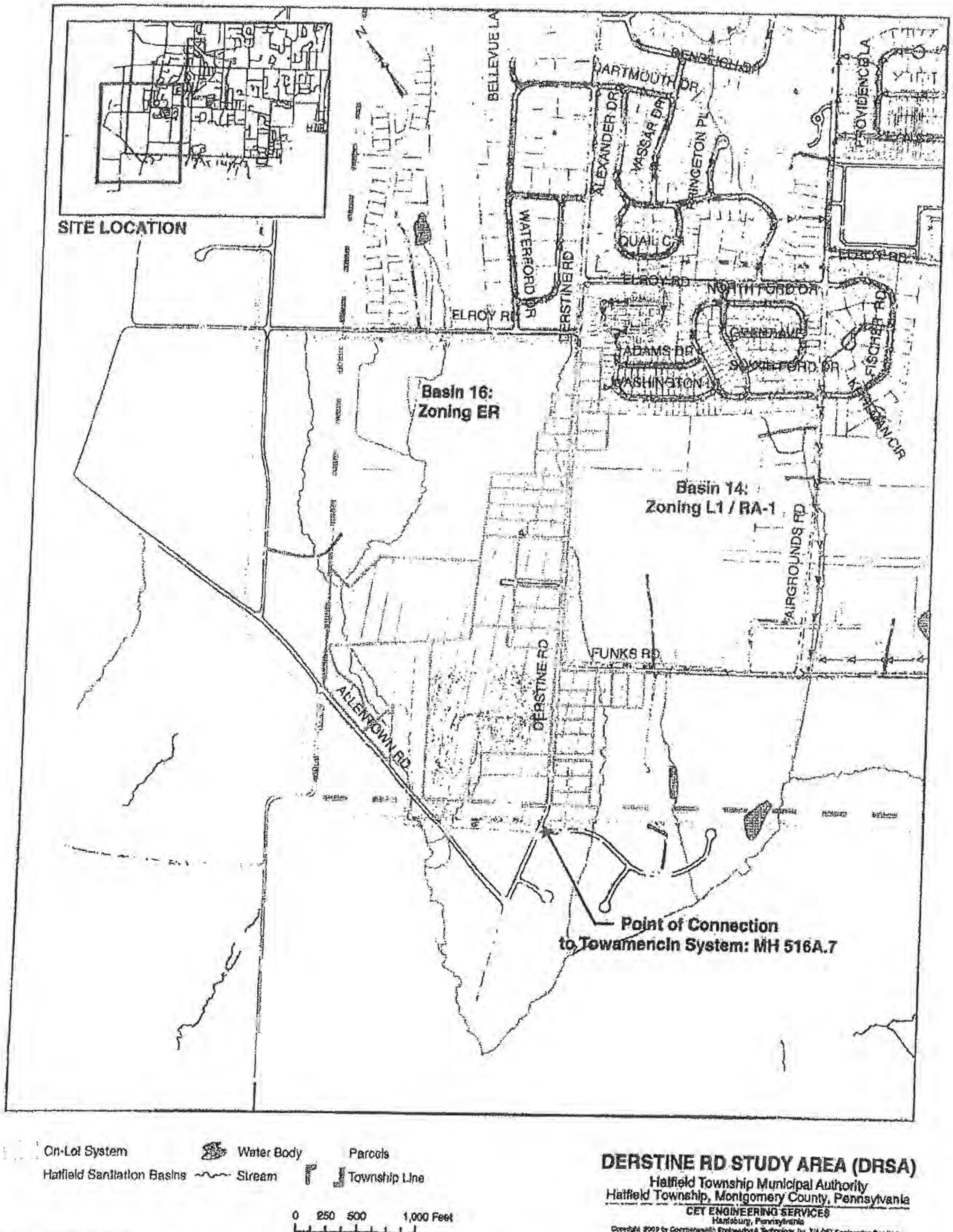
Should you have any questions or concerns please do not hesitate to contact me.

Sincerely,

Peter Dorney
Executive Director

Joel K. Kostelac, P.E.
Staff Engineer

Cc: Tom Whittle, CET
Joel Kostelac, CET
Andrew Haines, Hatfield Township
Ken Amey, Hatfield Township
Paul Mullin, HRMM&L
File



DERSTINE RD STUDY AREA (DRSA)
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

BURSICH
Sharing your Vision

Engineers | Planners | Surveyors | Landscape Architects

March 2, 2010

Mr. Robert Ford, Manager
Towamencin Township
1090 Troxel Road
P.O. Box 303
Kulpsville, PA 19443

RE: Derstine Run Study Area
Bursich Project No.: TOW-02/096441

Dear Rob:

We have reviewed the Hatfield Township Municipal Authority's (HTMA) attached February 8, 2010 letter, in regards to their request for sewer service to the Derstine Run Study Area (DRSA). See attached figures for study area. We offer the following comments and recommendations:

A. Hatfield Township & Hatfield Township Municipal Auth. Request

1. Sewer service to the Derstine Run development consisting of 240 EDU (67,200gpd). Planned connection to the UGTMA/TT sewer system would be Derstine Road at the Hatfield/Towamencin municipal boundary. Capacity is needed early 2010.

2. Sewer service to the existing homes with on-lot systems in Hatfield Township (HT) within the study area. Initially, ten existing homes (10 EDU, 2,800gpd) may connect to the HTMA sewer extension.

3. Future sewer extensions by HTMA, along with development of vacant lands, could result in an additional 220 EDU (61,600gpd) of required sewer capacity for the DRSA.

4. HT and HTMA are therefore requesting TT and UGTMA consider accepting the DRSA into the overall UGTMA sewer service area. HT and HTMA needs are summarized as follows:

Year	# EDU	Average Daily	Peak Flow Rate PF = 4.0
2010	250/EDU	70,000gpd	0.280mgd
Future	220 EDU	61,600gpd	0.246mgd
Totals	470 EDU	131,600gpd	0.526mgd

B. Comments

1. The UGTMA and TT have sufficient capacity at the UGTMA wastewater treatment plant for the 131,600gpd average daily flow, based on the 2009 WWTP capacity report.

2. The sewer collection and conveyance system from the proposed connection point on Derstine Road to the UGTMA wastewater treatment plant will need to be studied and analyzed for capacity. The scope of work will include a review of the existing sewer flows and calculation of future TT flows tributary to the sewer system. The flow metering of existing flows will require the hiring of a flow meter subcontractor. The flow metering duration will need to encompass at least three significant wet weather events. It appears three flow meter locations will be required as follows:

   a. On interceptor sewer near Allentown Road
   b. On interceptor sewer near Tomlinson Road
   c. On interceptor sewer near Wambold Road/Detwiler Road intersection

   In addition, data from the existing flow meters at the Rittenhouse Road pump station and UGTMA wastewater treatment would be utilized in the capacity study. Assuming the flow meters will only be installed for a two month period, we estimate the subcontractor's cost for the metering to be $5,000.

3. If the developer/HTMA wants TT to solicit for flow metering quotes, coordinate the flow meter installation and assist with meter data downloads, we can provide those services for TT. This would be similar to the capacity study completed for the development near the North Penn Water Authority.

4. The overall time frame for the study would be three months, assuming a two month flow meter data gathering period. If insufficient wet weather occurs during the two months, the study duration and cost would increase proportional to the gathering of the data.

5. We estimate the engineering costs for the capacity study to be in the range of $8,000 to $10,000 range. These costs are in addition to the subcontract flow meter estimated costs of $5,000.

6. The study will identify if the TT sewer system has sufficient capacity for the peak flow rates above. If there is insufficient capacity, the study will provide a preliminary recommendation on the necessary sewer system improvements to provide capacity along with estimated costs to handle the 2010 flows as Phase 1 and for future flow capacity as Phase 2.

7. If sewer service is provided to the DRSA, then the municipalities should develop a sewer service agreement. The agreement should include a requirement for a flow meter at the municipal boundary along with flow limit criteria.

C. Recommendations

1. TT/UGTMA should obtain a funding commitment for the capacity study.

2. Complete the sewer capacity study for the DRSA.

3. Develop a sewer service agreement with HT/HTMA.

4. Upon satisfactory completion of the above items, review planning module Chapter 94 sewer capacity requirements for developments within the DRSA.

We are available to meet with you to discuss the above comments.

Very truly yours,

William K. Dingman

William K. Dingman, P.E.
Senior Managing Engineer
Bursich Associates, Pottstown Office

Enclosures

pc: Mr. Geoff Smith, UGTMA Executive Director (w/encl)
Mr. Dick Smith, Bursich Associates, Inc. (w/encl)

RESOLUTION 10-

RESOLUTION AUTHORIZING THE PROPER OFFICERS TO EXECUTE THE AGREEMENT WITH HATFIELD TOWNSHIP MUNICIPAL AUTHORITY, HATFIELD TOWNSHIP, AND THE UPPER GWYNEDD TOWAMENCIN MUNICIPAL AUTHORITY PROVIDING FOR THE SALE OF THE SEWER CAPACITY, THE PROVISION OF SEWER SERVICE TO THE DERSTINE WATERSHED AREA AND THE TRANSFER OF MAINTENANCE OBLIGATIONS

A Resolution authorizing the proper officers to execute the agreement with Hatfield Township Municipal Authority, Hatfield Township, and the Upper Gwynedd Towamencin Municipal Authority providing for the sale of the sewer capacity, the provision of sewer service to the Derstine Watershed Area and the transfer of maintenance obligations

WHEREAS, there are certain geographical areas located within Hatfield Township with contours which make it preferable to provide public sanitary service by gravitational flow into the UGTMA Treatment Plant; and

WHEREAS, previously, Hatfield Township and the Hatfield Township Municipal Authority assigned and released certain sanitary sewer flows to Towamencin and the UGTMA; and

WHEREAS, in order to continue to facilitate gravitational flow and sewer treatment, Hatfield Township and the Hatfield Township Municipal Authority have requested that flows from certain additional areas (the "Derstine Watershed Area") be accepted by Towamencin and the UGTMA; and

WHEREAS, Towamencin is desirous of releasing the maintenance obligations for certain sewer lines existing in Hatfield Township to the Hatfield Township Municipal Authority;

WHEREAS, the parties have prepared an agreement setting forth the terms for the sale of sewer capacity as well as the delineation of certain other obligations amongst the parties.

NOW, THEREFORE, BE IT RESOLVED that the proper officers of the Township are authorized to execute the Agreement a copy of which is attached to this Resolution provided all other parties to the Agreement have previously approved said Agreement.

RESOLVED this ___day of _____, 2010.

BOARD OF SUPERVISORS
TOWAMENCIN TOWNSHIP

BY: _____
Daniel M. Littley, Jr., Chairman

ATTEST: _____
James P. Sinz, Secretary

September 17, 2010

AGREEMENT

THIS AGREEMENT ("Agreement") made this day of, 2010, among **HATFIELD TOWNSHIP MUNICIPAL AUTHORITY** ("HTMA"), **HATFIELD TOWNSHIP** ("Hatfield"), **TOWAMENCIN TOWNSHIP** ("Towamencin") and UPPER **GWYNEDD-TOWAMENCIN MUNICIPAL AUTHORITY** ("UGTMA").

RECITALS

A. There are certain geographical areas located within Hatfield Township whose contours make it preferable to provide public sanitary sewer service by gravitational flow into the UGTMA treatment plant.

B. HTMA, Hatfield, Towamencin and the UGTMA entered into an agreement on or about January 16, 1979 whereby Hatfield and the HTMA assigned and released the sanitary sewer flows from a certain area then known as the "Towamencin Watershed District in Hatfield Township" to Towamencin and the UGTMA and which called for the construction of sanitary sewer lines in and along Welsh Road to service those residential properties in the area. The 1979 Agreement is incorporated herein by reference.

C. By Stipulation to Montgomery County Court Docket No. 85-07822, certain sanitary sewer lines were constructed in and along Welsh Road with numerous conditions, including:

i). The sanitary sewer lines would be dedicated to the UGTMA and the UGTMA would be responsible for maintenance of the lines.

ii). The residential properties located in Hatfield Township which would discharge into the UGTMA treatment plant would be billed by HTMA at the HTMA rates,

plus $15 per EDU, per year.

iii). With the exception of the free standing restaurant, the sanitary sewer flows from the Ralph's Corner Shopping Center were reassigned to Hatfield and HTMA. A copy of the Stipulation and Order is incorporated herein by reference.

D. HTMA, Hatfield, Towamencin and the UGTMA entered into an agreement around January, 2001, regarding the sanitary sewer flows from the Vernon Court Subdivision. A copy of the 2001 Agreement is incorporated herein by reference.

E. Pursuant to the Agreement, Hatfield and the HTMA assigned and released the sanitary sewer flows from the Vernon Court Subdivision to Towamencin and the UGTMA subject to numerous conditions, including:

i). The sanitary sewer lines would be owned by the UGTMA and Towamencin would be responsible for the maintenance of the lines.

ii). The properties located within the Vernon Court Subdivision would be billed by Towamencin at the rates determined by Towamencin.

F. The parties in order to continue to facilitate gravitational flow and sewer treatment, have identified that certain area within Hatfield Township within the vicinity of Derstine Road and identified as Basin 16 on the plan attached hereto and made a part hereof as Exhibit "A" for assignment and release to Towamencin and the UGTMA ("Derstine Watershed Area").

G. The parties desire to detail the obligations of each party relating to the Derstine Watershed Area and the imminent construction of an age-restricted community in the Derstine Watershed Area.

H. The age-restricted community will consist of a phased 240 unit subdivision.

The developer ("Developer") of that project and the HTMA have entered into an agreement for construction of sewer lines ("Construction Agreement"), a copy of which is attached hereto and made part hereof as Exhibit "B".

I. The parties further desire to amend certain obligations of the parties relating to the Vernon Court Subdivision and the Welsh Road Watershed Area.

NOW, THEREFORE, in consideration of the mutual covenants and promises hereinafter set forth, and intending to be legally bound hereby, the parties agree as follows:

1. The recitals are incorporated herein by reference.

2. Hatfield and the HTMA agree to assign and release the Derstine Watershed Area to Towamencin and the UGTMA for the purpose of collection and treatment of waste waters.

3. Towamencin and the UGTMA affirm that there is presently sufficient capacity in the UGTMA treatment plant to accept 470 EDUs of capacity, the potential build out of the Derstine Watershed Area.

4. All properties located within the Derstine Watershed Area, including the proposed 240 unit age-restricted community, shall be direct customers of HTMA and shall be billed by HTMA at the Towamencin duly adopted rate, as amended from time to time. HTMA reserves the right to establish a special rate district to recoup administrative fees associated with billing.

5. The proposed sewer lines which will connect the Derstine Watershed Area to the Towamencin interceptor line (the "improvements") shall be constructed in accordance with the stricter construction rules, regulations and requirements of the HTMA or Towamencin, as detailed in the Construction Agreement, as well as in accordance with all

applicable federal, state and local laws and ordinances. HTMA and Towamencin each reserve the right to inspect the improvements during all stages of construction. HTMA shall promptly reimburse Towamencin for any invoices for engineering or legal review fees from the escrow fund established between HTMA and the developer.

6. Pursuant to the Construction Agreement, the developer must construct the Improvements in such a manner that the flows generated from the Derstine Watershed Area can be routinely monitored. The manner in which the flows will be monitored shall be determined by the HTMA and Towamencin engineers. A five feet diameter manhole shall be installed on the proposed sewer in Derstine Road within fifty feet of the Towamencin/ Hatfield municipal boundary. The purpose of the manhole is to allow for future flow monitoring of the sewage flows from the Derstine Watershed Area. Unless otherwise detailed herein, the maximum allowable monthly average flow rate from the Derstine Watershed Area shall be 216 gpd times the purchased number of EDUs tributary to the Derstine Road Hatfield/ Towamencin sewer connection point. The maximum allowable instantaneous flow rate shall be three times the maximum allowable monthly average flow rate from the Derstine Watershed Area.

The maximum allowable monthly average flow rate from the Vernon Court Subdivision shall be established by monitoring the existing flows from those areas to establish a baseline flow rate for each area. The method for determining the baseline flow rate shall be determined by the HTMA and Towamencin engineers. The maximum allowable instantaneous flow rate shall be three times the maximum allowable monthly average flow rate from the Vernon Court Subdivision. All costs related to the monitoring shall be split equally amongst HTMA and Towamencin.

The maximum allowable monthly average flow rate from the Welsh Road Watershed Area (identified as Basin 15 on the plan attached hereto and made a part hereof as Exhibit "A") shall be 216 gpd times the purchased number of EDUs attributed to the sanitary sewer on Welsh Road at the municipal boundary between Hatfield Township and Towamencin Township. The maximum allowable instantaneous flow rate from the Welsh Road Watershed Area shall be three (3) times the maximum allowable monthly average flow rate from the Welsh Road Watershed Area.

If the total allowable flow rate is exceeded, HTMA shall be responsible for taking those steps necessary to reduce the flows, including implementing any necessary inflow and infiltration reduction measures. HTMA shall be responsible for paying to Towamencin or the UGTMA any surcharge rates established by resolution imposed by Towamencin or the UGTMA.

7. Upon completion, inspection and dedication of the improvements, HTMA shall own and maintain the Improvements located within Hatfield Township. UGTMA shall own the improvements within Towamencin Township and Towamencin Township will maintain the improvements within Towamencin Township.

8. In accordance with the Construction Agreement, the Developer shall be obligated to pay HTMA tapping fees for 250 EDUs. 240 EDUs for the age-restricted community and 10 EDUs to connect those properties located adjacent to the age-restricted community. A list of the adjacent properties is attached hereto and made a part hereof as Exhibit "C". The payments for such fees shall due and owing in accordance with the phasing of the project. The first phase of the project shall account for 70 EDUs and HTMA acknowledges receipt from the Developer of the sums necessary for such purchase. Upon

execution of this Agreement, HTMA shall promptly pay Towamencin Forty-Seven Thousand Three Hundred Twenty Dollars ($47,320.00) (70 x $676.00) to cover Towamencin's tapping fee charge and promptly pay the UGTMA Seventy-Two Thousand Four Hundred Fifty Dollars ($72,450.00) (70 x $1035.00) to cover the UGTMA's tapping fee charge. For subsequent phases, upon receipt of tapping fees from the Developer, HTMA shall promptly pay Towamencin and the UGTMA their then current tapping fee rate for the total number of EDUs connecting to the system. In accordance with the Construction Agreement, the developer shall be entitled to no recapture.

9. Towamencin and the UGTMA agree to reserve the remaining 400 EDUs ("Excess EDUs'") of capacity for the future development of the Derstine Watershed Area for a period of two years from the date of this Agreement. Towamencin and the UGTMA agree that no tapping fees or any other charges shall be due until such time as individual properties connect to the sewer system and at such time only the tapping fees and charges due for the number of EDUs connected shall be due. After two years, Towamencin and the UGTMA agree that for a period of three years HTMA shall have a right of first refusal to purchase any and all remaining Excess EDUs.

10. Upon the subsequent connection of any of the properties in the Derstine Watershed Area not detailed in paragraph 8, HTMA shall promptly pay Towamencin and the UGTMA its then current tapping fee for each Excess EDU connected. Notwithstanding anything detailed herein, Towamencin and the UGTMA acknowledge that HTMA can pay the tapping fees for any of the reserved Excess EDUs at any time at the then current tapping fee. HTMA must provide a copy of all future plans for sanitary sewer construction within the Derstine Watershed Area, the Vernon Court Subdivision area and the Welsh Road

Watershed Area to Towamencin and the UGTMA for review. All sanitary sewer construction in areas tributary to Towamencin and the UGTMA shall be built to the stricter construction rules, regulations and requirements of HTMA or UGTMA.

11. HTMA agrees to promptly notify Towamencin and the UGTMA whenever any property or unit is connected to the sewer system served by the UGTMA wastewater treatment plant. Hatfield shall provide Towamencin and the UGTMA with notice of any Use and Occupancy permit issued for a property tributary to the UGTMA wastewater treatment plant.

12. Those properties located in the UGTMA wastewater treatment plant tributary area shall be bound by those ordinances, rules and regulations of Towamencin and/or the UGTMA relating to quality of waste, methods of connection, inflow and infiltration, etc. HTMA and Hatfield shall enact or cause to be enacted such ordinances and regulations or amendments thereto as may be necessary to effectuate the intent of this paragraph.

13. HTMA agrees to accept dedication of those dedicated sewer improvements in Hatfield Township currently servicing the Vernon Court Subdivision and the Welsh Road Watershed Area. Such acceptance is subject to an inspection of the existing conditions of the sewer improvements by HTMA. In the event such sewer improvements require immediate repair or are in unacceptable condition to HTMA, the parties agree to further discuss the ownership and/or maintenance responsibilities pertaining to those sewer improvements.

Towamencin agrees to provide HTMA with copies of the available "as-builts" from the sewer line projects for the Vernon Court Subdivision. Towamencin shall also provide HTMA with any correspondence between Towamencin and the developers/ contractors of the sewer lines relating to any issues with the installation thereof or the

materials utilized in therein.

14. HTMA shall be responsible for billing the customers located in the Vernon Court Subdivision and such customers shall be the direct customers of HTMA. For each customer, HTMA shall pay Towamencin in an amount equal to Towamencin's duly adopted rate as shall be amended from time to time. HTMA reserves the right to establish a special rate district to recoup administrative fees associated with billing.

15. HTMA shall continue to be responsible for billing the Welsh Road Watershed Area. For each customer, HTMA shall pay Towamencin in an amount equal to Towamencin's duly adopted rate as shall be amended from time to time. HTMA reserves the right to establish a special rate district to recoup administrative fees associated with billing.

16. Towamencin shall periodically bill HTMA at Towamencin's then duly adopted rate for the total number of EDUs connected to the sewer system by the Vernon Court Subdivision, Welsh Road Watershed Area and the Derstine Watershed Area. HTMA agrees to pay all bills within 45 days of receipt of same.

17. HTMA shall be solely responsible for filing sewer rental liens on those customers covered by this Agreement.

18. All existing agreements relating to the Welsh Road Watershed Area or the Vernon Court Subdivision, including the 1979 Agreement and the 2001 Agreement, are hereby terminated. The terms and conditions of this Agreement shall govern those areas.

19. This Agreement shall be interpreted and enforced in accordance with the laws of the Commonwealth of Pennsylvania.

20. Should any paragraph, term or provision of this Agreement hereafter be declared to be invalid or unenforceable for any reason, such declaration shall not affect or

impair the validity or enforceability of the remainder of this Agreement, it being the intention of the parties hereto that this Agreement would have been made and entered into had not such illegal or invalid provision been incorporated herein.

21. Neither this Agreement nor any provisions hereof may be waived, modified, amended, discharged or terminated except by an instrument in writing signed by the parties and then only to the extent set forth in such instrument.

22. This Agreement shall extend to and bind the parties and their respective successors in interest. This Agreement may not be assigned.

23. This Agreement embodies and constitutes the entire understanding between the parties with respect to the transaction contemplated herein and all prior and contemporaneous agreements, understandings, representations and statements, oral or written, is merged into this Agreement.

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement as of the date first hereinabove written.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

_____ By:_____

HATFIELD TOWNSHIP

_____ By:_____

TOWAMENCIN TOWNSHIP

_____ By:_____

UPPER GWYNEDD-TOWAMENCIN MUNICIPAL AUTHORITY

_____ By: _____

1985 Stipulation and Order

Montgomery County Docket 85-07822

HAMBURG, RUBIN, MULLIN & MAXWELL
BY: J. SCOTT MAXWELL, ESQUIRE
IDENTIFICATION NO. 09449
800 EAST MAIN STREET
LANSDALE, PA 19446-3098
(215) 368-3600

ATTORNEY FOR
PLAINTIFF

IN THE COURT OF COMMON PLEAS
OF MONTGOMERY COUNTY, PENNSYLVANIA
CIVIL ACTION - LAW

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY	:	NO. 85-07822
vs.	:	
TOWAMENCIN TOWNSHIP	:	IN EQUITY

O R D E R

AND NOW, this 31st day of DECEMBER, 1988, upon consideration of the foregoing Stipulation, it is hereby ORDERED THAT:

1. The request of Hatfield Township and Upper Gwynedd-Towamencin Municipal Authority to intervene is granted and they are hereby made parties to this action.

2. The foregoing Stipulation is approved and all parties are hereby bound by its terms.

3. The Prothonotary shall mark the docket in this action "Settled, Discontinued and Ended".

BY THE COURT:

/S/ ANITA BRODY J.

IN THE COURT OF COMMON PLEAS
OF MONTGOMERY COUNTY, PENNSYLVANIA
CIVIL ACTION - LAW

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY	:	No. 85-07822
	:	
	:	IN EQUITY
v.	:	
	:	
TOWAMENCIN TOWNSHIP	:	

STIPULATION OF COUNSEL RE: SETTLEMENT AND INTERVENTION

TO THE HONORABLE, THE JUDGES OF THE SAID COURT:

Undersigned counsel, with the consent of their respective clients, do hereby STIPULATE and AGREE as follows:

1. Upon approval of this Stipulation and entry of an appropriate Order by this Honorable Court, Hatfield Township and the Upper Gwynedd-Towamencin Municipal Authority shall be permitted to intervene in this litigation and become parties to it, and shall be bound by the terms of this Settlement Stipulation.

2. Hatfield Township and Towamencin Township agree to take such action as is required to revise their respective Act 537 Plans to reflect the terms of this settlement Stipulation.

3. Towamencin Township will take that action necessary to cause the developer of the Grist Mill Run Subdivision to install sewer lines to the south edge of Welsh Road in the approximate location depicted on Exhibit "A" which is attached hereto and incorporated herein by reference as if set forth in extenso.

4. Hatfield Township Municipal Authority will install the remaining portions of the collection lines required to provide sanitary sewer service to

residents in Hatfield Township located along the north side of Welsh Road. Prior to construction of the lines, the Engineers for the Hatfield Township Municipal Authority and Upper Gwynedd-Towamencin Municipal Authority will meet and agree on the design, materials, construction and inspection procedures for the lines.

5. Hatfield Township Municipal Authority will have sole discretion in determining the method and amount of assessing costs of constructing the collection lines which it installs, and shall have the right to collect and retain any assessment fees, capital contribution fees, tapping fees, connection fees or sewer rental charges it imposes upon Hatfield Township residents.

6. Hatfield Township Municipal Authority will dedicate the sewer lines which it constructs in Welsh Road to the Upper Gwynedd-Towamencin Municipal Authority which agrees to be responsible for the maintenance of these sewer lines.

7. Towamencin Township and/or the Upper Gwynedd-Towamencin Municipal Authority will determine the best method and timing of providing sanitary sewer service to Towamencin Township residents located along the south side of Welsh Road.

8. The Upper Gwynedd-Towamencin Municipal Authority shall determine the method of assessment and shall have the right to collect and retain any assessment fees, capital contribution fees, tapping fees, connection fees, or sanitary sewer rentals imposed on residents of Towamencin Township.

9. Towamencin Township and the Upper Gwynedd-Towamencin Municipal Authority agree to forgive any unpaid sanitary sewer rentals due it from Hatfield Township Municipal Authority as a result of providing sanitary sewer service to the Ralph's Corner Shopping Center.

10. The Upper Gwynedd-Towamencin Municipal Authority agrees to provide sanitary sewer service to the Ralph's Corner Shoping Center, without charge

to Hatfield Township Municipal Authority, until such time as the existing connection is terminated and sewage flows from the Ralph's Corner Shopping Center are directed to the Treatment Plant of the Hatfield Township Municipal Authority, or for a period of six (6) months from the date of this Stipulation, whichever first occurs.

11. Towamencin Township and the Upper Gwynedd-Towamencin Municipal Authority agree to give up the existing Ralph's Corner Shopping Center as a sewer customer and hereby grant all rights to it and the proposed Ralph's Corner Shopping Center Expansion to the Hatfield Township Municipal Authority with the exception of the proposed restaurant that will front Welsh Road just east of the existing shopping center. Hatfield Township agrees to amend its Act 537 Official Sewage Facilities Plan in accordance with this Agreement and to adopt an amendment to its Resolution accepting the Towamencin Township Act 537 Official Sewage Facilities Plan, to provide that the parcel upon which the proposed restaurant is to be located shall be included within the service area of Towamencin Township.

12. The proposed restaurant to be constructed on Welsh Road, just east of the existing Ralph's Corner Shopping Center, shall connect to the gravity sewer which is immediately adjacent to the proposed restaurant and flows to the Upper Gwynedd-Towamencin Treatment Plant.

13. Hatfield Township Municipal Authority and Hatfield Township grant Towamencin Township and Upper Gwynedd-Towamencin Municipal Authority the right to impose their fees and charges on the developer of the restaurant, but sewer rentals will be billed to Hatfield Township Municipal Authority at a rate equal to those rates charged by Hatfield Township Municipal Authority to similar customers plus Fifteen Dollars ($15.00) per equivalent dwelling unit.

14. The properties located in Hatfield Township which are to be served by the sewers to be installed pursuant to Paragraph 4 hereof draining to the Upper Gwynedd-Towamencin Municipal Authority treatment plant, shall be under and subject to all of the terms and conditions of the Towamencin Township Sewer Use Ordinance, as amended, in effect from time to time except as to the imposition of sewer rentals; in which case, said properties shall be billed by Towamencin Township to the Hatfield Township Municipal Authority for sewer service at the Hatfield Township Municipal Authority rate, together with Fifteen ($15.00) per property per year.

15. Towamencin Township and/or Upper Gwynedd-Towamencin Municipal Authority shall satisfy any and all sewer rental liens which may have been filed as a result of Hatfield Township Municipal Authority withholding payment for sewer rentals related to the Ralph's Corner Shopping Center.

16. The prior Agreement between the parties relating to the Ralph's Corner Shopping Center is hereby terminated.

17. By execution of this Stipulation, and the court approval thereof, this matter shall be marked in the Prothonotary's docket as "Settled, Discontinued and Ended".

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

By: _____
Hamburg, Rubin, Mullin & Maxwell, Solicitor

HATFIELD TOWNSHIP

By: _____
Pearlstine-Salkin Associates, Solicitor

UPPER GWYNEDD-TOWAMENCIN MUNICIPAL AUTHORITY

By: _____
Landis, Kerns & Hopkins, Solicitor

TOWAMENCIN TOWNSHIP

By: _____
Jenkins, Tarquini & Jenkins, Solicitor

2001 Agreement Among HTMA

Hatfield, Towamencin, and UGTMA

AGREEMENT AMONG HATFIELD TOWNSHIP HATFIELD TOWNSHIP MUNICIPAL AUTHORITY TOWAMENCIN TOWNSHIP AND UPPER GWYNEDD-TOWAMENCIN MUNICIPAL AUTHORITY

WHEREAS, there are certain areas located in Hatfield Township, north of Welsh Road, including the Vernon Court Development Tract, particularly set forth in a plan thereof made by T.H. Properties, Inc. ("Developer") dated May 10, 2000, last revised October 23, 2000 ("Plans"), which flow, by gravity, into the Upper Gwynedd-Towamencin sewer area; and

WHEREAS, by a prior undated agreement among the parties, Hatfield Township ("Hatfield") and the Hatfield Township Municipal Authority ("HTMA") agreed to assign this area of Hatfield Township's sewer capacity to Upper Gwynedd-Towamencin Municipal Authority ("UGTMA") and Towamencin Township ("Towamencin") in order to facilitate gravitation of flow and sewer treatment.

WHEREAS, Hatfield and HTMA, in order to continue to facilitate gravitational flow and sewer treatment, hereby assign to Towamencin and UGTMA the area designated as the Vernon Court Development on the Plans proposed by Developer; and

WHEREAS, all parties to the agreement desire to spell out the procedure of facilitating the installation of sewers and to properly initiate sewer coverage for the proposed homes in the Vernon Court Development.

NOW, THEREFORE, for and in consideration of the mutual covenants, promises and benefits to all parties, the parties hereby agree as follows:

1. Hatfield and HTMA agree to assign the area of the Vernon Court Development in Hatfield Township, as set forth in the Plans to Towamencin and UGTMA for the purpose of collection and treatment of waste waters.

2. The customers to be served in Vernon Court shall be residential customers only. The parties agree that as the customers within Vernon Court connect to the sewer collection lines, they shall be billed for annual sewer rental by Towamencin at such rate as Towamencin shall determined from time to time.

3. The parties agree that the individual properties will be direct customers of Towamencin.

4. The proposed sewer lines shall be constructed by the Developer of the property and Developer shall pay all of the necessary tapping fees for the purchase of the required

EDU's (50 EDU's from Towamencin at One Thousand Five Hundred Dollars ($1,500.00) per EDU and 50 EDU's from UGTMA at Three Thousand Four Hundred Fifty Dollars ($3,450.00) per EDU). The tapping fees shall be in addition to all costs involved in the construction of any collection lines, laterals, manholes, and any other sewage facilities required by Towamencin and UGTMA to be constructed within the development or are necessary to connect the development to the UGTMA's sewage system. Developer shall be solely responsible for the cost of construction of all sewer lines and equipment necessary to connect the development to UGTMA's sewer system.

5. Upon completion, inspection and certification of the lines, the sewer lines shall be owned by UGTMA and maintained by Towamencin regardless of the location of the lines, within or immediately adjacent to the right-of-way of Welsh Road.

6. Towamencin shall have the right to file assessment and/or sewer rental liens against customers connected to the proposed sewer lines serving Vernon Court.

7. The contemplated project shall be completed within two (2) years from the date of execution of this Agreement. Contemporaneously with the execution of this Agreement, the Developer of the tract shall post with Towamencin financial security and shall execute a financial security agreement for the construction of the sanitary sewer improvements shown on the Plans, all of which shall be in the form acceptable to the Solicitor for the parties hereto. Said financial security shall secure completion of the proposed sewer lines in accordance with the Plans and specifications approved by the Towamencin Township Engineer. In the event that the sewer lines are not completed in accordance with said plans and specifications within the two (2) year time limit established in this paragraph, Towamencin shall have the right to drawn down on the aforementioned financial security to the extent necessary to complete said lines. The amount of the financial security shall be equal to 110% of the estimated construction cost of the proposed sewer lines to be installed.

8. Developer shall be legally liable for the completion of said lines, even if the actual cost for the installation of said line exceeds the amount secured by the financial security. Towamencin agrees to continually update construction cost estimates and Developer agrees to add to the financial security any amounts sufficient to reflect the then current construction costs.

9. This Agreement shall not be constructed as providing for a reservation of any sewer capacity by and/or for the benefit of Developer unless and until Developer pays the tapping fees specified in paragraph 4 hereinabove.

10. The parties agree that any properties served within Hatfield Township as a result of this Agreement relating to Vernon Court shall be bound by those ordinances, rules and regulations of Towamencin and/or UGTMA relating to quality of waste, methods of

connection, inflow and infiltration, etc. HTMA and Hatfield, if necessary, shall enact or cause to be enacted such ordinances and regulations or amendments thereto as may be necessary to effectuate fully the intent of this paragraph.

11. The existing undated Agreement between the parties referred to in the second WHEREAS of this Agreement shall remain in full force and effect, unaltered by the terms of this Agreement. To the extent this Agreement or any of its terms is inconsistent with the provisions of the undated Agreement, a copy of which is attached hereto as Exhibit "A," the provisions of this Agreement shall control.

11. This Agreement shall be interpreted in accordance with the laws of the Commonwealth of Pennsylvania and may be modified only by a written document executed by all parties hereto.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be duly executed, the day and year first above written.

HATFIELD TOWNSHIP

By: _____

Attest: _____

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

By: _____

Attest: _____

TOWAMENCIN TOWNSHIP

By: _____

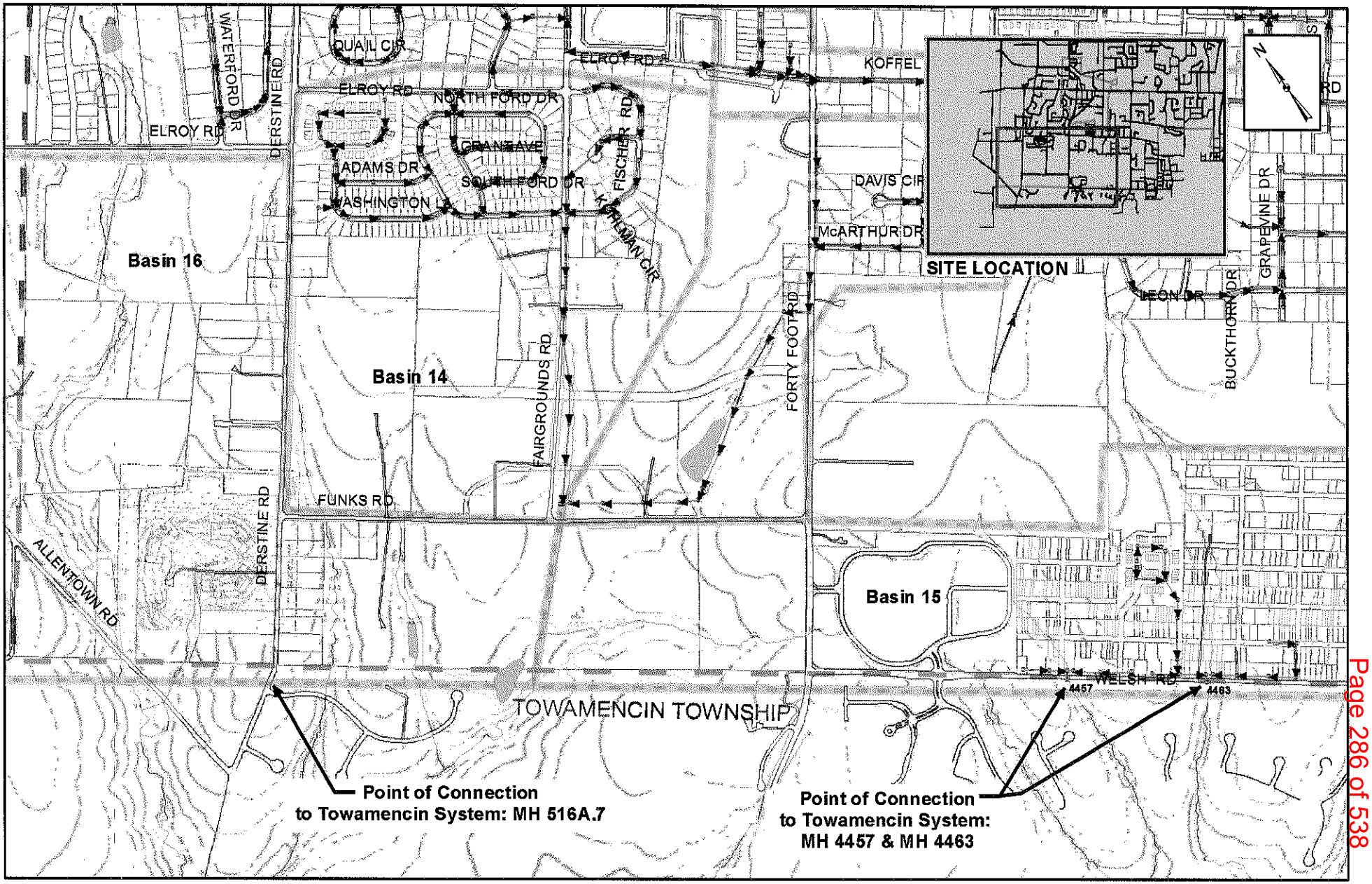
Attest: _____

UPPER GWYNEDD-TOWAMENCIN
MUNICIPAL AUTHORITY

By: _____

Attest: _____

Exhibit A



Hatfield Sanitation Basins
Manhole
Water Body
Parcels
Gravity Sewer
Stream
Township Line

0 250 500 1,000 Feet

DERSTINE & WELSH RD DRAINAGE AREA

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

Date: 8/30/2010
Path: J:\Hatfield Township Municipal Authority (0592)\6600 - Act 537\GIS\Derstine_and_Welsh_Rd.mxd

Exhibit B

Prepared by/Return to:
Paul G. Mullin, Esquire
Hamburg, Rubin, Mullin, Maxwell & Lupin
375 Morris Road, P.O. Box 1479
Lansdale, PA 19446-0773
215-661-0400

Parcel Numbers: 35-00-02842-00-3

AGREEMENT FOR CONSTRUCTION OF SEWER LINES

THIS AGREEMENT ("Agreement"), made this _____ day of _____, 2010 between **HATFIELD TOWNSHIP MUNICIPAL AUTHORITY** (hereinafter referred to as "Authority") and **DERSTINE RUN LIMITED PARTNERSHIP,** its successors and assigns (hereinafter referred to as "Developer").

W I T N E S S E T H:

WHEREAS, Authority is duly incorporated under the provisions of the Municipality Authorities Act, as amended, (the "Act") and has been designated as the agency within Hatfield Township, Montgomery County ("Township") responsible for providing sanitary sewer capacity and sanitary sewer service; and

WHEREAS, Developer is a corporation organized and existing under the laws of the Commonwealth of Pennsylvania with the principal office for the conduct of business located at 1292 Allentown Road, Lansdale, Pennsylvania 19446; and

WHEREAS, Developer presently owns or will shortly acquire ownership of certain real estate in Municipality known as Derstine Run Condominium, Unit #1 , 84 Derstine Road, Hatfield Township, Montgomery County Pennsylvania and consisting of approximately 5.4035 acres of land (the "Property"); being tax parcel no. _____ as more specifically

described in plans, prepared by Czop/Specter, Inc., dated September 2, 2009 and last revised June 21, 2010, said Plans being incorporated herein by reference as if set forth in extenso; and

WHEREAS, the Developer is utilizing the Property to construct a phased age restricted community and this Agreement shall cover phase 1 of the project; and

WHEREAS, Developer has agreed to construct and install sanitary sewer lines, sewer trunk lines, mains, laterals, and other appurtenances thereto, both on and leading to and from the aforesaid site, collectively referred to as the "Improvements", the quantities and costs of same being more specifically described in Exhibits "A" and "B", which is attached hereto and made part hereof, and the Authority is willing to provide such sanitary sewer service; and

WHEREAS, Developer and Authority acknowledge that the sanitary sewer flows shall be released by Hatfield Township and the Authority and will be treated by Towamencin and the Upper Gwynedd- Towamencin Municipal Authority ("UGTMA"); and

WHEREAS, Developer has agreed to pay to the Authority connection fees, tapping fees and certain sums of money to reimburse Authority for engineering, legal and administrative fees, and other related costs of said development.

NOW, THEREFORE, in consideration of the mutual covenants and promises hereinafter set forth, and intending to be legally bound hereby, the parties agree as follows:

1. Developer agrees that all construction shall be in accordance with the Plans and further agrees that prior to commencement of construction, Plans prepared for the aforesaid construction shall be submitted to the Authority, Towamencin and the UGTMA for their review and approval. Developer further agrees that should Authority, Towamencin or UGTMA Rules, Regulations, and/or Specifications change between the date of this Agreement and commencement of construction, Developer will construct in accordance with "then current"

Rules, Regulations, and Specifications. No construction shall commence unless and until the Authority, Towamencin and the UGTMA have approved such Plans and specifications.

2. Developer shall construct and install the Improvements as are more specifically set forth in Exhibit "A" in accordance with the Plans.

3. Developer agrees to employ a responsible, experienced contractor (the "Contractor") and to employ a sufficient workforce and equipment to complete construction of the Improvements.

4. Developer agrees that construction of the Improvements shall be pursued diligently and shall be made under the supervision of the Authority's and Towamencin's engineers, who shall be compensated for all costs of its employees engaged in the inspection of said project, and further agrees that said Improvements shall not be used until the construction is approved by the engineers, indicating that the required specifications have been met.

5. Developer will require its paving contractor to schedule the paving so that sanitary sewer lines and all their respective appurtenances are installed prior to hard surfacing of streets and will require its paving contractor to exercise due care in paving over any of the Improvements. If because of the non-observance of the above requirements, any part of the Improvements or any of the Authority's facilities are damaged or repaving is required, Developer will repair or replace such facilities to the reasonable satisfaction of the Authority or, upon receipt of the Authority's billing, reimburse the Authority in full for repairs or costs thus incurred.

