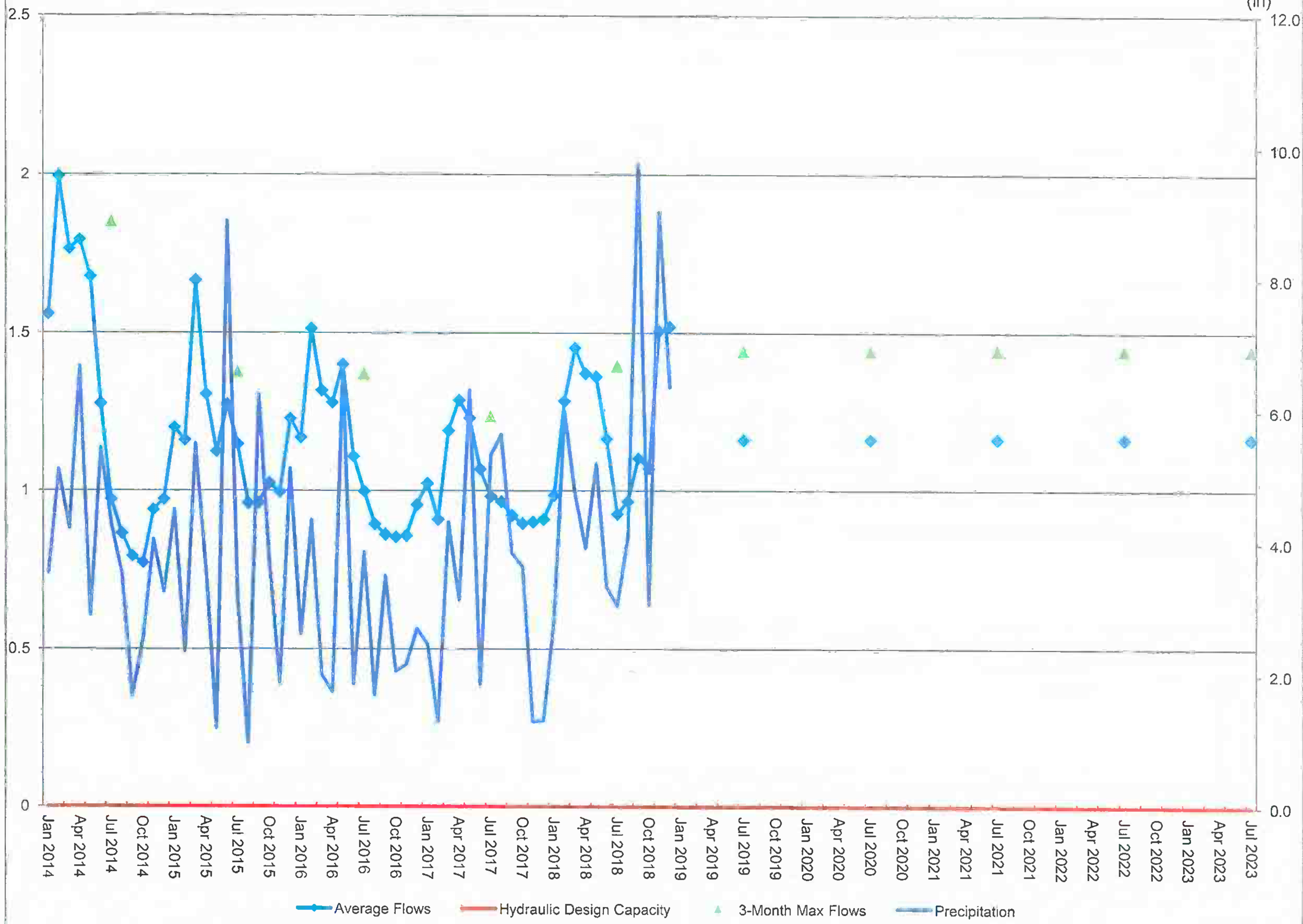
5-Year Measured and Projected Hydraulic Loads



NETHER PROVIDENCE TOWNSHIP MONTHLY FLOW METER DATA

Meter No.	Meter Location	Total EDUs	January		February		March		April		May		June		Comments
			Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	
1	Bullens Lane (before bridge, 30 ft. from guard rail)	195	1,237,670	205	1,459,698	267	1,788,032	296	1,395,722	239	1,267,872	210	1,020,732	174	
2	Avondale Road (at underpass for I-476)	492	6772879	444	7,926,341	575	9,851,629	646	8,589,824	582	9,011,164	591	7,276,972	493	
3	E. Rose Valley Road (at Avondale Lane, 25' in field from stop sign)	952	9,382,358	318	10,990,769	412	14,649,923	496	13,874,116	486	14,205,500	481	11,217,709	393	
4	I-476 (near stone support in creek, 40' up hill)	387	4,506,215	376	5,385,630	497	5,987,560	499	5,623,673	484	5,749,698	479	5,534,637	477	
	Unmetered Areas (average volume from all meters)	803	8,679,662	349	10,210,877	454	12,792,965	514	11,685,646	485	11,983,263	481	9,928,524	412	
	TOTAL	**2,829**	**30,578,784**		**35,973,315**		**45,070,109**		**41,168,981**		**42,217,497**		**34,978,574**		

Meter No.	Meter Location	Total EDUs	July		August		September		October		November		December		Comments
			Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	
1	Bullens Lane (before bridge, 30 ft. from guard rail)	195	923,143	153	1,032,658	171	1,176,777	201	1,135,136	188	1,419,196	243	1,331,724	220	
2	Avondale Road (at underpass for I-476)	492	6,157,991	404	6,188,180	406	6,625,825	449	6,434,205	422	9,123,994	618	10,122,951	664	
3	E. Rose Valley Road (at Avondale Lane, 25' in field from stop sign)	952	8,912,077	302	8,942,977	303	10,809,383	378	11,187,698	379	14,995,304	525	15,355,674	520	
4	I-476 (near stone support in creek, 40' up hill)	387	4,609,387	384	5,303,789	442	5,094,904	439	5,016,294	418	6,832,345	588	6,943,890	579	
	Unmetered Areas (average volume from all meters)	803	8,165,788	328	8,508,631	342	9,396,166	390	9,422,501	379	12,830,101	533	13,378,408	537	
	TOTAL	**2,829**	**28,768,386**		**29,976,235**		**33,103,055**		**33,195,834**		**45,200,940**		**47,132,647**		

SANITARY SEWER SYSTEM

NETHER PROVIDENCE TOWNSHIP

DELAWARE COUNTY, PENNSYLVANIA

JOHN P. DAMON ASSOCIATES, INC., CIVIL ENGINEERS (Sep90)
NDI ENGINEERING CO. (Jan96; Mar98; Jun02)

Pump Station Summary

There is one pumping station within the Township sewerage system. It is located at the "Mills of Rose Valley" development, just off of Brookhaven Road. It has two (2) pumps (rated 1,150 GPM each). This pump station is owned and maintained by the Mills of Rose Valley.

Industrial Waste Report

DELCORA is currently responsible for issuance of Industrial Waste Permits to companies discharging into Nether Providence Township Sewers. The regulation governing discharge of the industrial wastes as well as any program for surveillance and monitoring of industrial waste discharges is maintained by DELCORA.

There are no known industrial permits in the Nether Providence system.

Newtown Township

610-356-9550
FAX 610-356-5032

Herbert E. MacCombie, Jr., P.E.

CONSULTING ENGINEERS & SURVEYORS, INC.
1000 PALMERS MILL ROAD
MEDIA, PA 19063

James W. MacCombie, P.E., P.L.S.
Herbert E. MacCombie, III, Technician

REPLY TO:
P.O. BOX 118
BROOMALL, PA 19008-0118

March 12, 2019

Ms. Elizabeth Mahoney, Environmental Group Manager
Clean Water Section
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, PA 19401

Re: Chapter 94 Municipal Wasteload Management Plan
2018 Annual Report
Newtown Township, Delaware County, Municipal Authority

Dear Ms. Mahoney:

In accordance with PA DEP Chapter 94 Municipal Wasteload Management Plan, enclosed please find two (2) copies each of the 2018 Annual Report for the Newtown Township, Delaware County, Municipal Authority, for the Central Delaware County Authority (CDCA) service area and the Radnor-Haverford-Marple (RHM) service area.

Very Truly Yours,

James W. MacCombie, P.E.
Newtown Township Sewer Consultant

copy: Stephen Nease, NTMA Operations Officer
Charles Catania, Jr., P.E., CDCA Engineer
Dave Adams, Operations Manager at RHM Sewer Authority
File

CHAPTER 94 WASTELOAD MANAGEMENT

2018 ANNUAL REPORT

NEWTOWN TOWNSHIP, DELAWARE COUNTY, MUNICIPAL AUTHORITY
TRIBUTARY MUNICIPALITY REPORT
FOR THE
CENTRAL DELAWARE COUNTY AUTHORITY (CDCA)

REGISTERED
PROFESSIONAL
JAMES W. MacCOMBIE
ENGINEER
No. 31635-E

3/11/19

March 2019

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Newtown Township, Delaware County, Municipal Authority**	Permit No.:	**PA N/A**
Mailing Address:	**209 Bishop Hollow Road**	Effective Date:	**N/A**
City, State, Zip:	**Newtown Square, PA 19073**	Expiration Date:	**N/A**
Contact Person:	**Joseph Sweeney**	Renewal Due Date:	**N/A**
Title:	**Authority Chairman**	Municipality:	**Township of Newtown**
Phone:	**610-356-0200**	County:	**Delaware**
Email:	**cdpropertiesinc@comcast.net**	Consultant Name:	**Herbert E. Mac Combie, Jr, PE, Consulting Engineers & Surveyors, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   Hydraulic loading to Camelot Pump Station, Ashford Pump Station, and Ellis Preserve Pump Station included in Attachment 1, Appendix B.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

   Check the appropriate boxes:

   ☒ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment 1**)

   ☒ List summarizing each extension or project attached (**Attachment 1**)

   ☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

   Comments:

- Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

The Authority became an operating Authority in January of 2016, which means it now owns and is responsible for operation and maintenance of the sewer system Township-wide. The Authority currently uses Township administrative staff for billing as well as the Township Public Works Department to do periodic monitoring of the sewer system. The Authority has a contract with KBX Golden, LLC (formerly AQUA Wastewater, Inc.) to operate and maintain all Authority owned pump stations. Work is performed on an as needed basis, by Township staff or by private contractors, in addition to the long-term maintenance of all of the lines.

The Authority follows up on all complaints and inspections to repair Infiltration & Inflow (I&I) sources on an as-needed basis. The Radnor-Haverford-Marple (RHM) Sewer Authority also assists the Authority in identifying and repairing sources of I&I during video inspection of sewer pipe. There have not been any major maintenance, repair, and/or rehabilitation projects performed in the CDCA service area in the past five (5) years.

The Authority has established a capital reserve for future infrastructure improvements including video surveillance of existing sewer lines to determine problem areas of grease build-up and I&I. An infrastructure fee has been implemented and is being charged on a per dwelling unit basis every quarter.

All sewage flows in the CDCA service area are conveyed to the CDCA Interceptor near the intersection of Newtown Street Road (Rt 252) and Media Line Road.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

There were no Sanitary Sewer Overflows (SSOs) in the CDCA Service Area in 2018. There were no overload conditions and no major repairs in 2018.

The existing system is in good/fair working condition. The Authority has established a capital reserve for future infrastructure improvements including video surveillance of existing sewer lines to determine problem areas of grease build-up and I&I. An infrastructure fee has been implemented and is being charged on a per dwelling unit basis every quarter.

The Township adopted a Grease Trap Ordinance in 2016, which the Authority is enforcing. The Grease Trap Ordinance requires proper sizing and installation of traps or interceptors for establishments that generate Fats, Oils, and Grease (FOG) as well as establish a schedule of surveillance of sewer mains to determine problem areas and to establish a schedule for cleaning and maintenance.

During the next five (5) years the connection rate is anticipated to substantially increase as a result of new developments and pending sewer extension projects. In addition, the Newtown Township Municipal Authority has begun implementation of the Township's "Act 537 Plan Update". The projects were bid in 2018 and construction has commenced.

It is anticipated that there will be about two (2) to five (5) miscellaneous connections of existing (infill) EDUs per year within the CDCA Service Area of the Township.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☐ The collection system does not contain pump stations

☒ The collection system does contain pump stations (Number – **4**)

☒ Discussion of condition of each pump station attached (**Attachment 1**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

   c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

   Check the appropriate boxes:

   ☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment 1**)
   ☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

   Check the appropriate boxes:

   ☐ This report demonstrates an existing hydraulic overload condition.
   ☐ This report demonstrates a projected hydraulic overload condition.
   ☐ This report demonstrates an existing organic overload condition.
   ☐ This report demonstrates a projected organic overload condition.

   If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

   ☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

    ☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

    ☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

    ☒ Flow calibration report attached (**Attachment 1**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Stephen Nease, Operations Officer — Name of Responsible Official

Stephen M Nease — Signature

610-356-0200 — Telephone No.

3/4/2019 — Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

James W. MacCombie, P.E., P.L.S. — Name of Preparer

Signature

610-356-9550 — Telephone No.

3/4/2019 — Date

ATTACHMENT 1

Chapter 94 Wasteload Management

2018 Annual Report

Newtown Township, Delaware County, Municipal Authority
Tributary Municipality Report
for the
Central Delaware County Authority (CDCA)

March 2019

Prepared By:

Herbert E. MacCombie, Jr., P.E.
Consulting Engineers and Surveyors, Inc.
P.O. Box 118
Broomall, PA 19008

NEWTOWN TOWNSHIP, DELAWARE COUNTY, MUNICIPAL AUTHORITY

WASTELOAD MANAGEMENT REPORT
FOR THE
CDCA SERVICE AREA

2018 ANNUAL REPORT

TABLE OF CONTENTS

TABLES

APPENDICES

1.0 Introduction

This report has been prepared and submitted on behalf of Newtown Township as a tributary municipality to the DELCORA Western Regional Treatment Plant in the Central Delaware County Authority (CDCA) service area in compliance with PA Code Title 25, Part I, Subpart C, Article II, Chapter 94 Wasteload Management.

1.1 Sewer Service Area

Newtown Township is situated in the northwestern portion of Delaware County and is bounded by Radnor Township to the northeast, Marple Township to the southeast, Upper Providence Township to the south, Edgmont Township to the southwest, and Willistown Township, Chester County to the west and Easttown Township, Chester County to the northwest. Newtown Township is comprised of approximately 10.11 square miles in area.

Newtown Township is divided into two (2) drainage basins, the Crum Creek Basin and Darby Creek Basin. The Crum Creek Basin contains approximately 20% of the sewer collection system with a force main connection through Marple Township via the Crum Creek Interceptor in the CDCA service area. The existing CDCA service area is situated in the south-central portion of the Township.

The Newtown Township Municipal Authority (NTMA) took ownership of the Springton Pointe Estates Wastewater Treatment Plant (SPE WWTP) in 2007, which is permitted for an Annual Average Flow of 35,000 GPD and a Design Hydraulic Capacity of 60,900 GPD. The WWTP uses a Sequencing Batch Reactor (SBR) treatment process with land disposal of treated effluent. The WWTP only services the Springton Pointe Estates Community (including the Hempstead area), as well as the single-family dwellings along the easterly side of Stoney Brook Boulevard and townhouses along Wiltshire Lane. There are two (2) public pumping stations owned and operated by the Municipal Authority within the Springton Pointe Estates WWTP service area. One (1) is located on Wiltshire Lane and one (1) is located on Bakers Lane. Although the NTMA owns the SPE WWTP and has contracted KBX Golden, LLC (formerly AQUA Wastewater, Inc.) for the operation and maintenance, the

WWTP does not fall under the auspices of Chapter 94 for annual reporting. In the alternative, the Water Quality Management (WQM) Part II Permit for the WWTP requires Discharge Monitoring Reports be submitted to the PA DEP on a monthly basis. The Water Quality Management (WQM) permit for the WWTP had an expiration date of August 31, 2018. In lieu of renewing the permit, the Authority received approval of a Closure Plan since the WWTP has been shut down since April of 2016 when flow was diverted to the existing Camelot Lane Pump Station via the existing headworks pump station at the WWTP. The Closure Plan was submitted to the PA DEP under cover letter dated August 24, 2018 and was found to be acceptable as indicated in a response email from the Department dated October 22, 2018, with the requirement that groundwater monitoring and reporting to continue until the final groundwater monitoring report is approved by the Department.

It is important to note that the Authority got permission from the DEP to temporarily divert flow from the WWTP to the Camelot Lane Pump Station (public sewer system). The existing lift station for the WWTP is being used to pump sewage to the Camelot Lane Pump Station. The WWTP was rated to treat 35,000 GPD of sewage. The Authority is currently constructing the sewer extension as part of implementation of the approved Act 537 Plan Update. The Authority filed a Closure Plan, which was reviewed and approved by the DEP in lieu of filing for a renewal of the WQM Permit for the WWTP. The Authority continues to perform the required groundwater monitoring of the disposal fields even though no effluent was discharged since April 2016. Groundwater monitoring will continue until at least September 2019 per DEP approval of the Closure Plan.

The Municipal Authority owns, operates, and maintains a dedicated sanitary sewage collection system and does not utilize a combined sewer system. There are seven (7) public pumping stations owned and operated by the Municipal Authority within the CDCA service area. One (1) is located on Hickory Lane, one (1) is located off of Lewis Run Road within the Liseter development, one (1) is located along the westerly side of Newtown Street Road (SR 0252) in Ellis Preserve,one (1) is located on Camelot Lane, and as previously mentioned, one (1) is on Bakers Lane, one (1) on Wiltshire Lane, and one (1) at the Springton Pointe Estates WWTP, which is being used temporarily to pump to the Camelot Lane Pump Station until replaced as part of the public sewer extension project currently underway. Up until December, 2014, all flow leaving Newtown Township that is tributary to the CDCA system was pumped and metered at the Camelot Pump Station. Beginning on December 5, 2014 the Ashford (Liseter) Pump Station began receiving flow from the homes constructed in the Liseter Subdivision as well as receiving flow from the Episcopal Academy beginning on December 17, 2014. The Ashford Pump Station Force Main is the second point of discharge from Newtown Township into the CDCA system. The sewage is conveyed via force main in and along Newtown Street Road (SR 0252) to a newly constructed manhole along the CDCA interceptor just south of the intersection of Newtown Street Road and Media Line Road adjacent to the Delaware County Community College. The Ellis Pump Station, owned, operated, and maintained by the NTMA, currently pumps into the Ashford Force Main. The Gradyville Road Force Main, which is owned, operated, and maintained by DELCORA, conveys flow from Edgmont Township through the portion of the Ashford (Liseter) Force Main from Gradyville Road to the CDCA interceptor.

In 2016, the Newtown Township Municipal Authority became an "Operating Authority," when it began having ownership, as well as operation and maintenance responsibility of the public sewer system, including that of the Springton Pointe Estates Wastewater Treatment Plant. The Episcopal Academy Pump Station will continue to be privately owned, operated and maintained.

1.2 Wastewater Collection System

The wastewater collection system in the CDCA service area within Newtown Township that is tributary to the Camelot Pump Station is for the most part, comprised of eight (8) inch diameter pipe. The sewage is then pumped to the CDCA Interceptor and is conveyed to the DELCORA system for treatment at their Western Regional WWTP. In addition to the Camelot Pumping Station, the Municipal Authority also owns, operates, and maintains the Newtown Heights Pump Station (Hickory Lane P.S.), which is tributary to the Camelot Pump Station.

The wastewater collection system in the CDCA service area within Newtown Township that is tributary to the Ashford Pump Station is comprised of eight (8) inch diameter gravity sewer pipe. The sewage is then pumped from the Ashford (Liseter) Pump Station to the CDCA Interceptor via an eight (8) inch transitioning to a 10-inch HDPE force main and is conveyed to the DELCORA system for treatment at their Western Regional WWTP. The Episcopal Academy Pump Station, which is tributary to the Ashford Pump Station, is privately owned and operated and has a contract with McGovern for operations and maintenance. It is not to be dedicated to the Authority.

The wastewater collection system in the CDCA service area within Newtown Township that is tributary to the Ellis Preserve Pump Station is comprised of eight (8) inch diameter gravity sewer pipe. The sewage is then pumped from the Ellis Preserve Pump Station to the CDCA Interceptor via a 10-inch HDPE force main and is conveyed to the DELCORA system for treatment at their Western Regional WWTP.

All of the public pump stations within the CDCA service area in Newtown Township are operated and maintained by KBX Golden, LLC under a service contract with the Authority. The contract also includes operation and maintenance of the SPE WWTP lift station, the Wiltshire Lane, and the Bakers Lane Pump Stations.

The Camelot Pump Station is equipped with two (2) submersible Fairbanks Morse pumps. The current pumps are designed as follows: 850 gpm each @ 194' TDH @ 1760 RPM. The Hickory Lane Pump Station, which is tributary to the Camelot Pump Station, is equipped with two (2) Gorman-Rupp pumps. The current pumps are designed as follows: 80 gpm each @ 70' TDH.

The Ashford Pump Station is equipped with two (2) Fairbanks-Morse Submersible Solids-handling Pumps (Model 5435MV) with 14-inch diameter impellers, four (4) inch discharge connections, and 75 horsepower, 460-volt, three-phase 1780 rpm motors. The pump station has a design capacity of 570 gpm with an initial average daily flow (ADF) of 115,000 GPD and an ultimate ADF of 213,000 GPD subject to modification of the existing WQM permit.

The Ellis Preserve Pump Station is equipped with two (2) Fairbanks-Nijhuis Submersible Solids-handling Pumps (Model 5436MV) with 13.54-inch diameter impellers, six (6) inch discharge connections, and 100 horsepower, 460-volt, three-phase 1780 rpm motors. The pump station has an initial design capacity of 700 gpm with an initial average daily flow (ADF) of 185,000 GPD and an ultimate design capacity of 1,300 gpm with an ultimate ADF of 398,000 GPD subject to additional sewage planning approval(s).

2.0 Discussion of Hydraulic and Organic Loading Projections

During 2018 there were 18 days where greater than one (1) inch of rainfall in a 24-hour period was recorded. In nine (9) out of the 18 events there appears to be a direct correlation between increases in flow and rainfall greater than one (1) inch. In comparison, half of all rainfall events where greater than one (1) inch of rainfall occurred in a 24-hour period were recorded between September and the end of the year. The total rainfall amount recorded for this timespan (28.25 inches) represented about 46% of the total for the year (61.52 inches). Furthermore, 1/3 of all rainfall events where greater than one (1) inch of rainfall occurred in a 24-hour period occurred in the last two (2) months of the year (3 each month). Approximately 25% of the total rainfall for the year (15.41 inches) fell in this timespan.

Camelot Pump Station

The highest recorded 24-hour rainfall for 2018, 5.17 inches, occurred on September 7th into the 8th. On the same day, Camelot Pump Station saw a daily flow of 236,688 GPD, which is slightly higher than the average daily flow for the month of September. The highest daily flow of the year was recorded on December 20th, which was 309,600 GPD. This was preceded by a rainfall event of greater than one (1) inch four (4) days earlier and occurred during a rainfall event of greater than one (1) inch. The highest Average Daily Flow (ADF) of 224,226 GPD and the Maximum Daily Flow (MDF) of 309,600 GPD were both recorded in December. By comparison, the ADF for 2018 at the Camelot PS was 191,088 GPD.

The rest of the year saw similar results in rainfall events greater than one (1) inch in 24-hours and elevated peak flows. Although, the highest ratio of MDF to ADF for any month was 1.38 recorded in December. The average MDF to ADF ratio for the year was 1.24. Therefore, although there is a correlation in elevated flow in relation to peak rainfall events, the peaks in flow are not drastic.

The projected 2-year ADF at the Camelot Pump Station is 196,000 GPD as depicted on Table 5C. There were no flow metering devices installed on the collection system in 2018 for recording flow to the pump station in a peak instantaneous or peak hourly flow format. Therefore, based upon the PA DEP Water Management Program SERO Sewage Pumping Station Guidance a peaking factor of 3.8 was applied to the Annual Average Flow to derive a Peak Instantaneous Flow and a peaking factor of 3.8 was applied to the 2-year projected annual average flow to derive the 2-year projected maximum flow depicted on Table 6. As part of the Implementation of the "Act 537 Plan Update," expansion of the Camelot Pump Station will include the installation of an influent meter in order to monitor peak instantaneous or peak hourly flow as well as hydraulic loading of the pump station.

It should be noted that the Newtown Heights Pumping Station (Hickory Lane P.S.) is not equipped with a flow meter. Because this station is publicly owned it is required to document and report flows to DEP. No flow data is available at this time. The Authority has been apprised of this situation and is working to allocate funding for installation of a meter at this station. The Authority is exploring the feasibility of a gravity connection of the Hickory Lane Pump Station Service Area to the proposed Act 537 Plan Update sewer expansion project. If it is proven that a gravity connection is not feasible the Authority will seek to relocate the pump station to facilitate better access and provide the station with three-phase electric and evaluate upgrading motors and pumps at that time.

Ashford Pump Station

The highest recorded 24-hour rainfall for 2018, 5.17 inches, occurred on September 7th into the 8th. On the same day, the Ashford Pump Station saw a daily flow of 42,479 GPD, which is slightly higher than the average daily flow for the month of September. The highest daily flow of the year was recorded on December 17th, which was 74,834 GPD.

This was preceded by a rainfall event of greater than one (1) inch the previous day. The highest Average Daily Flow (ADF) of 44,637 GPD occurred for the month of November and the Maximum Daily Flow (MDF) of 74,834 GPD was recorded in December. By comparison, the ADF for 2018 at the Ashford PS was 37,575 GPD.

The projected 2-year ADF at the Ashford Pump Station is 73,000 GPD as depicted on Table 5A. There was no influent metering device installed on the collection system for recording flow to the pump station in a peak instantaneous or peak hourly flow format. Therefore, based upon the PA DEP Water Management Program SERO Sewage Pumping Station Guidance a peaking factor of 4.0 was applied to the Annual Average Flow to derive a Peak Instantaneous Flow and a peaking factor of 3.9 was applied to the 2-year projected annual average flow to derive the 2-year projected maximum flow.

Ellis Preserve Pump Station

The highest daily flow of 27,175 GPD occurred on September 25th and does not appear to be related to a rainfall event. The highest recorded 24-hour rainfall for 2018, 5.17 inches, occurred on September 7th into the 8th. On the same day, the Ellis Preserve Pump Station saw a daily flow of 22,284 GPD, which is higher than the average daily flow for the month of September. The next highest ADF of 2018 occurred on October 10th, which was 24,060 gpd. There was a couple of minor rainfall events during the preceding week totaling 0.52 inches of rainfall. There does not appear to be a direct correlation between rainfall events greater than one (1) inch in a 24-hour period and peak flow at the Ellis Preserve Pump Station.

The projected 2-year ADF at the Ellis Preserve Pump Station is 58,000 GPD as depicted on Table 5B. There was no influent metering device installed on the collection system for recording flow to the pump station in a peak instantaneous or peak hourly flow format. Therefore, based upon the PA DEP Water Management Program SERO Sewage Pumping Station Guidance a peaking factor of 4.2 was applied to the Annual Average Flow to derive a Peak Instantaneous Flow and a peaking factor of 3.9 was applied to the 2-year projected annual average flow to derive the 2-year projected maximum flow.

Edgmont/DELCORA Gradyville Road Force Main

The Gradyville Road Force Main is connected to the Ashford Force Main at the intersection of Gradyville Road and Newtown Street Road (SR 0252). The NTMA owns, operates, and maintains the Ashford Force Main to its discharge point into the CDCA sewer system. Edgmont is permitted to convey up to 0.350 MGD of sewage through the Gradyville Road Force Main. By agreement the NTMA is allowed to convey up to 0.050 MGD of future sewage flow through the line subject to additional planning approval. According to "The Delaware County Regional Water Quality Control Authority, Edgmont Township, Crum Creek Sewer District, Tributary Municipality, 2017 Chapter 94 Report," February 2018, prepared by Bradford Engineering Associates, Inc. included in Appendix D of this report, there is no anticipated hydraulic overload within the next five (5) years.

3.0 Sanitary Sewer Extensions & Proposed Projects

The sanitary sewer collection system is shown on the Newtown Township Sewer Map in Appendix A. The Township has completed their "Act 537 Plan Update", which addresses anticipated development in the CDCA service areas within the Township. All sewage flows in the CDCA service area would be conveyed to the CDCA Interceptor. The Act 537 Plan was approved on September 24, 2013 and was subsequently appealed. The Environmental Hearing Board upheld the Pennsylvania Department of Environmental Protection (PA DEP)'s approval of the plan by dismissing the appeal on August 31, 2015. The Newtown Township Municipal Authority has begun construction of the sewer expansion project.

There were new sanitary sewer extensions in 2018. The Ashford (Liseter) Subdivision, located on the northwest corner of Route 252 and Goshen Road, commenced construction of their sanitary sewer lines in 2013 and continued construction in Phases 3 and 4 through the end of 2018. The sewage pump station, and force main connection to the CDCA Interceptor located at Rt. 252 and Media Line Rd. was completed and placed into operation on December 5, 2014. However, as of the end of 2018, the pump station and collection system were not dedicated to the NTMA and were still in private ownership by Toll Brothers, who contracted with AQUA, PA Wastewater and KBX Golden, LLC to serve as the licensed wastewater operators of the station. Through the end of 2018, there are approximately 299 homes that were connected to the sewer system and occupied, with 63 connections being made in 2018. Ultimately, the Ashford (Liseter) Subdivision will consist of 449 new residential units with several accessory buildings for communal use and is anticipated to generate 115,000 GPD of sewage that will be conveyed via the CDCA Crum Creek Interceptor to the DELCORA WWTP. The pump station has initial planning approval for annual average flows of 115,000 GPD, as permitted by the Water Quality Management Part II Permit No. 2311403 by the PA DEP and has been designed to accept future connections from the Melmark campus and the Echo Valley and Hunt Valley Circle developments subject to modification of the WQM permit for up to 213,000 GPD. As previously mentioned, the Episcopal Academy Pump Station is currently discharging flow into the Ashford (Liseter) Pump Station. Additional sewage planning required for the Episcopal Academy connection to the Ashford (Liseter) Pump Station according to the PA DEP has been obtained through approval of the Township's Act 537 Plan Update.

The Episcopal Academy has Sewage Planning Approval to send 11,000 GPD to the Ashford (Liseter) Pump Station (DEP Code No.1-23943-147a-3J). However, based on metered flow data for 2018, the actual flow was approximately 8,045 GPD. Flow is conveyed to the Ashford (Liseter) Pump Station via a pump station and force main from the Episcopal Academy Campus. Water Quality Management Part II Permit No. 2314402 was issued by the PA DEP on June 27, 2014. The Episcopal Academy Pump Station was put into service and began contributing flow to the Ashford Pump Station on December 17, 2014.

There are several projects ongoing at the Ellis Preserve. Toll Brothers obtained Sewage Facilities Planning Module approval (DEP Code No. 1-23943-202-3J) for 76 townhomes in Sector 3. Construction commenced in late 2018 but no units were connected and occupied. The project is expected to generate 17,100 GPD of sewage. BPG obtained Sewage Facilities Planning Module approval (DEP Code No. 1-23943-209-3J) for 256 apartment units in three (3) buildings, 66 stacked townhouse units in 33 buildings, a clubhouse, and a pool house for a total of 325 units. The project is expected to generate 73,125 GPD of sewage. BPG also obtained Sewage Facilities Planning Exemption approval (DEP Code No. 1-23943-224-E) for the Sector J Office Building (AmeriHealth), which proposes construction of a 5-story office building expected to generate 37,800 GPD of sewage. The Ellis Preserve Pump Station construction has been completed and became operational on August 1, 2018. A Water Quality Management Part 2 Permit was issued by the DEP (Permit No. 2316403) as indicated by letter dated October 17, 2016 with the permit attached. The pump station includes a 10 ft square precast concrete wet well with a sewage grinder, two (2) 100 HP Fairbanks Nijhuis Submersible Solids-handling Pumps (Model 5436MV), a precast concrete valve vault, which includes a flow meter and an emergency connection point, along with a control building that will house a control panel, chemical treatment system, auto-dialer, and an emergency generator. The pump station has a design capacity of 700 gpm with an average annual flow of 185,000 GPD.

4.0 Sewerage System Monitoring, Maintenance, and Repairs

The Authority became an operating Authority in January of 2016, which means it now owns and is responsible for operation and maintenance of the sewer system Township-wide. The Authority currently uses Township administrative staff for billing as well as the Township Public Works Department to do periodic monitoring of the sewer system. The Authority has a contract with KBX Golden, LLC (formerly AQUA Wastewater Management, Inc.) to operate and maintain all Authority owned pump stations. Work is performed on an as needed basis, by Township staff or by private contractors, in addition to the long-term maintenance of all of the lines.

The Authority follows up on all complaints and inspections to repair Infiltration & Inflow (I&I) sources on an as-needed basis. The Radnor-Haverford-Marple (RHM) Sewer Authority also assists the Authority in identifying and repairing sources of I&I during video inspection of sewer pipe. There has not been any major maintenance, repair, and/or rehabilitation projects performed in the CDCA service area in the past five (5) years.

5.0 Condition of the Wastewater Collection System

The existing system is in good working condition. At present, no long-term plan has been developed by the Authority to address I&I detection, or to mitigate I&I. Newtown Township has adopted DELCORA's "Lateral Inspection and Repair/Replace Design Standards" to incorporate within their ordinance. Any portions of the system that appears to be experiencing I&I problems are addressed on a case-by-case basis. However, the

Authority has established a capital reserve for future infrastructure improvements including video surveillance of existing sewer lines to determine problem areas of grease build-up and I&I. An infrastructure fee has been implemented and is being charged on a per dwelling unit basis every quarter.

There are approximately 42.5 miles of eight (8) inch diameter sewer within the Township. Approximately 70% was constructed between 45 to 55 years ago between 1960 and 1970 with a total length of 157,080 l.f., which mainly drains through the RHM system, approximately 15% was constructed between 20 to 40 years ago between 1970 and 1980 with a total length of 33,600 l.f., and the remaining 15% was constructed within the past 25 years between the 1990s through present with a total length of 33,600 l.f. The large majority, about 80%, of the pipe is vitrified clay pipe (VCP) and transite pipe. The remainder of the system is comprised of PVC pipe. The CDCA service area covers about two (2) square miles and contains approximately 10.6 miles of pipe. The extension of the public sewer system associated with the Ashford/Liseter Subdivision is anticipated to ultimately consist of 20,353 L.F. of 8" diameter PVC pipe, 8,349 L.F. of 8" diameter HDPE force main, and 8,720 L.F. of 10" diameter HDPE force main, as well as a short distance of 12" diameter PVC pipe at the connection point to the CDCA interceptor.

The United States Census data for 2000 and 2010 was used to determine current population and the anticipated connections associated with proposed and future development within the CDCA service area in the Township (Refer to Table 1, 2A, & 2B).

TABLE 1
TOWNSHIP POPULATION STATISTICS

Description	Total Population	Average Household Size
2000 U.S. Census:	11,700	2.50
2010 U.S. Census:	12,216	2.49
Change in Population:	+516 Approx. 52 persons per Year or 0.44% Annual Increase	
2018 Population Estimate:	12,712	-

A projection was determined based upon projecting the growth rate of population between 2000 and 2010, which yielded a 4.4% increase. This was compared with DVRPC 2040 Municipal Level Population Forecast, which only had a 1.8% change. The DVRPC projections appear to under estimate future development within the Township. The CDCA service area estimated population connected to the public sewer in 2018 was 2,531. The U.S. Census estimates approximately 2.5 people per household as the average household size.

TABLE 2A
HISTORICAL AND 5-YEAR POPULATION PROJECTION

Year	Township Population Growth[1]	
	Total	Crum Creek Basin (20%) (CDCA Service Area)
2010	12,270	2,443
2011	12,324	2,454
2012	12,379	2,465
2013	12,434	2,476
2014	12,489	2,487
2015	12,544	2,498
2016	12,600	2,509
2017	12,712	2,520
2018	12,270	2,531
5-Year (2019-2023)	**12,939[2]**	**2,588**

(1) Based on U.S. Census: a population trend of 0.44% annual person increase between 2000 and 2010

(2) Based on projection of population trend of 0.44% annual person increase

During the next five (5) years the connection rate is anticipated to substantially increase as a result of new developments and pending sewer extension projects. In addition, the Newtown Township Municipal Authority has begun implementation of the Township's "Act 537 Plan Update". Refer to Tables 4A and 4B for a summary of anticipated connections to the public sewer within the CDCA service area in the next five (5) years. It is anticipated that there will be about two (2) to five (5) miscellaneous connections of existing (infill) EDUs per year within the Township.

Refer to Tables 5A, B, C, and D for the 5-Year Hydraulic Loading Projections for the CDCA service area within Newtown Township. Refer to Table 5E for the 5-Year Hydraulic Loading Projection for the Ashford Force Main discharge to the CDCA system, including tributary municipality flow from the Edgmont/DELCORA Force Main on Gradyville Road that connects to the NTMA Ashford Force Main at the intersection of Gradyville Road and Newtown Street Road (SR 0252).

TABLE 2B
Population Projections

		New Residential Connections[2]					
Projected Years	Previous Year Population[1]	Ashford PS Service Area	Ellis Preserve PS Service Area	Camelot PS Service Area	Total	Persons per Household	Projected Population
2018							*2,531*
2019	2,531	50	199	5	**254**	2.5	**3,166**
2020	3,166	86	31	17	**134**	2.5	**3,501**
2021	3,501	133	33	159	**325**	2.5	**4,314**
2022	4,314	78	28	80	**186**	2.5	**4,779**
2023	4,779	18	0	99	**117**	2.5	**5,071**

(1) The 2018 estimated population from Table 2A

(2) Refer to Table 4 - Only anticipated Residential connections were considered (Commercial and Institutional excluded) for Population Projection

TABLE 3
CRUM CREEK BASIN (CDCA SERVICE AREA) HISTORICAL AND PRESENT SEWER FLOWS
(2013 THROUGH 2018)

Year	2013	2014[1]	2015[2]	2016[2]	2017[2,3]	2018[5]
Total Annual Daily Flow (GPD)	134,840	132,565	153,040	181,863	202,509	234,742
Max Daily Flow (GPD)	218,434	379,922	263,126	251,713	264,501[4]	394,117
Ratio (Max DF/ADF)	1.62	2.87	1.72	1.38	1.32[4]	1.68

Years 2012, 2013, and January to November of 2014, are comprised of flow from Camelot Pump Station only

1. Includes flow from Ashford (Liseter) Pump Station from December only
2. Includes flow from Ashford (Liseter) Pump Station from the entire year
3. Includes flow from Ellis Preserve Pump and Haul (aka By-Pass Pumping) from October, November, and December 2017
4. Max Daily Flow and Ratio include flows from Ashford (Liseter) Pump Station and Camelot Pump Stations only
5. Includes Ellis Preserve Pump Station flow data beginning August 1, 2018

TABLE 4A

Projection of Anticipated Connections and Flows

Project Name	Plan Status	Total Flow (gpd)	Total Units of Allocation	Prior to 2018	2018	Remaining Units of Allocation	2019	2020	2021	2022	2023	Total in 5 Years	Total Beyond 5 Years	TOTAL
Echo Valley Development	Existing Neighborhood	35,700	136	0	0	136	0	26	50	50	10	136	0	136
Goshen Road Area	Existing Neighborhoods	9,975	38	0	0	38	0	10	15	10	3	38	0	38
Boot Road Area	Existing Neighborhoods	2,625	10	0	0	10	0	0	8	2	0	10	0	10
Boot Road Area	Existing Neighborhoods	5,775	22	0	0	22	0	0	15	5	2	22	0	22
Florida Park	Existing Neighborhood	33,338	127	0	0	127	0	0	50	40	30	120	7	127
Hunt Valley Circle	Existing Neighborhood	8,138	31	0	0	31	0	0	10	5	5	20	11	31
Hunter's Run	Existing Neighborhood	19,950	76	0	0	76	0	0	76	0	0	76	0	76
Campus Boulevard	Existing Commercial Office (North)	7,750	30	0	0	30	0	0	20	10	0	30	0	30
Campus Boulevard	Existing Commercial Office (South)	18,250	70	0	0	70	0	0	45	25	0	70	0	70
Springton Pointe Estates	Existing Neighborhood	35,000	133	133	0	0	0	0	0	0	0	0	0	133
Township Park Area (Bishop Hollow Rd)	Existing Neighborhood	1,050	4	0	0	4	0	4	0	0	0	4	0	4
Dogwood Area	Existing Neighborhood	2,100	8	0	0	8	0	8	0	0	0	8	0	8
Melmark School	Existing School	25,000	95	0	0	95	0	0	95	0	0	95	0	95
Episcopal Academy	Existing School (Currently Pump & Haul)	11,000	42	42	0	0	0	0	0	0	0	0	0	42
Ashford (Liseter) Development (250 gpd/EDU)	Prop. Mixed Use Development SFPM Approval (1-23943-171-3J)	115,000	460	236	63	161	50	50	50	11	0	161	0	460
Ellis Preserve Pumping Station	SFPM Approval (1-23943-202-3J)	185,000	705	51	227	427	199	31	33	28	0	291	136	705
BPG - Ellis Preserve Multifamily	Prop. Mixed Use Development SFPM Approval (1-23943-209-3J) 256 Apartment Units in 3 Bldgs; 66 Stacked Townhouse Units in 33 Bldgs; Clubhouse & Pool	73,125	325	51	208	66	15	15	18	18	0	66	0	325
	Building A (84 Units)		84	0	84	0	0	0	0	0	0	0	0	84
	Building B (89 Units)		89	0	89	0	0	0	0	0	0	0	0	89
	Building C (83 Units)		83	51	32	0	0	0	0	0	0	0	0	83
	Clubhouse (2 Units) & Pool (1 Unit)		3	0	3	0	0	0	0	0	0	0	0	3
	Stacked Townhouses (66 Units)		66	0	0	66	15	15	18	18	0	66	0	66
BPG - Ellis Preserve - Sector 2	AmeriHealth (Front Lawn Office)	37,800	168	0	0	168	168	0	0	0	0	168	0	168
Toll Brothers - Ellis Preserve Townhouses	Prop. Mixed Use Development SFPM Approval (1-23943-202-3J) 76 Townhouses	17,100	76	0	19	57	16	16	15	10	0	57	0	76
National Developers Realty, Inc.														
1.a. Marville Site Existing	Existing Newtown Business Center	3,500	13	0	0	13	0	0	13	0	0	13	0	13
1.b. Marville Site Proposed	Marville, Parcels D-1 & D-2, and Lot A	83,950	320	0	0	320	0	0	0	0	32	32	288	320
2. Olde Masters Property	Ex. Golf Course - Prop. Development	78,100	298	0	0	298	0	0	0	30	30	60	238	298
3. "Four Seasons" - Gradyville Rd	Prop. 5 Lots and 37 Lots	9,450	36	0	0	36	0	0	0	0	0	0	36	36
CAMELOT P.S. EXISTING FLOWS														
Camelot P.S. Existing Developments	Newtown Heights, Newtown Woods, Dudie Drive, Mary Jane Lane, Greenbriar Lane	71,900	-	-	-	-	-	-	-	-	-	-	-	-
Pulte Residential & Commercial	Existing Residential & Commercial	43,100	164	164	0	0	0	0	0	0	0	0	0	164
Existing Alberto/Terrazza														
Teca Restaurant (formerly	300 Seats	1,520	-	-	-	-	-	-	-	-	-	-	-	-
Existing Phase I Terrazza Condos	103 of 206 Units @ 200 gpd	20,600	103	103	0	0	0	0	0	0	0	0	0	103
Proposed Somerset/Cornerstone (109,600 gpd - PA DEP)	Bozzuto: 250 Apartments @ 200 gpd	50,000	250	250	0	0	0	0	0	0	0	0	0	250
	Muirwood: 137 Townhomes @ 225 gpd	30,825	137	137	0	0	0	0	0	0	0	0	0	137
	Remaining Flow not Assigned	28,775	128	0	0	128	0	0	0	0	0	0	128	128
	Remaining from 7-Party Agreement	3,280	15	0	0	15	0	0	0	0	0	0	15	15
Newtown Twp - CDCA	Misc Existing (Infill) @ 225 gpd/EDU 2018: 409 Hempstead	21,325	94	8	1	85	5	5	5	5	5	25	60	94
TOTAL Units of Allocation			3,545	1,124	291	2,130	254	134	485	221	117	1,211	919	3,545
TOTAL FLOW (GPD) @ 262.5 GPD/Unit (Unless Otherwise Noted)		961,975		[illegible]	75,563	548,500	65,863	34,363	126,500	57,688	30,525	[illegible]	[illegible]	[illegible]

Tributary to Ashford PS
Tributary to Ellis Preserve PS
Tributary to Camelot PS

TABLE 4B

Projection of Anticipated Connections and Flows

2018 Tabulation of Units of Allocation and Flow by Pump Station Service Area for Population and Hydraulic Loading Projections			Remaining Units of Allocation	2019	2020	2021	2022	~2023	Total in 5 Years	Total Beyond 5 Years	TOTAL
Ashford PS	Residential Units Only		376	50	86	133	78	18	365	11	675
	Total Units		471	50	86	228	78	18	460	11	812
	Flow from Total Units	(GPD)	121,625	12,500	21,950	59,225	20,338	4,725	118,738	2,888	207,400
		(MGD)	0.122	0.013	0.022	0.059	0.020	0.005	0.119	0.003	0.207
Ellis Preserve PS	Residential Units Only		427	199	31	33	28	0	291	136	702
	Total Units		427	199	31	33	28	0	291	136	705
	Flow from Total Units	(GPD)	112,025	44,775	6,975	7,425	6,300	0	65,475	35,637	185,000
		(MGD)	0.112	0.045	0.007	0.007	0.006	0.000	0.065	0.036	0.185
Camelot PS	Residential Units Only		1,132	5	17	159	80	99	360	772	1,928
	Total Units		1,232	5	17	224	115	99	460	772	2,028
	Flow from Total Units	(GPD)	314,850	1,125	4,275	58,613	30,000	25,800	119,813	195,038	496,263
		(MGD)	0.315	0.001	0.004	0.059	0.030	0.026	0.120	0.195	0.496
TOTAL	Residential Units Only		1,935	254	134	325	186	117	1,016	918	3,305
	Total Units		2,130	254	134	485	221	117	1,211	919	3,545
	Flow from Total Units	(GPD)	546,500	58,400	33,200	125,263	56,638	30,525	304,075	233,562	888,662
		(MGD)	0.548	0.058	0.033	0.125	0.057	0.031	0.304	0.234	0.889

6.0 Sewage Pumping Stations

Prior to December 5, 2014, the Camelot Pumping Station provided wastewater conveyance for the entire CDCA service area within the Township. Currently, the Ashford Force Main is the only other point of discharge from Newtown Township to the CDCA system. As previously mentioned, the Camelot Pump Station consists of two (2) submersible, explosion-proof, Fairbanks Morse pumps. The conditions of service of the pumps are as follows: 850 gpm each @ 194' TDH @ 1760 RPM. The station also is comprised of a below-grade precast concrete wet well and valve vault structures, and an influent grinder to macerate heavy solids and debris entering the station. A flow totalizer is in place on the force main to display the total gallons of wastewater pumped at the station. Refer to Appendix B for totalizer readings.

The Camelot Pump Station is owned and operated by the Newtown Township, Delaware County, Municipal Authority, who has engaged KBX Golden, LLC (formerly AQUA-PA Wastewater Management, Inc.) to maintain the pump station under a service contract. The flows are recorded approximately five (5) days per week. The pump station is also equipped with an alarm system/auto-dialer that contacts KBX Golden for wet well high and low water levels, pump motor failure, sewage grinder motor failure, loss of electric service, and emergency generator shut down and low fuel alarm. The station is in good operating condition with no current problems.

The station is designed for an average daily flow of 330,000 GPD for the service area within the Crum Creek Basin. As mentioned previously, the station's permitted capacity is the maximum pumping rate of one (1) pump of 850 gpm (1.22 MGD). Refer to Appendix C for a pump curve. Refer to Section 2.0 and Table 6 (this section) for Hydraulic Load Projection. This pump station is to be replaced as part of the Upper Crum Creek Watershed Public Sewer Extension Project in the next two (2) years under WQM Permit No. 2317401.

The Hickory Lane Pump Station, which is tributary to the Camelot Pump Station, is equipped with two (2) Gorman-Rupp pumps. The current pumps are designed as follows: 80 gpm each @ 70' TDH.

The Springton Pointe WWTP headworks pump station is equipped with two (2) F.E. Myers, Inc. Model 4V50 non-clog sewage pumps with five (5) horsepower 480V, three (3) phase motors, rated for 285 gpm at 35 feet of Total Dynamic Head (TDH). This is more than sufficient to handle the 35,000 GPD of flow to the plant/pump station. This station receives flow from the Bakers Lane Pump Station, Wiltshire Lane Pump Station, and surrounding Springton Pointe Estates residential community. This station currently pumps to the Camelot Lane Pump Station. There is no flow meter at this station. The station is to be replaced as part of the public sewer extension project currently underway.

The Bakers Lane Pump Station is situated at the end of the Bakers Lane cul-de-sac and is rated for 90 gpm. This station is tributary to the Springton Pointe Estates WWTP headworks pump station. There is no flow meter at this station.

The Wiltshire Lane Pump Station is situated along the southerly side of Wiltshire Lane and is rated for a hydraulic capacity of 65 gpm. The station was specified to be equipped with two (2) Hydromatic Pumps, Inc. Model No. G2FX500 or approved equal pumps, with 7.5-inch diameter impeller, 2-inch diameter discharge piping, with five (5) horsepower, 240V, three (3) phase motors. The station has a design flow rate of 50 gpm with a TDH of 33 feet. There is no flow meter at this station.

The Ashford Pump Station is equipped with two (2) Fairbanks-Morse Submersible Solids-handling Pumps (Model 5435MV) with 14-inch diameter impellers, four (4) inch discharge connections, and 75 horsepower, 460-volt, three-phase 1780 rpm motors. The pump station has a design capacity of 570 gpm with an initial average daily flow (ADF) of 115,000 GPD and an ultimate ADF of 213,000 GPD subject to additional sewage planning approval(s). The station is comprised of a 10 ft. square below-grade precast concrete wet well and valve vault structures as well as an influent grinder (Muffin Monster) to macerate heavy solids and debris entering the station. A flow totalizer is in place on the force main to display the total gallons of wastewater pumped at the station.