6. Developer may install the sanitary sewer collection system prior to the installation of curbing only upon the condition that Developer agrees to be responsible for, and to pay promptly upon request of the Authority, all costs and expenses, including legal and engineering fees, associated with any repair, replacement or relocation of any portion of such sanitary sewer

lines or related, laterals or other appurtenances caused in any way by the final grading of streets or installation or curbs, including settlement and insufficient ground cover, in order the meet the Authority's specifications. If lines are installed prior to installing curbs, Developer will be responsible for damage attributable to settling or relocation. Developer agrees that until and unless (i) all curbs are installed; (ii) all streets are finally graded and paved; and (iii) all portions of the sanitary sewer system including lines, laterals, manholes, pump stations and other appurtenances to the sewer Improvements are repaired, replaced or relocated and have been paid for in full by Developer, the Improvements will not be deemed to be "complete" or acceptable for dedication to the Authority.

7. In accordance with the Authority's specification and as set forth in the approved Plans, Developer will construct the individual building sewers between the lateral and the structures. Such construction will be subject to approval and inspection of the Authority's engineer and no trench will be backfilled or other work obscured prior to inspection. Whether billed by the Authority in advance based on estimated costs or whether billed after the Authority conducts the inspection, Developer will pay the cost of such inspection upon the Authority's written demand. If any defect in workmanship or material is found, the Authority will not render service until such defect is remedied.

8. Upon application by Developer, and upon payment of the current charge for each building, the Authority will furnish sanitary sewer service, as and when available, for Developer's use during construction on the Property.

9. On discovery of any defect in the construction of the Improvements or material utilized therein, or any variations from the Plans and materials utilized therein, or any variations from the Plans and specifications approved by the Authority, Towamencin or the UGTMA, the appropriate engineer or representative shall: (i) give notice of such defect or variations to the

Authority, Towamencin or UGTMA and the Developer; and (ii) unless Developer shall have forthwith corrected or caused to be corrected any such defect or variation, withhold authorization of further payments under construction contracts from the deposit with the Authority or held in escrow; provided that no failure on the part of one of the municipal engineers to discover any such defects or variations, or to give notice as required by this Paragraph, or to cause further disbursements from deposited funds to be withheld, shall operate as a waiver of any such defects or variations on the part of the Authority, Towamencin or UGTMA; and provided further that no such failure on the part of the appropriate municipal engineer shall limit the right of the Authority, Towamencin or UGTMA, as hereinafter provided, to reject any offer to dedicate and convey the completed Improvements to the Authority, or to refuse to provide sanitary sewer service. Developer shall be responsible for all phases of construction including the physical connection of the Improvements to the Authority's existing sewer system.

10. Developer agrees that all inspections of the construction of said Improvements or sections or phases thereof shall be made by the Authority and Towamencin through their engineers. After completion of construction, Developer shall request that a certificate be filed indicating that the construction has been completed in accordance with the approved Plans and the applicable rules and regulations.

11. Developer shall pay all costs of constructing and installing the Improvements, which shall be performed under the observation of the Authority's and Towamencin's engineer and shall pay all costs incurred by the Authority and Towamencin with respect thereto, all costs shall include, but are not limited to, all related supervisory, inspection, administrative, legal and engineering fees incurred by the Authority and Towamencin.

12. Developer shall reimburse the Authority for all costs made necessary by reason of infiltration of ground water into the sewer lines to be installed pursuant hereto as well as any and all costs to Authority incurred by reason of the treatment of infiltrated ground water.

13. Contemporaneously herewith, Developer agrees to enter into a Tri-Party Escrow Agreement in such form as is approved by the Authority, which shall provide for the deposit of funds or set aside of loan proceeds for the sole benefit of Authority, or the posting of an Irrevocable Letter of Credit in form satisfactory to the Authority solicitor, (the deposit, set aside or letter of credit collectively referred to as "Security") in the total amount of One Hundred Sixty Thousand and Seventy-Three Dollars ($160,073.00) which is anticipated to be a reasonable estimate, as determined by the Authority's and Towamencin's engineers of the total cost of Improvements, plus estimated fees and expenses for administrative, legal, and engineering costs, including, but not limited to, preparation of agreements and inspection of construction. The Authority shall segregate Sixty-Five Thousand Dollars ($65,000.00) of the Security specifically for those Improvements being constructed exclusively in Towamencin Township. If the Security is not available with the escrow agent or posted with the Authority solicitor, within ten (10) days of the execution of this Agreement, Authority shall have the right to terminate this Agreement by delivering written notice of said intention to Developer. Delivery of notice, as set forth above, shall constitute a revocation of any and all permits issued to Developer.

14. Developer agrees that should Authority's engineer, at any time prior to acceptance of the Improvements by Authority, determine that the amount of Security provided is insufficient to pay for completion of the Improvements or administrative, legal and engineering expenses, Developer shall increase the Security by such amount as is determined necessary by Authority's engineer, in their reasonable discretion. If Developer fails to provide additional Security within

fifteen (15) days, this Agreement shall terminate and all remaining Security shall be paid to the Authority.

15. Developer agrees to indemnify, save and hold harmless and defend Authority, its engineers, officers, employees, agents and servants from any and all liens, costs, liabilities, charges, claims, demands, losses, costs, including but not limited to legal fees and court costs, causes of action or suits of any kind or nature whatsoever, from any causes whatsoever, whether known or unknown, foreseen or unforeseen, arising by reason of or during performance of any work of any kind or nature covered by this Agreement.

16. Developer agrees that the indemnity obligations of Developer under this Agreement apply to, and include, claims made by employees of Developer and Developer's Contractors. Developer, on behalf of itself and its contractors, hereby waives the protection and immunity of the Worker's Compensation Act, as to any action brought against the Authority, and all other immunities or statutory provisions, which would otherwise prohibit, prevent or limit Developer from having the indemnification duties and liabilities set forth in this agreement.

17. The Authority will give prompt written notice to Developer of any such claim asserted against it, which claim, if sustained, may result in liability on the part of Developer hereunder; provided, however, that the reasonable failure on the part of the Authority to give such notice shall not relieve Developer from its obligations under this section. If requested by the Authority in such notification, Developer will promptly assume the defense thereof, employing competent counsel in such defense; provided, that nothing contained herein shall require the Authority to accept counsel unsatisfactory to it; and provided further, that no compromise or settlement of such claims shall be made without the prior written consent of the Authority.

18. If Developer fails to complete construction of the Improvements within one (1) year after providing Security to the Authority, or if Developer fails to prosecute the construction with reasonable promptness and diligence, or if Developer, after written request fails to correct defective materials or workmanship, upon ten (10) days' written notice to Developer, the Authority may, but shall not be obligated to, complete the Improvements or any portion thereof, and in such case any Security shall be paid to the Authority upon written demand therefor to pay the costs associated with such construction. The Authority shall have the right, but not the obligation, to secure materials of the quality and quantity required by the Plans and the necessary numbers of workmen, mechanics and the required equipment on the open market at the then current market prices from any party to complete the construction of the Improvements, or any portion thereof. In the event the Authority proceeds with construction pursuant to this Paragraph, Developer shall be deemed to have assigned to the Authority all materials, tools and equipment on the construction site for use in completing the construction.

19. Upon written request to the Authority to certify completed portions of the Improvements, the Authority's engineer shall issue such certification within forty-five (45) days and the Authority will then authorize the release of Security in an amount equal to the amount of the certified Improvements for payment to the appropriate Contractor. If within forty-five (45) days the Authority's engineer in writing states that the Improvements have not been satisfactorily completed, no release shall be authorized until such time as the work has been satisfactorily completed. The Authority shall at all times have the right to retain ten percent (10%) of the total cost of Improvements as set forth in Exhibit A, pending final certification. Upon completion of all of the Improvements certified by the Authority's engineer, the balance of Security shall be returned to the Developer.

20. Developer agrees that prior to the commencement of construction, Developer will furnish the Authority and its engineer with a certificate of insurance indicating that Developer has obtained public liability insurance, including XCU coverage, with limits of $1,000,000 for any one occurrence, $2,000,000 for multiple accidents, and $500,000 for property damage liability, which insurance includes the Authority, the Authority's engineer and the Township as additional insureds for all purposes. Such insurance shall be written by an insurer qualified for business in Pennsylvania and which is satisfactory to the Authority, and shall be on an "occurrence basis". Insurance written on a "claims made" basis shall not satisfy the requirements of this Agreement. The Authority and its solicitor, engineer, and officers shall not have modified or waived, and shall not be estopped from enforcing the requirements that insurance policies be written on an "occurrence basis" by any failure to object to any policy secured and submitted by or for Contractor, or by any other conduct. The obligation of Contractor to secure and maintain insurance written on an "occurrence basis" shall remain with Contractor, and shall be enforceable against Contractor, at all times, including after a loss has occurred, excepting only if the Authority shall have in writing expressly agreed to accept insurance which is not written on an "occurrence basis", which writing must expressly recognize that such insurance is not written on an "occurrence basis." Developer agrees to indemnify, save and hold harmless and defend Authority, its officers and employees, from any and all liens, charges, claims, demands, losses, costs, including but not limited to legal fees and court costs, causes of action or suits of any kind or nature whatsoever, from any causes whatsoever, whether known or unknown, arising by reason of or during performance of any work of any kind or nature covered by this Agreement.

21. Developer agrees that after the Authority's engineer files a certificate of completion, Developer shall dedicate and convey by appropriate deed of dedication to the

Authority, all Improvements, rights of entry, and such further rights of way and/or easements, free and clear of all liens and encumbrances which the Authority's solicitor deems to be necessary or desirable to perfect the Authority's interests in the sanitary sewer system as extended, and as the Authority's engineer deems desirable to enable the Authority to connect the system to other portions of the Authority's sanitary sewage system so as to insure efficient flow of sewage throughout the system. Such connection points will be locations satisfactory to both parties. The Authority agrees, upon approval of the same, to accept said dedication of such Improvements as Authority normally accepts in order to maintain and operate same as part of its sanitary sewer system. In no event shall Developer retain any right to convey or dedicate the sanitary sewer system, or to take service from any other supplier of sanitary sewer service. Developer shall supply the Authority with all pertinent tax parcel numbers, written legal descriptions of the easements and rights-of-way, and all costs, fees and any expenses for the preparing, registering and recording by the Authority of any document contemplated herein shall be paid by Developer upon demand therefor.

Developer agrees that Authority, or anyone else with Authority's permission, may make connections with the Improvements constructed by Developer, notwithstanding the fact that such connection is made prior to an offer of dedication.

22. Prior to commencing work on the Improvements, Developer shall supply all deeds of easements and rights-of-way noted by the Authority's engineer as necessary or desirable. All necessary easements, rights-of-way and acquisitions required by Developer are the responsibility of Developer, who agrees to pay all costs associated therewith. The Authority may, but shall not be required to, assist in the acquisition of rights-of-way using the Authority's powers of eminent domain. The Authority shall cooperate, at Developer's expense, to assist Developer in securing permits required by the Pennsylvania Department of Transportation.

23. Prior to dedication, the Developer agrees to register the underground facilities with the Pennsylvania One Call System. In accordance with 73 P.S. § 176 et seq. (the "Act"), the Developer shall be responsible for any obligations required of a Facility Owner, as defined in the Act, until such facilities are dedicated to the Authority.

24. Developer agrees that after the Authority's engineer files a certificate of completion, Developer shall dedicate and convey by appropriate deed of dedication to the Authority, all Improvements, rights of entry, and such further rights of way and/or easements, free and clear of all liens and encumbrances which the Authority's solicitor deems to be necessary or desirable to perfect the Authority's interests in the sanitary sewer system as extended, and as the Authority's engineer deems desirable to enable the Authority to connect the system to other portions of the Authority's sanitary sewage system so as to insure efficient flow of sewage throughout the system. Such connection points will be locations satisfactory to both parties. The Authority agrees, upon approval of the same, to accept said dedication of such Improvements as Authority normally accepts in order to maintain and operate same as part of its sanitary sewer system. In no event shall Developer retain any right to convey or dedicate the sanitary sewer system, or to take service from any other supplier of sanitary sewer service. Developer shall supply the Authority with all pertinent tax parcel numbers, written legal descriptions of the easements and rights-of-way, and all costs, fees and any expenses for the preparing, registering and recording by the Authority of any document contemplated herein shall be paid by Developer upon demand therefore.

Developer agrees that Authority, or anyone else with Authority's permission, may make connections with the Improvements constructed by Developer, notwithstanding the fact that such connection is made prior to an offer of dedication.

25. The Authority shall not be obligated to accept any deed of dedication, easements or rights-of-way or to provide sanitary sewer service until (i) Developer has provided a certificate prepared by its consulting engineers verifying satisfactory testing of the Improvements so dedicated and completion thereof in full compliance with the Plans and specifications approved by the Authority; (ii) the Authority in its sole discretion, has determined that the intended use of the sanitary sewer system has not been materially altered since its approval of the Plans and specifications; (iii) Developer's contractor has executed a written confirmation of its guarantee of the system as hereinafter provided; and (iv) Developer is not in default of any other obligations imposed pursuant to this Agreement.

26. At the time of acceptance of dedication by the Authority, Developer's Contractor shall guarantee to the Authority that the Improvements shall be free of defects in workmanship and any variations from the approved Plans and specifications, as may be amended, with respect to materials to be used and the methods of construction and installation of the Improvements for a period of eighteen (18) months after such dedication. In the event that any defects in workmanship are required to be corrected within such eighteen (18) month period, Developer's Contractor agrees to make all necessary repairs to correct such defects after receipt of written notice from the Authority specifying such defects in workmanship and describing the extent of the repairs required. Developer's Contractor Developer shall use its best efforts to complete any such repairs within thirty (30) days after the receipt of such written notice from the Authority, provided, however, that in the event of any emergency which Authority determines is a health or safety hazard, Authority shall provide notice to Developer and Developer's Contractor by telephone, followed by facsimile communication, to immediately commence to make such repairs and shall complete same within five (5) days of the notice by telephone. If Developer's Contractor fails to correct any such defects in workmanship in accordance with the terms and

provisions hereof, Authority may, at its option, after expiration of the grace period hereinabove provided, enter into possession, complete the work with its own men or by contract, and the entire reasonable cost of such completion including engineering and legal expenses shall be paid to Authority by Developer upon written demand therefor.

27. In order to further protect Authority, or in the event any of the work described herein with regard to the Property shall be performed by any purchaser of Developer then, at the time of the acceptance of dedication by the Authority, Developer or purchaser of Developer or Developer's contractor shall furnish Authority with an escrow fund, letter of credit or maintenance bond, which shall guarantee the Authority for a period of eighteen (18) months after the acceptance of said dedication against defects in workmanship in all such matters dedicated to the Authority. The escrow fund, maintenance bond or letter of credit shall be in the amount of fifteen percent (15%) of the original construction costs and in form satisfactory to the Authority's solicitor.

28. After such dedication to and acceptance by the Authority, and subject to the eighteen (18) month warranty against defects and workmanship, Authority shall operate and maintain at its sole cost and expense all such matters included within the dedication. The Authority shall promptly release any remaining Security and/or return any unused cash escrow, without any interest accumulations, to Developer upon Developer's written request to the Authority.

29. Developer, after completion and prior to dedication contemplated herein, shall supply the Authority with an accurate plan showing the physical location and depth of all facilities constructed under the provisions of this Agreement. It is also agreed that no lots or property abutting the sanitary sewer lines and construction herein shall be connected to said sanitary sewer lines until written approval is received from the Authority.

30. After acceptance of dedication of the Improvements by the Authority, the Improvements shall be the sole property of the Authority and the Authority shall have the right to connect other users of the Authority's systems to the Improvements.

31. Developer acknowledges that in addition to all other amounts payable under this Agreement, Developer, or any purchaser, assignee, heir or successor upon execution of this Agreement, will pay to the Authority a sewer tapping fee of One Hundred Ninety Thousand Eight Hundred and Twenty Dollars ($190,820.00) ($2,726.00 x 70 EDUS). Tapping fees are imposed in accordance with Act 57 of 2003 and the Authority Fee Schedule and Resolution implementing tapping fees. Developer specifically acknowledges that Developer has been afforded the opportunity to review Authority's fees and charges set forth in this Agreement and specifically agrees to the validity of the same. Developer further acknowledges that in exchange for the Authority releasing the capacity from its service area to Towamencin and the UGTMA, among other things, the Developer is paying tapping fees for ten properties located within the area of its development. Those EDUs are included within the calculation detailed in this paragraph. Developer further acknowledges that it is responsible for posting a Three Thousand Dollar ($3,000.00) with the Authority to cover UGTMA's legal fees. The Authority shall be responsible for timely paying the UGTMA's invoices and shall promptly return any unused portion of the escrow to the Developer upon project close out. Developer acknowledges that it shall not be entitled to any recapture.

32. It shall be Developer's responsibility to give or cause to be given all notices and to comply or cause compliance with all laws, ordinances, municipal rules and regulation and requirements of public authorities applying to or affecting the conduct of the project work.

33. Developer acknowledges and agrees that Authority's obligation to provide sanitary sewer capacity shall be null and void in the event action by the Department of Environmental Protection or the Delaware River Basin Commission precludes the Authority from providing the capacity for which Developer has contracted with Authority.

34. Upon the purchase or lease of the land subject to this Agreement, and prior to settlement thereto, Developer shall supply to the Authority the name or names and addresses of prospective purchasers and/or lessees of the subject tract, or any portion thereof. Developer further agrees that the Deed to any individual lot within the Property which is subject to a water or sewer easement will contain a specific reference to the easement to which the lot is subject.

35. The covenants and conditions contained herein shall be covenants running with the land and shall bind the successors, heirs, and assigns of each of the parties hereto. The rights and obligations of the parties hereunder may not be assigned except with the written consent of the Authority.

36. Developer agrees that the term of this Agreement shall be subject to Authority review one (1) year from the date hereof. At the end of the applicable period, if the project or stated phase thereof has not been completed, the Agreement may, at the sole discretion of the Authority, be extended or terminated by written notice to Developer.

37. Developer acknowledges that the sewer capacity reserved herein is site specific and may be used only on the Property which is the subject of this Agreement.

38. Authority may, in its sole discretion, record this Agreement or a memorandum of this Agreement in the Office of the Recorder of Deeds for the County in which the Property is located.

39. This Agreement shall be interpreted in accordance with the laws of the Commonwealth of Pennsylvania, contains the entire understanding between the parties and may be amended only in a written document signed by all parties.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed the day and year first written above.

Attest:

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

By: _____

Attest:

DERSTINE RUN LIMITED PARTNERSHIP
By: Derstine Run, Inc., its General partner

By: _____
PRESIDENT - DERSTINE RUN LIMITED PARTNERSHIP

Exhibit "A"

CZOP/SPECTER, INC.

DERSTINE RUN PHASE I

Date: 5/13/10

HATFIELD TOWNSHIP
PUBLIC IMPROVEMENT
CONSTRUCTION COST ESTIMATE FOR ESCROW

Description	Qty	Unit	Cost per unit	Sub-Total	Totals
2200 - Erosion & Sediment Controls - Entire Site					
Construction Entrance	1	EA	$ 1,500.00	1,500.00	
Sediment Trap Spillway	1	EA	$ 500.00	500.00	
Sediment Trap	1	LS	$ 800.00	800.00	
Silt Soxx	140	LF	$ 3.50	490.00	
Tree Protection Fence	225	LF	$ 3.00	675.00	
Rock Filter Berm	1	EA	$ 400.00	400.00	
Inlet Protection	4	EA	$ 90.00	360.00	
Temp Seed	6,500	SF	$ 0.07	455.00	
Tree Protection Fence	225	LF	$ 4.00	900.00	
				Total	6,080.00
2200 - Earthwork - Onsite					
Strip Topsoil	3,960	CY	$ 2.00	7,920.00	
Cut	440	CY	$ 3.00	1,320.00	
Fill	7,560	CY	$ 2.00	15,120.00	
Import Soil	8,000	CY	$ 4.00	32,000.00	
Rough Grade Site	285,975	SF	$ 0.03	8,579.25	
			$ -	-	
				Total	64,939.25
2500 - Storm Water Drainage					
6" SDR Pipe	1,170	LF	$ 15.00	17,550.00	
6" SDR Boots	80	EA	$ 20.00	1,600.00	
				Total	19,150.00
2500 - Detention Basin					
Excavation	576	CY	$ 2.25	1,296.00	
Planting Mix	506	CY	$ 4.00	2,024.00	
ERN Mix	10,000	SF	$ 0.15	1,500.00	
				Total	4,820.00
2551 - Water Distribution					
Escrowed with North Penn Water Authority					
				Total	-
2552 - Sanitary - Onsite				-	
8" DR-18	274	LF	$ 34.00	9,316.00	
6" DR-18	105	LF	$ 22.00	2,310.00	
Manhole	1	EA	$ 2,000.00	2,000.00	
Clean-Out / Wye	3	EA	$ 150.00	450.00	
MH Vacuum Test	1	EA	$ 75.00	75.00	
Mandrel Test Lines	274	LF	$ 0.50	137.00	
Air Test Lines	274	LF	$ 0.50	137.00	
TV Inspection	274	LF	$ 1.00	274.00	
				Total	14,699.00
2552 - Sanitary - ROW				-	
8" DR-18	996	LF	$ 34.00	33,864.00	
6" DR-18	410	LF	$ 65.00	26,650.00	
Manhole	3	EA	$ 2,000.00	6,000.00	
Wye	10	EA	$ 150.00	1,500.00	
MH Vacuum Test	3	EA	$ 75.00	225.00	
Mandrel Test Lines	996	LF	$ 0.50	498.00	
Air Test Lines	996	LF	$ 0.50	498.00	
TV Inspection	996	LF	$ 1.00	996.00	
Connect to Existing MH	1	LS	$ 1,500.00	1,500.00	
				Total	71,731.00

2610 - Paving - Onsite					
Fine Grade Paving	4,015	SY	$ 0.25	1,003.75	
6" 3A Stone Base	4,015	SY	$ 4.00	16,060.00	
4 1/2" Base Course	4,015	SY	$ 16.00	64,240.00	
1 1/2" Wear Surface	4,015	SY	$ 6.00	24,090.00	
Pavement Markings	1	LS	$ 575.00	575.00	
Street Signs	6	EA	$ 150.00	900.00	
				Total	106,868.75
2610 - Paving - Derstine Rd					
Fine Grade Paving	485	SY	$ 0.25	121.25	
6" 3A Stone Base	485	SY	$ 4.00	1,940.00	
5" Base Course	485	SY	$ 16.00	7,760.00	
1 1/2" Wear Surface	485	SY	$ 6.00	2,910.00	
Mill to Center Line	1,367	SY	$ 3.25	4,442.75	
1 1/2" Wear Surface	1,852	SY	$ 6.00	11,112.00	
Seal Curb Line	865	LF	$ 0.40	346.00	
Saw Cut	1,970	LF	$ 2.00	3,940.00	
Pavement Restoration	994	SY	$ 26.00	25,844.00	
Pavement Markings	1	LS	$ 5,000.00	5,000.00	
Street Signs	1	EA	$ 150.00	150.00	
Bumper Blocks	63	EA	$ 50.00	3,150.00	
Traffic Control	1	LS	$ 1,000.00	1,000.00	
				Total	67,716.00
2630 - Site Concrete - Onsite					
Sidewalks - 4" conc with 4" stone	3,640	SF	$ 3.00	10,920.00	
				Total	10,920.00
2620 - Curbing / 2630 - Site Concrete - Derstine Rd					
Sidewalk - Public- 4' W - Derstine Rd 4" conc with 4" stone	2,995	SF	$ 3.00	8,985.00	
18" Concrete Curb - Derstine Rd	865	LF	$ 12.00	10,380.00	
ADA Ramps - Derstine Rd	2	EA	$ 200.00	400.00	
				Total	19,765.00
2800 - Landscaping					
Trees & Shrubs	1	LS	$ 30,000.00	30,000.00	
Spread Topsoil	1,830	CY	$ 2.00	3,660.00	
Seed & Mulch	130,145	SF	$ 0.06	7,808.70	
				Total	41,468.70
Miscellaneous					
Parking Lot Lighting	22	EA	$ 1,450.00	31,900.00	
Retaining Wall	1,215	SF	$ 19.00	23,085.00	
Guard Rail	200	LF	$ 39.00	7,800.00	
Construction Stake-out	1	LS	$ 5,000.00	5,000.00	
Concrete Monuments R/W	6	EA	$ 150.00	900.00	
As Built Plans	1	LS	$ 1,500.00	1,500.00	
Inspection/Testing	1	LS	$ 5,000.00	5,000.00	
				Total	75,185.00
				Project Total	503,342.70
				10% Escalation	50,334.27
				Grand Total	553,676.97

Exhibit "B"

096441

DERSTINE RUN
PHASE 1
SANITARY SEWER ESTIMATE
TOWAMENCIN TOWNSHIP ONLY
JUNE 2010

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL COST
I. SANITARY SEWER				
1. 6" DR18 Lateral Pipe	20	LF	$40.00	$800.00
2. 8" DR 18 Main Pipe	210	LF	$70.00	$14,700.00
3. Wye	2	EA	$150.00	$300.00
4. 5' Dia. Manhole	1	EA	$4,000.00	$4,000.00
5. Standard Manhole	1	EA	$3,000.00	$3,000.00
6. Insertion Manhole	1	EA	$4,000.00	$4,000.00
7. Pressure Testing	250	LF	$1.45	$362.50
8. Manhole Testing	3	EA	$150.00	$450.00
9. Flushing and Televising	210	LF	$1.60	$336.00
10. Manhole Removal	1	LS	$1,000.00	$1,000.00
11. Manhole Plug and Cap	1	LS	$1,000.00	$1,000.00
12. Existing Sanitary Abandonment	1	LS	$1,000.00	$1,000.00
SUBTOTAL				$30,948.50
II. SANITARY TRENCH AND ROAD RESTORATION				
1. Fine Grading	170	SY	$0.25	$42.50
2. 5" Base Course	170	SY	$30.00	$5,100.00
3. Full Width Mill	560	SY	$5.00	$2,800.00
4. 1 1/2" Wearing Course (Full Width)	560	SY	$8.00	$4,480.00
5. Pavement Markings	1	LS	$500.00	$500.00
6. Seal Curb Line	210	LF	$0.40	$84.00
SUBTOTAL				$13,006.50
III. MISCELLANEOUS				
1. Lawn Restoration	1	LS	$1,000.00	$1,000.00
2. Survey Stakeout	1	LS	$1,400.00	$1,400.00
3. As-Built Drawings	1	LS	$735.91	$735.91
4. Engineering / Legal	1	LS	$10,000.00	$10,000.00
5. Traffic Maintenance and Protection	1	LS	$2,000.00	$2,000.00
SUBTOTAL				$15,135.91
SANITARY SEWER CONSTRUCTION COST ESTIMATE				$59,090.91
TOWNSHIP SECURITY (10%)				$5,909.09
TOTAL SANITARY SEWER ESCROW				$65,000.00

EXHIBIT "C"

To be Provided

Exhibit V-4

Tracey Engineers Re-rate Documentation

Hatfield Township, Montgomery County

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

DESIGN ENGINEER'S REPORT

AND

ANALYSIS

ON

RE-RATING

OF

EXISTING ADVANCED WASTEWATER TREATMENT FACILITY

HTMA
COPY

TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

DESIGN ENGINEER'S REPORT
AND
ANALYSIS
ON
RE-RATING
OF
EXISTING ADVANCED WASTEWATER TREATMENT FACILITY

INDEX

EXHIBITS

EXHIBITS - CONTINUED

TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

DESIGN ENGINEER'S REPORT
AND
ANALYSIS
ON
RE-RATING
OF
EXISTING ADVANCED WASTEWATER TREATMENT FACILITY

GENERAL

The Hatfield Township Municipal Authority has undertaken in the past decade, major wastewater treatment and sewage collection construction in response to growth pressures in both Hatfield Township and Montgomery Township, and to Regulatory requirements imposed by the Department of Environmental Resources (Pa DER) which set more stringent effluent limits for the treatment facility.

Hatfield Township constructed a new Sewage Collection System and an initial Sewage Treatment Plant in 1965-1967. Montgomery Township, at the same time, constructed limited initial Sewage Collection Lines, and connected to the Hatfield Township Sewage Treatment Plant. The initial Sewage Treatment Plant rated hydraulic capacity was 0.90 MGD, with incineration facilities sized to handle sludge from a 3.60 MGD future flow.

Regulatory imposition of strict Phosphorus limiting effluent criteria, in 1969, resulted in the construction in 1970-1972, of a 3.6 MGD Advanced Wastewater Treatment Facility, with sufficient capacity to meet anticipated growth in both Hatfield Township and Montgomery

Township to the year 1990. The strict Phosphorus limitation was not accompanied for this 1970-1972 construction by any nitrogen limiting criteria.

In 1973, Pa DER issued orders setting limiting effluent Nitrogen criteria, and further mandating Regional Wastewater Treatment, requiring all the communities in the Upper Neshaminy Basin to conduct joint planning. After some 2 years of meetings among the communities, Pa DER approved two (2) Regional Plants for the Upper Neshaminy Basin, one (1) in Lansdale, and the second at the HTMA existing facility site.

In the period 1975-1977, certain of the communities mandated to participate in the HTMA expansion project to a Regional Facility, petitioned Pa DER to withdraw from the project, and Pa DER in 1978 permitted such withdrawals to occur. The limiting effluent Nitrogen criteria remained as an Order, but enforcement was suspended pending the potential for an EPA Construction Grant to assist the Project.

With the withdrawal of several communities from the project in 1978, the design that had been developed to meet the Nitrogen Order was no longer viable due to the difference between the design capacity and the needs of the remaining communities.

Hatfield Township made repeated attempts in 1979-1981 to secure priority points for an EPA Construction Grant, but was unable to initiate a completed application due to constantly changing EPA grant application requirements. Finally, in 1982, HTMA was notified it must proceed to meet limiting Nitrogen requirements without Federal Grant Assistance.

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In 1982-1983, HTMA constructed extensive Relief and Interceptor Sewers throughout the Township, and in 1984-1985 constructed new Preliminary Treatment Units in the form of new Raw Sewage Screw Pumping, Mechanical Screening and Mechanical Grit and Grease Removal, sized for future Treatment Facility capacity then envisioned to meet the Nitrogen criteria, which were still in effect.

In 1986-1987, HTMA (with capital participation by Montgomery Township), constructed a new 6.43 MGD Counter-Current Low Load Aeration Facility, including additional 2nd-Stage Raw Sewage Screw Pumping and Primary Clarification.

This new Facility (the third treatment facility since 1967 at the site) was placed in operation in September 1987. Initial flows to this new facility in 1987 and early 1988 averaged 3.095 MGD, or 48.1% of design capacity.

In 1989, Hatfield Borough connected to the HTMA Collection and Treatment systems, phasing out-of-service their existing Sewage Treatment Plant. Montgomery Township has a committed capacity share in the existing 6.43 MGD facility of 2.14 MGD. Hatfield Borough has a maximum committed share of 0.75 MGD. The Hatfield Township capacity share is 3.54 MGD.

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CURRENT FLOWS AND LOADINGS

Continued growth in both Hatfield Township and Montgomery Township, and the connection in 1989 of Hatfield Borough to the AWTF, has greatly increased flows and loadings to the 6.43 MGD Facility, since it's start-up in 1987 at ±3.1 MGD average daily flow.

A "Preliminary Engineering Report" was developed in July 1990 to explore the possibility of re-rating the newly constructed 6.43 MGD Treatment Facility to some higher capacity. This "Preliminary Engineering Report" considered data on hydraulic and organic loadings for the period January 1990 through May 1990, which represented the highest level of hydraulic and organic loadings to the facility available for analysis.

The design of modifications necessary to re-rate the treatment facility has been completed and there is now available flow and loading data for an extended 16 month period from January 1990 through April 1991, on which to confirm original design considerations.

Exhibits 1 through 6 appended hereto summarize a variety of flow data for the 16 month period. Exhibit 7 summarizes organic loading data and Exhibits 8 and 9 summarize nutrient loading data. Exhibit 10 analyzes Q_{UP} peak hourly flow data for major flow days since June 1990.

When the design was being developed for the 6.43 MGD facility in 1984 and 1985, Primary Clarification-Flocculation was included to provide the capability of providing at least primary treatment to all of the influent flows, and for the purpose of subsequent solids handling

conditions, to utilize primary sludge periodically for increased dewatering capability prior to incineration.

The 1984-1985 design therefore did not contemplate continuous utilization of Primary Treatment, at least until later years when loadings increased significantly, but rather was based upon Secondary Treatment only in the new Counter-Current Low Load Aeration Facility.

Due to the significant increase in loadings since initial operation commenced in the new facility, the operation has included full Primary Treatment, and the efficiency of this Primary Treatment has been measurably greater than the original 1984-1985 design basis assumed.

This increased Primary efficiency, coupled with the very conservative design basis utilized in the 1984-1985 design has resulted in significantly different loadings currently than had been anticipated. The facility can, and has upon occasion, been demonstrated to have a much higher assimilative loading capability than the current hydraulic and organic loading limits.

In Table 1, the existing design basis is compared to actual current loadings, as average for the 16 month period through April 1991.

With respect to hydraulic flows, the 16 month flow average was 76.6% of current rated hydraulic capacity on an average daily flow basis; 83.9% on a peak 24 hour basis; and 68.6% on a Q_{UP} peak hourly rate basis.

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TABLE 1

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

EXISTING DESIGN BASIS

COMPARISON
WITH
CURRENT ACTUAL LOADINGS

		Existing Design Basis	January 1990 - April 1991 Actual Basis	% Of Existing Design
1.	Hydraulic Flows			
	Q_{A-24}	6.43 MGD - 1,012 m^3/h	4.926 MGD - 775 m^3/h	76.58%
	Q_{P-24}	13.65 MGD - 2,148 m^3/h	11.451 MGD - 1,802 m^3/h	83.87%
	Q_{UP} Rate	20.80 MGD - 3,272 m^3/h	14.256 MGD - 2,243 m^3/h	68.55%
2.	BOD_5	11,832 Lb/D - 5,378 kg/D (220.6 mg/l @ Q_A)	9,856 Lb/D - 4,480 kg/D (240 mg/l @ Q_A)	83.30% (108.79%)
3.	TSS	11,832 Lb/D - 5,378 kg/D (220.6 mg/l @ Q_A)	11,561 Lb/D - 5,255 kg/D (281 mg/l @ Q_A)	97.71% (127.38%)
4.	TKN	2,622 Lb/D - 1,192 kg/D (48.9 mg/l @ Q_A)	1,448 Lb/D - 658 kg/D (35.3 mg/l @ Q_A)	55.20% (72.19%)
5.	NH_3-N	1,929 Lb/D - 877 kg/D (36.0 mg/l @ Q_A)	755 Lb/D - 343 kg/D (18.5 mg/l @ Q_A)	39.11% (51.39%)
6.	N_{ORG}	693 Lb/D - 315 kg/D (12.9 mg/l @ Q_A)	693 Lb/D - 315 kg/D (16.8 mg/l @ Q_A)	100.0% (130.23%)
7.	NO_2-N + NO_3-N	62 Lb/D - 28 kg/D (1.15 mg/l @ Q_A)	97 Lb/D - 44 kg/D (2.4 mg/l @ Q_A)	157.14% (208.7%)
8.	Phosphorus (P)	462 Lb/D - 210 kg/D (8.6 mg/l @ Q_A)	251 Lb/D - 114 kg/D (6.1 mg/l @ Q_A)	54.29% (70.93%)

Organic loadings have averaged 83.3% of design for BOD_5 and 97.7% for TSS.

Nutrient loadings have averaged much less than design for the parameters of TKN, NH_3-N and P, at 55.2%, 39.1% and 54.3% respectively.

The Organic Nitrogen fraction has averaged 100% of design since the NH_3-N fraction has averaged less than 40% of design. The NO_2-N + NO_3-N fraction, while in excess of design values, is not a critical parameter, since the facility provides significant denitrification.

When the "Preliminary Engineering Report" was developed in July 1990, the 5 months of data available (January - May 1990) indicated higher flows, and BOD_5 and TSS loadings, as well as higher TKN loadings than shown in Table 1. At that time, it was indicated in the Report that flows and loadings were approaching a level where consideration of additional treatment capacity would be mandated by the requirements of Pa. DER Chapter 94.

Due to the significantly increased demonstrated Primary Treatment efficiency over the 16 month period tabulated in the Exhibits hereto, the application of Chapter 94 requirements to influent loadings would be misleading, since the critical loadings are to the Secondary Treatment Process.

In Table 2, the existing design basis for the Secondary Treatment Process units is compared to actual loadings after Primary Treatment. Hydraulic loadings and % of existing design are the

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TABLE 2

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

COUNTER-CURRENT LOW LOAD AERATION PROCESS

EXISTING DESIGN BASIS AFTER PRIMARY CLARIFICATION
COMPARISON
WITH
CURRENT ACTUAL LOADINGS

		Existing Design Basis	January 1990 - April 1991 Actual Basis	% Of Existing Design
1.	Hydraulic Flows			
	Q_{A-24}	6.43 MGD - 1,012 m^3/h	4.926 MGD - 775 m^3/h	76.58%
	Q_{P-24}	13.65 MGD - 2,148 m^3/h	11.451 MGD - 1,802 m^3/h	83.87%
	Q_{UP} Rate	20.80 MGD - 3,272 m^3/h	14.256 MGD - 2,243 m^3/h	68.55%
2.	BOD_5	11,832 Lb/D - 5,378 kg/D (220.6 mg/l @ Q_A)	4,970 Lb/D - 2,259 kg/D (121.0 mg/l @ Q_A)	60.00% (78.32%)
3.	TSS	11,832 Lb/D - 5,378 kg/D (220.6 mg/l @ Q_A)	3,280 Lb/D - 1,491 kg/D (79.8 mg/l @ Q_A)	69.32% (90.48%)
4.	TKN	2,622 Lb/D - 1,192 kg/D (48.9 mg/l @ Q_A)	1,157 Lb/D - 526 kg/D (28.2 mg/l @ Q_A)	44.13% (57.67%)
5.	NH_3-N	1,929 Lb/D - 877 kg/D (36.0 mg/l @ Q_A)	704 Lb/D - 320 kg/D (17.1 mg/l @ Q_A)	36.49% (47.50%)
6.	N_{ORG}	693 Lb/D - 315 kg/D (12.9 mg/l @ Q_A)	453 Lb/D - 206 kg/D (11.0 mg/l @ Q_A)	65.40% (85.27%)
7.	NO_2-N + NO_3-N	62 Lb/D - 28 kg/D (1.15 mg/l @ Q_A)	152 Lb/D - 69 kg/D (3.7 mg/l @ Q_A)	246.43% (321.74%)
8.	Phosphorus (P)	462 Lb/D - 210 kg/D (8.6 mg/l @ Q_A)	158 Lb/D - 72 kg/D (3.9 mg/l @ Q_A)	34.29% (45.35%)

same as indicated in Table 1. Organic and nutrient loadings, however, are significantly reduced as to % of existing design, when only the Secondary Treatment units are considered.

For instance, BOD_5 loadings constitute 83.3% of design on a raw influent basis, but only 60.0% of design to the Secondary Process. Similarly, TSS loadings constitute 97.7% of design on a raw influent basis, but only 69.3% of design to the Secondary Process. Other comparisons are TKN at 55.2% and 44.1%; NH_3-N at 39.1% and 36.5%; N_{ORG} at 100% and 65.4%; and P at 54.3% and 34.3%.

Since the Secondary Treatment Process is the element that affects final effluent values, and total treatment efficiency, the current operating situation is considerably less critical than raw influent loading values would indicate.

It should be noted that with respect to hydraulic flows, there are two (2) influent meters, one (1) for Montgomery Township interceptor lines, and one (1) for Hatfield Township interceptor lines. There is, however, the situation that certain Hatfield Township collector sewers enter the Treatment Facility through the Montgomery Township interceptor, and certain Montgomery Township collector sewers enter the Treatment Facility through the Hatfield Township interceptor. For these reasons, flows for both Townships must be adjusted by additions and deductions for flows not originating in the respective Townships. Some of these adjustments are not internally metered, hence average values are utilized.

In Exhibit 1, adjusted flows are indicated, combined, to be slightly greater on average than the combined total of the two meters, and the plant effluent meter indicates lesser flows than either combined total adjusted values or combined meter values. This is due in part to plant recycle flows, but also reflects the fact that inherent meter inaccuracies and differences in metering accuracy when two meter values are combined will occur at various flow ranges.

Effluent meter values are utilized in monthly reports to Pa. DER, since the values reflect actual discharges to the receiving stream. On the other hand, adjusted meter values are utilized in Tables 1 and 2 for the purpose of developing organic and nutrient average loading values.

An important element affecting the operation of the Treatment Facility is the ratio of peak daily flows to average daily flows. In the existing Facility, the ratio of Q_{P-24} to Q_{A-24} was set at 2.12:1, and the ratio of Q_{UP} hourly rate to Q_{A-24} was set at 3.23:1.

In Table 3, there is a comparison of Q_{P-24} Peak Daily Flows to Q_{A-24} Average Daily Flows, for each of the three (3) communities involved, and for the adjusted total for all three.

There is not a marked difference between the Q_{P-24}:Q_{A-24} ratios for each community, since they range from 1.697:1 to 1.749:1. For the combined adjusted total, the ratio is 1.621:1 which reflects the fact that the peak values in Exhibit 2 normally do not occur on the same day each month for each community.

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TABLE 3

COMPARISON
OF
Q_{P-24} PEAK DAILY FLOWS
TO
Q_{A-24} AVERAGE DAILY FLOWS

	Hatfield Township Adjusted	Hatfield Borough Adjusted	Montgomery Township Adjusted	Total Adjusted
Q_{A-24} (From Exhibit 2)	2.756 MGD	0.657 MGD	1.513 MGD	4.926 MGD
Q_{P-24} (From Exhibit 2)	4.821 MGD	1.117 MGD	2.568 MGD	7.987 MGD[A]
Ratio Q_{P-24} To Q_{A-24}	1.749:1	1.700:1	1.697:1	1.621:1

A - Total Adjusted QP-24 Is Less Than Sum Of Peak Flows For Each Community Since Peaks In Each Community Occurred On Same Day Of Month In Only 2 Of 16 Months

This current (16 month) average ratio of 1.621:1 may be compared to the 2.12:1 design assumption for the existing Facility.

In Exhibits 3 and 4, a comparison is developed for both the Hatfield Township and Montgomery Township meters as to flow ratios for the peak 24 hour flow in a month, versus average dry-weather weekday and weekend flows, and average meter flow.

Exhibit 5 is an analysis of metered flows instead of adjusted metered flows, and results in a $Q_{P-24}:Q_{A-24}$ ratio of 1.64:1.

Exhibit 6 compares ratios for the effluent meter, which averaged 1.71:1 for the 16 month period.

It is evident that current $Q_{P-24}:Q_{A-24}$ ratio averages are much less than the design basis used in the existing Facility.

The Q_{UP} peak hourly rate of flow is an important design parameter in that the limiting Secondary Clarifier surface settling rate is limited to 1.60 $m^3/m^2/h$ (945 GPD/SF) at this Q_{UP} rate.

In Exhibit 10, Q_{UP} flow rates for days of highest flow over the past 10 months are tabulated from Hatfield Township daily hydraulic flow records. The combined Q_{UP} flow rate ratio to Q_P peak daily flow averaged 1.50:1, which may be compared to the current design value for $Q_{UP}:Q_P$ of 1.52:1. The highest combined meter Q_{UP} flow rate in Exhibit 10 was a rate of 14.256 MGD, which occurred on April 25, 1991.

This highest combined meter Q_{UP} flow rate of 14.256 MGD represents a $Q_{UP}:Q_A$ ratio of 2.89:1, as compared to the current design value of 3.23:1. The average of the highest Q_{UP} rates, at 12.271 MGD provides a ratio of 2.49:1, Q_{UP} to Q_A.

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PRIMARY TREATMENT

As indicated previously herein, the efficiency of the Primary Treatment (Flocculation-Clarification) is significantly greater than the 1984-1985 design assumed.

In Table 4, this Primary Treatment Efficiency is tabulated for seven (7) loading parameters.

TABLE 4

PRIMARY TREATMENT EFFICIENCY

	Influent mg/l	Influent kg/D	Primary Effluent mg/l	Primary Effluent kg/D	Primary Treatment Efficiency
BOD_5 (From Exhibit 7)	240	4,480	121	2,259	49.6%
TSS (From Exhibit 7)	281	5,255	80	1,491	71.6%
TKN (From Exhibits 8 & 9)	35.2	658	28.2	526	20.1%
NH_3-N (From Exhibits 8 & 9)	18.4	343	17.1	320	6.7%
N_{ORG}	16.8	315	11.1	206	34.6%
NO_2-N + NO_3-N (From Exhibits 8 & 9)	2.4	44	3.7	69	(156.8%)
P (From Exhibits 8 & 9)	6.1	114	3.9	72	36.8%

Organic removal efficiencies (BOD_5 and TSS) are well above normal ranges. Nutrient removal efficiencies for TKN and P are also higher than would be anticipated. NH_3-N removal efficiency is low, since NH_3-N is essentially unaffected by Primary Treatment only. N_{ORG} removal efficiency is a function of TKN efficiency.

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CAPACITY RE-RATING POTENTIAL

The existing 6.43 MGD AWTF was very conservatively designed, with factors-of-safety of 25 to 50% having been provided for most unit processes over design calculation requirements.

Instead of planning for additional process units to increase the capacity of the facility, it is first considered necessary to determine what level of re-rating the capacity can be achieved, and the modifications required to permit such a re-rating.

Both hydraulic and organic (and nutrient) loadings must be analyzed, to determine the highest level of re-rating that can satisfactorily be treated in the existing units. In Exhibit 11, calculations on limiting hydraulic flows for the existing Headworks are developed, and similar calculations are developed in Exhibit 12 for the existing Primary Treatment and Counter-Current Low Load Aeration Secondary Treatment Units.

In Table 5, a Summary of Limiting Hydraulic Unit Capacities - Headworks Units is tabulated. With respect to the Headworks, the major units (excluding the Raw Sewage Screw Pumps) are the Mechanical Screens and the Mechanical Grit/Grease Removal Units. At Q_{A-24} flows, the Grit/Grease Channel has a limiting flow of 10.89 MGD, and the Grit Channel has a limiting flow of 14.72 MGD. The limiting capacity for the combined Grit/Grease Channels is 14.72 MGD, with only a slightly diminished Grease Unit efficiency above 10.89 MGD.

TABLE 5

SUMMARY OF LIMITING HYDRAULIC UNIT CAPACITIES

HEADWORKS UNITS

		QA-24	QP-24	QUP-24
A.	Interceptor Sewers To WWTF			
	Hatfield Township	15.0 MGD		34.0 MGD
	Montgomery Township	6.1 MGD		14.6 MGD
	Combined	21.1 MGD		48.6 MGD
B.	Raw Sewage Flow Metering			
	Hatfield Township			15.90 MGD
	Montgomery Township			10.41 MGD
	Combined			26.31 MGD
C.	Screw P.S. No. 1 Discharge Channel To Headworks			98.8 MGD
D.	Influent Channel To Mechanical Screens			
	Modification No. 2			43.16 MGD
E.	Mechanical Screens			
	Modification No. 2			59.40 MGD

TABLE 5 - CONTINUED

		QA-24	QP-24	QUP-24
F.	Exit Channel From Mechanical Screens			
	Modification No. 2			29.63 MGD
G	Grit Influent Channel			32.24 MGD
H.	Grit/Grease Unit Grit Channel	14.72 MGD	49.15 MGD	
I.	Grit/Grease Unit Grease Channel	10.89 MGD		
J.	Effluent Channel From Grit/ Grease Unit			68.49 MGD
K.	30" Diameter By-Pass Pipe Around Grit/Grease Unit			27.50 MGD*
L.	48" Diameter Pipe From Grit/ Grease Unit To Raw Sewage Screw Pump Station No. 2			27.00 MGD*

*Can Surcharge. Flow Will Be Greater

All other elements, including the Mechanical Screens, are limited at Q_{UP} flow rates, and not Q_{A-24} flows.

From Table 5, the limiting Q_{UP} flow rate is 27.0 MGD, the 48" Diameter Pipe from the Grit/Grease Unit to Raw Sewage Screw Pump Station No. 2, although a higher flow rate can occur in this line since it can surcharge.

The Raw Sewage Influent Screw Pumps (Screw P.S. #1) normally could be replaced in part with new 48" screw pumps but the pumps are no longer being manufactured hence no replacement pumps are available. Modifications in raw sewage pumping would be required to exceed the current Q_{UP} rate of 20.8 MGD.

Similar calculations are contained in Exhibit 12 for the existing Primary and Secondary Treatment Units and the Disinfection Units. In Table 6, a Summary of Limiting Hydraulic Unit Capacities - Process Units is tabulated. Differing units are subject to differing hydraulic limitations. The Primary Clarifiers and Internal Recirculation Pumping are Q_{A-24} limited; the Primary Flash Units, Secondary Clarifiers, Return Sludge Pumping, and Disinfection Units are Q_{P-24} limited; and Raw Sewage Metering, Secondary Clarifiers, 48" Effluent Pipe, Effluent Metering and 30" Effluent Pipe are Q_{UP} Rate limited.

With respect to the Process Units, the limiting flow rate would be a Q_{P-24} flow of 18.46 MGD for the Secondary Clarifiers.

TABLE 6

SUMMARY OF LIMITING HYDRAULIC UNIT CAPACITIES

PROCESS UNITS

		QA-24	QP-24	QUP RATE
A.	Raw Sewage Metering (P.S. No. 2 Discharge)			31.80 MGD
B.	Primary Flash Mix Units		31.41 MGD	
C.	Primary Clarifiers			
	(1) Flocculation Sections	9.54 MGD		
	(2) Clarifier Sections	10.05 MGD		
D.	Aeration Reactors	8.44 MGD*		
E.	Secondary Clarifiers		18.46 MGD	29.54 MGD
F.	Return Sludge Pumping		18.88 MGD	
G.	Internal Recirculation Pumping	9.81 MGD		
H.	Disinfection Units		29.70 MGD**	
I.	48" Effluent Pipe			>90.0 MGD
J.	Effluent Metering			32.57 MGD
K.	30" Effluent Pipe			51.7 MGD

* - Hydraulic Not Critical To Process Operation

** - Including Additional Contact Time In Downstream Piping and Backwash Storage Units

As previously indicated, the Headworks limiting flow was a Q_{UP} Rate of 27.0 MGD in the piping between the Headworks and Screw Pump Station No. 2.

The maximum re-rating Q_{A-24} flow would be a function of the 27.0 MGD Q_{UP} Rate of Flow and the Q_{UP}:Q_{P-24} ratio and the Q_{P-24}:Q_{A-24} ratio selected.

In Exhibit 10, the Q_{UP} Rate to Q_{P-24} flow over the past 16 months averaged 1.50:1. This would therefore set the Q_{P-24} peak 24 hour flow at 18.0 MGD.

The Q_{A-24} average 24 hour flow would, from Table 6, be limited to 8.44 MGD, which is the maximum flow to the Aeration Reactors if a minimum 16 hours hydraulic retention time is desired. Although the Aeration Reactor is not an hydraulic design, but rather an organic/ nutrient design, prudent design considerations indicate a minimum 16 hour detention time to be desirable at Q_{A-24} flow.

The Q_{A-24} 24 hour average daily flow for re-rating the facility is arbitrarily set at 8.25 MGD, which must then be analyzed both hydraulically and organically for adequacy of design.

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BASIS OF DESIGN AT 8.25 MGD Q_{A-24}

In order to analyze the adequacy of the existing facility being re-rated to Q_{A-24} flow of 8.25 MGD, a basis of design including organic and nutrient loadings must be developed. In Table 7, this Basis of Design is provided.

With respect to hydraulic flows, the Q_{A-24} design flow is set at 8.25 MGD. The Q_{P-24} flow is set at 18.00 MGD, which provides a Q_{P-24}:Q_{A-24} ratio of 2.19:1. This may be compared to the actual average ratio for the past 16 months of 1.621:1, from Table 3.

The Q_{UP} Rate of Flow is set at 27.00 MGD, which provides a Q_{UP}:Q_{A-24} ratio of 3.27:1. At the highest recorded Q_{UP} rate in the past 16 months, the actual peak Q_{UP}:Q_{A-24} ratio was 2.89:1, and at the average of Q_{UP} combined meter peak flows from Exhibit 10, the ratio was 2.49:1.

The hydraulic Basis of Design, therefore, provides margins in anticipated Q_{P-24} and Q_{UP} flow rates well in excess of actual recorded values for the past 16 months.

With respect to organic loadings, raw influent loadings are set at concentrations of 240 mg/l BOD_5 and 280 mg/l TSS, per the average concentrations for the last 16 months from Exhibit 7.

With respect to nutrient loadings, raw influent loadings are set at concentrations of 40 mg/l TKN; 22 mg/l NH_3-N; 18 mg/l N_{ORG}; 3 mg/l NO_2 + NO_3-N; and 8 mg/l P. Average concentrations for the past 16 months have been 35.2 mg/l TKN; 18.5 mg/l NH_3-N; 16.8 mg/l

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TABLE 7

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
BASIS OF DESIGN
WWTF RE-RATING

I.	HYDRAULIC FLOWS	
	Q_{A-24}, Average Daily Flow	8.25 MGD - 1,298 m^3/h 5,711 GPM - 360.5 l/s
	Q_{P-24}, Peak 24 Hour Flow	18.00 MGD - 2,832 m^3/h 12,461 GPM - 786.7 l/s (219% of Q_{A-24})
	Q_{UP}, Peak Hourly Flow Rate	27.00 MGD - 4,248 m^3/h 18,691 GPM - 1,180 l/s (327% of Q_{A-24})
II.	ORGANIC LOADINGS - RAW INFLUENT	
	BOD_5	16,513 Lb/D - 7,506 kg/D (240 mg/l @ Q_A)
	TSS	19,265 Lb/D - 8,757 kg/D (280 mg/l @ Q_A)
III.	NUTRIENT LOADINGS - RAW INFLUENT	
	TKN	2,752 Lb/D - 1,251 kg/D (40 mg/l @ Q_A)
	NH_3-N	1,514 Lb/D - 688 kg/D (22 mg/l @ Q_A)

N_{ORG}	1,328 Lb/D - 563 kg/D (18 mg/l @ Q_A)
NO_2-N + NO_3-N	206 Lb/D - 94 kg/D (3 mg/l @ Q_A)
P	550 Lb/D - 250 kg/D (8 mg/l @ Q_A)

IV. ORGANIC LOADINGS - SECONDARY INFLUENT

BOD_5 (35% Removal - Current 49.6%)	10,899 Lb/D - 4,954 kg/D (158 mg/l @ Q_A)
TSS (55% Removal - Current 71.6%)	9,247 Lb/D - 4,203 kg/D (134 mg/l @ Q_A)

V. NUTRIENT LOADINGS - SECONDARY TREATMENT

TKN (15% Removal - Current 20.1%)	2,339 Lb/D - 1,063 kg/D (34 mg/l @ Q_A)
NH_3-N (4.5% Removal - Current 6.7%)	1,445 Lb/D - 657 kg/D (21 mg/l @ Q_A)
N_{ORG} (27.8% Removal - Current 34.6%)	894 Lb/D - 406 kg/D (13 mg/l @ Q_A)
NO_2-N + NO_3-N (60% Increase - Current 56.8% Increase)	330 Lb/D - 150 kg/D (4.8 mg/l @ Q_A)
P (25% Removal - Current 36.8%)	413 Lb/D - 188 kg/D (6 mg/l @ Q_A)

N_{ORG}; 2.4 mg/l NO_2 + NO_3-N; and 6.1 mg/l P. Nutrient raw influent concentrations are therefore set higher than current average values.

The organic and nutrient loadings to the Counter-Current Low Load Aeration Secondary Treatment Process will be a function of the efficiency of Primary Treatment. For the past 16 months, Primary BOD_5 and TSS efficiencies have averaged 49.6% and 71.6% respectively. The average surface settling rate has been, at current Q_{A-24} flows, 481 GPD/SF. At 8.25 MGD Q_{A-24}, the surface settling rate would be 821 GPD/SF.

At Hatfield Township, the primary clarification is accomplished by Flocculating Clarifiers, which have a provision for chemical addition to promote higher solids removals, but current operation does not provide for pre-primary clarifier chemical use. The ability to add chemicals in the future exists, to offset, at least in part, the average surface settling rate increase at 8.25 MGD.

Notwithstanding this ability for future chemical addition, Secondary Influent organic loadings at 8.25 MGD are set at a BOD_5 primary efficiency of 35% and a primary TSS efficiency of 55%, or well below current average efficiencies.

With respect to Secondary Influent nutrient loadings at 8.25 MGD, primary efficiencies are set at 15% TKN removal (currently 20.1%); 4.5% NH_3-N removal (currently 6.7%); 27.8% N_{ORG} removal (currently 34.6%); 60% NO_2 + NO_3-N increase (currently 56.8% increase); and 25% P removal (currently 36.8%).

This revised Basis of Design at 8.25 MGD must be analyzed to determine existing plant modifications necessary to permit the re-rating of the facility.

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ANALYSIS OF EXISTING FACILITY AT 8.25 MGD

In Exhibit 13, Component Calculations are developed for each element of the existing plant at a re-rated 8.25 MGD, and associated organic and nutrient design loadings. Where modifications are required to existing units to meet the re-rated flows and loadings, they are indicated in Exhibit 13.

A listing of required modifications to permit the re-rating of the existing facility from 6.43 MGD to 8.25 MGD is contained in Table 8. With the exception of the modifications to Screw Pump Station Nos. 1 and 2, the modifications required are limited and not major cost items.

Additional diffusers in each Aeration Reactor (80 each) can be accomplished at scheduled maintenance periods on the diffusers.

The spare, unmounted 700 mm diameter Return Sludge Tube Screw Pump as a stand-by unit would require no interruption of plant operations.

Modifications to the channels in the Headworks would require units to be out-of-service only long enough to remove existing channel slabs, and to pour new curbing and install new grating. This work would be scheduled during the pump modifications to Pump Station No. 1.

The major modifications would be the increase at each Screw Pump Station to a capacity of 27.0 MGD, which would be the Q_{UP} Rate of Flow at a Q_{A-24} re-rated flow of 8.25 MGD.

TABLE 8

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

MODIFICATIONS REQUIRED

TO

RE-RATE HYDRAULIC CAPACITY

FROM

6.43 MGD TO 8.25 MGD

1. RAW SEWAGE SCREW PUMP STATION NO. 1

   Increase Maximum Pumping Capacity From 20.09 MGD To 27.0 MGD

2. INFLUENT CHANNEL TO MECHANICAL SCREENS

   Remove Existing Slab Over Channel And Add 1'-4" High Curbing Along Channel, All Covered With New Grating

3. MECHANICAL SCREENS

   Remove Existing Slab Over Channels And Add 1'-4" High Curbing Along Channel, All Covered With New Grating

4. EXIT CHANNEL FROM MECHANICAL SCREENS (INFLUENT CHANNEL TO GRIT/GREASE UNIT)

   Remove Existing Slab Over Channel And Add 1'-4" High Curbing Along Channel, All Covered With New Grating

5. RAW SEWAGE SCREW PUMP STATION NO. 2

   Increase Maximum Pumping Capacity To 27.0 MGD

6. AERATION REACTORS

   Add 160 Additional Diffusers.

7. RETURN SLUDGE SCREW PUMPING

   Provide One (1) Unmounted 700 mm Diameter Tube Mounted Screw Pump For Standby Installation.

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Under normal circumstances, the existing Enclosed Screw Pumps might be replaced, one at a time, with 48" diameter pumps, with no interruption to existing operations. Unfortunately, however, this type of screw pump is no longer manufactured by the equipment maker who supplied the original pumps, and there is only one other manufacturer still making such pumps. Dimensions at the existing pump structures and discharge mountings appear to not be compatible with the required dimensions of the remaining enclosed screw pump manufacturer without major modifications.

Further, the existing enclosed screw pumps have had, since initial operations in 1984 at Pump Station No. 1, and later since 1987 in Pump Station No. 2, a history of failed lower bearings and some upper bearings, which has resulted in significant maintenance costs to repair.

After a thorough evaluation, the Authority has determined that it does not desire to replace the existing pumps with larger sized enclosed screw pumps.

Neither Screw Pump Station No. 1 or No. 2 can be modified without extended interruption of raw sewage pumping. It is therefore necessary to develop a temporary raw sewage pumping plan during the station modification period, since operation of the entire facility is dependent upon raw sewage pumping.

MODIFICATIONS TO RAW SEWAGE PUMP STATIONS

As indicated in the prior section, modifications to the Treatment units to re-rate the facility to 8.25 MGD are limited in scope, excepting for modifications to Raw Sewage Screw Pump Stations 1 and 2.

The modifications in these pump stations would be extensive, and would require additional temporary or permanent raw sewage pumping capacity so that the operation of the Treatment Facility could proceed uninterrupted during the construction, excepting for minor, short-term periods.

The July 1990 Preliminary Engineering Report considered four (4) alternatives in providing the additional raw sewage pumping capacity.

Alternative No. 1

Alternative No. 1 would retain all the Enclosed Screw Pumps in both pump stations, and add supplemental pumps and pump structures outside each existing screw pump station.

The supplemental pumping capacity to each of the Screw Pump Stations would be 7.0 MGD, providing a permanent total pumping capacity of 27.8 MGD at Screw Pump Station No. 1 and 31.0 MGD at Screw Pump Station No. 2.

This alternative would not require temporary pumping during the construction of the supplemental pump stations, but would require two (2) new supplemental structures, one (1) at each screw pump station.

This alternative is dependent upon continuing reliability of the existing Enclosed Screw Pumps, which have shown a history of extensive problems since their original installation. The pumps in Screw Pump Station No. 1 initiated operation in December 1984, and each of the five (5) pumps had to be rebuilt due to separation of the torque tube from the pump enclosure. Further, each of the lower bearings has been replaced at least once, and several of the upper bearings have been replaced.

More recently, one of the repaired pumps in Screw Pump Station No. 1 has sheared at the upper coupling and there is a potential that the repairs done earlier were the same for all five (5) pumps, and are susceptible to failure for the remaining four (4) pumps.

A continuing problem with Enclosed Screw Pumps in Screw Pump Station No. 1 is the periodic submergence of the lower bearings, occasioned by very heavy flow rates in wet-weather periods. While these lower bearings have been lubricated immediately after each submergence, potential damage to the bearings cannot be accurately determined. There is no way to limit these periodic submergences, excepting to construct a permanent, separate pump station to handle all flows in excess of a submergence condition. The capacity of such a separate station would have to

be sufficient to prevent bearing submergence, and would reduce the capacity of the existing five (5) pumps in order to guarantee non-submergence. This separate permanent pumping would require duplicate pumps, each rated at a minimum of 8.0 MGD.

The pumps in Screw Pump Station No. 2, while not subject to submergence, have been troubled also with both upper and lower bearing failures since operation commenced in this Station in September 1987.

The original pump manufacturer, Schreiber Corporation, Inc., no longer makes and markets the Enclosed Screw Pump. The manufacturer has extended additional warranties on the pumps in both stations, but would not be able to replace pumps with new units in future years. There is only one (1) other manufacturer known to market an Enclosed Screw Pump, and similar problems with this manufacturer's pumps have been reported.

In short, there would appear to be a serious question as to the reliability of this type of Pump, and reliance on Enclosed Screw pumps for the next 15 - 20 years as the basic raw sewage pumping.

Alternative No. 2

Alternative No. 2 would be to replace the ten (10) Enclosed Screw Pumps in Screw Pump Station Nos. 1 and 2 with new Open Flight Screw Pumps. Such a program would require temporary pumping of ±15 MGD capacity during the construction and pump replacement period.

A total of six (6) new Open Flight Screw Pumps would be required, three (3) each at Station Nos. 1 and 2. All six (6) pumps would be identical, and would be 72" diameter pumps, each rated at 9,400 GPM (13.54 MGD). Design Q_{UP} of 27.0 MGD would be provided with one (1) pump out of service at each Station.

The Open Flight Screw Pumps would require modifications to the existing pump structures including construction of pedestals in the wet well to support the pumps, and the construction of channels along the sloping portions of the Stations into which the pump torque tubes and flights would be placed. Portions of the existing station concrete would have to be removed to permit the pump channels to be formed.

The Open Flight Screw Pump lower bearings would always be submerged, but a positive lubrication system would be provided such that the submergence of the bearings would not affect the bearings or the pump operation.

The Open Flight Screw Pumps would have the advantage of being able to sustain higher wet-weather flow rates than is possible with the existing Enclosed Screw Pumps.

Open Flight Screw Pumps are available from a number of manufacturers, and have a long history of consistent and reliable operation.

Alternative No. 3

Alternative No. 3 would be similar to Alternative No. 2 in that Open Flight Screw Pumps would be utilized, but the total of pumps would be four (4), two (2) in each existing Screw Pump Station. The pumps would be identical to those in Alternative No. 2, that is, 72" Diameter pumps, each rated at 9,400 GPM (13.54 MGD). As with Alternative No. 2, temporary pumping of ±15 MGD capacity would be required during the construction and pump replacement period.

With two (2) pumps only in each station, a third pump, an Immersible Pump, could be placed in the wet-well of Station No. 1 as a stand-by pump in the event one (1) of the Open Flight Screw Pumps were out-of-service. The Immersible Pump would also be rated at 9,400 GPM (13.54 MGD).

The Immersible Pump in existing Screw Pump Station No. 1 would be piped so that it would discharge to either the Headworks Influent Channel, or at the Effluent Channel at existing Screw Pump Station No. 2.

As a stand-by unit in Station No. 1, this pump would preserve full Preliminary Treatment in the Headworks Units. In the event of a failure of one of the two Open Flight Screw Pumps in Station No. 2, this stand-by unit in Station No. 1 could discharge at the Effluent Channel of Station No. 2. This single Immersible Pump would serve as a stand-by pump for both Stations.

An alternative to Alternative No. 3 would be to utilize a 5,000 GPM (7.20 MGD) Immersible Pump in existing Screw Pump Station No. 1 and to rehabilitate existing Centrifugal Pump Station No. 2 with it's three (3) 3,500 GPM Centrifugal Pumps serving as a back-up, with the Immersible Pump, to a failure of an Open Flight Screw Pump in Station No. 1. The discharge of existing Centrifugal Station No. 2 would have to be re-piped from the existing Surge Storage Tanks to the Effluent Channel of Screw Pump Station No. 2.

Alternative No. 3 would, in essence, reduce the need for one (1) 9,400 GPM Immersible Pump in Screw Pump Station No. 2, and reduce the total of Open Flight Screw Pumps from six (6) to four (4).

The alternative to Alternative No. 3 would utilize a smaller Immersible Pump in Screw Pump Station No. 1, together with a re-habilitated existing Centrifugal Station No. 2, re-piped to the Effluent Channel of Screw Pump Station No. 2.

Alternative No. 4

Alternative No. 4 would replace all ten (10) existing Enclosed Screw Pumps in both Stations with a total of six (6) Immersible Pumps, three (3) in each Station.

Each Immersible Pump would be rated at 9,400 GPM (13.54 MGD), providing full stand-by capability at each Station at the re-rated Q_{UP} rate of 27.0 MGD.

As with Alternative Nos. 2 and 3, temporary pumping of ±15 MGD capacity would be required during the construction and pump replacement period.

Temporary Pumping

Alternative Nos. 2, 3 and 4 all would require temporary pumping during the construction and pump replacement period. This temporary pumping requirement has been indicated at ±15 MGD capacity. This capacity would provide for a buffer over the highest Q_{UP} rate historically seen on April 25, 1991, at 14.292 MGD (Exhibit 10). This would provide a peak pumping capacity of ±10,417 GPM.

The period of temporary pumping required would appear to be a minimum of six (6) months. The Project would be scheduled such that no work on the Stations would be undertaken until all the new pumps and auxiliary equipment were on-site. Removal of the existing pumps and concrete removals in the existing Stations would require up to 2 months. New concrete channels (Alternative Nos. 2 and 3) would require, with curing time, up to 2 months. New Pump installation would require an estimated 1 to 2 months to complete all installation and the necessary electrical work.

It is obvious that ±15 MGD of temporary pumping would be expensive, and would require a construction period to prepare for service. Further, since the pumping would be temporary, for a ±6 month period, full stand-by temporary pumping should not be required.

The type of temporary pumping provided could vary significantly. An initial consideration was to excavate an area near the existing Screw Pump Station No. 1 and use a hypalon liner with concrete pump pedestals and a concrete retaining wall 76 feet long and 12 feet high. Such an excavation would require sloping sides to maintain an angle of repose, and initial sketches and calculations indicated a surface excavation of ±180 x 60 feet rectangle, and a bottom excavation ±16 feet square, with a total depth of 24 feet. The depth is controlled by the invert elevations of the interceptor sewers.

Such a temporary construction would be in an area in which rock is prevalent, and such a pumping arrangement would require new meter flumes on support columns, since the existing meters would be out of service during the temporary pumping period.

This initial approach was deemed too expensive and was discarded as a temporary pumping alternative.

A second consideration would be to construct a concrete pump and metering pit, similar to the meter and wet well area of Screw Pump Station No. 1, adjacent to Screw Pump Station No. 1. This would also be expensive construction and would have no use after the new pumps were in place in Stations 1 and 2.

Either of these temporary pumping considerations would utilize only one (1) pumping operation, directly to the Effluent Channel of Screw Pump Station No. 2, hence there would be no Screening and Grit and Grease Removal available during the temporary pumping period. The

only way to preserve Preliminary Treatment during portions of the construction period would be to provide additional ±15 MGD capacity at Screw Pump Station No. 2. In such a situation, the temporary pumping would be low head pumping at each Station versus high head pumping with one (1) set of temporary pumps at Pump Station No. 1 area only.

Construction of such duplicate temporary pumping would be expensive, and would not be a cost-effective consideration.

In the investigations of how best to provide temporary pumping, since it would be an expensive short-term cost, a review of piping in and around Screw Pump Station No. 1, together with future pumping considerations, for recycle flows after the new Incinerator became operational, led to consideration of combining temporary pumping with permanent future requirements, even to a plant capacity expansion beyond 8.25 MGD.

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ALTERNATIVE TEMPORARY/PERMANENT PUMPING

Future requirements indicate the need in 10 - 15 years to increase the Plant Capacity to some level beyond 8.25 MGD. The obvious design would be the construction of a third Train at ±4 MGD to increase total plant capacity to ±12 - 12.5 MGD.

The construction of the new Incinerator will result in recycle flows at 24 DT/D sludge processing of ±750,000 to 800,000 GPD. At lesser sludge processing levels, the recycle flows will be less, but the rate of sludge processing will be independent of HTMA plant capacity due to the potential of significant outside sources for sludge, hence sizeable recycle flows may be present before a third train expansion is required.

As a part of the Incinerator design, a separate Scrubber recycle-centrate return pump station would be utilized. The design capacity of such a station would be ±650 - 700 GPM, or 0.94 to 1.01 MGD.

Current plant recycle flows are all directed to Screw Pump Station No. 1 via a 36" diameter pipe in the area of Pump Station No. 1. This 36" diameter pipe is virtually at a flat grade in this area with a fall of ±2 inches in ±200 feet. This 36" recycle pipe could be intercepted near existing Centrifugal Pump Station No. 2 (Structure E-3 on Construction Drawings) and directed to this existing Centrifugal Station.

Station E-3 contains three (3) 3,500 GPM centrifugal pumps and was the main pump station for the prior 3.6 MGD Activated Sludge Plant, with a 20" force main to that plant's Surge Storage Basins. The maximum pumping capacity of this station was ±5,200 GPM, or ±7.5 MGD. The station is currently periodically exercised, and could be re-habilitated at a fairly moderate cost. The 20" force main from this Station E-3 could be intercepted near the existing Surge Basins, and continued to the Effluent Channel of Screw Pump Station No. 2.

This rehabilitation/pipe extension would permit Station E-3 to serve as the future plant recycle station, eliminating the need to construct a separate station as a part of the Incinerator Project.

At the same time, the flat slope on the 36" existing plant recycle line would permit this line to reverse flows from Screw Pump Station No. 1 to Centrifugal Station E-3, to serve as a part of the temporary pumping requirements.

Existing Centrifugal Pump Station E-3, is connected to existing Centrifugal Pump Station E-2, by a 30" diameter pipe such that the wet wells of the two (2) stations can serve both stations. Centrifugal Station E-2 was the original main pump station for the 1967 initial Sewage Treatment Plant, and had three (3) pumps, rated at 500 GPM, 1,000 GPM and 1,300 GPM. These pumps are no longer operational nor exercised. This Station E-2 pumps through a force main to the existing Surge Storage Basins, which are currently unused.

Centrifugal Station E-2 would not have sufficient wet well capacity, even with the interconnection to Station E-3 wet well, to enable it to be fitted with new pumps as additional temporary pumping. It is, however, an existing structure, and it could be gutted and the dry well area converted to a wet well, which would be sufficient to enable an Immersible Pump(s) to be installed to augment the temporary pumping capacity.

A new force main would be required from Station E-2 to the Effluent Channel of Screw Pump Station No. 2. The pumping capacity necessary to provide ±15 MGD temporary pumping (with Station E-3 and its separate force main) would be ±7.5 MGD, or ±5,200 GPM.

This rehabilitated Station E-2 would not, at ±7.5 MGD capacity, have sufficient capacity after temporary pumping was no longer necessary, to serve as a full standby to modified Screw Pump Station No. 1.

Instead, it was recommended in the Preliminary Engineering Report that this existing Station be fitted with 9,400 GPM (13.54 MGD) total effective capacity Immersible Pumps with 2-Speed motors. During temporary pumping, the pump would provide the full temporary requirements with one (1) of the 3,500 GPM pumps in Station E-3 (total 18.58 MGD), and after temporary pumping, would, at the lower speeds, provide the effective total 9,400 GPM to the discharge channel of Screw Pump Station No. 1.

In the future, when a plant expansion to ±12 - 12.5 MGD were required, this Station E-2 could become the main pump station for the third Process train of ±4 MGD. Since the existing Headworks could not absorb a Q_{A-24} flow of 12 - 12.5 MGD, a separate new Headworks would be required in conjunction with the third Process Train, including a third Primary Clarifier-Flocculator, and additional Chlorine Contact capacity at that time.

The utilization of existing Centrifugal Stations E-3 and E-2 for temporary pumping would be applicable to Alternative Nos. 2, 3 and 4 as discussed prior herein.

For Alternative No. 1, retaining all existing Enclosed Screw Pumps, and adding 7.0 MGD pumping capacity, a different, but similar, arrangement would be required. Existing Station E-2 would be gutted, as in the temporary pumping requirement, and would be fitted with a new Pre-Rotation Immersible Pump with a capacity of 5,000 GPM (7.2 MGD). Existing Station E-3 would be rehabilitated to serve as a recycle pump station. A new 36" line from Screw Pump Station No. 1 to Centrifugal Station E-2 would be required, and a new pump sump with weir would be required in Screw Pump Station No. 1. A new Immersible Pump sump would be required at Screw Pump Station No. 2, adjacent to the Station.

The Preliminary Engineering Report of July 1990 developed detailed construction requirements for the four (4) alternatives; detailed horsepower requirements for each alternative; and a Supplement to Preliminary Engineering Report (July 1990) developed detailed construction cost estimates for each alternative.

On the basis of a subjective review of these three (3) elements, it was recommended that Alternative No. 3 be selected, and that existing Centrifugal Pump Station Nos. E-2 and E-3 be renovated, to provide both the ±15 MGD Temporary Pumping requirement, and later, after installation of the two (2) 72" Open-flight Screw Pumps in the existing Screw Pump Stations, modified Station E-2 would serve as the stand-by for both Screw Pump Station Nos. 1 and 2 72" open-flight screw pumps. Renovated Station E-3 would then serve as the recycle-scrubber water-centrate pump station.

The Authority concurred in this recommendation, and Alternative No. 3 was selected as the design basis for modification of the existing Screw Pump Stations as a part of the re-rating of the facility from 6.43 MGD (current hydraulic capacity) to 8.25 MGD.

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SELECTED RAW SEWAGE PUMPING ALTERNATIVE NO. 3

The selected Raw Sewage Pumping Alternative No. 3 was slightly modified during the design period by the addition of a new flow diversion box between Existing Centrifugal Pump Stations E-2 and E-3, to enable future permanent diversion of stand-by pumping for Screw Pump Station Nos. 1 and 2 to modified Station E-2, without affecting the utilization of Station E-3 for separate recycle-scrubber water-centrate pumping around the Headworks.

A Flow Schematic for Alternative No. 3 is contained in Figure 1.

During the use of modified Existing Centrifugal Pump Station No. E-2 as the temporary pumping facility for installing the new open-flight screw pumps, Preliminary Treatment (i.e. Mechanical Screening and Mechanical Grit/Grease Removal) will not be available. During this period, modifications to Headworks structure channels will take place. Thereafter, when this Station E-2 serves as the stand-by pumping unit for either Screw Pump Station No. 1 or No. 2, Preliminary Treatment to 13.54 MGD will be available, but not beyond 13.54 MGD if a pump is out-of-service in either Screw Pump Station.

Alternative No. 3 provides the option for installation at some future date of a third 72" open flight screw pump in each Screw Pump Station, and the conversion of Station E-2 to the raw sewage pump station for a third Headworks-Primary Clarifier-Counter-Current-Disinfection Train at ±4 - 4.125 MGD.

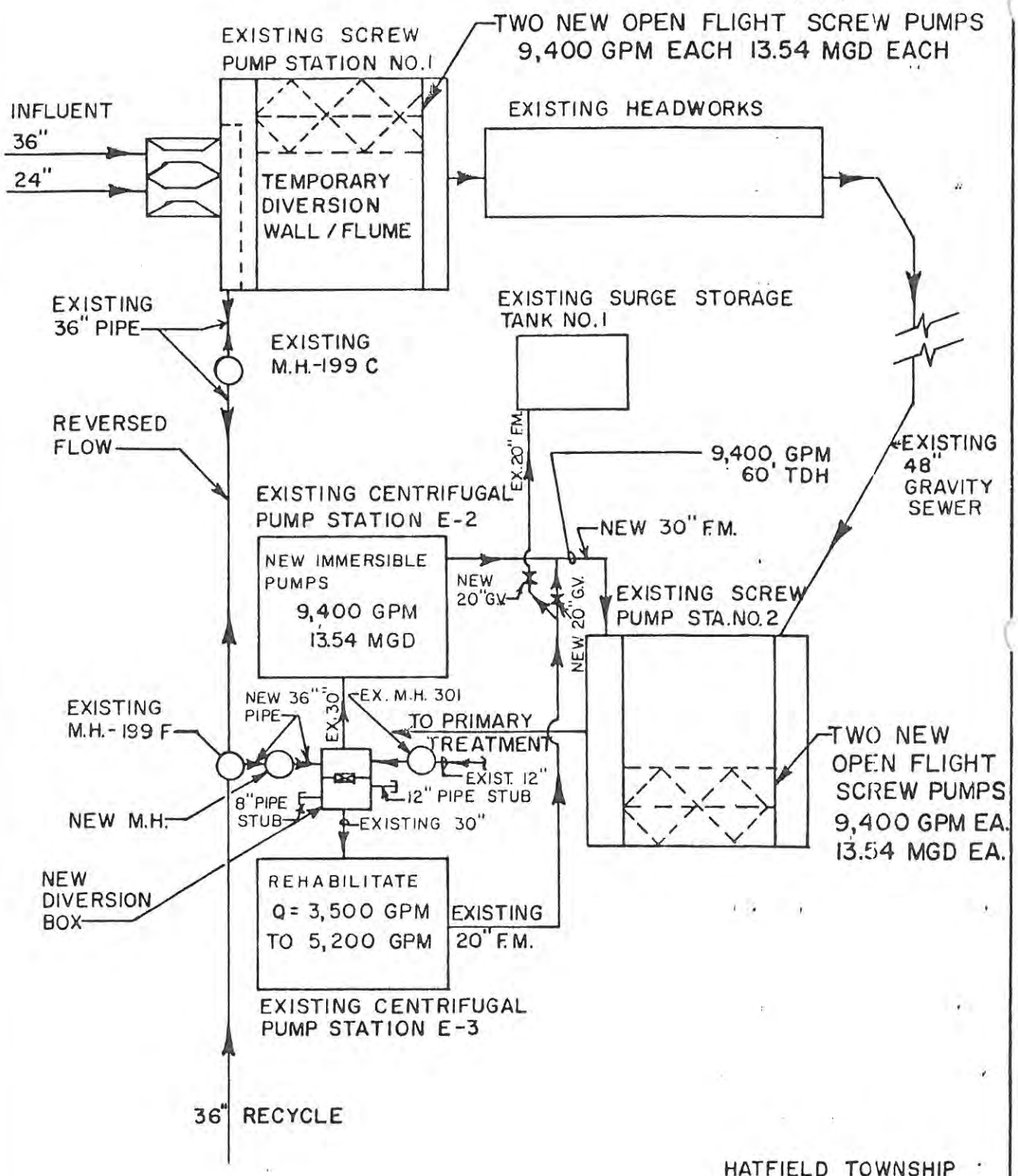

FIGURE NO. 1

TRACY ENGINEERS, INC., CAMP HILL, PA.

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ACTUAL OPERATING DATA - SINGLE COUNTER-CURRENT TRAIN

The calculations and analyses herein demonstrate that the existing 6.43 MGD Wastewater Treatment Facility can be re-rated to 8.25 MGD, with certain modifications and additions, the major items being the increase in raw sewage pumping at existing Screw Pump Station Nos. 1 and 2 from a peak rate of 20.8 MGD to 27.0 MGD.

While the calculations herein are sufficient to demonstrate the feasibility of the re-rating on a design basis, there is additional operating data available to support the design calculations.

On occasions, the existing two-train Secondary Treatment Facility has operated for extended periods with only one-train in service. One such operation occurred in the 47 day period extending from April 13, 1990 to May 29, 1990. Actual operations during this 47 day period are tabulated in Exhibit 14 for flow and influent/effluent concentrations. In Exhibit 14, efficiencies of treatment for BOD_5, TSS, NH_3-N, NO_2 + NO_3-N and P are also developed on a concentration basis.

While concentration limitations form a portion of NPDES PA 0026247 effluent discharge limitations, they do not depict actual operating conditions as accurately as influent loadings and effluent discharge loadings.

Therefore, the data tabulated in Exhibit 14 on a concentration basis has been converted in Exhibit 15 on an organic loading basis, in kg/D, and in Exhibit 16 on a nutrient basis, also in

kg/D. Also indicated in Exhibits 15 and 16 are the equivalent influent flows and loadings if both trains had been in service during the 47 day period, and the efficiencies obtained with the single-train operation.

It should be noted in both Exhibits 15 and 16, that averages are provided separately for the 18 days single train operation in April 1990, and the 29 days single-train operation in May 1990, since effluent limitations become more stringent for BOD_5 and NH_3-N commencing May 1 of each year. Also shown in Exhibits 15 and 16 are the averages for the full 47 day period on a continuous basis.

The data in Exhibits 14 , 15 and 16 is summarized in Table 9 on an Influent Loadings/ Concentrations basis. From Table 9, it can be seen that the % of design loadings for flow and critical parameters during the 47 day single-train operation were 167.8% of one-train design flow; 174.3% of BOD_5 design loading; 207.4% of TSS design loading; 79.0% of NH_3-N design loading; 378.6% of NO_2 + NO_3-N design loading; and 107.5% of P design loading.

In Table 10, the same data is summarized on an Effluent Discharge Loadings/Concentrations basis. In Table 10, for BOD_5 and NH_3-N, the data reflects the change in limitations for discharge commencing May 1 of each year.

Flows during the 47 day single-train operation period averaged 167.8% of one-train design, being 151.5% in April and 170.4% in May. Effluent BOD_5 discharge loading was 13.8% of permitted in April, and 46.2% of permitted in May.

TABLE 9

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SINGLE-TRAIN OPERATION

COMPARISON

OF

INFLUENT LOADINGS/CONCENTRATIONS

Parameter	Design Limitation	April 13 - 30, 1990 Actual	% Of Design	May 1 - 29, 1990 Actual	% Of Design	April 13 - May 29, 1990 Actual	% Of Design
Q_{A-24}, 24 Hour Average Daily Flow	3.215 MGD	4.870 MGD	151.5%	5.478 MGD	170.4%	5.245 MGD	167.8%
Q_{P-24}, 24 Hour Peak Daily Flow	6.825 MGD	7.882 MGD	115.5%	9.108 MGD	133.4%	9,108 MGD	133.4%
Q_{UP}, Ultimate Peak Flow Rate	10.400 MGD	NA	-	NA	-	NA	-
BOD_5 - kg/D	2,689	4,402	163.7%	4,862	180.8%	4,686	174.3%
mg/l	220.6	238.4	108.1%	234.1	106.1%	235.7	106.8%
TSS - kg/D	2,689	5,404	201.0%	5,686	211.4%	5,578	207.4%
mg/l	220.6	292.7	132.7%	273.8	124.1%	280.5	127.2%
NH_3-N - kg/D	438	332.9	76.8%	354.0	80.8%	345.9	79.0%
mg/l	36.0	18.0	50.0%	17.0	47.2%	17.4	48.3%
$NO_2 + NO_3$-N - kg/D	14	60.4	431.4%	48.4	345.7%	53.0	378.6%
mg/l	1.15	3.27	284.4%	2.33	202.6%	2.67	232.2%
P - kg/D	105	103.3	98.4%	118.8	113.1%	112.9	107.5%
mg/l	8.6	5.6	65.1%	5.7	66.3%	5.7	66.3%

NA - Not Available

TABLE 10

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SINGLE-TRAIN OPERATION

COMPARISON

OF

EFFLUENT DISCHARGE LOADINGS/CONCENTRATIONS

Parameter			Permit/ Design Limitation	April 13 - 30, 1990 Actual	% Of Permit/ Design	May 1 - 29, 1990 Actual	% Of Permit/ Design	April 13 - May 29, 1990 Actual	% Of Permit/ Design
Q_{A-24}, 24 Hour Average Daily Flow			3.215 MGD	4.870 MGD	151.5%	5.478 MGD	170.4%	5.245 MGD	167.8%
Q_{P-24}, 24 Hour Peak Daily Flow			6.825 MGD	7.882 MGD	115.5%	9.108 MGD	133.4%	9,108 MGD	133.4%
Q_{UP}, Ultimate Peak Flow Rate			10.400 MGD	NA	-	NA	-	NA	-
BOD_5	-	kg/D 11/1 - 4/30	731.3	128.9	13.8%				
		mg/l	30	7.0	23.3%				
		kg/D 5/1 - 10/31	365.6			168.6	46.2%		
		mg/l	15			8.1	54.0%		
TSS	-	kg/D	731.3	186.1	25.4%	180.6	24.7%	182.7	25.0%
		mg/l	30	10.1	33.7%	8.7	29.0%	9.2	30.7%
NH_3-N	-	kg/D 11/1 - 4/30	146.3	62.1	42.4%				
		mg/l	6	3.4	56.7%				
		kg/D 5/1 - 10/31	48.8			62.0	127.0%		
		mg/l	2			3.1	155.0%		
$NO_2 + NO_3$-N	-	kg/D 7/1 - 10/31	219.4	154.2	70.3%	117.4	53.5%	131.5	59.9%
		mg/l	9	8.35	92.8%	2.33	62.8%	6.61	73.4%
P	-	kg/D	48.8	10.9	22.3%	12.5	25.6%	11.9	24.4%
		mg/l	2	0.6	30.0%	0.6	30.0%	0.6	30.0%

NA - Not Available

Effluent TSS discharge loading averaged 25.0% of permitted for the 47 day period, and 25.4% in April and 24.7% in May. TSS has no seasonal differential.