The Ashford Pump Station is owned and operated by Toll Brothers, who has engaged KBX Golden to maintain the pump station under a service contract. The pump station was put into operation on December 5, 2014. The pump station is also equipped with an alarm system/auto-dialer that contacts KBX Golden for wet well high and low water levels, pump motor failure, sewage grinder motor failure, loss of electric service, and emergency generator shut down and low fuel alarm. The station is in good operating condition with no current problems. It is anticipated that dedication of the Ashford (Liseter) Pump Station, Sanitary Sewer Force Main will be accepted by the NTMA in Spring of 2019. The station is designed for an ultimate average daily flow of 213,000 GPD. The station's permitted capacity is the maximum pumping rate of one (1) pump of 570 gpm (0.821 MGD). Refer to Appendix C for a pump curve. Refer to Section 2.0 and Table 6 (this section) for Hydraulic Load Projection.

The Ellis Preserve Pump Station began operation on August 1, 2018. A Water Quality Management Part 2 Permit was issued by the DEP (Permit No. 2316403) as indicated by letter dated October 17, 2016 with the permit attached. The pump station includes a 10 ft square precast concrete wet well with a sewage grinder, two (2) 100 HP Fairbanks Nijhuis Submersible Solids-handling Pumps (Model 5436MV), a precast concrete valve vault, which includes a flow meter and an emergency connection point, along with a control building that will house a control panel, chemical treatment system, auto-dialer, and an emergency generator. The pump station has a design capacity of 700 gpm with an average annual flow of 185,000 GPD.

TABLE 5A

5-Year Hydraulic Loading Projections

Hydraulic Loading Projection - Ashford Pump Station				
		New Connections[2]		
Projected Years	Previous Year Annual Average Flow[1]	Ashford PS Service Area	Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(MGD)	(MGD)
2019	0.038	50	0.013	0.051
2020	0.051	86	0.022	0.073
2021	0.073	228	0.059	0.132
2022	0.132	78	0.020	0.152
2023	0.152	18	0.005	0.157

(1) The 2019 previous year annual average flow starts with 2018 ADF

(2) Refer to Table 4A and 4B for flow allocations per unit.

New Connections Account for Commercial and Institutional Units for flow projections

TABLE 5B
5-Year Hydraulic Loading Projections

Hydraulic Loading Projection - Ellis Preserve Pump Station				
		New Connections[2]		
Projected Years	Previous Year Annual Average Flow[1]	Ellis Preserve PS Service Area	Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(MGD)	(MGD)
2019	0.006	199	0.045	0.051
2020	0.051	31	0.007	0.058
2021	0.058	33	0.007	0.065
2022	0.065	28	0.006	0.071
2023	0.071	0	0.000	0.071

(1) The 2019 previous year annual average flow starts with December 2018 Pump and Haul ADF

(2) Refer to Table 4A and 4B for flow allocations per unit
New Connections Account for Commercial and Institutional Units for flow projections

TABLE 5C
5-Year Hydraulic Loading Projections

Hydraulic Loading Projection - Camelot Lane Pump Station/Force Main to CDCA				
		New Connections[2]		
Projected Years	Previous Year Annual Average Flow[1]	Camelot PS Service Area	Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(MGD)	(MGD)
2019	0.191	5	0.001	0.192
2020	0.192	17	0.004	0.196
2021	0.196	224	0.059	0.255
2022	0.255	115	0.030	0.285
2023	0.285	99	0.026	0.311

(1) The 2019 previous year annual average flow starts with 2018 ADF

(2) Refer to Table 4A and 4B for flow allocations per unit

New Connections Account for Commercial and Institutional Units for flow projections

TABLE 5D

5-Year Hydraulic Loading Projections

Hydraulic Loading Projection - Total CDCA Area within Newtown Twp										
		New Connections[2]								
Projected Years	Previous Year Annual Average Flow[1]	Ashford PS Service Area		Ellis Preserve PS Service Area		Camelot PS Service Area			Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(MGD)
2019	0.235	50	0.013	199	0.045	5	0.001	**254**	0.059	**0.294**
2020	0.294	86	0.022	31	0.007	17	0.004	**134**	0.033	**0.327**
2021	0.327	228	0.059	33	0.007	224	0.059	**485**	0.125	**0.452**
2022	0.452	78	0.020	28	0.006	115	0.030	**221**	0.056	**0.508**
2023	0.508	18	0.005	0	0.000	99	0.026	**117**	0.031	**0.539**

(1) The 2019 previous year annual average flow starts with 2018 ADF

(2) Refer to Table 4A and 4B for flow allocations per unit

New Connections Account for Commercial and Institutional Units for flow projections

TABLE 5E

5-Year Hydraulic Loading Projections

Hydraulic Loading Projection - Total from Ashford Force Main to CDCA (including Edgmont/DELCORA Force Main)										
		New Connections[2]								
Projected Years	Previous Year Annual Average Flow[1]	Ashford PS Service Area		Ellis Preserve PS Service Area		Edgmont/DELCORA Runnymeade PS Service Area[3]			Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(MGD)
2019	0.162	50	0.013	199	0.045	11	0.003	**260**	0.061	0.223
2020	0.223	86	0.022	31	0.007	85	0.022	**202**	0.051	0.274
2021	0.274	228	0.059	33	0.007	95	0.025	**356**	0.091	0.365
2022	0.365	78	0.020	28	0.006	113	0.030	**219**	0.056	0.421
2023	0.421	18	0.005	0	0.000	231	0.061	**249**	0.066	0.487

(1) The 2019 previous year annual average flow starts with 2018 ADF (including Edgmont/DELCORA flow per Reference (3) below)

(2) Refer to Table 4A, 4B, and Reference (3) below for flow allocations per unit
New Connections Account for Commercial and Institutional Units for flow projections

(3) Refer to Table 4 of Attachment A (pg A-3) of "The Delaware County Regional Water Quality Control Authority, Edgmont Township, Crum Creek Sewer District, Tributary Municipality 2018 Chapter 94Report, February 2019," prepared by Bradford Engineering Associates, Inc. for Annual Average Flow Projection for Edgmont Twp.

TABLE 5F
5-Year Hydraulic Loading Projections

Hydraulic Loading Projection - Total Discharge to CDCA from NTMA System								
		New Connections[2]						
Projected Years	Previous Year Annual Average Flow[1]	TOTAL Increased Flow from Ashford FM to CDCA		TOTAL Increased Flow from Camelot FM to CDCA			Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(MGD)
2019	0.353	260	0.061	5	0.001	**265**	0.062	0.415
2020	0.415	202	0.051	17	0.004	**219**	0.055	0.470
2021	0.470	356	0.091	224	0.059	**580**	0.150	0.620
2022	0.620	219	0.056	115	0.030	**334**	0.086	0.706
2023	0.706	249	0.066	99	0.026	**348**	0.092	0.798

(1) The 2019 previous year annual average flow starts with 2018 ADF (including Edgmont/DELCORA flow per Reference (3) below)

(2) Refer to Table 4A, 4B, and Reference (3) below for flow allocations per unit
New Connections Account for Commercial and Institutional Units for flow projections.

(3) Refer to Table 4 of Attachment A (pg A-3) of "The Delaware County Regional Water Quality Control Authority, Edgmont Township, Crum Creek Sewer District, Tributary Municipality 2018 Chapter 94Report, February 2019," prepared by Bradford Engineering Associates, Inc. for Annual Average Flow Projection for Edgmont Twp.

TABLE 6

Pump Stations						
		Permitted Capacities		Present Flows		Projected Flows
Pump Station Name	Number of Pumps	AA Permitted Capacity[4] (GPD)	Hydraulic Design Capacity[1] (GPD)	Annual Average Flows (GPD)	Peak Instantaneous (or Peak Hourly) Flow[2] (gpm)	2-Year Projected Maximum Flow[3] (GPD)
Camelot Pump Station	2	330,000 (229.2 gpm)	1.224 MGD (850 gpm)	191,146	504[2]	744,800 (517 gpm)
Ashford Pump Station	2	115,000 (79.9 gpm) 213,000 (147.9 gpm)	0.821 MGD (570 gpm)	37,575	104[2]	284,700 (198 gpm)
Ellis Preserve Pump Station	2	185,000 (128.5 gpm)	1.008 MGD (700 gpm)	6,058[5]	18[2]	220,400 (153 gpm)

1. Excluding Capacity of Backup Pump = Maximum Pump Rate
2. The Peak Instantaneous Flow was determined by applying a Peaking Factor pursuant to the *Pennsylvania Department of Environmental Protection, Water Management Program, Southeast Regional Office, Sewage Pumping Station Guidance*, last revised March 24, 1999.
   a. Peaking Factor = 3.8 for Camelot P.S. based on AADF of 0.191 MGD
   b. Peaking Factor = 4.0 for Ashford P.S. based on AADF of 0.038 MGD
   c. Peaking Factor = 4.2 for Ellis Preserve P.S. based on Design Calculation Report and AADF of 0.006 MGD
3. 2-Year Projected Peak Flow = (Projected 2-Year AA Flow to P.S.) x (Pump Station Peaking Factor); pursuant to the *Pennsylvania Department of Environmental Protection, Water Management Program, Southeast Regional Office, Sewage Pumping Station Guidance*, last revised March 24, 1999:
   a. Projected 2-Year AA Flow to Camelot P.S. Based on Proposed Connections (0.196 MGD in 2020 per Table 5C) x (P.S. Peaking Factor of 3.8)
   b. Projected 2-Year AA Flow to Ashford P.S. Based on Proposed Connections (0.073 MGD in 2020 per Table 5A) x (P.S. Peaking Factor of 3.9)
   c. Projected 2-Year AA Flow to Ellis Preserve P.S. Based on Proposed Connections (0.058 MGD in 2020 per Table 5B) x (P.S. Peaking Factor of 3.9)
4. The Permitted Capacity of the Ashford P.S. is currently 115,000 GPD with an ultimate Permitted Capacity of 213,000 GPD subject to additional planning approvals for adjacent surrounding areas.
5. The Annual Average Flow for Ellis Preserve was taken from the date the pump station was placed into operation (August 1, 2018).

7.0 Sanitary Sewer Overflow 2018

There were no Sanitary Sewer Overflows (SSOs) in the CDCA Service Area in 2018. There were no overload conditions and no major repairs in 2018.

8.0 Industrial Wastewater

No industrial waste is discharged to the system. As part of the recently approved Act 537 Plan and revised Sewer Lateral Connection Application, commercial and industrial users are required to complete a "Commercial/Industrial User Survey" as part of any future connection application to the system.

9.0 Proposed Plan to Reduce Projected Overload Conditions

The Authority continues to identify and remove illegal connections to the system, addresses sources of I&I on an as-needed basis, and maintains the system in good working order. In planning to reduce sources of I&I, Newtown Township has adopted DELCORA's new lateral standards. No overloads in the CDCA service area are anticipated.

APPENDIX

A. NEWTOWN TOWNSHIP SEWER MAP

B. PUMP STATIONS – FLOW DATA

C. PUMP STATIONS – PUMP CURVES

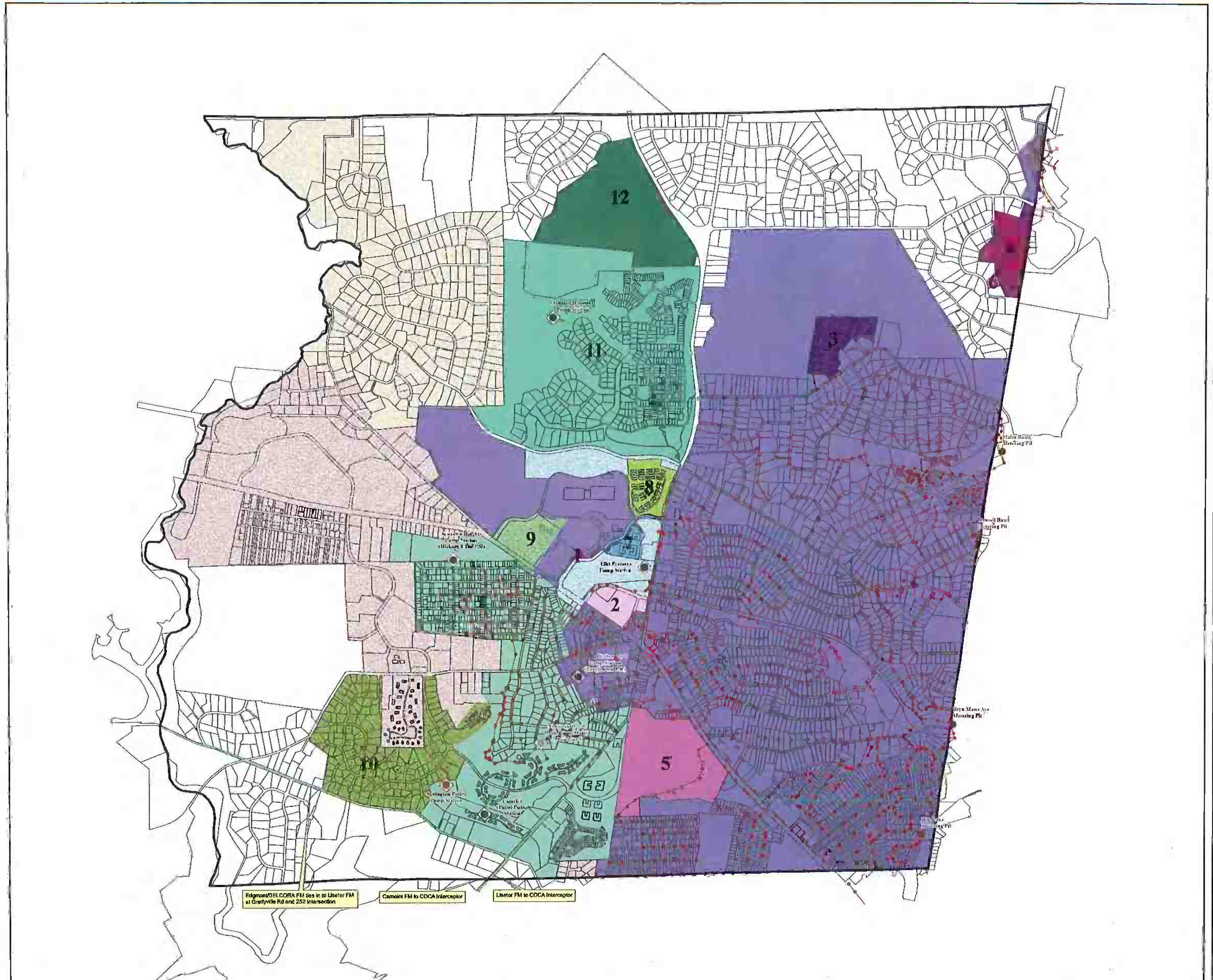
D. THE DELAWARE COUNTY REGIONAL WATER QUALITY CONTROL AUTHORITY, EDGMONT TOWNSHIP, CRUM CREEK SEWER DISTRICT, TRIBUTARY MUNICIPALITY, 2018 CHAPTER 94 REPORT, FEBRUARY 2019, PREPARED BY BRADFORD ENGINEERING ASSOCIATES, INC.

Appendix (A)

Newtown Township Sanitary Sewer System Map

Newtown Township, Delaware County, Municipal Authority
Tributary Municipality
Annual Report
2018

Newtown Township Sanitary Sewer System



- Metering Pits
- Treatment Plants
- Pump Stations
- Pump Stations Abandoned
- Manholes
- Sewer Lines

- Radnor Haverford Marple Sewer Authority
- 1. Ellis Preserve Town Center - Newtown Square Firehouse PADEP Code 1-23943-222-X
- 2. Ellis Town Center (Phase 1, Sector 1) PADEP Code 1-23943-194-X
- 3. Timber Lane Area Serviced by Existing Sanitary Sewer
- 4. Worthing Subdivision connected to public sewer via Planning Module. PADEP Code No. 1--23943-453-3JREV
- 5. Dunwoody Village (Penrose Carriage Homes) PADEP Code No. 1-23943-201-3J
- 6. No Planning Needed - PA DEP Code No. 1-23943-200-X
- Central Delaware County Authority
- 7. Ellis Preserve Town Center Multi-family PADEP Code 1-23943-209-3J
- 8. Ellis Preserve Townhouses PADEP Code 1-23943-202-3J
- 9. Ellis Preserve Sector 2 Office Building PADEP Code 1-23943-224-E
- 10. Springton Pointe Estates PS
- 11. Ashford (Liseter). PA DEP Code No. 1-23943-171-3J
- 12. Episcopal Academy - DEP Code No. 1-23943-147A-3J
- BPG (Ellis Preserve) P.S. Service Area
- Camelot P.S. Service Area
- Ashford P.S. Service Area

Data:
Roads, Water, Parcels, Municipal Boundary - DCPD Data

Metering Pits locations were created from Kelly Engineering Newtown Sewer Map, 2003

Sewer Lines, manhole, & pumpstation locations digitized by JMT in 2003 and updated by DCPD using Kelly Engineering and Pennoni Assoc. Inc Newtown Sewer Maps, 2003 and 2007.

Important
This map is for analytical purposes only. It is not intended for navigation or exact location of infrastructure. The reliability of this map depends on the accuracy of its underlying data sources which have not been verified. Unauthorized duplication or distribution is prohibited.

Prepared by
Delaware County
Planning Department
2019

N

0 1,000 2,000 4,000 Feet

1 inch = 1,000 feet

APPENDIX (B)

PUMP STATIONS – FLOW DATA

NEWTOWN TOWNSHIP, DELAWARE COUNTY, MUNICIPAL AUTHORITY
TRIBUTARY MUNICIPALITY
ANNUAL REPORT
2018

CAMELOT PUMP STATION
2018 FLOW

Date	January 2018		February 2018		March 2018		April 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		190,442	4,908,857	123,800	58,455	229,222		193,086
2	9,778,264	211,716	5,032,657	193,333	287,677	**236,825**	6,364,731	196,205
3	9,989,980	144,691		193,333		**236,825**	6,560,936	200,206
4	134,672	141,047		193,333		**236,825**	6,761,142	199,081
5	275,719	185,610	5,612,657	122,315	998,151	184,522	6,960,223	152,638
6		185,610	5,734,972	183,259	1,182,673	189,323	7,112,861	192,033
7		185,610	5,918,231	205,937	1,371,996	206,572		192,033
8	832,548	**216,641**	6,124,168	149,031		206,572		192,033
9	1,049,189	142,203	6,273,199	214,634	1,785,139	209,789	7,688,959	178,118
10		142,203		214,634		209,789	7,867,077	127,784
11	1,333,595	187,000		214,634		209,789	7,994,861	198,371
12	1,520,595	180,868	6,917,100	174,776	2,414,505	185,368	8,193,232	172,231
13		180,868	7,091,876	182,883	2,599,873	194,885	8,365,463	211,039
14		180,868	7,274,759	**217,063**	2,794,758	184,734		211,039
15	2,063,198	189,390	7,491,822	180,630	3,026,777	184,734		211,039
16	2,252,588	135,168	7,672,452	189,516	3,164,225	194,895	8,998,580	175,378
17	2,387,756	203,210		189,516		194,895	9,173,958	**232,106**
18	2,590,966	176,163		189,516		194,895	9,406,064	153,580
19	2,767,129	165,724	8,241,001	161,691	3,748,910	170,765	9,559,644	213,622
20		165,724	8,402,692	213,272	3,919,675	163,986	9,773,266	172,165
21		165,724	8,615,964	148,806	4,083,661	232,081		172,165
22	3,264,302	144,178	8,764,770	164,294	4,315,742	172,917		172,165
23	3,408,480	191,408	8,929,064	200,326	4,488,659	204,335	289,762	192,392
24	3,599,888	158,936		200,326		204,335	482,154	186,610
25	3,758,824	127,280		200,326		204,335	668,764	183,011
26	3,886,104	170,605	9,530,042	173,734	5,101,665	204,856	851,775	142,373
27		170,605	9,703,776	189,252	5,306,521	124,624	994,148	194,487
28		170,605	9,893,028	165,426	5,431,145	171,830		194,487
29	4,397,920	149,689			5,602,975	182,498		194,487
30	4,547,609	155,679			5,785,473	193,086	1,577,610	178,460
31	4,703,288	205,569				193,086		

> 1" of Rainfall in 24-hours

	January	February	March	April
Daily Avg.	171,646	183,914	197,200	186,147
Max	216,641	217,063	236,825	232,106

CAMELOT PUMP STATION
2018 FLOW

Date	May 2018		June 2018		July 2018		August 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	1,756,070	166,359	7,612,241	201,152		167,289	8,247,815	230,671
2	1,922,429	177,135		201,152	3,182,802	172,623	8,478,486	112,548
3	2,099,564	177,384		201,152	3,355,425	184,611	8,591,034	177,471
4	2,276,948	185,621	8,215,696	173,048		184,611		177,471
5		185,621	8,388,744	175,192	3,724,647	130,187		177,471
6		185,621	8,563,936	201,610	3,854,834	159,974	9,123,446	167,212
7	2,833,811	193,575	8,765,546	149,494		159,974	9,290,658	161,246
8	3,027,386	171,114	8,915,040	187,219		159,974	9,451,904	214,742
9	3,198,500	181,058		187,219	4,334,755	**216,366**	9,666,646	129,200
10	3,379,558	135,785		187,219	4,551,121	130,615	9,795,846	200,984
11	3,515,343	212,032	9,476,698	199,724	4,681,736	187,797		200,984
12		212,032	9,493,470	199,724	4,869,533	125,002		200,984
13		212,032	9,876,146	185,041	4,994,535	170,868	398,800	207,039
14	4,151,439	169,184	124,729	185,041		170,868	605,839	174,959
15	4,320,623	152,261	246,229	173,383		170,868	780,798	190,207
16	4,472,884	225,968		173,383	5,507,138	176,582	971,005	167,000
17	4,698,852	201,080		173,383	5,683,720	181,578	1,138,005	194,076
18	4,899,932	**227,006**	766,377	170,653	5,865,298	159,604		194,076
19		**227,006**	937,030	170,746	6,024,902	121,819		194,076
20		**227,006**	1,107,776	**217,103**	6,146,721	184,142	1,720,234	**233,411**
21	5,580,949	191,628	1,324,879	138,963		184,142	1,953,645	232,103
22	5,772,577	218,252	1,463,842	180,138		184,142	2,185,748	119,320
23	5,990,829	200,845		180,138	6,699,147	165,839	2,305,068	132,763
24	6,191,674	171,643		180,138	6,864,986	166,743	2,437,831	178,938
25	6,363,317	168,434	2,004,255	172,100	7,031,729	182,975		178,938
26		168,434	2,176,355	182,356	7,271,785	182,975		178,938
27	6,700,185	203,655	2,358,711	118,505	7,397,678	176,369	2,974,646	163,572
28		203,655	2,477,216	203,719		176,369	3,138,218	198,109
29	7,107,494	169,912	2,680,935	167,289		176,369	3,336,327	172,367
30	7,277,406	181,542		167,289	7,926,786	179,375	3,508,694	156,495
31	7,458,948	153,293			8,106,161	141,654	3,665,189	195,149

> 1" of Rainfall in 24-hours

	May 2018	June 2018	July 2018	August 2018
Daily Avg.	**188,909**	**180,109**	**168,784**	**181,049**
Max	**227,006**	**217,103**	216,366	233,411

CAMELOT PUMP STATION
2018 FLOW

Date	September 2018		October 2018		November 2018		December 2018		January 2019	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		195,149	9,862,324	191,806	5,705,346	152,214		220,190		245,692
2	4,055,486	155,677	54,131	192,308	5,857,560	205,074		220,190		245,692
3		155,677	246,439	191,061		205,074	2,821,470	264,762		0
4	4,366,840	165,213	437,500	188,987		205,074	3,086,232	139,940		0
5	4,532,053	180,986	626,487	199,371	6,472,782	208,922	3,226,172	218,757		0
6	4,713,039	205,620		199,371	6,681,704	235,459	3,444,929	191,012		0
7	4,918,659	236,688		199,371	6,917,163	206,698	3,635,941	209,552		0
8		236,688	1,224,599	175,167	7,123,861	171,172		209,552		0
9		236,688	1,399,766	191,863	7,295,033	220,457		209,552		0
10	5,628,723	218,448	1,591,629	176,482		220,457	4,264,598	190,895		0
11	5,847,171	191,439	1,817,826	**176,482**		220,457	4,455,493	197,274		0
12	6,038,610	**249,841**	1,944,592	208,542	7,956,405	269,069	4,652,767	206,165		0
13	6,288,451	157,398		208,542	8,225,474	166,176	4,858,932	186,758		0
14	6,445,849	202,536		208,542	8,391,650	203,506	5,045,690	242,515		0
15		202,536	2,570,219	170,168	8,595,156	**283,628**		242,515		0
16		202,536	2,740,387	174,124	8,878,784	241,181		242,515		0
17	7,053,457	187,920	2,914,511	**217,710**	9,630,014	241,181	5,773,235	191,226		0
18	7,241,377	205,776	3,132,221	147,132		241,181	5,964,461	197,720		0
19	7,447,153	212,300	3,279,353	192,818		241,181	6,162,181	272,406		0
20	7,659,453	134,325		192,818	9,843,508	183,999	6,434,587	**309,600**		0
21	7,793,778	190,175		192,818	27,508	206,328	6,744,187	232,514		0
22		**190,175**	3,857,807	165,881		206,328		232,514		0
23		**190,175**	4,023,688	**174,871**	440,163	269,893		232,514		0
24	8,364,303	188,265	4,198,559	182,447		269,893	7,441,728	219,102		0
25	8,552,568	237,285	4,381,006	163,494		269,893		219,102		0
26	9,016,162	237,285	4,544,500	203,070	1,249,843	250,037	7,879,931	268,111		0
27		237,285		203,070	1,499,880	244,166	8,148,042	222,742		0
28	9,264,422	199,301		203,070	1,744,046	219,961	8,370,784	245,692		0
29		199,301	5,153,709	177,572	1,964,007	196,892		245,692		0
30		199,301	5,331,281	181,208	2,160,899	220,190		245,692		0
31			5,512,489	192,857			9,107,860	245,692		

> 1" of Rainfall in 24-hours

September 2018	October 2018	November 2018	December 2018		
Daily Avg. **200,066**	Daily Avg. 188,485	Daily Avg. **222,525**	Daily Avg. **224,918**	AADF 2018	191,146
Max **249,841**	Max 217,710	Max **283,628**	Max 309,600	Annual Max.	309,600

Episcopal Academy 2018

	Begin	End	Days	Usage (Gallons)
Quarter 1	1/1/2018	3/31/2018	90	688,070
Quarter 2	4/1/2018	6/30/2018	91	625,285
Quarter 3	7/1/2018	9/30/2018	92	795,552
Quarter 4	10/1/2018	12/31/2018	92	827,392
			365	
TOTAL Gallons				2,936,299
Average Daily Flow (Gallons)				**8,045**

NOTE: Flow is tributary to the Ashford PS and is accounted for in the Ashford PS meter readings

ASHFORD PUMP STATION
2018 FLOW

Date	January 2018		February 2018		March 2018		April 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		37,217	9,588,472	34,936	580,227	39,461		27,411
2	8,445,902	43,780	9,623,408	39,461	619,688	27,866	1,610,000	32,285
3	8,489,682	30,114		39,461		27,866		32,285
4	8,519,796	29,712		39,461		27,866	1,674,570	55,368
5	8,549,508	34,487	9,741,792	23,332	703,287	34,425	1,729,938	22,987
6		34,487	9,765,124	46,198	737,712	31,651	1,752,925	38,271
7		34,487	9,811,322	37,062	769,363	**42,080**		38,271
8	8,652,970	54,950	9,848,384	19,972	811,443	29,931		38,271
9	8,707,920	39,444	9,868,356	38,781	841,374	32,785	1,867,737	25,308
10	8,747,364	32,376		38,781		32,785	1,893,045	39,624
11	8,779,740	36,882		38,781		32,785	1,981,871	39,624
12	8,816,622	39,315	9,984,700	33,563	939,730	36,622		39,624
13		39,315	18,264	40,423	976,352	36,528	2,011,916	49,253
14		39,315	58,687	50,880	1,012,880	36,844		49,253
15	8,934,568	38,640	109,567	24,412	1,065,836	36,844		49,253
16	8,973,208	35,026	133,979	30,725	1,086,568	33,665	2,159,676	27,590
17	9,008,234	54,112		30,725		33,665	2,187,266	54,782
18	9,062,346	25,144		30,725		33,665	2,242,048	27,487
19	9,087,490	38,221	226,153	27,442	1,187,563	35,038	2,269,535	34,421
20		38,221	253,595	51,578	1,222,601	29,926	2,303,956	34,796
21		38,221	305,173	23,319	1,252,527	36,929		34,796
22	9,202,154	39,226	328,492	29,796	1,289,456	32,420		34,796
23	9,241,380	57,942	358,288	36,117	1,321,876	33,331	2,408,344	40,552
24	9,299,322	39,394		36,117		33,331	2,448,896	40,113
25	9,338,716	20,492		36,117		33,331	2,489,009	38,971
26	9,359,208	37,013	466,640	37,316	1,421,870	32,041	2,527,980	34,887
27		37,013	503,956	41,456	1,453,911	18,105	2,562,867	30,403
28		37,013	545,412	34,815	1,472,016	26,325		30,403
29	9,470,248	37,338			1,498,341	29,426		30,403
30	9,507,586	39,474			1,527,767	27,411	2,654,075	59,354
31	9,547,060	41,412				27,411		

> 1" of Rainfall in 24-hours

January 2018	February 2018	March 2018	April 2018
Daily Avg. (GPD)	**Daily Avg.**	**Daily Avg.**	**Daily Avg.**
38,046	**35,420**	**32,334**	**37,695**
Max (GPD)	**Max**	**Max**	**Max**
57,942	51,578	**42,080**	59,354

ASHFORD PUMP STATION
2018 FLOW

Date	May 2018		June 2018		July 2018		August 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	2,713,429	36,824	3,875,389	36,828		28,442	5,803,546	31,711
2	2,750,253	44,514		36,828	4,854,248	29,923	5,835,257	32,034
3	2,794,767	32,486		36,828	4,884,171	25,791	5,867,291	34,394
4	2,827,253	35,351	3,985,874	28,377		25,791		34,394
5		35,351	4,014,251	31,903		25,791		34,394
6		35,351	4,046,154	41,343	4,961,545	27,203	5,970,472	34,325
7	2,933,305	39,740	4,087,497	20,539	4,988,748	23,344	6,004,797	34,337
8	2,973,045	39,165	4,108,036	32,064		23,344	6,039,134	45,934
9	3,012,210	37,277		32,064		23,344	6,085,068	20,516
10	3,049,487	29,713		32,064	5,058,780	38,827	6,105,584	40,403
11	3,079,200	44,098	4,204,228	37,246	5,097,607	41,301		40,403
12		44,098	4,241,474	32,042	5,138,908	24,609		40,403
13		44,098	4,273,516	32,107	5,163,517	25,609	6,226,792	23,184
14	3,211,495	32,508	4,319,460	32,107	5,189,126	29,462	6,249,976	31,948
15	3,244,003	37,540	4,337,729	28,547		29,462	6,281,924	38,836
16	3,281,543	46,659		28,547		29,462	6,320,760	27,350
17	3,328,202	38,020		28,547	5,277,512	38,472	6,348,110	34,490
18	3,366,222	37,592	4,423,369	30,520	5,315,984	34,481		34,490
19		37,592	4,453,889	32,139	5,350,465	27,341		34,490
20		37,592	4,486,028	**45,922**	5,377,806	25,914	6,451,581	**50,497**
21	3,478,999	37,077	4,531,950	20,645	5,403,720	29,304	6,502,078	29,700
22	3,516,076	**51,346**	4,552,595	29,659		29,304	6,531,778	44,100
23	3,567,422	32,391		29,659		29,304	6,575,878	25,088
24	3,599,813	34,310		29,659	5,491,633	34,245	6,600,966	32,652
25	3,634,123	36,485	4,641,573	27,431	5,525,878	34,340		32,652
26		36,485	4,669,004	44,931	5,560,218	35,461		32,652
27	3,707,093	30,058	4,713,935	25,275	5,613,002	35,461	6,698,923	31,814
28		30,058	4,739,210	29,712	5,631,139	**53,237**	6,730,737	43,485
29	3,767,208	36,702	4,768,922	28,442		**53,237**	6,774,222	29,462
30	3,803,910	41,558		28,442	5,737,613	36,782	6,803,684	34,268
31	3,845,468	29,921			5,774,395	29,151	6,837,952	41,049

> 1" of Rainfall in 24-hours

	May 2018	June 2018	July 2018	August 2018
Daily Avg.	37,483	31,681	31,540	34,692
Max	51,346	45,922	53,237	50,497

ASHFORD PUMP STATION
2018 FLOW

Date	September 2018		October 2018		November 2018		December 2018		January 2019	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		41,049	8,126,129	43,991	9,422,936	34,588		40,913		0
2	6,920,049	30,925	8,170,120	43,477	9,457,524	42,507		40,913		0
3		30,925	8,213,597	46,193		42,507	843,879	65,841		0
4	6,981,898	36,591	8,259,790	34,229		42,507	909,720	26,934		0
5	7,018,489	38,928	8,294,019	39,044	9,585,044	46,192	936,654	52,245		0
6	7,057,417	48,048		39,044	9,631,236	49,066	988,899	39,641		0
7	7,105,465	42,479		39,044	9,680,302	49,058	1,028,540	41,749		0
8		42,479	8,411,150	34,466	9,729,360	36,912		41,749		0
9		42,479	8,445,616	44,084	9,766,272	40,790		41,749		0
10	7,232,902	44,020	8,489,700	38,341		40,790	1,153,787	46,701		0
11	7,276,922	43,892	8,550,178	38,341		40,790	1,200,488	41,683		0
12	7,320,814	44,276	8,566,382	40,703	9,888,642	45,591	1,242,171	48,990		0
13	7,381,806	27,560		40,703	9,954,492	45,591	1,291,161	41,890		0
14	7,409,366	41,519		40,703	9,979,824	53,519	1,333,051	32,875		0
15		41,519	8,688,490	41,586	33,344	44,118		32,875		0
16		41,519	8,730,076	44,292	77,462	48,927		32,875		0
17	7,533,924	41,972	8,774,368	43,166		48,927	1,431,677	74,834		0
18	7,575,896	46,384	8,832,082	43,166		48,927	1,506,511	41,783		0
19	7,622,280	41,552	8,860,700	41,620	224,244	39,859	1,548,294	60,835		0
20	7,675,391	41,552		41,620	264,103	36,914	1,609,129	65,426		0
21	7,705,384	38,339		41,620	301,017	42,018	1,674,555	40,789		0
22		38,339	8,985,560	39,504		42,018		40,789		0
23		38,339	9,025,064	41,938	385,052	50,011		40,789		0
24	7,820,402	44,191	9,067,002	**49,306**		50,011	1,796,921	46,696		0
25	7,864,593	**51,654**	9,116,308	37,052		50,011		46,696		0
26	7,916,247	51,239	9,153,360	42,353	535,085	49,154	1,890,313	48,718		0
27	7,967,486	44,072		42,353	584,239	45,374	1,939,031	47,949		0
28	8,011,558	38,190		42,353	629,613	**59,046**	1,986,980	38,840		0
29		38,190	9,280,420	46,664	688,659	32,481		38,840		0
30		38,190	9,327,084	47,208	721,140	40,913		38,840		0
31			9,374,292	48,644			2,103,500	38,840		

> 1" of Rainfall in 24-hours

	September 2018	October 2018	November 2018	December 2018		
Daily Avg.	41,014	41,832	44,637	44,525	AADF 2018	37,575
Max	51,654	49,306	59,046	74,834	Annual Max.	74,834

ELLIS PRESERVE PUMP STATION
2018 FLOW

Date	May 2018		June 2018		July 2018		August 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1							931,561	9,667
2							941,228	7,091
3							948,319	12,495
4								12,495
5								12,495
6							985,805	9,728
7							995,533	9,659
8							1,005,192	15,476
9							1,020,668	7,477
10							1,028,145	15,663
11							1,080,780	15,663
12								15,663
13								15,663
14							1,090,797	10,384
15							1,101,181	13,076
16							1,114,257	9,253
17							1,123,510	12,827
18								12,827
19								12,827
20							1,161,992	13,813
21							1,175,805	5,392
22							1,181,197	18,000
23							1,199,197	9,468
24							1,208,665	10,719
25								10,719
26								10,719
27							1,240,822	9,163
28							1,249,985	13,736
29							1,263,721	9,157
30							1,272,878	9,192
31							1,282,070	13,935

> 1" of Rainfall in 24-hours

	May 2018	June 2018	July 2018	August 2018
Daily Avg.	0	0	0	11,756
Max	0	0	0	18,000

ELLIS PRESERVE PUMP STATION
2018 FLOW

Date	September 2018		October 2018		November 2018		December 2018		January 2019	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		13,935	1,731,788	15,263	2,266,160	9,758		15,467		0
2	1,309,939	9,565	1,747,051	12,793	2,275,918	15,890		15,467		0
3		9,565	1,759,844	17,132		15,890	2,754,624	16,420		0
4	1,329,068	11,479	1,776,976	14,727		15,890	2,771,044	9,051		0
5	1,340,547	12,191	1,791,703	18,708	2,323,589	15,812	2,780,095	14,880		0
6	1,352,738	13,650		18,708	2,339,401	18,906	2,794,975	11,265		0
7	1,366,388	22,284		18,708	2,358,307	14,361	2,806,240	14,247		0
8		22,284	1,847,828	19,289	2,372,668	9,851		14,247		0
9		22,284	1,867,117	18,883	2,382,519	16,295		14,247		0
10	1,433,239	12,901	1,886,000	24,060		16,295	2,848,982	14,232		0
11	1,446,140	11,445	1,910,060	11,997		16,295	2,863,214	11,251		0
12	1,457,585	18,551	1,922,057	20,178	2,431,404	16,955	2,874,465	14,259		0
13	1,476,136	7,653		20,178	2,456,264	16,955	2,888,724	13,542		0
14	1,483,789	12,231		20,178	2,465,314	14,342	2,902,266	16,213		0
15		12,231	1,982,590	18,130	2,479,656	20,149		16,213		0
16		12,231	2,000,720	17,504	2,499,805	16,748		16,213		0
17	1,520,483	12,248	2,018,224	21,833		16,748	2,950,904	11,238		0
18	1,532,731	12,995	2,040,057	13,614		16,748	2,962,142	9,272		0
19	1,545,726	13,692	2,053,671	19,440	2,550,048	13,830	2,971,414	19,742		0
20	1,559,418	9,920		19,440	2,563,878	13,100	2,991,156	19,091		0
21	1,569,338	16,681		19,440	2,576,978	13,976	3,010,247	12,032		0
22		16,681	2,111,990	16,845		13,976		12,032		0
23		16,681	2,128,835	18,640	2,604,930	16,453		12,032		0
24	1,619,381	17,295	2,147,475	20,165		16,453	3,046,342	11,854		0
25	1,636,676	27,175	2,167,640	10,550		16,453		11,854		0
26	1,663,851	16,108	2,178,190	15,528	2,654,290	14,158	3,070,049	15,881		0
27	1,679,959	16,171		15,528	2,668,448	13,488	3,085,930	14,245		0
28	1,696,130	11,886		15,528	2,681,936	16,481	3,100,175	13,738		0
29		11,886	2,224,774	16,613	2,698,417	9,805		13,738		0
30		11,886	2,241,387	10,555	2,708,222	15,467		13,738		0
31			2,251,942	14,218			3,141,389			

> 1" of Rainfall in 24-hours

September 2018	October 2018	November 2018	December 2018		
Daily Avg. 14,526	Daily Avg. 17,238	Daily Avg. 15,251	Daily Avg. 13,923	AADF 2018	6,058
Max 27,175	Max 24,060	Max 20,149	Max 19,742	Annual Max.	24,060

TOTAL TO CDCA (NTMA ONLY)
2018 FLOW

Date	January 2018 Total	January 2018 Daily	February 2018 Total	February 2018 Daily	March 2018 Total	March 2018 Daily	April 2018 Total	April 2018 Daily
1	0	227,659	14,497,329	158,736	638,682	268,683	0	**220,497**
2	18,224,166	255,496	14,656,065	232,795	907,365	264,691	7,974,731	228,490
3	18,479,662	174,805	0	232,795	0	264,691	6,560,936	232,491
4	8,654,468	170,759	0	232,795	0	264,691	8,435,712	254,449
5	8,825,227	220,097	15,354,449	145,647	1,701,438	218,947	8,690,161	175,625
6	0	220,097	15,500,096	229,457	1,920,385	220,974	8,865,786	230,303
7	0	220,097	15,729,553	242,999	2,141,359	248,652	0	230,303
8	9,485,518	**271,591**	15,972,552	169,003	811,443	236,503	0	230,303
9	9,757,109	181,647	16,141,555	253,415	2,626,513	242,574	9,556,696	203,426
10	8,747,364	174,579	0	253,415	0	242,574	9,760,122	167,408
11	10,113,335	223,882	0	253,415	0	242,574	9,976,732	237,995
12	10,337,217	220,183	16,901,800	208,339	3,354,235	221,990	8,193,232	211,855
13	0	220,183	7,110,140	223,306	3,576,225	231,413	10,377,379	260,292
14	0	220,183	7,333,446	**267,943**	3,807,638	221,578	0	260,292
15	10,997,766	228,030	7,601,389	205,042	4,092,613	221,578	0	260,292
16	11,225,796	170,194	7,806,431	220,241	4,250,793	228,560	11,158,256	202,968
17	11,395,990	257,322	0	220,241	0	228,560	11,361,224	**286,888**
18	11,653,312	201,307	0	220,241	0	228,560	11,648,112	181,067
19	11,854,619	203,946	8,467,154	189,133	4,936,473	205,803	11,829,179	248,043
20	0	203,946	8,656,287	264,850	5,142,276	193,912	12,077,222	206,961
21	0	203,946	8,921,137	172,125	5,336,188	**269,010**	0	206,961
22	12,466,456	183,404	9,093,262	194,090	5,605,198	205,337	0	206,961
23	12,649,860	249,350	9,287,352	236,443	5,810,535	237,667	2,698,106	232,944
24	12,899,210	198,330	0	236,443	0	237,667	2,931,050	226,723
25	13,097,540	147,772	0	236,443	0	237,667	3,157,773	221,982
26	13,245,312	207,619	9,996,682	211,050	6,523,535	236,897	3,379,755	177,260
27	0	207,619	10,207,732	230,708	6,760,432	142,729	3,557,015	224,890
28	0	207,619	10,438,440	200,241	6,903,161	198,155	0	224,890
29	13,868,168	187,027			7,101,316	211,924	0	224,890
30	14,055,195	195,153			7,313,240	220,497	4,231,685	237,814
31	14,250,348	246,981				220,497		

> 1" of Rainfall in 24-hours

	January 2018	February 2018	March 2018	April 2018
Daily Avg. (GPD)	**209,704**	**219,334**	**229,534**	**223,842**
Max (GPD)	**271,591**	**267,943**	**269,010**	**286,888**

TOTAL TO CDCA (NTMA ONLY)
2018 FLOW

Date	May 2018		June 2018		July 2018		August 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	4,469,499	203,183	11,487,630	237,980	0	195,731	14,982,922	272,049
2	4,672,682	221,649	0	237,980	8,037,050	202,546	15,254,971	151,673
3	4,894,331	209,870	0	237,980	8,239,596	210,402	15,406,644	224,360
4	5,104,201	220,972	12,201,570	201,425	0	210,402	0	224,360
5	0	220,972	12,402,995	207,095	3,724,647	155,978	0	224,360
6	0	220,972	12,610,090	242,953	8,816,379	187,177	16,079,723	211,265
7	5,767,116	233,315	12,853,043	170,033	4,988,748	183,318	16,290,988	205,242
8	6,000,431	210,279	13,023,076	219,283	0	183,318	16,496,230	276,152
9	6,210,710	218,335	0	219,283	4,334,755	**239,710**	16,772,382	157,193
10	6,429,045	165,498	0	219,283	9,609,901	169,442	16,929,575	257,050
11	6,594,543	256,130	13,680,926	236,970	9,779,343	229,098	1,080,780	257,050
12	0	256,130	13,734,944	231,766	10,008,441	149,611	0	257,050
13	0	256,130	14,149,662	217,148	10,158,052	196,477	6,625,592	245,886
14	7,362,934	201,692	4,444,189	217,148	5,189,126	200,330	7,946,612	217,291
15	7,564,626	189,801	4,583,958	201,929	0	200,330	8,163,903	242,119
16	7,754,427	**272,627**	0	201,929	5,507,138	206,044	8,406,022	203,603
17	8,027,054	239,100	0	201,929	10,961,232	220,050	8,609,625	241,394
18	8,266,154	264,598	5,189,746	201,173	11,181,282	194,085	0	241,394
19	0	264,598	5,390,919	202,885	11,375,367	149,160	0	241,394
20	0	264,598	5,593,804	**263,025**	11,524,527	210,056	9,333,807	**297,721**
21	9,059,948	228,705	5,856,829	159,608	5,403,720	213,446	9,631,528	267,195
22	9,288,653	269,598	6,016,437	209,797	0	213,446	9,898,723	181,420
23	9,558,251	233,236	0	209,797	6,699,147	195,143	10,080,143	167,319
24	9,791,487	205,953	0	209,797	12,356,619	**200,988**	10,247,462	222,310
25	9,997,440	204,919	6,645,828	199,531	12,557,607	**217,315**	0	222,310
26	0	204,919	6,845,359	227,287	12,832,003	218,435	0	222,310
27	10,407,278	233,712	7,072,646	143,780	13,010,680	211,830	10,914,391	204,549
28	0	233,712	7,216,426	233,431	5,631,139	229,606	11,118,940	255,330
29	10,874,702	206,614	7,449,857	195,731	0	229,606	11,374,270	210,986
30	11,081,316	223,100	0	195,731	13,664,399	216,157	11,585,256	199,955
31	11,304,416	183,214			13,880,556	170,805	11,785,211	250,132

> 1" of Rainfall in 24-hours

	May 2018	June 2018	July 2018	August 2018
Daily Avg. (GPD)	**226,391**	**211,790**	**200,324**	**227,497**
Max (GPD)	**272,627**	**263,025**	**239,710**	**297,721**

TOTAL TO CDCA (NTMA ONLY)
2018 FLOW

Date	September 2018		October 2018		November 2018		December 2018		January 2019	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	0	250,132	19,720,241	251,060	17,394,442	196,560	0	276,571		
2	12,285,474	196,166	9,971,302	248,578	17,591,002	263,471	0	276,571		
3	0	196,166	10,219,880	254,386	0	263,471	6,419,973	347,023		
4	12,677,806	213,283	10,474,266	237,943	0	263,471	6,766,996	175,925		
5	12,891,089	232,105	10,712,209	257,123	18,381,415	270,926	6,942,921	285,882		
6	13,123,194	267,318	0	257,123	18,652,341	303,431	7,228,803	241,918		
7	13,390,512	301,451	0	257,123	18,955,772	270,117	7,470,721	265,549		
8	0	301,451	11,483,577	228,922	19,225,889	217,935	0	265,549		
9	0	301,451	11,712,499	254,830	19,443,824	277,542	0	265,549		
10	14,294,864	275,369	11,967,329	**238,883**	0	277,542	8,267,367	251,828		
11	14,570,233	246,776	12,278,064	226,820	0	277,542	8,519,195	250,208		
12	14,817,009	312,668	12,433,031	269,423	20,276,451	331,615	8,769,403	269,414		
13	15,146,393	192,611	0	269,423	20,636,230	228,722	9,038,817	242,190		
14	15,339,004	256,287	0	269,423	20,836,788	271,367	9,281,007	291,603		
15	0	256,287	13,241,299	229,884	11,108,156	**347,895**	0	291,603		
16	0	256,287	13,471,183	235,920	11,456,051	306,856	0	291,603		
17	16,107,864	242,140	13,707,103	282,709	9,630,014	306,856	10,155,816	277,298		
18	16,350,004	265,155	14,004,360	203,912	0	306,856	10,433,114	248,775		
19	16,615,159	267,544	14,193,724	253,878	2,774,292	294,870	10,681,889	352,983		
20	16,894,262	185,797	0	253,878	12,671,489	234,013	11,034,872	**394,117**		
21	17,068,500	245,195	0	253,878	2,905,503	262,321	11,428,989	285,334		
22	0	245,195	14,955,357	222,230	0	262,321	0	285,334		
23	0	245,195	15,177,587	235,449	3,430,145	336,358	0	285,334		
24	17,804,086	249,751	15,413,036	251,918	0	336,358	12,284,991	277,651		
25	18,053,837	**316,114**	15,664,954	211,096	0	336,358	0	277,651		
26	18,596,260	304,632	15,876,050	260,951	4,439,218	313,349	12,840,293	332,710		
27	9,647,445	297,528	0	260,951	4,752,567	303,028	13,173,003	284,936		
28	18,972,110	249,377	0	260,951	5,055,595	295,488	13,457,939	298,270		
29	0	249,377	16,658,903	240,849	5,351,083	239,178	0	298,270		
30	0	249,377	16,899,752	238,971	5,590,261	276,571	0	298,270		
31			17,138,723	255,719			14,352,749	284,532		

	September 2018	October 2018	November 2018	December 2018		
Daily Avg. (GPD)	255,606	247,555	282,413	282,918	AADF 2018	234,742
Max (GPD)	316,114	282,709	347,895	394,117	Annual Max.	394,117

GRADYVILLE RD FORCE MAIN FROM EDGMONT TWP
2018 FLOW

Date	January 2018		February 2018		March 2018		April 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		105,072		107,582		113,915		108,458
2		109,924		**110,088**		104,954		111,929
3		106,628		120,940		112,972		109,633
4		98,463		**131,498**		127,665		105,709
5		**106,921**		109,008		120,226		120,495
6		118,718		**103,072**		110,838		109,759
7		113,363		118,603		119,590		121,295
8		109,097		118,487		118,856		119,427
9		103,709		111,113		124,887		102,829
10		104,777		119,701		**128,691**		104,711
11		**108,167**		151,233		**120,709**		106,656
12		148,319		110,285		**112,517**		107,752
13		**119,019**		114,050		110,174		109,753
14		120,128		104,338		113,485		126,259
15		117,929		110,421		110,522		117,888
16		110,609		119,181		105,453		163,405
17		115,731		121,116		115,974		113,748
18		131,334		126,371		110,810		105,070
19		117,883		129,504		110,130		107,492
20		119,260		109,209		107,593		**109,849**
21		111,272		96,610		97,871		111,165
22		102,541		102,978		109,218		103,776
23		113,086		114,893		103,930		90,621
24		112,313		**114,893**		120,284		100,758
25		107,992		114,893		114,054		118,793
26		98,489		109,477		113,113		109,789
27		111,500		116,244		103,136		123,533
28		122,549		101,212		102,287		133,510
29		112,011				108,601		130,192
30		115,956				111,541		109,886
31		109,905				118,131		