Effluent NH_3-N discharge loading averaged 42.4% of permitted in April, but 127.0% of permitted in May, when the limitation changed from 146.3 kg/D to 48.8 kg/D.

Effluent NO_2 + NO_3-N discharge loading averaged 59.9% of permitted for the 47 day period, and 70.3% in April and 53.5% in May. Effluent NO_2 + NO_3-N limitations are effective only July 1 through October 31, and were not in force in April and May.

Effluent P discharge loading averaged 24.4% of permitted for the 47 day period, and 22.3% in April and 25.6% in May. As with TSS, there is no seasonal differential for P, as to effluent limitations.

The data in Tables 9 and 10 can be more easily compared as indicated in Table 11, for the two periods April and May. Flows were 151.5% of design for a single train in April and 170.4% in May.

BOD_5 effluent in April was 13.8% of permit, despite a loading of 163.7% of design. In May, the BOD_5 effluent was 54.0% of permit, despite a loading of 180.8% of design. The BOD_5 effluent limit reduced commencing May 1.

TABLE 11

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SINGLE-TRAIN OPERATION

INFLUENT/EFFLUENT LOADINGS

Parameter		Design/ Permit Limitation	April 13 - 30, 1990 Actual	% Of Design/ Permit	May 1 - 29, 1990 Actual	% Of Design Permit
Q_{A-24}, 24 Hour Average Daily Flow		3.215 MGD	4.870 MGD	151.5%	5.478 MGD	170.4%
Q_{P-24}, 24 Hour Peak Daily Flow		6.825 MGD	7.882 MGD	115.5%	9.108 MGD	133.4%
BOD_5 -	Influent	2,689 kg/D	4,402 kg/D	163.7%	4,862 kg/D	180.8%
	Effluent - April	731.3 kg/D	128.9 kg/D	17.6%[A]		
	Effluent - May	365.6 kg/D			168.8 kg/D	54.0%
TSS -	Influent	2,689 kg/D	5,404 kg/D	201.0%	5,686 kg/D	211.4%
	Effluent	731.3 kg/D	186.1 kg/D	25.4%[A]	180.6 kg/D	24.7%
NH_3-N -	Influent	438 kg/D	332.9 kg/D	76.0%	354 kg/D	80.8%
	Effluent - April	146.3 kg/D	62.1 kg/D	42.4%[A]		
	Effluent - May	48.8 kg/D			62.0 kg/D	127.0%[A]
$NO_2 + NO_3$-N -	Influent	14 kg/D	60.4 kg/D	431.4%	48.4 kg/D	345.7%
	Effluent	219.4 kg/D	154.2 kg/D	70.3%[A]	117.4 kg/D	53.5%[A]
P -	Influent	105 kg/D	103.3 kg/D	98.4%	118.8 kg/D	113.1%
	Effluent	48.8 kg/D	10.9 kg/D	22.3%[A]	12.5 kg/D	25.6%[A]

A - Of Permit Limitation

TSS effluent was 25.4% of permit in April and 24.7% of permit in May, with corresponding influent loadings of 201.0% in April and 211.4% in May of design.

NH_3-N effluent was 42.4% of permit in April, against 76.0% loading of design. In May, when the limit changed, the NH_3-N effluent was 127.0% of permit, against 80.8% loading of design.

NO2 + NO3-N effluent was 70.3% of permit in April and 53.5% of permit in May, with corresponding design loadings of 431.4% and 345.7% respectively.

P effluent was 22.3% of permit in April and 25.6% of permit in May, despite respective loadings of 98.4% of design in April and 113.1% of design in May.

Table 11 indicates that despite influent loadings at or well above design for all parameters except NH_3-N, all permit limitations were met with the exception of NH_3-N in May.

It is to be noted in Table 11 that influent loadings in May averaged above influent loadings in April, with the exception of NO_2 + NO_3-N.

The hydraulic loading in April was equivalent to 9.74 MGD for a two-train operation, and the hydraulic loading in May was equivalent to 10.96 MGD for a two-train operation. These averages were well above the re-rating 8.25 MGD Q_{A-24} design flow.

The single exception to meeting effluent limitations in the 47 day period was the NH_3-N discharge loading (and concentration) for May.

The data in Tables 9, 10 and 11 (and Exhibits 14, 15 and 16) for each day in the 47 day single-train operational period must be affected by cumulative carry-overs from preceeding days, particularly very high flow days, which is the reason averages over an extended period are more representative of actual operation than is a single-day result.

Notwithstanding this situation, operations for flow days in the 47 day period ranging between 7.25 and 9.25 MGD are tabulated in Exhibits 17 and 18, to determine what the average results were on days in the single-train operation when the averages were close, hydraulically, to the re-rating hydraulic design of 8.25 MGD.

This data in Exhibits 17 and 18 is summarized in Table 12, in the same format as Table 11 for the full 47 day period of single-train operation. The hydraulic averages for these 22 days of flow between 7.25 and 9.25 MGD was 8.156 MGD for an equivalent two-train operation, with an average of 8.192 equivalent MGD in April, and 8.124 equivalent MGD in May. The hydraulic flows were 127.4% of design for April and 126.4% of design for May, as contrasted to 151.5% and 170.4% of design for the full 47 day period.

BOD_5 influent loadings were somewhat less, on average, in both April and May, than for the full 47 days, but only slightly so, being 160 to 170% of design. Effluent BOD_5 discharge loadings

TABLE 12

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SINGLE-TRAIN OPERATION

7.25 - 9.25 MGD

INFLUENT/EFFLUENT LOADINGS

Parameter	Design/ Permit Limitation	April 13 - 30, 1990 Actual	% Of Design/ Permit	May 1 - 29, 1990 Actual	% Of Design/ Permit
Q_{A-24}, 24 Hour Average Daily Flow	3.215 MGD	4.096 MGD	127.4%	4.062 MGD	126.4%
Q_{P-24}, Peak 24 Hour Flow	6.825 MGD	4.645 MGD	68.1%	4.568 MGD	66.9%
BOD_5 - Influent	2,689 kg/D	4,345 kg/D	161.6%	4,615 kg/D	171.6%
Effluent - April	731.3 kg/D	109.8 kg/D	15.0%A		
Effluent - May	365.6 kg/D			107.8 kg/D	29.5%A
TSS - Influent	2,689 kg/D	5,326 kg/D	298.1%	5,181 kg/D	192.7%
Effluent	731.3 kg/D	122.2 kg/D	16.7%A	98.2 kg/D	13.4%A
NH_3-N - Influent	438 kg/D	319.1 kg/D	72.8%	342.9 kg/D	78.3%
Effluent - April	146.3 kg/D	83.9 kg/D	57.4%A		
Effluent - May	48.8 kg/D			57.2 kg/D	117.2%A
$NO_2 + NO_3$-N - Influent	14 kg/D	45.3 kg/D	323.6%	19.6 kg/D	140.0%
Effluent	219.4 kg/D	123.6 kg/D	56.3%A	117.7 kg/D	53.6%A
P - Influent	105 kg/D	100.1 kg/D	95.3%	109.0 kg/D	103.8%
Effluent	48.8 kg/D	10.4 kg/D	21.3%A	10.0kg/D	20.5%A

A - Of Permit Limitation

were less in both months, markedly so in May reducing from 54% of permit, to 29.5% of permit.

Influent TSS loadings were somewhat less than for the 47 day period, but were still almost double design values. Effluent discharge loadings reduced measurably for each month, especially in May to only 13.4% of permit.

Influent NH_3-N loadings were only slightly decreased from 47 day values and effluent discharge loadings in April rose to 57.4% of permit, but were only 117.2% of permit in May.

Influent NO_2 + NO_3-N loadings reduced markedly in both months, but especially so in May. Effluent discharge loading reduced measurably in April but was virtually the same in May.

Influent P loadings were only slightly less in each month, as were effluent discharge loadings, which were close to 20 - 21% of permit.

The data in Exhibits 17 and 18, and in Table 12, illustrates that at hydraulic conditions comparable in the period of single-train operation to the re-rating 8.25 MGD design, resulted in greater operating efficiencies than for the full 47 day period, with only the May NH_3-N effluent discharge loading being above current permit.

Margins-of-operating safety for all other parameters, at ±8.2 MGD equivalent actual operation were 46 - 80% of current permit conditions.

SINGLE TRAIN NH_3-N

The operating data for the 47 days of single-train operation indicate exceptional efficiencies for all parameters at overload conditions beyond an equivalent 8.25 MGD hydraulic flow, with the single exception of NH_3-N, in the summertime period when the concentration limitation reduces from 6 mg/l to 2 mg/l.

The NH_3-N loading in May 1990 was 80.8% of current design hence an initial observation might be that the re-rating could be suspect with respect to NH_3-N reduction. This observation would not, however, be an accurate depiction of the nitrification capability of the re-rating.

Nitrification is a function of supplying sufficient O_2 with sufficient MLVSS, to enable the nitrification activity to sustain. In a Counter-Current Low Load Aeration Reactor, the O_2 available is a competition between oxidizing bacteria (BOD_5) and nitrifying bacteria (NH_3-N). Where the amount of O_2 available to satisfy both demands is not present, the nitrifying activity will become less efficient, since the oxidizing bacteria will consume the available O2 at the expense of the nitrifying bacteria.

The waste at Hatfield Township over the 16 month period January 1990 - April 1991 indicated an average influent NH_3-N loading of 343 kg/D (Exhibit 8). This is not, however, the true ammonia nitrogen loading, since the influent TKN loading averaged 658 kg/D, and the N_{ORG} (organic nitrogen) loading averaged 315 kg/D.

A significant portion of the N_{ORG} will convert to NH_3-N, and be additive to the measured NH_3-N loading, thus increasing significantly the ammonia nitrogen requiring nitrification (conversion to NO_3-N).

In the re-rating analysis at 8.25 MGD (Exhibit 13), it was assumed that 90% of the N_{ORG} would ammonify. In the period May 1 - May 29, 1990, the influent BOD_5 averaged 4,615 kg/D, and the influent NH_3-N averaged 342.9 kg/D, or exactly the 16 month average (Exhibit 8). N_{ORG} in the influent averaged by interpolation, ±315 kg/D. The oxygen requirements for oxidation and nitrification for this period would be a function of required O_2 per kg of BOD_5 and NH_3-N to the Secondary Treatment process, and would also be a function of the actual Primary treatment efficiencies on each day.

Average Primary efficiencies for the 16 month period (Table 4) were 49.6% for BOD_5, 6.7% for NH_3-N and 34.6% for N_{ORG}. Data is not available for each of the 29 days in May 1990, but oxygen requirements can be estimated for this period, if the Primary average efficiencies are assumed to have occurred each day in the period. Since they must obviously not have been the same each day, the result must be only an approximation of oxygen requirements each day.

Loadings to Secondary Treatment would be assumed to average

4,615 kg BOD_5/D x 0.504	=	2,326 kg BOD_5/D
342.9 kg NH_3-N/D x 0.933	=	320 kg NH_3-N/D
315.0 kg N_{ORG}/D x 0.654	=	206 kg N_{ORG}/D

Oxygen requirements would have been assumed to average

2,326 kg BOD_5/D x 1.6 kg O_2/kg BOD_5	=	3,722 kg O_2/D
320 kg NH_3-N/D x 4.6 kg O_2/kg NH_3-N	=	1,472 kg O_2/D
206 kg N_{ORG}/D x 4.6 kg O_2/kg N_{ORG}	=	948 kg O_2/D
		6,142 kg O_2/D
	=	255.9 kg O_2/Hr

Air requirements, at an assumed α of 0.80 would have been assumed to average

$$Q_{AIR} = \frac{255.9 \text{ kg } O_2/\text{Hr}}{0.280 \text{ kg } O_2/m^3 \text{ Air} \times 0.0468/\text{m} \times 4.8 \text{ m}}$$

$$= 4{,}069 \text{ } m^3 \text{ Air/Hour}$$

$$= 67.8 \text{ } m^3 \text{ Air/Minute}$$

At an α of 0.75, the Q_{AIR} requirement would have been assumed to average 72.3 m^3 Air/Minute.

There are three (3) Blowers at each Reactor, each two-speed, with a high-speed out-put each at 34.3 m^3 Air/Minute. With one (1) blower stand-by, the air output would have been 68.6 m^3 Air/Minute, or virtually the same as the average air requirement.

Since the air requirement assumed a uniform Primary efficiency on a daily basis, and assumes an α on a constant basis, neither of which is static, but rather varies from day to day, and in the

case of α, from hour to hour, precise air requirements for each day in May 1990 cannot be determined. On an average basis, however, and utilizing the assumptions noted, Air Requirements on heavy loading days in May 1990 would have been estimated at

	kg O_2/D	kg O_2/Hr	m3 Air/Minute
May 1	9,750	406	107.6
May 5	8,406	350	92.7
May 10	8,077	337	89.3
May 11	6,869	286	75.8
May 18	8,466	353	93.5
May 19	7,516	313	83.0
May 23	6,860	286	75.7
May 24	7,717	322	85.2

It is evident that in May 1990, there were days when the calculated air requirements (utilizing Primary efficiency averages and an α of 0.80 on a constant basis) were significantly greater than the output of two blowers. The fact that these overload O_2 requirements resulted in only exceeding current effluent discharge loading limits by ±17% in May 1990 attests to the nitrification capability at loadings ±15% greater than will be design loadings in the re-rated 8.25 MGD.

NH_3-N discharge loading in May 1990 was the only parameter exceeding current discharge limits, and the limitation was Air capacity by reason of high overloads of BOD_5, NH_3-N and N_{ORG}, which were well beyond 8.25 MGD design loadings.

It is requested that PA DER approve the Re-Rating application of Hatfield Township Municipal Authority, to increase the capacity of the existing AWTF from

Q_{A-24} Average Daily Flow	6.43 MGD	To	8.25 MGD
Q_{P-24} Peak 24 Hour Flow	13.65 MGD	To	18.00 MGD
Q_{UP} Rate	20.80 MGD	To	27.00 MGD
Raw Influent BOD_5	5,378 kg/D	To	7,506 kg/D
Raw Influent TSS	5,378 kg/D	To	8,757 kg/D
Raw Influent TKN	1,192 kg/D	To	1,251 kg/D
Raw Influent NH_3-N	877 kg/D	To	688 kg/D
Raw Influent NO_2-N + NO_3-N	28 kg/D	To	94 kg/D
Raw Influent P	210 kg/D	To	250 kg/D
Primary Effluent BOD_5	3,765 kg/D	To	4,954 kg/D
Primary Effluent TSS	2,151 kg/D	To	4,203 kg/D
Primary Effluent TKN	1,192 kg/D	To	1,063 kg/D
Primary Effluent NH_3-N	877 kg/D	To	657 kg/D

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
DESIGN ENGINEER'S REPORT AND ANALYSIS
ON RE-RATING CAPACITY OF EXISTING
ADVANCED WASTEWATER TREATMENT FACILITY

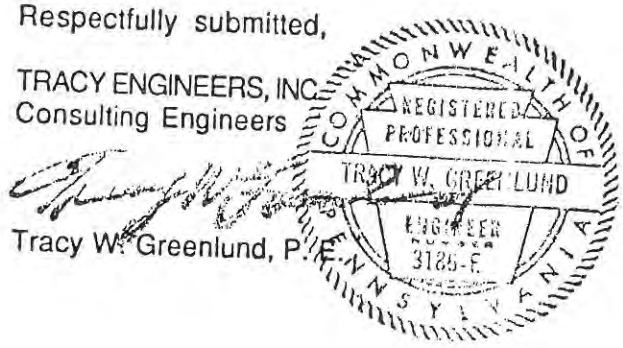
Primary Effluent NO_2-N + NO_3-N	28 kg/D	To	150 kg/D
Primary Effluent P	210 kg/D	To	188 kg/D

It is further requested that the NPDES Permit PA 0026247, be revised to reflect the following:

Parameter	Permitted Discharge Concentration mg/l	Permitted Discharge Loading kg/D	Permitted Discharge Loading Lb/D
BOD_5 - 5/1 - 10/31	15	469	1,032
- 11/1 -4 /30	30	938	2,064
TSS	30	938	2,064
NH_3-N - 5/1 - 10/31	2	62.5	138
- 11/1 - 4/30	6	187.5	412
NO_2 + NO_3-N - 7/1 - 10/31	9	281.5	619
P	2	62.5	138

Respectfully submitted,

TRACY ENGINEERS, INC.
Consulting Engineers



Tracy W. Greenlund, P.E.

June 3, 1991

EXHIBITS

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS

OF

FLOW DATA - I

	Hatfield Township Adjusted MGD	Hatfield Borough MGD	Montgomery Township Adjusted MGD	Total Adjusted MGD	Hatfield Township Meter MGD	Montgomery Township Meter MGD	Combined Total MGD	Effluent Meter MGD	Deviation MGD	% Deviation
January 1990	3.430	0.746	1.579	5.755	4.073	1.597	5.670	4.912	0.758	13.4
February	3.235	0.680	1.479	5.394	3.825	1.496	5.321	4.664	0.657	12.3
March	2.641	0.559	1.221	4.421	3.119	1.239	4.358	3.810	0.548	12.6
April	3.245	0.679	1.449	5.373	3.832	1.467	5.299	4.667	0.632	11.9
May	3.336	0.682	1.647	5.665	3.903	1.665	5.568	4.597	0.971	17.4
June	2.680	0.658	1.414	4.752	3.227	1.432	4.658	3.920	0.738	15.8
July	2.035	0.499	1.128	3.662	2.416	1.145	3.561	3.319	0.242	6.8
August	2.131	0.537	1.067	3.735	2.544	1.085	3.629	3.588	0.041	1.1
September	1.756	0.476	1.068	3.300	2.122	1.085	3.207	2.953	0.254	7.9
October	1.974	0.560	1.283	3.817	2.410	1.301	3.711	3.043	0.668	18.0
November	1.707	0.677	1.277	3.661	2.268	1.294	3.562	3.130	0.432	12.1
December	3.042	0.758	1.758	5.558	3.694	1.775	5.469	4.780	0.689	12.6
January 1991	3.286	0.825	2.122	6.233	4.005	2.139	6.145	5.435	0.710	11.6
February	2.725	0.647	1.535	4.907	3.247	1.553	4.800	4.232	0.568	11.8
March	3.810	0.812	2.265	6.887	4.490	2.282	6.773	5.790	0.983	14.5
April	3.065	0.718	1.916	5.699	3.638	1.933	5.571	4.884	0.687	12.3
Averages	2.576	0.657	1.513	4.926	3.301	1.530	4.831	4.233	0.598	12.4

EXHIBIT 1

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS

OF

FLOW DATA - II

	Hatfield Township Adjusted MGD	Hatfield Township Adjusted Peak MGD	Hatfield Borough MGD	Hatfield Borough Peak MGD	Montgomery Township Adjusted MGD	Montgomery Township Adjusted Peak MGD	Total Adjusted MGD	Total Adjusted Peak MGD	Total of Peaks
January 1990	3.430	5.899 (10)	0.746	1.351 (25)	1.579	3.233 (25)	5.755	8.802 (10)	10.483
February	3.235	5.384 (24)	0.680	0.965 (4)	1.479	2.383 (4)	5.394	8.070 (24)	8.732
March	2.641	4.707 (17)	0.559	0.918 (20)	1.221	2.183 (17)	4.421	7.437 (17)	7.808
April	3.245	5.388 (4)	0.679	1.235 (3)	1.449	2.583 (3)	5.373	8.288 (4)	9.206
May	3.336	5.728 (30)	0.682	1.282 (30)	1.647	2.883 (29)		9.393 (30)	10.648
June	2.680	5.379 (19)	0.658	1.042 (19)	1.414	2.183 (15)	4.752	8.404 (19)	8.604
July	2.035	4.178 (21)	0.499	0.703 (13)	1.128	2.283 (21)	3.662	7.022 (21)	7.164
August	2.131	3.494 (6)	0.537	0.776 (6)	1.067	1.483 (6)	3.735	5.753 (6)	5.753
September	1.756	3.514 (22)	0.476	0.738 (22)	1.068	1.583 (22)	3.300	5.835 (22)	5.835

EXHIBIT 2
- 1 -

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY - ANLAYSIS OF FLOW DATA - II

	Hatfield Township Adjusted MGD	Hatfield Township Adjusted Peak MGD	Hatfield Borough MGD	Hatfield Borough Peak MGD	Montgomery Township Adjusted MGD	Montgomery Township Adjusted Peak MGD	Total Adjusted MGD	Total Adjusted Peak MGD	Total of Peaks
October	1.924	3.434 (23)	0.560	0.854 (24)	1.283	1.793 (23)	3.817	6.029 (23)	6.081
November	1.707	2.797 (11)	0.677	1.224 (10)	1.277	2.263 (10)	3.661	6.161 (10)	6.284
December	3.042	5.832 (18)	0.758	1.544 (4)	1.758	3.873 (30)	5.558	9.107 (18)	11.249
January 1991	3.286	5.428 (10)	0.825	1.607 (12)	2.122	3.763 (16)	6.233	9.019 (16)	10.798
February	2.725	4.316 (7)	0.647	0.882 (7)	1.535	1.963 (7)	4.907	7.161 (7)	7.161
March	3.810	6.079 (4)	0.812	1.249 (23)	2.265	6.443 (6)	6.887	11.451 (6)	13.771
April	3.065	5.578 (22)	0.718	1.503 (21)	1.916	3.603 (21)	5.699	9.866 (21)	10.684
Averages	2.756	4.821	0.657	1.117	1.513	2.568	4.926	7.987	8.725
		1.75:1		1.70:1		1.70:1		1.62:1	1177:1

( ) - Day Of Month

EXHIBIT 2
- 2 -

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS
OF
FLOW DATA - III
HATFIELD TOWNSHIP METER

	Average Dry-Weather Weekday Flow MGD	Average Dry-Weather Week-End Flow MGD	Peak Flow In Month MGD	Ratio Peak Flow To Average Weekday Flow	Ratio Peak Flow To Average Weekend Flow	Ratio Peak Flow To Hatfield Twp. Average Meter Flow
January 1990	3.124	2.652	6.690	2.14:1	2.52:1	1.64:1
February	3.180	3.050	6.200	1.95:1	2.03:1	1.62:1
March	2.620	2.683	5.200	1.98:1	1.94:1	1.67:1
April	3.020	2.500	6.100	2.02:1	2.44:1	1.59:1
May	3.100	2.900	6.800	2.19:1	2.34:1	1.74:1
June	2.664	2.780	6.300	2.36:1	2.27:1	1.95:1
July	2.315	2.200	4.700	2.03:1	2.14:1	1.95:1
August	2.360	1.982	4.100	1.74:1	2.07:1	1.61:1
September	1.995	1.908	4.200	2.11:1	2.20:1	1.98:1
October	2.127	2.120	4.100	1.93:1	1.93:1	1.70:1
November	2.086	2.052	3.780	1.81:1	1.84:1	1.67:1
December	2.254	1.925	6.820	3.03:1	3.54:1	1.85:1
January 1991	2.730	2.745	6.240	2.29:1	2.27:1	1.56:1
February	2.803	2.850	5.060	1.81:1	1.78:1	1.56:1
March	2.938	2.770	6.960	2.37:1	2.51:1	1.55:1
April	2.470	2.720	6.480	2.62:1	2.38:1	1.78:1
Averages	2.612	2.490	5.608	2.15:1	2.25:1	1.70:1

EXHIBIT 3

EXHIBIT 4

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS
OF
FLOW DATA - IV
MONTGOMERY TOWNSHIP METER

	Average Dry-Weather Weekday Flow MGD	Average Dry-Weather Week-End Flow MGD	Peak Flow In Month MGD	Ratio Peak Flow To Average Weekday Flow	Ratio Peak Flow To Average Weekend Flow	Ratio Peak Flow To Mont. Twp. Average Meter Flow
January 1990	1.206	1.070	3.250	2.69:1	3.04:1	2.04:1
February	1.100	1.200	2.400	2.18:1	2.00:1	1.60:1
March	1.060	1.150	2.200	2.08:1	1.91:1	1.78:1
April	1.140	1.250	2.600	2.28:1	2.08:1	1.77:1
May	1.400	1.325	2.900	2.07:1	2.19:1	1.74:1
June	1.309	1.391	2.200	1.68:1	1.58:1	1.54:1
July	1.090	1.017	2.390	2.19:1	2.35:1	2.09:1
August	1.066	1.098	1.500	1.41:1	1.37:1	1.38:1
September	1.007	1.006	1.500	1.49:1	1.49:1	1.38:1
October	1.128	1.278	1.810	1.60:1	1.42:1	1.39:1
November	1.162	1.326	2.280	1.96:1	1.72:1	1.76:1
December	1.386	1.352	3.890	2.81:1	2.88:1	2.19:1
January 1991	1.624	1.680	3.780	2.33:1	2.25:1	1.77:1
February	1.374	1.428	1.980	1.44:1	1.39:1	1.28:1
March	1.555	1.848	6.460	4.15:1	3.50:1	4.30:1
April	1.654	1.708	3.620	2.19:1	2.12:1	2.41:1
Averages	1.266	1.320	2.798	2.21:1	2.12:1	1.83:1

TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
ANALYSIS
OF
FLOW DATA - V
HATFIELD TOWNSHIP METER
+
MONTGOMERY TOWNSHIP METER

	Average Daily Flow Hatfield Twp. Meter MGD	Average Daily Flow Montg. Twp. Meter MGD	Average Daily Combined Flow MGD	Peak Flow In Month MGD	Ratio Peak To Average
January 1990	4.073	1.597	5.670	8.700	1.53:1
February	3.825	1.496	5.321	8.000	1.50:1
March	3.119	1.239	4.358	7.400	1.70:1
April	3.832	1.467	5.299	8.200	1.55:1
May	3.903	1.665	5.568	9.200	1.65:1
June	3.227	1.432	4.659	8.300	1.78:1
July	2.416	1.145	3.561	7.000	1.97:1
August	2.544	1.085	3.629	5.600	1.54:1
September	2.122	1.085	3.207	5.800	1.81:1
October	2.410	1.301	3.711	5.910	1.59:1
November	2.268	1.294	3.562	6.060	1.70:1
December	3.694	1.775	5.469	9.930	1.82:1
January 1991	4.005	2.139	6.145	8.880	1.45:1
February	3.247	1.553	4.800	7.040	1.47:1
March	4.490	2.282	6.772	11.262	1.66:1
April	3.638	1.933	5.571	9.970	1.76:1
Averages	3.301	1.530	4.831	7.942	1.64:1

EXHIBIT 5

TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
ANALYSIS
OF
FLOW DATA - VI
EFFLUENT METER

	Average Daily Effluent Flow MGD	Peak Flow In Month MGD	Ratio Peak To Average
January 1990	4.912	7.920	1.61:1
February	4.664	6.900	1.48:1
March	3.810	7.400	1.94:1
April	4.667	7.000	1.50:1
May	4.597	8.100	1.76:1
June	3.920	7.390	1.89:1
July	3.319	7.400	2.23:1
August	3.588	5.710	1.59:1
September	2.953	3.800	1.29:1
October	3.043	5.260	1.73:1
November	3.130	5.500	1.76:1
December	4.780	11.700	2.45:1
January 1991	5.435	7.950	1.46:1
February	4.232	6.300	1.49:1
March	5.790	8.350	1.44:1
April	4.884	9.140	1.87:1
Averages	4.233	7.239	1.71:1

EXHIBIT 6

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS

OF

ORGANIC DATA

	Combined Adjusted Influent MGD	Influent BOD_5 mg/l	Influent BOD_5 kg/D	Influent TSS mg/l	Influent TSS kg/D	Secondary Influent BOD_5 kg/D	Secondary Influent TSS kg/D
January 1990	5.755	252	5,498	281	6,131	3,612	1,852
February	5.394	240	4,908	288	5,889	2,758	1,661
March	4.421	247	4,140	342	5,732	2,231	1,485
April	5.373	226	4,603	277	5,642	2,209	1,879
May	5.665	238	5,111	272	5,841	2,300	1,571
June	4.752	282	5,080	325	5,855	2,774	1,171
July	3.662	399	5,539	476	6,608	2,721	1,097
August	3.735	395	5,593	463	6,556	1,954	1,288
September	3.300	312	3,903	434	5,429	1,576	901
October	3.817	315	3,941	371	4,641	1,614	826
November	3.661	238	3,303	235	3,261	2,012	1,416
December	5.558	161	3,392	181	3,814	1,728	1,412
January 1991	6.233	164	3,875	186	4,395	1,985	2,174
February	4.907	185	3,441	197	3,665	1,842	1,339
March	6.887	164	4,282	152	3,968	2,402	1,932
April	5.699	235	5,077	309	6,676	2,420	1,858
Averages	4.926	240	4,480	281	5,255	2,259	1,491
Primary Treatment Efficiency						49.6%	71.6%

EXHIBIT 7

EXHIBIT 8

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS

OF

NUTRIENT DATA - I

	Combined Adjusted Influent MGD	Influent TKN mg/l	Influent TKN kg/D	Influent NH_3-N mg/l	Influent NH_3-N kg/D	Influent NO_2-NO_3-N mg/l	Influent NO_2-NO_3-N kg/D	Influent P mg/l	Influent P kg/D
January 1990	5.755	24.5	528	14.2	310	3.3	72	5.5	120
Februry	5.394	28.8	589	15.5	317	3.5	72	5.2	106
March	4.421	39.9	669	16.1	270	3.4	57	5.4	90
April	5.373	29.6	603	16.0	326	2.8	57	5.4	110
May	5.665	35.0	752	17.4	374	2.2	47	5.7	122
June	4.752	37.0	666	17.9	322	1.2	22	6.4	115
July	3.662	58.0	805	27.8	386	2.5	35	8.6	119
August	3.735	51.9	735	28.0	396	1.5	21	8.2	116
September	3.300	58.2	728	30.1	377	2.8	35	9.1	114
October	3.817	48.3	699	23.8	344	1.6	23	7.8	113
November	3.661	43.7	606	23.7	329	1.5	21	9.7	135
December	5.558	29.7	626	16.7	352	2.2	46	5.4	114
January 1991	6.233	25.3	598	16.8	397	2.2	52	5.4	128
February	4.907	32.1	597	17.3	322	3.5	65	5.4	100
March	6.887	22.4	585	11.5	300	1.8	47	3.4	89
April	5.699	34.0	735	16.9	365	1.7	37	6.3	136
Averages	4.926	35.2	658	18.4	343	2.4	44	6.1	114

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS
OF
NUTRIENT DATA - II

	Combined Adjusted Influent MGD	Secondary Influent TKN mg/l	Secondary Influent TKN kg/D	Secondary Influent NH_3-N mg/l	Secondary Influent NH_3-N kg/D	Secondary Influent NO_2-NO_3-N mg/l	Secondary Influent NO_2-NO_3-N kg/D	Secondary Influent P mg/l	Secondary Influent P kg/D
January 1990	5.755	23.6	515	15.2	332	5.0	109	4.2	92
February	5.394	27.6	564	15.0	307	5.3	108	3.9	80
March	4.421	32.0	536	15.8	265	4.6	77	3.3	55
April	5.373	24.9	507	16.2	330	6.6	134	3.8	77
May	5.665	26.8	576	17.6	378	3.8	82	3.2	69
June	4.752	28.4	512	16.7	301	3.2	58	4.3	77
July	3.662	43.8	608	25.7	357	1.5	21	4.8	67
August	3.735	38.3	542	28.2	399	0.6	8	4.2	59
September	3.300	40.1	502	25.2	315	0.7	9	4.8	60
October	3.817	35.1	508	20.8	301	0.8	12	3.7	54
November	3.661	35.6	494	22.0	305	3.9	54	4.1	57
December	5.558	23.3	491	14.9	314	4.9	103	3.7	78
January 1991	6.233	21.7	513	12.5	295	3.3	78	3.2	76
February	4.907	25.4	472	14.5	270	6.2	115	4.2	78
March	6.887	21.8	569	12.5	326	3.6	94	3.6	94
April	5.699	23.9	516	15.0	324	2.0	43	3.7	80
Averages	4.926	28.2	526	17.1	320	3.7	69	3.9	72
Primary Treatment Efficiency			20.06%		6.71%		(54.17%)		36.84%

EXHIBIT 9

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS
OF
FLOW DATA - VII
QUP FLOW RATES

Day	Hatfield Twp. Meter Average Daily Flow MGD	Hatfield Township Meter Peak Flow Rate MGD	Montgomery Twp. Meter Average Daily Flow MGD	Montgomery Twp. Meter Peak Flow Rate MGD	Combined Meter Average Daily Flow MGD	Combined Meter Peak Flow Rate MGDA	Effluent Meter Average Daily Flow MGD	Hatfield Township QUP Flow Rate To QP	Montgomery Township QUP Flow Rate To QP	Combined QUP Flow Rate To QP
6/16/90	4.928	12.384	2.193	4.320	7.121	13.392	6.570	2.51:1	1.97:1	1.88:1
6/19/90	4.646	9.936	1.932	4.032	6.578	13.104	5.890	2.14:1	2.09:1	1.99:1
6/20/90	6.276	8.208	2.010	3.024	8.286	10.800	7.390	1.31:1	1.50:1	1.30:1
6/23/90	2.911	7.488	1.280	3.600	4.191	11.088	3.520	2.57:1	2.81:1	2.65:1
1/9/91	5.060	8.928	3.061	4.464	8.121	12.096	7.320	1.76:1	1.46:1	1.49:1
1/10/91	6.328	10.080	2.548	7.056	8.786	12.672	7.690	1.59:1	2.77:1	1.44:1
1/11/91	4.741	7.488	2.511	4.320	7.252	11.232	6.680	1.58:1	1.72:1	1.55:1
1/12/91	5.051	10.512	3.654	4.464	8.705	14.112	7.770	2.08:1	1.22:1	1.62:1
1/13/91	5.741	9.648	2.852	4.176	8.593	11.808	7.650	1.68:1	1.46:1	1.37:1
1/16/91	5.091	8.784	3.779	4.464	8.870	12.672	7.550	1.73:1	1.18:1	1.43:1
1/17/91	5.856	10.080	3.011	6.768	8.867	13.824	7.950	1.72:1	2.25:1	1.56:1
1/21/91	5.177	8.064	2.392	3.312	7.569	10.800	6.870	1.56:1	1.38:1	1.43:1
3/3/91	3.655	7.362	2.046	3.456	5.701	11.088	4.980	2.01:1	1.69:1	1.94:1
3/4/91	6.958	8.352	2.425	3.744	9.383	11.232	8.350	1.20:1	1.54:1	1.20:1
3/6/91	4.836	7.488	2.269	3.456	7.105	10.656	6.460	1.55:1	1.52:1	1.50:1
3/7/91	6.098	8.784	2.320	3.456	8.418	11.520	7.580	1.44:1	1.49:1	1.37:1
3/18/91	5.659	8.208	3.390	4.608	9.049	12.240	8.100	1.45:1	1.36:1	1.35:1
3/19/91	6.209	11.808	2.553	3.600	8.762	13.680	7.960	1.90:1	1.41:1	1.56:1
3/23/91	5.314	7.776	3.100	4.320	8.414	10.512	7.730	1.46:1	1.39:1	1.25:1
3/24/91	6.315	8.640	2.482	3.312	8.797	10.800	8.110	1.37:1	1.33:1	1.23:1
3/25/91	4.894	7.632	2.142	6.048	7.036	12.960	6.610	1.56:1	2.82:1	1.84:1
3/30/91	6.234	8.064	2.628	3.600	8.862	11.664	8.070	1.29:1	1.37:1	1.32:1
4/21/91	6.171	9.360	3.618	4.896	9.789	13.689	9.140	1.52:1	1.35:1	1.40:1
4/22/91	6.483	8.640	2.506	3.888	8.989	11.952	8.470	1.33:1	1.55:1	1.33:1
4/24/91	6.223	9.936	2,823	4.176	9.046	13.536	8.230	1.60:1	1.48:1	1.50:1
4/25/91	5.834	11.520	2.447	3.456	8.281	14.256	7.610	1.97:1	1.41:1	1.72:1
5/6/91	6.250	9.072	3.374	4.320	9.624	12.672	8.830	1.45:1	1.28:1	1.32:1
5/7/91	6.283	8.784	2.665	6.336	8.948	13.536	8.130	1.40:1	2.38:1	1.51:1
Averages	5.544	9.052	2.643	4.310	8.184	12.271	7.672	1.63:1	1.63:1	1.50:1

A - Combind Meter Peak Flow-Rate Is Less Than Sum Of Meter Peak Flows Since Peaks Do Not Occur In Each Meter Simultaneously

EXHIBIT 10

TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

LIMITING HYDRAULIC UNIT CAPACITIES

EXISTING AWTF

HEADWORKS UNITS

1. INTERCEPTOR SEWERS TO WWTF

A. From Hatfield Township To Influent Metering -

36" Diameter Pipes, 0.0062 Slope

Capacity Flowing Full - 34.0 MGD

Capacity Flowing 7/10 Full - 29.24 MGD

Allowable Design Capacity - 15.0 MGD

B. From Montgomery Township To Influent Metering -

24" Diameter Pipes, 0.0096 Slope

Capacity Flowing Full - 14.6 MGD

Capacity Flowing 7/10 Full - 12.56 MGD

Allowable Design Capacity - 6.13 MGD

C. To Influent Metering, Combined Total Flows -

Capacities Flowing Full -

34.0 MGD + 14.6 MGD = 48.6 MGD

Capacities Flowing 7/10 Full -

29.24 MGD + 12.56 MGD = 41.80 MGD

Allowable Design Capacities -

15.0 MGD + 6.13 MGD = 21.13 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - HEADWORKS UNITS

2. RAW SEWAGE FLOW METERING

A. Hatfield Township Flow Meter -

1'-6" Throat, Capacity Range 0.10 - 15.90 MGD

Meter Will Be At 94.3% Of Capacity At Interceptor Allowable Design Capacity

B. Montgomery Township Flow Meter -

1'-0" Throat, Capacity Range 0.07 - 10.41 MGD

Meter Will Be 58.9% Of Capacity At Interceptor Allowable Design Capacity

3. SCREW P.S. NO. 1 DISCHARGE COLLECTION BOX

Dimensions - 6'-0" W x 32'-0" L x 0'-9" Average D.

Volume - 144 Cu. Ft. = 1,080 Gallons

4. SCREW P.S. NO. 1 DISCHARGE CHANNEL TO HEADWORKS

$Q = AV$ Where $V = \frac{1.486}{n} R^{2/3} S^{1/2}$

$n = 0.016$

$R = 0.75$

$S = 0.112$

$Q = 6 \text{ Ft.} \times \frac{1.486}{0.016} \times 0.75^{2/3} \times 0.112^{1/2}$

$= 6 \text{ Ft}^2 \times 92.875 \times 0.819 \times 0.334$

$= 152.4 \text{ CFS}$

$= 1{,}143 \text{ Gal/Sec.} = 68.595 \text{ GPM}$

$= 98.8 \text{ MGD}$

TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - HEADWORKS UNITS

5. INFLUENT CHANNEL TO MECHANICAL SCREENS

A. At Existing Dimensions -

Width, W = 1.83 m (6.00 Ft)
Depth, T = 0.52 m (1.706 Ft)
Area, A = 1.83 m x 0.52 m = 0.952 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 0.952 m^2 x 1 m/s x 3,600 Sec/Hour = 3,427.2 m^3/h
= 21.78 MGD

B. At Grating Replacement Of Existing Slab Over Channel -

Width, W = 1.83 m (6.00 Ft)
Depth, T = 0.625 m (2.05 Ft)
Area, A = 1.83 m x 0.625 m = 1.144 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 1.144 m^2 x 1 m/s x 3,600 Sec/Hour = 4,118.4 m^3/h
= 26.18 MGD

C. At Replacement Of Existing Slab Over Channel + 1'-4" Curb Covered By New Grating

Width, W = 1.83 m (6.00 Ft)
Depth, T = 1.030 m (3.38 Ft)
Area, A = 1.83 m x 1.030 m = 1.886 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 1.886 m^2 x 1 m/s x 3,600 Sec/Hour = 6,789.6 m^3/h
= 43.16 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - HEADWORKS UNITS

6. MECHANICAL SCREENS

A. At Existing Dimensions -

Gross Width, W_G = 3 Screens x 1.0 m/Screen = 3.00 m (9.84 Ft)
Clear Width, W_C = 3 Screens (42 Bars/Screen x 0.02 m Clear/Bar)
= 2.52 m (8.266 Ft)
Depth, T = 0.60 m (1.97 Ft)
Area, A = 2.52 m x 0.60 m = 1.512 m^2

Maximum Flow Through Screens @ 1.0 m/s Velocity -

Q = 1.512 m^2 x 1 m/s x 3,600 Sec/Hour = 5,443.2 m^3/h
= 34.60 MGD

B. At Grating Replacement Of Existing Slab Over Channel -

Clear Width, W_C = 2.52 m (8.266 Ft)
Depth, T = 0.625 m (2.05 Ft)
Area, A = 2.52 m x 0.625 m = 1.575 m^2

Maximum Flow Through Screens @ 1.0 m/s Velocity -

Q = 1.575 m^2 x 1 m/s x 3,600 Sec/Hour = 5,670 m^3/h
= 36.04 MGD

C. At Replacement Of Existing Slab Over Channel + 1'-4" Curb Covered By New Grating

Clear Width, W_C = 2.52 m (8.266 Ft)
Depth, T = 1.030 m (3.38 Ft)
Area, A = 2.52 m x 1.030 m = 2.596 m^2

Maximum Flow Through Screens @ 1.0 m/s Velocity -

Q = 2.596 m^2 x 1 m/s x 3,600 Sec/Hour = 9,346 m^3/h
= 59.40 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - HEADWORKS UNITS

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7. EXIT CHANNEL FROM MECHANICAL SCREENS (INFLUENT CHANNEL TO GRIT/GREASE UNIT)

A. At Existing Dimensions -

Width, W = 1.20 m (3.94 Ft)
Depth, T = 0.60 m (1.97 Ft)
Area, A = 1.20 m x 0.60 m = 0.720 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 0.720 m^2 x 1 m/s x 3,600 Sec/Hour = 2,592 m^3/h
= 16.47 MGD

16.47 MGD Is For 0.72 m (2.36 Ft) Length Only. Channel Will Surcharge At T > 0.60 m. Maximum Surcharge Is T = 0.75 m (2.46 Ft).

B. At Grating Replacement Of Existing Slab Over Channel -

Width, W = 1.20 m (3.94 Ft)
Depth, T = 0.674 m (2.21 Ft)
Area, A = 1.20 m x 0.674 m = 0.809 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 0.809 m^2 x 1 m/s x 3,600 Sec/Hour = 2,912.4 m^3/h
= 18.51 MGD

18.51 MGD Is For 0.72 m (2.36 Ft) Length Only.

C. At Replacement Of Existing Slab Over Channel + 1'-4" Curb Covered By New Grating

Width, W = 1.20 m (3.94 Ft)
Depth, T = 1.079 m (3.54 Ft)
Area, A = 1.20 m x 1.079 m = 1.295 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 1.295 m^2 x 1 m/s x 3,600 Sec/Hour = 4,662 m^3/h
= 29.63 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - HEADWORKS UNITS

8. GRIT INFLUENT/GRIT BY-PASS PIPE CHANNEL

A. At Existing Dimensions -

Width, W = 1.20 m (3.94 Ft)
Depth, T = 1.174 m (3.85 Ft)
Area, A = 1.20 m x 1.174 m = 1.409 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 1.409 m^2 x 1 m/s x 3,600 Sec/Hour = 5,072.4 m^3/h
= 32.24 MGD

9. GRIT/GREASE UNIT

A. Grit Channel -

Width, W = 2.60 m (8.53 Ft)
Length, L = 35.70 m (117.10 Ft)
Area, A = 10.83 m^2 (116.53 SF)

Maximum Flow At Minimum Grit Channel Detention Time @ Q_{A-24} Of 10 Minutes -

$$Q = \frac{35.70\ m \times 10.83\ m^2}{0.167\ Hours} = 2{,}315\ m^3/h$$
= 14.72 MGD

Maximum Flow At Minimum Grit Channel Detention Time @ Q_{P-24} Of 3 Minutes -

$$Q = \frac{35.70\ m \times 10.83\ m^2}{0.050\ Hours} = 7{,}732.6\ m^3/h$$
= 49.15 MGD

B. Grease Channel

Width, W = 2.40 m (7.87 Ft)
Length, L = 35.70 m (117.10 Ft)
Area, A = 85.68 m^2

Maximum Flow At Maximum Q_{A-24} Hydraulic Surface Rate Of 20, $m^3/m^2/h$ -

Q = 2.40 m x 35.70 m x 20 $m^3/m^3/h$ = 1,713.6 m^3/h
= 10.89 MGD

Beyond Hydraulic Surface Rate Of 20 $m^3/m^2/h$, Grease Flotation Efficiency Decreases. Maximum Grit Channel Flow Is Limiting Flows For Combined Grit/ Grease Unit.