> 1" of Rainfall in 24-hours

January	February	March	April
Daily Avg. (GPD)	**Daily Avg.**	**Daily Avg.**	**Daily Avg.**
112,604	**114,893**	**112,972**	**113,805**
Max (GPD)	**Max**	**Max**	**Max**
148,319	**151,233**	**128,691**	**163,405**

GRADYVILLE RD FORCE MAIN FROM EDGMONT TWP
2018 FLOW

Date	May 2018 Total	May 2018 Daily	June 2018 Total	June 2018 Daily	July 2018 Total	July 2018 Daily	August 2018 Total	August 2018 Daily
1		113,423		109,789		107,701		108,073
2		105,211		124,086		109,130		106,986
3		112,471		122,065		100,917		118,061
4		110,751		108,515		92,346		107,306
5		109,201		108,863		97,365		105,302
6		113,614		113,410		103,677		107,902
7		114,005		112,037		104,269		105,305
8		109,213		115,672		103,220		105,874
9		100,044		112,049		101,204		99,684
10		111,301		118,851		102,265		107,584
11		92,278		129,430		108,181		126,335
12		125,046		113,330		107,655		119,898
13		132,804		115,958		95,913		180,892
14		113,740		108,796		102,758		112,387
15		109,866		105,700		107,420		115,383
16		114,938		107,431		102,776		116,719
17		128,258		108,487		100,956		105,274
18		121,378		110,662		97,517		118,315
19		145,653		106,251		103,795		136,342
20		122,507		107,197		107,018		118,216
21		110,589		110,048		104,450		119,264
22		121,838		111,366		128,864		120,869
23		114,675		**125,599**		107,320		**112,313**
24		108,092		**120,715**		114,034		110,185
25		104,239		**106,633**		116,841		116,297
26		113,824		102,303		**112,650**		101,960
27		107,547		107,324		108,339		106,273
28		106,575		115,155		110,616		108,104
29		110,913		116,018		104,237		110,178
30		103,831		101,693		104,409		102,606
31		114,992				105,372		113,706

> 1" of Rainfall in 24-hours

	May 2018	June 2018	July 2018	August 2018
Daily Avg.	113,639	112,514	105,588	114,309
Max	145,653	129,430	128,864	180,892

GRADYVILLE RD FORCE MAIN FROM EDGMONT TWP
2018 FLOW

Date	September 2018		October 2018		November 2018		December 2018		January 2019	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		108,622		122,477		105,923		159,021		0
2		106,215		130,324		102,265		164,697		0
3		114,783		128,661		126,598		142,049		0
4		108,881		126,241		108,393		136,308		0
5		104,719		114,239		118,769		133,295		0
6		113,317		131,792		126,686		124,860		0
7		**120,209**		117,509		112,532		119,680		0
8		143,970		117,281		111,484		129,252		0
9		169,004		120,192		125,373		131,395		0
10		136,052		108,279		127,407		123,101		0
11		123,479		115,045		126,920		124,150		0
12		122,591		114,470		111,385		118,159		0
13		115,742		123,077		134,357		117,875		0
14		110,406		114,620		111,572		117,622		0
15		112,043		118,370		126,989		126,764		0
16		119,225		104,896		164,718		153,118		0
17		110,263		118,395		140,145		117,895		0
18		116,838		111,455		139,387		117,246		0
19		109,780		113,712		142,675		118,864		0
20		114,694		118,419		151,266		122,356		0
21		111,328		118,852		164,362		176,321		0
22		113,917		111,280		149,734		152,158		0
23		121,945		109,441		144,225		151,745		0
24		120,899		**110,345**		190,088		168,268		0
25		141,174		106,453		159,194		149,876		0
26		123,716		106,687		155,968		**163,109**		0
27		117,501		137,762		158,914		149,807		0
28		138,064		108,022		158,984		187,741		0
29		125,665		103,171		**146,975**		158,322		0
30		117,860		104,326		141,454		148,989		0
31				95,442				161,293		

> 1" of Rainfall in 24-hours

	September 2018	October 2018	November 2018	December 2018		
Daily Avg.	120,430	115,524	136,158	140,817	AADF 2018	117,771
Max	169,004	137,762	190,088	187,741	Annual Max.	190,088

TOTAL TO CDCA (NTMA and EDGMONT)
2018 FLOW

Date	January 2018		February 2018		March 2018		April 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	0	332,731	14,497,329	266,318	638,682	382,598	0	**328,955**
2	18,224,166	365,420	14,656,065	342,883	907,365	369,645	7,974,731	340,419
3	18,479,662	281,433	0	353,735	0	377,663	6,560,936	342,124
4	8,654,468	269,222	0	364,293	0	**392,356**	8,435,712	360,158
5	8,825,227	327,018	15,354,449	254,655	1,701,438	339,173	8,690,161	296,120
6	0	338,815	15,500,096	332,529	1,920,385	331,812	8,865,786	340,062
7	0	333,460	15,729,553	361,602	2,141,359	368,242	0	351,598
8	9,485,518	**380,688**	15,972,552	287,490	811,443	355,359	0	349,730
9	9,757,109	285,356	16,141,555	364,528	2,626,513	367,461	9,556,696	306,255
10	8,747,364	279,356	0	373,116	0	371,265	9,760,122	272,119
11	10,113,335	332,049	0	**404,648**	0	363,283	9,976,732	344,651
12	10,337,217	368,502	16,901,800	318,624	3,354,235	334,507	8,193,232	319,607
13	0	339,202	7,110,140	337,356	3,576,225	341,587	10,377,379	370,045
14	0	340,311	7,333,446	372,281	3,807,638	335,063	0	386,551
15	10,997,766	345,959	7,601,389	315,463	4,092,613	332,100	0	378,180
16	11,225,796	280,803	7,806,431	339,422	4,250,793	334,013	11,158,256	366,373
17	11,395,990	373,053	0	341,357	0	344,534	11,361,224	**400,636**
18	11,653,312	332,641	0	346,612	0	339,370	11,648,112	286,137
19	11,854,619	321,829	8,467,154	318,637	4,936,473	315,933	11,829,179	355,535
20	0	323,206	8,656,287	374,059	5,142,276	301,505	12,077,222	316,810
21	0	315,218	8,921,137	268,735	5,336,188	366,881	0	318,126
22	12,466,456	285,945	9,093,262	297,068	5,605,198	314,555	0	310,737
23	12,649,860	362,436	9,287,352	351,336	5,810,535	341,597	2,698,106	323,565
24	12,899,210	310,643	0	351,336	0	357,951	2,931,050	327,481
25	13,097,540	255,764	0	351,336	0	351,721	3,157,773	340,775
26	13,245,312	306,108	9,996,682	320,527	6,523,535	350,010	3,379,755	287,049
27	0	319,119	10,207,732	346,952	6,760,432	**245,865**	3,557,015	348,423
28	0	330,168	10,438,440	301,453	6,903,161	300,442	0	358,400
29	13,868,168	299,038			7,101,316	320,525	0	355,082
30	14,055,195	311,109			7,313,240	332,038	4,231,685	347,700
31	14,250,348	356,886						

> 1" of Rainfall in 24-hours

	January 2018	February 2018	March 2018	April 2018
Daily Avg. (GPD)	322,693	334,227	342,635	337,647
Max (GPD)	380,688	404,648	392,356	400,636

TOTAL TO CDCA (NTMA and EDGMONT)
2018 FLOW

Date	May 2018		June 2018		July 2018		August 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	4,469,499	316,606	11,487,630	347,769	0	303,432	14,982,922	380,122
2	4,672,682	326,860	0	362,066	8,037,050	311,676	15,254,971	258,659
3	4,894,331	322,341	0	360,045	8,239,596	311,319	15,406,644	342,421
4	5,104,201	331,723	12,201,570	309,940	0	302,748	0	331,666
5	0	330,173	12,402,995	315,958	3,724,647	253,343	0	329,662
6	0	334,586	12,610,090	356,363	8,816,379	290,854	16,079,723	319,167
7	5,767,116	347,320	12,853,043	282,070	4,988,748	287,587	16,290,988	310,547
8	6,000,431	319,492	13,023,076	334,955	0	286,538	16,496,230	382,026
9	6,210,710	318,379	0	331,332	4,334,755	340,914	16,772,382	256,877
10	6,429,045	276,799	0	338,134	9,609,901	271,707	16,929,575	364,634
11	6,594,543	348,408	13,680,926	366,400	9,779,343	337,279	1,080,780	383,385
12	0	381,176	13,734,944	345,096	10,008,441	257,266	0	376,948
13	0	388,934	14,149,662	333,106	10,158,052	292,390	6,625,592	**426,778**
14	7,362,934	315,432	4,444,189	325,944	5,189,126	303,088	7,946,612	329,678
15	7,564,626	299,667	4,583,958	307,629	0	307,750	8,163,903	357,502
16	7,754,427	387,565	0	309,360	5,507,138	308,820	8,406,022	320,322
17	8,027,054	367,358	0	310,416	10,961,232	321,006	8,609,625	346,668
18	8,266,154	385,976	5,189,746	311,835	11,181,282	291,602	0	359,709
19	0	**410,251**	5,390,919	309,136	11,375,367	252,955	0	377,736
20	0	387,105	5,593,804	**370,222**	11,524,527	317,074	9,333,807	415,937
21	9,059,948	339,294	5,856,829	269,656	5,403,720	317,896	9,631,528	386,459
22	9,288,653	391,436	6,016,437	321,163	0	**342,310**	9,898,723	302,289
23	9,558,251	347,911	0	335,396	6,699,147	302,463	10,080,143	279,632
24	9,791,487	314,045	0	330,512	12,356,619	315,022	10,247,462	332,495
25	9,997,440	309,158	6,645,828	306,164	12,557,607	334,156	0	338,607
26	0	318,743	6,845,359	329,590	12,832,003	331,085	0	324,270
27	10,407,278	341,259	7,072,646	251,104	13,010,680	320,169	10,914,391	310,822
28	0	340,287	7,216,426	348,586	5,631,139	340,222	11,118,940	363,434
29	10,874,702	317,527	7,449,857	311,749	0	333,843	11,374,270	321,164
30	11,081,316	326,931	0	297,424	13,664,399	320,566	11,585,256	302,561
31	11,304,416	298,206			13,880,556	276,177	11,785,211	363,838

> 1" of Rainfall in 24-hours

	May 2018	June 2018	July 2018	August 2018
Daily Avg. (GPD)	**340,031**	**324,304**	**305,912**	**341,807**
Max (GPD)	**410,251**	**370,222**	**342,310**	**426,778**

TOTAL TO CDCA (NTMA and EDGMONT)
2018 FLOW

Date	September 2018		October 2018		November 2018		December 2018		January 2019	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	0	358,754	19,720,241	373,537	17,394,442	302,483	0	435,592		
2	12,285,474	302,381	9,971,302	378,902	17,591,002	365,736	0	441,268		
3	0	310,949	10,219,880	383,047	0	390,069	6,419,973	489,072		
4	12,677,806	322,164	10,474,266	364,184	0	371,864	6,766,996	312,233		
5	12,891,089	336,824	10,712,209	371,362	18,381,415	389,695	6,942,921	419,177		
6	13,123,194	380,635	0	388,915	18,652,341	430,117	7,228,803	366,778		
7	13,390,512	421,660	0	374,632	18,955,772	382,649	7,470,721	385,229		
8	0	445,**421**	11,483,577	346,203	19,225,889	329,419	0	394,801		
9	0	**470,455**	11,712,499	375,022	19,443,824	402,915	0	396,944		
10	14,294,864	411,421	11,967,329	347,162	0	404,949	8,267,367	374,929		
11	14,570,233	370,255	12,278,064	341,865	0	404,462	8,519,195	374,358		
12	14,817,009	435,259	12,433,031	383,893	20,276,451	443,000	8,769,403	387,573		
13	15,146,393	308,353	0	392,500	20,636,230	363,079	9,038,817	360,065		
14	15,339,004	366,693	0	384,043	20,836,788	382,939	9,281,007	409,225		
15	0	368,330	13,241,299	348,254	11,108,156	474,884	0	418,367		
16	0	375,512	13,471,183	340,816	11,456,051	471,574	0	444,721		
17	16,107,864	352,403	13,707,103	**401,104**	9,630,014	447,001	10,155,816	395,193		
18	16,350,004	381,993	14,004,360	315,367	0	446,243	10,433,114	366,021		
19	16,615,159	377,324	14,193,724	367,590	2,774,292	437,545	10,681,889	471,847		
20	16,894,262	300,491	0	372,297	12,671,489	385,279	11,034,872	**516,473**		
21	17,068,500	356,523	0	372,730	2,905,503	426,683	11,428,989	461,655		
22	0	359,112	14,955,357	333,510	0	412,055	0	437,492		
23	0	367,140	15,177,587	344,890	3,430,145	480,583	0	437,079		
24	17,804,086	370,650	15,413,036	362,263	0	**526,446**	12,284,991	445,919		
25	18,053,837	457,288	15,664,954	317,549	0	495,552	0	427,527		
26	18,596,260	428,348	15,876,050	367,638	4,439,218	469,317	12,840,293	495,819		
27	9,647,445	415,029	0	398,713	4,752,567	461,942	13,173,003	434,743		
28	18,972,110	387,**441**	0	368,973	5,055,595	454,472	13,457,939	486,011		
29	0	375,042	16,658,903	344,020	5,351,083	386,153	0	456,592		
30	0	367,237	16,899,752	343,297	5,590,261	418,025	0	447,259		
31			17,138,723	351,161			14,352,749	445,825		

	September 2018	October 2018	November 2018	December 2018		
Daily Avg. (GPD)	376,036	363,079	418,571	423,735	AADF 2018	352,556
Max (GPD)	470,455	401,104	526,446	516,473	Annual Max.	526,446

NOAA Local Climatological Data
for Philadelphia International Airport

Summary of Hourly Data

Days >1" Rainfall

Water Equivalent of Snowfall

Date	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
1	0.00	0.03	0.56	0.00	0.00	0.06	0.00	0.41	0.08	0.00	0.00	0.07
2	0.00	0.17	[illegible]	0.12	0.00	0.25	0.00	0.08	0.00	0.34	0.37	0.55
3	0.00	0.00	0.00	0.08	0.00	0.61	0.01	0.51	0.00	0.01	0.27	0.00
4	[illegible]	0.86	0.00	0.06	0.00	0.24	0.00	0.10	0.00	0.18	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.03
6	0.00	0.00	0.23	0.03	0.00	0.00	0.10	0.00	0.01	0.00	1.65	0.00
7	0.00	0.82	1.28	0.00	0.00	0.00	0.00	0.05	4.54	0.00	0.00	0.00
8	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.63	0.03	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04	1.84	0.00	0.75	0.00
10	0.00	0.41	0.00	0.00	0.00	0.77	0.00	0.00	0.23	0.00	0.00	0.00
11	0.00	1.68	0.00	0.00	0.00	0.69	0.00	0.79	0.00	0.73	0.00	0.00
12	1.42	0.00	0.06	0.00	1.49	0.00	0.15	0.00	0.00	0.36	0.23	0.00
13	0.05	0.00	0.03	0.00	0.49	0.00	0.00	0.52	0.00	0.07	1.04	0.00
14	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.73	0.00	0.00	0.00	0.11
15	0.00	0.25	0.00	0.56	0.55	0.00	0.38	0.00	0.00	0.10	[illegible]	0.44
16	0.00	0.33	0.00	2.28	0.25	0.00	0.00	0.00	0.00	0.00	0.26	1.01
17	0.07	0.40	0.00	0.00	0.36	0.00	0.07	0.00	0.01	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.34	0.26	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.34	0.00	0.00	0.00	0.00
20	0.00	0.00	0.40	0.00	0.01	0.29	0.00	0.00	0.00	0.07	0.02	0.56
21	0.00	0.01	1.06	0.00	0.00	0.00	0.74	0.02	0.00	0.00	0.00	1.16
22	0.00	0.06	0.00	0.00	0.35	0.16	0.24	0.05	0.01	0.00	0.00	0.09
23	0.46	0.23	0.00	0.00	0.00	0.01	0.00	0.00	0.70	0.00	0.00	0.00
24	0.00	0.06	0.00	0.11	0.00	0.00	0.08	0.00	0.05	0.00	2.01	0.02
25	0.00	0.66	0.00	0.16	0.00	0.00	1.14	0.00	0.36	0.00	0.01	0.00
26	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.14	0.31	0.89	0.00
27	0.00	0.00	0.00	0.25	0.08	0.00	0.15	0.00	0.02	0.87	0.00	0.00
28	0.40	0.00	0.02	0.14	0.00	0.25	0.00	0.00	0.88	0.00	0.00	1.67
29	0.00		0.08	0.15	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
30	[illegible]		0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00		0.00		0.02		0.00	0.11		0.00		0.67
TOTAL	**2.85**	**6.02**	**4.74**	**3.94**	**5.21**	**3.34**	**3.06**	**4.11**	**9.76**	**3.08**	**9.03**	**6.38**
MAX	**1.42**	**1.68**	**1.28**	**2.28**	**1.49**	**0.77**	**1.14**	**0.79**	**4.54**	**0.87**	**2.01**	**1.67**
MAX 24HR	**1.47**	**2.09**	**1.51**	**2.84**	**1.98**	**1.46**	**1.22**	**1.25**	**5.17**	**1.18**	**2.02**	**1.72**

APPENDIX (C)

PUMP STATIONS – PUMP CURVES

NEWTOWN TOWNSHIP, DELAWARE COUNTY, MUNICIPAL AUTHORITY
TRIBUTARY MUNICIPALITY
ANNUAL REPORT
2018

ASHFORD PUMP STATION

Company: EEI
...me:
...: 8/20/2010

Fairbanks Morse
Pentair Water

Pump:

Size: 4"5435MV
Type: 5430-SOLIDS HANDLING
Synch speed: 1800 rpm
Speed: 1780 rpm
Dia: 14.0 inch
Curve: 35M404E
Impeller: T4E1E
Specific Speeds: Ns: 1111 Nss: 7106
Dimensions: Suction: 4 in Discharge: 4 in

Pump Limits:

Temperature: 104 °F
Pressure: 125 psi g
Sphere size: 3 in
Power: —
Eye area: —

Search Criteria:

Flow: 750 US gpm
Head: 200 ft TDH

Fluid:

Water
Density: 62.25 lb/ft³
Viscosity: 1.105 cP
NPSHa: —
Temperature: 60 °F
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a

Motor:

Consult Fairbanks Morse Pump, 60 Hz to select a motor for this pump.

— Data Point —

Flow:	562 US gpm
Head:	186 ft
Eff:	62%
Power:	42.8 hp
NPSHr:	11.5 ft

— Design Curve —

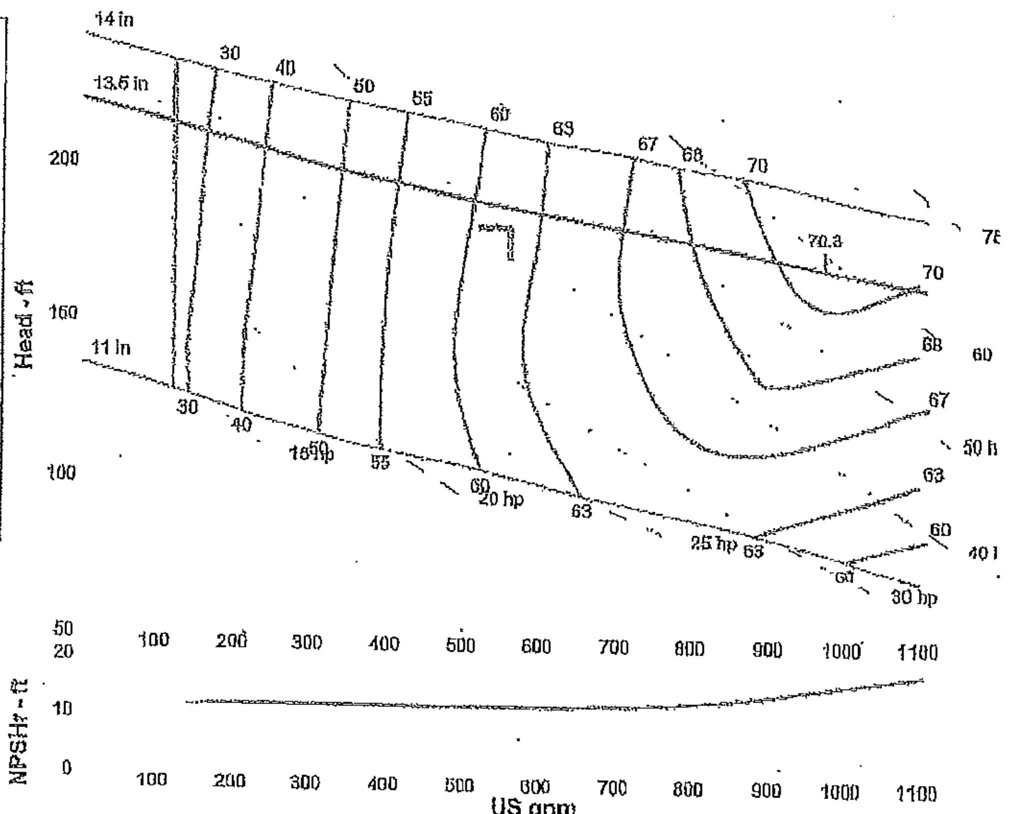
Shutoff head:	220 ft
Shutoff dP:	95 psi
Min flow:	120 US gpm

BEP: 70% @ 974 US gpm

NOL power: 64.6 hp @ 1107 US gpm

— Max Curve —

Max power: 72.6 hp @ 1108 US gpm



Curve efficiencies are typical. For guaranteed values, contact Fairbanks Morse or your local distributor. Las eficiencias en curvas son típicas. Para valores garantizados contacte a Fairbanks Morse o a su distribuidor local.

Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
674	1780	181	66	46.8	11.7
562	1780	186	62	42.8	11.5
450	1780	192	57	38.1	11.5
337	1780	198	50	33.8	11.5
225	1780	205	38	30.2	11.5

CAMELOT PUMP STATION

4" 5435
MV
SUBMERSIBLE

1780 RPM

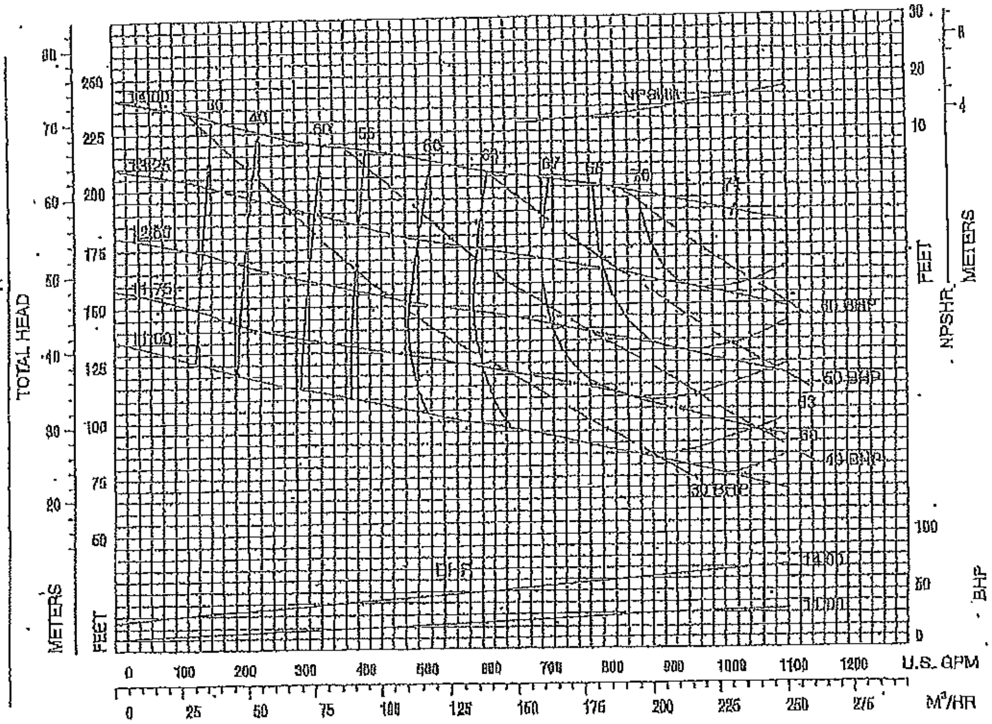
NO. OF VANES
2

SUCTION SIZE
4"

IMPELLER
T4E1E

INLET AREA
35.65 SQ.IN.

MAX. SPHERE
3"



5" 5436
MT, W, WD
SUBMERSIBLE

1780 RPM

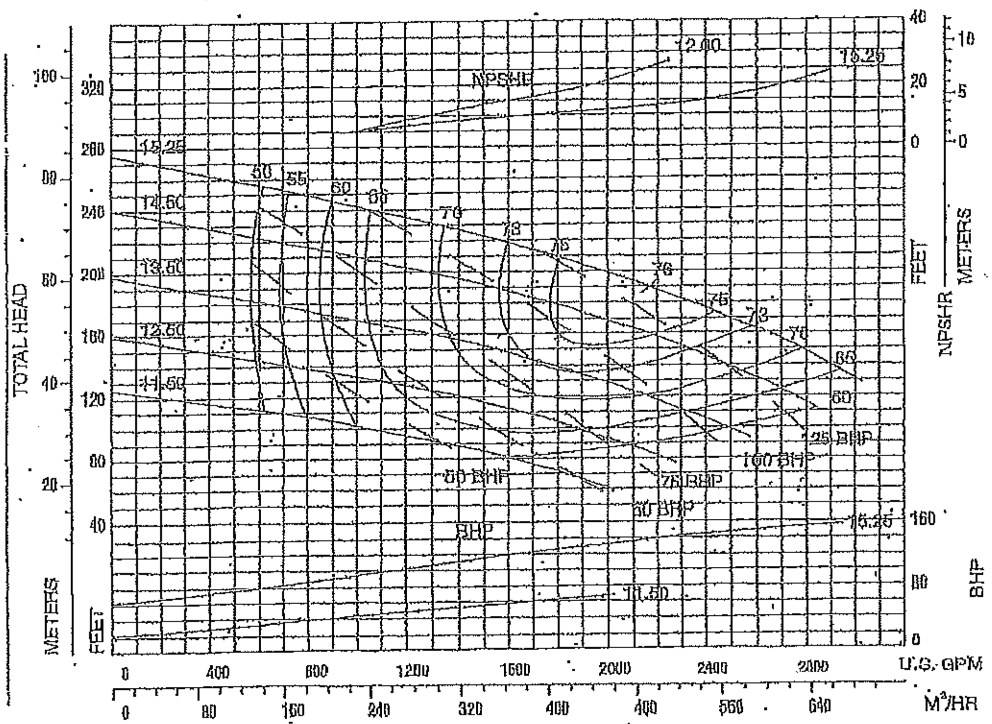
NO. OF VANES
2

SUCTION SIZE
6"
(WD: 8" OR 10")

IMPELLER
T5D1AS

INLET AREA
62.05 SQ.IN.

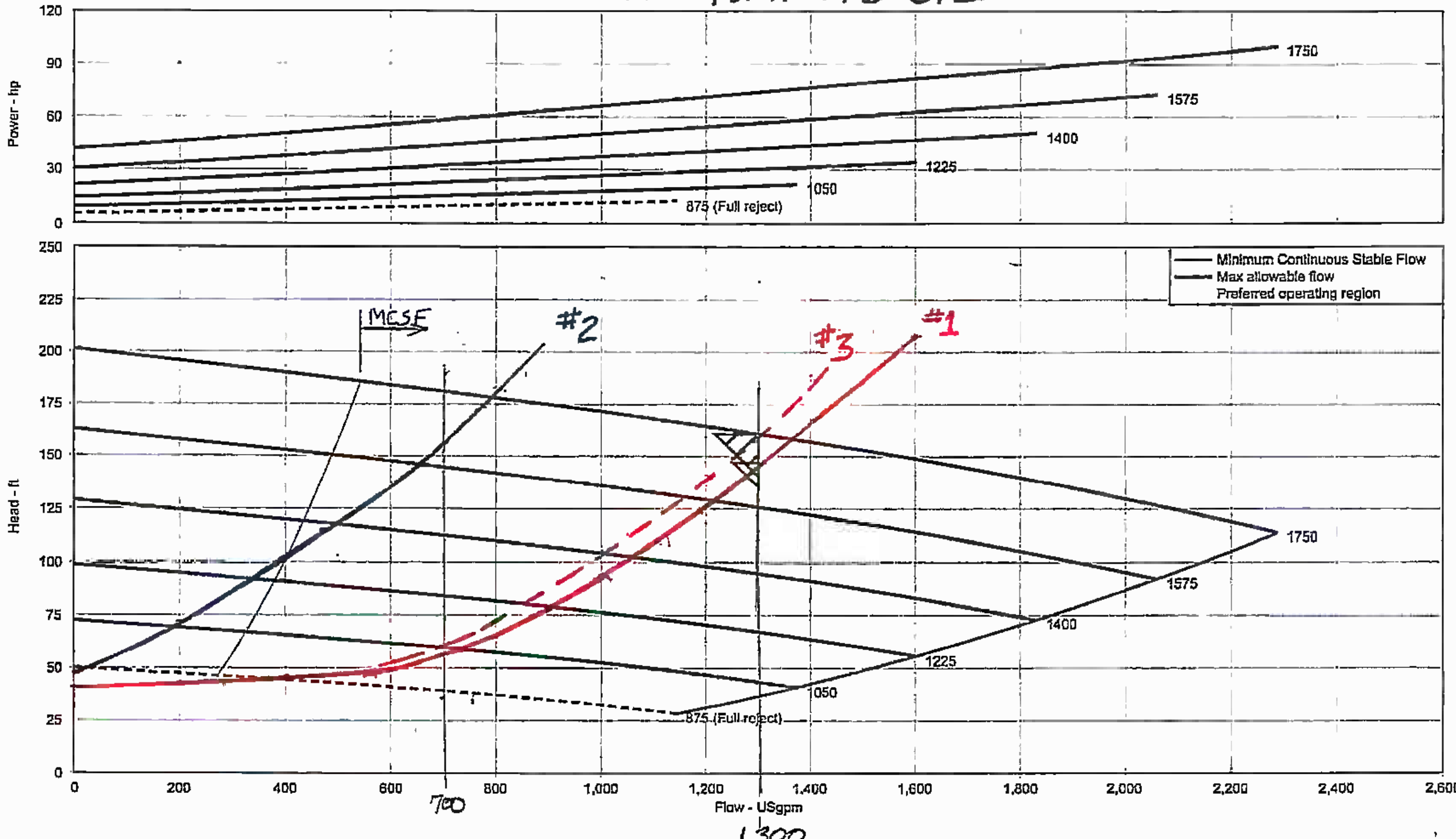
MAX. SPHERE
3"



PENTAIR

Customer ELLIS PUMP STATION
Project name ANALYSIS OF PUMPING SCENARIOS AND PUMP VFD SPEED

Multi-Speed Performance Curve
Encompass 2.0 - 15.5.1.0



Item number	: Default	Size	: 6" 6438 (W, MT, WD)	Flow, rated	: 1,300.0 USgpm
Service	:	Stages	: 1	Differential head / pressure, rated	: 161.0 ft
Quantity	: 1	Speed, rated	: 1750 rpm	NPSH required	: 20.08 ft
Quote number	:	Based on curve number	: 6-54x6-1800-T5D1AS	Fluid density, rated / max	: 1.000 / 1.000 SG
Date last saved	: 01 Dec 2015 11:46 AM	Efficiency	: 71.23 %	Viscosity	: 1.00 cP
		Power, rated	: 74.18 hp	Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00
				Impeller diameter, rated	: 13.54 INCH

PUMPING SCENARIOS:

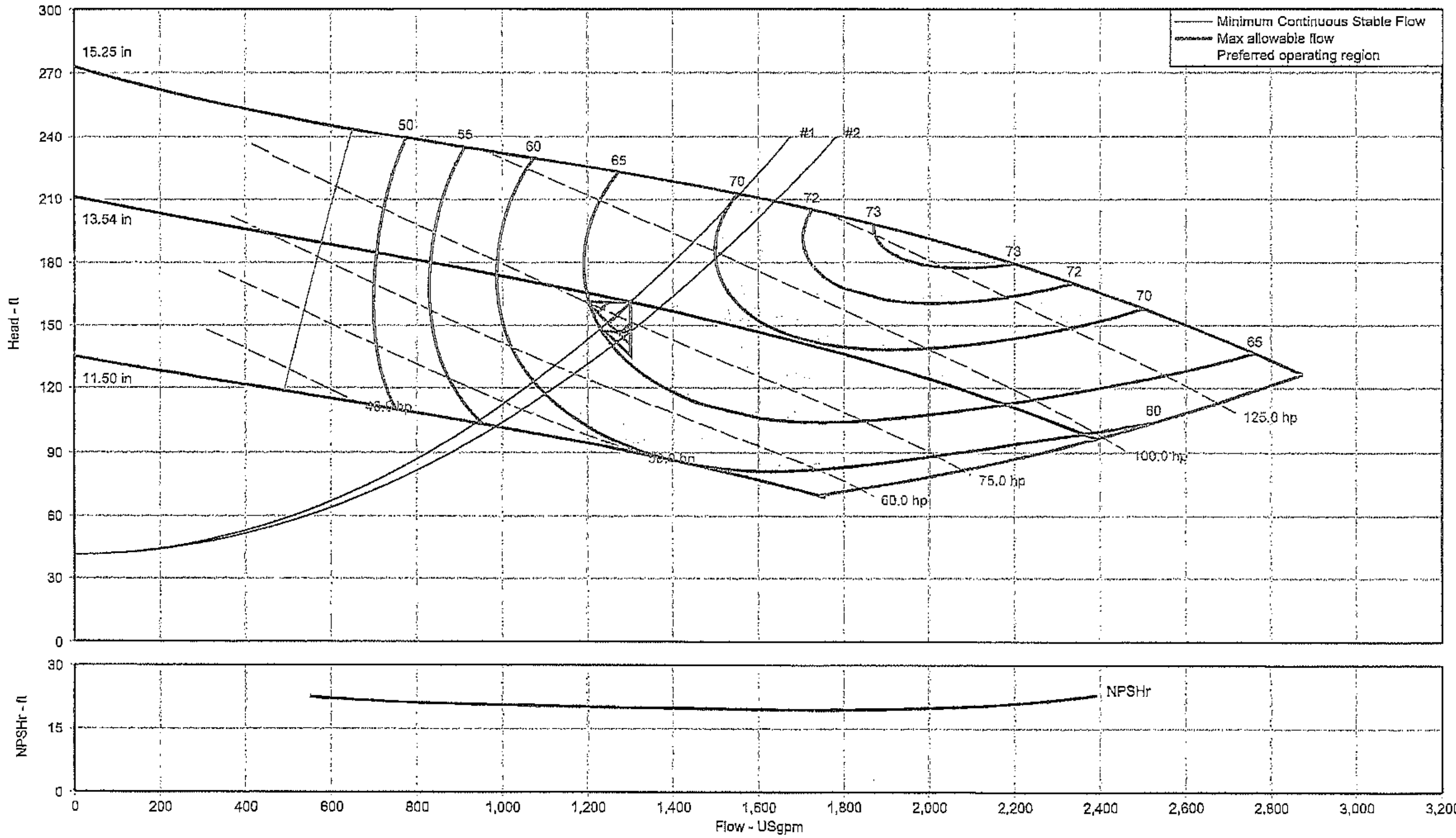
1. Ellis PS Pumping Independently: Design 700 gpm@ 52 ft TDH, Maximum 1,365 gpm @ 160 ft TDH
2. Ellis PS Pumping and sharing Force Main with Lister PS @ 625 gpm + Crum Creek PS @ 800 gpm: Design 700 gpm @ 158 ft TDH
3. Future Ellis PS Pumping + Crum Creek PS @ 800 gpm: 1,300 gpm @ 161 ft TDH

PENTAIR

Customer :
Project name :

Pump Performan urve

Encompass ... - 15.5.1.0



Item number	Default	Size	5" 5436MV	Flow, rated	1,300.0 USgpm
Service		Stages	1	Differential head / pressure, rated	161.0 ft
Quantity	1	Speed, rated	1780 rpm	NPSH required	20.08 ft
Quote number		Based on curve number	5-5436MV-1800-T5D1AS	Fluid density, rated / max	1.000 / 1.000 SG
Date last saved	01 Dec 2015 12:50 PM	Efficiency	78.2 %	Viscosity	1.00 cP
		Power, rated	67.6	Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	1.00 / 1.00 / 1.00 / 1.00

PENTAIR

FAIRBANKS NIJHUIS
3501 FAIRBANKS AVENUE · KANSAS CITY, KANSAS 66106
WWW.FAIRBANKSNIJHUIS.COM

PHONE: +1-913-371-5000 · FAX:

APPENDIX (D)

DELCORA/EDGMONT TOWNSHIP
TRIBUTARY MUNICIPALITY REPORT

NEWTOWN TOWNSHIP, DELAWARE COUNTY, MUNICIPAL AUTHORITY
TRIBUTARY MUNICIPALITY
ANNUAL REPORT
2018

The Delaware County Regional Water Quality Control Authority

DELCORA

Edgmont Township

CRUM CREEK SEWER DISTRICT

TRIBUTARY MUNICIPALITY

"2018 Chapter 94 Report"

February 2019

Prepared by:

Bradford Engineering Associates, Inc.
2710 Concord Road, Suite 3
Aston, PA 19014
610.497.6200
610.500.5677 fax
info@bea-inc.com

TABLE OF CONTENTS

Attachments

3800-FM-BPNPSM0507 4/2014
Chapter 94 Report

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**DELCORA**	Permit No.:	**PA2314403,2314404,2314405**
Mailing Address:	**100 E. Fifth Street**	Effective Date:	**7-21-14**
City, State, Zip:	**Chester, PA 19016**	Expiration Date:	
Contact Person:	**Robert Willert**	Renewal Due Date:	
Title:	**Executive Director**	Municipality:	**Edgmont Township**
Phone:	**610.876.5523**	County:	**Delaware County**
Email:	**willertr@delcora.org**	Consultant Name:	**Bradford Engineering**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☒ Line graph for flows attached (**Attachment A**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☐ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   Table 3 evaluates the projects in the Crum Creek System. See Attachment A

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

☒ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment B**)

☐ List summarizing each extension or project attached (**Attachment**)

☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

Approximately 34,434 lf of sanitary sewer was televised in 2016. Approximatley 4,378 feet was cleaned. Manhole inserts with odor control were installed in three manholes.

The system is monitored by DELCORA's maintenance staff. A representative is onsite three times per week inspecting the pump stations. Additionally, an advance SCADA monitors pump station performance and operating conditions. This is essentially monitored by DELCORA 24-hrs a day as part of their overall system monitoring program. Attachement C are copies of the maintenance work on the system.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

The system is in good condition overall. There are no known surcharge conditions and most of the system is fairly new. There were a number of capped sewer installed throughout Edgmont Township over the past 30 plus years. These systems were installed in the Crum Creek District in accordance with Township Ordinances. The Crum Creek Sewer Project was completed in 2016. This project essentially connected all of the exsiting capped sewer and commuity sewer system as well as installed new sewer to provide public sewer to the entire District. See map in Attachement B for details.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☐ The collection system does not contain pump stations
☒ The collection system does contain pump stations (Number – **3**)
☒ Discussion of condition of each pump station attached (**Attachment D**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

   c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

Check the appropriate boxes:

☐ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)
☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

☐ This report demonstrates an existing hydraulic overload condition.
☐ This report demonstrates a projected hydraulic overload condition.
☐ This report demonstrates an existing organic overload condition.
☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Robert J. Willert
Name of Responsible Official

Robert J. Willert
Signature

610-876-5523
Telephone No.

February 25, 2019
Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Walter Fazler, PE
Name of Preparer

Walter Fazler
Signature

610.497.6200
Telephone No.

February 25, 2019
Date

Narrative Describing the Edgmont Crum Creek Sewer District

DELCORA is the owner and operator of the public sewer system in a section of Edgmont Township known as the Crum Creek Sewer District. The following is an excerpt from the latest revision to the Edgmont Township Act 537 Plan. This is a description of the current public sewer facilities in Edgmont Township.

Edgmont Township is a township of the second class located in the north central portion of Delaware County Pennsylvania. Total area is approximately 9.7 square miles. Its northern boundary is on the Delaware County-Chester County line where it lies adjacent to Westtown and Willistown Townships, Chester County. In Delaware County, it is bordered by Thornbury Township on the west, Middletown Township on the south, and Upper Providence Township on the southeast. On the east, the Township is bordered by Crum Creek, the Springton Reservoir, and Newtown Township.

The Crum Creek Sewer District was the focus of the 2010 Special Study. It is located in the northeast section of the Township. Broadly described, the District is bounded to the north by Chester County, to the east by Newtown Township, to the South by Upper Providence Township and to the west by the Ridley Creek State Park.

Previous Planning

An Act 537 Plan for the Crum Creek District was completed in 2007 (2007 Study) based on the potential for membership in the CDCA. The advantage of joining CDCA is the availability of a more extensive (350,000 gpd) disposal option that is cost effective, environmentally sound, and able to be implemented within a reasonable time frame to meet Edgmont's needs.

CDCA owns a conveyance system that discharges to the Delaware County Regional Water Quality Control Authority (DELCORA) system for final conveyance and treatment. DELCORA currently has the capacity available to meet Edgmont's needs and is willing to accept sewage flows from Edgmont Township. The plan outlined in the

2007 Study would provide for discharge to the CDCA facilities via the Newtown Township conveyance system.

2007 Study amends 2004 Plan:

1. Pursuant to the 2007 Study, Edgmont Township would enter an agreement with DELCORA to design, permit, finance, build, own, operate and maintain the proposed sewage facilities in the Crum Creek District and to accept, treat and dispose of the sewage from Edgmont Township. This is a change from the sewage treatment and land application contemplated under the 2004 (Aqua) Plan.
2. Edgmont Township would enter into an agreement with Newtown Township to accept and convey sewage to CDCA.
3. Edgmont Township would enter into an agreement with CDCA to accept and convey sewage to DELCORA.
4. Edgmont Township would adopt an ordinance establishing the Crum Creek Sewer District and require connection to the public sewer system.

Edgmont Township 2010 Special Study evaluates alternatives:

The current Special Study (2010 Study) is being undertaken to further develop and evaluate additional alternatives for both the collection system and conveyance methods to reach the CDCA system, as well as to provide for current sewage needs in the West Chester Pike corridor of Edgmont Township that exceed the Crum Creek District. The 2010 Study will look to identify cost effective options and alternatives that can be implemented in a time frame suitable to the needs of Edgmont Township. In addition to many internal service options, three major alternatives were reviewed for conveyance to the CDCA system. The conveyance options included pumping through Newtown Township in combination with Newtown flows, pumping through Newtown Township individually, and pumping through Upper Providence Township individually.

Alternatives Of Choice

The 2010 Special Study revises and updates the 2007 Plan and provides for the adoption of the following items:

Alternate 2. All of Service District C and District F (West Chester Pike corridor West) will be formally included in the Crum Creek District. Modifications to the CDCA service agreement will be required.

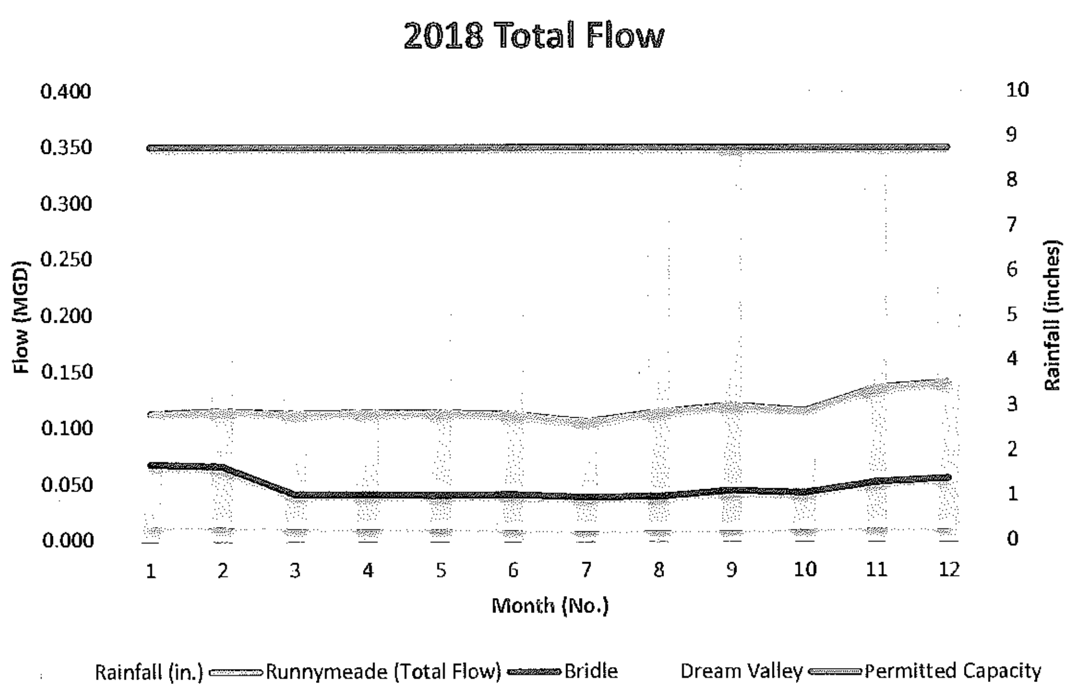
Conveyance of wastewater to the CDCA system will be implemented via adoption of **Alternates 1D and 1G.** These alternates provide for an internal collection system comprised of conventional gravity collection system, low-pressure system and pump station and force mains for Districts A-E. These districts will convey the flow to a regional pump station to be constructed by Edgmont on the West side of the Geist reservoir. The main pump station would discharge to the CDCA system via a route through Newtown Township along Gradyville Road.

ATTACHMENT A

Current Hydraulic Loading

Table 1 indicates the current hydraulic loading in the system. A line graph depicting the monthly average monthly flows is shown in Chart 1. The monthly rainfall is also shown for reference. Rainfall was taken from the National Weather Service rain gauge at the Brandywine River. The permitted capacity of the Crum Creek System is 0.350 MGD:

TABLE 1 Pump Station Hydraulic Loading Average Daily Flow (MGD)						
Pump Station	Bridle	Runnymeade	Dream Valley	Total Flow	Permitted Capacity	Rainfall (in.)
January	0.068	0.113	0.014	0.113	0.350	2.36
February	0.066	0.115	0.014	0.115	0.350	4.78
March	0.041	0.113	0.013	0.113	0.350	3.89
April	0.041	0.114	0.013	0.114	0.350	3.11
May	0.040	0.114	0.013	0.114	0.350	5.89
June	0.041	0.113	0.012	0.113	0.350	5.92
July	0.038	0.106	0.011	0.106	0.350	3.03
August	0.039	0.114	0.011	0.114	0.350	7.47
September	0.045	0.120	0.011	0.120	0.350	9.05
October	0.042	0.116	0.012	0.116	0.350	2.63
November	0.052	0.136	0.013	0.136	0.350	8.45
December	0.055	0.141	0.013	0.141	0.350	6.39
Average	0.047	0.118	0.013	0.118	0.350	5.248



5 Year Hydraulic Loading Projections

The following table was developed utilizing the Map in Attachment B of this report. The flow was calculated using an average daily flow of 262.5 gallons per day per EDU. It should be noted that the flow projects shown in Table 2A are not approved flow and are being used as an engineering tool to predict infrastructure capacity.

TABLE 2

Projects that have received Planning Approval

Subdivision Name	Connection Point	Number of EDUs	Number of EDU's Remaining	Estimated ADF Remaining (gpd) *
Crum Creek District A	Bridle PS	100.00	14.00	3,675.00
Crum Creek District B	Bridle PS	162.00	8.00	2,100.00
Crum Creek District C	Bridle PS	105.00	15.00	3,937.50
Crum Creek District C1	Bridle PS	15.00	-	-
Crum Creek District D	Bridle PS	65.00	9.00	2,362.50
Crum Creek District E	Bridle/Runnymeade PS	919.00	97.00	25,462.50
Crum Creek District F	Bridle PS	171.00	171.00	44,887.50
				-
				-
Total		**1537.00**	**314.00**	**82,425.00**

*Based on 262.5 gpd/EDU

TABLE 2A

Projects that may require public sewer

Subdivision Name	Connection Point	Number of EDUs	Number of EDU's Remaining	Estimated ADF Remaining (gpd) *
Runnymeade Phase 7	Runnymeade	249	249	65,362.50
				-
				-
				-
				-
				-
Total		**249**	**249**	**65,363**

*Based on 262.5 gpd/EDU

Note: EDU Projections are for planning purposes. Assignment of EDUs does not guarantee capacity or assignment of capacity to the parcel or project listed.

Adjusted Annual Average Flow

Tables 3 was developed using the PaDEP example for calculating the five-year adjusted annual average flow. Flow projections are a best guess number and largely depend on regional economic conditions.

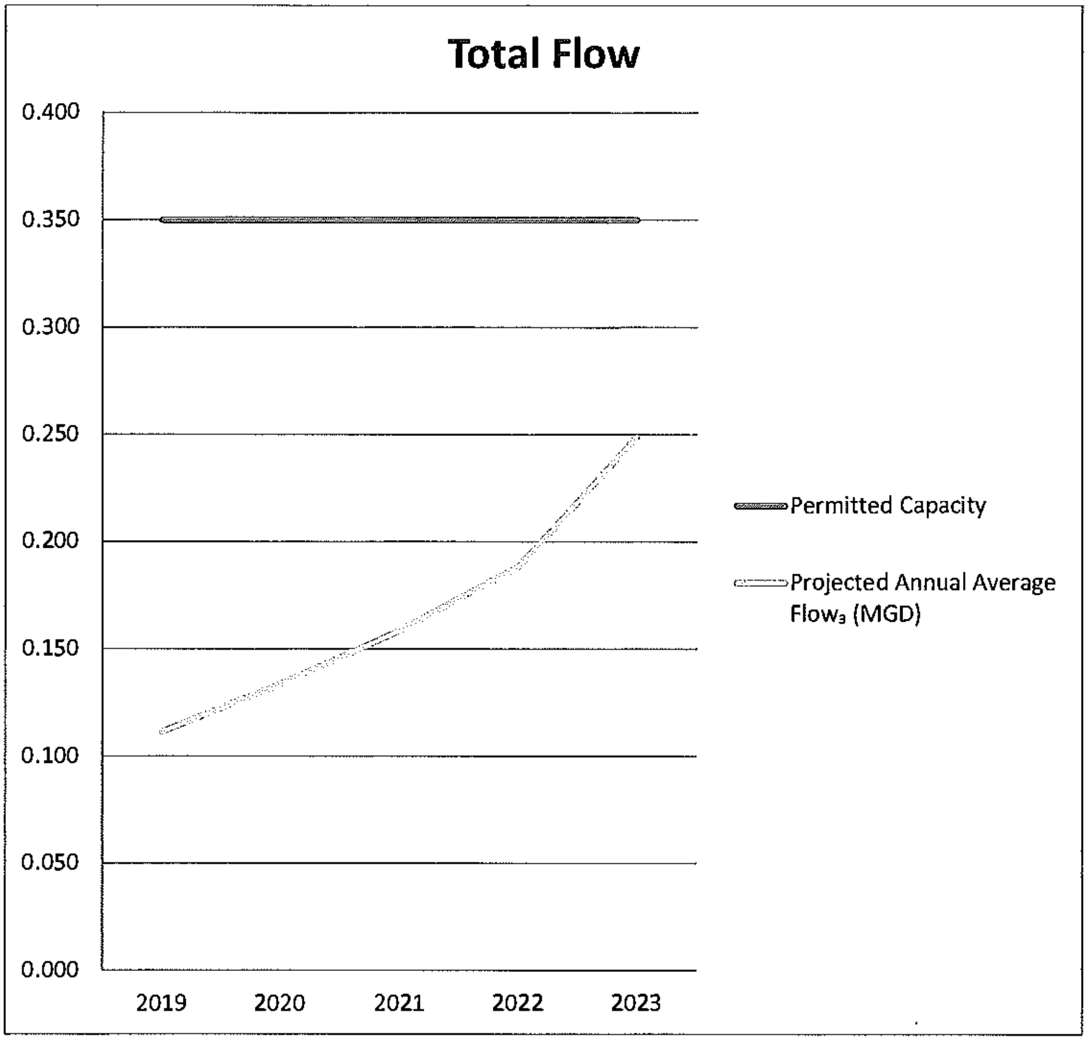
TABLE 3							
Calculation of Adjusted Annual Average Flow							
Year	AA Flow in MGD		All EDUs connected				Adjusted AA Flow
		2014	2015	2016	2017	2018	
2014	0.000		0.000	0.098	0.006	0.001	0.105
2015	0.000			0.098	0.006	0.001	0.105
2016	0.098				0.006	0.001	0.105
2017	0.108					0.001	0.109
2018	0.118						0.118
5 Year Average	0.065					5 Year Average	0.108

Annual Average Flow Projection for the Next 5 Years

The following Table 4 and Chart were developed using the PaDEP example for calculating the five-year adjusted annual average flow. Flow projections are a best guess number and largely depend on regional economic conditions.

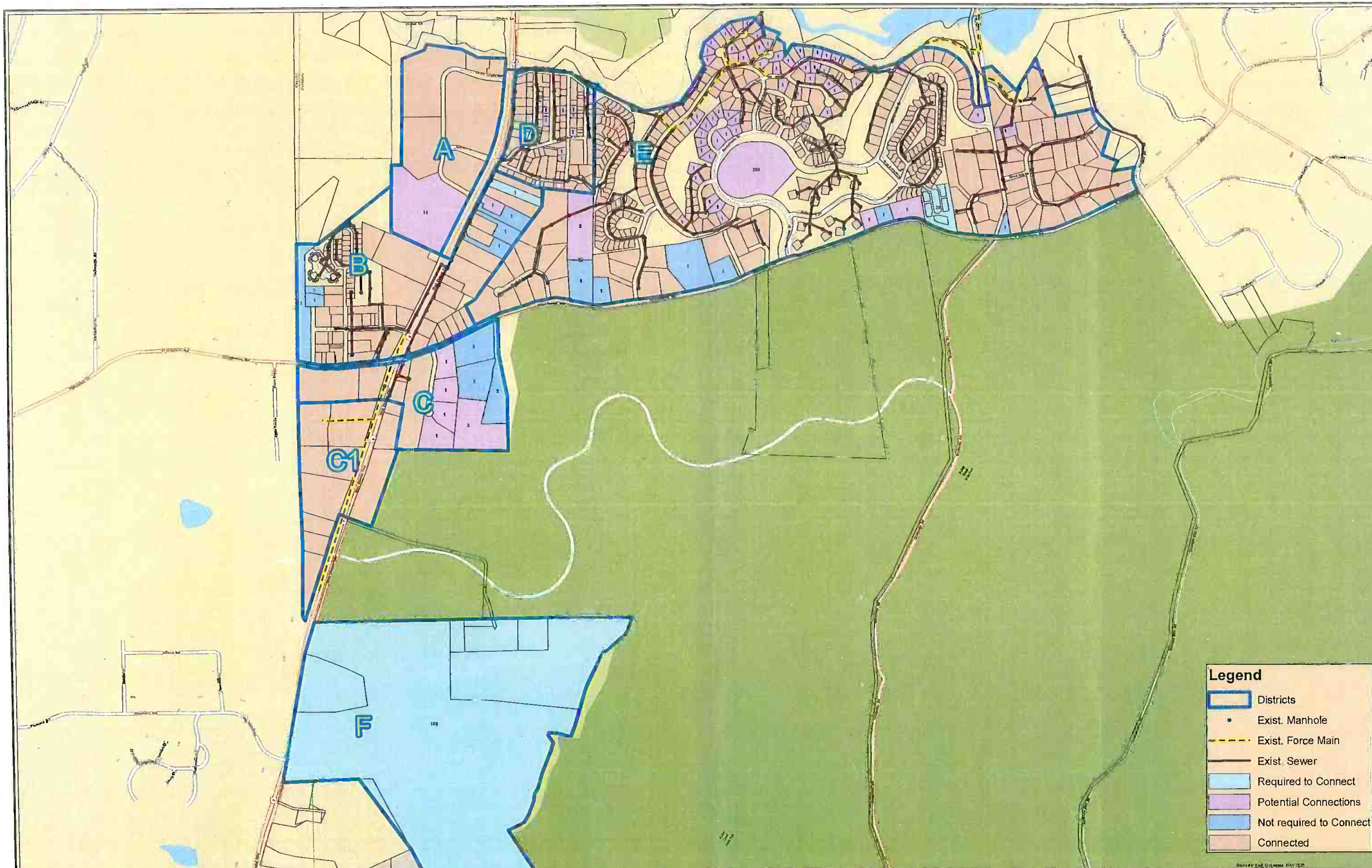
TABLE 4					
Adjusted Projections					
Year	Previous Year's Annual Average Flow1	New EDUs	Increased Flow2 (MGD)	Projected Annual Average Flow3 (MGD)	Permitted Capacity
2019	0.108	11	0.003	0.111	0.350
2020	0.111	85	0.022	0.134	0.350
2021	0.134	95	0.025	0.158	0.350
2022	0.158	113	0.030	0.188	0.350
2023	0.188	231	0.061	0.249	0.350

Notes
1. The 2019 projection starts with the 5-year adjusted annual average as calculated in Table 3
2. Increase Flow = New EDUs x 262.5 / 1,000,000.
3. Projected Annual Average Flow = Previous Years Annual Average Flow + Increased Flow
4. Projections include all contemplated projects from Table 2A


Total Flow
0.400
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
2019
2020
2021
2022
2023
Permitted Capacity
Projected Annual Average Flow3 (MGD)

<u>ATTACHMENT B</u>

MAP OF THE SEWER SYSTEM



DELCORA
100 E. Fifth Street
Chester, PA 19016
(610) 876-5523

Crum Creek Sewer District
2018 Chapter 94 Report
February 2019

Bradford Engineering Associates, Inc.
2710 Concord Road, Suite 3
Aston, Pa 19014
(610) 497-6200

ATTACHMENT C

MAINTENANCE RECORDS

KROHNE

GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

This spreadsheet is protected, thus entry is only allowed in the drop-down boxes & bright green cells.
To use this calculator, you will only need to input the requested information in the bright green cells from your data tags.
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Printing of the programming results is allowed by simply choosing "Print" through your File menu.

<u>Important:</u> If there is a flowrate value present at the zero setting, you must compensate to obtain proper evaluation values.
You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 2/23/18 **Serial #:** C155000731 **Tag #:** Bridle Way Pump Station

Flow Tube Model #: Enviromag 2000 F **Commission #:** **Tested by:** William Doleski

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	1000	USGal/min
Select Meter Dia.	=	Inch	mm
		6	150
DN	=	150	mm
Diameter	=	6.0	inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\%\,(Hz)}$	=	1000	Hz
GK	=	3.2181	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{263546.369}{72407.25} = 3.640$$

Y_{MAX} = 2.0

Max Knob Setting: C

Output Current	I	=	12.792	mA
Output Frequency	Freq $_{MAX}$	=	549.484	Hz
Calibrated Flowrate	Q	=	549.484	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	6.20	137.37	137.37	137.500	0.09%
B	8.40	274.74	274.74	275.000	0.09%
C	12.79	549.48	549.48	549.700	0.04%
D					
E					

Version: Rev 1.3.2-USA

William Doleski Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.02.23 14:31:59 -05'00'
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Printing of the programming results is allowed by simply choosing "Print" through your File menu.

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You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 6/19/18 | Serial #: C155000731 | Tag #: Bridle Way Pump Station

Flow Tube Model #: Enviromag 2000 F | Commission #: | Tested by: W Doleski J Mullins

	DATA INPUT AREAS (In green)	
INPUT VARIABLES		
Converter	=	IFC 300(GK)
Q Fullscale	=	1000 USGal/min
Select Meter Dia.	=	Inch mm 6 150
DN	=	150 mm
Diameter	=	6.0 Inch (ref only)
$I_{0\%}$	=	4 mA
$I_{100\%}$	=	20 mA
$P_{100\%\,(Hz)}$	=	1000 Hz
GK	=	3.2181 <use GK
GKL	=	<do not use
K	=	Value automatically chosen from K value table

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{263546.369}{72407.25} = 3.640$$

Y_{MAX} = 2.0

Max Knob Setting: C

Output Current	I	=	12.792	mA
Output Frequency	$Freq_{MAX}$	=	549.484	Hz
Calibrated Flowrate	Q	=	549.484	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	6.20	137.37	137.37	138.400	0.75%
B	8.40	274.74	274.74	276.000	0.46%
C	12.79	549.48	549.48	549.000	-0.09%
D					
E					

William Doleski

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DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.07.03 13:10:35 -05'00'
Reason: I have reviewed this document

Version: Rev 1.3.2-USA

Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Bridle Way Flowmeter

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	12/07/18	
Instrument Tag:	Bridle Way Flowmeter	Next Due:	03/07/19	
Manufacturer:	Krohne			
Model Number:	IFC 300		**As Found**	**As Left**
Serial Number:	C15500731	Zero Error	-0.0062%	-0.0062%
Calibrated Range:	0-1000 GPM	Span Error	-0.0062%	-0.0062%
Description:	Bridle Way Flowmeter	Max. Error	0.0447%	0.0447%
Instrument Accuracy:	1.5000%	Min. Error	-0.0062%	-0.0062%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	1000.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

Input			As Found Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	3.9990	-0.0062%
13.7370%	137.3700	137.6000		6.1970	6.1970	0.0230%
27.4740%	274.7400	275.0000		8.3950	8.3980	0.0447%
54.9480%	549.4800	549.5000		12.7910	12.7950	0.0270%

Input			As Left Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	3.9990	-0.0062%
13.7300%	137.3700	137.6000		6.1970	6.1970	0.0230%
27.4740%	274.7400	275.0000		8.3950	8.3980	0.0447%
54.9480%	549.4800	549.5000		12.7910	12.7950	0.0270%

Tag Notes

Shutdown:

FT = 0.0 GPM
mA = 3.999
LOI = 0.0 GPM
GK 3.2181

Meter and SCADA scaling do not match.

William Doleski
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DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2019.01.04 11:18:28 -05'00'
Reason: I have reviewed this document

Technician Certification ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting
and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Bridle Way Flowmeter

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	09/21/18	
Instrument Tag:	Bridle Way Flowmeter	Next Due:	12/21/18	
Manufacturer:	Krohne			
Model Number:	IFC 300		**As Found**	**As Left**
Serial Number:	C15500731	Zero Error	0.0000%	0.0000%
Calibrated Range:	0-1000 GPM	Span Error	0.0000%	0.0000%
Description:	Bridle Way Flowmeter	Max. Error	4.5270%	0.0542%
Instrument Accuracy:	1.5000%	Min. Error	0.0000%	-0.0050%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	1000.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

Input			As Found Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	4.0000	0.0000%
13.7370%	137.3700	137.6000		6.1970	6.2020	0.0542%
27.4740%	274.7400	274.8000		8.3950	8.4000	0.0373%
54.9480%	549.4800	594.5000		12.7910	12.7950	4.5270%

Input			As Left Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	4.0000	0.0000%
13.7300%	137.3700	137.6000		6.1970	6.2020	0.0542%
27.4740%	274.7400	274.8000		8.3950	8.4000	0.0373%
54.9480%	594.8000	594.5000		12.7910	12.7950	-0.0050%

Tag Notes

Shutdown:

FT = 0.0 GPM
mA = 3.999
LOI = 0.0 GPM
GK 3.2181

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DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.10.08 13:01:28 -05'00'
Reason: I have reviewed this document

Technician Certification ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

KROHNE

GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

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If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 2/23/18 **Serial #:** C15500730 **Tag #:** Dream Valley Pump Station

Flow Tube Model #: Enviromag 2000 F **Commission #:** **Tested by:** William Doleski

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	750	USGal/min
Select Meter Dia.	=	Inch mm	
		4 100	
DN	=	100	mm
Diameter	=	4.0	Inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\% (Hz)}$	=	1000	Hz
GK	=	2.7266	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{197659.7768}{27266} = 7.249$$

Y_{MAX} = 5.0

Max Knob Setting: D

Output Current	I	=	15.036	mA
Output Frequency	Freq $_{MAX}$	=	689.720	Hz
Calibrated Flowrate	Q	=	517.290	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	5.10	68.97	51.73	52.000	0.52%
B	6.21	137.94	103.46	104.000	0.52%
C	8.41	275.89	206.92	207.110	0.09%
D	15.04	689.72	517.29		
E					

Version: Rev 1.3.2-USA

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GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

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The Converter type, engineering units, diameter and frequency have drop down boxes, allowing the user to simply choose from the list.
This spreadsheet will automatically choose inch or metric (depending upon the converter), and state which GK(L) to use.
Printing of the programming results is allowed by simply choosing "Print" through your File menu.**

**Important: If there is a flowrate value present at the zero setting, you must compensate to obtain proper evaluation values.
You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).**

Date Recorded: 6/19/18 Serial #: C15500730 Tag #: Dream Valley Pump Station

Flow Tube Model #: Enviromag 2000 F Commission #: Tested by: W Doleski/J Mullins

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	750	USGal/min
Select Meter Dia.	=	Inch mm	
		4 100	
DN	=	100	mm
Diameter	=	4.0	Inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\% (Hz)}$	=	1000	Hz
GK	=	2.7266	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{197659.7768}{27266} = 7.249$$

$Y_{MAX} =$ 5.0

Max Knob Setting: D

Output Current	I	=	15.036	mA
Output Frequency	Freq $_{MAX}$	=	689.720	Hz
Calibrated Flowrate	Q	=	517.290	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	5.10	68.97	51.73	52.000	0.52%
B	6.21	137.94	103.46	104.000	0.52%
C	8.41	275.89	206.92	207.110	0.09%
D	15.04	689.72	517.29	517.300	0.00%
E					

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Version: Rev 1.3.2-USA

Calibration Report

Smith Instrument Co.

ISA CERTIFIED CONTROL SYSTEMS TECHNICIAN

ICEA
Instrument Contracting
and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Dream Valley Flowmeter

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	12/07/18	
Instrument Tag:	Dream Valley Flowmeter	Next Due:	03/07/19	
Manufacturer:	Krohne			
Model Number:	IFC 300		**As Found**	**As Left**
Serial Number:	C15500730	Zero Error	-0.0188%	-0.0188%
Calibrated Range:	0-750 GPM	Span Error	-0.0197%	-0.0197%
Description:	Dream Valley Flowmeter	Max. Error	0.0346%	0.0346%
Instrument Accuracy:	1.5000%	Min. Error	-0.0188%	-0.0188%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	750.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

Input			As Found Data	Output	
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	3.9970	-0.0188%
6.8970%	51.7275	51.9400	5.1030	5.1040	0.0346%
13.7900%	103.4250	103.6600	6.2060	6.2060	0.0313%
27.5890%	206.9175	207.1300	8.4140	8.4130	0.0221%
68.9720%	517.2900	517.3300	15.0350	15.0340	-0.0009%

Input			As Left Data	Output	
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	3.9970	-0.0188%
6.8970%	51.7275	51.9400	5.1030	5.1040	0.0346%
13.7900%	103.4250	103.6600	6.2060	6.2060	0.0313%
27.5890%	206.9175	207.1300	8.4140	8.4130	0.0221%
69.9720%	517.2900	517.3300	15.0350	15.0340	-0.0009%

Tag Notes

GK 2.7266

William Doleski
Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2019.01.04 09:26:52 -05'00'
Reason: I have reviewed this document

Technician Certification: ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Co.

Instrument Contracting and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Dream Valley Flowmeter

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	09/21/18	
Instrument Tag:	Dream Valley Flowmeter	Next Due:	12/21/18	
Manufacturer:	Krohne			
Model Number:	IFC 300		**As Found**	**As Left**
Serial Number:	C15500730	Zero Error	0.0000%	0.0000%
Calibrated Range:	0-750 GPM	Span Error	0.0576%	0.0576%
Description:	Dream Valley Flowmeter	Max. Error	0.0893%	0.0893%
Instrument Accuracy:	1.5000%	Min. Error	0.0000%	0.0000%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	750.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

As Found Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	4.0000	0.0000%
6.8970%	51.7275	51.9600	5.1030	5.1110	0.0810%
13.7900%	103.4250	103.7200	6.2060	6.2140	0.0893%
27.5890%	206.9175	207.1000	8.4140	8.4220	0.0743%
68.9720%	517.2900	517.3000	15.0350	15.0440	0.0576%

As Left Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	4.0000	0.0000%
6.8970%	51.7275	51.9600	5.1030	5.1110	0.0810%
13.7900%	103.4250	103.7200	6.2060	6.2140	0.0893%
27.5890%	206.9175	207.1000	8.4140	8.4220	0.0743%
69.9720%	517.2900	517.3000	15.0350	15.0440	0.0576%

Tag Notes

GK 2.7266

William Doleski

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Date: 2018.10.08 13:07:51 -05'00'
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Technician Certification: ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Co.

Instrument Contracting and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymede Flowmeter

Instrument Data

Customer Name:	Delcora
Instrument Tag:	Runnymede Flowmeter
Manufacturer:	Krohne
Model Number:	IFC 300
Serial Number:	C15501259
Calibrated Range:	0-1500 GPM
Description:	Runnymede Flowmeter
Instrument Accuracy:	1.5000%

Test Results

Cal. Date:	12/07/18	
Next Due:	03/07/19	
	As Found	**As Left**
Zero Error	-0.0250%	-0.0250%
Span Error	-0.0250%	-0.0250%
Max. Error	0.0514%	0.0514%
Min. Error	-0.0552%	-0.0552%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	1500.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

Input			As Found Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	3.9960	-0.0250%
20.4200%	306.3100	306.8000		7.2670	7.2700	0.0514%
40.8400%	612.6300	612.8000		10.5340	10.5310	-0.0074%
81.6800%	1225.2600	1224.9000		17.0660	17.0610	-0.0552%

Input			As Left Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	3.9960	-0.0250%
20.4200%	306.3100	306.8000		7.2670	7.2700	0.0514%
40.8400%	612.6300	612.8000		10.5340	10.5310	-0.0074%
81.6800%	1225.2600	1224.9000		17.0660	17.0610	-0.0552%

Tag Notes

GK 2.486

Shutdown:
Recorder = 3.9 GPM
mA = 3.997
FT = 0.0
LOI = 0.0

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Technician Certification: ISA Level III

Technician Signature

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Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymede Flowmeter

Instrument Data		**Test Results**			
Customer Name:	Delcora	Cal. Date:	09/21/18		
Instrument Tag:	Runnymede Flowmeter	Next Due:	12/21/18		
Manufacturer:	Krohne				
Model Number:	IFC 300			**As Found**	**As Left**
Serial Number:	C15501259	Zero Error		-0.0125%	-0.0125%
Calibrated Range:	0-1500 GPM	Span Error		-0.0125%	-0.0125%
Description:	Runnymede Flowmeter	Max. Error		0.1147%	0.1147%
Instrument Accuracy:	1.5000%	Min. Error		-0.0882%	-0.0882%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	1500.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

As Found Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	3.9980	-0.0125%
20.4200%	306.3100	307.0000	7.2670	7.2780	0.1147%
40.8400%	612.6300	612.1900	10.5340	10.5310	-0.0481%
81.6800%	1225.2600	1224.5000	17.0660	17.0600	-0.0882%

As Left Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	3.9980	-0.0125%
20.4200%	306.3100	307.0000	7.2670	7.2780	0.1147%
40.8400%	612.6300	612.1900	10.5340	10.5310	-0.0481%
81.6800%	1225.2600	1224.5000	17.0660	17.0600	-0.0882%

Tag Notes

GK 2.486

Shutdown:
Recorder = 2.25 GPM
mA = 3.998
FT = 0.0
LOI = 0.0

William Doleski

Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
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Technician Certification ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

KROHNE

GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

This spreadsheet is protected, thus entry is only allowed in the drop-down boxes & bright green cells.
To use this calculator, you will only need to input the requested information in the bright green cells from your data tags.
The Converter type, engineering units, diameter and frequency have drop down boxes, allowing the user to simply choose from the list.
This spreadsheet will automatically choose inch or metric (depending upon the converter), and state which GK(L) to use.
Printing of the programming results is allowed by simply choosing "Print" through your File menu.

Important: If there is a flowrate value present at the zero setting, you must compensate to obtain proper evaluation values.
You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 2/23/18 **Serial #:** C15501259 **Tag #:** Runnymead Pump Station

Flow Tube Model #: Enviromag 2000 F **Commission #:** **Tested by:** William Doleski

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	1000	USGal/min
Select Meter Dia.	=	Inch 8	mm 200
DN	=	200	mm
Diameter	=	8.0	Inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\%\,(Hz)}$	=	1000	Hz
GK	=	4.0364	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{263546.369}{161456} = 1.632$$

Y_{MAX} = 1.0

Max Knob Setting	B	Output Current	I =	13.802 mA
		Output Frequency	$Freq_{MAX}$ =	612.628 Hz
		Calibrated Flowrate	Q =	612.628 USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	8.90	306.31	306.31	307.000	0.22%
B	13.80	612.63	612.63	613.300	0.11%
C				1225.400	
D					
E					

Version: Rev 1.3.2-USA

William Doleski
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DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.02.23 14:34:50 -05'00'
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Record printed: 2/23/2018 2:34 PM

KROHNE

GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

This spreadsheet is protected, thus entry is only allowed in the drop-down boxes & bright green cells.
To use this calculator, you will only need to input the requested information in the bright green cells from your data tags.
The Converter type, engineering units, diameter and frequency have drop down boxes, allowing the user to simply choose from the list.
This spreadsheet will automatically choose Inch or metric (depending upon the converter), and state which GK(L) to use.
Printing of the programming results is allowed by simply choosing "Print" through your File menu.

<u>Important:</u> If there is a flowrate value present at the zero setting, you must compensate to obtain proper evaluation values.
You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 6/19/18 **Serial #:** C15501259 **Tag #:** Runnymead Pump Station

Flow Tube Model #: Enviromag 2000 F **Commission #:** **Tested by:** William Doleski

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	1500	USGal/min
Select Meter Dia.	=	Inch mm 8 200	
DN	=	200	mm
Diameter	=	8.0	Inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\% (Hz)}$	=	1000	Hz
GK	=	4.0364	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{395319.5535}{161456} = \boxed{2.448}$$

Y_{MAX} = 2.0

Max Knob Setting: C

Output Current	I	=	17.069	mA
Output Frequency	Freq $_{MAX}$	=	816.838	Hz
Calibrated Flowrate	Q	=	1225.257	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	7.27	204.21	306.31	307.000	0.22%
B	10.53	408.42	612.63	613.000	0.06%
C	17.07	816.84	1225.26	1225.000	-0.02%
D					
E					

William Doleski Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.07.05 14:15:39 -05'00'
Reason: I have reviewed this document

Version: Rev 1.3.2-USA

Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymead PS Flow Recorder

Instrument Data

Customer Name:	Delcora
Instrument Tag:	Runnymead PS Flow Recorder
Manufacturer:	Honeywell
Model Number:	TMV16R-40
Serial Number:	15W37C000000983463
Calibrated Range:	4-20 Ma
Description:	Runnymead PS Flow Recorder
Instrument Accuracy:	0.5000%

Test Results

Cal. Date: 12/07/18
Next Due: 03/07/19

	As Found	As Left
Zero Error	0.2833%	0.2833%
Span Error	0.3700%	0.3700%
Max. Error	0.2833%	0.2833%
Min. Error	0.0867%	0.0867%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	4.0000	20.0000	mA	Martel MC1200	9474060
Output Value	0.0000	1500.0000	GPM	Visual from LOI	

As Found Data

	Input		Output		
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	4.0000	4.0000	0.0000	4.2500	0.2833%
25%	8.0000	8.0000	375.0000	378.4700	0.2313%
50%	12.0000	12.0000	750.0000	753.2100	0.2140%
75%	16.0000	16.0000	1125.0000	1127.4300	0.1620%
100%	20.0000	20.0000	1500.0000	1501.3000	0.0867%

As Left Data

	Input		Output		
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	4.0000	4.0000	0.0000	4.2500	0.2833%
25%	8.0000	8.0000	375.0000	378.4700	0.2313%
50%	12.0000	12.0000	750.0000	753.2100	0.2140%
75%	16.0000	16.0000	1125.0000	1127.4300	0.1620%
100%	20.0000	20.0000	1500.0000	1501.3000	0.0867%

Tag Notes

William Doleski

Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2019.01.04 10:30:09 -05'00'
Reason: I have reviewed this document

Technician Signature

Technician Certification ISA Level III

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Co.

ISA Certified Control Systems Technician

ICEA
Instrument Contracting
and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymead PS Flow Recorder

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	02/23/18	
Instrument Tag:	Runnymead PS Flow Recorder	Next Due:	06/23/18	
Manufacturer:	Honeywell			
Model Number:	TMV16R-40		**As Found**	**As Left**
Serial Number:	15W37C000000983463	Zero Error	0.0747%	0.0747%
Calibrated Range:	4-20 Ma	Span Error	-0.7360%	-0.7360%
Description:	Runnymead PS Flow Recorder	Max. Error	0.0747%	0.0747%
Instrument Accuracy:	0.5000%	Min. Error	-0.8107%	-0.8107%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	4.0000	20.0000	mA	Martel MC1200	9474060
Output Value	0.0000	1500.0000	GPM	Visual from LOI	

Input			As Found Data	Output	
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	4.0000	4.0000	0.0000	1.1200	0.0747%
25%	8.0000	8.0000	375.0000	372.4800	-0.1680%
50%	12.0000	12.0000	750.0000	744.2400	-0.3840%
75%	16.0000	16.0000	1125.0000	1115.8000	-0.6133%
100%	20.0000	20.0000	1500.0000	1487.8400	-0.8107%

Input			As Left Data	Output	
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	4.0000	4.0000	0.0000	1.1200	0.0747%
25%	8.0000	8.0000	375.0000	372.4800	-0.1680%
50%	12.0000	12.0000	750.0000	744.2400	-0.3840%
75%	16.0000	16.0000	1125.0000	1115.8000	-0.6133%
100%	20.0000	20.0000	1500.0000	1487.8400	-0.8107%

Tag Notes

SCADA:

Shutdown
FT = 0.0 MGD
LOI = 0
mA = 3.999
Recorder = 1.12 GPM

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Technician Signature

Technician Certification ISA Level III

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Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting
and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymead PS Flow Recorder

Instrument Data		Test Results		
Customer Name:	Delcora	Cal. Date:	06/19/18	
Instrument Tag:	Runnymead PS Flow Recorder	Next Due:	09/19/18	
Manufacturer:	Honeywell			
Model Number:	TMV16R-40		**As Found**	**As Left**
Serial Number:	15W37C000000983463	Zero Error	0.0173%	0.0173%
Calibrated Range:	4-20 Ma	Span Error	-0.9160%	-0.9160%
Description:	Runnymead PS Flow Recorder	Max. Error	0.0173%	0.0173%
Instrument Accuracy:	0.5000%	Min. Error	-0.9333%	-0.9333%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	4.0000	20.0000	mA	Martel MC1200	9474060
Output Value	0.0000	1500.0000	GPM	Visual from LOI	

Input			As Found Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	4.0000	4.0000		0.0000	0.2600	0.0173%
25%	8.0000	8.0000		375.0000	371.7000	-0.2200%
50%	12.0000	12.0000		750.0000	744.0000	-0.4000%
75%	16.0000	16.0000		1125.0000	1115.0000	-0.6667%
100%	20.0000	20.0000		1500.0000	1486.0000	-0.9333%

Input			As Left Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	4.0000	4.0000		0.0000	0.2600	0.0173%
25%	8.0000	8.0000		375.0000	371.7000	-0.2200%
50%	12.0000	12.0000		750.0000	744.0000	-0.4000%
75%	16.0000	16.0000		1125.0000	1115.0000	-0.6667%
100%	20.0000	20.0000		1500.0000	1486.0000	-0.9333%

Tag Notes

SCADA:

Shutdown
FT = 0.0 MGD
LOI = 0
mA = 3.997
Recorder = 0.26 GPM

William Doleski

Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.07.05 14:18:39 -05'00'
Reason: I have reviewed this document

Technician Certification ISA Level III

Technician Signature

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Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymead PS Flow Recorder

Instrument Data		Test Results		
Customer Name:	Delcora	Cal. Date:	09/21/18	
Instrument Tag:	Runnymead PS Flow Recorder	Next Due:	12/21/18	
Manufacturer:	Honeywell			
Model Number:	TMV16R-40		**As Found**	**As Left**
Serial Number:	15W37C000000983463	Zero Error	0.1500%	0.1500%
Calibrated Range:	4-20 Ma	Span Error	-0.2093%	-0.2093%
Description:	Runnymead PS Flow Recorder	Max. Error	0.1500%	0.1500%
Instrument Accuracy:	0.5000%	Min. Error	-0.3593%	-0.3593%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	4.0000	20.0000	mA	Martel MC1200	9474060
Output Value	0.0000	1500.0000	GPM	Visual from LOI	

As Found Data

Input			Output		
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	4.0000	4.0000	0.0000	2.2500	0.1500%
25%	8.0000	8.0000	375.0000	375.4300	0.0287%
50%	12.0000	12.0000	750.0000	749.0400	-0.0640%
75%	16.0000	16.0000	1125.0000	1121.7800	-0.2147%
100%	20.0000	20.0000	1500.0000	1494.6100	-0.3593%

As Left Data

Input			Output		
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	4.0000	4.0000	0.0000	2.2500	0.1500%
25%	8.0000	8.0000	375.0000	375.4300	0.0287%
50%	12.0000	12.0000	750.0000	749.0400	-0.0640%
75%	16.0000	16.0000	1125.0000	1121.7800	-0.2147%
100%	20.0000	20.0000	1500.0000	1494.6100	-0.3593%

Tag Notes

SCADA:

Shutdown
FT = 0.0 MGD
LOI = 0
mA = 3.998
Recorder = 2.25 GPM

William Doleski
Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.10.08 11:24:14 -05'00'
Reason: I have reviewed this document

Technician Certification: ISA Level III

Technician Signature

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<u>**ATTACHMENT D**</u>

Sewage Pumping Stations

ATTACHMENT D

Sewage Pumping Stations

The following is a discussion of the Crum Creek Sewer District's 3 pump stations. The tables below are based on discharge meter readings for each. This method does not permit the determination of actual peak flows received by the stations. The tables indicate an estimated peak flow based on the WQM Permits.

Even with the WQM peaking factors, a level considered conservatively safe when reviewing station capacity, the reserve capacity is felt to be adequate for even the most severe wet weather conditions.

The tables also list the five-year estimated growth for each station based on the areas listed in Table 2.

The system is monitored by DELCORA's maintenance staff. A representative is onsite three times per week inspecting the pump stations. Additionally, an advance SCADA monitors pump station performance and operating conditions. This is essentially monitored by DELCORA 24-hrs a day as part of their overall system monitoring program.

Tables 5A, 5B and 5C are summary of the Pump Station Hydraulic Conditions along with the 5-year projections. Following the summaries are the monthly pump station flow data.

TABLE 5A					
Adjusted Projections Bridle Pump Station					
Year	**Previous Year's Annual Average Flow (MGD)₁**	**New EDUs**	**Increased Flow₂ (MGD)**	**Projected Peak Flow (3.5 Peak factor) (MGD)**	**Max Single Pump Rate (MGD)**
2019	0.055	9	0.002	0.202	0.792
2020	0.058	18	0.005	0.218	0.792
2021	0.062	28	0.007	0.244	0.792
2022	0.070	27	0.007	0.269	0.792
2023	0.077	160	0.042	0.416	0.792

Notes
1. The 2018 projection starts with the December Average Daily Flow
2. Increase Flow = New EDUs x 262.5 / 1,000,000.
3. Projected Annual Average Flow = Previous Years Annual Average
4. Projections include all contemplated projects from Table 2A

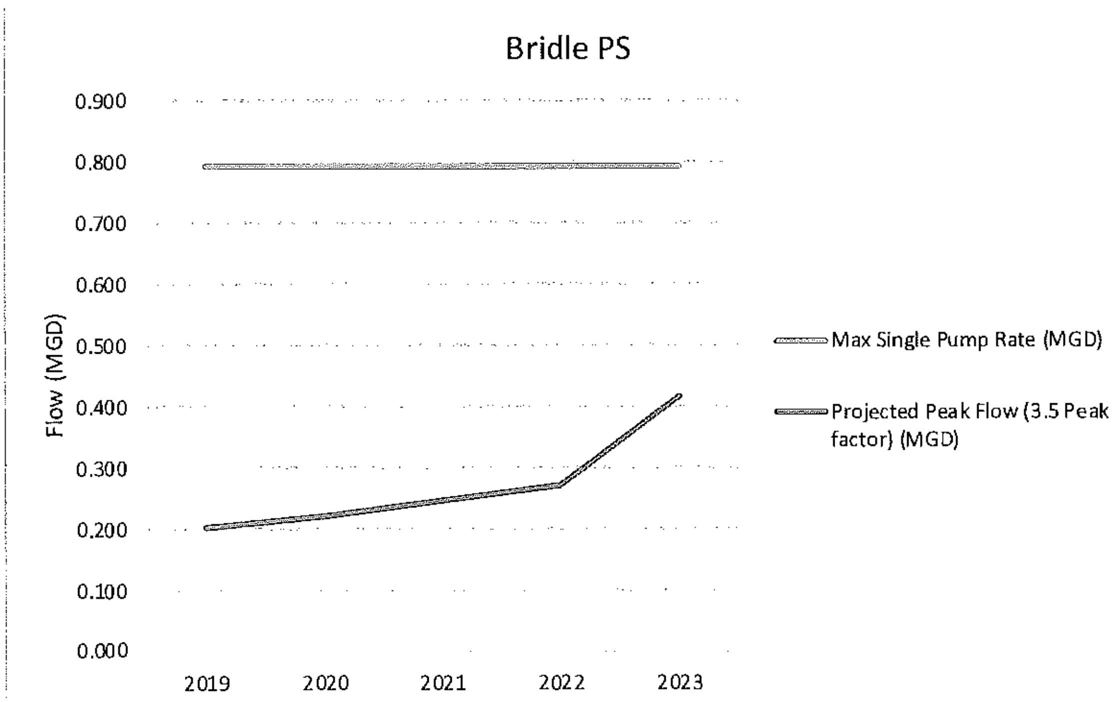


TABLE 5B					
Adjusted Projections Runnymeade Pump Station					
Year	**Previous Year's Annual Average Flow (MGD)[1]**	**New EDUs**	**Increased Flow[2] (MGD)**	**Projected Peak Flow (3.5 Peak factor) (MGD)**	**Max Single Pump Rate (MGD)**
2019	0.141	11	0.003	0.503	1.224
2019	0.144	85	0.022	0.581	1.224
2020	0.166	109	0.029	0.681	1.224
2021	0.195	120	0.032	0.791	1.224
2022	0.226	238	0.062	1.010	1.224

Notes

1. The 2018 projection starts with the December Average Daily Flow
2. Increase Flow = New EDUs x 262.5 / 1,000,000.
3. Projected Annual Average Flow = Previous Years Annual Average
4. Projections include all contemplated projects from Table 2A

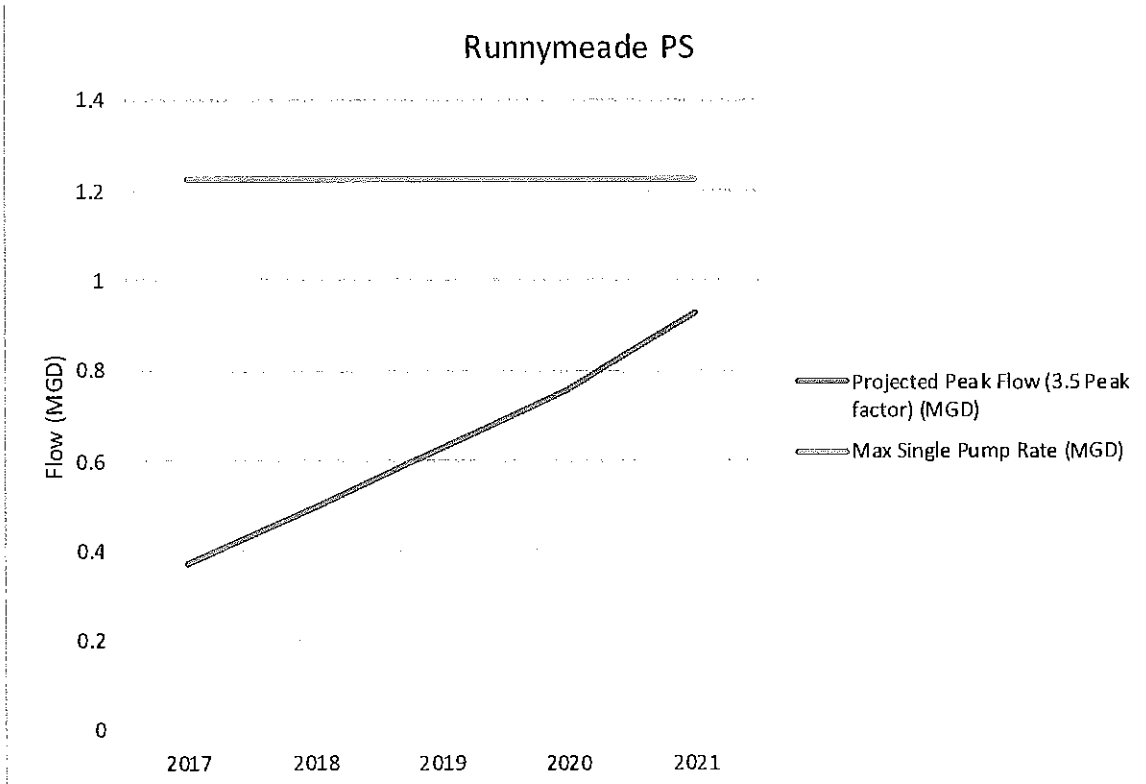
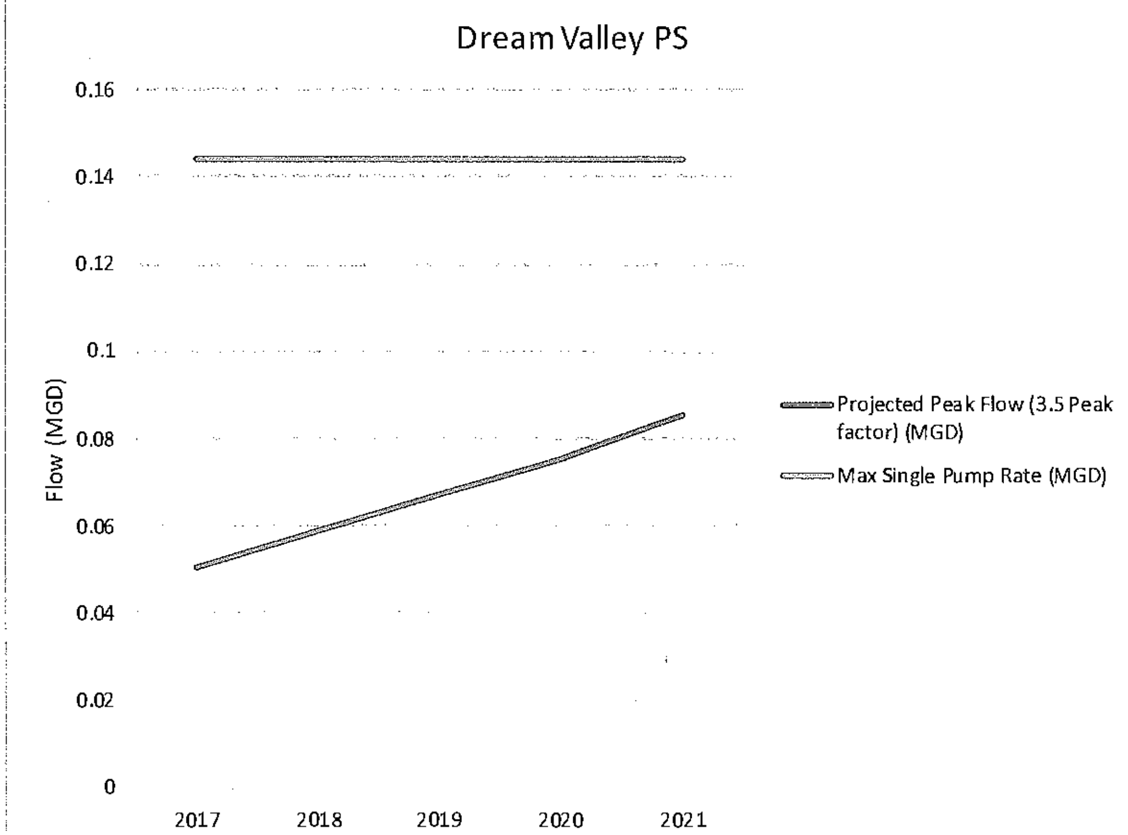


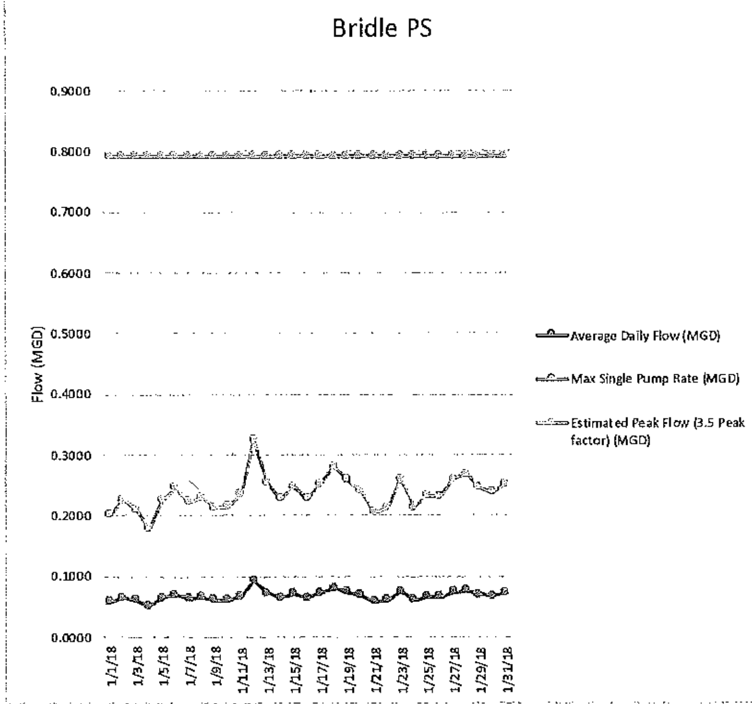
TABLE 5C					
Adjusted Projections Dream Valley Pump Station					
Year	Previous Year's Annual Average Flow (MGD)₁	New EDUs	Increased Flow₂ (MGD)	Projected Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2019	0.013	0	0.000	0.050	0.144
2019	0.014	7	0.002	0.059	0.144
2020	0.017	7	0.002	0.067	0.144
2021	0.019	7	0.002	0.075	0.144
2022	0.022	7	0.003	0.085	0.144

Notes

1. The 2018 projection starts with the December Average Daily Flow
2. Increase Flow = New EDUs x 262.5 / 1,000,000.
3. Projected Annual Average Flow = Previous Years Annual Average Flow + Increased Flow
4. Projections include all contemplated projects from Table 2A

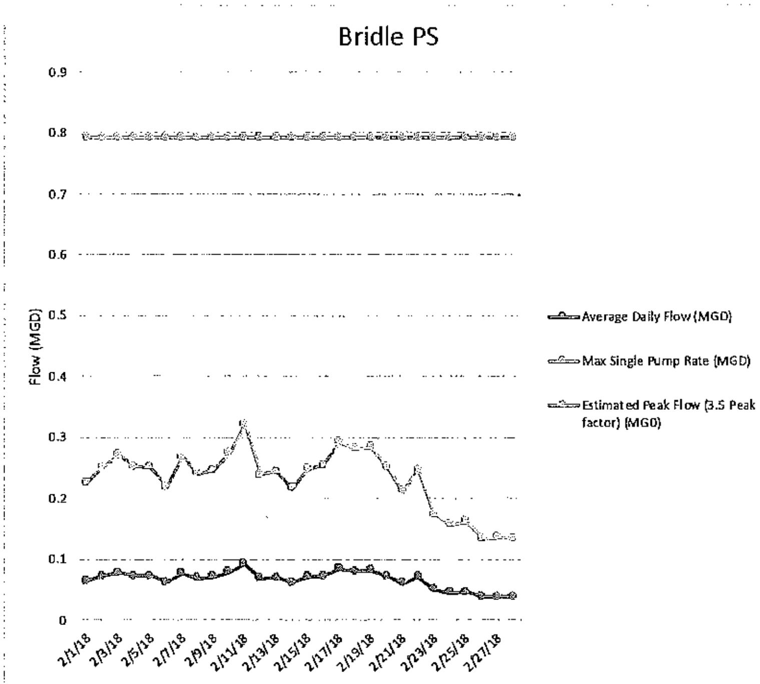


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
1/1/18	0.0577	0.202	0.792
1/2/18	0.0648	0.227	0.792
1/3/18	0.0603	0.211	0.792
1/4/18	0.0508	0.178	0.792
1/5/18	0.0642	0.225	0.792
1/6/18	0.0701	0.245	0.792
1/7/18	0.0637	0.223	0.792
1/8/18	0.0658	0.230	0.792
1/9/18	0.0610	0.213	0.792
1/10/18	0.0613	0.215	0.792
1/11/18	0.0674	0.236	0.792
1/12/18	0.0926	0.324	0.792
1/13/18	0.0727	0.254	0.792
1/14/18	0.0651	0.228	0.792
1/15/18	0.0706	0.247	0.792
1/16/18	0.0652	0.228	0.792
1/17/18	0.0721	0.252	0.792
1/18/18	0.0804	0.281	0.792
1/19/18	0.0740	0.259	0.792
1/20/18	0.0689	0.241	0.792
1/21/18	0.0582	0.204	0.792
1/22/18	0.0608	0.213	0.792
1/23/18	0.0745	0.261	0.792
1/24/18	0.0609	0.213	0.792
1/25/18	0.0665	0.233	0.792
1/26/18	0.0661	0.231	0.792
1/27/18	0.0742	0.260	0.792
1/28/18	0.0768	0.269	0.792
1/29/18	0.0701	0.245	0.792
1/30/18	0.0679	0.238	0.792
1/31/18	0.0723	0.253	0.792