10. EFFLUENT CHANNEL FROM GRIT/GREASE UNIT

Width, W = 2.60 m (8.58 Ft)
Depth, T = 1.151 m (3.78 Ft)
Area, A = 2.60 m x 1.151 m = 2.993 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 2.993 m^2 x 1 m/s x 3,600 Sec/Hour = 10,774.8 m^3/h
= 68.49 MGD

11. 30" DIAMETER BY-PASS PIPE AROUND GRIT/GREASE UNIT

30" Diameter Pipe @ 0.010 Slope

Capacity Flowing Full = 27.50 MGD w/No Surcharge

Pipe Will Surcharge Due To Physical Location, Hence Flow Will Be >27.50 MGD

12. 48" DIAMETER PIPE FROM GRIT/GREASE UNIT TO RAW SEWAGE SCREW PUMP STATION NO. 2

48" Diameter Pipe @ 0.0008 Slope

Capacity Flowing Full = 27.0 MGD w/No Surcharge

Pipe Can Surcharge Due To Influent Location, Hence Flow Can Be Greater Than 27.0 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

LIMITING HYDRAULIC UNIT CAPACITIES

EXISTING AWTF

COUNTER-CURRENT LOW LOAD AERATION UNITS

AND

DISINFECTION UNITS

1. RAW SEWAGE FLOW METERING (P.S. NO. 2 DISCHARGE)

Two (2) Meters, One (1) To Each Train

1-6" Throat, Each - Capacity Range 0.10 - 15.90 MGD

Total Combined Flow Metering Capacity - 0.20 - 31.80 MGD

2. PRIMARY FLASH MIX UNITS

Two (2) Units, One (1) To Each Train

Length, L = 16'-0"
Width, W = 16'-0"
Water Depth, WD = 11.36 Ft.

Volume, V = 16 Ft x 15 Ft x 11.36 Ft = 2,908.2 Cu. Ft.
= 21,811 Gallons Each

Maximum Flow Capacity At Minimum 2 Minute Detention -

$$Q = \frac{21811 \text{ Gallons}}{2 \text{ Minutes}} = 10{,}906 \text{ GPM}$$
= 15.704 MGD Each

Maximum Combined Flow Capacity = 31.41 MGD

3. PRIMARY CLARIFIERS

A. Flocculator Sections

Two (2) Units, One (1) To Each Train

Diameter, D = 45'-0" (13.72 m)
Depth, T = 8'-4" (2.54 m)

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - COUNTER-CURRENT LOW
LOAD AERATION UNITS AND DISINFECTION UNITS

Volume, V = 1,590.43 SF x 8.33 Ft = 13,248.3 Cu. Ft.
= 375.3 m^3
= 99,361 Gallons Each

Maximum Flow At 15 Minutes Minimum Detention (Q_{P-24}) -

$$Q = \frac{99361 \text{ Gallons}}{15 \text{ Minutes}}$$

= 6.224 GPM
= 9.539 MGD Each
= 19.078 MGD Total

Maximum Flow At 30 Minutes Minimum Detention (Q_{A-24}) -

$$Q = \frac{99361 \text{ Gallons}}{30 \text{ Minutes}}$$

= 3.312 GPM
= 4.769 MGD Each
= 9.538 MGD Total

B. Clarifier Sections

Two (2) Units, One (1) To Each Train

Diameter, D = 80'-0" (24.39 m)
Side Water Depth, SWD = 14'-0" (4.27 m)

Volume, V = 5,026.56 SF x 14 Ft = 70,371.8 Cu. Ft.
= 1,993.53 m^3
= 527,789 Gallons Each

Surface Area, A = 5,026.56 SF Each

Maximum Flow At Maximum Surface Settling Rate Of 1,000 GPD/SF (Q_{A-24}) -

Q = 5,026.56 SF x 1,000 GPD/SF = 5.027 MGD Each
= 10.054 MGD Total

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - COUNTER-CURRENT LOW
LOAD AERATION UNITS AND DISINFECTION UNITS

4. AERATION REACTORS

Two (2) Units, One (1) Each Train

Diameter, D = 170'-0" (52.0 m) (Total Reactor Diameter)
Side Water Depth, SWD = 16'-5" (5.0 m)

Volume, V = 2,123.72 m^2 x 5 m = 10,618.6 m^3 Each
= 21,237.2 m^3 Total

Maximum Flow Capacity At Minimum Detention Time Of 16 Hours (Q_{A-24}) -

$$Q = \frac{21237.2\ m^3}{16\ Hours} = 1,327.3\ m^3/h$$
= 8.44 MGD

Aeration Detention Time Is Not A Critical Design Or Operational Criteria.

5. SECONDARY CLARIFIERS

Two (2) Units, One (1) At Each Train

Diameter, D = 141.04' (43.0 m)
Side Water Depth, SWD = 9.84' (3.0 m)

Volume, V = 1,452.20 m^2 x 3 m = 4,356.6 m^3 Each
= 8,713.2 m^3 Total

Surface Area, A = 1,452.20 m^2 Each
= 2,904.40 m^2 Total

Maximum Flow At Maximum Surface Settling Rate Of 1.00 $m^3/m^2/h$ At Q_{P-24} -

Q = 2,904.4 m^2 x 1.00 $m^3/m^2/h$
= 2,904.4 m^3/h
= 18.46 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - COUNTER-CURRENT LOW
LOAD AERATION UNITS AND DISINFECTION UNITS

Maximum Flow At Maximum Surface Settling Rate Of 1.600 $m^3/m^2/h$ At $Q_{UP\ RATE}$ -

$Q = 2{,}904.4\ m^2 \times 1.600\ m^3/m^2/h$
$= 4{,}647\ m^3/h$
$= 29.54$ MGD

6. RETURN SLUDGE PUMPING

Six (6) Screw Pumps, Three (3) At Each Train

Pump Size - 700 mm (27") Diameter Each

Pump Capacity Range - 900 GPM @ 40° (56.8 l/s) To 1,560 GPM @ 30° Each (98.5 l/s)

RAS, Ratio, R_V = 0.714 @ Q_{P-24} Flow

Maximum Pumping Capacity @ 30° Angle -

w/6 Pumps = 6 x 98.5 l/s = 591 l/s (9,361 GPM) (13.48 MGD)

Q_{P-24} Flow @ 13.48 MGD and R_V = 0.714 -

$$\frac{13.48\ MGD}{0.714} = 18.88\ MGD$$

7. INTERNAL RECIRCULATION PUMPING

Six (6) Screw Pumps, Three (3) At Each Train

Pump Size - 900 mm (36") Diameter Each

Pump Capacity = 2,970 GPM (187.5 l/s) @ 30° Each
= 6 x 187.5 l/s = 1,125 l/s

Q_{A-24} @ RAS_{INT} = 1,125 l/s = 25.74 MGD and Efficiency = 0.800 -

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - COUNTER-CURRENT LOW
LOAD AERATION UNITS AND DISINFECTION UNITS

$$\text{Efficiency} = \frac{RAS + RAS_{INT}}{Q + RAS + RAS_{INT}}$$

$$Q = \frac{RAS + RAS_{INT} - [0.80\ RAS + 0.80\ RAS_{INT}]}{0.80}$$

$$= \frac{13.48\ MGD + 25.74\ MGD - [10.78\ MGD - 20.59\ MGD}{0.80}$$

$$= 9.81\ MGD$$

8. DISINFECTION UNITS

Twelve (12) Channels

Width, W = 8 @ 10'-0", 4 @ 9'-0"
Length, L = 8 @ 31'-0", 4 @ 28'-0"
Side Water Depth, SWD = 8'-0"

Volume, V = 8(31' x 10' x 8') + 4(28' x 9' x 8')
= 19,840 Cu. Ft. + 8,064 Cu. Ft.
= 27,904 Cu. Ft.
= 209,280 Gallons

Volume, V, Downstream Piping and Structures

48" D. Pipe	41,467 Gallons
30" D. Pipe	10,303 Gallons
Existing Backwash Storage	48,306 Gallons
	100,076 Gallons

Maximum Flow At Minimum Detention Time Of 15 Minutes (Q_{P-24}) -

$$Q = \frac{309356\ Gallons}{15\ Minutes} = 20{,}624\ GPM$$
$$= 29.70\ MGD$$

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - COUNTER-CURRENT LOW
LOAD AERATION UNITS AND DISINFECTION UNITS

9. 48" EFFLUENT PIPE

48" Diameter Pipe, 0.0126 Slope
Capacity Flowing Full - >90 MGD

10. EFFLUENT METERING FLUME

One (1) Meter
3'-0" Throat - Capacity Range 0.39 - 32.57 MGD

11. 30" EFFLUENT PIPE

30" Diameter Pipe, 0.0392 Slope
Capacity Flowing Full - 51.7 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

COMPONENT CALCULATIONS

EXISTING AWTF

AT

8.25 MGD

I. RAW SEWAGE FLOW METERING

A. Re-Rated Q_{UP} Rate of Flow - 4,248 m^3/h (27.0 MGD)

B. Total Metering Capacity - 0.17 MGD - 26.31 MGD

C. No Modifications Required At Q_{A-24} = 8.25 MGD

II. RAW SEWAGE SCREW PUMP STATION NO. 1

A. Existing - Three (3) 42" Diameter Enclosed Screw Pumps and Two (2) 36" Diameter Enclosed Screw Pumps

B. Existing Maximum Capacity - 20.09 MGD

C. Station Modification - Increase Maximum Capacity To 27.0 MGD

III. INFLUENT CHANNEL TO MECHANICAL SCREENS

A. Remove Existing Slab Over Channel And Add 1'-4" High Curbing, All Covered With New Grating.

B. Freeboard Provided At 27.0 MGD

Width, W = 1.83 m (6.00 Ft)

Depth, T = 1.030 m (3.38 Ft)

Depth of Flow @ 27.0 MGD -

$$\text{Area, A} = \frac{Q}{V} = \frac{4248\ m^3/h}{1.0\ m/Sec \times 3600\ Sec/Hr}$$

$$= 1.18\ m^2$$

$$\text{Depth Of Flow} = \frac{1.18\ m^2}{1.83\ m\ \text{Width}} = 0.644\ m$$

Freeboard = 1.030 m - 0.644 m = 0.386 m (15.20 Inches)

IV. MECHANICAL SCREENS

A. Remove Existing Slabs Over Channels And Add 1'-4" High Curbing, All Covered With New Grating.

B. Freeboard Provided At 27.0 MGD

Clear Width, Net After Deduction For Bar Widths = 2.52 m (8.266 Ft)

Depth, T = 1.030 m

Depth of Flow @ 27.0 MGD

Area, A = $1.18\ m^2$

$$\text{Depth Of Flow} = \frac{1.18\ m^2}{2.52\ m\ \text{Width Clear}} = 0.468\ m$$

Freeboard = 1.030m - 0.468 m = 0.562 m (22.13 Inches)

V. EXIT CHANNEL FROM MECHANICAL SCREENS (INFLUENT CHANNEL TO GRIT/GREASE UNIT)

A. Remove Existing Slab Over Channel And Add 1'-4" High Curbing, All Covered With New Grating.

B. Freeboard Provided At 27.0 MGD

Width, W = 1.20 m (3.94 Ft)
Depth, T = 1.079 m (3.54 Ft)

Depth of Flow @ 27.0 MGD -

Area, A = $1.18\ m^2$

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

Depth Of Flow = $\frac{1.18\ m^2}{1.20\ m\ Width}$ = 0.983 m

Freeboard = 1.079 m - 0.983 m = 0.096 m (3.78 Inches)

VI. GRIT INFLUENT/GRIT BY-PASS CHANNEL

A. Existing Capacity = 32.24 MGD

B. No Modifications Required At Q_{UP} = 27.0 MGD

VII. GRIT/GREASE UNIT

A. Grit Channel

1. Dimensions -

Width, W	=	2.60 m (8.53 Ft)
Length, L	=	35.70 m (117.10 Ft)
X-Sectional Area, A	=	10.83 m^2 (116.53 SF)

2. Detention At Q_{A-24} = 1,298 m^3/h -

$\frac{10.83\ m^2 \times 35.70\ m}{1298\ m^3/h}$ = 0.290 Hours (17.4 Minutes)

[Minimum Detention Required At Q_{A-24} = 10 Minutes]

3. Detention At Q_{P-24} = 2,832 m^3/h -

$\frac{386.63\ m^3}{2832\ m^3/h}$ = 0.137 Hours (8.2 Minutes)

[Minimum Detention Required At Q_{P-24} = 3 Minutes]

4. No Modification Required.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

B. Grease Channel

1. Dimensions -

Width, W	=	2.40 m (7.87 Ft)
Length, L	=	35.70 m (117.10 Ft)
Surface Area, A	=	85.68 m^2

2. Hydraulic Surface Rate At Q_{A-24} = 1,298 m^3/h

$$HSR = \frac{1298\ m^3/h}{85.68\ m^2} = 15.15\ m^3/m^2/h$$

[Maximum Allowable At Q_{A-24} = 20 $m^3/m^2/h$]

3. No Modification Required.

VIII. EFFLUENT CHANNEL FROM GRIT/GREASE UNIT

A. Existing Capacity = 68.49 MGD

B. No Modification Required At Q_{UP} = 27.0 MGD

IX. 30" DIAMETER BY-PASS PIPE AROUND GRIT/GREASE UNIT

A. Existing Capacity Flowing Full w/No Surcharge = 27.50 MGD

B. No Modification Required At QUP = 27.0 MGD
With Gate To Grit Unit Closed, Flow Will Be Greater Than 27.50 MGD.

X. 48" DIAMETER PIPE FROM GRIT/GREASE UNIT TO RAW SEWAGE SCREW PUMP STATION NO. 2

A. Existing Capacity Flowing Full w/No Surcharge = 27.0 MGD

B. No Modification Required At Q_{UP} = 27.0 MGD.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

XI. RAW SEWAGE SCREW PUMP STATION NO. 2

A. Existing - Five (5) 42" Diameter Enclosed Screw Pumps

B. Existing Maximum Capacity = 24.4 MGD

C. Station Modification - Increase Maximum Capacity To 27.0 MGD

XII. SCREW PUMP STATION NO. 2 DISCHARGE METERING

A. Existing - Two (2) 1'-6" Throat Flumes, One (1) To Each Primary Train

B. Existing Capacity -

0.10 - 15.90 MGD Each

0.20 - 31.80 MGD Total

C. No Modification Required At Q_{UP} = 27.0 MGD

XIII. PRIMARY FLASH MIX UNITS

A. Existing - Two (2) Units, One (1) To Each Primary Train

B. Existing Capacity And Detention At Q_{UP} = 27.0 MGD -

$$\frac{2 \times 21811 \text{ Gallons}}{27.0 \text{ MGD}} = 0.0016 \text{ Days} \quad (2.33 \text{ Minutes})$$

C. Detention At $Q_{P\text{-}24}$ = 18.00 MGD -

$$\frac{43622 \text{ Gallons}}{18.0 \text{ MGD}} = 0.024 \text{ Days} \quad (3.49 \text{ Minutes})$$

D. Detention At $Q_{A\text{-}24}$ = 8.25 MGD -

$$\frac{43622 \text{ Gallons}}{8.25 \text{ MGD}} = 0.0052 \text{ Days} \quad (7.6 \text{ Minutes})$$

E. No Modification Required At $Q_{A\text{-}24}$ = 8.25 MGD and Q_{UP} = 27.0 MGD.

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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

XIV. PRIMARY CLARIFIER/FLOCCULATORS

A. Existing - Two (2) Units

B. Flocculation Sections -

1. Existing Capacity = 99,361 Gallons, Each
= 198,722 Gallons Total

2. Detention At Q_{P-24} = 18.0 MGD -

$$\frac{198722 \text{ Gallons}}{18.0 \text{ MGD}} = 0.011 \text{ Days} \quad (15.90 \text{ Minutes})$$

3. No Modification Required At Q_{P-24} = 18.0 MGD.

C. Clarifier Sections -

1. Existing Capacity = 527,789 Gallons Each w/o Center Core
= 1,055,578 Gallons Total

2. Existing Surface Area = 5,026.56 SF Each
= 10,053 SF Total

3. Detention At Q_{A-24} = 8.25 MGD -

$$\frac{1055578 \text{ Gallons}}{8.25 \text{ MGD}} = 0.128 \text{ Days}$$
$$= 3.07 \text{ Hours}$$

4. Detention At Q_{P-24} = 18.0 MGD -

$$\frac{1055578 \text{ Gallons}}{18.0 \text{ MGD}} = 0.059 \text{ Days}$$
$$= 1.41 \text{ Hours}$$

5. Surface Settling Rate At Q_{A-24} = 8.25 MGD -

$$\frac{8.25 \text{ MGD}}{10053 \text{ SF}} = 821 \text{ GPD/SF}$$

6. Surface Settling Rate At Q_{P-24} = 18.0 MGD -

$$\frac{18.0 \text{ MGD}}{10053 \text{ SF}} = 1{,}791 \text{ GPD/SF}$$

7. No Modification Required At Q_{A-24} = 8.25 MGD And Q_{P-24} = 18.0 MGD. Assumed BOD_5 Primary Efficiency At 35% (Current 49.6%) And TSS Primary Efficiency At 55% (Current 71.6%).

XV. AERATION REACTORS

A. Existing - Two (2) GR-D Reactors, Each 52 m Diameter (170.56 Ft) x 5 m (16.4 Ft) SWD And 25 m Diameter (82.0 Ft) x 5 m (16.4 Ft) SWD

B. Existing Volume = 21,237.2 m^3 Total (749,673 Cu. Ft.) (5,622,549 Gallons)

C. Reactor MLSS @ 4,000 mg/l MLSS -

21,232 m^3 x 4.0 kg/m^3 = 84,928 kg MLSS

D. Food To Mass Ratio @ 4,000 mg/l MLSS -

$$\frac{4879 \text{ kg } BOD_5}{84928 \text{ kg MLSS}} = 0.0579 \text{ kg } BOD_5/\text{kg MLSS}$$

(Normal Low Load Aeration F/M = 0.050 - 0.075 kg BOD_5/kg MLSS)

E. Denitrification -

1. N Loading To Denitrification Zone (Anoxic Zone) -

(0.75 NH_3-N Concentration @ 21.0 mg/l) + (90% N_{ORG} Concentration @ 13.0 mg/l) + (NO_2-NO_3-N Influent Concentration @ 4.8 mg/l) - (Effluent NO_3 Concentration @ 5 mg/l) = 32.25 mg/l NO_3-N Including 25% NH_3-N Synthesis In Sludge

32.25 mg/l NO_3-N x 1,000 l/m^3 x 1,298 m^3/h = 41,860,500 mg NO_3-N/Hr

2. Total MLVSS -

$$\frac{5000 \text{ mg/l [DN Zone]} \times 0.70 \text{ Volatile} \times 1000 \text{ l/m}^3 \times 4909 \text{ m}^3}{1000 \text{ mg/g}}$$

= 17,181,500 g MLVSS

3. Maximum Denitrification At Maximum DN Conversion Rate Of

$$\frac{1.875 \text{ mg } NO_3\text{-N}}{\text{g MLVSS-Hr}}$$

$$\frac{41860500 \text{ mg } NO_3\text{-N}}{17181500 \text{ g MLVSS-Hr}} = \frac{2.436 \text{ mg } NO_3\text{-N}}{\text{g MLVSSS-Hr}}$$

$$\frac{1.875}{2.436} \times 100 = 76.97\%$$

4. Anticipated DN Efficiency w/o O_2 Minimizers = ±75.0%

5. Anticipated DN Efficiency w/O_2 Minimizers = ±85.0%

F. Nitrification -

1. Current Plant BOD_5 Efficiency (Secondary Treatment Only) -

$$\frac{121.0 \text{ mg/l} - 6.0 \text{ mg/l}}{122.0 \text{ mg/l}} = 0.9504$$

2. SRT At 8.25 MGD $Q_{A\text{-}24}$ -

$$\frac{84928 \text{ kg MLSS}}{0.9504 \times 4879 \text{ kg/D Input } BOD_5} = 18.32 \text{ Days}$$

3. Total mg NH_3-N -

(0.75 NH_3-N Concentration @ 21.0 mg/l) + (90% N_{ORG} Concentration @ 13.0 mg/l) = 27.45 mg/l NH_3-N

27.45 mg/l NH_3-N x 1,000 l/m^3 x 1,298 m^3/h = 35,630,100 mg NH_3-N/Hr

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

4. Total MLVSS -

$$\frac{4000 \text{ mg/l} \times 0.70 \text{ Volatile} \times 1000 \text{ l/m}^3 \times 21232 \text{ m}^3}{1000 \text{ mg/g}}$$

= 59,449,600 g MLVSS

5. Minimum Nitrification Conversion Rate Required -

$$\frac{35630100 \text{ mg } NH_3\text{-N}}{59449600 \text{ g MLVSS-Hr}} = \frac{0.599 \text{ mg } NH_3\text{-N}}{\text{g MLVSSS-Hr}}$$

6. Nitrification Conversion Rates Available -

@ 7.5° C $\quad \frac{1.100 \text{ mg } NH_3\text{-N}}{\text{g MLVSS-Hr}}$

@ 15° C $\quad \frac{1.600 \text{ mg } NH_3\text{-N}}{\text{g MLVSS-Hr}}$

G Reactor Detention Times -

@ $Q_{A\text{-}24}$ = 1,298 m^3/h -

$$\frac{21232 \text{ m}^3}{1298 \text{ m}^3/\text{h}} = 16.35 \text{ Hours}$$

@ $Q_{P\text{-}24}$ = 2,832 m^3/h -

$$\frac{21232 \text{ m}^3}{2832 \text{ m}^3/\text{h}} = 7.50 \text{ Hours}$$

@ Q_{UP} Rate = 4,248 m^3/h -

$$\frac{21232 \text{ m}^3}{4248 \text{ m}^3/\text{h}} = 5.02 \text{ Hours}$$

H. No Modification Required To Aeration Reactors At $Q_{A\text{-}24}$ = 8.25 MGD.

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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

XVI. SECONDARY CLARIFIERS

A. Existing - Two (2) Clarifiers, Each 43.0 m Diameter (141.04 Ft) x 3.0 m SWD (9.84 Ft)

B. Capacity And Surface Area -

Capacity = 8,713.2 m^3 Total (2,306,820 Gallons)

Surface Area = 2,904.40 m^2 Total (31,635 Sq. Ft.)

C. Detentions -

@ Q_{A-24} = 1,298 m^3/h -

$$\frac{8713.2\ m^3}{1298\ m^3/h} = 6.71 \text{ Hours}$$

@ Q_{P-24} = 2,832 m^3/h -

$$\frac{8713.2\ m^3}{2832\ m^3/h} = 3.08 \text{ Hours}$$

@ Q_{UP} Rate = 4,248 m^3/h -

$$\frac{8713.2\ m^3}{4248\ m^3/h} = 2.05 \text{ Hours}$$

D. Surface Settling Rates -

@ Q_{A-24} = 1,298 m^3/h -

$$\frac{1298\ m^3/h}{2904.4\ m^2} = 0.447\ m^3/m^2/h \quad (264 \text{ GPD/SF})$$

@ Q_{P-24} = 2,832 m^3/h -

$$\frac{2832\ m^3/h}{2904.4\ m^2} = 0.975\ m^3/m^2/h \quad (576 \text{ GPD/SF})$$

[Maximum Allowable = 1.000 $m^3/m^2/h$ (591 GPD/SF)]

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

@ Q_{UP} Rate = 4,248 m^3/h -

$$\frac{4248\ m^3/h}{2904.4\ m^2} = 1.463\ m^3/m^2/h \quad (864\ GPD/SF)$$

[Maximum Allowable = 1.600 $m^3/m^2/h$ (945 GPD/SF)]

E. MLSS Floor Loading -

$$\frac{21232\ m^3 \times 4\ kg/m^3}{2904.4\ m^2} = 29.24\ kg/m^2$$

$$= 5.98\ Lb/SF$$

F. No Modification Required To Secondary Clarifiers At Q_{A-24} = 8.25 MGD.

XVII. RETURN SLUDGE PUMPING

A. Existing - Six (6) Tube Mounted Adjustable Inclination Screw Pumps, Three (3) At Each Reactor. Each 700 mm (27" Diameter), Adjustable 30° To 40°.

B. Existing Capacity -

56.8 l/s	To	98.5 l/s Each
(900 GPM	To	1,560 GPM Each)
(204.5 m^3/h	To	295.5 m^3/h Each)

C. RAS, Ratio, R_v = $\frac{TS_R[\text{MLSS In Reactor}]}{TS_{RS}[\text{MLSS In RAS}] - TS_R}$

$$= \frac{4000\ mg/l}{12000\ mg/l - 4000\ mg/l} = 0.50$$

D. RAS Required At Q_{16} Peak Sanitary Flows = 1,947 m^3/h (12.38 MGD)

1,947 m^3/h x 0.50 = 974 m^3/h

@ Q_{A-24} -

$$\frac{974\ m^3/h}{1298\ m^3/h} = 0.750{:}1 \text{ Recirculation}$$

@ Q_{P-24} -

$$\frac{0.50 \times 2832\ m^3/h}{2832\ m^3/h} = 0.500{:}1 \text{ Recirculation}$$

E. RAS Pumping Capacity Range Required @ 4,000 mg/l MLSS And 12,000 mg/l RAS-TSS (SVI = 100 mg/l) -

974 m^3/h To 1,432 m^3/h

F. Capacities Available, Each Range -

@ 30°	-	295.5 m^3/h
@ 31°	-	286.4 m^3/h
@ 32°	-	277.3 m^3/h
@ 33°	-	268.2 m^3/h
@ 34°	-	259.1 m^3/h
@ 35°	-	250.0 m^3/h
@ 36°	-	240.9 m^3/h
@ 37°	-	231.8 m^3/h
@ 38°	-	222.7 m^3/h
@ 39°	-	213.6 m^3/h
@ 40°	-	204.5 m^3/h

G. Capacities Provided With Existing Pumps -

4 Pumps @ 35°	=	1,000 m^3/h
4 Pumps @ 30°	=	1,182 m^3/h
6 Pumps @ 36°	=	1,445 m^3/h

H. At 5,000 mg/l Maximum Reactor MLSS And Operating SVI = 75 ml/l -

1. RAS, Ratio, R_V = $\frac{5000\ mg/l}{16000\ mg/l - 5000\ mg/l}$ = 0.455

2. RAS Required At Q_{16} Peak Sanitary Flow = 1,947 m^3/h (12.38 MGD)

1,947 m^3/h x 0.455 = 886 m^3/h

@ Q_{P-24} -

0.455 x 2,832 m^3/h = 1,289 m^3/h

I. RAS Pumping Capacity Range Required @ 5,000 mg/l MLSS Maximum And 16,000 mg/l RAS-TSS (SVI = 75 ml/l) -

886 m^3/h To 1,289 m^3/h

J. Capacities Provided With Existing Pumps -

4 Pumps @ 38° = 891 m^3/h

4 Pumps @ 30° = 1,182 m^3/h

6 Pumps @ 38° = 1,336 m^3/h

K. Modifications Required - Provide One (1) Unmounted 700 mm Diameter Tube Mounted Screw Pump For Standby. Installation Time ±4 Hours.

XVIII. INTERNAL RECIRCULATION PUMPING

A. Existing - Six (6) Tube Mounted Adjustable Inclination Screw Pumps, Three (3) At Each Reactor. Each 900 mm (36") Diameter. Adjustable 25° To 40°.

B. Existing Capacity -

110.5 l/s	To	187.5 l/s Each
(1,750 GPM	To	2,970 GPM Each)
(398 m^3/h	To	675 m^3/h Each)

C. Pumping Capacity Required @ Q_{A-24} = 8.25 MGD And DN Efficiency Of ±82.5%

$$RAS_{INT} = \frac{[Efficiency \times Q] + [Efficiency \times RAS] - RAS}{0.175}$$

$$= \frac{[0.825 \times 1298\ m^3/h] + [0.825 \times 974\ m^3/h] - 974\ m^3/h}{0.175}$$

$$= 5{,}145\ m^3/h \quad (34.96\ MGD)$$

D. Capacities Available, Each Pump -

@ 25°	-	675.0 m^3/h
@ 26°	-	656.5 m^3/h
@ 27°	-	638.0 m^3/h
@ 28°	-	619.5 m^3/h
@ 29°	-	601.0 m^3/h
@ 30°	-	582.5 m^3/h
@ 31°	-	564.0 m^3/h
@ 32°	-	545.5 m^3/h
@ 33°	-	527.0 m^3/h
@ 34°	-	508.5 m^3/h
@ 35°	-	490.0 m^3/h
@ 36°	-	471.5 m^3/h
@ 37°	-	453.0 m^3/h
@ 38°	-	434.5 m^3/h
@ 39°	-	416.0 m^3/h
@ 40°	-	398.0 m^3/h

E. Capacities Provided With Existing Pumps -

6 Pumps @ 25° = 4,050 m^3/h

F. Maximum Theoretical DN Efficiency w/o O_2 Minimizers -

$$\text{Efficiency} = \frac{RAS + RAS_{INT}}{Q + RAS + RAS_{INT}}$$

$$= \frac{974\ m^3/h + 4050\ m^3/h}{1278\ m^3/h + 974\ m^3/h + 4050\ m^3/h}$$

$$= 0.797$$

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

G. Maximum Theoretical DN Efficiency w/O_2 Minimizers -

0.797 + 0.075 = 0.872

H. Theoretical Effluent NO_3-N -

31.25 mg/l NO_3-N x 0.872 = 27.25 mg/l Removed

Effluent NO_3-N = 4.0 mg/l NO_3-N

I. No Modification Required At Q_{A-24} = 8.25 MGD In Internal Recirculation Pumping

XIX. AERATION BLOWERS

A. Existing - Six (6) Rotary Lobe Positive Displacement 2-Speed Blowers, Three (3) At Each Aeration Reactor. Each GMb/GLb 14.9 @ 600 m Bar Pressure (8.70 psi)

B. Existing Blower Capacity, At Each Reactor -

1. Blower #1 - 34.3 m^3 Air/Min (1,212 CFM) At High Speed
   - 21.1 m^3 Air/Min (744 CFM) At Low Speed

   Blower #2 - 34.3 m^3 Air/Min (1,212 CFM) At High Speed
   - 21.1 m^3 Air/Min (744 CFM) At Low Speed

   Blower #3 - 34.3 m^3 Air/Min (1,212 CFM) At High Speed
   - 14.4 m^3 Air/Min (510 CFM) At Low Speed

2. Blower Combinations, At Each Reactor -

   a. Minimum Blower Operations -

   (1) Blower #3 @ Low Speed - 14.4 m^3 Air/Min - 510 CFM

   (2) Blower #2 (Or #1) @ Low Speed - 21.1 m^3 Air/Min - 744 CFM

   b. Intermediate Blower Operations -

   (1) Blower #1 @ High Speed - 34.3 m^3 Air/Min - 1,212 CFM

(2) Blower #3 @ Low Speed + Blower #2 (Or #1) @ Low Speed - 35.5 m^3 Air/Min - 1,254 CFM

(3) Blower #1 + Blower #2 @ Low Speeds - 42.2 m^3 Air/Min - 1,488 CFM

(4) Blower #3 @ Low Speed + Blower #2 (Or #1) @ High Speed - 49.7 m^3 Air/Min - 1,754 CFM

(5) Blower #2 (Or #1) @ Low Speed + Blower #1 (Or #3) @ High Speed - 55.4 m^3 Air/Min - 1,956 CFM

(6) Blowers #3, #2 and #1 @ Low Speeds - 56.6 m^3 Air/Min - 1,998 CFM

c. Normal Blower Operation @ 8.25 MGD Loading -

(1) Blower #2 And Blower #1 (Or #3) @ High Speeds - 68.7 m^3 Air/Min - 2,424 CFM

d. Maximum Blower Operations -

(1) Blower #2 And Blower #1 @ High Speed + Blower #3 @ Low Speed - 83.1 m^3 Air/Min - 2,934 CFM

(2) Blower #2 (Or #1) And Blower #3 @ High Speed + Blower #1 (Or #2) @ Low Speed - 89.7 m^3 Air/Min - 3,168 CFM

(3) Blowers #3, #2 and #1 @ High Speeds - 103.0 m^3 Air/Min - 3,636 CFM

3. Diffuser Throughput Rates -

a. Maximum Diffuser Taps - 960 Diffusers @ Each Aeration Reactor

b. Length Of Each Diffuser - 2.5 Ft.

c. Maximum Length Of Installed Diffusers - 2,400 L.F. @ Each Aeration Reactor

d. Throughput Rates -

@ 510 CFM	-	0.212 CFM/Ft.
@ 744 CFM	-	0.310 CFM/Ft.
@ 1,212 CFM	-	0.505 CFM/Ft.
@ 1,254 CFM	-	0.522 CFM/Ft.
@ 1,488 CFM	-	0.620 CFM/Ft.
@ 1,754 CFM	-	0.731 CFM/Ft.
@ 1,956 CFM	-	0.815 CFM/Ft.
@ 1,998 CFM	-	0.832 CFM/Ft.
@ 2,424 CFM	-	1.010 CFM/Ft.
@ 2,934 CFM	-	1.222 CFM/Ft.
@ 3,168 CFM	-	1.320 CFM/Ft.
@ 3,636 CFM	-	1.515 CFM/Ft.

e. Recommended Throughput Rates -

Minimum Recommended	- 0.540 CFM/Ft.
Optimum	- 1.080 to 1.610 CFM/Ft.
Maximum Continuous Operation	- 1.790 CFM/Ft.
Maximum 2 Hour Throughput Rate	- 2.690 CFM/Ft.
Ultimate Maximum 5 Minute Throughput Rate	- 3.590 CFM/Ft.

C. Aeration Capacity Required -

1. O_2 Required, Gross -

1.6 kg O_2/kg BOD_5 x 4,879 kg BOD_5	=	7,806 kg O_2
4.6 kg O_2/kg NH_3-N x 1,022 kg NH_3-N*	=	4,703 kg O_2
Total O_2	=	12,509 kg O_2

*NH_3-N + 0.90 N_{ORG}

2. O_2 Required, Net -

a. Oxygen Credit For Nitrification Synthesis -

25% of NH_3-N Will Synthesize (Be Taken Up) In Sludge Without O_2 Requirement

b. Oxygen Credit For Denitrification -

There Will Be An O_2 Recovery As A Result Of The Denitrification Activity, Through The Breakdown Of NO_3-N to NO_2 and O_2. The O_2 Recovery As A Result Of DN May Be Expressed As

$$1\ g\ NH_4^+\text{-}N + 4.57\ g\ O_2 \xrightarrow{[N]} 1\ g\ NO_3\text{-}N$$

$$1\ g\ NH_4^+\text{-}N \xrightarrow{[N]} 1\ g\ N_2\text{-}N + 2.86\ g\ O_2$$

$$O2\ Recovery = \frac{2.86\ g\ O_2\ Recoverd}{4.57\ g\ O_2\ Utilized} \times 100 = 62.6\%$$

Use 60.0%

c. Net O_2 Required For Nitrification -

4,703 kg O_2/D x 0.75 x 0.60 x 0.872 Efficiency
= 1,845 kg O_2 Credit

d. Net Oxygen Required For Oxidation, Stabilization And Nitrification -

(4,703 kg O_2 - 1,845 kg O_2) + 7,806 kg O_2 = 10,664 kg O_2

D. Air Requirements -

1. O_2 Required -

10,664 kg O_2/Day = 444.3 kg O_2/Hour

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COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

2. Q_{AIR} -

$$\frac{\text{kg } O_2/\text{Hour}}{0.280 \text{ kg } O_2/m^3 \text{ Air} \times \text{Transfer/meter} \times \text{Meter Immersion Depth}}$$

3. O_2 Transfer/Meter -

O_2 Transfer Per European Clean Water Transfer Tests @ 5.0 m SWD = 5.85%/m Diffuser Immersion Depth.

Assume $\alpha = 0.80$. α is Rate Of Transfer Of O_2 In Wastewater To O_2 Transfer In Clean Water.

O_2 Transfer/Meter In Wastewater -

0.80 x 5.85%/meter = 4.68%/meter

4. Q_{AIR} Required, Net Including Synthesis And DN Credit -

$$Q_{AIR} = \frac{444.3 \text{ kg } O_2/\text{Hour}}{0.280 \text{ kg } O_2/m^3 \text{ Air} \times 0.0468/m \times 4.8 \text{ m}}$$

= 7,064 m^3 Air/Hour

= 117.7 m^3 Air/Minute (4,156 CFM) Total

= 58.85 m^3 Air/Minute (2,078 CFM) Each Reactor

5. Q_{AIR} Required, Gross w/o Synthesis And DN Credit -

$$Q_{AIR} = \frac{521.2 \text{ kg } O_2/\text{Hour}}{0.280 \text{ kg } O_2/m^3 \text{ Air} \times 0.0468/m \times 4.8 \text{ m}}$$

= 8,286 m^3 Air/Hour

= 138.1 m^3 Air/Minute (4,875 CFM) Total

= 69.05 m^3 Air/Minute (2,437 CFM) Each Reactor

6. Required Air Vs. Air Capacity -

Q_{AIR} Gross = 69.0 m^3 Air/Min (2,437 CFM) Each Reactor

Q_{AIR} Net = 58.8 m^3 Air/Min (2,078 CFM) Each Reactor

Air Capacity = 68.7 m^3 Air/Min (2,424 CFM) Each Reactor @ Normal Blower Operation (2 Blowers @ High Speed Each Reactor, 1 Blower Standby)

Diffuser Throughput Rate @ 68.7 m3 Air/Min (2,424 CFM) =

1.010 CFM/Ft.

Air Capacity Factor-Of-Safety At Net Requirements = 16.8%

E. Modifications Required @ 8.25 MGD Loading. No Blower Modifications Required. Original Number Of Diffusers Installed At 800 Must Be Increased To 960 Diffusers.