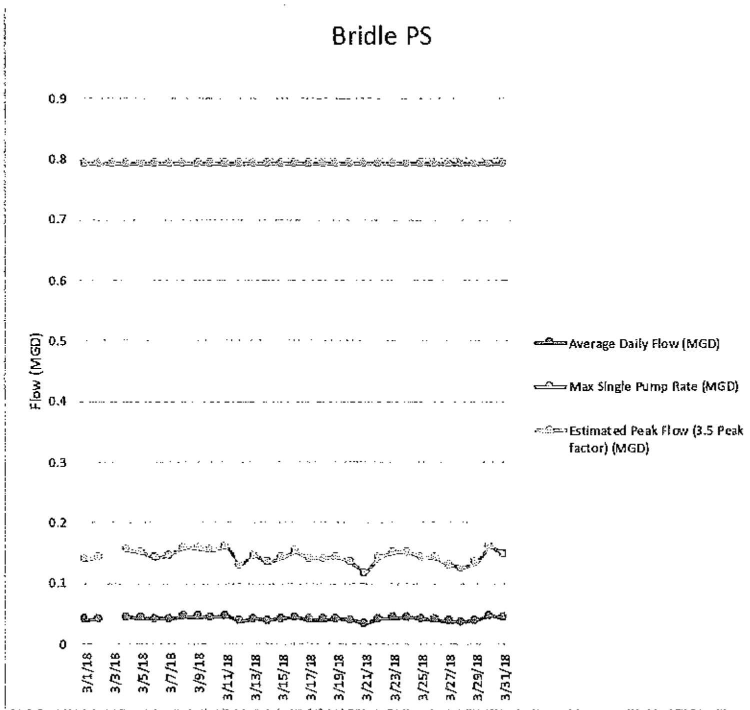


Min	0.051
Max	0.093
Ave	0.068

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2/1/18	0.0643536	0.225	0.792
2/2/18	0.0720144	0.252	0.792
2/3/18	0.0773424	0.271	0.792
2/4/18	0.071712	0.251	0.792
2/5/18	0.0716976	0.251	0.792
2/6/18	0.0623808	0.218	0.792
2/7/18	0.0762336	0.267	0.792
2/8/18	0.0686304	0.240	0.792
2/9/18	0.0703152	0.246	0.792
2/10/18	0.078336	0.274	0.792
2/11/18	0.0919296	0.322	0.792
2/12/18	0.0682848	0.239	0.792
2/13/18	0.069696	0.244	0.792
2/14/18	0.0619056	0.217	0.792
2/15/18	0.0708768	0.248	0.792
2/16/18	0.0727344	0.255	0.792
2/17/18	0.0832896	0.292	0.792
2/18/18	0.08028	0.281	0.792
2/19/18	0.081072	0.284	0.792
2/20/18	0.0718128	0.251	0.792
2/21/18	0.0603792	0.211	0.792
2/22/18	0.0704304	0.247	0.792
2/23/18	0.0494928	0.173	0.792
2/24/18	0.0446976	0.156	0.792
2/25/18	0.0461088	0.161	0.792
2/26/18	0.0379872	0.133	0.792
2/27/18	0.0388224	0.136	0.792
2/28/18	0.038448	0.135	0.792

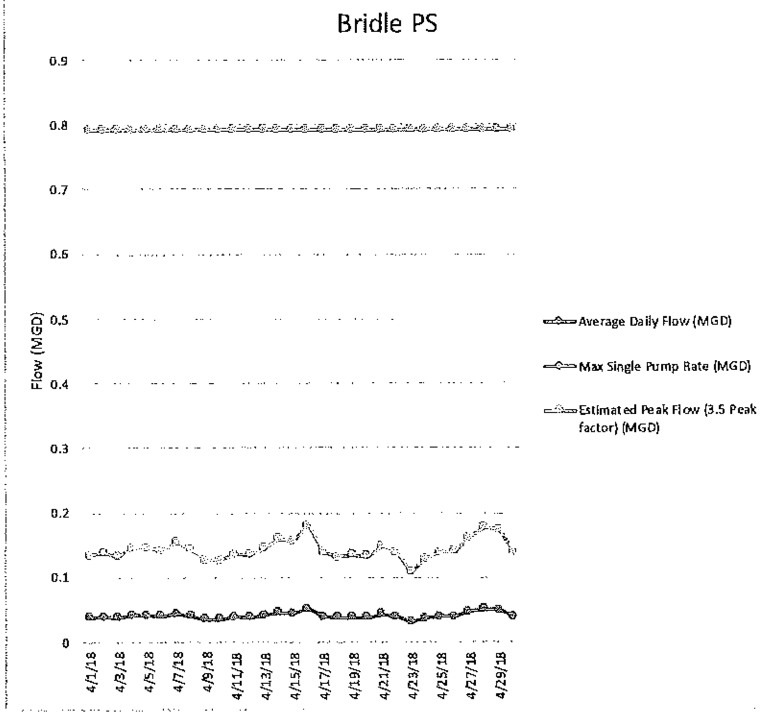


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
3/1/18	0.0398016	0.139	0.792
3/2/18	0.040824	0.143	0.792
3/3/18			0.792
3/4/18	0.044208	0.155	0.792
3/5/18	0.0430416	0.151	0.792
3/6/18	0.0406512	0.142	0.792
3/7/18	0.0415728	0.146	0.792
3/8/18	0.0453744	0.159	0.792
3/9/18	0.0447552	0.157	0.792
3/10/18	0.0443664	0.155	0.792
3/11/18	0.0459504	0.161	0.792
3/12/18	0.037152	0.130	0.792
3/13/18	0.0416016	0.146	0.792
3/14/18	0.0383616	0.134	0.792
3/15/18	0.0405936	0.142	0.792
3/16/18	0.0435168	0.152	0.792
3/17/18	0.040032	0.140	0.792
3/18/18	0.0402048	0.141	0.792
3/19/18	0.0407808	0.143	0.792
3/20/18	0.0383904	0.134	0.792
3/21/18	0.0335088	0.117	0.792
3/22/18	0.0407952	0.143	0.792
3/23/18	0.042912	0.150	0.792
3/24/18	0.0431712	0.151	0.792
3/25/18	0.0408384	0.143	0.792
3/26/18	0.040392	0.141	0.792
3/27/18	0.0371808	0.130	0.792
3/28/18	0.0355392	0.124	0.792
3/29/18	0.0380448	0.133	0.792
3/30/18	0.045936	0.161	0.792
3/31/18	0.0420912	0.147	0.792



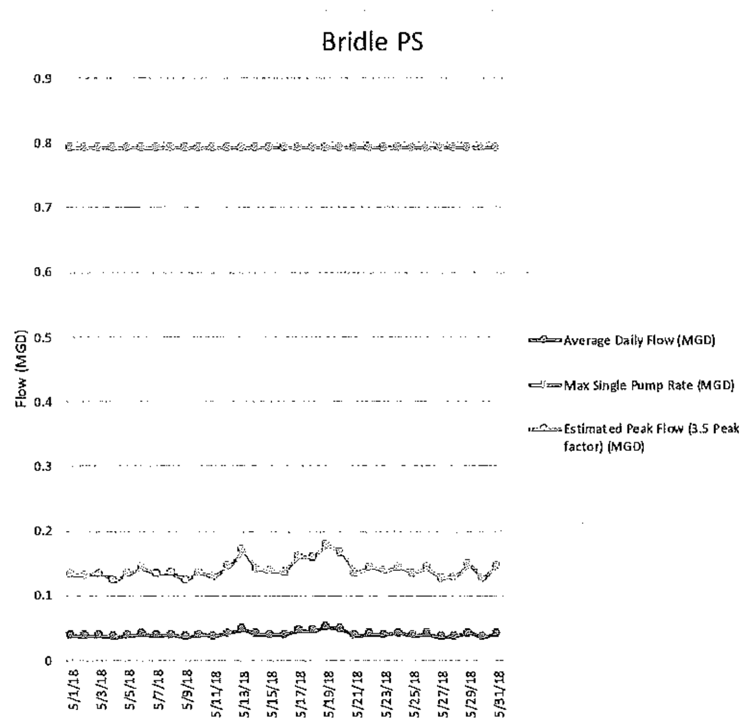
Min	0.034
Max	0.046
Ave	0.041

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
4/1/18	0.038376	0.134	0.792
4/2/18	0.0395424	0.138	0.792
4/3/18	0.0377856	0.132	0.792
4/4/18	0.0417312	0.146	0.792
4/5/18	0.0416736	0.146	0.792
4/6/18	0.0402768	0.141	0.792
4/7/18	0.0443232	0.155	0.792
4/8/18	0.0409536	0.143	0.792
4/9/18	0.036	0.126	0.792
4/10/18	0.0361296	0.126	0.792
4/11/18	0.0387792	0.136	0.792
4/12/18	0.0384912	0.135	0.792
4/13/18	0.0414144	0.145	0.792
4/14/18	0.0455616	0.159	0.792
4/15/18	0.0446112	0.156	0.792
4/16/18	0.0518256	0.181	0.792
4/17/18	0.0394992	0.138	0.792
4/18/18	0.0374976	0.131	0.792
4/19/18	0.0384048	0.134	0.792
4/20/18	0.0379728	0.133	0.792
4/21/18	0.0425088	0.149	0.792
4/22/18	0.0394704	0.138	0.792
4/23/18	0.0306	0.107	0.792
4/24/18	0.0366768	0.128	0.792
4/25/18	0.039672	0.139	0.792
4/26/18	0.0398016	0.139	0.792
4/27/18	0.04608	0.161	0.792
4/28/18	0.0507888	0.178	0.792
4/29/18	0.0496656	0.174	0.792
4/30/18	0.0397008	0.139	0.792



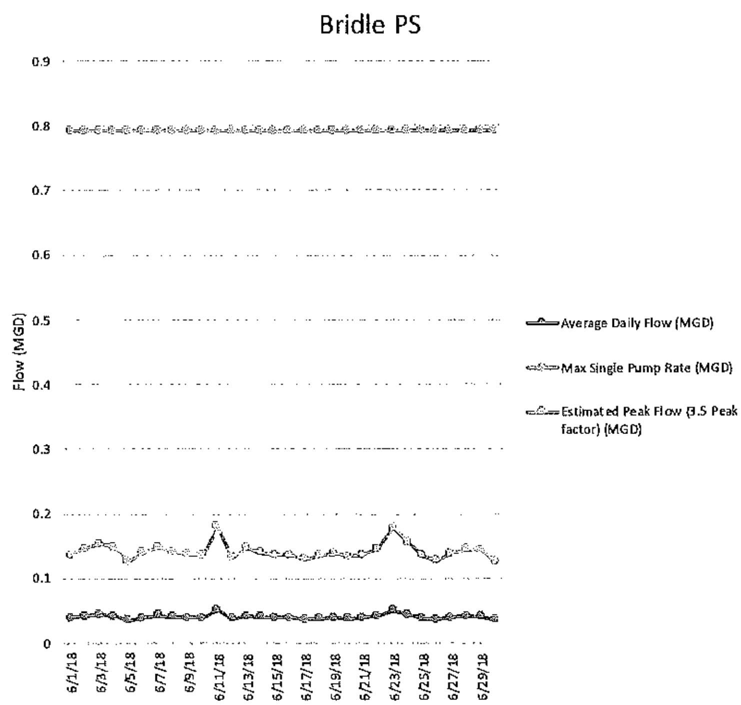
Min	0.031
Max	0.052
Ave	0.041

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
5/1/18	0.0380016	0.133	0.792
5/2/18	0.0374256	0.131	0.792
5/3/18	0.0382608	0.134	0.792
5/4/18	0.0350064	0.123	0.792
5/5/18	0.0378576	0.133	0.792
5/6/18	0.0407088	0.142	0.792
5/7/18	0.0383184	0.134	0.792
5/8/18	0.0387072	0.135	0.792
5/9/18	0.0353808	0.124	0.792
5/10/18	0.0386352	0.135	0.792
5/11/18	0.0367776	0.129	0.792
5/12/18	0.041256	0.144	0.792
5/13/18	0.0483696	0.169	0.792
5/14/18	0.0402192	0.141	0.792
5/15/18	0.039168	0.137	0.792
5/16/18	0.0389232	0.136	0.792
5/17/18	0.0457488	0.160	0.792
5/18/18	0.0451728	0.158	0.792
5/19/18	0.0509328	0.178	0.792
5/20/18	0.0473616	0.166	0.792
5/21/18	0.038232	0.134	0.792
5/22/18	0.0409536	0.143	0.792
5/23/18	0.0392112	0.137	0.792
5/24/18	0.0412128	0.144	0.792
5/25/18	0.0383328	0.134	0.792
5/26/18	0.040536	0.142	0.792
5/27/18	0.0361008	0.126	0.792
5/28/18	0.0366912	0.128	0.792
5/29/18	0.0419328	0.147	0.792
5/30/18	0.036072	0.126	0.792
5/31/18	0.0418896	0.147	0.792



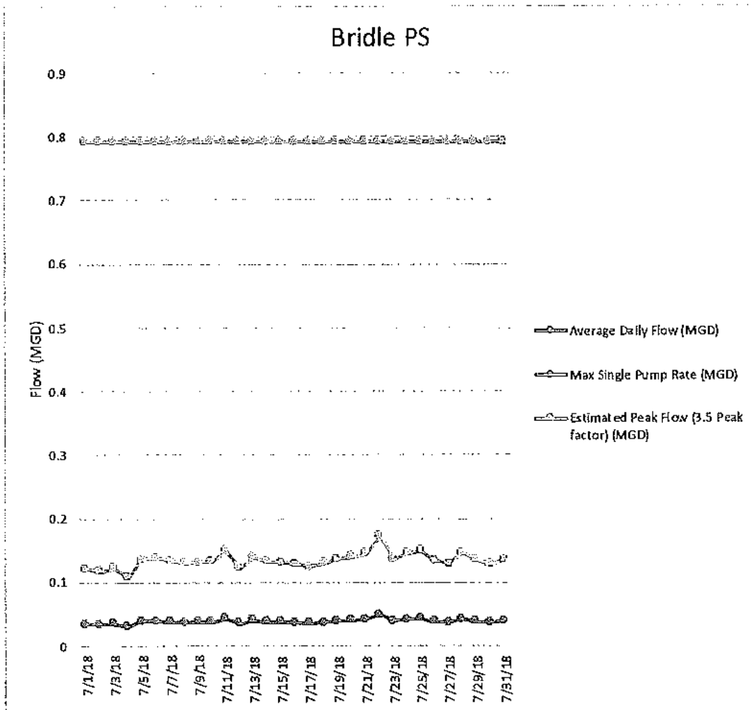
Min	0.035
Max	0.051
Ave	0.040

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
6/1/18	0.0387648	0.136	0.792
6/2/18	0.0418752	0.147	0.792
6/3/18	0.0439632	0.154	0.792
6/4/18	0.0422928	0.148	0.792
6/5/18	0.0360864	0.126	0.792
6/6/18	0.039816	0.139	0.792
6/7/18	0.0424656	0.149	0.792
6/8/18	0.0404352	0.142	0.792
6/9/18	0.0394416	0.138	0.792
6/10/18	0.0389808	0.136	0.792
6/11/18	0.0513216	0.180	0.792
6/12/18	0.0379008	0.133	0.792
6/13/18	0.0420192	0.147	0.792
6/14/18	0.0400896	0.140	0.792
6/15/18	0.0389088	0.136	0.792
6/16/18	0.0390096	0.137	0.792
6/17/18	0.0372816	0.130	0.792
6/18/18	0.0384912	0.135	0.792
6/19/18	0.0397152	0.139	0.792
6/20/18	0.0381168	0.133	0.792
6/21/18	0.0390672	0.137	0.792
6/22/18	0.0417168	0.146	0.792
6/23/18	0.0509472	0.178	0.792
6/24/18	0.0447552	0.157	0.792
6/25/18	0.0385632	0.135	0.792
6/26/18	0.0365184	0.128	0.792
6/27/18	0.039528	0.138	0.792
6/28/18	0.041256	0.144	0.792
6/29/18	0.0409104	0.143	0.792
6/30/18	0.0357696	0.125	0.792



Min	0.036
Max	0.051
Ave	0.041

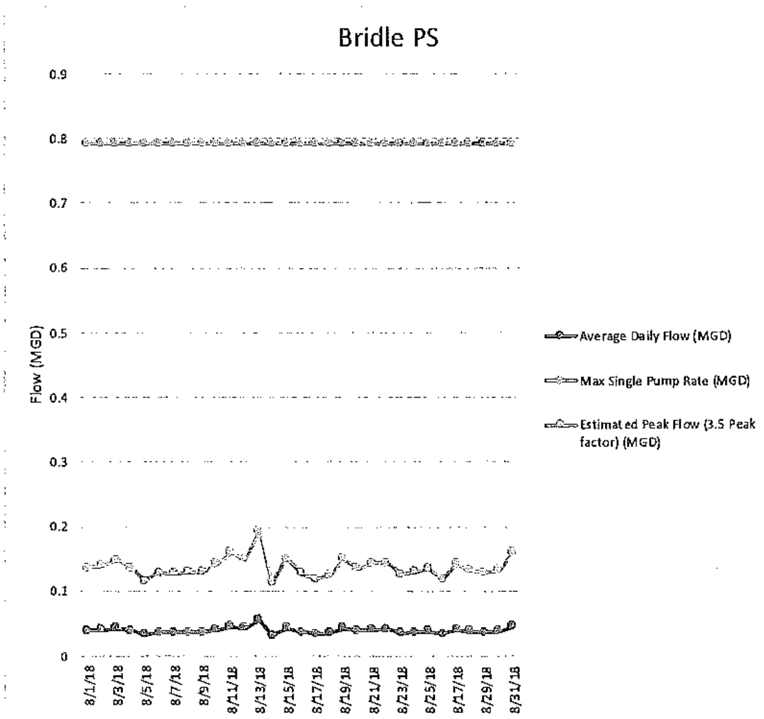
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
7/1/18	0.03456	0.121	0.792
7/2/18	0.0337248	0.118	0.792
7/3/18	0.035136	0.123	0.792
7/4/18	0.0306144	0.107	0.792
7/5/18	0.0389664	0.136	0.792
7/6/18	0.0395568	0.138	0.792
7/7/18	0.0382608	0.134	0.792
7/8/18	0.037008	0.130	0.792
7/9/18	0.037584	0.132	0.792
7/10/18	0.0379728	0.133	0.792
7/11/18	0.0428976	0.150	0.792
7/12/18	0.035064	0.123	0.792
7/13/18	0.0399456	0.140	0.792
7/14/18	0.0377424	0.132	0.792
7/15/18	0.0374544	0.131	0.792
7/16/18	0.0369216	0.129	0.792
7/17/18	0.0354816	0.124	0.792
7/18/18	0.0371232	0.130	0.792
7/19/18	0.0390096	0.137	0.792
7/20/18	0.0401472	0.141	0.792
7/21/18	0.041544	0.145	0.792
7/22/18	0.0491328	0.172	0.792
7/23/18	0.0389376	0.136	0.792
7/24/18	0.0414288	0.145	0.792
7/25/18	0.0429408	0.150	0.792
7/26/18	0.03816	0.134	0.792
7/27/18	0.0368352	0.129	0.792
7/28/18	0.0417312	0.146	0.792
7/29/18	0.0386064	0.135	0.792
7/30/18	0.0364464	0.128	0.792
7/31/18	0.039024	0.137	0.792



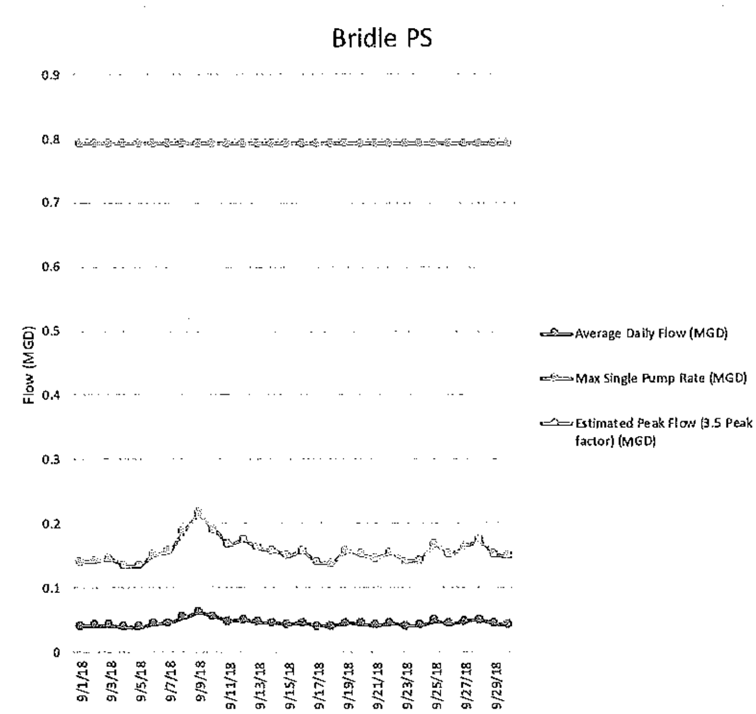
Min	0.031
Max	0.049
Ave	0.038

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
8/1/18	0.0389952	0.136	0.792
8/2/18	0.0400608	0.140	0.792
8/3/18	0.0426384	0.149	0.792
8/4/18	0.0387504	0.136	0.792
8/5/18	0.0333072	0.117	0.792
8/6/18	0.0368928	0.129	0.792
8/7/18	0.0363312	0.127	0.792
8/8/18	0.0372528	0.130	0.792
8/9/18	0.03708	0.130	0.792
8/10/18	0.0405936	0.142	0.792
8/11/18	0.0454896	0.159	0.792
8/12/18	0.0427824	0.150	0.792
8/13/18	0.055368	0.194	0.792
8/14/18	0.0323136	0.113	0.792
8/15/18	0.0430704	0.151	0.792
8/16/18	0.036432	0.128	0.792
8/17/18	0.0340416	0.119	0.792
8/18/18	0.0356112	0.125	0.792
8/19/18	0.0428976	0.150	0.792
8/20/18	0.0386784	0.135	0.792
8/21/18	0.0409392	0.143	0.792
8/22/18	0.0411984	0.144	0.792
8/23/18	0.0359136	0.126	0.792
8/24/18	0.0371664	0.130	0.792
8/25/18	0.0385488	0.135	0.792
8/26/18	0.0341136	0.119	0.792
8/27/18	0.0407232	0.143	0.792
8/28/18	0.0378	0.132	0.792
8/29/18	0.0368064	0.129	0.792
8/30/18	0.038016	0.133	0.792
8/31/18	0.0456768	0.160	0.792

Min	0.032
Max	0.055
Ave	0.039



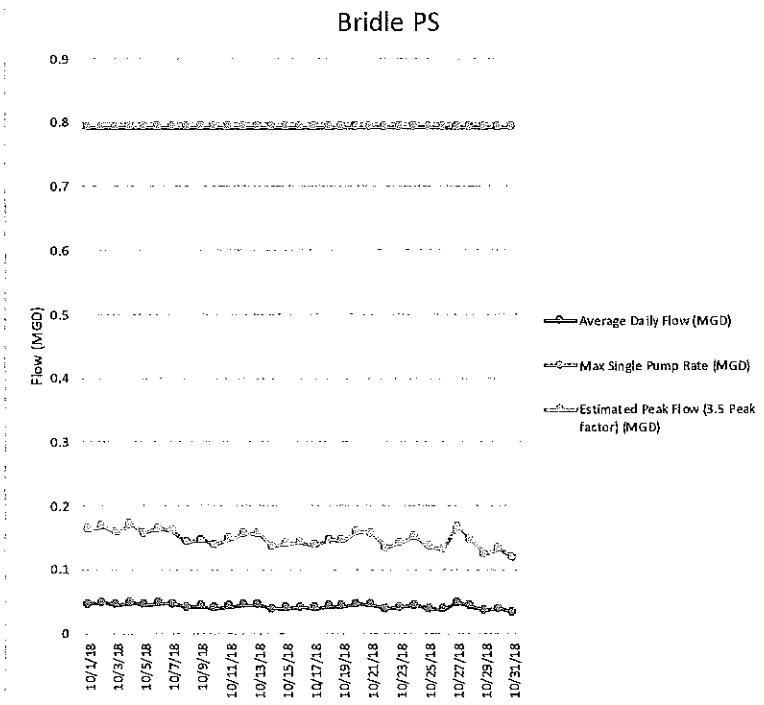
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
9/1/18	0.0400176	0.140	0.792
9/2/18	0.0404064	0.141	0.792
9/3/18	0.0414432	0.145	0.792
9/4/18	0.038088	0.133	0.792
9/5/18	0.0381744	0.134	0.792
9/6/18	0.043056	0.151	0.792
9/7/18	0.0446688	0.156	0.792
9/8/18	0.053568	0.187	0.792
9/9/18	0.061632	0.216	0.792
9/10/18	0.0541296	0.189	0.792
9/11/18	0.0474336	0.166	0.792
9/12/18	0.0499392	0.175	0.792
9/13/18	0.045936	0.161	0.792
9/14/18	0.0447984	0.157	0.792
9/15/18	0.0424368	0.149	0.792
9/16/18	0.0449856	0.157	0.792
9/17/18	0.0394848	0.138	0.792
9/18/18	0.0394128	0.138	0.792
9/19/18	0.045	0.158	0.792
9/20/18	0.0433152	0.152	0.792
9/21/18	0.0414144	0.145	0.792
9/22/18	0.0441504	0.155	0.792
9/23/18	0.0399024	0.140	0.792
9/24/18	0.0405072	0.142	0.792
9/25/18	0.0478368	0.167	0.792
9/26/18	0.0432576	0.151	0.792
9/27/18	0.0465984	0.163	0.792
9/28/18	0.0495216	0.173	0.792
9/29/18	0.0431568	0.151	0.792
9/30/18	0.0423504	0.148	0.792



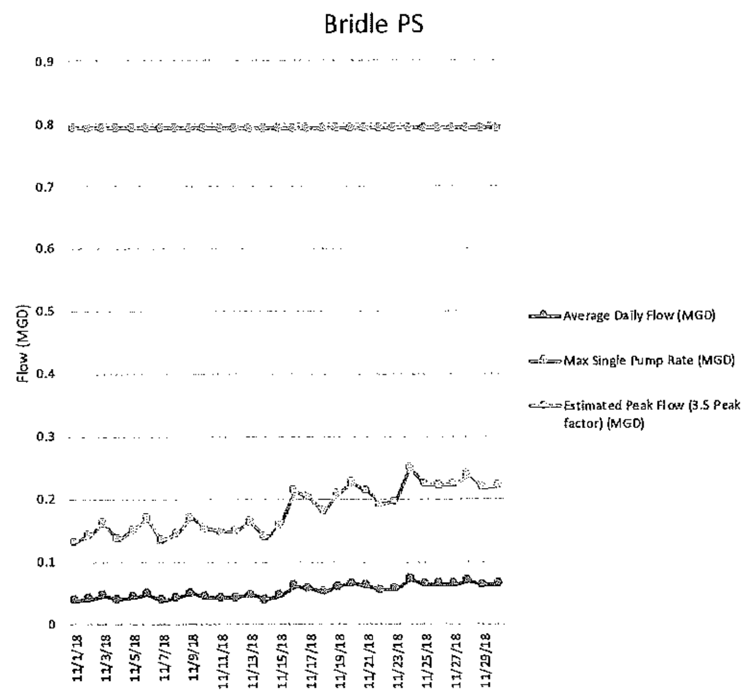
Min	0.038
Max	0.062
Ave	0.045

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
10/1/18	0.0464112	0.162	0.792
10/2/18	0.0479376	0.168	0.792
10/3/18	0.045216	0.158	0.792
10/4/18	0.0488304	0.171	0.792
10/5/18	0.0448992	0.157	0.792
10/6/18	0.0467568	0.164	0.792
10/7/18	0.0456768	0.160	0.792
10/8/18	0.040968	0.143	0.792
10/9/18	0.0419904	0.147	0.792
10/10/18	0.039744	0.139	0.792
10/11/18	0.0422784	0.148	0.792
10/12/18	0.044856	0.157	0.792
10/13/18	0.0444816	0.156	0.792
10/14/18	0.0388512	0.136	0.792
10/15/18	0.0400896	0.140	0.792
10/16/18	0.0409392	0.143	0.792
10/17/18	0.039528	0.138	0.792
10/18/18	0.0418608	0.147	0.792
10/19/18	0.0416736	0.146	0.792
10/20/18	0.0456192	0.160	0.792
10/21/18	0.044784	0.157	0.792
10/22/18	0.03816	0.134	0.792
10/23/18	0.040536	0.142	0.792
10/24/18	0.0433152	0.152	0.792
10/25/18	0.0386928	0.135	0.792
10/26/18	0.0375696	0.131	0.792
10/27/18	0.0477936	0.167	0.792
10/28/18	0.0417024	0.146	0.792
10/29/18	0.0353808	0.124	0.792
10/30/18	0.038016	0.133	0.792
10/31/18	0.033768	0.118	0.792

Min	0.034
Max	0.049
Ave	0.042

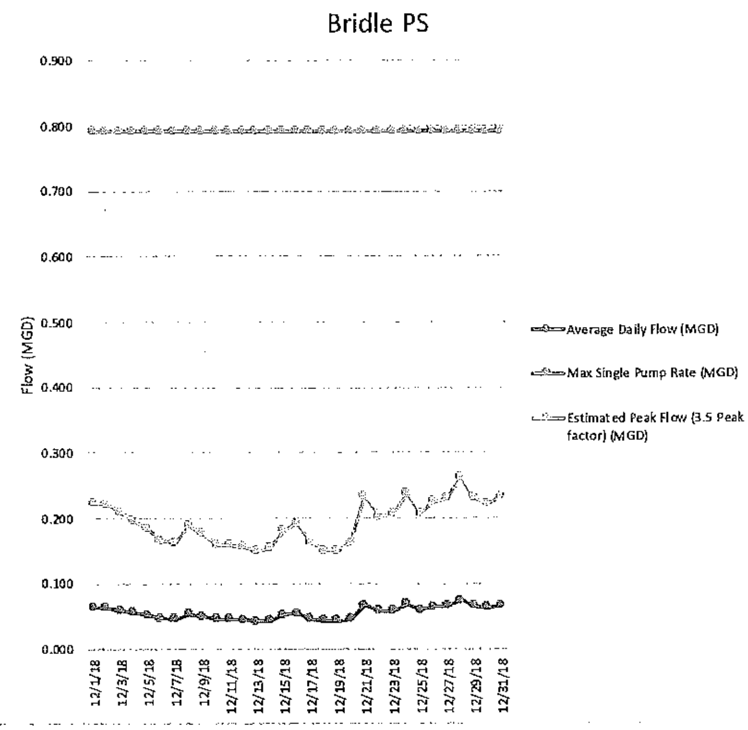


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
11/1/18	0.0374976	0.1312416	0.792
11/2/18	0.0406512	0.142	0.792
11/3/18	0.0461232	0.161	0.792
11/4/18	0.0385776	0.135	0.792
11/5/18	0.042624	0.149	0.792
11/6/18	0.048096	0.168	0.792
11/7/18	0.0379584	0.133	0.792
11/8/18	0.0413856	0.145	0.792
11/9/18	0.0487296	0.171	0.792
11/10/18	0.0435168	0.152	0.792
11/11/18	0.0418464	0.146	0.792
11/12/18	0.0423072	0.148	0.792
11/13/18	0.0468144	0.164	0.792
11/14/18	0.0393984	0.138	0.792
11/15/18	0.0454464	0.159	0.792
11/16/18	0.0608544	0.213	0.792
11/17/18	0.0576576	0.202	0.792
11/18/18	0.0510624	0.179	0.792
11/19/18	0.0593712	0.208	0.792
11/20/18	0.0644256	0.225	0.792
11/21/18	0.0608688	0.213	0.792
11/22/18	0.054504	0.191	0.792
11/23/18	0.0559728	0.196	0.792
11/24/18	0.0714528	0.250	0.792
11/25/18	0.0634752	0.222	0.792
11/26/18	0.0631008	0.221	0.792
11/27/18	0.0637344	0.223	0.792
11/28/18	0.068112	0.238	0.792
11/29/18	0.0620496	0.217	0.792
11/30/18	0.0629424	0.220	0.792



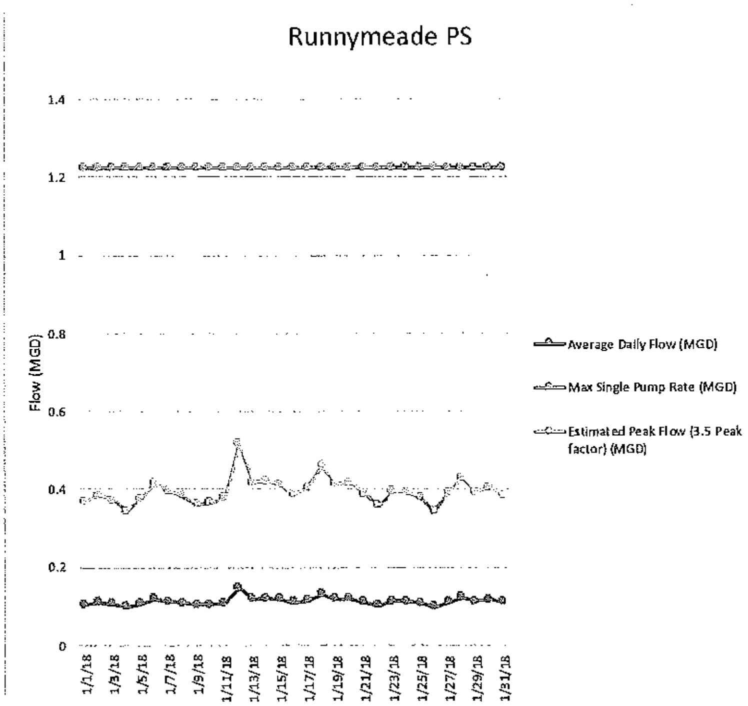
Min	0.037
Max	0.071
Ave	0.052

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
12/1/18	0.0639072	0.224	0.792
12/2/18	0.0634896	0.222	0.792
12/3/18	0.0599616	0.210	0.792
12/4/18	0.0558576	0.196	0.792
12/5/18	0.0527904	0.185	0.792
12/6/18	0.0472464	0.165	0.792
12/7/18	0.0464112	0.162	0.792
12/8/18	0.0537552	0.188	0.792
12/9/18	0.0502992	0.176	0.792
12/10/18	0.0454752	0.159	0.792
12/11/18	0.0455904	0.160	0.792
12/12/18	0.0446544	0.156	0.792
12/13/18	0.0427392	0.150	0.792
12/14/18	0.044136	0.154	0.792
12/15/18	0.0517824	0.181	0.792
12/16/18	0.0548352	0.192	0.792
12/17/18	0.0464688	0.163	0.792
12/18/18	0.0430704	0.151	0.792
12/19/18	0.0431712	0.151	0.792
12/20/18	0.0463536	0.162	0.792
12/21/18	0.0669312	0.234	0.792
12/22/18	0.0577296	0.202	0.792
12/23/18	0.0586944	0.205	0.792
12/24/18	0.0679248	0.238	0.792
12/25/18	0.0592992	0.208	0.792
12/26/18	0.064512	0.226	0.792
12/27/18	0.0657504	0.230	0.792
12/28/18	0.07488	0.262	0.792
12/29/18	0.0656928	0.230	0.792
12/30/18	0.0633168	0.222	0.792
12/31/18	0.0666288	0.233	0.792



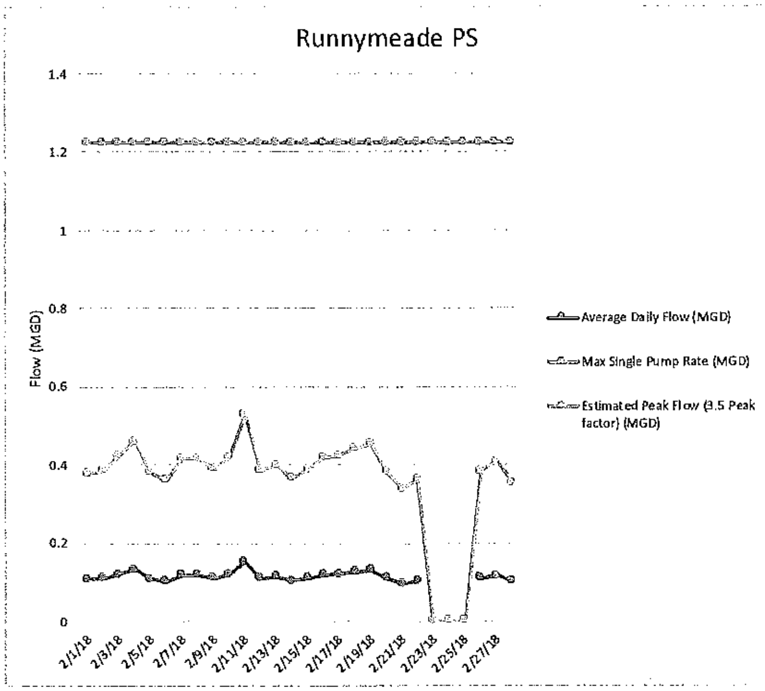
Min	0.043
Max	0.075
Ave	0.055

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
1/1/18	0.10507248	0.368	1.224
1/2/18	0.10992384	0.385	1.224
1/3/18	0.10662768	0.373	1.224
1/4/18	0.09846288	0.345	1.224
1/5/18	0.10692144	0.374	1.224
1/6/18	0.11871792	0.416	1.224
1/7/18	0.11336256	0.397	1.224
1/8/18	0.10909728	0.382	1.224
1/9/18	0.1037088	0.363	1.224
1/10/18	0.10477728	0.367	1.224
1/11/18	0.10816704	0.379	1.224
1/12/18	0.14831856	0.519	1.224
1/13/18	0.11901888	0.417	1.224
1/14/18	0.12012768	0.420	1.224
1/15/18	0.1179288	0.413	1.224
1/16/18	0.11060928	0.387	1.224
1/17/18	0.11573136	0.405	1.224
1/18/18	0.13133376	0.460	1.224
1/19/18	0.11788272	0.413	1.224
1/20/18	0.11926	0.417	1.224
1/21/18	0.111272	0.389	1.224
1/22/18	0.102541	0.359	1.224
1/23/18	0.113086	0.396	1.224
1/24/18	0.112313	0.393	1.224
1/25/18	0.107992	0.378	1.224
1/26/18	0.098489	0.345	1.224
1/27/18	0.1115	0.390	1.224
1/28/18	0.122549	0.429	1.224
1/29/18	0.112011	0.392	1.224
1/30/18	0.115956	0.406	1.224
1/31/18	0.109905	0.385	1.224



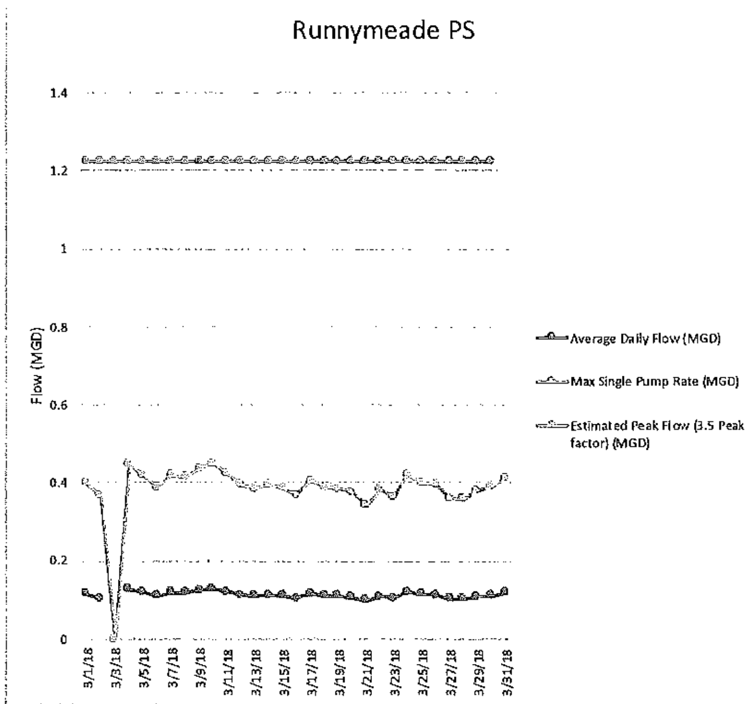
Min	0.098
Max	0.148
Ave	0.113

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2/1/18	0.107582	0.377	1.224
2/2/18	0.110088	0.385	1.224
2/3/18	0.12094	0.423	1.224
2/4/18	0.131498	0.460	1.224
2/5/18	0.109008	0.382	1.224
2/6/18	0.103072	0.361	1.224
2/7/18	0.118603	0.415	1.224
2/8/18	0.118487	0.415	1.224
2/9/18	0.111113	0.389	1.224
2/10/18	0.119701	0.419	1.224
2/11/18	0.151233	0.529	1.224
2/12/18	0.110285	0.386	1.224
2/13/18	0.11405	0.399	1.224
2/14/18	0.104338	0.365	1.224
2/15/18	0.110421	0.386	1.224
2/16/18	0.119181	0.417	1.224
2/17/18	0.121116	0.424	1.224
2/18/18	0.126371	0.442	1.224
2/19/18	0.129504	0.453	1.224
2/20/18	0.109209	0.382	1.224
2/21/18	0.09661	0.338	1.224
2/22/18	0.102978	0.360	1.224
2/23/18		0.000	1.224
2/24/18		0.000	1.224
2/25/18		0.000	1.224
2/26/18	0.109477	0.383	1.224
2/27/18	0.116244	0.407	1.224
2/28/18	0.101212	0.354	1.224
			1.224
			1.224

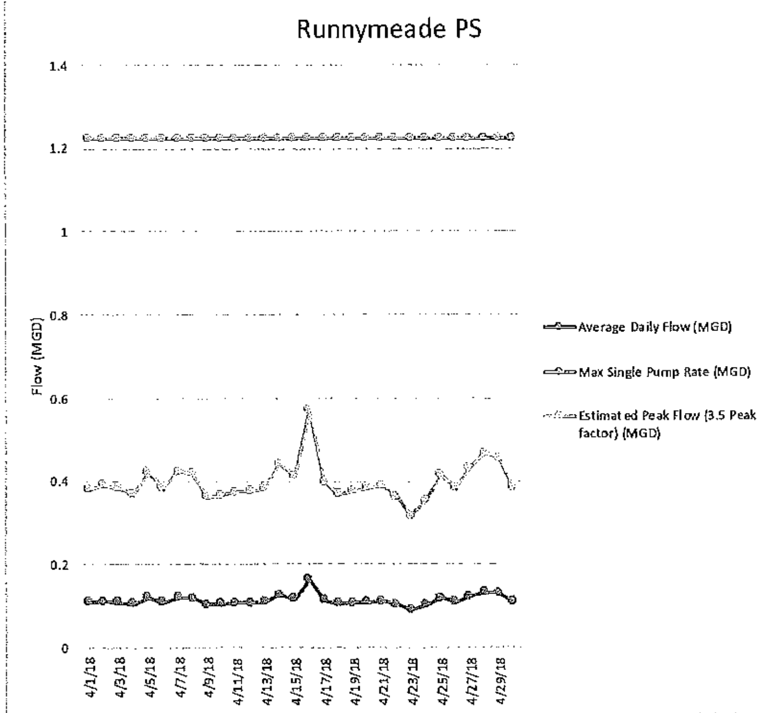


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
3/1/18	0.113915	0.399	1.224
3/2/18	0.104954	0.367	1.224
3/3/18		0.000	1.224
3/4/18	0.127665	0.447	1.224
3/5/18	0.120226	0.421	1.224
3/6/18	0.110838	0.388	1.224
3/7/18	0.11959	0.419	1.224
3/8/18	0.118856	0.416	1.224
3/9/18	0.124887	0.437	1.224
3/10/18	0.128691	0.450	1.224
3/11/18	0.120709	0.422	1.224
3/12/18	0.112517	0.394	1.224
3/13/18	0.110174	0.386	1.224
3/14/18	0.113485	0.397	1.224
3/15/18	0.110522	0.387	1.224
3/16/18	0.105453	0.369	1.224
3/17/18	0.115974	0.406	1.224
3/18/18	0.11081	0.388	1.224
3/19/18	0.11013	0.385	1.224
3/20/18	0.107593	0.377	1.224
3/21/18	0.097871	0.343	1.224
3/22/18	0.109218	0.382	1.224
3/23/18	0.10393	0.364	1.224
3/24/18	0.120284	0.421	1.224
3/25/18	0.114054	0.399	1.224
3/26/18	0.113113	0.396	1.224
3/27/18	0.103136	0.361	1.224
3/28/18	0.102287	0.358	1.224
3/29/18	0.108601	0.380	1.224
3/30/18	0.111541	0.390	1.224
3/31/18	0.118131	0.413	

Min	0.098
Max	0.129
Ave	0.113



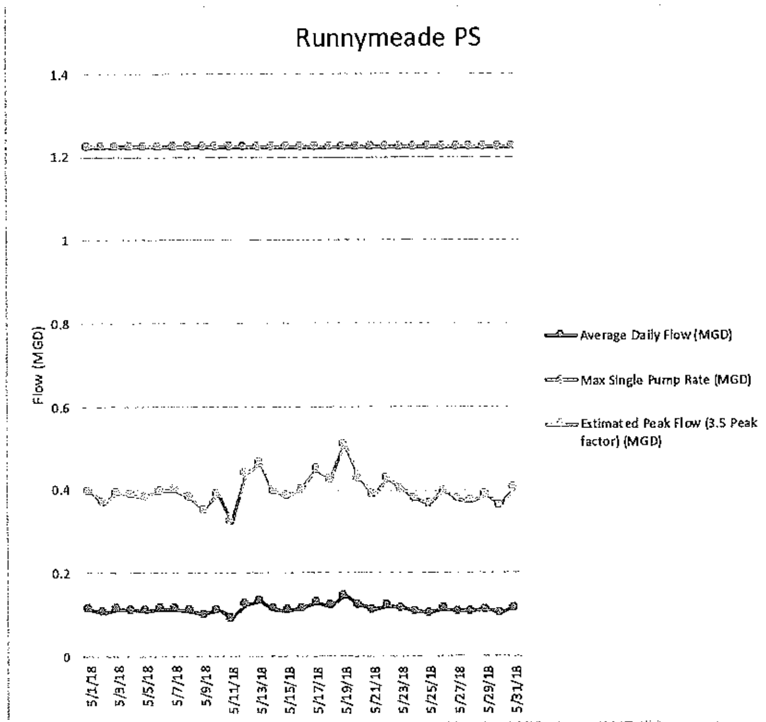
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
4/1/18	0.108458	0.380	1.224
4/2/18	0.111929	0.392	1.224
4/3/18	0.109633	0.384	1.224
4/4/18	0.105709	0.370	1.224
4/5/18	0.120495	0.422	1.224
4/6/18	0.109759	0.384	1.224
4/7/18	0.121295	0.425	1.224
4/8/18	0.119427	0.418	1.224
4/9/18	0.102829	0.360	1.224
4/10/18	0.104711	0.366	1.224
4/11/18	0.106656	0.373	1.224
4/12/18	0.107752	0.377	1.224
4/13/18	0.109753	0.384	1.224
4/14/18	0.126259	0.442	1.224
4/15/18	0.117888	0.413	1.224
4/16/18	0.163405	0.572	1.224
4/17/18	0.113748	0.398	1.224
4/18/18	0.10507	0.368	1.224
4/19/18	0.107492	0.376	1.224
4/20/18	0.109849	0.384	1.224
4/21/18	0.111165	0.389	1.224
4/22/18	0.103776	0.363	1.224
4/23/18	0.090621	0.317	1.224
4/24/18	0.100758	0.353	1.224
4/25/18	0.118793	0.416	1.224
4/26/18	0.109789	0.384	1.224
4/27/18	0.123533	0.432	1.224
4/28/18	0.13351	0.467	1.224
4/29/18	0.130192	0.456	1.224
4/30/18	0.109886	0.385	1.224



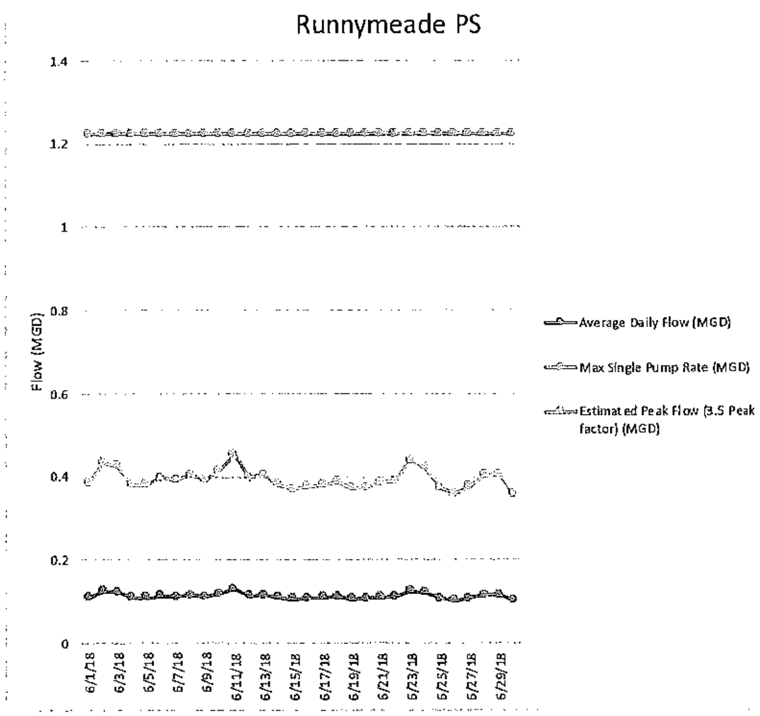
Min	0.091
Max	0.163
Ave	0.114

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
5/1/18	0.113423	0.397	1.224
5/2/18	0.105211	0.368	1.224
5/3/18	0.112471	0.394	1.224
5/4/18	0.110751	0.388	1.224
5/5/18	0.109201	0.382	1.224
5/6/18	0.113614	0.398	1.224
5/7/18	0.114005	0.399	1.224
5/8/18	0.109213	0.382	1.224
5/9/18	0.100044	0.350	1.224
5/10/18	0.111301	0.390	1.224
5/11/18	0.092278	0.323	1.224
5/12/18	0.125046	0.438	1.224
5/13/18	0.132804	0.465	1.224
5/14/18	0.11374	0.398	1.224
5/15/18	0.109866	0.385	1.224
5/16/18	0.114938	0.402	1.224
5/17/18	0.128258	0.449	1.224
5/18/18	0.121378	0.425	1.224
5/19/18	0.145653	0.510	1.224
5/20/18	0.122507	0.429	1.224
5/21/18	0.110589	0.387	1.224
5/22/18	0.121838	0.426	1.224
5/23/18	0.114675	0.401	1.224
5/24/18	0.108092	0.378	1.224
5/25/18	0.104239	0.365	1.224
5/26/18	0.113824	0.398	1.224
5/27/18	0.107547	0.376	1.224
5/28/18	0.106575	0.373	1.224
5/29/18	0.110913	0.388	1.224
5/30/18	0.103831	0.363	1.224
5/31/18	0.114992	0.402	1.224

Min	0.092
Max	0.146
Ave	0.114

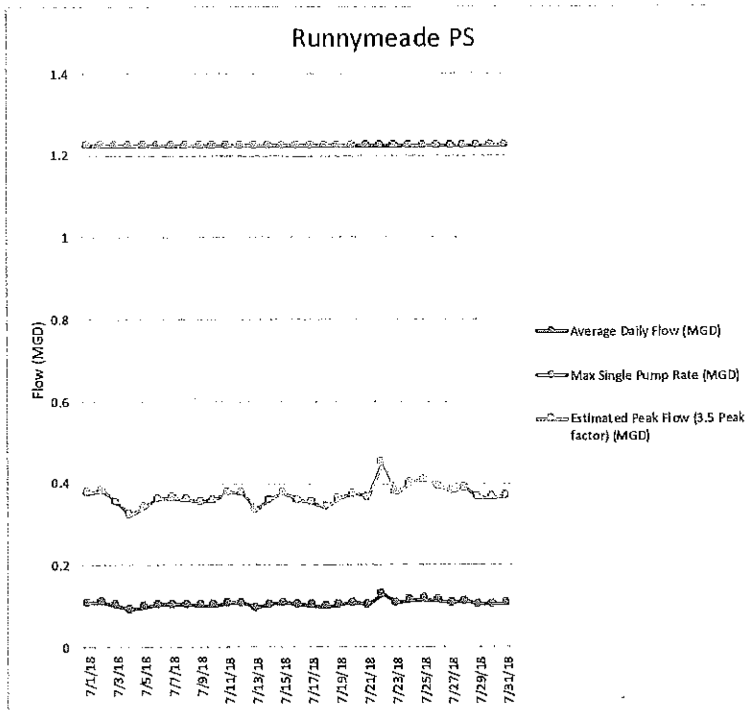


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
6/1/18	0.109789	0.384	1.224
6/2/18	0.124086	0.434	1.224
6/3/18	0.122065	0.427	1.224
6/4/18	0.108515	0.380	1.224
6/5/18	0.108863	0.381	1.224
6/6/18	0.11341	0.397	1.224
6/7/18	0.112037	0.392	1.224
6/8/18	0.115672	0.405	1.224
6/9/18	0.112049	0.392	1.224
6/10/18	0.118851	0.416	1.224
6/11/18	0.12943	0.453	1.224
6/12/18	0.11333	0.397	1.224
6/13/18	0.115958	0.406	1.224
6/14/18	0.108796	0.381	1.224
6/15/18	0.1057	0.370	1.224
6/16/18	0.107431	0.376	1.224
6/17/18	0.108487	0.380	1.224
6/18/18	0.110662	0.387	1.224
6/19/18	0.106251	0.372	1.224
6/20/18	0.107197	0.375	1.224
6/21/18	0.110048	0.385	1.224
6/22/18	0.111366	0.390	1.224
6/23/18	0.125599	0.440	1.224
6/24/18	0.120715	0.423	1.224
6/25/18	0.106633	0.373	1.224
6/26/18	0.102303	0.358	1.224
6/27/18	0.107324	0.376	1.224
6/28/18	0.115155	0.403	1.224
6/29/18	0.116018	0.406	1.224
6/30/18	0.101693	0.356	1.224



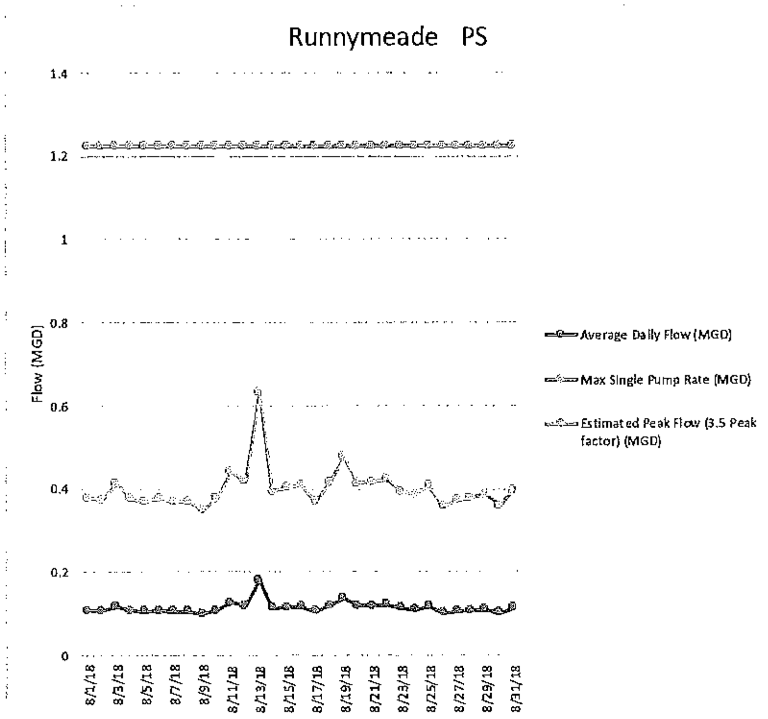
Min	0.102
Max	0.129
Ave	0.113

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
7/1/18	0.107701	0.377	1.224
7/2/18	0.10913	0.382	1.224
7/3/18	0.100917	0.353	1.224
7/4/18	0.092346	0.323	1.224
7/5/18	0.097365	0.341	1.224
7/6/18	0.103677	0.363	1.224
7/7/18	0.104269	0.365	1.224
7/8/18	0.10322	0.361	1.224
7/9/18	0.101204	0.354	1.224
7/10/18	0.102265	0.358	1.224
7/11/18	0.108181	0.379	1.224
7/12/18	0.107655	0.377	1.224
7/13/18	0.095913	0.336	1.224
7/14/18	0.102758	0.360	1.224
7/15/18	0.10742	0.376	1.224
7/16/18	0.102776	0.360	1.224
7/17/18	0.100956	0.353	1.224
7/18/18	0.097517	0.341	1.224
7/19/18	0.103795	0.363	1.224
7/20/18	0.107018	0.375	1.224
7/21/18	0.10445	0.366	1.224
7/22/18	0.128864	0.451	1.224
7/23/18	0.10732	0.376	1.224
7/24/18	0.114034	0.399	1.224
7/25/18	0.116841	0.409	1.224
7/26/18	0.11265	0.394	1.224
7/27/18	0.108339	0.379	1.224
7/28/18	0.110616	0.387	1.224
7/29/18	0.104237	0.365	1.224
7/30/18	0.104409	0.365	1.224
7/31/18	0.105372	0.369	1.224



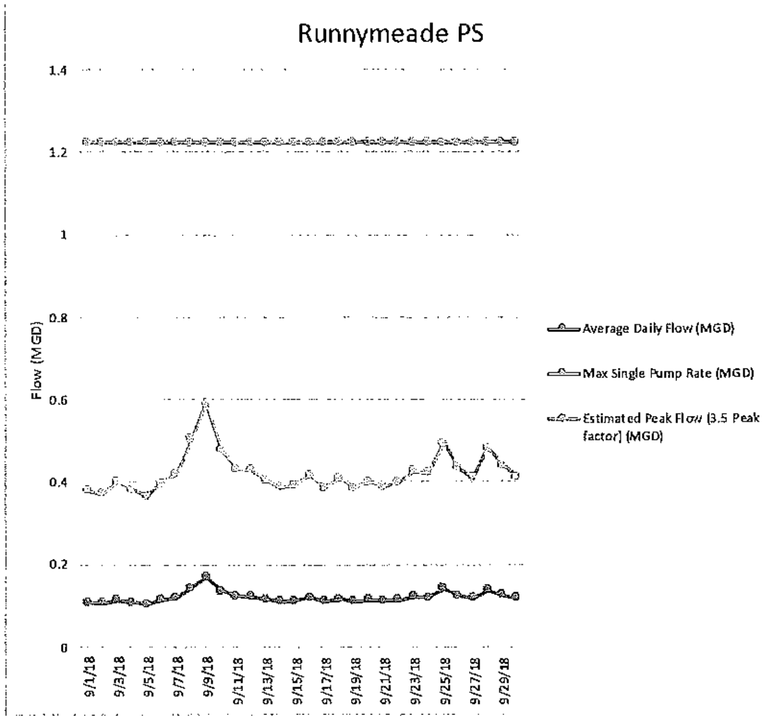
Min	0.092
Max	0.129
Ave	0.106

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
8/1/18	0.108073	0.378	1.224
8/2/18	0.106986	0.374	1.224
8/3/18	0.118061	0.413	1.224
8/4/18	0.107306	0.376	1.224
8/5/18	0.105302	0.369	1.224
8/6/18	0.107902	0.378	1.224
8/7/18	0.105305	0.369	1.224
8/8/18	0.105874	0.371	1.224
8/9/18	0.099684	0.349	1.224
8/10/18	0.107584	0.377	1.224
8/11/18	0.126335	0.442	1.224
8/12/18	0.119898	0.420	1.224
8/13/18	0.180892	0.633	1.224
8/14/18	0.112387	0.393	1.224
8/15/18	0.115383	0.404	1.224
8/16/18	0.116719	0.409	1.224
8/17/18	0.105274	0.368	1.224
8/18/18	0.118315	0.414	1.224
8/19/18	0.136342	0.477	1.224
8/20/18	0.118216	0.414	1.224
8/21/18	0.119264	0.417	1.224
8/22/18	0.120869	0.423	1.224
8/23/18	0.112313	0.393	1.224
8/24/18	0.110185	0.386	1.224
8/25/18	0.116297	0.407	1.224
8/26/18	0.10196	0.357	1.224
8/27/18	0.106273	0.372	1.224
8/28/18	0.108104	0.378	1.224
8/29/18	0.110178	0.386	1.224
8/30/18	0.102606	0.359	1.224
8/31/18	0.113706	0.398	1.224



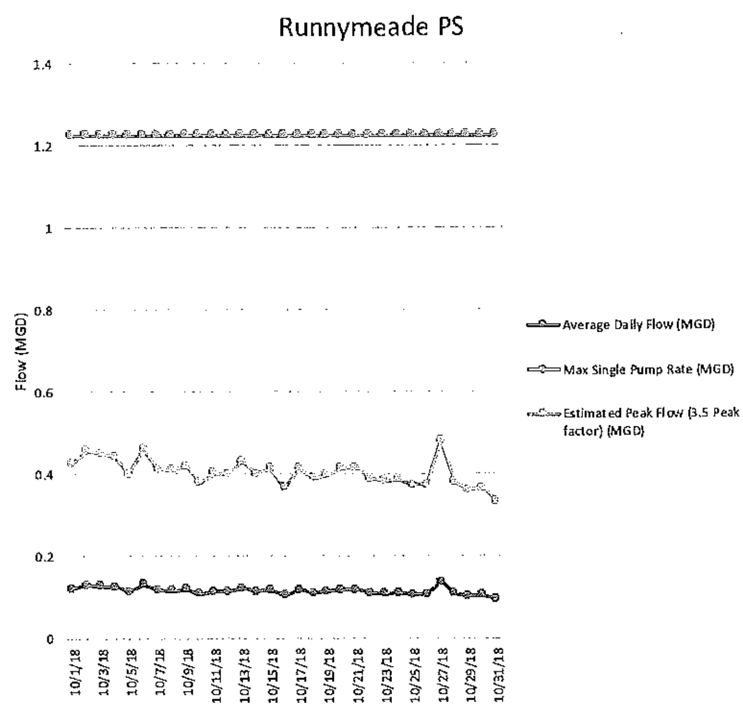
Min	0.100
Max	0.181
Ave	0.114

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
9/1/18	0.108622	0.380	1.224
9/2/18	0.106215	0.372	1.224
9/3/18	0.114783	0.402	1.224
9/4/18	0.108881	0.381	1.224
9/5/18	0.104719	0.367	1.224
9/6/18	0.113317	0.397	1.224
9/7/18	0.120209	0.421	1.224
9/8/18	0.14397	0.504	1.224
9/9/18	0.169004	0.592	1.224
9/10/18	0.136052	0.476	1.224
9/11/18	0.123479	0.432	1.224
9/12/18	0.122591	0.429	1.224
9/13/18	0.115742	0.405	1.224
9/14/18	0.110406	0.386	1.224
9/15/18	0.112043	0.392	1.224
9/16/18	0.119225	0.417	1.224
9/17/18	0.110263	0.386	1.224
9/18/18	0.116838	0.409	1.224
9/19/18	0.10978	0.384	1.224
9/20/18	0.114694	0.401	1.224
9/21/18	0.111328	0.390	1.224
9/22/18	0.113917	0.399	1.224
9/23/18	0.121945	0.427	1.224
9/24/18	0.120899	0.423	1.224
9/25/18	0.141174	0.494	1.224
9/26/18	0.123716	0.433	1.224
9/27/18	0.117501	0.411	1.224
9/28/18	0.138064	0.483	1.224
9/29/18	0.125665	0.440	1.224
9/30/18	0.11786	0.413	1.224



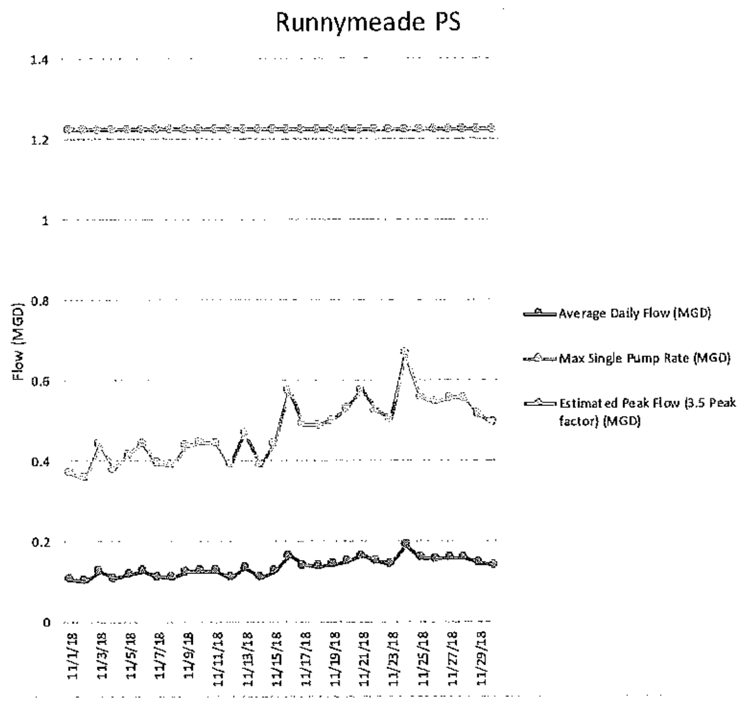
Min	0.105
Max	0.169
Ave	0.120

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
10/1/18	0.122477	0.429	1.224
10/2/18	0.130324	0.456	1.224
10/3/18	0.128661	0.450	1.224
10/4/18	0.126241	0.442	1.224
10/5/18	0.114239	0.400	1.224
10/6/18	0.131792	0.461	1.224
10/7/18	0.117509	0.411	1.224
10/8/18	0.117281	0.410	1.224
10/9/18	0.120192	0.421	1.224
10/10/18	0.108279	0.379	1.224
10/11/18	0.115045	0.403	1.224
10/12/18	0.11447	0.401	1.224
10/13/18	0.123077	0.431	1.224
10/14/18	0.11462	0.401	1.224
10/15/18	0.11837	0.414	1.224
10/16/18	0.104896	0.367	1.224
10/17/18	0.118395	0.414	1.224
10/18/18	0.111455	0.390	1.224
10/19/18	0.113712	0.398	1.224
10/20/18	0.118419	0.414	1.224
10/21/18	0.118852	0.416	1.224
10/22/18	0.11128	0.389	1.224
10/23/18	0.109441	0.383	1.224
10/24/18	0.110345	0.386	1.224
10/25/18	0.106453	0.373	1.224
10/26/18	0.106687	0.373	1.224
10/27/18	0.137762	0.482	1.224
10/28/18	0.108022	0.378	1.224
10/29/18	0.103171	0.361	1.224
10/30/18	0.104326	0.365	1.224
10/31/18	0.095442	0.334	1.224



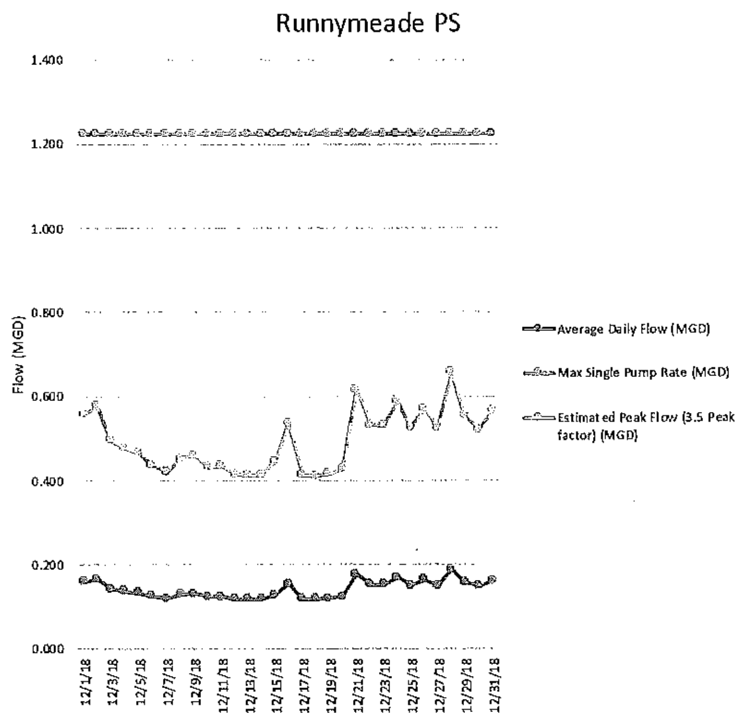
Min	0.095
Max	0.138
Ave	0.116

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
11/1/18	0.105923	0.3707305	1.224
11/2/18	0.102265	0.358	1.224
11/3/18	0.126598	0.443	1.224
11/4/18	0.108393	0.379	1.224
11/5/18	0.118769	0.416	1.224
11/6/18	0.126686	0.443	1.224
11/7/18	0.112532	0.394	1.224
11/8/18	0.111484	0.390	1.224
11/9/18	0.125373	0.439	1.224
11/10/18	0.127407	0.446	1.224
11/11/18	0.12692	0.444	1.224
11/12/18	0.111385	0.390	1.224
11/13/18	0.134357	0.470	1.224
11/14/18	0.111572	0.391	1.224
11/15/18	0.126989	0.444	1.224
11/16/18	0.164718	0.577	1.224
11/17/18	0.140145	0.491	1.224
11/18/18	0.139387	0.488	1.224
11/19/18	0.142675	0.499	1.224
11/20/18	0.151266	0.529	1.224
11/21/18	0.164362	0.575	1.224
11/22/18	0.149734	0.524	1.224
11/23/18	0.144225	0.505	1.224
11/24/18	0.190088	0.665	1.224
11/25/18	0.159194	0.557	1.224
11/26/18	0.155968	0.546	1.224
11/27/18	0.158914	0.556	1.224
11/28/18	0.158984	0.556	1.224
11/29/18	0.146975	0.514	1.224
11/30/18	0.141454	0.495	1.224



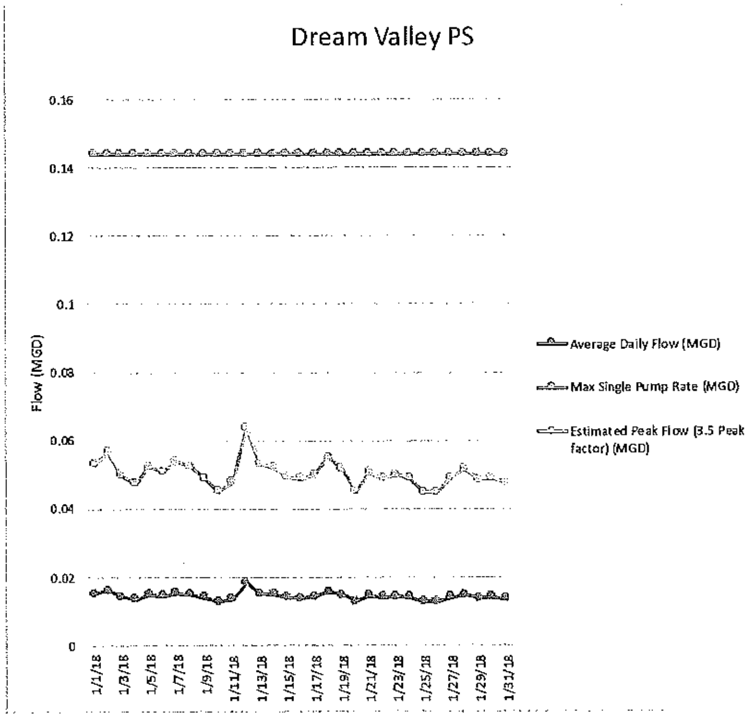
Min	0.102
Max	0.190
Ave	0.136

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
12/1/18	0.159021	0.557	1.224
12/2/18	0.164697	0.576	1.224
12/3/18	0.142049	0.497	1.224
12/4/18	0.136308	0.477	1.224
12/5/18	0.133295	0.467	1.224
12/6/18	0.12486	0.437	1.224
12/7/18	0.11968	0.419	1.224
12/8/18	0.129252	0.452	1.224
12/9/18	0.131395	0.460	1.224
12/10/18	0.123101	0.431	1.224
12/11/18	0.12415	0.435	1.224
12/12/18	0.118159	0.414	1.224
12/13/18	0.117875	0.413	1.224
12/14/18	0.117622	0.412	1.224
12/15/18	0.126764	0.444	1.224
12/16/18	0.153118	0.536	1.224
12/17/18	0.117895	0.413	1.224
12/18/18	0.117246	0.410	1.224
12/19/18	0.118864	0.416	1.224
12/20/18	0.122356	0.428	1.224
12/21/18	0.176321	0.617	1.224
12/22/18	0.152158	0.533	1.224
12/23/18	0.151745	0.531	1.224
12/24/18	0.168268	0.589	1.224
12/25/18	0.149876	0.525	1.224
12/26/18	0.163109	0.571	1.224
12/27/18	0.149807	0.524	1.224
12/28/18	0.187741	0.657	1.224
12/29/18	0.158322	0.554	1.224
12/30/18	0.148989	0.521	1.224
12/31/18	0.161293	0.565	1.224



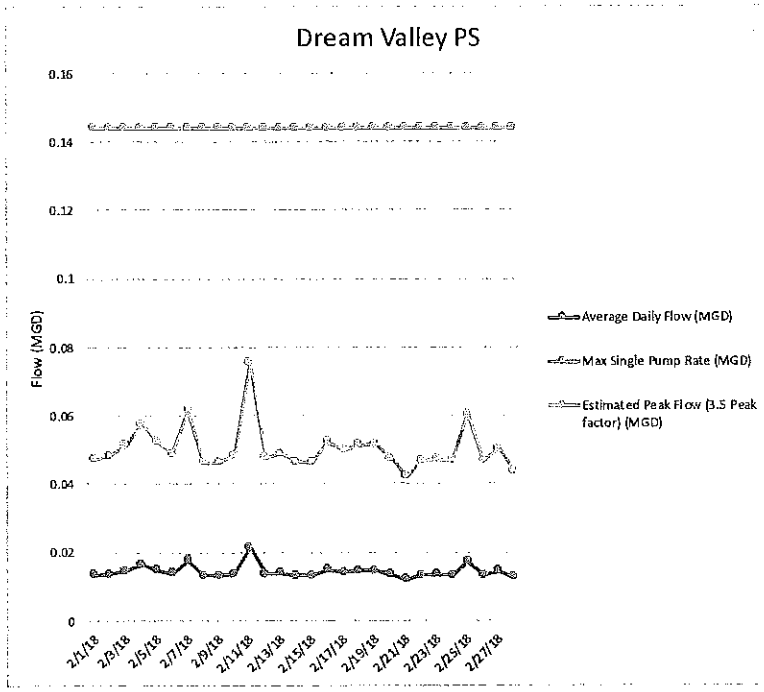
Min	0.117
Max	0.188
Ave	0.141

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
1/1/18	0.0151488	0.053	0.144
1/2/18	0.0162	0.057	0.144
1/3/18	0.0142272	0.050	0.144
1/4/18	0.0135648	0.047	0.144
1/5/18	0.0149472	0.052	0.144
1/6/18	0.0145296	0.051	0.144
1/7/18	0.0154368	0.054	0.144
1/8/18	0.0149184	0.052	0.144
1/9/18	0.0140256	0.049	0.144
1/10/18	0.0128592	0.045	0.144
1/11/18	0.0136656	0.048	0.144
1/12/18	0.0182592	0.064	0.144
1/13/18	0.0152064	0.053	0.144
1/14/18	0.0148608	0.052	0.144
1/15/18	0.0140976	0.049	0.144
1/16/18	0.0139248	0.049	0.144
1/17/18	0.0142848	0.050	0.144
1/18/18	0.0157392	0.055	0.144
1/19/18	0.0147168	0.052	0.144
1/20/18	0.0128736	0.045	0.144
1/21/18	0.0144576	0.051	0.144
1/22/18	0.0139824	0.049	0.144
1/23/18	0.014256	0.050	0.144
1/24/18	0.0139824	0.049	0.144
1/25/18	0.012816	0.045	0.144
1/26/18	0.012816	0.045	0.144
1/27/18	0.01404	0.049	0.144
1/28/18	0.0147168	0.052	0.144
1/29/18	0.0138672	0.049	0.144
1/30/18	0.013968	0.049	0.144
1/31/18	0.0136512	0.048	0.144

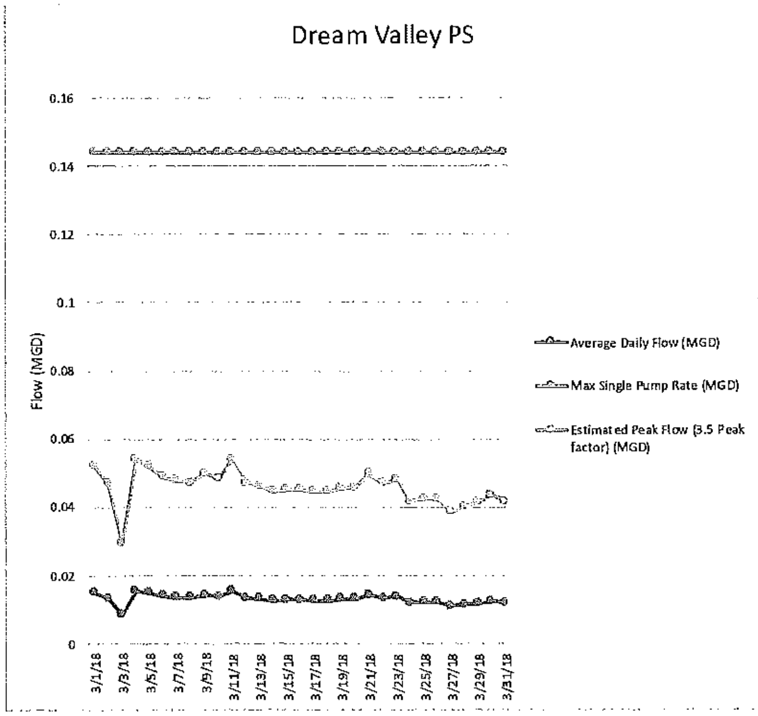


Min	0.013
Max	0.018
Ave	0.014

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2/1/18	0.0135072	0.047	0.144
2/2/18	0.013824	0.048	0.144
2/3/18	0.0146736	0.051	0.144
2/4/18	0.0164736	0.058	0.144
2/5/18	0.0150192	0.053	0.144
2/6/18	0.013968	0.049	0.144
2/7/18	0.0176112	0.062	0.144
2/8/18	0.0132336	0.046	0.144
2/9/18	0.013248	0.046	0.144
2/10/18	0.0138528	0.048	0.144
2/11/18	0.0216288	0.076	0.144
2/12/18	0.0136512	0.048	0.144
2/13/18	0.0139392	0.049	0.144
2/14/18	0.0132768	0.046	0.144
2/15/18	0.013248	0.046	0.144
2/16/18	0.0149904	0.052	0.144
2/17/18	0.0142704	0.050	0.144
2/18/18	0.0147168	0.052	0.144
2/19/18	0.0147744	0.052	0.144
2/20/18	0.0135504	0.047	0.144
2/21/18	0.012024	0.042	0.144
2/22/18	0.0133488	0.047	0.144
2/23/18	0.0135072	0.047	0.144
2/24/18	0.0133776	0.047	0.144
2/25/18	0.0172656	0.060	0.144
2/26/18	0.0133632	0.047	0.144
2/27/18	0.0143568	0.050	0.144
2/28/18	0.0124848	0.044	0.144

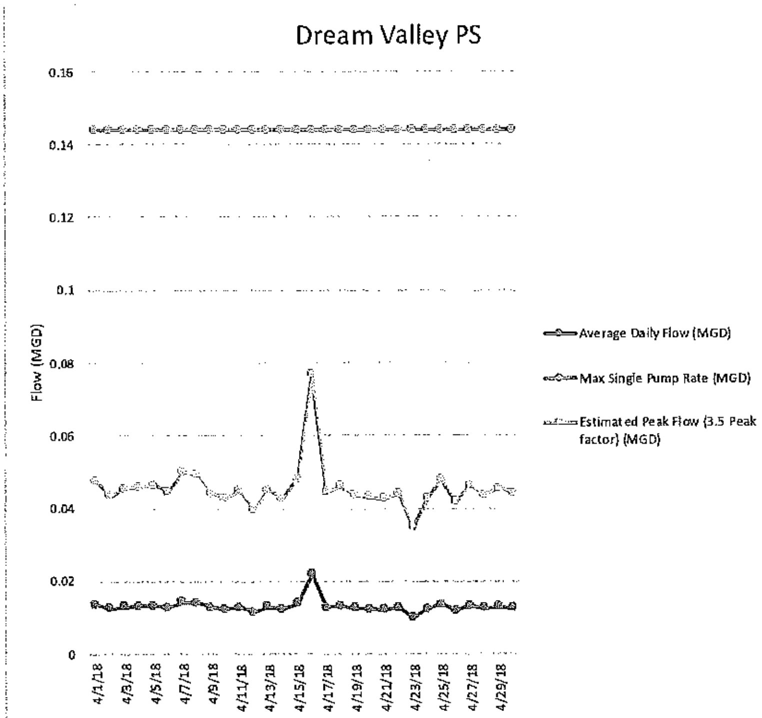


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
3/1/18	0.0148608	0.052	0.144
3/2/18	0.0134352	0.047	0.144
3/3/18	0.0084096	0.029	0.144
3/4/18	0.0155088	0.054	0.144
3/5/18	0.0148608	0.052	0.144
3/6/18	0.0139392	0.049	0.144
3/7/18	0.01368	0.048	0.144
3/8/18	0.0134928	0.047	0.144
3/9/18	0.014256	0.050	0.144
3/10/18	0.013824	0.048	0.144
3/11/18	0.0154944	0.054	0.144
3/12/18	0.013464	0.047	0.144
3/13/18	0.0132336	0.046	0.144
3/14/18	0.0127584	0.045	0.144
3/15/18	0.012888	0.045	0.144
3/16/18	0.0129024	0.045	0.144
3/17/18	0.012744	0.045	0.144
3/18/18	0.012744	0.045	0.144
3/19/18	0.013032	0.046	0.144
3/20/18	0.013104	0.046	0.144
3/21/18	0.0142128	0.050	0.144
3/22/18	0.0134496	0.047	0.144
3/23/18	0.013752	0.048	0.144
3/24/18	0.01188	0.042	0.144
3/25/18	0.0121536	0.043	0.144
3/26/18	0.0121104	0.042	0.144
3/27/18	0.0110304	0.039	0.144
3/28/18	0.0114912	0.040	0.144
3/29/18	0.011808	0.041	0.144
3/30/18	0.012456	0.044	0.144
3/31/18	0.0119088	0.042	0.144



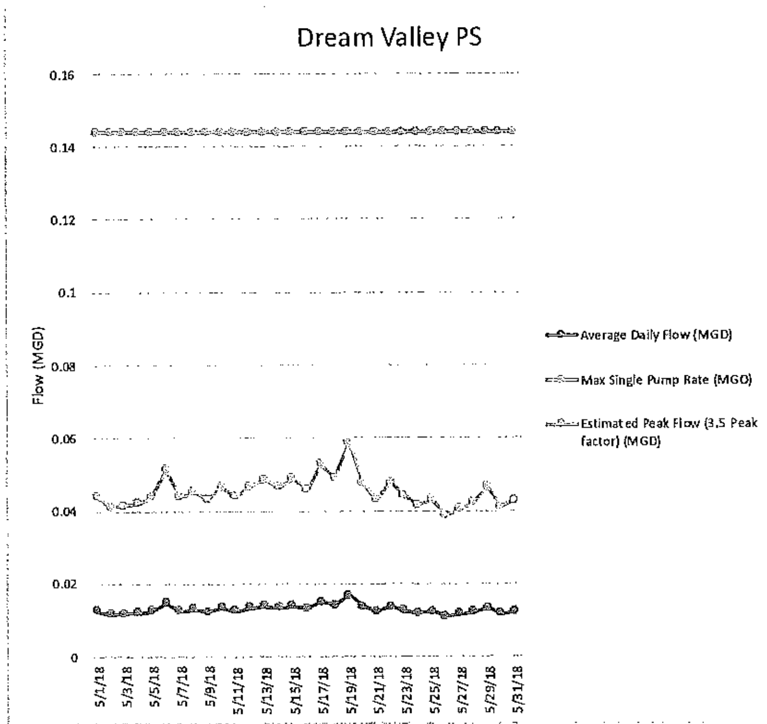
Min	0.008
Max	0.016
Ave	0.013

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
4/1/18	0.0135792	0.048	0.144
4/2/18	0.0123984	0.043	0.144
4/3/18	0.0129888	0.045	0.144
4/4/18	0.0130752	0.046	0.144
4/5/18	0.013248	0.046	0.144
4/6/18	0.0127152	0.045	0.144
4/7/18	0.0142992	0.050	0.144
4/8/18	0.0141264	0.049	0.144
4/9/18	0.0126144	0.044	0.144
4/10/18	0.01224	0.043	0.144
4/11/18	0.012816	0.045	0.144
4/12/18	0.0113328	0.040	0.144
4/13/18	0.0128592	0.045	0.144
4/14/18	0.0122112	0.043	0.144
4/15/18	0.0137664	0.048	0.144
4/16/18	0.0218592	0.077	0.144
4/17/18	0.0126864	0.044	0.144
4/18/18	0.0131472	0.046	0.144
4/19/18	0.012456	0.044	0.144
4/20/18	0.0122976	0.043	0.144
4/21/18	0.0121392	0.042	0.144
4/22/18	0.0126144	0.044	0.144
4/23/18	0.0099216	0.035	0.144
4/24/18	0.0121824	0.043	0.144
4/25/18	0.01368	0.048	0.144
4/26/18	0.01188	0.042	0.144
4/27/18	0.013248	0.046	0.144
4/28/18	0.0124416	0.044	0.144
4/29/18	0.0129744	0.045	0.144
4/30/18	0.0125856	0.044	0.144



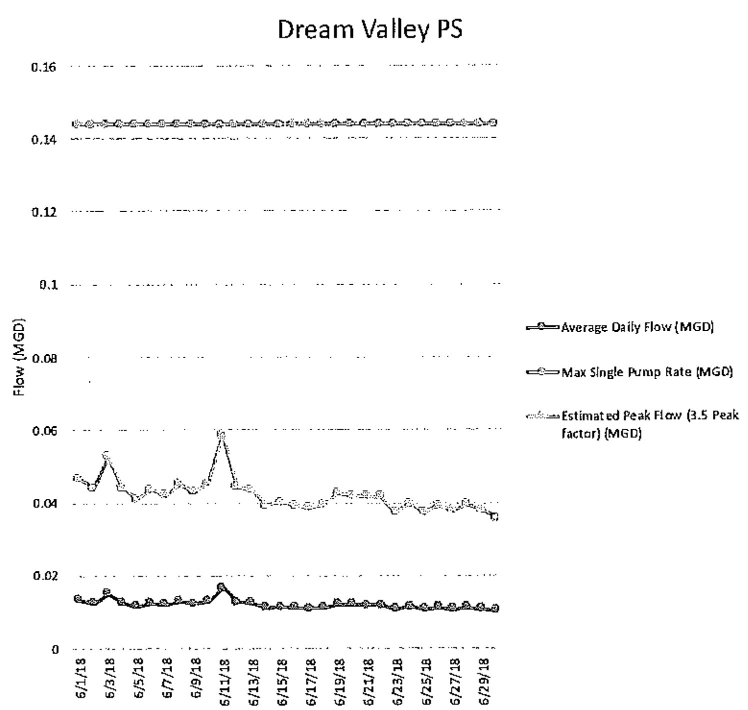
Min	0.010
Max	0.022
Ave	0.013

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
5/1/18	0.0125568	0.044	0.144
5/2/18	0.0117072	0.041	0.144
5/3/18	0.0118368	0.041	0.144
5/4/18	0.0120384	0.042	0.144
5/5/18	0.012528	0.044	0.144
5/6/18	0.014688	0.051	0.144
5/7/18	0.012528	0.044	0.144
5/8/18	0.012888	0.045	0.144
5/9/18	0.0123696	0.043	0.144
5/10/18	0.0132768	0.046	0.144
5/11/18	0.0125568	0.044	0.144
5/12/18	0.0133344	0.047	0.144
5/13/18	0.0138384	0.048	0.144
5/14/18	0.0132912	0.047	0.144
5/15/18	0.013896	0.049	0.144
5/16/18	0.013104	0.046	0.144
5/17/18	0.0150336	0.053	0.144
5/18/18	0.0139824	0.049	0.144
5/19/18	0.0167904	0.059	0.144
5/20/18	0.013536	0.047	0.144
5/21/18	0.0122832	0.043	0.144
5/22/18	0.0135792	0.048	0.144
5/23/18	0.0125856	0.044	0.144
5/24/18	0.0118224	0.041	0.144
5/25/18	0.0122688	0.043	0.144
5/26/18	0.0110592	0.039	0.144
5/27/18	0.0115344	0.040	0.144
5/28/18	0.0120384	0.042	0.144
5/29/18	0.0132624	0.046	0.144
5/30/18	0.0117216	0.041	0.144
5/31/18	0.0122112	0.043	0.144



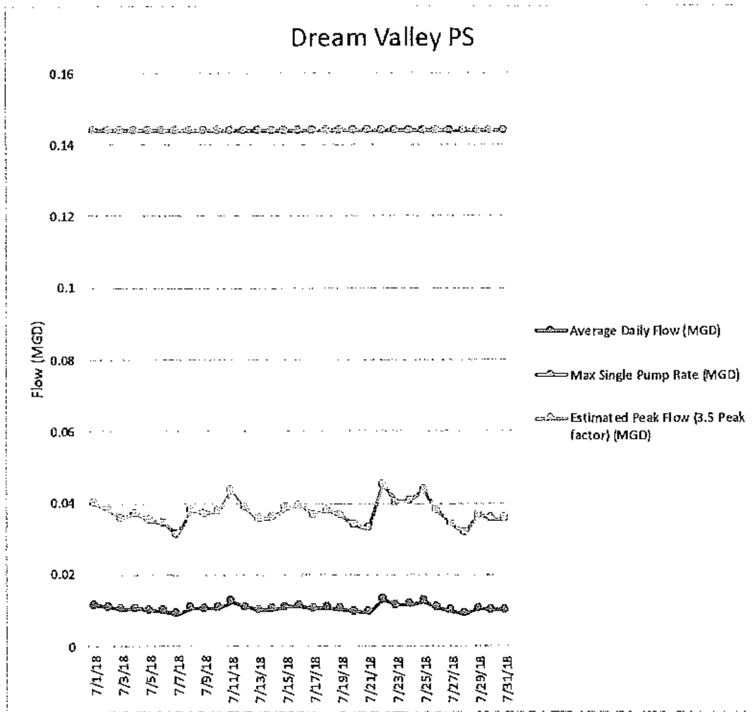
Min	0.011
Max	0.017
Ave	0.013

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
6/1/18	0.0133632	0.047	0.144
6/2/18	0.0125856	0.044	0.144
6/3/18	0.0150768	0.053	0.144
6/4/18	0.0125712	0.044	0.144
6/5/18	0.0117072	0.041	0.144
6/6/18	0.012456	0.044	0.144
6/7/18	0.0120528	0.042	0.144
6/8/18	0.0129312	0.045	0.144
6/9/18	0.0122976	0.043	0.144
6/10/18	0.0130032	0.046	0.144
6/11/18	0.0167904	0.059	0.144
6/12/18	0.0126432	0.044	0.144
6/13/18	0.0124992	0.044	0.144
6/14/18	0.0112176	0.039	0.144
6/15/18	0.011448	0.040	0.144
6/16/18	0.0111888	0.039	0.144
6/17/18	0.0110448	0.039	0.144
6/18/18	0.0112464	0.039	0.144
6/19/18	0.012168	0.043	0.144
6/20/18	0.0119808	0.042	0.144
6/21/18	0.0119232	0.042	0.144
6/22/18	0.0118944	0.042	0.144
6/23/18	0.0106704	0.037	0.144
6/24/18	0.0113472	0.040	0.144
6/25/18	0.010656	0.037	0.144
6/26/18	0.0112032	0.039	0.144
6/27/18	0.0107856	0.038	0.144
6/28/18	0.0112464	0.039	0.144
6/29/18	0.0108144	0.038	0.144
6/30/18	0.0102096	0.036	0.144



Min	0.010
Max	0.017
Ave	0.012

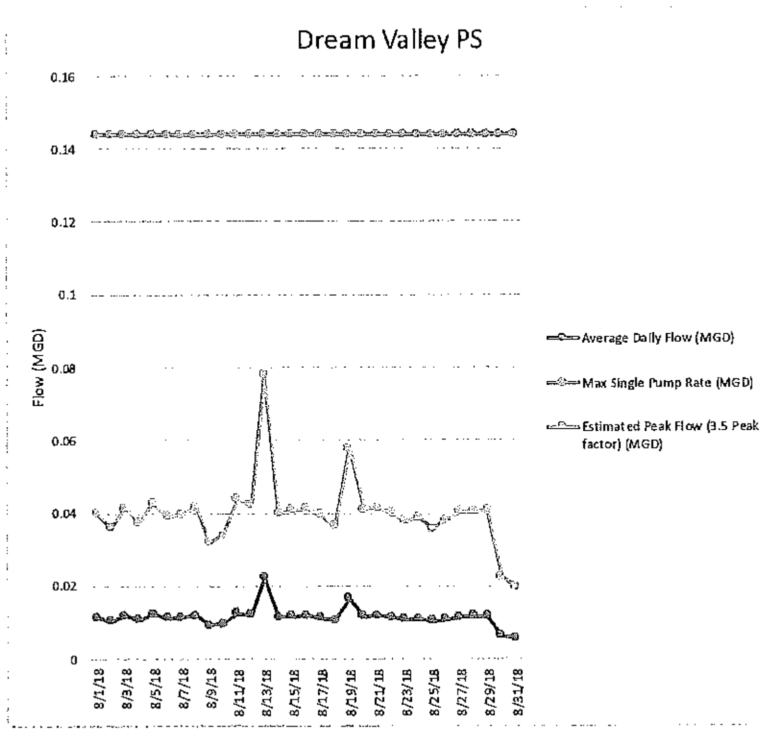
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
7/1/18	0.0114192	0.040	0.144
7/2/18	0.0109008	0.038	0.144
7/3/18	0.0101952	0.036	0.144
7/4/18	0.0105552	0.037	0.144
7/5/18	0.0100368	0.035	0.144
7/6/18	0.0098496	0.034	0.144
7/7/18	0.0089424	0.031	0.144
7/8/18	0.0108	0.038	0.144
7/9/18	0.0105552	0.037	0.144
7/10/18	0.0107568	0.038	0.144
7/11/18	0.0124992	0.044	0.144
7/12/18	0.0110448	0.039	0.144
7/13/18	0.0101664	0.036	0.144
7/14/18	0.0102672	0.036	0.144
7/15/18	0.0110304	0.039	0.144
7/16/18	0.0111888	0.039	0.144
7/17/18	0.0104832	0.037	0.144
7/18/18	0.0108144	0.038	0.144
7/19/18	0.0103968	0.036	0.144
7/20/18	0.0096336	0.034	0.144
7/21/18	0.0093744	0.033	0.144
7/22/18	0.0128448	0.045	0.144
7/23/18	0.0114336	0.040	0.144
7/24/18	0.0115632	0.040	0.144
7/25/18	0.0124128	0.043	0.144
7/26/18	0.0107424	0.038	0.144
7/27/18	0.0097776	0.034	0.144
7/28/18	0.0089856	0.031	0.144
7/29/18	0.0104256	0.036	0.144
7/30/18	0.0101376	0.035	0.144
7/31/18	0.0101664	0.036	0.144



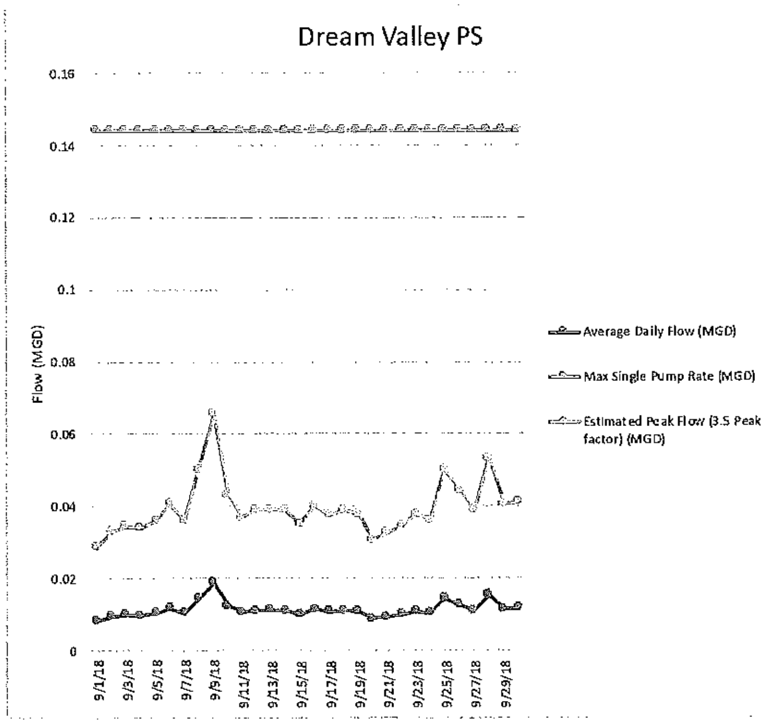
Min	0.009
Max	0.013
Ave	0.011

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
8/1/18	0.0113904	0.040	0.144
8/2/18	0.0102816	0.036	0.144
8/3/18	0.0118224	0.041	0.144
8/4/18	0.0106848	0.037	0.144
8/5/18	0.0121968	0.043	0.144
8/6/18	0.0111168	0.039	0.144
8/7/18	0.0113184	0.040	0.144
8/8/18	0.0119088	0.042	0.144
8/9/18	0.0091152	0.032	0.144
8/10/18	0.0096768	0.034	0.144
8/11/18	0.0125424	0.044	0.144
8/12/18	0.0121104	0.042	0.144
8/13/18	0.022248	0.078	0.144
8/14/18	0.0114192	0.040	0.144
8/15/18	0.0116352	0.041	0.144
8/16/18	0.011808	0.041	0.144
8/17/18	0.0112464	0.039	0.144
8/18/18	0.0104112	0.036	0.144
8/19/18	0.0165168	0.058	0.144
8/20/18	0.0116928	0.041	0.144
8/21/18	0.0118368	0.041	0.144
8/22/18	0.0114048	0.040	0.144
8/23/18	0.0107424	0.038	0.144
8/24/18	0.0110592	0.039	0.144
8/25/18	0.010224	0.036	0.144
8/26/18	0.0108	0.038	0.144
8/27/18	0.0115056	0.040	0.144
8/28/18	0.01152	0.040	0.144
8/29/18	0.0116496	0.041	0.144
8/30/18	0.0064224	0.022	0.144
8/31/18	0.0055872	0.020	0.144

Min	0.006
Max	0.022
Ave	0.011



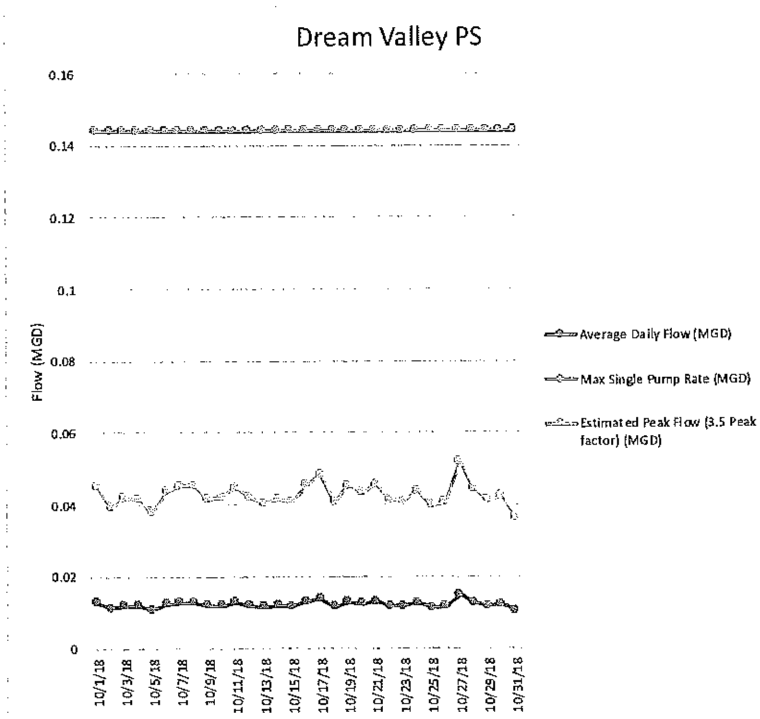
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
9/1/18	0.0082656	0.029	0.144
9/2/18	0.0094896	0.033	0.144
9/3/18	0.009864	0.035	0.144
9/4/18	0.0096912	0.034	0.144
9/5/18	0.0103104	0.036	0.144
9/6/18	0.0116064	0.041	0.144
9/7/18	0.0102816	0.036	0.144
9/8/18	0.0142848	0.050	0.144
9/9/18	0.0187344	0.066	0.144
9/10/18	0.0123264	0.043	0.144
9/11/18	0.0105552	0.037	0.144
9/12/18	0.0111456	0.039	0.144
9/13/18	0.0111744	0.039	0.144
9/14/18	0.011088	0.039	0.144
9/15/18	0.0100224	0.035	0.144
9/16/18	0.0114192	0.040	0.144
9/17/18	0.0107568	0.038	0.144
9/18/18	0.011088	0.039	0.144
9/19/18	0.0108	0.038	0.144
9/20/18	0.0087552	0.031	0.144
9/21/18	0.0093024	0.033	0.144
9/22/18	0.0098352	0.034	0.144
9/23/18	0.0107712	0.038	0.144
9/24/18	0.0102672	0.036	0.144
9/25/18	0.0143136	0.050	0.144
9/26/18	0.0127008	0.044	0.144
9/27/18	0.0111168	0.039	0.144
9/28/18	0.0152352	0.053	0.144
9/29/18	0.0115776	0.041	0.144
9/30/18	0.0117216	0.041	0.144