XX. WASTE SLUDGE THICKENING PITS

A. Existing - Two (2) Thickening Pits, One (1) At Each Reactor.

B. Existing Capacity -

25.0 Ft x 11.08 Ft x 13.04 Ft SWD = 3,613 CF Each
= 27,098 Gallons Each
= 54,196 Gallons Total

C. Waste Sludge Weight @ 8.25 MGD -

@ F/M = 0.0579 kg BOD_5/kg MLSS = 0.490 kg WS/kg BOD_5
@ 10°-12° C, With Nitrification And Chemical Sludge

0.490 kg WS/kg BOD_5 x 4,879 kg BOD_5/D = 2,391 kg WS/D

D. Waste Sludge Volume @ 8.25 MGD -

1. To Thickening Pits -

@ SVI = 75 ml/l, Maximum MLSS in WS = 16 g/l

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

Assume MLSS in WS @ 90% = 14.4 g/l

$$\text{Volume WS} = \frac{\text{kg WS/D}}{\text{1000 kg WS/m}^3 \times \text{MLSS in RAS As Decimal}}$$

$$= \frac{\text{2391 kg WS/D}}{\text{1000 kg WS/m}^3 \times 0.0144}$$

$$= 166.0 \text{ m}^3\text{/D}$$

$$= 43{,}960 \text{ Gallons/D}$$

2. From Thickening Pits, @ 2.5% Solids -

$$\text{Volume WS} = \frac{\text{2391 kg WS/D}}{\text{1000 kg WS/m}^3 \times 0.025}$$

$$= 95.6 \text{ m}^3\text{/D}$$

$$= 25{,}321 \text{ Gallons/D}$$

3. Average In Thickening Pits -

$$\frac{\text{43960 Gallons/D} + \text{25231 Gallons/D}}{2} = 34{,}640 \text{ Gallons/Day}$$

E. Waste Sludge Detention Available In Thickening Pits -

$$\frac{\text{54196 Gallons Capacity}}{\text{34640 Gallons/Day Waste Sludge}} = 1.56 \text{ Days}$$

F. No Modifications Required In Thickening Pits At 8.25 MGD.

XXI. DISINFECTION

A. Existing - Chlorine Contact Tanks, Duplicate Units, Six Channels Per Tank

B. Existing Capacity - 209,280 Gallons Total

C. Detention Provided At QP-24 = 18.0 MGD -

$$\frac{\text{209280 Gallons}}{\text{18.0 MGD}} = 0.0163 \text{ Days}$$

$$= 16.74 \text{ Minutes}$$

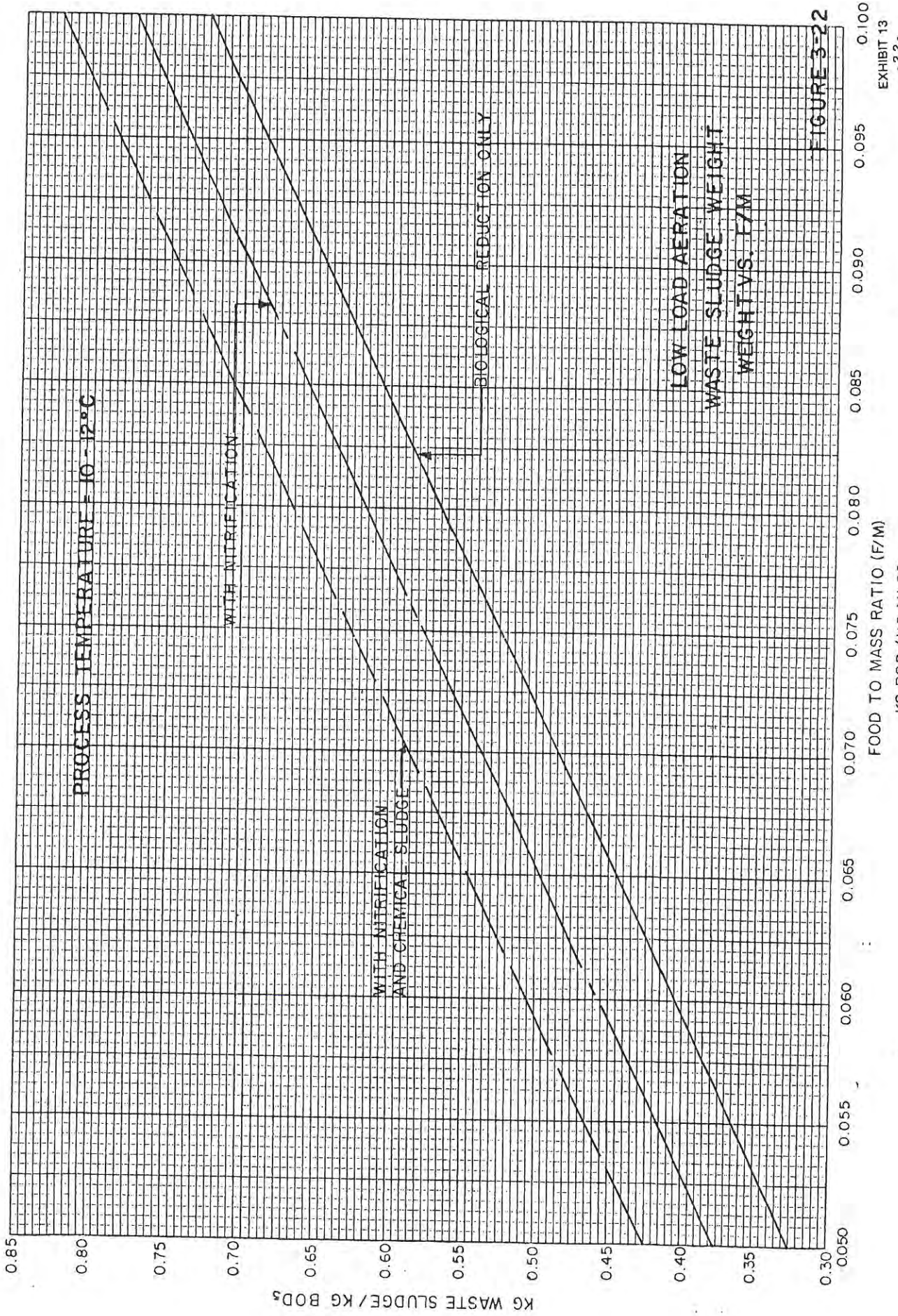

FIGURE 3-22

EXHIBIT 13
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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

D. Additional Detention Available In 48" Diameter And 30" Diameter Effluent Pipes, And In Existing Backwash Storage Tanks -

1. 48" Diameter Pipe, 440 LF -

12.566 SF x 440 Ft = 5,229 Cu. Ft.
= 41,467 Gallons

2. 30" Diameter Pipe, 280 LF -

4.906 SF x 280 Ft = 1,374 Cu. Ft.
= 10,303 Gallons

3. Existing Backwash Storage Tanks -

@ 28' Diameter x 5.23 SWD Each

615.752 SF x 5.23 Ft x 2 = 6,441 Cu. Ft.
= 48,306 Gallons

E. Total Chlorine Contact Detention Capacity Available -

209,280 Gallons + 41,467 Gallons + 10,303 Gallons + 48,306 Gallons
= 309,356 Gallons

F. Total Chlorine Contact Detentions Available -

1. @ Q_{P-24} = 18.0 MGD -

$$\frac{309356 \text{ Gallons}}{18.0 \text{ MGD}} = 0.0172 \text{ Days} = 24.7 \text{ Minutes}$$

2. @ QUP Rate = 27.0 MGD -

$$\frac{309356 \text{ Gallons}}{27.0 \text{ MGD}} = 0.0146 \text{ Days} = 16.49 \text{ Minutes}$$

G. No Modifications Required In Chlorine Contact Capacity At 8.25 MGD.

TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

XXII. SLUDGE STORAGE SILO

A. Existing - One (1) Non-Mechanical Silo - 52 Ft. Diameter x 41 Ft. SWD With 14.25 Ft Cone Bottom

B. Existing Capacity -

$$(2{,}123.72 \text{ SF} \times 41 \text{ Ft}) + 0.33\left(\frac{3.1416 \times 52 \text{ Ft}^2 \times 14.25 \text{ Ft}}{4}\right)$$

$$= 87{,}073 \text{ Cu. Ft.} + 7{,}877 \text{ Cu. Ft.} = 94{,}960 \text{ Cu. Ft.}$$

$$= 712{,}200 \text{ Gallons}$$

C. Waste Sludge/Day From Thickening Pits = 25,321 Gallons/Day

D. Detention Available -

$$\frac{712200 \text{ Gallons}}{25321 \text{ GPD}} = 28.1 \text{ Days}$$

E. No Modifications Required To Sludge Storage Silo At 8.25 MGD.

XXIII. SLUDGE DEWATERING

A. Existing - Two (2) 1,000 Lb/Hour Centrifuges
One (1) 3,000 Lb/Hour Centrifuge Under Construction

B. Capacity Provided -

5,000 Lb/Hour = 2.5 Tons/Hour

C. Maximum Daily Capacity, All Three (3) Centrifuges -

2.5 Tons/H x 24 Hours/Day = 60 Tons/Day

D. Sludge Produced From Silo @ 8.25 MGD Loading -

2,391 kg/D = 5,260 Lb/Day = 2.63 Tons/Day

E. Sludge Produced From Primary Clarification -

4,816 kg/D = 10,519 Lb/Day = 5.30 Tons/Day

F. Total Daily Sludge -

2.63 Tons/Day + 5.30 Tons/Day = 7.93 Tons/Day

G. No Modifications Required In Centrifuges At 8.25 MGD.

XXIV. SLUDGE INCINERATION

A. Existing - 24 DT/Day New Incinerator Under Design

B. No Modifications Required In Incineration At 8.25 MGD.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SUMMARY

OF

OPERATING DATA

SINGLE TRAIN OPERATION

OF

COUNTER-CURRENT LOW LOAD AERATION UNITS

FLOW AND INFLUENT/EFFLUENT CONCENTRATIONS

Date	Influent Flow MGD	Influent BOD_5 mg/l	Influent TSS mg/l	Influent NH_3-N mg/l	Influent $NO_2 + NO_3$-N mg/l	Influent P mg/l	Effluent BOD_5 mg/l	Effluent TSS mg/l	Effluent NH_3-N mg/l	Effluent $NO_2 + NO_3$-N mg/l	Effluent P mg/l
April 10, 1990	5.177	157	143	12.8	1.5	4.5	5	6	1.4	6.0	0.5
April 11	5.387	215	394	14.4	8.8	5.1	6	6	3.2	6.0	1.2
April 12	4.758	192	550	13.9	0.8	4.3	7	15	2.2	8.0	0.5
Commence Single Train Operation April 13											
April 13	4.260	215	411	13.9	0.8	4.3	7	15	2.2	8.0	0.5
April 14	5.072	224	371	18.6	0.8	4.5	7	15	2.2	8.0	0.5
April 15	7.882	141	186	13.2	0.8	4.2	7	15	2.2	8.0	0.5
April 16	7.205	138	200	13.5	10.4	3.9	5	13	0.6	12.0	0.5
April 17	5.683	113	135	11.4	2.3	3.7	8	16	1.5	10.1	0.4
April 18	5.491	280	239	16.4	3.4	5.8	5	11	1.6	5.9	0.4
April 19	4.832	301	405	18.7	4.8	5.6	7	10	1.0	8.9	0.5
April 20	4.645	287	275	16.4	2.8	6.0	13	9	0.8	12.2	0.6
April 21	5.213	231	306	17.3	2.8	5.9	13	9	0.8	12.2	0.6

EXHIBIT 14

- 1 -

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY - SUMMARY OF OPERATING DATA - SINGLE TRAIN OPERATION OF COUNTER-CURRENT LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT CONCENTRATIONS

Date	Influent Flow MGD	Influent BOD_5 mg/l	Influent TSS mg/l	Influent NH_3-N mg/l	Influent $NO_2 + NO_3$-N mg/l	Influent P mg/l	Effluent BOD_5 mg/l	Effluent TSS mg/l	Effluent NH_3-N mg/l	Effluent $NO_2 + NO_3$-N mg/l	Effluent P mg/l
April 22	4.410	313	415	16.9	2.8	6.3	13	9	0.8	12.2	0.6
April 23	5.316	256	224	20.3	2.4	6.0	4	5	2.7	3.7	0.8
April 24	4.180	185	186	16.2	2.8	5.6	5	6	6.7	2.4	1.4
April 25	4.113	309	325	24.8	3.1	6.9	7	6	10.1	9.0	0.9
April 26	3.884	302	483	29.8	7.6	7.1	10	7	17.6	1.7	1.0
April 27	3.773	330	478	22.6	1.0	7.5	4	7	4.9	8.4	0.4
April 28	3.870	287	268	24.2	1.1	7.5	4	7	4.9	8.4	0.4
April 29	3.728	326	341	21.4	1.0	7.6	4	7	4.9	8.4	0.4
April 30	4.097	255	266	21.4	6.1	6.1	2	5	2.7	7.6	0.5
May 1, 1990	8.186	192	205	23.6	0.9	5.9	3	4	4.8	5.7	0.4
May 2	3.680	397	432	24.2	2.2	7.8	2	4	2.3	8.6	0.4
May 3	3.674	405	438	29.4	1.9	8.9	4	6	4.4	5.5	1.3
May 4	4.568	184	301	16.2	1.2	4.8	4	8	5.0	4.7	0.3
May 5	6.275	218	273	16.0	1.1	4.9	4	8	5.0	4.7	0.3
May 6	4.541	168	223	15.7	1.2	4.2	4	8	5.0	4.7	0.3
May 7	4.333	244	200	24.3	0.9	5.9	5	6	2.5	9.5	0.4
May 8	3.898	374	259	25.3	1.0	8.1	7	6	2.8	10.3	0.4
May 9	3.679	342	321	24.5	1.6	6.6	6	7	2.5	9.6	0.3
May 10	7.827	195	277	13.5	6.6	4.4	14	13	2.5	10.4	0.4
May 11	6.629	206	206	15.2	3.6	6.2	10	15	1.7	6.9	0.5
May 12	5.144	213	220	15.4	3.4	6.2	10	15	1.7	6.9	0.5

EXHIBIT 14
- 2 -

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY - SUMMARY OF OPERATING DATA - SINGLE TRAIN OPERATION OF COUNTER-CURRENT LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT CONCENTRATIONS

Date	Influent Flow MGD	Influent BOD_5 mg/l	Influent TSS mg/l	Influent NH_3-N mg/l	Influent $NO_2 + NO_3$-N mg/l	Influent P mg/l	Effluent BOD_5 mg/l	Effluent TSS mg/l	Effluent NH_3-N mg/l	Effluent $NO_2 + NO_3$-N mg/l	Effluent P mg/l
May 13	6.310	212	218	15.3	3.4	6.2	10	15	1.7	6.9	0.5
May 14	7.235	198	232	16.3	2.2	4.8	7	9	1.0	4.7	0.6
May 15	5.794	245	317	16.2	6.0	6.5	6	7	2.0	6.9	0.6
May 16	7.650	135	258	9.6	3.3	3.6	8	11	1.8	8.6	0.5
May 17	9.108	180	196	8.2	2.6	3.3	7	17	0.6	5.9	0.6
May 18	6.813	263	205	16.4	1.0	4.7	13	8	4.8	5.6	0.8
May 19	5.760	285	320	15.9	1.1	5.4	13	8	4.8	5.6	0.8
May 20	5.034	179	126	13.7	1.0	3.7	13	8	4.8	5.6	0.8
May 21	5.019	120	198	16.8	3.8	4.4	6	6	2.8	10.1	0.6
May 22	4.945	260	273	16.1	1.7	6.5	5	5	0.6	10.4	0.7
May 23	4.201	349	348	20.7	1.3	6.4	13	8	4.9	8.4	1.3
May 24	4.507	361	539	22.8	1.6	8.1	9	5	3.1	6.9	1.1
May 25	4.023	346	427	23.5	0.8	8.9	10	6	3.9	6.8	0.6
May 26	4.657	242	286	21.3	0.9	7.3	10	6	3.9	6.8	0.6
May 27	3.715	251	304	21.6	0.9	7.4	10	6	3.9	6.8	0.6
May 28	3.929	220	259	21.5	0.8	7.0	10	6	3.9	6.8	0.6
May 29	7.719	187	341	6.7	3.9	4.9	9	6	0.8	9.0	0.8
Commence Two Train Operation - May 30											
May 30	9.393	75	100	4.1	3.5	1.9	9	7	0.3	7.2	0.7
May 31	7.458	125	138	9.9	1.4	3.0	5	12	1.1	5.3	0.8

EXHIBIT 14
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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY - SUMMARY OF OPERATING DATA - SINGLE TRAIN OPERATION OF COUNTER-CURRENT LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT CONCENTRATIONS

Date	Influent Flow MGD	Influent BOD_5 mg/l	Influent TSS mg/l	Influent NH_3-N mg/l	Influent $NO_2 + NO_3$-N mg/l	Influent P mg/l	Effluent BOD_5 mg/l	Effluent TSS mg/l	Effluent NH_3-N mg/l	Effluent $NO_2 + NO_3$-N mg/l	Effluent P mg/l
Averages April 13 - April 30, 1990 (18 Days)	4.870	250	305	18.7	3.77	6.6	6.9	9.6	3.8	9.97	0.6
Average Efficiency							97.2%	96.9%	79.7%	(264.5%)	90.9%
Averages May 1 - May 29, 1990 (29 Days)	5.478	247	283	18.1	2.14	6.5	8.5	8.8	3.1	7.22	0.7
Average Efficiency							96.6%	96.9%	82.9%	(337.4%)	89.2%
Averages April 13 - May 29, 1990 (47 Days)	5.245	248	291	18.4	2.76	6.5	7.9	9.1	3.4	8.27	0.6
Average Efficiency							96.8%	96.9%	81.5%	(299.6%)	90.8%

EXHIBIT 14
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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SUMMARY

OF

OPERATING ORGANIC DATA

SINGLE TRAIN OPERATION

OF

COUNTER-CURRENT LOW LOAD AERATION UNITS

FLOW AND INFLUENT/EFFLUENT LOADINGS

EXHIBIT 15
- 1 -

Date	Influent Flow MGD	Equivalent Influent Flow Two Train Operation kg/D	Influent BOD_5 Loading kg/D	Equivalent Influent BOD_5 Loading Two Train Operation kg/D	Effluent BOD_5 Loading kg/D	BOD_5 Efficiency	Influent TSS Loading kg/D	Equivalent Influent TSS Loading Two Train Operation kg/D	Effluent TSS Loading kg/D	TSS Efficiency
April 10, 1990	5.177	5.177	3,081	3,081	98.1	96.8%	2,806	2,806	117.8	95.8%
April 11	5.387	5.387	4,391	4,391	122.5	97.2%	8,046	8,046	122.5	98.5%
April 12	4.758	4.758	3,463	3,463	126.3	96.4%	9,920	9,920	270.6	97.3%
Commence Single Train Operation April 13										
April 13	4.260	8.520	3,472	6,944	113.0	96.8%	6,637	13,274	242.2	96.4%
April 14	5.072	10.144	4,307	8,614	134.6	96.9%	7,133	14,266	288.4	96.0%
April 15	7.882	15.764	4,213	8,426	209.2	95.0%	5,558	11,116	448.2	91.9%
April 16	7.205	14.410	3,769	7,538	136.6	96.4%	5,463	10,925	355.1	93.5%
April 17	5.683	11.366	2,434	4,868	172.3	92.9%	2,908	5,816	344.7	88.2%
April 18	5.491	10.982	5,828	11,656	104.1	98.2%	4,975	9,950	229.0	95.4%
April 19	4.832	9.664	5,514	11,028	128.2	97.7%	7,419	14,838	183.2	97.5%

SUMMARY OF OPERATING ORGANIC DATA - SINGLE TRAIN OPERATION - COUNTER-CURRENT OPERATION OF LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent Flow MGD	Equivalent Influent Flow Two Train Operation kg/D	Influent BOD_5 Loading kg/D	Equivalent Influent BOD_5 Loading Two Train Operation kg/D	Effuent BOD_5 Loading kg/D	BOD_5 Efficiency	Influent TSS Loading kg/D	Equivalent Influent TSS Loading Two Train Operation kg/D	Effluent TSS Loading kg/D	TSS Efficiency
April 20	4.645	9.290	5,054	10,108	228.9	95.9%	4,842	9,684	158.5	96.7%
April 21	5.213	10.426	4,565	9,130	256.9	94.4%	6,047	12,094	177.9	97.1%
April 22	4.410	8.820	5,233	10,466	217.3	95.9%	6,938	13,876	150.5	97.8%
April 23	5.316	10.632	5,159	10,318	80.6	98.4%	4,514	9,028	100.8	97.8%
April 24	4.180	8.360	2,932	5,864	79.2	97.3%	2,947	5,894	95.1	96.8%
April 25	4.113	8.226	4,818	9,636	109.1	97.7%	5,067	10,134	93.6	98.2%
April 26	3.884	7.768	4,447	8,894	147.2	96.7%	7,112	14,224	103.1	98.6%
April 27	3.773	7.546	4,720	9,440	57.2	98.8%	6,837	13,674	100.1	98.5%
April 28	3.870	7.740	4,211	8,422	58.7	98.6%	3,932	7,864	102.7	97.4%
April 29	3.728	7.456	4,607	9,214	56.5	98.8%	4,819	9,638	98.9	98.0%
April 30	4.097	8.194	3,960	7,920	31.1	99.2%	4,131	8,262	77.7	98.1%
Averages April 13 - April 30, 1990 (18 Days)	4.870	9.740	4,402	8,804	128.9	97.1%	5,404	10,808	186.1	96.6%
May 1, 1990	8.186	16.372	5,958	11,916	93.1	98.4%	6,362	12,724	124.1	98.0%
May 2	3.680	7.360	5,538	11,076	27.9	99.5%	6,027	12,054	55.8	99.1%
May 3	3.674	7.348	5,641	11,282	55.7	99.0%	6,100	12,200	83.6	99.3%
May 4	4.568	9.136	3,186	6,372	69.3	97.8%	5,212	10,424	138.5	97.3%
May 5	6.275	12.550	5,816	10,372	95.2	98.2%	6,494	12,988	190.3	97.1%

EXHIBIT 15
- 2 -

SUMMARY OF OPERATING ORGANIC DATA - SINGLE TRAIN OPERATION - COUNTER-CURRENT OPERATION OF LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent Flow MGD	Equivalent Influent Flow Two Train Operation kg/D	Influent BOD_5 Loading kg/D	Equivalent Influent BOD_5 Loading Two Train Operation kg/D	Effuent BOD_5 Loading kg/D	BOD_5 Efficiency	Influent TSS Loading kg/D	Equivalent Influent TSS Loading Two Train Operation kg/D	Effluent TSS Loading kg/D	TSS Efficiency
May 5	6.275	12.550	5,816	10,372	95.2	98.2%	6,494	12,988	190.3	97.1%
May 6	4.541	9.082	2,892	5,784	68.9	97.6%	3,839	7,678	137.7	98.2%
May 7	4.333	8.666	4,008	8,016	82.1	98.0%	3,285	6,570	98.6	97.0%
May 8	3.898	7.796	5,527	11,054	103.4	98.1%	3,827	7,654	88.7	97.7%
May 9	3.679	7.358	4,770	9,540	83.7	98.2%	4,477	8,954	97.6	97.8%
May 10	7.827	15.654	5,786	11,572	415.4	92.8%	8,219	16,438	385.7	95.3%
May 11	6.629	13.258	5,177	10,354	251.3	95.2%	5,177	10,354	376.9	92.7%
May 12	5.144	10.288	4,154	8,308	195.0	95.3%	4,290	8,580	292.5	93.2%
May 13	6.310	12.620	5,071	10,142	239.2	95.3%	5,215	10,430	358.8	93.1%
May 14	7.235	14.470	5,431	10,862	192.0	96.5%	6,363	12,726	246.8	96.1%
May 15	5.794	11.588	5,381	10,762	131.8	97.6%	6,963	13,926	153.8	97.8%
May 16	7.650	15.300	3,915	7,830	232.0	94.1%	7,482	14,964	319.0	95.7%
May 17	9.108	18.216	6,215	12,430	241.7	96.1%	6,767	13,534	587.0	91.3%
May 18	6.813	13.626	6,793	13,586	335.5	95.1%	5,295	10,590	206.6	96.1%
May 19	5.760	11.520	6,223	12,446	283.9	95.4%	6,987	13,974	174.7	97.5%
May 20	5.034	10.068	3,416	6,832	248.1	92.7%	2,404	4,808	152.7	93.6%
May 21	5.019	10.038	2,283	4,566	114.2	95.0%	3,767	7,534	114.2	97.0%
May 22	4.945	9.890	4,874	9,748	93.7	98.1%	5,118	10,236	93.7	98.2%
May 23	4.201	8.402	5,558	11,116	207.0	96.3%	5,542	11,084	127.4	97.7%

EXHIBIT 15
- 3 -

SUMMARY OF OPERATING ORGANIC DATA - SINGLE TRAIN OPERATION - COUNTER-CURRENT OPERATION OF LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent Flow MGD	Equivalent Influent Flow Two Train Operation kg/D	Influent BOD_5 Loading kg/D	Equivalent Influent BOD_5 Loading Two Train Operation kg/D	Effuent BOD_5 Loading kg/D	BOD_5 Efficiency	Influent TSS Loading kg/D	Equivalent Influent TSS Loading Two Train Operation kg/D	Effluent TSS Loading kg/D	TSS Efficiency
May 24	4.507	9.014	6,168	12,336	153.8	97.5%	9,209	18,418	85.4	99.1%
May 25	4.023	8.046	5,277	10,554	152.5	97.1%	6,512	13,024	91.5	98.6%
May 26	4.657	9.314	4,272	8,544	176.5	95.9%	5,049	10,098	105.9	97.9%
May 27	3.715	7.430	3,535	7,070	140.8	96.0%	4,281	8,562	84.5	98.0%
May 28	3.929	7.858	3,277	6,554	148.9	95.5%	3,858	7,716	89.4	97.7%
May 29	7.719	15.438	5,472	10,944	263.4	95.2%	9,978	19,956	175.6	98.2%
Commence Two Train Operation - May 30										
May 30	9.393	9.393	2,671	2,671	320.5	88.0%	3,561	3,561	249.3	93.0%
May 31	7.458	7.458	3,534	3,534	141.4	96.0%	3,902	3,902	339.3	91.3%
Averages May 1 - May 29, 1990 (29 Days)	5.478	10.956	4,862	9,724	168.8	96.5%	5,686	11,318	180.6	96.8%
Averages April 13 - May 29, 1990 (47 Days)	5.245	10.490	4,686 (235.7 mg/l)	9,372	153.5 (7.7 mg/l)	96.7%	5,578 (280.5 mg/l)	11,156	182.7 (9.2 mg/l)	96.7%

EXHIBIT 15
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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SUMMARY

OF

OPERATING NUTRIENT DATA

SINGLE TRAIN OPERATION

OF

COUNTER-CURRENT LOW LOAD AERATION UNITS

FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent MGD	Equivalent Influent Flow Two Train kg/D	Influent NH_3-N kg/D	Equivalent Influent NH_3-N Loading Two Train kg/D	Effluent NH_3-N kg/D	Efficiency	Influent $NO_2 + NO_3$-N kg/D	Equivalent Influent $NO_2 + NO_3$-N Loading Two Train kg/D	Effluent $NO_2 + NO_3$-N kg/D	Efficiency	Influent P Loading kg/D	Equivalent Influent P Loading One Train kg/D	Effluent P Loading kg/D	P Efficiency
April 10, 1990	5.177	5.177	251.2	251.2	27.5	89.0%	29.4	29.4	117.8	(400.7%)	88.3	88.3	9.8	88.9%
April 11	5.387	5.387	294.1	294.1	65.3	77.8%	179.7	179.7	122.5	31.7%	104.2	104.2	24.5	76.5%
April 12	4.758	4.758	250.7	250.7	39.7	84.2%	14.4	14.4	144.3	(1,002.1%)	77.6	77.6	9.0	88.4%
Commence Single Train Operation April 13														
April 13	4.260	8.520	224.5	449.0	35.5	84.2%	12.9	25.8	129.2	(1,001.6%)	69.4	138.8	8.1	94.2%
April 14	5.072	10.144	357.6	715.2	42.3	88.2%	15.4	30.8	153.8	(998.8%)	86.5	173.0	9.6	88.9%
April 15	7.882	15.764	394.4	788.8	65.7	83.3%	23.9	47.8	239.0	(1,001.1%)	125.5	251.0	14.9	88.1%
April 16	7.205	14.410	368.7	737.5	16.4	95.6%	284.1	568.2	327.8	(115.4%)	106.5	213.0	13.7	87.1%
April 17	5.683	11.366	245.6	491.2	32.3	86.8%	49.6	99.2	217.6	(438.7%)	79.7	159.4	8.6	89.2%
April 18	5.491	10.982	341.4	682.8	33.3	90.2%	70.8	141.6	122.8	(173.5%)	120.7	241.4	8.3	93.1%
April 19	4.832	9.664	342.5	685.0	18.3	94.7%	87.9	175.8	163.0	(185.5%)	102.6	205.2	9.2	91.0%
April 20	4.645	9.290	288.8	577.6	14.1	95.1%	49.3	98.6	214.8	(435.8%)	105.7	211.4	10.6	90.0%
April 21	5.213	10.426	341.9	683.8	15.8	95.4%	55.3	110.6	241.1	(436.0%)	116.6	233.2	11.9	89.8%
April 22	4.410	8.820	282.5	565.0	13.4	95.3%	46.8	93.6	204.0	(435.8%)	105.3	210.6	10.0	90.5%
April 23	5.316	10.632	409.1	818.2	54.4	86.7%	48.4	96.8	74.6	(154.1%)	120.9	241.8	16.1	86.7%

EXHIBIT 16

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SUMMARY OF OPERATING NUTRIENT DATA - SINGLE TRAIN OPERATION - COUNTER-CURRENT OPERATION OF LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent MGD	Equivalent Influent Flow Two Train kg/D	Influent NH_3-N kg/D	Equivalent Influent NH_3-N Loading Two Train kg/D	Effluent NH_3-N kg/D	Efficiency	Influent $NO_2 + NO_3$-N kg/D	Equivalent Influent $NO_2 + NO_3$-N Loading Two Train kg/D	Effluent $NO_2 + NO_3$-N kg/D	Efficiency	Influent P Loading kg/D	Equivalent Influent P Loading One Train kg/D	Effluent P Loading kg/D	P Efficiency
April 24	4.180	8.360	256.7	513.4	106.2	58.6%	44.4	88.8	42.8	3.6%	88.7	177.4	22.1	75.1%
April 25	4.113	8.226	386.7	773.4	157.5	59.3%	48.3	96.6	140.3	(290.5%)	107.6	215.2	14.0	87.0%
April 26	3.884	7.768	438.8	877.5	259.1	41.0%	111.9	223.8	25.0	77.7%	104.5	209.0	14.7	85.9%
April 27	3.773	7.546	323.2	646.4	70.1	78.3%	14.3	28.6	120.1	(840.2%)	107.3	214.6	5.7	94.7%
April 28	3.870	7.740	355.0	710.0	71.9	79.8%	16.1	32.2	123.2	(765.4%)	110.0	220.0	5.9	94.6%
April 29	3.728	7.456	302.4	604.8	69.2	77.1%	14.1	28.2	118.7	(841.9%)	107.4	214.8	5.7	94.7%
April 30	4.097	8.194	332.4	664.8	41.9	87.4%	94.7	189.4	118.0	(124.6%)	94.7	189.4	7.8	91.8%
Averages April 13 - April 30, 1990 (18 Days)	4.870	9.740	332.9	665.8	62.1	81.4%	60.4	120.8	154.2	(255.3%)	103.3	206.6	10.9	89.4%
May 1, 1990	8.186	16.372	732.4	1,464.8	149.0	79.7%	27.9	55.8	176.9	(634.0%)	183.1	366.2	12.4	93.2%
May 2	3.680	7.360	337.6	675.2	32.1	90.5%	30.7	61.4	120.0	(390.8%)	108.8	217.6	5.6	94.8%
May 3	3.674	7.348	409.5	819.0	61.3	85.0%	26.5	53.0	76.6	(289.1%)	124.0	248.0	18.1	85.4%
May 4	4.568	9.136	280.5	561.0	86.6	69.1%	20.8	41.6	81.4	(391.3%)	83.1	166.2	5.2	93.7%
May 5	6.275	12.550	380.6	761.2	118.9	68.9%	26.2	52.4	111.8	(426.7%)	116.6	233.2	7.1	93.9%
May 6	4.541	9.082	270.3	540.6	86.1	68.2%	20.7	41.4	80.9	(390.9%)	72.3	144.6	5.2	92.8%
May 7	4.333	8.666	399.2	798.4	41.1	89.7%	14.8	29.6	156.0	(1,054.4%)	96.9	193.8	6.6	93.2%
May 8	3.898	7.796	373.9	747.8	41.4	88.9%	14.8	29.6	152.2	(1,028.4%)	119.7	239.4	5.9	95.1%
May 9	3.679	7.358	341.7	683.4	34.9	89.8%	22.3	44.6	133.9	(600.4%)	92.0	184.0	4.2	95.4%
May 10	7.827	15.654	400.6	801.2	74.2	81.5%	195.8	391.6	308.6	(157.6%)	130.6	261.2	11.9	90.9%
May 11	6.629	13.258	382.0	764.0	42.7	88.8%	90.5	181.0	173.4	(191.6%)	155.8	311.6	12.6	91.9%

EXHIBIT 16
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SUMMARY OF OPERATING NUTRIENT DATA - SINGLE TRAIN OPERATION - COUNTER-CURRENT OPERATION OF LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent MGD	Equivalent Influent Flow Two Train kg/D	Influent NH_3-N kg/D	Equivalent Influent NH_3-N Loading Two Train kg/D	Effluent NH_3-N kg/D	Efficiency	Influent $NO_2 + NO_3$-N kg/D	Equivalent Influent $NO_2 + NO_3$-N Loading Two Train kg/D	Effluent $NO_2 + NO_3$-N kg/D	Efficiency	Influent P Loading kg/D	Equivalent Influent P Loading One Train kg/D	Effluent P Loading kg/D	P Efficiency
May 12	5.144	10.288	300.3	600.6	33.2	88.9%	66.3	132.6	134.6	(191.6%)	155.8	311.6	12.6	91.9%
May 13	6.310	12.620	366.0	732.0	40.7	88.9%	81.3	162.6	165.0	(203.0%)	148.3	296.6	14.4	90.3%
May 14	7.235	14.470	447.1	894.2	27.4	93.9%	60.3	120.6	128.9	(213.8%)	131.7	263.4	16.5	87.4%
May 15	5.794	11.588	355.8	711.6	43.9	87.7%	131.8	263.6	151.6	(115.0%)	142.8	285.6	13.2	90.8%
May 16	7.650	15.300	278.4	556.8	52.2	81.2%	95.7	191.4	249.4	(260.6%)	104.4	208.8	14.5	86.1%
May 17	9.108	18.216	283.1	566.2	20.7	92.7%	89.8	179.6	203.7	(226.8%)	113.9	227.8	20.7	81.8%
May 18	6.813	13.626	423.6	847.2	124.0	70.7%	25.8	51.6	144.6	(560.6%)	121.4	242.8	20.7	83.0%
May 19	5.760	11.520	347.2	694.4	104.8	69.8%	24.0	48.0	122.3	(509.5%)	117.9	235.8	17.5	85.4%
May 20	5.034	10.068	261.4	522.8	91.6	65.0%	19.1	38.2	106.9	(559.5%)	70.6	141.2	15.3	78.3%
May 21	5.019	10.038	319.6	730/5	53.3	83.3%	72.3	142.6	192.2	(265.8%)	83.7	167.4	11.4	86.4%
May 22	4.945	9.890	301.8	603.6	11.2	96.3%	31.9	63.8	195.0	(611.2%)	121.8	243.6	13.1	89.2%
May 23	4.201	8.402	329.7	659.4	78.0	76.3%	20.7	41.4	133.8	(646.3%)	129.0	258.0	20.7	80.9%
May 24	4.507	9.014	389.6	779.1	53.0	86.4%	27.3	54.6	117.9	(431.8%)	138.4	276.8	18.8	86.4%
May 25	4.023	8.046	358.4	716.8	59.5	83.4%	12.2	24.4	103.7	(850.0%)	135.7	271.4	9.2	93.2%
May 26	4.657	9.314	376.0	752.0	68.9	81.7%	15.9	31.8	120.0	(755.0%)	128.9	257.8	10.6	91.8%
May 27	3.715	7.430	304.2	608.4	54.9	82.0%	12.7	25.4	95.8	(754.1%)	104.2	208.2	8.4	91.9%
May 28	3.929	7.858	320.2	640.4	58.1	81.9%	11.9	23.8	101.3	(851.1%)	104.3	208.6	8.9	91.5%
May 29	7.719	15.438	196.1	392.2	23.4	89.4%	114.1	228.2	263.4	(230.8%)	143.4	286.8	23.4	83.7%
Commence Two Train Operation - May 30														
May 30	9.393	9.393	146.0	146.0	10.7	92.3%	124.6	124.6	256.4	(205.8%)	67.7	67.7	24.9	63.2%
May 31	7.458	7.458	279.9	279.9	31.1	88.9%	39.6	39.6	149.8	(378.4%)	84.8	84.8	22.6	73.4%

EXHIBIT 16
- 3 -

SUMMARY OF OPERATING NUTRIENT DATA - SINGLE TRAIN OPERATION - COUNTER-CURRENT OPERATION OF LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent MGD	Equivalent Influent Flow Two Train kg/D	Influent NH_3-N kg/D	Equivalent Influent NH_3-N Loading Two Train kg/D	Effluent NH_3-N kg/D	Efficiency	Influent $NO_2 + NO_3$-N kg/D	Equivalent Influent $NO_2 + NO_3$-N Loading Two Train kg/D	Effluent $NO_2 + NO_3$-N kg/D	Efficiency	Influent P Loading kg/D	Equivalent Influent P Loading One Train kg/D	Effluent P Loading kg/D	P Efficiency
Averages May 1 - May 29, 1990 (29 Days)	5.478	10.956	354.0	708.0	62.0	82.5%	48.4	96.8	117.4	(242.5%)	118.8	237.6	12.5	89.5%
Averages April 13 - May 29, 1990 (47 Days)	5.245	10.490	345.9 (17.4 mg/l)	691.8	62.0 (3.1 mg/l)	82.1%	53.0 (2.67 mg/l)	106.0	131.5 (6.61 mg/l)	(248.1%)	112.9 (5.7 mg/l)	225.8	11.9 (0.6 mg/l)	89.5%

EXHIBIT 16
- 4 -

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SUMMARY

OF

OPERATING ORGANIC DATA

SINGLE TRAIN OPERATION

EQUIVALENT FLOWS 7.25 - 9.25 MGD

Date	Influent Flow MGD	Equivalent Influent Flow Two Train Operation kg/D	Influent BOD_5 Loading kg/D	Equivalent Influent BOD_5 Loading Two Train Operation kg/D	Effuent BOD_5 Loading kg/D	BOD_5 Efficiency	Influent TSS Loading kg/D	Equivalent Influent TSS Loading Two Train Operation kg/D	Effluent TSS Loading kg/D	TSS Efficiency
April 13, 1990	4.260	8.520	3,472	6,944	113.0	96.8%	6,637	13,274	242.2	96.4%
April 20	4.645	9,290	5,054	10,108	228.9	95.9%	4,842	9,684	158.5	96.7%
April 22	4.410	8.820	5,233	10,466	217.3	95.9%	6,938	13,876	150.5	97.8%
April 24	4.180	8.360	2,932	5,864	79.2	97.3%	2,947	5,894	95.1	96.8%
April 25	4.113	8.226	4,818	9,636	109.1	97.7%	5,067	10,134	93.6	98.2%
April 26	3.884	7.768	4,447	8,894	147.2	96.7%	7,112	14,224	103.1	98.6%
April 27	3.773	7.546	4,720	9,440	57.2	98.8%	6,837	13,674	100.1	98.5%
April 28	3.870	7.740	4,211	8,422	58.7	98.6%	3,932	7,864	102.7	97.4%
April 29	3.728	7.456	4,607	9,214	56.5	98.8%	4,819	9,638	98.9	98.0%
April 30	4.097	8.194	3,960	7,920	31.1	99.2%	4,131	8,262	77.7	98.1%
Averages 10 Days	4.096	8.192	4,345	8,690	109.8	97.5%	5,326	10,652	122.2	97.7%
			(279.8 mg/l)		(7.1 mg/l)		(343.0 mg/l)		(7.9 mg/l)	

EXHIBIT 17
- 1 -

SUMMARY OF OPERATING ORGANIC DATA - SINGLE TRAIN OPERATION - EQUIVALENT FLOWS 7.25 - 9.25 MGD

Date	Influent Flow MGD	Equivalent Influent Flow Two Train Operation kg/D	Influent BOD_5 Loading kg/D	Equivalent Influent BOD_5 Loading Two Train Operation kg/D	Effuent BOD_5 Loading kg/D	BOD_5 Efficiency	Influent TSS Loading kg/D	Equivalent Influent TSS Loading Two Train Operation kg/D	Effluent TSS Loading kg/D	TSS Efficiency
May 2	3.680	7.360	5,538	11,076	27.9	99.5%	6,027	12,054	55.8	99.1%
May 3	3.674	7.348	5,641	11,282	55.7	99.0%	6,100	12,200	83.6	99.3%
May 4	4.568	9.136	3,186	6,372	69.3	97.8%	5,212	10,424	138.5	97.3%
May 6	4.541	9.082	2,892	5,784	68.9	97.6%	3,839	7,678	137.7	98.2%
May 7	4.333	8.666	4,008	8,016	82.1	98.0%	3,285	6,570	98.6	97.0%
May 8	3.898	7.796	5,527	11,054	103.4	98.1%	3,827	7,654	88.7	97.7%
May 9	3.679	7.358	4,770	9,540	83.7	98.2%	4,477	8,954	97.6	97.8%
May 23	4.201	8.402	5,558	11,116	207.0	96.3%	5,542	11,084	127.4	97.7%
May 24	4.507	9.014	6,168	12,336	153.8	97.5%	9,209	18,418	85.4	99.1%
May 25	4.023	8.046	5,277	10,554	152.5	97.1%	6,512	13,024	91.5	98.6%
May 27	3.715	7.430	3,535	7,070	140.8	96.0%	4,281	8,562	84.5	98.0%
May 28	3.929	7.858	3,277	6,554	148.9	95.5%	3,858	7,716	89.4	97.7%
Averages 12 Days	4.062	8.124	4,615 (297.7 mg/l)	9,230	107.8 (7.0 mg/l)	97.7%	5,181 (336.4 mg/l)	10,362	98.2 (6.4 mg/l)	98.1%
Averages 22 Days	4.078	8.156	4,492 (290.6 mg/l)	8,984	108.7 (7.0 mg/l)	97.6%	5,247 (339.4 mg/l)	10,494	109.1 (7.1 mg/l)	97.9%

EXHIBIT 17
- 2 -

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SUMMARY

OF

OPERATING NUTRIENT DATA

SINGLE TRAIN OPERATION

EQUIVALENT FLOWS 7.25 - 9.25 MGD

Date	Influent MGD	Equivalent Influent Flow Two Train kg/D	Influent NH_3-N kg/D	Equivalent Influent NH_3-N Loading Two Train kg/D	Effluent NH_3-N kg/D	Efficiency	Influent $NO_2 + NO_3$-N kg/D	Equivalent Influent $NO_2 + NO_3$-N Loading Two Train kg/D	Effluent $NO_2 + NO_3$-N kg/D	Efficiency	Influent P Loading kg/D	Equivalent Influent P Loading One Train kg/D	Effluent P Loading kg/D	P Efficiency
April 13	4.260	8.520	224.5	449.0	35.5	84.2%	12.9	25.8	129.2	(1,001.6%)	69.4	138.8	8.1	94.2%
April 20	4.645	9.290	288.8	577.6	14.1	95.1%	49.3	98.6	214.8	(435.8%)	105.7	211.4	10.6	90.0%
April 22	4.410	8.820	282.5	565.0	13.4	95.3%	46.8	93.6	204.0	(435.8%)	105.3	210.6	10.0	90.5%
April 24	4.180	8.360	256.7	513.4	106.2	58.6%	44.4	88.8	42.8	3.6%	88.7	177.4	22.1	75.1%
April 25	4.113	8.226	386.7	773.4	157.5	59.3%	48.3	96.6	140.3	(290.5%)	107.6	215.2	14.0	87.0%
April 26	3.884	7.768	438.8	877.5	259.1	41.0%	111.9	223.8	25.0	77.7%	104.5	209.0	14.7	85.9%
April 27	3.773	7.546	323.2	646.4	70.1	78.3%	14.3	28.6	120.1	(840.2%)	107.3	214.6	5.7	94.7%
April 28	3.870	7.740	355.0	710.0	71.9	79.8%	16.1	32.2	123.2	(765.4%)	110.0	220.0	5.9	94.6%
April 29	3.728	7.456	302.4	604.8	69.2	77.1%	14.1	28.2	118.7	(841.9%)	107.4	214.8	5.7	94.7%
April 30	4.097	8.194	332.4	664.8	41.9	87.4%	94.7	189.4	118.0	(124.6%)	94.7	189.4	7.8	91.8%
Averages 10 Days	4.096	8.192	319.1 (20.6 mg/l)	638.2	83.9 (5.4 mg/l)	73.7%	45.3 (2.92 mg/l)	90.6	123.6 (7.96 mg/l)	(272.9%)	100.1 (6.4 mg/l)	200.2	10.4 (0.7 mg/l)	89.6%

EXHIBIT 18

- 1 -

SUMMARY OF OPERATING NUTRIENT DATA - SINGLE TRAIN OPERATION - EQUIVALENT FLOWS 7.25 - 9.25 MGD

Date	Influent MGD	Equivalent Influent Flow Two Train kg/D	Influent NH_3-N kg/D	Equivalent Influent NH_3-N Loading Two Train kg/D	Effluent NH_3-N kg/D	Efficiency	Influent $NO_2 + NO_3$-N kg/D	Equivalent Influent $NO_2 + NO_3$-N Loading Two Train kg/D	Effluent $NO_2 + NO_3$-N kg/D	Efficiency	Influent P Loading kg/D	Equivalent Influent P Loading One Train kg/D	Effluent P Loading kg/D	P Efficiency
May 2	3.680	7.360	337.6	675.2	32.1	90.5%	30.7	61.4	120.0	(390.8%)	108.8	217.6	5.6	94.8%
May 3	3.674	7.348	409.5	819.0	61.3	85.0%	26.5	53.0	76.6	(289.1%)	124.0	248.0	18.1	85.4%
May 4	4.568	9.136	280.5	561.0	86.6	69.1%	20.8	41.6	81.4	(391.3%)	83.1	166.2	5.2	93.7%
May 6	4.541	9.082	270.3	540.6	86.1	68.2%	20.7	41.4	80.9	(390.9%)	72.3	144.6	5.2	92.8%
May 7	4.333	8.666	399.2	798.4	41.1	89.7%	14.8	29.6	156.0	(1,054.4%)	96.9	193.8	6.6	93.2%
May 8	3.898	7.796	373.9	747.8	41.4	88.9%	14.8	29.6	152.2	(1,028.4%)	119.7	239.4	5.9	95.1%
May 9	3.679	7.358	341.7	683.4	34.9	89.8%	22.3	44.6	133.9	(600.4%)	92.0	184.0	4.2	95.4%
May 23	4.201	8.402	329.7	659.4	78.0	76.3%	20.7	41.4	133.8	(646.3%)	129.0	258.0	20.7	80.9%
May 24	4.507	9.014	389.6	779.1	53.0	86.4%	27.3	54.6	117.9	(431.8%)	138.4	276.8	18.8	86.4%
May 25	4.023	8.046	358.4	716.8	59.5	83.4%	12.2	24.4	103.7	(850.0%)	135.7	271.4	9.2	93.2%
May 27	3.715	7.430	304.2	608.4	54.9	82.0%	12.7	25.4	95.8	(754.1%)	104.2	208.2	8.4	91.9%
May 28	3.929	7.858	320.2	640.4	58.1	81.9%	11.9	23.8	101.3	(851.1%)	104.3	208.6	8.9	91.5%
Averages 12 Days	4.062	8.124	342.9 (22.3 mg/l)	685.8	57.2 (3.7 mg/l)	83.3%	19.6 (1.27 mg/l)	39.2	112.8 (7.32 mg/l)	(575.5%)	109.0 (7.1 mg/l)	218.0	9.7 (0.6 mg/l)	91.1%
Averages 22 Days	4.078	8.156	332.1 (21.5 mg/l)	664.2	69.3 (4.5 mg/l)	79.1%	31.3 (2.02 mg/l)	62.6	117.7 (7.61 mg/l)	(376.0%)	105.0 (6.8 mg/l)	210.0	10.0 (0.6 mg/l)	90.5%

EXHIBIT 18
- 2 -

Exhibit V-5

Preliminary Hydraulic Calculations

Hatfield Township, Montgomery County

	UNITS	DESIGN FLOWS Average Daily	Peak Hour Flow 1	Peak Hour Flow 2	Peak Hour Flow 3
	mgd	8.4	21.5	24.0	27.0
	gpm	5833	14931	16667	18750
	cfs	13.0	33.3	37.1	41.8
PS 2 to Grit Grease					
Assumed Water Surface in PS 2 Influent		271.36	271.36	271.36	271.36
Pipe Size (in)		48.00	48.00	48.00	48.00
Pipe velocity (ft/s) (*2 pipes*)		0.5	1.3	1.5	1.7
Pipe Headloss (ft/ft)		0.0000	0.0002	0.0002	0.0003
Pipe Length (ft)		702	702	702	702
Friction Losses (ft)		0.025	0.140	0.172	0.214
Minor Loss Coefficient		2.00	2.00	2.00	2.00
Minor Losses (ft)		0.008	0.054	0.068	0.086
Total Losses (ft)		0.033	0.195	0.240	0.300
Water Level in Grit / Grease Effluent Channel		271.39	271.55	271.60	271.66
Grit Grease TOW		278.00	278.00	278.00	278.00
Freeboard		6.61	6.45	6.40	6.34
Grit Grease Launder Weir Elev.		275.34	275.34	275.34	275.34
Freefall (Weir to WS)		3.95	3.79	3.74	3.68
Water Level in Grit Grease					
Water Level in Grit Grease Effluent Channel		271.39	271.55	271.60	271.66
Grit Grease Launder Weir Elev.		275.34	275.34	275.34	275.34
Weir Length (ft)		8.53	8.53	8.53	8.53
Head on weir (ft)		0.59	1.11	1.20	1.29
Water Surface in Grit Grease		275.93	276.45	276.54	276.63
Water Level in Exit Channel from Screens to GG					
Water Surface in Grit Grease		275.93	276.45	276.54	276.63
Water Surface in Exit Channel (after door)		275.93	276.45	276.54	276.63
Port under door Area (sf) (4' wide x 2.5' high)		10.00	10.00	10.00	10.00
Head loss through port ($h = (Q/cA)^2/2g$		0.07	0.45	0.56	0.71
Water Surface at Exit of screens (before door)		276.00	276.90	277.09	277.34
Head loss through screen		0.33	0.33	0.33	0.33
Water Surface at Influent of Screens		276.33	277.23	277.42	277.67
Top of Wall at Influent Channel		278.00	278.00	279.00	278.00
Freeboard		1.67	0.77	1.58	0.33
Water Level in Effleunt of PS 1					
Water Surface at Influent of Screens		276.33	277.23	277.42	277.67
Port under door Area (sf) (6' wide x 1.5' high)		9.00	9.00	9.00	9.00
Head loss through port ($h = (Q/cA)^2/2g$		0.08	0.55	0.69	0.87
Water Surface at Exit of PS 1		276.42	277.78	278.11	278.54
Top of Wall		278.00	278.00	278.00	278.00
Freeboard		1.58	0.22	-0.11	-0.54

Exhibit V-6

Onlot Management Ordinance

Hatfield Township, Montgomery County

ORDINANCE NO. 608

AN ORDINANCE ESTABLISHING REGULATIONS FOR THE INSPECTION, PUMPING, MAINTENANCE, OPERATION, REHABILITATION AND ADMINISTRATION OF ONLOT SEWAGE SYSTEMS AND PROVIDING PENALTIES FOR VIOLATIONS THEREOF

WHEREAS, Hatfield Township (the "Township) has an obligation to provide for and/or insure adequate sewage treatment and protection of the public health by preventing the discharge of untreated or inadequately treated sewage as mandated by municipal codes, the Clean Streams Law (35 P.S. §691.1001) and the Pennsylvania Sewage Facilities Act (35 P.S. §750.1 et seq.).

WHEREAS, the Township Act 537 Official Wastewater Facilities Plan has evaluated the need to provide adequate sewage facilities and has found the formation of an On-Lot Sewage Management Program to be an effective method of preventing and abating water pollution and hazards to the public health.

WHEREAS, the purpose of this Ordinance is to: (1) keep the Township compliant with the requirements of the Clean Streams Law (Act of 1937, P.L. 1987, No. 394) and the Pennsylvania Sewage Facilities Act (Act of 1966 P.L. 1535, No. 537, as amended, known as Act 537); (2) provide for inspection, pumping, maintenance, and rehabilitation of on-lot sewage disposal systems; (3) establish penalties and appeal procedures necessary for the proper administration of such a management program.

WHEREAS, the Commissioners of the Township after due consideration of the proposed ordinance at a duly advertised public meeting, has determined that the health, safety and general welfare of the citizens and residents of Hatfield Township will be served by the passing of the within ordinance.

NOW, THEREFORE, IT IS HEREBY ENACTED AND ORDAINED by the Board of Commissioners of Hatfield Township, Montgomery County, Pennsylvania, as follows:

§I. Amendment of the Code.

Chapter 224, Sewers and Sewage Disposal, is hereby amended by adding the following Article IV, On-lot Sewage Management Program:

Section 224-34. APPLICABILITY

From the effective date of this Ordinance, its provisions shall apply to all properties utilizing on-lot sewer systems in Hatfield Township. The provisions of this Ordinance shall apply to all persons, and all other entities owning any property serviced by an on-lot sewage system or a community on-lot sewage system.

Section 224-35. DEFINITIONS

As used in this chapter, the following words and terms shall have the following definitions.

Act 537 – The Act of January 24, 1966, PL 1535, as amended, 35 P.S. §750.1 et. seq., known as the Pennsylvania Sewage Facilities Act.

Board – The Board of Commissioners, Hatfield Township, Montgomery County, Pennsylvania.

Department - shall mean the Department of Environmental Protection of the Commonwealth of Pennsylvania (DEP).

Individual Sewage System - shall mean a system of piping, tanks or other facilities serving a single lot and collecting and disposing of sewage in whole or in part into the soil or into any waters of this Commonwealth.

Malfunction shall mean a condition which occurs when an on-lot sewage disposal system discharges sewage onto the surface of the ground, into ground waters of this Commonwealth, into surface waters of this Commonwealth, backs up into a building connected to the system or in any manner causes a nuisance or hazard to the public health or pollution of ground or surface water or contamination of public or private drinking water wells. Systems shall be considered to be malfunctioning if any condition noted above occurs for any length of time during any period of the year.

Official Sewage Facilities Plan - shall mean a comprehensive plan for the provision of adequate sewage disposal systems, adopted by the Board and approved by the Pennsylvania Department of Environmental Protection, pursuant to the Pennsylvania Sewage Facilities Act.

On-lot Sewage System - shall mean any system for disposal of domestic sewage involving pretreatment and subsequent disposal of the clarified sewage into a subsurface soil absorption area or retaining tank; this term includes both individual sewage systems and community sewage systems.

Person - shall mean any individual, association, public or private corporation for profit or not for profit, partnership, firm, trust, estate, department, board, bureau of agency of the Commonwealth, political subdivision, municipality, district, authority, or any other legal entity whatsoever which is recognized by law as the subject of rights and duties. Whenever used in any clause prescribing and imposing a penalty or imposing a fine or imprisonment, the term person shall include the members of an association, partnership or firm and the officers of any local agency or municipal, public or private corporation for profit or not for profit.

Rehabilitation - shall mean work done to modify, alter, repair, enlarge or replace an existing on-lot sewage disposal system.

Sewage - shall mean any substance that contains any of the waste products or excrement or other discharge from the bodies of human beings or animals and any noxious or deleterious substances being harmful or inimical to the public health, or to animal or aquatic life, or to the use of water for domestic water supply or for recreation or which constitutes pollution under the Act of June 22, 1937 (P.L. 1987, No. 394), known as "The Clean Streams Law," as amended.

Sewage Management Program - shall mean a comprehensive set of legal and administrative requirements encompassing the requirements of this ordinance, the Sewage Facilities Act, the Clean Streams Law, the regulations promulgated thereunder and such other requirements adopted by the Board to effectively enforce and administer this ordinance.

Section 224-35. PERMITS.

A. No person shall install, construct or alter an individual sewage system or community sewage system or construct or install or occupy any building or structure for which an individual sewage system or community sewage system is to be installed without first obtaining a permit from the Montgomery County Health Department ("MCHD") which permit shall indicate that the site and the plans and specifications of such system are in compliance with the provisions of the Clean Streams Law (35 P.S. §§691.1-691.1001) and the Pennsylvania Sewage Facilities Act (35 P.S. 750.1 *et seq.)* and the regulations adopted pursuant to those Acts.

B. No system or structure designed to provide individual or community sewage disposal shall be covered from view until approval to cover the same has been given by the MCHD. If 72 hours have elapsed, excepting Sundays and Holidays, since the MCHD received notification of completion of construction, the applicant may cover said system or structure unless permission has been specifically refused by the MCHD.

C. No building or occupancy permit shall be issued and no work shall begin on any alteration or conversion of any existing structure, if said alteration or conversion will result in the increase or potential increase in sewage flows from the structure, until either the structure's owner receives a permit for alteration or replacement of the existing sewage disposal system or until the structure's owner receives written notification from the MCHD that such a permit will not be required. The MCHD shall determine whether the proposed alteration or conversion of the structure will result in increased sewage flows.

Section 224-36. INSPECTIONS.

A. Any on-lot sewage system may be inspected by the Township at any reasonable time as of the effective date of this Ordinance and the Township shall have the right to enter upon land for the purposes of the inspections described herein.

B. Such inspections may include a physical tour of the property, the taking of samples from surface water, wells, other groundwater sources, the sampling of the contents of the sewage disposal system itself and/or the introduction of a traceable substance into the interior plumbing of the structure served to ascertain the path and ultimate destination of wastewater generated in the structure.

C. An initial inspection and subsequent periodic inspections of an on-lot sewage system shall be conducted when an on-lot sewage system is pumped. Inspections shall be conducted by a qualified pumper/hauler for the purpose of determining the functional status of a sewage system. The individual property or on-lot sewage system owner shall contact and make arrangements directly with the qualified pumper/hauler for the inspection of an on-lot sewage system. A copy of the report shall be provided to the Township within thirty (30) days of its completion.

D. The Township may inspect any on-lot sewage system known to be, or suspected to be malfunctioning. Should the Township's inspection reveal that the on-lot sewage system is malfunctioning, the Township shall notify the property owner of the corrective action that needs to be taken or the Township may take action to require the correction of the malfunction.

Section 224-37. OPERATION.

Only normal domestic wastes shall be discharged into any on-lot sewage disposal system. The following shall not be discharged into the system.

1. Industrial waste.

2. Automobile oil and other non-domestic oil.

3. Toxic or hazardous substances or chemicals, including but not limited to, pesticides, disinfectants (excluding household cleaners), acids, paints, paint thinners, herbicides, gasoline and other solvents.

4. Clean surface or groundwater, including water from roof or cellar drains, springs, basement sump pumps and french drains.

Section 224-38. MAINTENANCE.

A. The Township shall provide written notification to all owners of property served by an on-lot sewage system that their system must be pumped by the end of the calendar year in which the letter is received. The Township shall follow a schedule whereby all of the owners of properties within the Township served by an on-lot sewage system are notified once every four (4) years. The notified property owners must have the sewage system pumped within the time specified in the Township's letter, unless the owner(s) can provide the Township with a pumping certification indicating that the on-lot sewage system was pumped within one (1) year prior to the date of the Township's notice letter.

B. Commencing from the date of the pumping as prescribed in section 224-38(A), removal of septage or other solids from an on-lot sewage system shall be performed at least once every four (4) years thereafter. The property owner shall furnish a copy of the pumping certification to the Township within thirty (30) days of the date of the pumping.

C. The Township may allow an on-lot sewage system to be pumped out at less frequent intervals when the owner can demonstrate that the sewage system and/or uses thereof are unique and do not require pumping every four (4) years. In no case shall such period extend beyond eight (8) years. The Township shall solely determine if an extension of time will be granted and the length of the extension.

D. A sewage system shall be deemed to be pumped when all organic solids are removed and the total average liquid depth remaining in the tank is less than one inch.

E. The Township may require additional maintenance activity as needed including, but not limited to, cleaning and unclogging of piping, service of mechanical equipment, removal of obstructing roots or trees and/or the diversion of surface water away from the absorption area.

F. The required frequency of pumping may be increased at the discretion of the Township, if:

(1) An on-lot sewage system is found to be malfunctioning;

(2) An on-lot sewage system is found to be undersized;

(3) The treatment tanks are filled with solids in excess of 1/3 of the liquid depth of the tank or with scum in excess of 1/3 of the liquid depth of the tank;

(4) The hydraulic load on the system increases significantly above original permit or design average;

(5) A garbage grinder is used in the building; or

(6) Other good cause can be shown.

G. Any person owning a structure served by a sewage system containing an aerobic treatment tank shall follow the operation and maintenance recommendations of the equipment manufacturer. In no case may the service or pumping interval for aerobic treatment tanks exceed that required for septic tanks.

H. Any person owning a structure served by a cesspool shall have that system pumped according to the scheduled prescribed for septic tanks.

I. Holding tanks shall be pumped out at intervals that prevent the overflow, leakage, back-up, and other malfunction characteristic of an overload system.

J. The owner of a property upon which an on-lot sewage system is constructed shall maintain the area around such system so as to provide convenient access for inspection, maintenance, and pumping; and shall divert surface water and downspouts away from the absorption area and sewage system components.

K. Tanks shall only be pumped from or through the manhole/access port, i.e. the largest tank opening. Tanks shall not be pumped from or through the observation port.

Section 224-39. REHABILITATION.

Any on-lot sewage system or component thereof found to be malfunctioning shall be repaired, modified or replaced to correct the conditions causing the malfunction. Rehabilitation shall be performed in accordance with 25 Pa. Code Chapter 73, (Standards for Sewage Disposal System) and any other applicable rules and regulations of the Department. The rehabilitated sewage system may be inspected to certify its compliance with any applicable local and state standards.

Section 224-40. IMMINENT HEALTH HAZARD; LIENS.

When an imminent health hazard exists due to failure of a property owner to maintain, repair, or replace an on-lot sewage system as provided under the terms of this Ordinance, the Township shall have the right to perform, or contract to have performed, the work required to abate the health hazard, pollution, or nuisance. The property and/or system owner shall be charged for the work performed, and, if necessary, a lien shall be recorded against the property. The Township reserves the right to pursue all other lawful remedies in addition to and not exclusive of any abatement and lien process.

Section 224-41. DISPOSAL OF SEPTAGE.

A. All septage originating within the Township shall be disposed of at sites or facilities approved by the Pennsylvania Department of Environmental Protection for the acceptance of septage.

B. Only qualified pumpers/haulers shall be utilized by any owner in the Township.

Section 224-42. ADMINISTRATION.

A. The Township shall fully utilize those powers it possesses and that have been delegated through enabling statues and ordinances to effect the purposes of this Ordinance.

B. The Township shall utilize qualified individuals to carry out the provisions of this Ordinance.

C. All permits, records, reports, files and other written material relating to the installation, operation, maintenance, and malfunction of an on-lot sewage system in the Township shall become the property of the Township.

D. The Township may establish all administrative procedures necessary to properly carry out the provisions of this Ordinance.

E. The Township may establish and adopt a fee schedule and subsequently collect fees to cover the cost of administering the on-lot maintenance program.

Section 224-43. APPEALS.

A. Appeals from decisions made under this Ordinance shall be made to the Township in writing within fifteen (15) days from the date of the decision in question.

B. The appellant shall be entitled to a hearing before the Hatfield Township Board of Commissioners at its next regular scheduled meeting, if the appeal is received at least fourteen (14) days prior to that meeting. If the appeal is received within fourteen (14) days of the next regularly scheduled meeting, the Hatfield Township Board of Commissioners shall determine whether to hear the appeal at the pending meeting or wait to hear the appeal at the following meeting. The Township shall thereafter affirm, modify, or reverse the aforesaid decision. The hearing may be postponed for a good cause shown by the appellant or the Township.

Section 224-44. PENALTIES.

Any person failing to comply with any provision of this Ordinance shall be subject to a fine of One Thousand Dollars ($1,000.00). In default thereof, the Solicitor is authorized to pursue the violations as a summary offense and any person may be subject to imprisonment for a period of not more than thirty (30) days. Each day of noncompliance shall a constitute a separate offense.

§II. Repealer.

All ordinances or parts of ordinances which are inconsistent herewith are hereby repealed, it being understood and intended that all ordinances and the Code of Ordinances for the Township of Hatfield such as are not otherwise specifically in conflict or inconsistent with this ordinance, shall remain in full force and effect, the same being reaffirmed hereby.

§III. **Severability.**

If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such provisions shall be separate, distinct and independent, and such holding shall not effect the validity of the remaining portions of this Ordinance.

§IV. **Failure to Enforce not a Waiver.**

The failure of the Township to enforce any provision of this Ordinance shall not constitute a waiver by the Township of its rights of future enforcement hereunder.

§V. **Effective Date.**

This ordinance shall take effect within five (5) days of passage.

§VI. **Enactment.**

Under the authority conferred by the First Class Township Code and other relevant statutory law, the Commissioners of the Township of Hatfield in the County of Montgomery, Commonwealth of Pennsylvania do hereby enact and ordain this ordinance to the Code of Ordinances for the Township of Hatfield this 29th day of September 2010.

HATFIELD TOWNSHIP

Attest: _____
Andrew S. Haines, Manager

By: _____
Scott Brown, Present

Exhibit V-7

Example Public Education Handouts

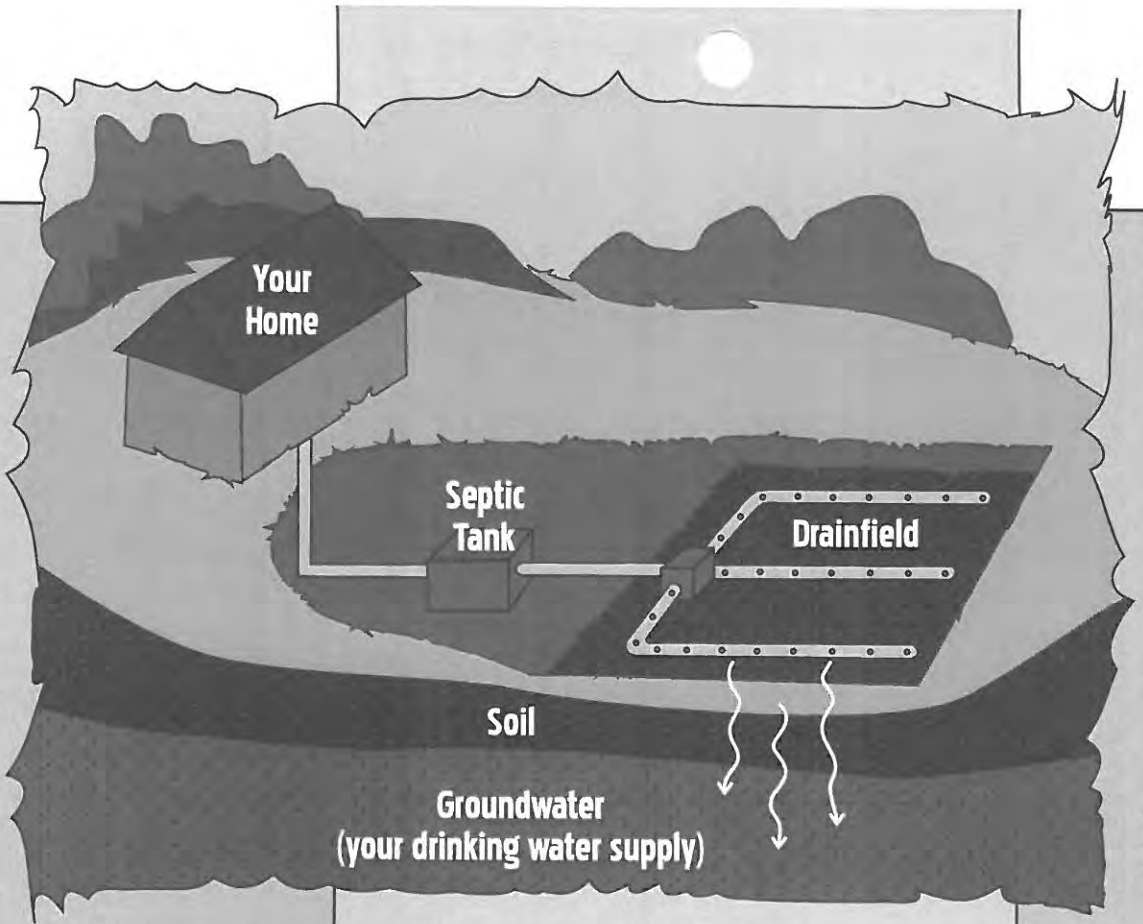
Hatfield Township, Montgomery County

How does it do that?

Septic systems treat household waste using:

- The septic tank
- The soil absorption field/ drainfield or lagoon

Wastewater from the bathroom, kitchen, and laundry flow to the tank, where heavy solids collect at the bottom and bacteria start decomposing the solids. Liquid effluent flows into the drainfield or lagoon where the soil provides a final treatment of the wastewater.



What if it doesn't work?

A septic system that **does not** work can have a negative impact on human and animal health. Inadequate treatment of wastewater allows bacteria, viruses and other disease-causing pathogens to enter surface and groundwater supplies. Protect your health, drinking water, and property value by properly maintaining your septic system.

How do I make sure it's working?

A properly functioning septic system will treat wastewater in a natural and safe way. Routine maintenance of your system will reduce both risks to human health and costs.

Septic owners should:

- Keep accurate septic system records (i.e. dates of inspection, pumping, problems).
- Have systems inspected and pumped every 2 to 3 years.
- Prevent vehicles and trailers from driving or parking on top of the drainfield.
- Avoid the use of additives. Save your money for an inspection or pumping.

Where is this thing?

Try finding your septic tank by:

- Going to the basement or area of the house that has sewer pipes going outside through the wall or floor. This will indicate the direction or location of the septic tank.
- Taking a metal rod and gently probing in the soil about 10 to 15 feet from the foundation of the house. Search for pipes or some sort of a metal, plastic, or concrete tank.

Find the system's drainfield by looking for:

- Areas where grass isn't growing well, grass is greener, or it grows faster.
- Areas where there is a slight depression or mound.
- Areas where the soil is soggy when the rest of the yard is dry.

Once you locate your system draw a simple map of the location to keep in your records. To prevent future malfunctions you may want to install a fence around the drainfield area.

If you **DO NOT** receive a sewage bill, then you own a septic system.

Do I smell something?

Signs of a failing system are:

- Sewage in the yard.
- A foul smelling, blackish/grayish liquid in the drainfield area.
- Sewage backup in sinks, toilets, showers, and bath tubs.

Can septic systems affect communities?

- Septic systems are considered the 2nd most frequent source of groundwater pollution by state agencies.

  U.S. Environmental Protection Agency, National Water Quality Inventory Report to Congress (305(b) Report), 1998

- Almost 10,000 water body impairments are due to pathogen or nutrient contamination. Septic systems are contributors of these contaminants.

  U.S. Environmental Protection Agency, 1998 Section 303(d) List Fact Sheet: National Picture of Impaired Waters Highlights of the 1998 303(d) Lists (based on Tracking System data available 04/06/00)

What else should I know?

On the web

- University of Nebraska
  http://wastewater.unl.edu
- University of Minnesota
  http://septic.umn.edu
- National Environmental Services Center
  http://www.nesc.wvu.edu

Sponsors

The Groundwater Foundation is an international nonprofit organization based in Lincoln, Nebraska dedicated to educating the public about the nature and value of groundwater. For more information about The Groundwater Foundation and its programs, visit www.groundwater.org or call 1-800-858-4844.

Funding provided by the Nebraska Department of Environmental Quality, the Nebraska Health Care Cash Fund and the Nebraska Drinking Water State Revolving Fund through the Nebraska Department of Environmental Quality Source Water Protection Program. Additional support provided by the Water Systems Council.

Handle It.

Maintain Your Septic. Protect Your Health.

Maintain my what?

A septic system is an on-site structure that treats household waste with a septic tank and a soil absorption system. Failing septic systems can contaminate lakes, creeks, and shallow drinking water supplies.

Why Do Septic Systems Fail?

The worst nightmare a homeowner with a septic system faces is the failure of their system. Failure of the system results in sewage backup in the household plumbing. In addition to the household, it can also emerge on the surface of the ground in the drain field which is damaging to the environment and unsafe for your family. Your well and nearby streams can become contaminated, which poses yet another costly and dangerous situation.

Some general warning signs of septic system failure are:

1. The alarm on your system goes off
2. Plumbing problems within the residence:
    - Clogged or sluggish drain lines
    - Sewage backup in the drain lines and appliances
    - Gurgling noises in the pipes and drain lines
3. Sewage or grey water on the surface of the ground in your drain field
4. Soft, mushy ground or thicker green grass around the system
5. Sewage odor outside of the residence

Failure of a system is normally caused by three factors:

1. Inadequate maintenance of the system
2. Improper design
3. Faulty installation

System Failures:

Factor #1 - Inadequate Maintenance

A correctly designed and installed system will not function without proper maintenance. It is vital to the life of your system that regular pumping and maintenance be performed on your system to help prevent system problems before they occur.

Your septic tank must be pumped on a regular basis. If it is not pumped, solids will accumulate within the tank and eventually flow into the drain field clogging the system. The baffles may also become damaged and eventually deteriorate within the tank allowing the scum to escape into the drain field.

The years between pumping are directly affected by the number of occupants in the household and the amount of water generated by items such as toilets, appliances and showers. Households with garbage disposals must be pumped more frequently due to the amount of solids that the disposal distributes into the tank. An average household with moderate water usage needs to be pumped approximately every two years.

Years between pumping

Tank Size (gal)	Household Size (number of people)									
	1	2	3	4	5	6	7	8	9	10
300	2.00	1.00	1.00	1.00	0.50	0.50	0.50	0.50	0.50	0.50
500	4.00	2.50	1.50	1.00	1.00	0.60	0.50	0.25	0.25	0.25
1000	5.00	3.00	3.00	2.00	2.00	1.50	1.50	1.50	1.00	1.00
1250	5.00	5.00	4.00	3.00	2.50	2.00	1.50	1.50	1.00	1.00

Taking care of the area within and around your drain field can also help to prevent a system failure.

Most vegetation will seek a source of water if it does not receive the amount it needs to grow. In search of moisture, trees and shrubs with deep roots can wrap around the distribution lines leading to the bed, clogging and damaging them. Therefore, always keep your drain field free of harmful vegetation.

Another way to protect the drain field is to make sure no heavy vehicles or equipment are driven across the area. Excessive weight can crush the pipes and damage the drain field resulting in failure. It can also compact the soil beyond natural compaction and does not allow proper circulation or drainage within the soil.

Surface water problems can also occur. Distribution pipes should always remain buried at a safe level beneath the ground. If they become exposed to the surface, freezing can occur causing the pipes to become damaged and blocked.

Another step a homeowner should take to prevent failures is to monitor water usage. A system is designed specifically to handle a certain amount of water based on the number of occupants within a home. If the number of occupants or water usage increases, then the tank must be pumped more regularly to dispose of the extra waste within the tank. Also, the extra amount of detergent, chemicals and cleaners that are flushed through the system can change the quality of the water and kill the bacteria cultures within the tank. The tank will not function without the bacteria.

In general, a large number of occupants and a small, undersized septic tank that is not pumped regularly is a failure waiting to happen.

Factor #2 - Improper Design

The design of your system is based on soil percolation rates and the size of the household. It is important to have your percolation tests performed by a trained, licensed Sewage Enforcement Officer (SEO) to ensure that the results are accurate. Undersizing of any of the following items can be damaging to your system:

1. Septic tank
2. Groundwater drainage
3. Drain field

An undersized septic tank will become clogged and pass solids into the drain field. Current regulations required a minimum 900 gallon dual compartment tank with inlet and outlet baffles or tees. An effluent filter is also beneficial to retain solids in the tank.

The groundwater levels within your area also play an important role in the proper function of your system. If that factor is not taken into consideration, heavy periods of groundwater flow will cause the system to become saturated and can contaminate your wells and surrounding areas.

If percolation tests are not run properly, the drain field may not be sized or designed correctly. An undersized drain field will eventually lead to costly maintenance and an early system failure.

It should not take a backup of sewage within your home to show that there are problems with your system. Problems may already be occurring before you notice clogged pipes within your home. An improper design acts like a chain reaction resulting in one problem after another.

Factor #3 - Installation Failures

Again, it is vital that you have a trained, experienced professional install your system. Even if the tests are performed correctly by the SEO, the system can still malfunction if it is not installed properly. If the distribution lines are spaced unevenly or not placed on the right grade, the water will not be distributed evenly within the drain field. This imbalance can cause a hydraulic overload. As mentioned above, the weight from heavy machinery and vehicles can also damage the drain field. Be sure to rope off the area around your drain field when installing a new system or having work done on your existing system so that the ground is not disturbed.

Conclusion:

Proper knowledge, prompt, professional services and a little common sense can all help to prevent septic system failures. If you have any questions or would like to have your system inspected, call your service technician today. Preventative maintenance is the key to the extended life of your system.

What are the factors that can cause backups?

One factor is buildup such as soap residue, garbage disposal waste, hair, and grease. Buildup leads to unwanted backups, but can be the easiest to correct and control.

A second factor which can contribute to backups is the age and/or condition of your drain lines.

1. The oldest pipes were made of terra cotta or clay and usually are in sections 2 feet in length. Because an average line had many joints, the rate of failure increases due to poor grouting, root infiltration or pipe degradation.
2. Next, orangeburg pipe was introduced as a new concept in pipe manufacturing. Made of many layers of tar paper, the interior of this type of pipe tends to fail when the inner most layer bubbles and/or deforms from outside pressures such as rocks or bracing.
3. Then, cast iron was introduced as a strong and more durable pipe. The biggest problem with cast iron is rusting from the inside causing restriction.
4. Today, plastic pipe is commonly used proving itself to be very reliable when installed properly.

Finally, proper installation of your pipes is imperative to keep them free flowing. Improper bedding of drain lines can cause settlement resulting in improper slopes or dips, sunken joints, root infiltration or breaks. The result of these problems is improper flow and buildup.

How can I tell if my lines are flowing properly?

You may experience few or NO warning signals prior to your lines actually backing up. Although each situation may differ for each household, you may notice a slowing of the lines or drains prior to a complete blockage. Often you will hear gurgling or bubbling sounds in the lines, or you may smell an odor coming from your drains. If you experience any of these warning signs, call an experienced technician to come out and troubleshoot your drain line problem. There have several resources to diagnose and fix the problem, such as, cable or "snaking" machines, hydro-jetting units, and television inspection cameras. A quick diagnosis of the problems can save you time and money.

What is the difference between cabling and jetting services?

Cables or "snakes" can be used on lines or drains from 1-¼" to 6" in diameter. Some cables can reach inside a line up to 100 feet. If the line is longer than 100 feet, a high-pressure water jet can be used, and is effective on lines from 2" to 54" in diameter and up to 500 feet in length. The cable will remove debris eliminating the immediate blockage and opening the line. A high-pressure water jet will wash down the buildup on the inside of the pipe reducing the risk of further clogging problems due to buildup. With proper maintenance, you can keep your lines open and flowing.

I just had a back up problem last year. Why did the line back up again?

You may have defects in your plumbing lines. If you have a chronic problem with a particular drain line, you may need to repair or replace the problem line. A service technician can help you determine where the problem lies. A television camera inspection service and line locating

service can save you time and money over conventional excavation methods. Using a camera and locating equipment, they can look for isolated problems, check the condition of the entire line, and provide an estimate to correct the problem.

What is involved in removing roots from my line?

Roots can cause back ups in most types of pipe. Commonly, small fibrous roots can infiltrate any joint or crack in your pipe and grow thick enough to clog a line. The best solution is to cut the roots out using cutters or blades and then treat the line with a foaming root killer, such as Rootx ®. Rootx is a non-systemic chemical with the active ingredient Dichlobenil that retards any further root growth for up to one year. If you choose not to treat the line with a root killer, the roots will grow in thicker and heavier causing another blockage before long. In time, root growth will ultimately destroy the integrity of pipe leading to pipeline replacement.

What can I do to reduce the risk of my lines backing up?

A few simple practices can help to alleviate problems:

- Don't plant trees or shrubbery over or near the drain line or absorption area.
- Use a lighter weight toilet paper.
- Make sure there are baskets or screens on every drain.
- Limit the use of the garbage disposal. When using it, run plenty of water and have the blades sharpened often.
- Dispose of grease and oil in your residential trash.
- Use liquid soaps. Powdered soaps are made with wax that can leave behind a residue.
- Do not flush feminine products, baby wipes, paper towels, or nonbiodegradable materials.
- Make sure all outside drain caps are above-grade, fitted and secured properly.

I am thinking about purchasing a property. The former owner is not providing any information on previous problems or history of maintenance. How can I find out?

A service technician can locate and inspect drain lines for defects and determine:

- if it is a shared line with a neighbor
- if the line is excessively dirty
- evidence of root infiltration
- evidence of pipe deterioration

To be constructed, all onlot systems in the area had to be permitted by the County Health Department. A file search by tax parcel id number and address may provide construction and repair information.

Any information gathered may be put in report form and given to you with recommendations.

Helpful Hints

It is important for residents with septic systems to have a basic knowledge of how their system functions so they can maintain their systems and ensure it is functioning properly to save time and money, and to protect public health and the environment.

- NEVER enter a septic tank. The gasses within the tank can be toxic and fatal.
- Pump your septic tank regularly. Clogged drain fields are the leading reason for septic system malfunctions and failures.
- Conserve water. This prolongs the life of your system. Reducing the water flow into the system helps the solids within the tank to sink to the bottom, producing less agitation within the tank. The likelihood of solids passing into the drain field is then greatly diminished.
- Monitor your water consumption. Your system is designed to handle certain levels of water based on the number of occupants living at your residence. Make adjustments if the water usage increases drastically.
- Always promptly repair leaky fixtures, faucets and toilets. These leaks add up to extra water and agitation of solids in the tank which can lead to eventual system malfunctions.
- Showers require less water than baths.
- Front loading washers use 1/3 less water than top loading units.
- Only use the clothes washer and dishwasher when you have a full load. Think water conservation!
- Always use a trap in your sinks to help prevent larger solids from passing into your tank. These solids can eventually cause clogging problems if not contained.
- Always keep your drain field free of trees, roots, storm and surface water as well any other things that may obstruct and damage the area.
- Know the exact location of your septic tank and drain field. This can save time when the system needs to be pumped or repaired.
- Never drive heavy equipment or vehicles over your drain field. This can damage the area and cause a system failure.
- Always pump the tank through the large central manhole, not the baffle ports. A riser can be installed on the manhole to make it more accessible for pumping.
- Place a copy of your sewage permit and application for a new system in a safe place for possible future use.
- Always read product labels carefully to make sure they are safe for your septic system.
- Use white toilet tissue. It breaks down faster within the tank. The dye in colored tissue holds the fiber together longer and takes longer to break down in the tank.
- NEVER put harmful products or objects into your system.
- Periodically check the visible condition of your system and pump tank mechanisms.
- Make sure your system has been properly designed by a trained professional and meets all SEO (Sewage Enforcement Officer) and DEP (Department of Environmental Protection) regulations.
- Make sure drain lines are not exposed or placed too close to the surface of the ground. Freezing lines can cause serious damage to a system.
- Chemical or biological additives are not a substitute for regular pumping.
- Recognize changes in water quality.
- Know you septic system size, age and condition. If you do not know, have it pumped and inspected to determine these crucial factors.

Exhibit V-8

EPA Management Models

Hatfield Township, Montgomery County

Table 1: Summary of Management Models

TABLE 1: SUMMARY OF MANAGEMENT MODELS

TYPICAL APPLICATIONS	PROGRAM DESCRIPTION	BENEFITS	LIMITATIONS
MODEL 1 - HOMEOWNER AWARENESS MODEL			
• Areas of low environmental sensitivity where sites are suitable for conventional onsite systems.	• Systems properly sited and constructed based on prescribed criteria. • Owners made aware of maintenance needs through reminders. • Inventory of all systems	• Code-compliant system. • Ease of implementation; based on existing, prescriptive system design and site criteria. • Provides an inventory of systems that is useful in system tracking and area-wide planning.	• No compliance/problem identification mechanism. • Sites must meet siting requirements. • Cost to maintain database and owner education program.
MODEL 2 - MAINTENANCE CONTRACT MODEL			
• Areas of low to moderate environmental sensitivity where sites are marginally suitable for conventional onsite systems due to small lots, shallow soils, or low-permeability soils. • Small clustered systems.	• Systems properly sited and constructed. • More complex treatment options, including mechanical components or small clusters of homes. • Requires service contracts to be maintained. • Inventory of all systems. • Service contract tracking system.	• Reduces the risk of treatment system malfunctions. • Protects homeowner investment.	• Difficulty in tracking and enforcing compliance because it must rely on the owner or contractor to report a lapse in a valid contract for services. • No mechanism provided to assess effectiveness of maintenance program.
MODEL 3 - OPERATING PERMIT MODEL			
• Areas of moderate environmental sensitivity such as wellhead or source water protection zones, shellfish growing waters, or bathing/water contact recreation. • Systems treating high-strength wastes or large-capacity systems.	• Establishes system performance and monitoring requirements. • Allows engineered designs but may provide prescriptive designs for specific receiving environments. • Regulatory oversight by issuing renewable operating permits that may be revoked for noncompliance. • Inventory of all systems. • Tracking system for operating permit and compliance monitoring. • Minimum for large-capacity systems.	• Allows systems in more environmentally sensitive areas. • Operating permit requires regular compliance monitoring reports. • Identifies noncompliant systems and initiates corrective actions. • Decreases need for regulation of large systems. • Protects homeowner investment.	• Higher level of expertise and resources for regulatory authority to implement. • Requires permit tracking system. • Regulatory authority needs enforcement powers.
MODEL 4 - RESPONSIBLE MANAGEMENT ENTITY (RME) OPERATION AND MAINTENANCE (O&M) MODEL			
• Areas of moderate to high environmental sensitivity where reliable and sustainable system operation and maintenance (O&M) is required, e.g., sole source aquifers, wellhead or source water protection zones, critical aquatic habitats, or outstanding value resource waters. • Clustered systems.	• Establishes system performance and monitoring requirements. • Professional O&M services through RME (either public or private). • Provides regulatory oversight by issuing operating or NPDES permits directly to the RME. (System ownership remains with the property owner.) • Inventory of all systems. • Tracking system for operating permit and compliance monitoring.	• O&M responsibility transferred from the system owner to a professional RME that is the holder of the operating permit. • Identifies problems needing attention before failures occur. • Allows use of onsite treatment in more environmentally sensitive areas or for treatment of high-strength wastes. • Can issue one permit for a group of systems. • Protects homeowner investment.	• Enabling legislation may be necessary to allow RME to hold operating permit for an individual system owner. • RME must have owner approval for repairs; may be conflict if performance problems are identified and not corrected. • Need for easement/right of entry. • Need for oversight of RME by regulatory authority.
MODEL 5 - RESPONSIBLE MANAGEMENT ENTITY (RME) OWNERSHIP MODEL			
• Areas of greatest environmental sensitivity where reliable management is required. Includes sole source aquifers, wellhead or source water protection zones, critical aquatic habitats, or outstanding value resource waters. • Preferred management program for clustered systems serving multiple properties under different ownership (e.g., subdivisions).	• Establishes system performance and monitoring requirements. • Professional management of all aspects of decentralized systems through public/private RMEs that own or manage individual systems. • Qualified, trained, owners and licensed professional owners/operators. • Provides regulatory oversight by issuing operating or NPDES permit. • Inventory of all systems. • Tracking system for operating permit and compliance monitoring.	• High level of oversight if system performance problems occur. • Simulates model of central sewerage, reducing the risk of noncompliance. • Allows use of onsite treatment in more environmentally sensitive areas. • Allows effective area-wide planning/watershed management. • Removes potential conflicts between the user and RME. • Greatest protection of environmental resources and owner investment.	• Enabling legislation and/or formation of special district may be required. • May require greater financial investment by RME for installation and/or purchase of existing systems or components. • Need for oversight of RME by regulatory authority. • Private RMEs may limit competition. • Homeowner associations may not have adequate authority.

Note: If applicable NPDES requirements under the CWA or UIC requirements under the SDWA supercede any less stringent or inconsistent provision

Appendices

Hatfield Township, Montgomery County

Appendix A

Resolution(s) of Adoption

HATFIELD TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA
RESOLUTION NO. 10-24

A RESOLUTION OF THE COMMISSIONERS OF HATFIELD TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA, ADOPTING THE TOWNSHIP'S 537 PLAN.

RECITALS

A. Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection ("DEP") adopted pursuant thereto and being Chapter 71 of Title 25 of the Pennsylvania Code, requires the Hatfield Township ("Township") to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the Township.

B. Hatfield Township Municipal Authority ("Authority"), the entity responsible for the disposal and treatment of sewage wastes within the Township, through its engineer, CET Engineering Services, has prepared an "Act 537 Plan Update" which provides for the sewage facilities in a portion of Hatfield Township.

C. Based upon studies and available alternatives, the alternative of choice to be implemented is the re-rate of the existing Advanced Wastewater Treatment Facility to meet existing and future flow requirements and the implementation of a Sewage Management Program to provide oversight of the existing on-lot sewage disposal systems within the Township. The key implementation activities/ dates include the following:

- Adoption of Act 537 Plan Revision: October 2010
- Submission of Act 537 Plan Revision to DEP November 2010
- Approval of Act 537 Plan Revision: May 2011
- Implementation of Alternatives 1 and 2: June 2011

D. The Township finds that the Act 537 Plan Update described above conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of Hatfield Township hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the "Official Plan" of the Township, the above referenced Act 537 Plan Update. The Township hereby assures the Department of the complete and timely implementation of the said plan as required by law.

HATFIELD TOWNSHIP

BY: _____
Scott Brown, President

I, Andrew Haines, Secretary of Hatfield Township, hereby certify that the foregoing is a true copy of Township Resolution No. 10-22, adopted October 27, 2010.

ATTEST: _____
Andrew S. Haines
Township Manager/Secretary

HATFIELD TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA
RESOLUTION NO. 10-24

A RESOLUTION OF THE COMMISSIONERS OF HATFIELD TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA, ADOPTING THE TOWNSHIP'S 537 PLAN.

RECITALS

A. Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection ("DEP") adopted pursuant thereto and being Chapter 71 of Title 25 of the Pennsylvania Code, requires the Hatfield Township ("Township") to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the Township.

B. Hatfield Township Municipal Authority ("Authority"), the entity responsible for the disposal and treatment of sewage wastes within the Township, through its engineer, CET Engineering Services, has prepared an "Act 537 Plan Update" which provides for the sewage facilities in a portion of Hatfield Township.

C. Based upon studies and available alternatives, the alternative of choice to be implemented is the re-rate of the existing Advanced Wastewater Treatment Facility to meet existing and future flow requirements and the implementation of a Sewage Management Program to provide oversight of the existing on-lot sewage disposal systems within the Township. The key implementation activities/ dates include the following:

- Adoption of Act 537 Plan Revision: October 2010
- Submission of Act 537 Plan Revision to DEP November 2010
- Approval of Act 537 Plan Revision: May 2011
- Implementation of Alternatives 1 and 2: June 2011

D. The Township finds that the Act 537 Plan Update described above conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of Hatfield Township hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the "Official Plan" of the Township, the above referenced Act 537 Plan Update. The Township hereby assures the Department of the complete and timely implementation of the said plan as required by law.