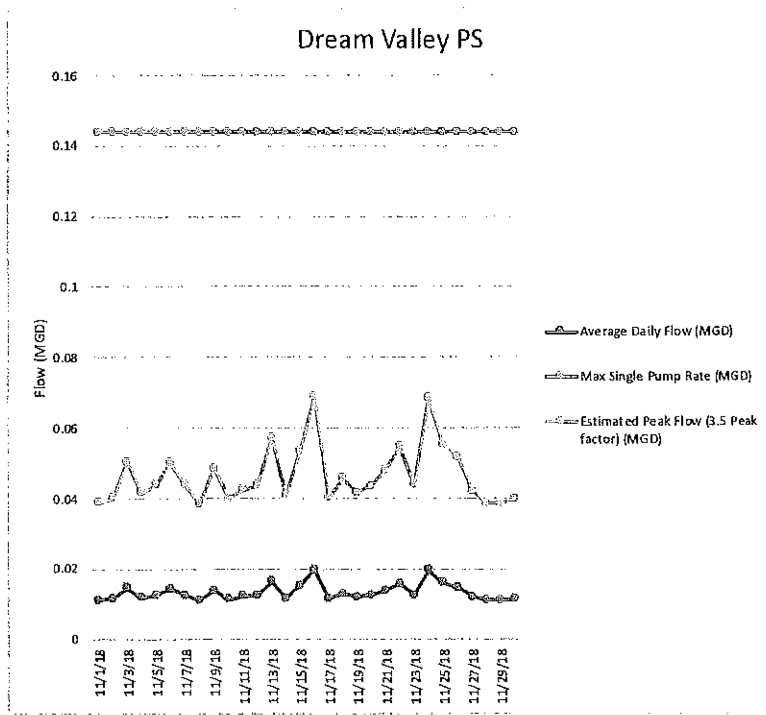
Min	0.008
Max	0.019
Ave	0.011

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
10/1/18	0.0129312	0.045	0.144
10/2/18	0.011232	0.039	0.144
10/3/18	0.0119664	0.042	0.144
10/4/18	0.0118944	0.042	0.144
10/5/18	0.0108144	0.038	0.144
10/6/18	0.0124704	0.044	0.144
10/7/18	0.01296	0.045	0.144
10/8/18	0.0129168	0.045	0.144
10/9/18	0.01188	0.042	0.144
10/10/18	0.0120384	0.042	0.144
10/11/18	0.0127872	0.045	0.144
10/12/18	0.0119664	0.042	0.144
10/13/18	0.0115632	0.040	0.144
10/14/18	0.0118656	0.042	0.144
10/15/18	0.0116928	0.041	0.144
10/16/18	0.0130176	0.046	0.144
10/17/18	0.013824	0.048	0.144
10/18/18	0.0115776	0.041	0.144
10/19/18	0.0129456	0.045	0.144
10/20/18	0.0123696	0.043	0.144
10/21/18	0.0130752	0.046	0.144
10/22/18	0.0117936	0.041	0.144
10/23/18	0.011664	0.041	0.144
10/24/18	0.0125568	0.044	0.144
10/25/18	0.0113184	0.040	0.144
10/26/18	0.0116208	0.041	0.144
10/27/18	0.0148752	0.052	0.144
10/28/18	0.0127152	0.045	0.144
10/29/18	0.011736	0.041	0.144
10/30/18	0.012096	0.042	0.144
10/31/18	0.0103824	0.036	0.144

Min	0.010
Max	0.015
Ave	0.012

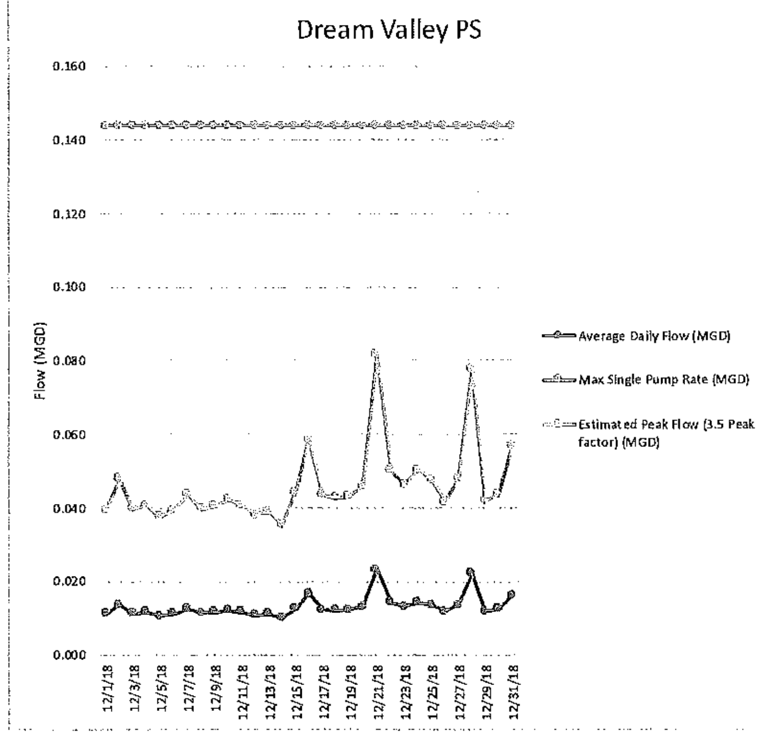


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
11/1/18	0.0110304	0.0386064	0.144
11/2/18	0.0114624	0.040	0.144
11/3/18	0.0144	0.050	0.144
11/4/18	0.011808	0.041	0.144
11/5/18	0.0125136	0.044	0.144
11/6/18	0.0142848	0.050	0.144
11/7/18	0.012456	0.044	0.144
11/8/18	0.0109728	0.038	0.144
11/9/18	0.0138672	0.049	0.144
11/10/18	0.0113616	0.040	0.144
11/11/18	0.0121104	0.042	0.144
11/12/18	0.0124848	0.044	0.144
11/13/18	0.016344	0.057	0.144
11/14/18	0.0116064	0.041	0.144
11/15/18	0.0152496	0.053	0.144
11/16/18	0.0196848	0.069	0.144
11/17/18	0.0114336	0.040	0.144
11/18/18	0.0129744	0.045	0.144
11/19/18	0.01188	0.042	0.144
11/20/18	0.0124272	0.043	0.144
11/21/18	0.0136944	0.048	0.144
11/22/18	0.0156096	0.055	0.144
11/23/18	0.0124848	0.044	0.144
11/24/18	0.0195264	0.068	0.144
11/25/18	0.0157968	0.055	0.144
11/26/18	0.0147888	0.052	0.144
11/27/18	0.0120096	0.042	0.144
11/28/18	0.0110016	0.039	0.144
11/29/18	0.011016	0.039	0.144
11/30/18	0.0113904	0.040	0.144



Min	0.011
Max	0.020
Ave	0.013

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
12/1/18	0.0112896	0.040	0.144
12/2/18	0.01368	0.048	0.144
12/3/18	0.0113328	0.040	0.144
12/4/18	0.0116208	0.041	0.144
12/5/18	0.0106848	0.037	0.144
12/6/18	0.0112752	0.039	0.144
12/7/18	0.012456	0.044	0.144
12/8/18	0.0113616	0.040	0.144
12/9/18	0.0116064	0.041	0.144
12/10/18	0.0120528	0.042	0.144
12/11/18	0.0116208	0.041	0.144
12/12/18	0.010872	0.038	0.144
12/13/18	0.0111744	0.039	0.144
12/14/18	0.0100656	0.035	0.144
12/15/18	0.0126144	0.044	0.144
12/16/18	0.0167472	0.059	0.144
12/17/18	0.0124416	0.044	0.144
12/18/18	0.0121824	0.043	0.144
12/19/18	0.0123264	0.043	0.144
12/20/18	0.0131328	0.046	0.144
12/21/18	0.0233712	0.082	0.144
12/22/18	0.0142992	0.050	0.144
12/23/18	0.0132768	0.046	0.144
12/24/18	0.0143712	0.050	0.144
12/25/18	0.0136656	0.048	0.144
12/26/18	0.0118944	0.042	0.144
12/27/18	0.01368	0.048	0.144
12/28/18	0.0221904	0.078	0.144
12/29/18	0.0119664	0.042	0.144
12/30/18	0.0125424	0.044	0.144
12/31/18	0.0162	0.057	0.144



Min	0.010
Max	0.023
Ave	0.013

Newtown Township

Will be forwarded when received.

Prospect Park Borough

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Borough of Prospect Park**	Permit No.:	**PAN/A**
Mailing Address:	**720 Maryland Ave**	Effective Date:	**N/A**
City, State, Zip:	**Prospect Park, PA 19076**	Expiration Date:	**N/A**
Contact Person:	**Deborah A. Hurst**	Renewal Due Date:	**N/A**
Title:	**Borough Secretary**	Municipality:	**Prospect Park Borough**
Phone:	**610-532-1007**	County:	**Delaware**
Email:	**dhurst@prospectparkborough.com**	Consultant Name:	**Catania Engineering Associates, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   Please note that the Chapter 94 Spreadsheet was used to show monthly average flows and projections; it is understood that this report is for a collection system only.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

   Check the appropriate boxes:

   ☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)
   ☐ List summarizing each extension or project attached (**Attachment**)
   ☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

   Comments:

   No sewer extensions were constructed or approved within the past calendar year. A copy of the sanitary sewer system map is attached.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

   Borough personnel and equipment and outside contractors are utilized for sewer system operation and maintenance on an as-needed basis.

   Prospect Park, in coordination with DELCORA, has flow metering equipment to monitor flows through the sanitary system. CSL Services, Inc. was contracted by DELCORA to calibrate and maintain the flow monitoring equipment throughout 2018. Calibration reports are maintained by DELCORA. Prospect Park utilizes flow data to assist in the identification of areas that require attention.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

   Check the appropriate boxes:

   ☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

   ☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

   Comments:

   No SSOs were reported for the 2018 calendar year.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

   Check the appropriate boxes:

   ☒ The collection system does not contain pump stations

   ☐ The collection system does contain pump stations (Number –)

   ☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

   c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

   Check the appropriate boxes:

   ☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

   ☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

- ☐ This report demonstrates an existing hydraulic overload condition.
- ☐ This report demonstrates a projected hydraulic overload condition.
- ☐ This report demonstrates an existing organic overload condition.
- ☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Deborah A. Hurst	Deborah A. Hurst
Name of Responsible Official	Signature
610-532-1007	2-21-2019
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Elizabeth A. Catania	Elizabeth A Catania
Name of Preparer	Signature
610-532-2884	2/21/19
Telephone No.	Date

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chapter 94 Spread: Sewage Treatment Pl

Reporting Year: 2018

Facility Name: Prospect Park Borough - CDCA

Permit No.:

Persons/EDU: 3.5

Existing Hydraulic Design Capacity: MGD
Upgrade Planned in Next 5 Years? Year:
Future Hydraulic Design Capacity: MGD

Existing Organic Design Capacity: lbs BOD5/day
Upgrade Planned in Next 5 Years? Year:
Future Organic Design Capacity: lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2014	2015	2016	2017	2018
January	1.15803	1.09747	0.82466	0.82466	0.77381
February	1.57221	0.97901	1.17092	1.17092	1.0764
March	1.3104	1.35713	0.95968	0.95968	1.15895
April	1.41543	1.03937	0.87683	0.87683	0.8715
May	1.28858	0.74754	1.09906	1.09906	0.90401
June	0.97335	0.89789	0.79768	0.79768	0.82415
July	0.85512	0.79123	0.76977	0.76977	0.65529
August	0.80649	0.60719	0.63984	0.63984	0.71257
September	0.76855	0.60953	0.67396	0.67396	0.85397
October	0.74641	0.691	0.64077	0.64077	0.82906
November	0.88797	0.64289	0.65597	0.65597	1.22856
December	0.96198	0.89046	0.79908	0.79908	1.15834
Annual Avg	1.06204343	0.86255895	0.82568555	0.82568555	0.92055037
Max 3-Mo Avg	1.43268104	1.14453697	1.00247735	1.00247735	1.07198786
Max : Avg Ratio	1.35	1.33	1.21	1.21	1.16
Existing EDUs	4,138.0	4,138.0	4,138.0	4,138.0	4,138.0
Flow/EDU (GPD)	256.7	208.4	199.5	199.5	222.5
Flow/Capita (GPD)	73.3	59.6	57.0	57.0	63.6
Exist. Overload?					

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2014	2015	2016	2017	2018
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Annual Avg					
Max Mo Avg					
Max : Avg Ratio					
Existing EDUs	4,138	4,138	4,138	4,138	4,138
Load/EDU					
Load/Capita					
Exist. Overload?					

Projected Flows for Next Five Years (MGD)

	2019	2020	2021	2022	2023
New EDUs	1.0	1.0	1.0	1.0	1.0
New EDU Flow	0.0002	0.0002	0.0002	0.0002	0.0002
Proj. Annual Avg	0.8995	0.8997	0.8999	0.9001	0.9003
Proj. Max 3-Mo Avg	1.12773	1.12798	1.12823	1.12849	1.12874
Proj. Overload?					

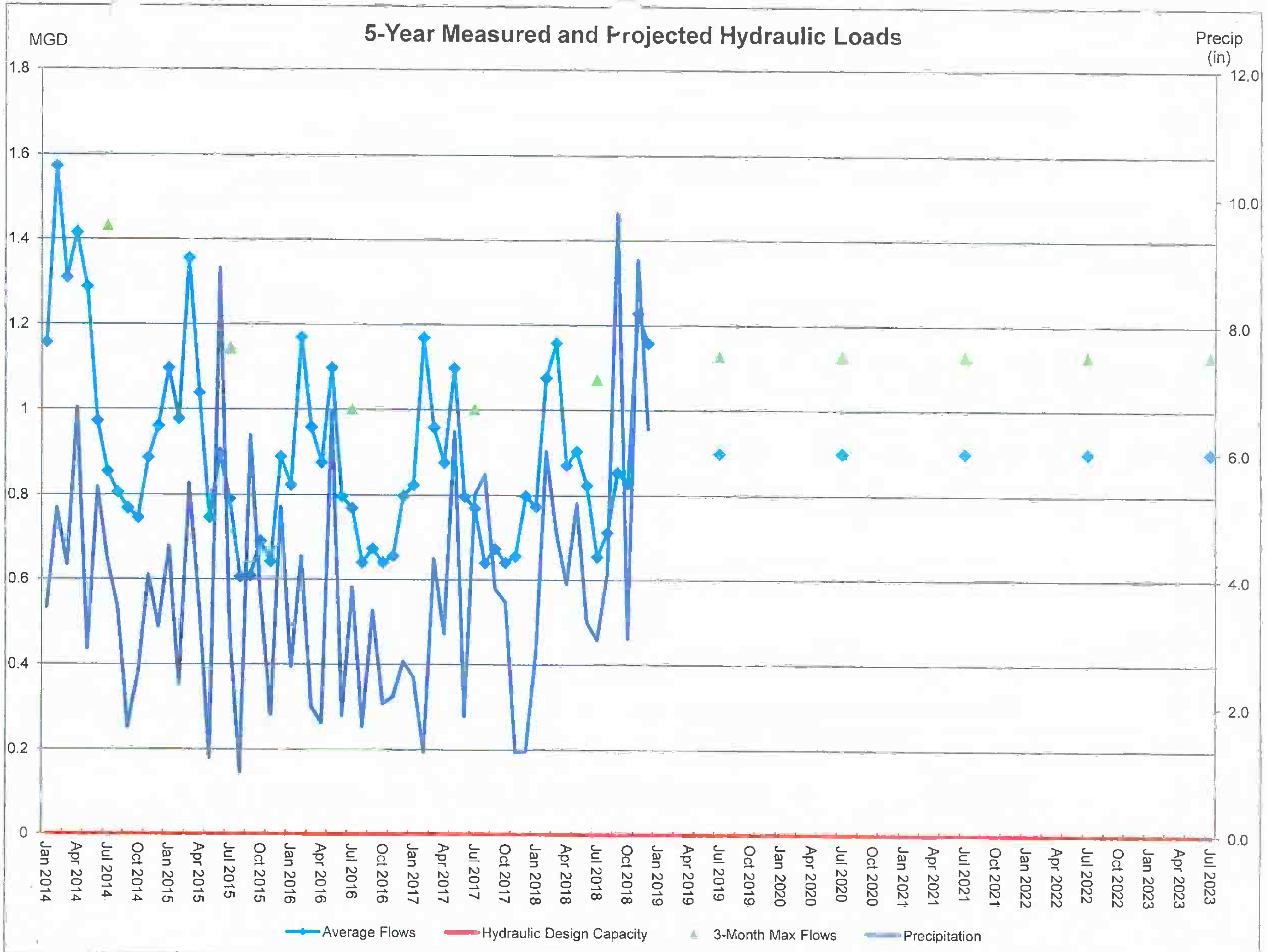
Projected BOD5 Loads for Next Five Years (lbs/day)

	2019	2020	2021	2022	2023
New EDUs	1	1	1	1	1
New EDU Load	0.584	0.584	0.584	0.584	0.584
Proj. Annual Avg	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Proj. Max Avg	#DIV/0!				
Proj. Overload?	#DIV/0!				

Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (inches)

Month	2014	2015	2016	2017	2018
January	3.56	4.52	2.63	2.48	2.85
February	5.12	2.36	4.36	1.3	6.02
March	4.23	5.52	2.01	4.33	4.74
April	6.69	3.58	1.75	3.15	3.94
May	2.91	1.2	6.65	6.33	5.21
June	5.46	8.89	1.87	1.86	3.34
July	4.3	3.16	3.88	5.35	3.06
August	3.55	0.98	1.7	5.66	4.11
September	1.69	6.27	3.52	3.86	9.76
October	2.54	3.76	2.06	3.66	3.08
November	4.07	1.89	2.17	1.3	9.03
December	3.27	5.14	2.72	1.31	6.38


5-Year Measured and Projected Hydraulic Loads
MGD
Precip (in)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 2014
Apr 2014
Jul 2014
Oct 2014
Jan 2015
Apr 2015
Jul 2015
Oct 2015
Jan 2016
Apr 2016
Jul 2016
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Jan 2017
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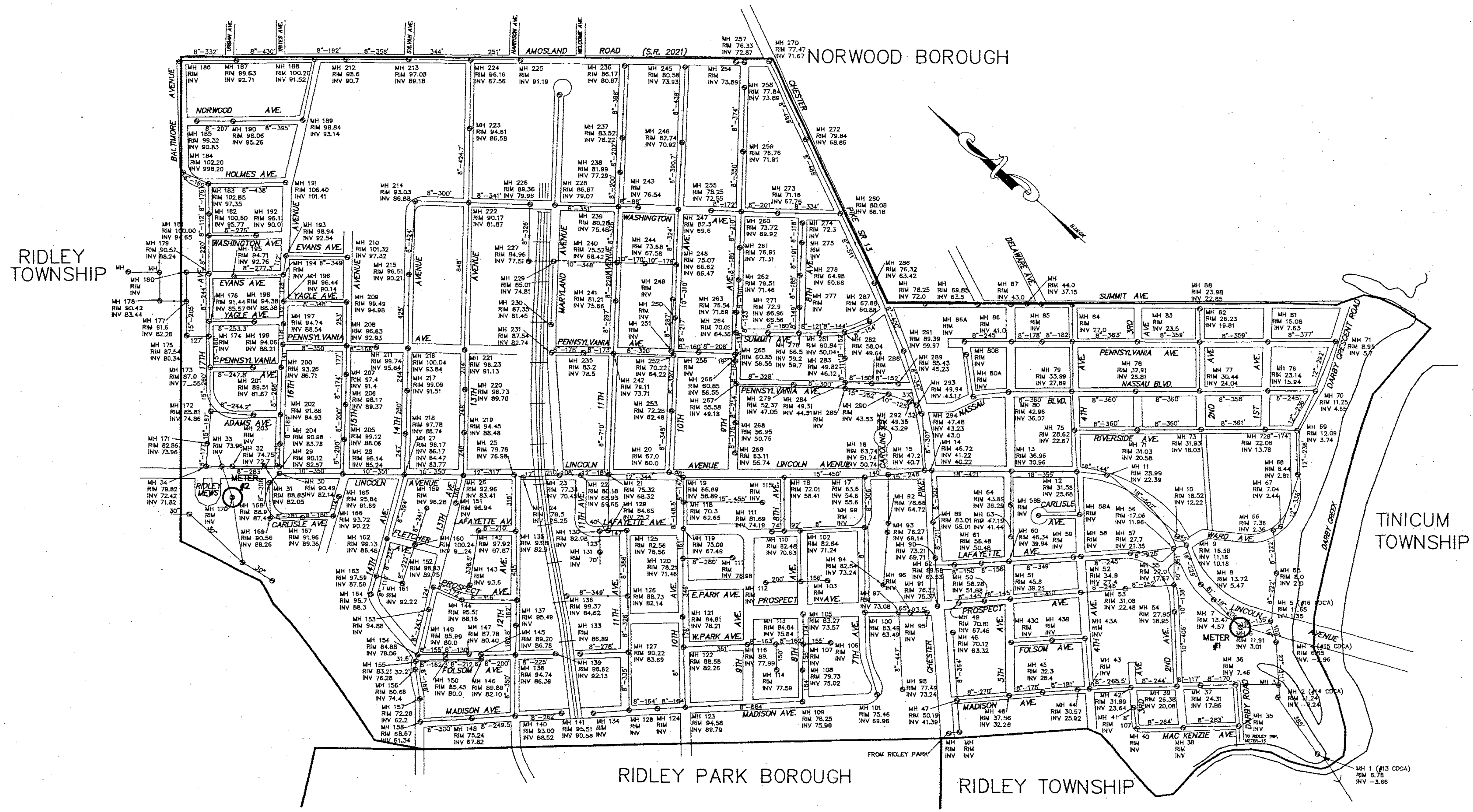
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Apr 2023
Jul 2023
Average Flows
Hydraulic Design Capacity
3-Month Max Flows
Precipitation

PROSPECT PARK BOROUGH MONTHLY FLOW METER DATA

Meter No.	Meter Location	Total EDUs	Outside EDUs	January			February			March			April			May			June			Comments
				Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	
1	Off Lincoln Avenue (SR-420, near Darby Creek)	2,601	306	16,022,197	200	*-1,792,722*	19,787,203	273	*-2,276,042*	23,137,515	290	*-2,488,989*	17,459,864	225	*-1,993,283*	18,951,742	238	*-1,989,047*	16,941,569	221	*-1,704,111*	Outside flow from Ridley Park Borough's Meter No.: 11
2	Off Lincoln Avenue (SR-420, near 16th Avenue)	715	283	6428072	314	*-2,225,453*	9,227,944	535	*-2,753,560*	10,322,264	520	*-3,364,582*	7,399,424	357	*-2,776,623*	7,553,992	341	*-2,983,292*	6,201,008	290	*-2,440,542*	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate).
	Unmetered Areas (average volume from all meters)	822		5,555,989	218		7,229,966	314		8,321,343	327		6,055,545	246		6,490,814	255		5,726,547	232		Use average EDU from all Propsect meters for estimate
	TOTAL	**4,138**	**589**	**23,988,083**			**31,215,511**			**35,927,551**			**26,144,927**			**28,024,209**			**24,724,471**			

Meter No.	Meter Location	Total EDUs	Outside EDUs	July			August			September			October			November			December			Comments
				Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	
1	Off Lincoln Avenue (SR-420, near Darby Creek)	2,601	306	14,066,073	175	*-1,593,580*	14,711,588	*185*	-1,576,696	16,556,660	217	-1,614,414	17,135,971	218	*-1,649,664*	22,763,598	300	*-2,112,508*	22,442,867	288	*-1,983,090*	Outside flow from Ridley Park Borough's Meter No.: 11
2	Off Lincoln Avenue (SR-420, near 16th Avenue)	715	283	5,091,727	234	*-1,955,167*	5,900,829	*287*	-2,062,353	7,017,838	366	-2,274,844	6,454,499	318	*-2,192,657*	10,716,257	592	*-3,047,116*	10,084,752	533	*-2,952,827*	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate).
	Unmetered Areas (average volume from all meters)	822		4,705,039	185		5,116,285	*201*		5,933,725	241		5,952,687	234		8,536,571	346		8,316,971	326		Use average EDU from all Propsect meters for estimate
	TOTAL	**4,138**	**589**	**20,314,092**			**22,089,653**			**25,618,965**			**25,700,836**			**36,856,802**			**35,908,673**			



GRAPHIC SCALE

(IN FEET)
1 inch = 300 ft.

INFORMATION SHOWN ON THIS PLAN IS THE RESULT OF PROFESSIONAL SERVICES RENDERED BY CATANIA ENGINEERING ASSOCIATES, INC. REPRODUCTION OF THIS PLAN FOR THE PURPOSE OF CREATING ADDITIONAL COPIES OR REVISING PLAN WITHOUT APPROVAL OF CATANIA ENGINEERING ASSOCIATES, INC. IS PROHIBITED. CERTIFICATION FOR THE WORK CONTAINED HEREIN IS LIMITED TO THE ENTITY FOR WHOM THE WORK WAS PERFORMED, AS OF THE DATE SHOWN ON THE PLAN.

NO.	DATE	REVISION	DWN. BY	CKD. BY
1	2/14/13	UPDATE	J.M.D	D.A.

CATANIA ENGINEERING ASSOCIATES, INC.
Consulting Engineers
520 WEST MacDADE BOULEVARD
MILMONT PARK, PA. 19033-3311
TEL. (610) 532-2884
FAX. (610) 532-2923

ELIZABETH A. CATANIA
ENGINEER

SANITARY SEWER MAP
BOROUGH OF PROSPECT PARK

BOROUGH OF PROSPECT PARK — DELAWARE COUNTY, PA.

DWN. BY	J.M.D.	DSG. BY	FIELD BOOK/PAGE	SCALE	1" = 300'	DRAWING NO.	84300 112-PV-08
CKD. BY	E.A.C.			DATE	09-17-08	SHEET	1 OF 1 SHEETS

Industrial Waste Report

DELCORA is currently responsible for issuance of Industrial Waste Permits to companies discharging into Prospect Park Borough Sewers. The regulation governing discharge of the industrial wastes as well as any program for surveillance and monitoring of industrial waste discharges is maintained by DELCORA.

There are no known industrial permits for the Borough system.

Ridley Park Borough

Ridley Park Borough

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Borough of Ridley Park**	Permit No.:	**PAN/A**
Mailing Address:	**105 East Ward Street**	Effective Date:	**N/A**
City, State, Zip:	**Ridley Park, PA 19078**	Expiration Date:	**N/A**
Contact Person:	**Richard Tutak**	Renewal Due Date:	**N/A**
Title:	**Borough Manager**	Municipality:	**Ridley Park Borough**
Phone:	**610-532-2100**	County:	**Delaware**
Email:	**manager@ridleyparkborough.org**	Consultant Name:	**Catania Engineering Associates, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

Please note that the Chapter 94 Spreadsheet was used to show monthly average flows and projections; it is understood that this report is for a collection system only.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

- ☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)
- ☐ List summarizing each extension or project attached (**Attachment**)
- ☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

No sewer extensions were constructed or approved within the past calendar year. A copy of the sanitary sewer system map is available upon request.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

Borough forces are used for troubleshooting of the sanitary sewer system. Contract forces are used for routine maintenance.

Ridley Park, in coordination with DELCORA has flow metering equipment to monitor flows through the sanitary system. CSL Services, Inc. was contracted by DELCORA to calibrate and maintain the flow monitoring equipment throughout 2018. Calibration reports are maintained by DELCORA. Ridley Park currently has 9 flow meters installed that monitor approximately 79% of the total flow throughout the Borough.

Flow data is utilized to assist in the identification of areas that require attention.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

Based upon previous video inspections, the system is in fair to good condition. There are no known areas of capacity exceedance and no areas of capacity exceedance expected in the next five years.

Ridley Park had no SSOs in 2018.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number –)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

   c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

Check the appropriate boxes:

☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

☐ This report demonstrates an existing hydraulic overload condition.
☐ This report demonstrates a projected hydraulic overload condition.
☐ This report demonstrates an existing organic overload condition.
☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Richard Tutak	[signature]
Name of Responsible Official	Signature
610-532-2100	2/19/2019
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Charles Catania Jr.	Charles J Catania Jr
Name of Preparer	Signature
610-532-2884	2/19/19
Telephone No.	Date

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chapter 94 Spread
Sewage Treatment Pl

Reporting Year: 2018

Facility Name: Ridley Park Borough - CDCA

Permit No.:

Persons/EDU: 3.5

Existing Hydraulic Design Capacity: MGD
Upgrade Planned in Next 5 Years? Year:
Future Hydraulic Design Capacity: MGD

Existing Organic Design Capacity: lbs BOD5/day
Upgrade Planned in Next 5 Years? Year:
Future Organic Design Capacity: lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2014	2015	2016	2017	2018
January	1.24542	1.1955	1.04015	0.87994	0.93702
February	1.46788	1.10392	1.29622	0.84909	1.2381
March	1.3186	1.56442	1.11378	1.05817	1.39923
April	1.38261	1.19006	0.95855	1.03113	1.21801
May	1.29731	1.04291	1.07091	1.03068	1.17681
June	1.08315	1.21052	0.91202	0.90997	1.0134
July	0.97393	1.12716	0.84291	0.96022	0.89188
August	0.92689	0.91466	0.77686	0.96441	0.91693
September	0.88205	0.90975	0.76382	0.88738	1.00837
October	0.88025	0.97091	0.75011	0.84808	0.97414
November	0.98609	0.86055	0.7531	0.81972	1.34496
December	1.06239	1.06553	0.85661	0.82404	1.27823
Annual Avg	1.12554659	1.09632416	0.92791913	0.92190374	1.11642496
Max 3-Mo Avg	1.38969386	1.28794766	1.15005105	1.0399938	1.28511563
Max : Avg Ratio	1.23	1.17	1.24	1.13	1.15
Existing EDUs	3,803.0	3,803.0	3,803.0	3,803.0	3,803.0
Flow/EDU (GPD)	296.0	288.3	244.0	242.4	293.6
Flow/Capita (GPD)	84.6	82.4	69.7	69.3	83.9
Exist. Overload?					

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2014	2015	2016	2017	2018
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Annual Avg					
Max Mo Avg					
Max : Avg Ratio					
Existing EDUs	3,803	3,803	3,803	3,803	3,803
Load/EDU					
Load/Capita					
Exist. Overload?					

Projected Flows for Next Five Years (MGD)

	2019	2020	2021	2022	2023
New EDUs	1.0	1.0	1.0	1.0	1.0
New EDU Flow	0.0003	0.0003	0.0003	0.0003	0.0003
Proj. Annual Avg	1.03792	1.03822	1.03852	1.03882	1.03912
Proj. Max 3-Mo Avg	1.23057	1.23093	1.23128	1.23164	1.232
Proj. Overload?					

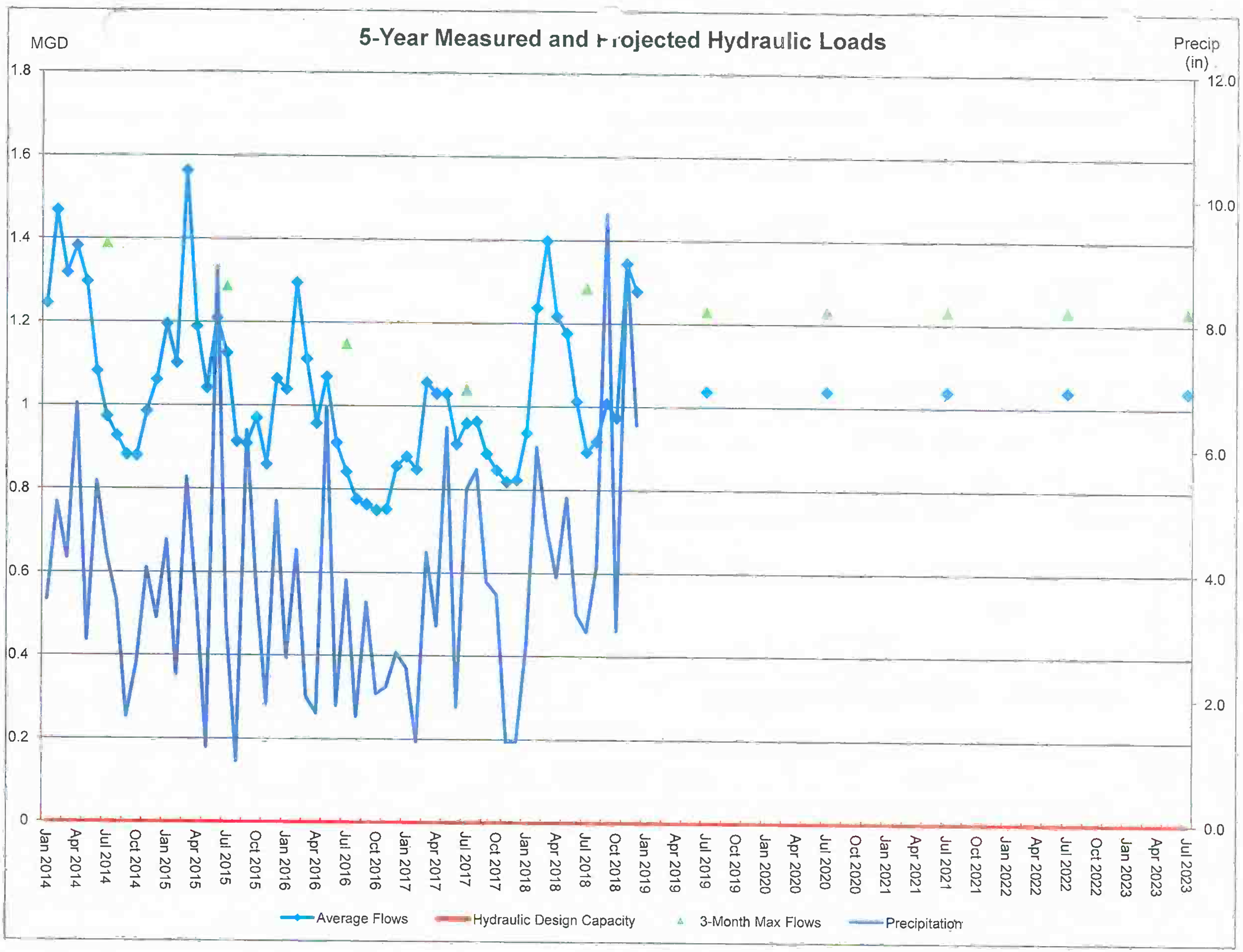
Projected BOD5 Loads for Next Five Years (lbs/day)

	2019	2020	2021	2022	2023
New EDUs	1	1	1	1	1
New EDU Load	0.584	0.584	0.584	0.584	0.584
Proj. Annual Avg	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Proj. Max Avg	#DIV/0!				
Proj. Overload?	#DIV/0!				

Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (Inches)

Month	2014	2015	2016	2017	2018
January	3.56	4.52	2.63	2.48	2.85
February	5.12	2.36	4.36	1.3	6.02
March	4.23	5.52	2.01	4.33	4.74
April	6.69	3.58	1.75	3.15	3.94
May	2.91	1.2	6.65	6.33	5.21
June	5.46	8.89	1.87	1.86	3.34
July	4.3	3.16	3.88	5.35	3.06
August	3.55	0.98	1.7	5.66	4.11
September	1.69	6.27	3.52	3.86	9.76
October	2.54	3.76	2.06	3.66	3.08
November	4.07	1.89	2.17	1.3	9.03
December	3.27	5.14	2.72	1.31	6.38


5-Year Measured and Projected Hydraulic Loads
MGD
Precip (in)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 2014
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Jan 2022
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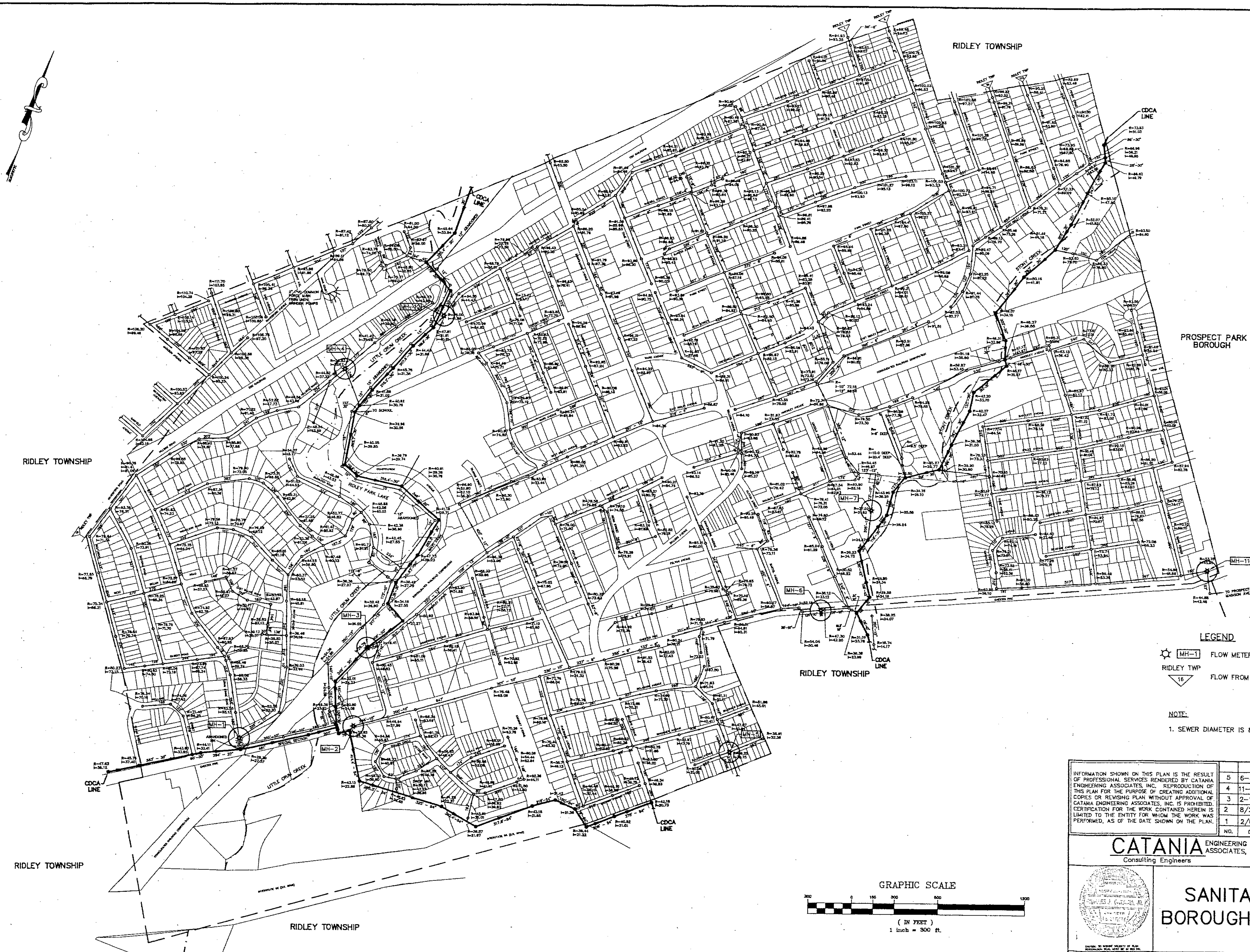
Jul 2022
Oct 2022
Jan 2023
Apr 2023
Jul 2023
Average Flows
Hydraulic Design Capacity
3-Month Max Flows
Precipitation

RIDLEY PARK BOROUGH MONTHLY FLOW METER DATA

Meter No.	Meter Location	Total EDUs	Outside EDUs	January			February			March			April			May			June			Comments
				Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	
1	Chester Pike (west of Little Crum Creek)	239	18	2,278,528	312	*-141,548*	2,924,193	444	*-175,138*	3,219,255	439	*-214,002*	2,639,877	372	*-176,605*	2,530,566	342	*-189,750*	2,090,172	292	*-155,229*	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate)
2	Chester Pike (near Myrtle)	226		1,487,051	212		1,812,458	286		2,529,244	361		1,936,055	286		2,084,572	298		1,737,110	256		
3	Hinkley Avenue (near Henderson Avenue)	328		4,350,344	428		5,478,129	596		7,726,048	760		6,224,403	633		5,763,256	567		5,085,843	517		
4	Hillside Road	63		652,173	334		1,193,318	676		1,786,925	915		1,564,619	828		1,619,432	829		1,306,521	691		
5	Ladomus Avenue (at Baldwin)	76		746,697	317		849,231	399		898,397	381		869,219	381		886,560	376		769,455	337		
6	Off Chester Pike (at Morton Avenue)	606		3,921,288	209		3,734,796	220		4,466,451	238		4,166,338	229		4,028,310	214		3,251,697	179		
7	Behind Morton Avenue	727		5,364,375	238		5,744,812	282		6,877,296	305		5,902,984	271		6,306,579	280		5,454,762	250		
11	Chester Pike (near Burk Avenue)	306		1,792,722	189		2,276,042	266		2,488,989	262		1,993,283	217		1,989,047	210		1,704,111	186		Flows thru Prospect Park Borough's Meter No.: 1
12	214 W. Rogers Street (down path, in front)	425	7	2,446,424	185	*-55,047*	3,492,115	293	*-68,109*	4,415,413	334	*-83,223*	3,683,696	288	*-68,680*	3,743,752	283	*-73,792*	2,724,006	212	*-60,367*	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate).
	Unmetered Areas (average volume from all meters)	807		6,204,748	248		7,405,019	328		9,265,369	370		7,805,216	322		7,792,543	311		6,494,050	268		Use average EDU from all Propsect meters for estimate
	TOTAL	**3,803**	**25**	**29,047,755**			**34,666,866**			**43,376,162**			**36,540,405**			**36,481,075**			**30,402,131**			

Meter No.	Meter Location	Total EDUs	Outside EDUs	July			August			September			October			November			December			Comments
				Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	
1	Chester Pike (west of Little Crum Creek)	239	18	2,007,613	275	*-124,357*	2,113,161	289	*-131,174*	2,476,658	352	*-144,690*	2,701,599	374	*-139,462*	3,419,711	487	*-193,810*	3,543,242	490	*-187,812*	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate)
2	Chester Pike (near Myrtle)	226		1,423,605	203		1,553,334	222		1,744,838	257		1,621,257	231		2,485,664	367		2,332,381	333		
3	Hinkley Avenue (near Henderson Avenue)	328		4,512,996	444		4,562,072	449		4,596,229	467		4,417,750	434		7,870,273	800		7,320,569	720		
4	Hillside Road	63		797,482	408		709,084	363		860,222	455		843,323	432		1,732,890	917		1,815,827	930		
5	Ladomus Avenue (at Baldwin)	76		637,039	270		657,352	279		747,201	328		742,975	315		754,380	331		780,315	331		
6	Off Chester Pike (at Morton Avenue)	606		2,923,814	156		3,155,152	168		3,096,182	170		3,319,754	177		3,584,877	197		3,579,002	191		
7	Behind Morton Avenue	727		5,353,291	238		5,446,087	242		5,802,233	266		5,730,071	254		5,926,066	272		5,998,422	266		
11	Chester Pike (near Burk Avenue)	306		1,593,580	168		1,576,696	166		1,614,414	176		1,649,664	174		2,112,508	230		1,983,090	209		Flows thru Prospect Park Borough's Meter No.: 1
2	214 W. Rogers Street (down path, in front)	425		2,665,699	202	*-48,361*	2,762,478	209	*-51,012*	3,052,355	239	*-56,268*	2,915,192	221	*-54,235*	4,112,874	322	*-75,370*	4,069,003	308	*-73,038*	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate).
	Unmetered Areas (average volume from all meters)	807		5,905,795	236		6,071,712	243		6,461,806	267		6,450,537	258		8,618,701	356		8,464,129	338		Use average EDU from all Propsect meters for estimate
	TOTAL	**3,803**	18	**27,648,196**			**28,424,942**			**30,251,180**			**30,198,425**			**40,348,764**			**39,625,130**			



NOTE:

1. SEWER DIAMETER IS 8" UNLESS OTHERWISE NOTED.

INFORMATION SHOWN ON THIS PLAN IS THE RESULT OF PROFESSIONAL SERVICES RENDERED BY CATANIA ENGINEERING ASSOCIATES, INC. REPRODUCTION OF THIS PLAN FOR THE PURPOSE OF CREATING ADDITIONAL COPIES OR REVISING PLAN WITHOUT APPROVAL OF CATANIA ENGINEERING ASSOCIATES, INC. IS PROHIBITED. CERTIFICATION FOR THE WORK CONTAINED HEREIN IS LIMITED TO THE ENTITY FOR WHOM THE WORK WAS PERFORMED, AS OF THE DATE SHOWN ON THE PLAN.

NO.	DATE	REVISION	DWN. BY	CKD. BY
5	6-17-15	LAT. CONN. CRESSWELL ST	J.M.D.	
4	11-13-13	KING COURT ADDED	J.A.S.	
3	2-18-13	FLOW METERS ADDED	P.H.M	N.M
2	8/20/09	ADD KEARNEY PLACE	J.M.D.	C.J.C.
1	2/08/07		J.M.D.	C.J.C.

CATANIA ENGINEERING ASSOCIATES, INC.
Consulting Engineers
520 WEST MacDADE BOULEVARD
MILMONT PARK, PA. 19033-3311
TEL. (610) 532-2884
FAX. (610) 532-2923

SANITARY SEWER MAP
BOROUGH OF RIDLEY PARK

DWN. BY M.N.G. CKD. BY C.J.C. | DSG. BY C. | FIELD BOOK/PAGE C. | SCALE 1" = 300' DATE 03/08/04 | DRAWING NO. 83600 SHEET 1 OF 1 SHEETS

Industrial Waste Report

DELCORA is currently responsible for issuance of Industrial Waste Permits to companies discharging into Ridley Park Borough Sewers. The regulation governing discharge of the industrial wastes as well as any program for surveillance and monitoring of industrial waste discharges is maintained by DELCORA.

There are no known industrial permits for the Ridley Park system.

Ridley Township

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION

Permittee Name:	**Township of Ridley**	Permit No.:	**PAN/A**
Mailing Address:	**100 East MacDade Boulevard**	Effective Date:	**N/A**
City, State, Zip:	**Folsom, PA 19033**	Expiration Date:	**N/A**
Contact Person:	**Ed Pisani**	Renewal Due Date:	**N/A**
Title:	**Township Manager**	Municipality:	**Ridley Township**
Phone:	**610-534-4806**	County:	**Delaware**
Email:	**episani@ridleytwp.org**	Consultant Name:	**Catania Engineering Associates, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   Please note that the Chapter 94 Spreadsheet was used to show monthly average flows and projections; it is understood that this report is for a collection system only.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

   Check the appropriate boxes:

   ☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)

   ☐ List summarizing each extension or project attached (**Attachment**)

   ☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

   Comments:

   No sewer extensions were constructed or approved within the past calendar year. A copy of the sanitary sewer system map is attached.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

   See attachment.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

Based upon a periodic video inspection, the system is in fair to good condition. No SSOs were reported for the 2018 calendar year.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number – **0**)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

   c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

Check the appropriate boxes:

☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

☐ This report demonstrates an existing hydraulic overload condition.
☐ This report demonstrates a projected hydraulic overload condition.
☐ This report demonstrates an existing organic overload condition.
☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Edmond Pisani	[signature]
Name of Responsible Official	Signature
610-534-4806	2/19/2019
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Charles Catania Jr.	Charles Catania Jr.
Name of Preparer	Signature
610-532-2884	2/19/19
Telephone No.	Date

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chapter 94 Spread: Sewage Treatment Pl

Reporting Year: 2018

Facility Name: Ridley Township - CDCA

Permit No.:

Persons/EDU: 3.5

Existing Hydraulic Design Capacity: MGD
Upgrade Planned in Next 5 Years? Year:
Future Hydraulic Design Capacity: MGD

Existing Organic Design Capacity: lbs BOD5/day
Upgrade Planned in Next 5 Years? Year:
Future Organic Design Capacity: lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2014	2015	2016	2017	2018
January	2.88152	2.95962	2.60981	2.66328	2.34189
February	3.81816	2.8779	3.27572	2.39357	3.20809
March	3.27011	3.99639	2.5334	3.06201	3.54062
April	3.33828	3.03785	2.29887	3.10314	3.01929
May	4.58293	2.56218	2.97893	3.00923	3.13938
June	3.70487	3.08916	2.53915	2.3158	2.85384
July	3.26464	2.98195	2.40895	2.30136	2.05746
August	3.08063	2.30561	2.2587	2.32495	2.17025
September	2.80186	2.26722	2.19083	2.07167	2.47366
October	2.80763	2.41293	2.27812	2.00728	2.30738
November	3.28761	2.24874	2.16222	2.04998	3.31342
December	3.64524	2.71021	2.46291	2.10746	3.10732
Annual Avg	3.3736227	2.78731469	2.49896726	2.45080256	2.7777156
Max 3-Mo Avg	3.87535684	3.30404862	2.86524619	3.05812275	3.25599744
Max : Avg Ratio	1.15	1.19	1.15	1.25	1.17
Existing EDUs	9,620.0	9,482.0	9,482.0	9,482.0	9,482.0
Flow/EDU (GPD)	350.7	294.0	263.5	258.5	292.9
Flow/Capita (GPD)	100.2	84.0	75.3	73.8	83.7
Exist. Overload?					

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2014	2015	2016	2017	2018
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Annual Avg					
Max Mo Avg					
Max : Avg Ratio					
Existing EDUs	9,620	9,482	9,482	9,482	9,482
Load/EDU					
Load/Capita					
Exist. Overload?					