HATFIELD TOWNSHIP

BY: _____
Scott Brown, President

I, Andrew Haines, Secretary of Hatfield Township, hereby certify that the foregoing is a true copy of Township Resolution No. 10-22, adopted October 27, 2010.

ATTEST: _____
Andrew S. Haines
Township Manager/Secretary

Appendix B

Montgomery County Planning Commission and Health Department Comments

CET ENGINEERING SERVICES

November 23, 2010

Montgomery County Planning Commission
Montgomery County Courthouse
P.O. Box 311
Norristown, PA 19404
Attn: Jon A. Lesher

Re: Hatfield Township Act 537 Plan Revision
Montgomery County Planning Commission Review Comments

Dear Jon,

Hatfield Township has finalized and adopted the Act 537 Plan Revision reviewed by the County in May of this year. Thank you for your comments. As such, we are providing responses to these comments, to be included in the submission to PA DEP.

Comment 1: On-lot Management Ordinance – The County supports this measure and would be willing to assist Hatfield Township with this process.
Response 1: Thank you. The Township has passed an On-lot Management Ordinance (included in the Plan) and will contact the County for assistance upon approval by DEP.

Comment 2: Soil Survey Map – The proposed update revision using soil data gained from the Montgomery County Soil Survey. Please be aware that Montgomery County now uses the Web Soil Survey from USDA and NRCS for our soil mapping data.
Response 2: Soil information from all the sources listed above, and others, was used in the preparation of the Plan Revision.

A copy of the Plan Revision is available at Hatfield Township and HTMA for your review at any time.

Thanks very much, please don't hesitate to contact us should you have any concerns.

Sincerely,

Joel Kostelac, P.E.
Staff Engineer

Enclosure

Xc: Andrew Haines, Hatfield Township
Peter Dorney, Hatfield Township Municipal Authority

CET ENGINEERING SERVICES

March 24, 2010

Montgomery County Planning Commission
Montgomery County Courthouse
P.O. Box 311
Norristown, PA 19404

Re: Hatfield Township DRAFT Act 537 Plan Revision
Montgomery County Planning Commission Review

To Whom It May Concern:

Enclosed is a draft copy of the Hatfield Township Act 537 Sewage Facilities Plan Update, which the Township is prepared to adopt. The Act 537 Plan Revision proposes a hydraulic re-rate of the Hatfield Township Municipal Authority's Advanced Wastewater Treatment Plant. The plan also addresses the management of sewage facilities in the Township including plans to maintain onlot systems, and to identify, repair or replace malfunctioning systems.

As you are aware, one of the requirements of the 537 Plan is to provide evidence that the municipality has requested, reviewed and considered comments by appropriate official planning agencies of the county. We are forwarding the enclosed document to you on behalf of the Hatfield Township Board of Commissioners in order to meet this requirement. All County comments will be considered, with written responses provided to the County and included in the final plan.

The Hatfield Township Board of Commissioners would like to submit their plan as soon as possible. Any assistance in expediting the County's review, therefore, would be appreciated. Please contact us if you have questions or need additional information

Sincerely,

Joel Kostelac, P.E.
Staff Engineer

Enclosure

Xc: Andrew Haines, Hatfield Township (no enclosure)
Peter Dorney, Hatfield Township Municipal Authority (no enclosure)

MONTGOMERY COUNTY PLANNING COMMISSION
box 311 • norristown • pennsylvania • 19404-0311 • 610-278-3722
office location: suite 201 • one montgomery plaza • swede & airy streets • norristown pa
FAX 610-278-3941 • Website www.montcopa.org/plancom

SEWAGE FACILITIES PLANNING MODULE
COMPONENT 4b - COUNTY PLANNING AGENCY REVIEW

5/10/2010

MCPC 537 Number: 10-2027
Hatfield Township Act 537 Sewage Facilities Plan Update
Hatfield Township
Date revision received by the County Planning Commission:
3/25/2010

Andrew Haines, Manager
Hatfield Township
1950 School Rd.
Hatfield, PA 19440-1992

Dear Mr. Haines:

We have reviewed this application for a revision to the Township's Sewage Facilities Plan in accordance with regulations issued under Act 537, "The Pennsylvania Sewage Facilities Act," as requested. We are forwarding this letter as a report of our review and recommendations.

BACKGROUND

Hatfield Township has submitted an Act 537 Official Plan Update Revision for review. The purpose of the Update Revision is to evaluate the adequacy of existing sewage facilities, to identify on-lot sewage disposal needs areas and to identify and evaluate alternatives, as necessary, for the continued use of existing facilities. To achieve these purposes, the proposed Update Revision concludes the following actions should be taken. The necessary additional permitted capacity required at the Hatfield Township Municipal Authority Wastewater Treatment Plant would be provided through a hydraulic re-rate up to 7.5 MGD ADF and 11.55 MGD MMF. For on-lot sewage disposal needs in the Township, the Update Revision proposes two actions. In the Derstine Road Study Area (DRSA), an extension of the conventional collection system from the Towamencin system as part of a proposed development project would be preferable. The alternative for the DRSA would be to continue the use of the on-lot systems in the area and enact a Township sewage management program with an on-lot sewage disposal system ordinance.

COMMENTS

On-lot Management Ordinance – The County supports this measure and would be willing to assist Hatfield Township with this process.

Soil Survey Map – The proposed Update Revision using soil data gained from the Montgomery County Soil Survey. Please be aware that Montgomery County now uses the Web Soil Survey from USDA and NRCS for our soil mapping data.

RECOMMENDATION

Once these issues have been addressed to the satisfaction of the Township and DEP, we have no objection to this 537 Planning Module. Should there be any questions regarding the content of this letter, please contact me at (610) 278-3750.

Sincerely,

Jon A. Lesher
Environmental Planner
(610) 278-3750
jlesher@montcopa.org

c: Elizabeth Mahoney, DEP, SERO
Peter Dorney, HTMA Exec. Director
Joel Kostelac, CET Engineering Services

CET ENGINEERING SERVICES

March 24, 2010

Walter Higgins, SEO
Montgomery County Health Department
Montgomery County Human Services Center
P.O. Box 311
Norristown, PA 19404

Re: Hatfield Township DRAFT Act 537 Plan Revision
Montgomery County Health Department Review

Dear Walter,

Enclosed is a draft copy of the Hatfield Township Act 537 Sewage Facilities Plan Update, which the Township is prepared to adopt. The Act 537 Plan Revision proposes a hydraulic re-rate of the Hatfield Township Municipal Authority's Advanced Wastewater Treatment Plant. The plan also addresses the management of sewage facilities in the Township including plans to maintain onlot systems, and to identify, repair or replace malfunctioning systems.

As you are aware, one of the requirements of the 537 Plan is to provide evidence that the municipality has requested, reviewed and considered comments by appropriate official health departments of the county. We are forwarding the enclosed document to you on behalf of the Hatfield Township Board of Commissioners in order to meet this requirement. All comments will be considered, with written responses provided to the County and included in the final plan.

The Hatfield Township Board of Commissioners would like to submit their plan as soon as possible. Any assistance in expediting the Department's review, therefore, would be appreciated. Please contact us if you have questions or need additional information

Sincerely,

Joel Kostelac, P.E.
Staff Engineer

Enclosure

Xc: Andrew Haines, Hatfield Township (no enclosure)
Peter Dorney, Hatfield Township Municipal Authority (no enclosure)

COUNTY OF MONTGOMERY

Commissioners
James R. Matthews
Chairman
Joseph M. Hoeffel Bruce L. Castor, Jr.

Joseph M. DiMino, DO
Director of Health/Medical Director

MONTGOMERY COUNTY HEALTH DEPARTMENT
1430 DeKalb Street, PO Box 311
Norristown, PA 19404-0311
Phone: 610-278-5117 Fax: 610-278-5167
TDD: 610-631-1211
www.health.montcopa.org

April 22, 2010

Joel Kostelac, P.E.
CET Engineering Services
1240 N. Mountain Road
Harrisburg, PA 17112

Re: Hatfield Township DRAFT Act 537 Plan Revision
Hatfield Township, Montgomery County

Dear Mr. Kostelac:

The Montgomery County Health Department (MCHD) has reviewed the Hatfield Township DRAFT Act 537 Plan Revision for Hatfield Township, Montgomery County. MCHD has no objections at this time to the proposed revision of the Hatfield Township official plan.

If you have any further questions, please contact me at (610) 278-5117 ext 6729.

Sincerely,

Walter Higgins
Environmental Health Specialist/SEO
Division of Water Quality Management
whiggins@montcopa.org

Enclosures

xc: Department of Environmental Protection, SERO
Andrew S. Haines, Hatfield Township Manager
File

CET ENGINEERING SERVICES

March 30, 2010

Hatfield Township Planning Commission
1950 School Road
Hatfield, PA 19440

Re: Hatfield Township Act 537 Plan
Planning Commission Comment Request

Dear Planning Commission,

On behalf of the Hatfield Township Board of Commissioners, CET Engineering Services requests your review and comment of the Hatfield Township Act 537 Sewage Facilities Plan Update, a copy of which is available at the Township office. The Act 537 Plan Revision proposes a hydraulic re-rate of the Hatfield Township Municipal Authority's Advanced Wastewater Treatment Plant. The plan also addresses the management of sewage facilities in the Township including plans to maintain onlot systems, and to identify, repair or replace malfunctioning systems.

As you are aware, one of the requirements of the 537 Plan is to provide evidence that the municipality has requested, reviewed and considered comments by appropriate official planning agencies of the Township. All comments will be considered, with written responses provided to the Township Planning Commission and included in the plan.

Please feel free to contact CET Engineering Services if you have questions or need additional information

Sincerely,

Joel Kostelac, P.E.
Staff Engineer

Xc: Andrew Haines, Hatfield Township
Peter Dorney, Hatfield Township Municipal Authority

HATFIELD TOWNSHIP PLANNING COMMISSION MEETING MINUTES
April 20, 2010

I. CALL TO ORDER

Vice-Chair Miller called the meeting to order at 7:35pm. Other members present were Mr. Hughes and Mr. Rogers. Staff members present were Ms. Abromavitz and Mr. Amey.

II. MINUTES

Mr. Hughes made a motion to approve the minutes of March 16, 2010 as submitted. Mr. Rogers seconded the motion and it passed unanimously.

III. SUBDIVISIONS & LAND DEVELOPMENTS

A. Oak Tree Industrial Associates – (09-03)

Mr. Altemose appeared with his engineer, Shimon Guy, and explained the project and the improvements proposed for the Bergey Road frontage. Mr. Altemose noted that he is willing to improve the frontage of the Diaddezio property as well if the property owner will agree to allow the work to be done. Waivers have been requested for plan scale, 6" curb reveal, a narrower buffer than required along the Diaddezio property line, location of trees along the right of way of Bergey Road, and size of trees in the PPL right of way. The only waiver the Planning Commission had concern about was the buffer along the Diaddezio's line; they asked Mr. Amey to contact the property owners to be sure they agreed with the buffer plantings and the trail location.

The other outstanding issue is approval from PPL for work in their right of way. Mr. Altemose will return once he has approval from PPL and in the meantime Mr. Amey will contact the Diaddezio's to get their reaction to the plans.

Mr. Altemose will return once these issues are resolved.

IV. OTHER BUSINESS

A. Mr. Amey reviewed the new Act 537 Plan prepared by the HTMA and their engineer. He explained that Township staff has been working with the authority for over two years and the plan is now ready to be submitted to DEP. This plan will resolve issues of concern to DEP, will plan for the proper monitoring of on-site systems, and will

plan for service to areas of the Township currently not provided with sanitary sewer service. Mr. Hughes made a motion to endorse the new 537 Plan. Ms. Miller seconded the motion and it passed unanimously.

B. Mr. Hughes noted that after this meeting he would be stepping down as a member of the Planning Commission. The other members wished him well as he continues his service to the Township as the 3rd Ward Commissioner.

V. ADJOURNMENT

With no further business to transact, the meeting was adjourned at 8:45pm.

Appendix C

Proof of Public Notice

Bucks County, SS.

HATFIELD TWP MUNICIPAL
3200 ADVANCE LN
COLMAR, PA 18915

3-2158229300
0005831631-01

Laurie Clark being duly affirmed according to law, deposes and says that he/she is the Legal Billing Co-ordinator of the CALKINS NEWSPAPER INCORPORATED, Publisher of The Intelligencer, a newspaper of general circulation, published and having its place of business at Doylestown, Bucks County, Pa. and Horsham, Montgomery County, Pa.; that said newspaper was established in 1886; that securely attached hereto is a facsimile of the printed notice which is exactly as printed and published in said newspaper on

March 23, 2010

and is a true copy thereof; and that this affiant is not interested in said subject matter of advertising; and all of the allegations in this statement as to the time, place and character of publication are true.

Laurie Clark
LEGAL BILLING CO-ORDINATOR

Affirmed and subscribed to me before me this 23rd day of March 2010 A.D.

Karen McGovern

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Karen McGovern, Notary Public
Tullytown Boro, Bucks County
My Commission Expires Feb. 19, 2013
Member, Pennsylvania Association of Notaries

Ad Content Proof

NOTICE
HATFIELD TOWNSHIP, MONTGOMERY COUNTY
ACT 537 SEWAGE FACILITIES PLAN SPECIAL STUDY

Section 5 of Act 537 of January 24, 1966, P.L. 1535, known as the "Pennsylvania Sewage Facilities Act", as amended, and Chapter 71.31 of Title 25 of the Pennsylvania Code of the Pennsylvania Department of Environmental Protection Rules and Regulations, requires that this Public Notice be published as a service to the public.

Notice is hereby given that the Board of Commissioners of Hatfield Township (Township), Montgomery County, having prepared an Act 537 Sewage Facilities Plan Revision (Act 537 Plan) for the Township with the stated purpose to protect public health, to prevent sewage disposal problems and to protect groundwater and surface waters of the Commonwealth. The Act 537 Plan Revision proposes hydraulic relief of the Hatfield Township Municipal Authority's Advanced Wastewater Treatment Plant. The plan also addresses the management of sewage facilities in the Township including plans to maintain on-lot systems, and identify, repair or replace malfunctioning systems.

Publication of this notice establishes a 30-day comment period. Copies of the Act 537 Plan Revision are available for public inspection from 8:00 a.m. through 4:00 p.m. at the Hatfield Township Building, 1950 School Road, Hatfield, PA 19440 and at the Hatfield Township Municipal Authority at 3200 Advance Lane, Colmar, PA 18915. Residents of Hatfield Township and other interested parties should submit their comments to the Township on or before Friday, April 30, 2010.

If you are a person with a disability who wishes to review and comment on the proposed Plan and requires an accommodation to do so, please contact Hatfield Township Municipal Services at 215-368-5100 to discuss how the Township may best accommodate your needs.

1t M 23

PUBLIC NOTICE
HATFIELD TOWNSHIP, MONTGOMERY COUNTY
ACT 537 SEWAGE FACILITIES PLAN SPECIAL STUDY

Section 5 of Act 537 of January 24, 1966, P.L. 1535, known as the "Pennsylvania Sewage Facilities Act", as amended, and Chapter 71.31 of Title 25 of the Pennsylvania Code of the Pennsylvania Department of Environmental Protection Rules and Regulations, requires that this Public Notice be published as a service to the public.

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Publication of this notice establishes a 30-day comment period. Copies of the Act 537 Plan Revision are available for public inspection from 8:00 am through 4:00 pm at the Hatfield Township Building, 1950 School Road, Hatfield, PA 19440 and the Hatfield Township Municipal Authority at 3200 Advance Lane, Colmar, PA 18915. Residents of Hatfield Township and other interested parties should submit their comments to the Township on or Friday April 23, 2010.

If you are a person with a disability who wishes to review and comment on the proposed Plan and requires an accommodation to do so, please contact the Hatfield Township Municipal Offices at 215-855-0900 to discuss how the Township may best accommodate your needs.

Appendix D

Comments and Responses

HATFIELD TOWNSHIP

27 May 2010

Mr. Pete Dorney
Hatfield Township Municipal Authority
3200 Advance Lane
Colmar, PA 18915-9729

Re: 537 Plan Public Comment Period

Dear Pete,

The public comment periods on the Act 537 Plan update has closed, and please accept this letter to confirm that Hatfield Township did not receive any comments to the draft plan.

Should you have any questions or concerns, please do not hesitate to contact me at your convenience.

Sincerely,

Andrew S. Haines
Township Manager

Cc: Act 537 Plan File

Plates

Plates 1 – 6

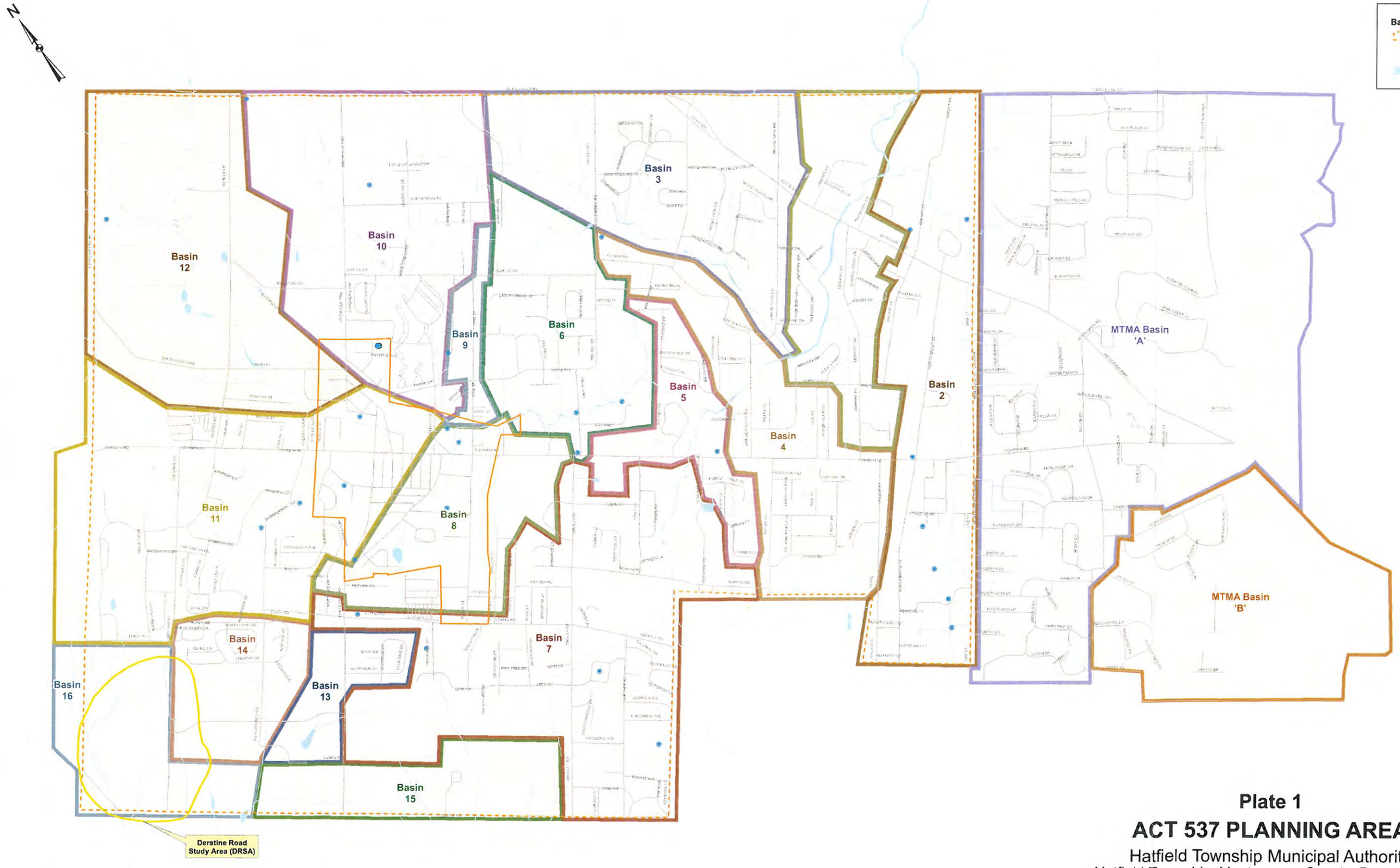

Plate 1

ACT 537 PLANNING AREA

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

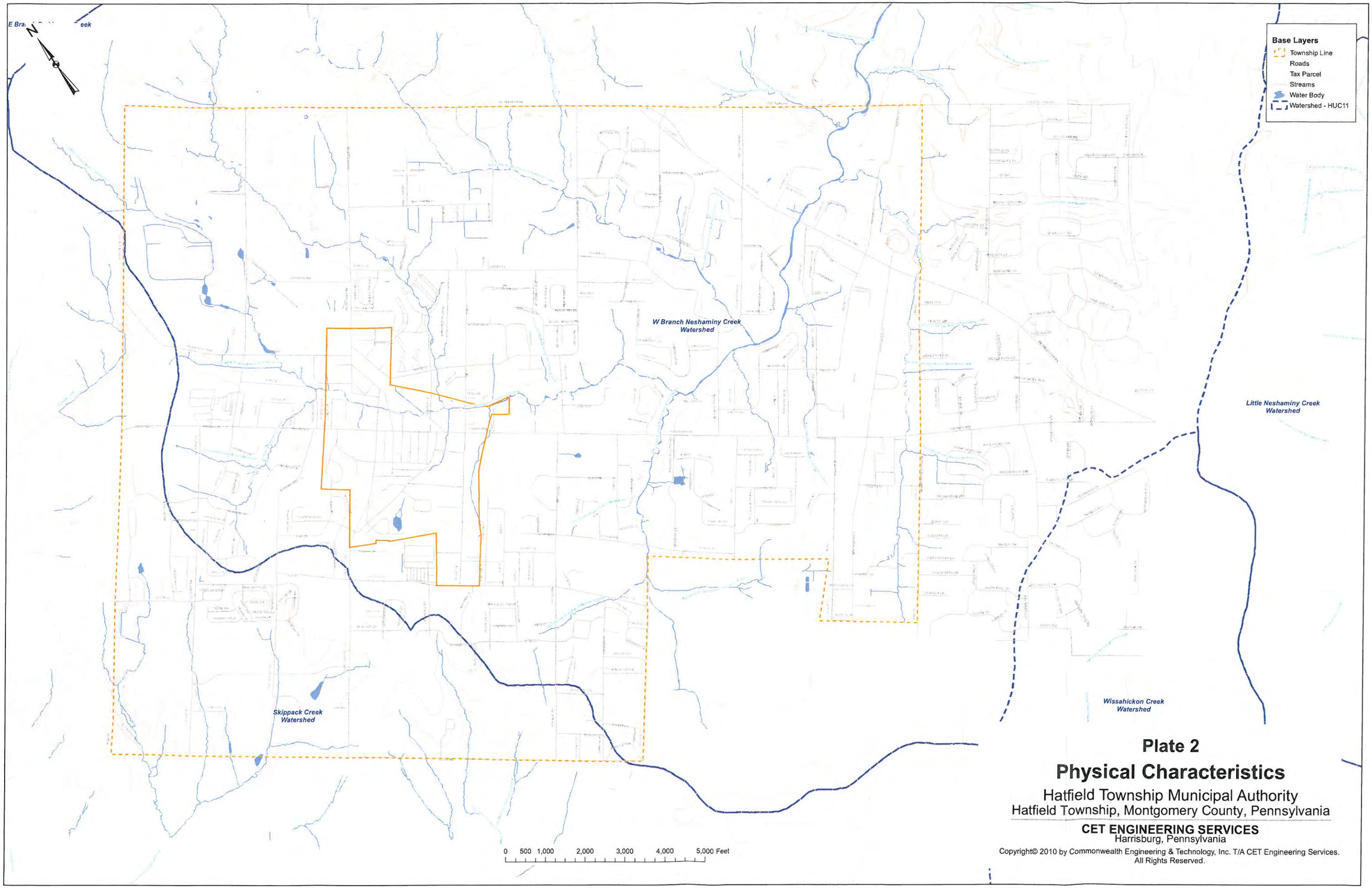

Plate 2

Physical Characteristics

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

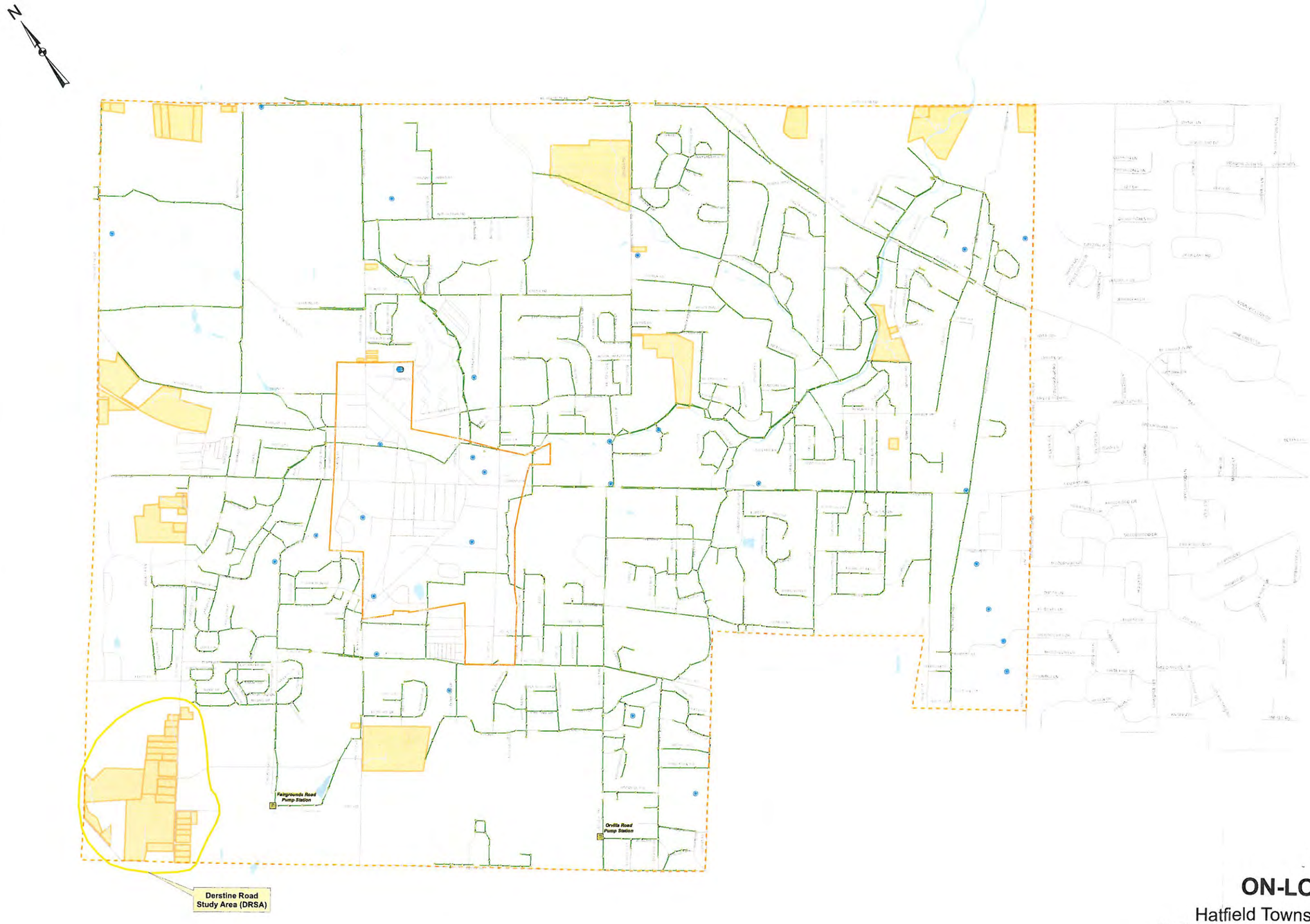

Plate 3

ON-LOT SYSTEMS

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

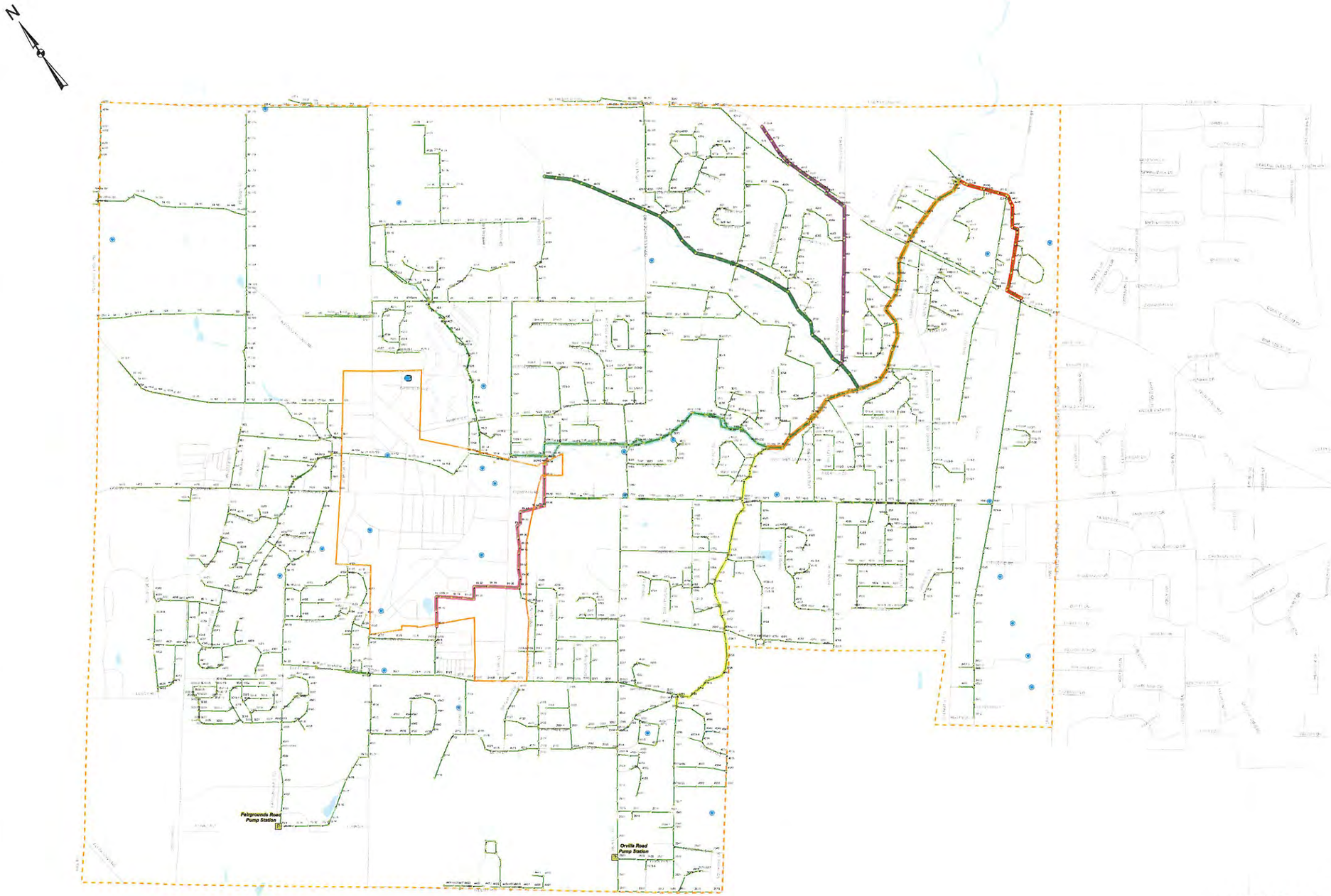

Plate 4

SANITARY SEWER SYSTEM

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

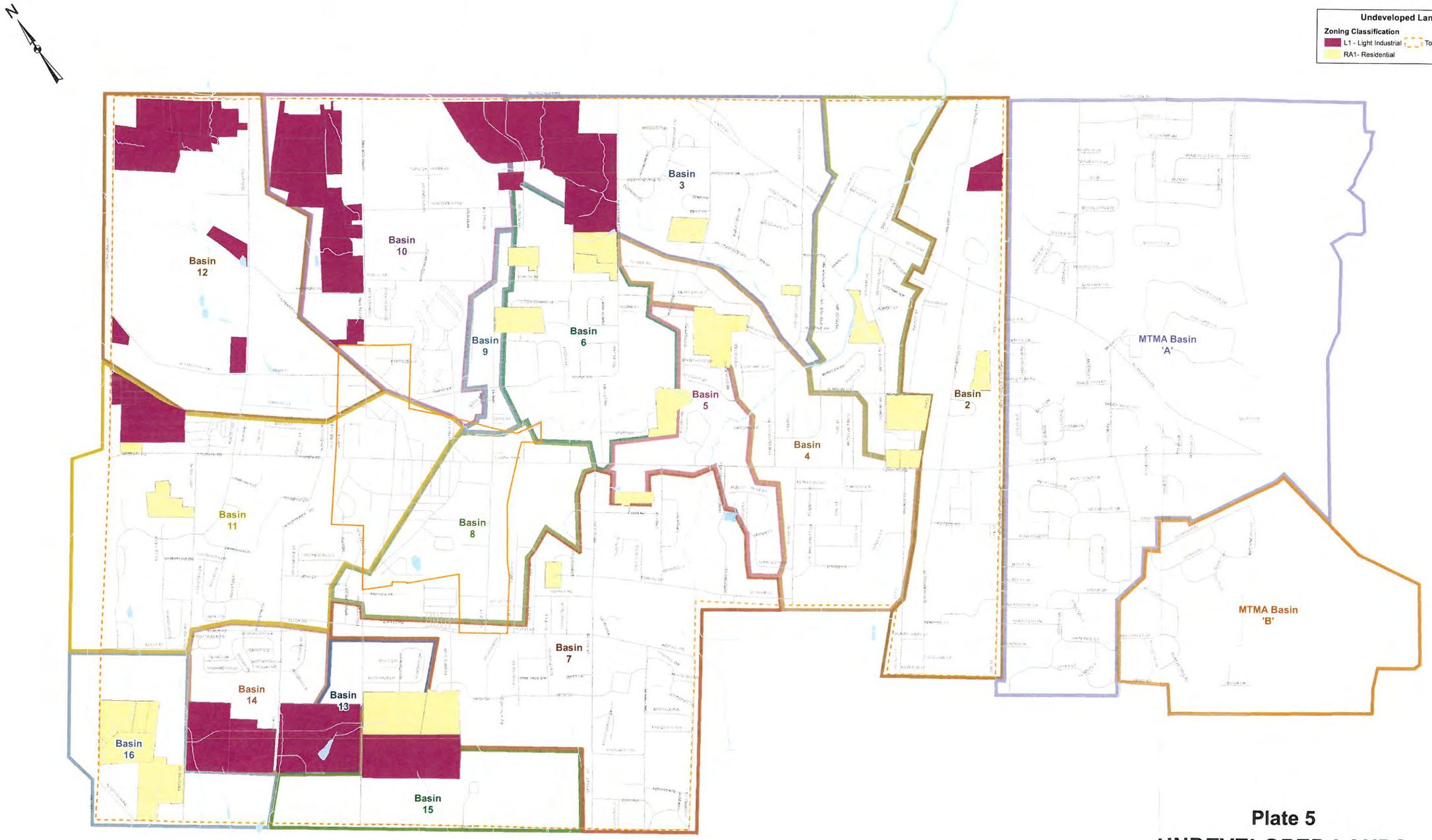

Plate 5

UNDEVELOPED LANDS

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

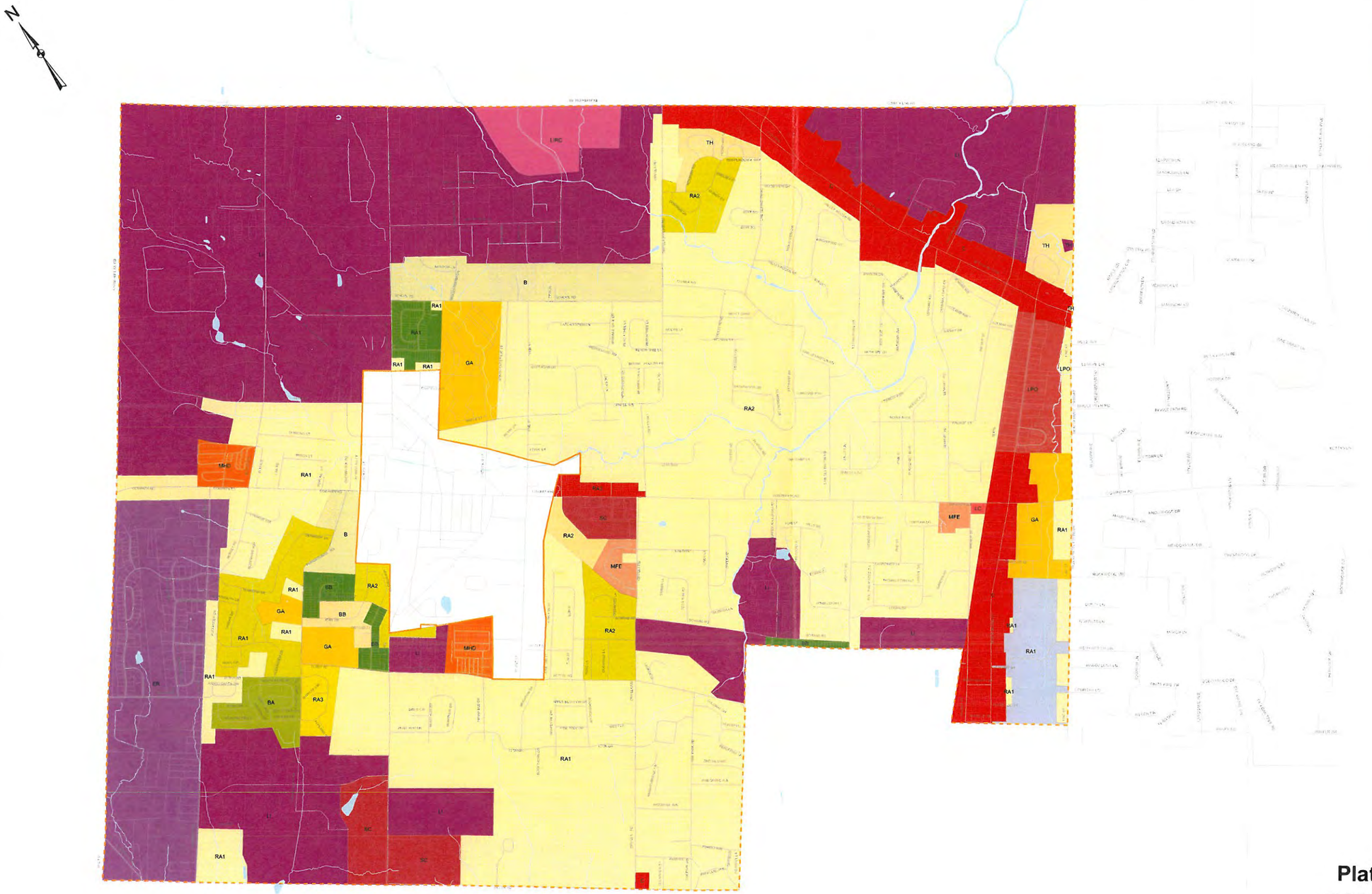

Plate 6
ZONING

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

In re: Application of Pennsylvania-American Water Company under Sections 1102(a) and 1329 of the Pennsylvania Public Utility Code, 66 Pa C.S. §§ 1102(a) and 1329, for approval of (1) the transfer, by sale, to Pennsylvania-American Water Company, of substantially all of the assets, properties and rights related to the wastewater collection and treatment system owned and operated by Towamencin Township and Towamencin Municipal Authority, and (2) the rights of Pennsylvania-American Water Company to begin to offer or furnish wastewater service to the public in the Township of Towamencin and portions of the Townships of Franconia, Lower Salford and Worcester and the Borough of Lansdale, all in Montgomery County, Pennsylvania	Docket No. A-2023-3039900
In re: Application of Pennsylvania-American Water Company under Section 1329 of the Pennsylvania Public Utility Code, 66 Pa C.S. § 1329, for approval of the use for ratemaking purposes of the lesser of the fair market value or the negotiated purchase price of the assets related to the wastewater collection and treatment system owned and operated by Towamencin Municipal Authority and the Township of Towamencin	Docket No. A-2023-_____
In re: Petition of Pennsylvania-American Water Company, related to its acquisition of the wastewater collection and treatment system owned and operated by Towamencin Municipal Authority and the Township of Towamencin, for approval under Section 1329 of the Pennsylvania Public Utility Code, 66 Pa. C.S. § 1329, to (i) collect a distribution system improvement charge, (ii) for book and ratemaking purposes, accrue Allowance for Funds Used During Construction for post-acquisition improvements not recovered through the distribution system improvement charge, (iii) for book and ratemaking purposes, defer depreciation related to post-acquisition improvements not recovered through the distribution system improvement charge, and (iv) include, in its next base rate case, a claim for transaction and closing costs.	Docket No. P-2023-_____

In re: Filing by Pennsylvania-American Water Company under Section 507 of the Pennsylvania Public Utility Code, 66 Pa. C.S. § 507, of (i) the Asset Purchase Agreement By and Among the Towamencin Municipal Authority, the Township of Towamencin and NextEra Water Pennsylvania, LLC, and the First Amendment to the Asset (ii) the Assignment and Assumption Agreement of Asset Purchase Agreement By and Among the Towamencin Municipal Authority, the Township of Towamencin, NextEra Water Pennsylvania, LLC and Pennsylvania-American Water Company, and (ii) seven agreements with municipal corporations to be assumed by Pennsylvania-American Water Company upon closing of its acquisition of substantially all of the assets related to the wastewater collection and treatment system owned and operated by Towamencin Township and Towamencin Municipal Authority	:	Docket Nos. U-2023-_____, *et al*.

CERTIFICATE OF SERVICE

I hereby certify that I have served a true copy of the foregoing Responses of Pennsylvania-American Water Company to the Bureau of Technical Utility Services Deficiencies – August 31, 2023, upon the parties, listed below in accordance with the requirements of 52 Pa. Code §1.54 (relating to service by a party).

PARTIES SERVED ON OCTOBER 13, 2023, IN THE MANNER SPECIFIED

Carrie B. Wright
Prosecutor
Pennsylvania Public Utility Commission
Bureau of Investigation and Enforcement
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120
carwright@pa.gov
(***VIA*** *electronic mail*)

Sharon E. Webb
Assistant Small Business Advocate
Commonwealth of Pennsylvania
Office of Small Business Advocate
555 Walnut Street, 1st Floor
Harrisburg, PA 17101
swebb@pa.gov
(***VIA*** *electronic mail*)

Christopher M. Andreoli
Assistant Consumer Advocate
Darryl A. Lawrence
Senior Assistant Consumer Advocate
Harrison W. Breitman
Assistant Consumer Advocate
Office of Consumer Advocate
555 Walnut Street
5th Floor, Forum Place
Harrisburg, PA 17101-1923
candreoli@paoca.org
dlawrence@paoca.org
hbreitman@paoca.org
(***VIA*** *electronic mail*)

Lauren A. Gallagher, Esq.
Samantha L. Newell, Esq.
Seven Neshaminy Interplex, Ste. 200
Trevose, PA 19053
lgallagher@rudolphclarke.com
snewell@rudolphclarke.com
Counsel for Upper Gwynedd Township
(***VIA*** *electronic mail*)

Teresa K. Harrold, Esq. (PA ID # 311082)
Director, Corporate Counsel
Pennsylvania-American Water Company
852 Wesley Drive
Mechanicsburg, PA 17055
Phone: (717) 550-1562
E-mail: teresa.harrold@amwater.com

David P. Zambito, Esquire (PA ID 80017)
Jonathan P. Nase, Esquire (PA ID 44003)
Cozen O'Connor
17 North Second Street, Suite 1410
Harrisburg, PA 17101
Phone: (717) 703-5892
E-mail: dzambito@cozen.com
E-mail: jnase@cozen.com

Attorneys for
Pennsylvania-American Water Company