Projected Flows for Next Five Years (MGD)

	2019	2020	2021	2022	2023
New EDUs	1.0	1.0	1.0	1.0	1.0
New EDU Flow	0.0003	0.0003	0.0003	0.0003	0.0003
Proj. Annual Avg	2.77798	2.77828	2.77858	2.77888	2.77918
Proj. Max 3-Mo Avg	3.2784	3.27875	3.2791	3.27946	3.27981
Proj. Overload?					

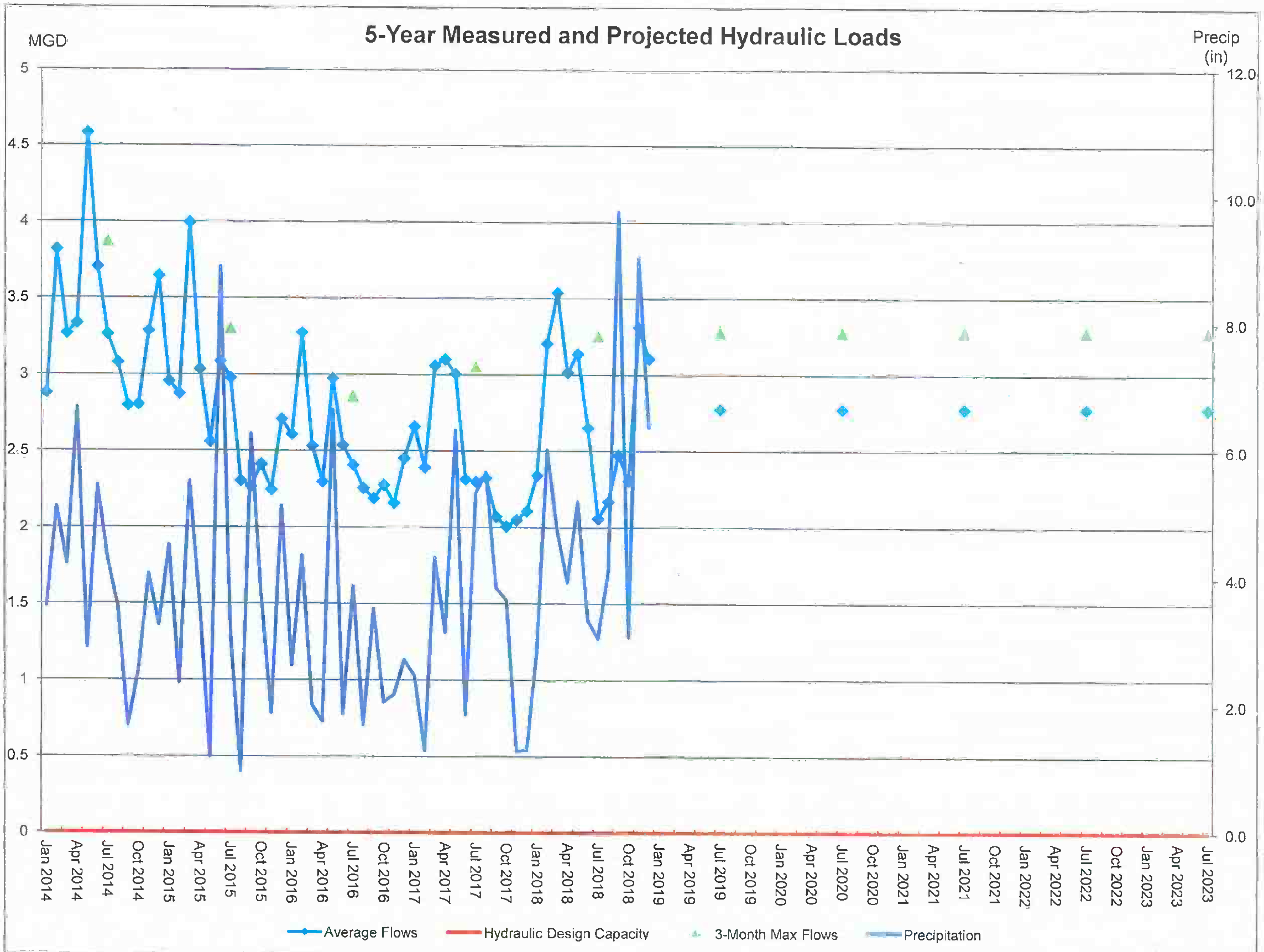
Projected BOD5 Loads for Next Five Years (lbs/day)

	2019	2020	2021	2022	2023
New EDUs	1	1	1	1	1
New EDU Load	0.584	0.584	0.584	0.584	0.584
Proj. Annual Avg	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Proj. Max Avg	#DIV/0!				
Proj. Overload?	#DIV/0!				

Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (Inches)

Month	2014	2015	2016	2017	2018
January	3.56	4.52	2.63	2.48	2.85
February	5.12	2.36	4.36	1.3	6.02
March	4.23	5.52	2.01	4.33	4.74
April	6.69	3.58	1.75	3.15	3.94
May	2.91	1.2	6.65	6.33	5.21
June	5.46	8.89	1.87	1.86	3.34
July	4.3	3.16	3.88	5.35	3.06
August	3.55	0.98	1.7	5.66	4.11
September	1.69	6.27	3.52	3.86	9.76
October	2.54	3.76	2.06	3.66	3.08
November	4.07	1.89	2.17	1.3	9.03
December	3.27	5.14	2.72	1.31	6.38

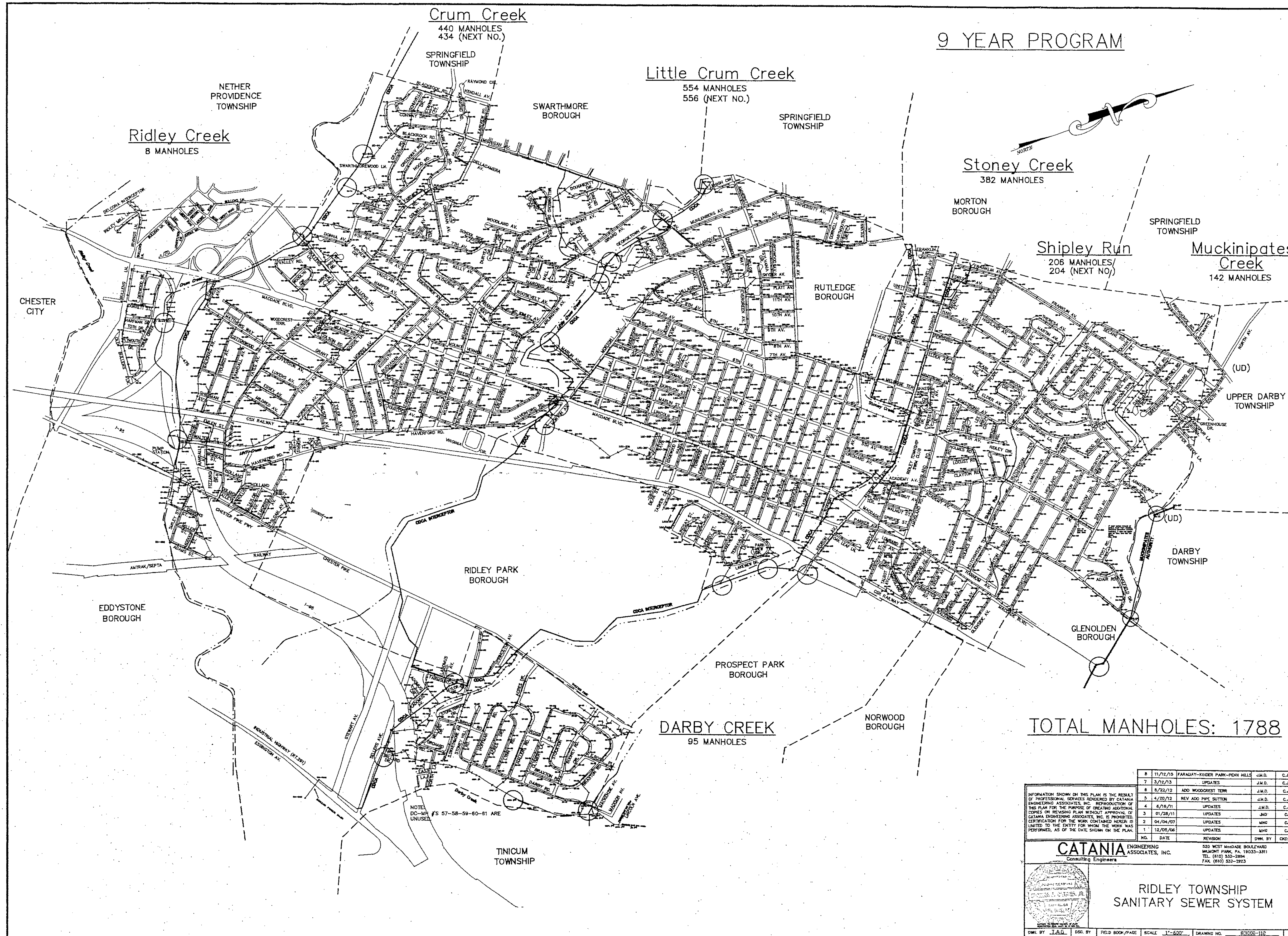

5-Year Measured and Projected Hydraulic Loads
MGD
Precip (in)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 2014
Apr 2014
Jul 2014
Oct 2014
Jan 2015
Apr 2015
Jul 2015
Oct 2015
Jan 2016
Apr 2016
Jul 2016
Oct 2016
Jan 2017
Apr 2017
Jul 2017
Oct 2017
Jan 2018
Apr 2018
Jul 2018
Oct 2018
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Apr 2023
Jul 2023
Average Flows
Hydraulic Design Capacity
3-Month Max Flows
Precipitation

RIDLEY TOWNSHIP MONTHLY FLOW METER DATA

Meter No.	Meter Location	Total EDUs	Outside EDUs	January			February			March			April			May			June			Comments
				Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	
4	Walter Street (at Randall Avenue)	1,122		5,899,920	170		8,908,500	**284**		11,108,083	319		7,485,472	222		9,469,269	272		7,336,941	218		
5	Tower, Utility Road (Crum Creek Drive at Harfman)	256		1,577,929	199		1,782,238	**249**		2,081,588	262		1,915,419	249		1,591,662	201		1,262,755	164		
6	Bullens Lane (at Crum Creek)	349		3,805,315	352		4,952,120	507		4,928,267	456		4,136,846	395		3,946,172	365		2,996,437	286		
7	Behind Ardsley	538		4,117,628	247		4,307,707	**286**		5,580,274	335		4,730,565	293		4,789,016	287		4,323,674	268		
8	Behind Blackrock Road (at Michigan Avenue)	**285**		2,694,625	305		3,370,260	**422**		4,361,303	494		3,510,646	411		3,218,171	364		2,753,931	322		
10	Behind Georgetown Cul-De-Sac	472	171	4,584,853	295	*-1,832,065*	5,686,567	458	*-1,825,303*	6,907,731	532	*-1,942,257*	5,519,935	413	*-1,786,557*	6,018,932	450	*-1,815,967*	4,808,728	382	*-1,360,606*	Outside flow from Swarthmore Borough's Meter No.: 4
11	End of 7th Avenue	676		4,090,420	195		4,697,585	248		6,108,556	291		5,103,496	252		5,135,170	245		4,078,821	201		
13	Behind Haverford Road (near MacDade Blvd.)	129		1,119,978	280		1,235,123	**342**		1,748,367	437		1,432,058	370		1,506,943	377		1,341,115	347		
14	Hoffman Road (at Darby Road)	329		2,356,436	231		2,594,621	**282**		2,888,510	283		2,747,872	278		2,771,115	272		2,628,417	266		
15	Darby Road (at Darby Creek)	550	79	5,344,760	329	*-533,970*	5,658,802	376	*-694,851*	6,298,892	377	*-799,740*	5,194,877	326	*-581,981*	5,481,978	333	*-623,813*	4,735,451	296	*-550,362*	Outside EDUs from Prospect Park Borough (using average from all Prospect's meters for estimate)
19	Chester Pike (near Smiley Street)	330		2,520,135	246		3,799,497	**411**		4,205,501	411		2,956,795	299		2,833,592	277		2,409,209	243		
21	Lakeview Drive (inst into interceptor D/S of SC-280)	409		3,321,690	262		5,735,351	501		6,239,382	492		3,758,968	306		4,105,258	324		3,387,727	276		
22	945 Agnes Avenue																					Outside flow in CDCA Interceptor. Not included in gal/EDU calculation
23	Across from 1916 Franklin Avenue (in driveway)																					Outside flow in CDCA Interceptor. Not included in gal/EDU calculation
24	Intersection of Sutton and Second Avenues	1,634		43,248,311	289	*-28,614,140*	47,992,104	355	*-31,754,864*	60,021,937	424	*-38,546,544*	51,784,523	426	*-30,906,956*	55,831,010	465	*-32,269,455*	46,829,767	382	*-28,089,915*	Outside EDUs from Ridley Township Meter No's: 22 and 23
	Unmetered Areas (average volume from all meters)	2,403		18,896,689	254		23,380,939	347		28,569,221	384		23,576,769	327		25,331,629	340		20,723,048	287		Use average EDU from all Propsect meters for estimate
	TOTAL	**9,482**	**250**	**72,598,514**			**89,826,396**			**109,759,071**			**90,578,747**			**97,320,682**			**79,615,138**			

RIDLEY TOWNSHIP MONTHLY FLOW METER DATA

Meter No.	Meter Location	Total EDUs	Outside EDUs	July			August			September			October			November			December			Comments
				Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	
4	Walter Street (at Randall Avenue)	1,122		6,396,422	184		6,546,650	188		8,647,691	257		7,481,475	215		10,691,541	318		9,947,060	286		
5	Tower, Utility Road (Crum Creek Drive at Harfman)	256		1,419,198	179		1,411,857	178		1,488,624	194		1,396,583	176		2,032,250	265		2,010,646	253		
6	Bullens Lane (at Crum Creek)	349		2,328,690	215		2,466,869	228		2,522,550	241		2,765,560	256		3,500,374	334		3,931,515	363		
7	Behind Ardsley	538		3,474,763	208		3,964,996	238		4,584,667	284		4,681,716	281		5,506,598	341		4,759,640	285		
8	Behind Blackrock Road (at Michigan Avenue)	285		2,399,102	272		2,667,697	302		3,146,182	368		3,000,782	340		4,166,980	487		4,073,719	461		
10	Behind Georgetown Cul-De-Sac	472	171	3,857,554	292	*-1,136,602*	4,064,539	298	*-1,284,372*	4,457,799	351	*-1,287,096*	4,052,794	291	*-1,337,042*	6,081,594	488	*-1,676,313*	6,424,314	507	*-1,689,392*	Outside flow from Swarthmore Borough's Meter No.: 4
11	End of 7th Avenue	676		3,621,869	173		3,874,525	185		4,011,978	198		4,248,141	203		6,681,355	329		6,210,376	296		
13	Behind Haverford Road (near MacDade Blvd.)	129		1,111,375	278		1,356,981	339		1,449,930	375		1,486,367	372		2,152,725	556		2,083,571	521		
14	Hoffman Road (at Darby Road)	329		2,471,742	242		2,604,085	255		2,762,963	280		2,834,651	278		3,444,636	349		3,491,671	342		
15	Darby Road (at Darby Creek)	550	79	4,619,448	285	*-452,187*	4,620,016	283	*-491,711*	4,693,302	292	*-570,273*	4,713,121	284	*-572,095*	5,537,629	334	*-820,425*	5,182,435	300	*-799,320*	Outside EDUs from Prospect Park Borough (using average from all Prospect's meters for estimate)
19	Chester Pike (near Smiley Street)	330		1,912,722	187		1,985,139	194		2,561,016	259		2,455,180	240		3,933,772	397		3,545,110	347		
21	Lakeview Drive (inst into interceptor D/S of SC-280)	409		3,030,203	239		3,397,030	268		5,835,556	476		4,165,392	329		5,134,873	418		5,040,933	398		
22	945 Agnes Avenue																					Outside flow in CDCA Interceptor. Not included in gal/EDU calculation
23	Across from 1916 Franklin Avenue (in driveway)																					Outside flow in CDCA Interceptor. Not included in gal/EDU calculation
24	Intersection of Sutton and Second Avenues	1,634		37,034,583	239	*-24,909,240*	38,539,871	248	*-25,958,067*	38,664,681	216	*-28,075,886*	40,055,852	228	*-28,518,032*	51,870,111	350	*-34,708,528*	52,244,082	336	*-35,202,464*	Outside EDUs from Ridley Township Meter No's: 22 and 23
	Unmetered Areas (average volume from all meters)	2,403		16,601,652	223		17,511,781	235		19,316,082	268		18,618,216	250		25,873,569	359		25,072,941	337		Use average EDU from all Propsect meters for estimate
	TOTAL	**9,482**	**250**	**63,781,294**			**67,277,886**			**74,209,766**			**71,528,661**			**99,402,741**			**96,326,837**			



NO.	DATE	REVISION	DWN. BY	CKD. BY
8	11/12/15	FARADAY-KINDER PARK-PENN HILLS	J.M.D.	C.J.C
7	3/12/13	UPDATES	J.M.D.	C.J.C
6	8/22/12	ADD WOODCREST TERR	J.M.D.	C.J.C
5	4/20/12	REV ADD PIPE SUTTON	J.M.D.	C.J.C
4	6/16/11	UPDATES	J.M.D.	C.J.C.
3	01/28/11	UPDATES	JMD	CJC
2	04/04/07	UPDATES	MNG	CJC
1	12/05/06	UPDATES	MNG	CJC

CATANIA ENGINEERING ASSOCIATES, INC.
Consulting Engineers
520 WEST MacDADE BOULEVARD
MILMONT PARK, PA. 19033-3311
TEL. (610) 532-2884
FAX. (610) 532-2923

RIDLEY TOWNSHIP SANITARY SEWER SYSTEM

DWN. BY T.A.G. | CKD. BY C.J.C. | DSG. BY | FIELD BOOK/PAGE | SCALE 1"-600' | DATE 01/03/03 | DRAWING NO. 83000-112 | SHEET 1 OF 1 SHEETS

Sanitary Sewer Monitoring Summary

Township forces are used for inspection, troubleshooting and routine maintenance of the sanitary sewer system.

Each year, a portion of the system is cleaned and video inspected as part of the Township's Preventative Maintenance Program. The Line Cleaning Program is completed by Township personnel and is set as a 4-year program to address the entire system. The Video Inspection Program is an ongoing 9-year program. Each phase in contracted to a sewer specialty contractor.

To monitor the flow within the system, the Township has strategically placed 15 flow meters in the CDCA system, 3 meters in the Muckinipates system, and 0 meters in DELCORA system (less than 20 EDU's) that records flow data in 15 minute intervals as part of the DELCORA metering system. This data is reviewed to ensure proper flow conditions and to help identify areas that may be experiencing abnormally low or high flows for investigating potential issues.

Pump Station Summary

Small compressed air ejector station at Chester Pike near Crum Creek is maintained under contract.

Rutledge Borough

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Borough of Rutledge**	Permit No.:	**PAN/A**
Mailing Address:	**212 Unity Terrace**	Effective Date:	**N/A**
City, State, Zip:	**Rutledge, PA 19070**	Expiration Date:	**N/A**
Contact Person:	**Barbarann Keffer**	Renewal Due Date:	**N/A**
Title:	**Borough Administrator**	Municipality:	**Rutledge Borough**
Phone:	**610-544-1028**	County:	**Delaware**
Email:	**rutledgemanager@gmail.com**	Consultant Name:	**Catania Engineering Associates, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   Please note that the Chapter 94 Spreadsheet was used to show monthly average flows and projections; it is understood that this report is for a collection system only.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

   Check the appropriate boxes:

   ☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)

   ☐ List summarizing each extension or project attached (**Attachment**)

   ☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

   Comments:

   No sewer extensions were constructed or approved within the past calendar year. A copy of the sanitary sewer system map is attached.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

   Contract forces are used for troubleshooting and routine maintenance. Video inspection is conducted periodically and as-needed in conjunction with required emergency repairs. Using the video inspections, the Borough has prioritized the sewer system's needs and is employing a multi-year program to treat structural deficiencies.

   In 2018 the Borough compelted two (2) separate projects which included the relining of approximately 5,200 linear feet of 8 inch pipe, the rehabiliation of approximtately 16 manholes and assoicated improvements.

   The Borough of Rutledge, in coordination with DELCORA has flow metering equipment to monitor flows through the sanitary system. CSL Services, Inc. was contracted by DELCORA to calibrate and maintain the flow monitoring equipment throughout 2018. Calibration reports are maintained by DELCORA. Rutledge Borough utilizes flow data to assist in the identification of areas that require attention.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

Based on video inspections, the system is in fair to good condition.

There are no known areas of capacity exceedance and no areas of capacity exceedance expected in the next five years. No SSOs were reported for the 2018 calendar year.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number –)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

   c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

Check the appropriate boxes:

☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

☐ This report demonstrates an existing hydraulic overload condition.
☐ This report demonstrates a projected hydraulic overload condition.
☐ This report demonstrates an existing organic overload condition.
☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Barbarann Keffer	BKeffer
Name of Responsible Official	Signature
610-544-1028	2.22.19
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Charles Catania Jr.	Charles Catania Jr.
Name of Preparer	Signature
610-532-2884	2/20/19
Telephone No.	Date

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chapter 94 Spread
Sewage Treatment Pl

Reporting Year: 2018

Facility Name: Rutledge Borough - CDCA

Permit No.:

Persons/EDU: 3.5

Existing Hydraulic Design Capacity: MGD
Upgrade Planned in Next 5 Years? Year:
Future Hydraulic Design Capacity: MGD

Existing Organic Design Capacity: lbs BOD5/day
Upgrade Planned in Next 5 Years? Year:
Future Organic Design Capacity: lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2014	2015	2016	2017	2018
January	0.29967	0.18637	0.16696	0.11105	0.10788
February	0.37771	0.14091	0.17313	0.10262	0.13275
March	0.28682	0.23449	0.15239	0.13061	0.16349
April	0.30886	0.22205	0.15443	0.13615	0.14082
May	0.20473	0.13269	0.17779	0.11085	0.12129
June	0.12718	0.18123	0.13116	0.09144	0.10921
July	0.12271	0.16052	0.10986	0.10389	0.09768
August	0.11696	0.11841	0.10434	0.09153	0.1086
September	0.11565	0.11156	0.09221	0.09127	0.12108
October	0.11147	0.13995	0.08978	0.09056	0.12678
November	0.13809	0.11762	0.08887	0.0835	0.19181
December	0.17121	0.16215	0.11762	0.09808	0.19118
Annual Avg	0.1984217	0.15899624	0.12987788	0.10346241	0.13437224
Max 3-Mo Avg	0.3244618	0.19914917	0.16741261	0.12587116	0.16992404
Max : Avg Ratio	1.64	1.25	1.29	1.22	1.26
Existing EDUs	527.0	527.0	527.0	527.0	527.0
Flow/EDU (GPD)	376.5	301.7	246.4	196.3	255.0
Flow/Capita (GPD)	107.6	86.2	70.4	56.1	72.9
Exist. Overload?					

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2014	2015	2016	2017	2018
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Annual Avg					
Max Mo Avg					
Max : Avg Ratio					
Existing EDUs	527	527	527	527	527
Load/EDU					
Load/Capita					
Exist. Overload?					

Projected Flows for Next Five Years (MGD)

	2019	2020	2021	2022	2023
New EDUs	1.0	1.0	1.0	1.0	1.0
New EDU Flow	0.0003	0.0003	0.0003	0.0003	0.0003
Proj. Annual Avg	0.14533	0.14563	0.14593	0.14623	0.14653
Proj. Max 3-Mo Avg	0.19351	0.19391	0.19431	0.19471	0.19511
Proj. Overload?					

Projected BOD5 Loads for Next Five Years (lbs/day)

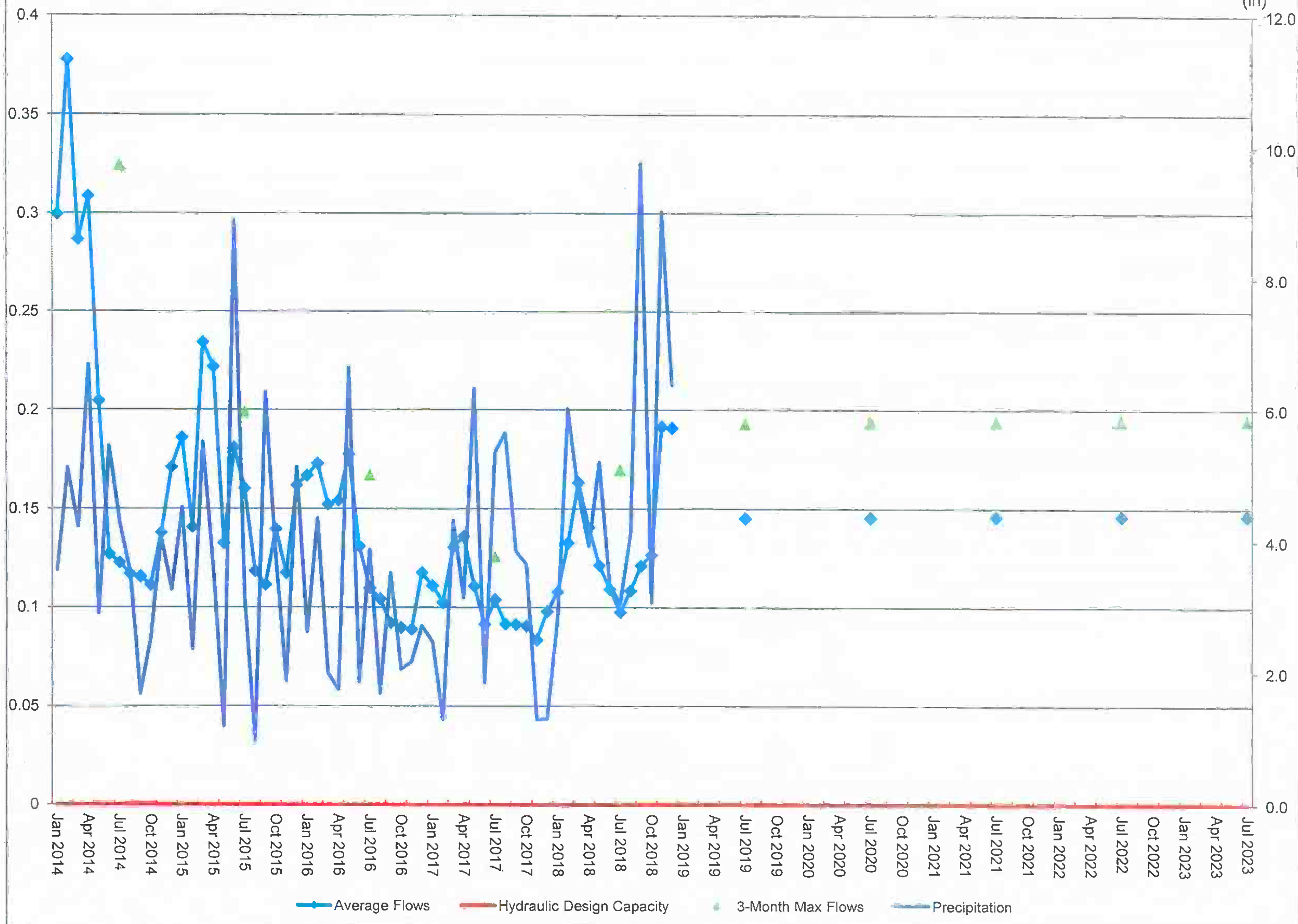
	2019	2020	2021	2022	2023
New EDUs	1	1	1	1	1
New EDU Load	0.584	0.584	0.584	0.584	0.584
Proj. Annual Avg	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Proj. Max Avg	#DIV/0!				
Proj. Overload?	#DIV/0!				

Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (Inches)

Month	2014	2015	2016	2017	2018
January	3.56	4.52	2.63	2.48	2.85
February	5.12	2.36	4.36	1.3	6.02
March	4.23	5.52	2.01	4.33	4.74
April	6.69	3.58	1.75	3.15	3.94
May	2.91	1.2	6.65	6.33	5.21
June	5.46	8.89	1.87	1.86	3.34
July	4.3	3.16	3.88	5.35	3.06
August	3.55	0.98	1.7	5.66	4.11
September	1.69	6.27	3.52	3.86	9.76
October	2.54	3.76	2.06	3.66	3.08
November	4.07	1.89	2.17	1.3	9.03
December	3.27	5.14	2.72	1.31	6.38

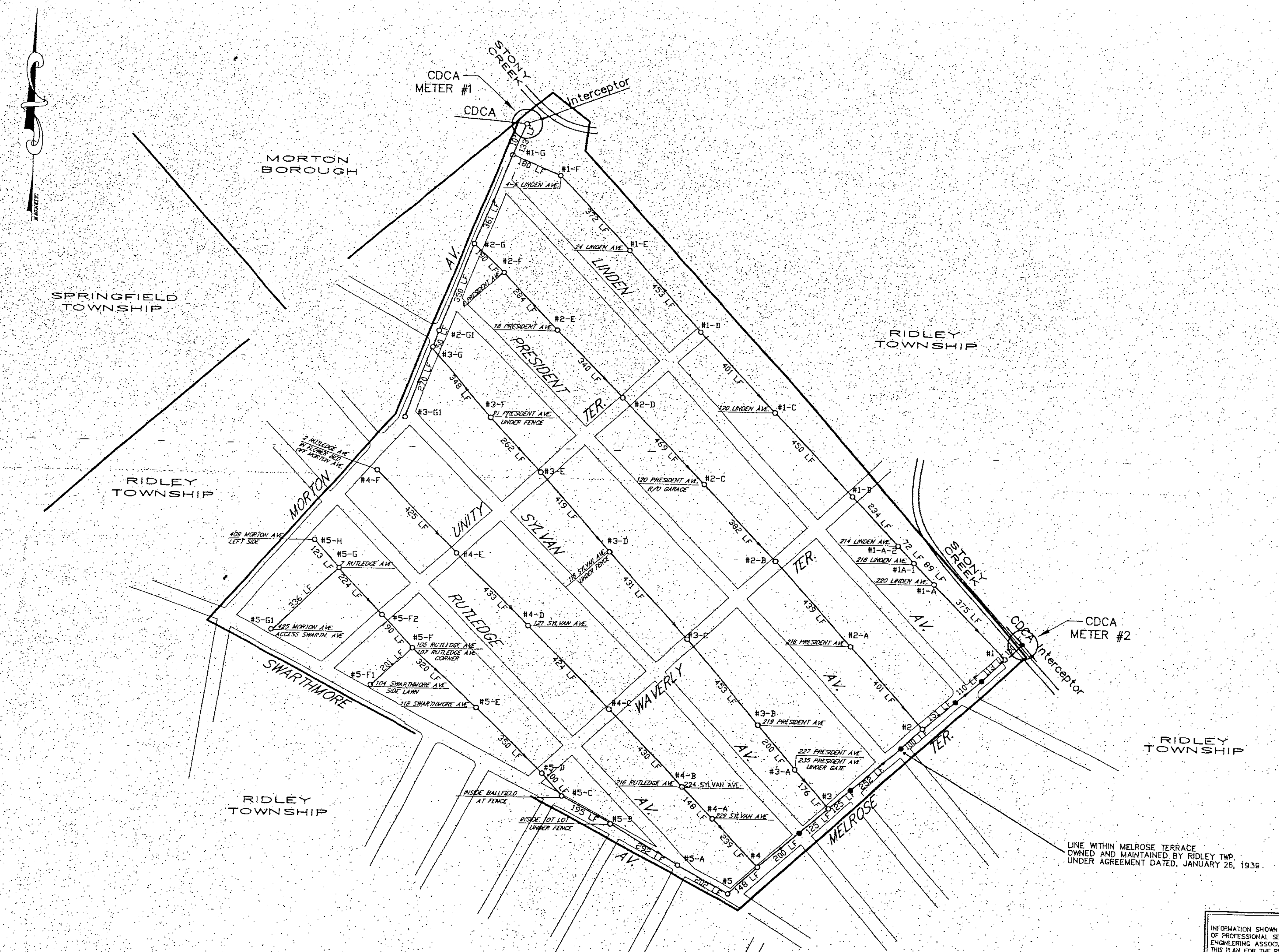
5-Year Measured and Projected Hydraulic Loads



RUTLEDGE BOROUGH MONTHLY FLOW METER DATA

Meter No.	Meter Location	Total EDUs	Outside EDUs	January				February				March				April				May			June				Comments
				Recorded Volume	Gallons EDU/Day	Outside EDUs	Missing Volume (est)	Recorded Volume	Gallons EDU/Day	Outside EDUs	Missing Volume (est)	Recorded Volume	Gallons EDU/Day	Outside EDUs	Missing Volume (est)	Recorded Volume	Gallons EDU/Day	Outside EDUs	Missing Volume (est)	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Missing Volume (est)	
1	Melrose Terrace (between Agnes Avenue and Linden Avenue	423	205	4,096,743	368	-1,612,077		4,665,580	438	-1,994,629		5,820,238	552	-2,437,241	345,268	2,121,261	466	-2,011,335	2,939,299	4,739,601	382	-2,161,042	4,064,544	351	-1,767,884		Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate)
2	Morton Avenue	77	10	648,783	275	-78,638		821,643	386	-97,299		1,020,114	434	-118,890		907,858	403	-98,114		961,568	412	-105,417	742,254	346	-86,238	40,108	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate)
	Unmetered Areas (average volume from all meters)	27		289,403	346			321,660	425			438,583	524			365,587	451			325,394	389		283,527	350			Use average EDU from all Propsect meters for estimate
	TOTAL	**527**	**215**	**3,344,214**				**3,716,955**				**5,068,072**				**4,224,556**				**3,760,104**			**3,276,311**				

Meter No.	Meter Location	Total EDUs	Outside EDUs	July				August				September				October				November			December				Comments
				Recorded Volume	Gallons EDU/Day	Outside EDUs	Missing Volume (est)	Recorded Volume	Gallons EDU/Day	Outside EDUs	Missing Volume (est)	Recorded Volume	Gallons EDU/Day	Outside EDUs	Missing Volume (est)	Recorded Volume	Gallons EDU/Day	Outside EDUs	Missing Volume (est)	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Missing Volume (est)	
1	Melrose Terrace (between Agnes Avenue and Linden Avenue	423	205	3,511,174	295	-1,416,287		3,709,614	328	-1,493,931		4,087,196	373	-1,647,856		4,269,392	397	-1,588,321		6,045,039	587	-2,207,275	6,416,278	633	-2,138,973		Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate)
2	Morton Avenue	77	10	357,262	181	-69,087	382,972	929,620	412	-72,875		959,092	437	-80,383		986,533	438	-77,479		1,526,339	706	-107,672	1,240,638	547	-104,340		Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate)
	Unmetered Areas (average volume from all meters)	27		262,045	81			291,072	348			314,342	388			340,117	406			497,978	615		512,868	613			Use average EDU from all Propsect meters for estimate
	TOTAL	**527**	**215**	**3,028,079**				**3,363,500**				**3,632,391**				**3,930,243**				**5,754,409**			**5,926,470**				



NO.	DATE	REVISION	DWN. BY	CKD. BY
2	2-18-13	FLOW METER UPDATE	P.H.M	N.M
1	10/2/11	UPDATED PLAN	J.M.D.	C.J.C.

CATANIA ENGINEERING ASSOCIATES, INC.
Consulting Engineers
520 WEST MacDADE BOULEVARD
MILMONT PARK, PA. 19033-3311
TEL. (610) 532-2884
FAX. (610) 532-2923

RUTLEDGE BOROUGH
SANITARY SEWER SYSTEM

DWN. BY T.A.G. | CKD. BY C.J.C. | DSG. BY | FIELD BOOK/PAGE | SCALE 1" = 200' | DATE 1/7/2003 | DRAWING NO. 83350-112 | SHEET 1 OF 1 SHEETS

Industrial Waste Report

DELCORA is currently responsible for issuance of Industrial Waste Permits to companies discharging into Rutledge Borough Sewers. The regulation governing discharge of the industrial wastes as well as any program for surveillance and monitoring of industrial waste discharges is maintained by DELCORA.

There are no known industrial permits for the Rutledge Borough system.

Springfield Township

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION

Permittee Name:	**Sprinfield Township - CDCA**	Permit No.:	**PAWH0025**
Mailing Address:	**50 Powell Road**	Effective Date:	
City, State, Zip:	**Springfield, PA 19064**	Expiration Date:	
Contact Person:	**Lee Fulton**	Renewal Due Date:	
Title:	**Township Manager**	Municipality:	**Springfield Township**
Phone:	**610-544-1300**	County:	**Delaware County**
Email:	**lfulton@springfielddelco.org**	Consultant Name:	**McCormick Taylor, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:

   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:

   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   N/A

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

- ☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)
- ☐ List summarizing each extension or project attached (**Attachment**)
- ☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

There were no sewer extensions made in 2018. In addition, there are no planned or approved extensions at this time.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

Monitoring, maintenance and rehabilitation programs have been established in accordance with the Water Environment Federation's (WEF) Existing Sewer Evaluation and Rehabilitation (WEF MOP FD-6; ASCE MREP-62) and WEF's MOP 7.

DELCORA installed six flow meters within the Central Delaware County Authority sewer shed within Springfield Township. The recorded data includes four meters that records only Springfield Township; however, the other two meters include flow from both Springfield and Ridley Townships. The maintenance of these meters is the responsibility of DELCORA. These meters record the flow every 15 minutes and the transmission of information happens periodically throughout the day. Since the meters are maintained and owned by DELCORA, the required calibration report would have to be obtained from them.

The Township's sewer lines have been catalogued and prioritized for inspection and evaluation. The Public Works Department conducts inspection and evaluation activities according to the schedule prescribed by the Township Engineer. Inspection and evaluation are facilitated through a jet cleaning truck and a closed circuit television sewer inspection truck operated by a three man crew from the Public Works Department. Public Works inspects between 10 and 20 miles of sewer line annually. The lines are evaluated for defects (breaks, roots, I/I, grease, etc.) by the field crew and also by the Public Works Superintendent and Township Engineer. Any defects discovered during evaluation are assessed, rated and prioritized for repair or further evaluation as necessary. To reduce the amount of Inflow and Infiltration within the sewer shed, Springfield Township will need to evaluate areas within the sewer shed that have been identified as areas of concern.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☒ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☐ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

There was one SSO that occurred in 2018. The Sanitary Sewer Overflow (SSO) Report to PADEP - Water Management is attached for your use.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number –)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

   c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

Check the appropriate boxes:

☐ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:
- ☐ This report demonstrates an existing hydraulic overload condition.
- ☐ This report demonstrates a projected hydraulic overload condition.
- ☐ This report demonstrates an existing organic overload condition.
- ☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Lee Fulton, Township Manager	J. Lee Fulton
Name of Responsible Official	Signature
610-544-1300	2-14-19
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Susan M. Guisinger-Colon, P.E.	Susan M Guisinger-Colon
Name of Preparer	Signature
610-640-3500	2/15/2019
Telephone No.	Date

Attachment A

Sanitary Sewer Overflow (SSO) Report to PADEP- Water Management **DEP fax: 484-250-5971**

Please check the appropriate box ☑ Dry Weather Overflow ☐ Wet Weather Overflow

1. Date, Name, Phone # of person completing this report	Date: February 26, 2018 Name: Jeffrey W. Bickel Phone: 610-636-8935
2. Your organization name and address ?	Name: Springfield Township County: Delaware Address: 1258 Church Rd / 50 Powell Rd Township/Municipality: Springfield Twp. Springfield, PA 19064
Sewer system owner and permit number	Springfield Township (WH0025)
3. Date found and specific location of SSO. Including Municipality/County (if different from #2) ?	Date: 2/26/2018 Municipality: Springfield Township Location(Street & #): 610 E. Woodland Ave County: Delaware
4. How was SSO discovered? By whom ?	The superintendent for Springwood Apartments reported the overflow to John Devlin, Township Plumbing Inspector.
5. Start and end time of SSO (actual or estimate?)	Start time - 2/26/2018, 10:39 AM End time - 2/26/208, 11:05 AM
6. Date, time and name of person who called PADEP originally to notify of SSO ?	Date : 2/26/2018 Time : 11:15 - 11:20 AM Name : Linda Anders
7. Description and actual or estimated volume of SSO	Approximately 150 gallons of sewage was released to the the environment through the vent/cleanout due to a physical blockage in the 8-inch TCP sewer main.
8. Where, precisely, did SSO go ? (land, roadway, basement, swale, storm sewer, creek, etc) Please include creek name or street location.	The SSO discharged to the PennDOT storm sewer system that outlets to Stoney Creek, tributary to Darby Creek.
9. What caused SSO ? How was it stopped ?	The minor blockage was caused by small amounts of roots and grease, and lodged paper towles; located at a 90-degree bend. The line was flushed clear using the high pressure jet unit. Clog was eliminated and restored the capacity of the sewer main.
10. Describe extent of contamination and how it was cleaned up	Absorbant towels used to contain and remove sewage from paved surfaces; no contamination was evident in Stoney Creek/storm sewer system.
11. What actions will be taken to prevent a re-occurrence ? When ?	Sewer line was video inspected after cleaning with jet unit; passed inspection. Springfield sewer department wil continue to check and periodically flush the main.
12. Other comments ?	Springfield's goal is to keep our streams clear.
13.Downstream notifications made: (All downstream users such as public water supplies must be notified)	There are no public water supplies downstream from Springfield Township.

Swarthmore Borough

Pennoni

MUNICIPAL WASTELOAD MANAGEMENT

2018 Chapter 94 Report

Prepared For:

BOROUGH OF SWARTHMORE

DELAWARE COUNTY, PA

Prepared By:

PENNONI ASSOCIATES INC.

1900 Market Street, Suite 300
Philadelphia, PA 19103
215-222-3000

FEBRUARY 2019

COMMONWEALTH OF PENNSYLVANIA
REGISTERED
PROFESSIONAL
JOSEPH A. MASTRONARDO
ENGINEER
No.

02-15-19

JOSEPH A. MASTRONARDO

BOROUGH ENGINEER

SWATB 00720

Pennoni

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Pennoni

PERMITTEE:

NAME: Jane Billings, Borough Manager

ORGANIZATION: Borough of Swarthmore

ADDRESS: Borough Administrative Office
121 Park Avenue
Swarthmore, PA 19081- 1536

PHONE: (610) 543-4599

PREPARER:

NAME: Joseph A. Mastronardo, PE

ORGANIZATION: Pennoni Associates Inc.

ADDRESS: 1900 Market Street
Philadelphia, PA 19103

PHONE: (215) 222-3000

This report has been prepared in accordance with Title 25, Part 1, Subpart C, Article 11, Chapter 94, of the Commonwealth of Pennsylvania Regulations.

1. INTRODUCTION

Sewage flows from Swarthmore Borough are conveyed to DELCORA's Western Regional Treatment Plant via the Central Delaware County Authority's Crum Creek Interceptor and Little Crum Creek Interceptor and DELCORA's Central Pump Station. The system serves approximately 1,350 single-family residential dwelling units, 700 multi-family dwelling units, a college, an elementary school, a private school for special-needs students, and various commercial establishments in a three-block business district.

1.1. DESCRIPTION OF SYSTEM

The Borough Sanitary Sewer Collection System consists of 95,670 feet (FT) of sewer pipe broken down by size as follows:

a) 14,800 FT of 6 inch pipe.
b) 71,250 FT of 8 inch pipe.
c) 9,000 FT of 10 inch pipe.
d) 160 FT of 12 inch pipe.
e) 460 FT of 15 inch pipe.

The sewers are comprised mainly of terra-cotta/clay pipe, with some cast iron, the majority of which was installed in the 1950's. Poly-vinyl chloride (PVC) has been used for the newer replacements. There are no combined sewers, pump stations, or force mains.

Based upon a "Sewer System Evaluation" completed by Pennoni Associates in 1994, the system is in fair to good condition. Work identified in the study to correct infiltration and inflow and other structural problems has been completed. In 2002, the Borough approved a new sanitary sewer plan that includes dedicated funding for the maintenance program discussed in section 5 as well as for capital improvements to rectify problems identified in the inspection program.

Between 2011 and 2018, the Borough has performed video inspections of approximately 64,000 feet (FT) of sewer pipe, including 14,000 feet (FT) of sewer pipe in 2018 and identified a list of potential rehabilitation segments. Based on the analysis of the televised lines, the Borough has compiled a comprehensive list of sanitary sewer rehabilitation work. Additional lines will be identified and televised in 2019.

In 2019, a sanitary sewer replacement and lining contact will be undertaken to complete a portion of the sewer rehabilitation work identified during recent video inspections.

2. HYDRAULIC & ORGANIC LOADINGS

The Borough of Swarthmore does not own a sewage treatment plant.

3. BASIS OF HYDRAULIC & ORGANIC PROJECTIONS

The Borough of Swarthmore does not own a sewage treatment plant.

4. SEWER EXTENSIONS

Development within the Borough is projected to occur at a slow place, as the Borough is mostly "built-out". The majority of new sewer connections are "infill" developments adding laterals to existing sewer mains. No sanitary sewer extensions were constructed within the Borough in 2018.

5. SEWER SYSTEM MONITORING, MAINTENANCE, REPAIR AND REHABILITATION

The Borough's Public Works Department provides routine maintenance and emergency line cleaning on a daily basis and has developed a Seven Year Plan which serves as a basis for ongoing Sewer Maintenance and Inspection programs as follows:

a) The Borough contracts with an outside contractor nearly every year to clean, root cut and video inspect a portion of the sewer system as part of an ongoing preventative maintenance program.

b) During the course of the year, the Public Works Department responds to various sewer blockages and in some cases repair work is completed. Attached in Appendix A is a comprehensive list of blockages/repairs for the year 2018.

c) As part of the routine preventive maintenance program, every year the Borough contracts with a private company to apply chemical root control within identified sewer line segments. In 2018 the Borough treated over 3,000 feet of sanitary sewer. The Borough has allocated $20,000 for root control in 2019.

6. CONDITION OF THE SEWER SYSTEM

6.1. POPULATION STATISTICS

The U.S. Census Bureau statistical data was used as a basis for the historical growth trend in the Borough as shown in Table 1 below:

TABLE 1 - Historical Population Growth	
Year	**Swarthmore Borough**
2010 U.S. Census:	6,194
2014	6,198
2015	6,195
2016	6,218
2017	6,243
2018	6,255

Note:
(1) Based on U.S. Census, ACS Demographic and Housing Estimate (2010-2017).
(2) Based on average population growth over past 5 years

Per the 2010 U.S. Census, the Borough had experienced a slight increase in population in the past 5-year period. A population increase of 61 people has been estimated for the population trend between 2010 and 2018. In accordance with the 2010 U.S. Census, the average household size is 2.68.

6.2. HISTORICAL AND PRESENT SEWER FLOWS

Flow data is monitored in 5 manholes located throughout the Borough before flow is conveyed into the Little Crum and Crum Interceptors. Locations of sanitary sewer facilities are shown in Figure 1; the historic flows (past 5 years) for each sewer basin are included in Appendix B.

6.3. PROJECTED SEWER FLOWS

6.3.1. PROJECTED CONNECTIONS

In 2018, zero (0) new EDUs were added to the Borough collection system. Table 3 provides a summary of total projected connections anticipated to occur within the next five years. The projected flows are based on records of properties under construction, or currently awaiting Act 537 planning approval.

Table 2
HISTORICAL AND PRESENT SEWER FLOWS

Hydraulic Loading (MGD)						Rainfall (in)
Month	**2014**	**2015**	**2016**	**2017**	**2018**	**2018**
January	0.738	0.758	0.628	0.585	0.562	2.85
February	0.978	0.733	0.799	0.556	0.834	6.02
March	0.903	0.996	0.666	0.679	0.949	4.74
April	0.932	0.866	0.637	0.695	0.857	3.94
May	0.929	0.693	0.718	0.684	0.828	5.21
June	0.698	0.796	0.571	0.600	0.675	3.34
July	0.605	0.734	0.531	0.561	0.535	3.06
August	0.576	0.559	0.480	0.550	0.535	4.11
September	0.525	0.511	0.480	0.525	0.634	9.76
October	0.527	0.538	0.482	0.535	0.636	3.08
November	0.623	0.501	0.502	0.517	0.923	9.03
December	0.686	0.646	0.563	0.545	0.924	5.71
Annual Average (AA)	0.727	0.694	0.588	0.586	0.741	5.07
3 Month Max Avg	0.938	0.865	0.701	0.686	0.880	
5-year Avg	0.667					

NOTES:

The 2018 average three month maximum are highlighted

Table 3
Recent and Projected Sewer Connections

Approved/ Built Date	Name	Allocated No. of EDUs	Remaining No. of EDUs	Built in 2018	Project Buildout Schedule				
					2019	2020	2021	2022	2023
	Infill Connections	0	10		2	2	2	2	2
2019	Residential Development	4	4		1	3			
2018	BEP Building	0	0						
2016	Whittier Space (built out)	0	0						
2016	NPPR (built out)	46	0						
2015	Pavillion	5	5			5			
2014	Wellness Center (built out)	0	0						
2014	Danawell Dorms (built out)	38	0						
2014	Town Center West (built out)	42	0						
				TOTAL	3	10	2	2	2

Existing EDU's	2664
New in 2018	0
Total Connections	2664

Table 4
5 -Year Hydraulic Loading Projections

Hydraulic Loading Projection					
Projected Years	Previous Year Annual Average Flow (1)	New Connection(2)	Unit Flow(3)	Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(GPD/EDU)	(MGD)	(MGD)
2019	0.667	3	268	0.001	0.668
2020	0.668	10	268	0.003	0.671
2021	0.671	2	268	0.001	0.671
2022	0.671	2	268	0.001	0.672
2023	0.672	2	268	0.001	0.672

NOTES:

(1) The 2019 previous year annual average flow starts with the previous 5-Year Hydraulic Annual Average Flow; See Table 2

(2) See Table 4 - Existing and Projected Sewer Connection Summary; a unit flow of 268 gpd/EDU (100 gpd x 2.68 people per household)

(3) Unit Flow of 268 GPD/EDU; Per the 2010 U.S. Census of 2.68 people per household * 100 gpd

6.3.2. BASIS FOR PROJECTED HYDRAULIC LOADING

The projected annual average flow for the Borough at the end of the next five year period is estimated to be 0.672 MGD. The projected hydraulic loadings (2019 thru 2023) presented in Table 4, are developed by adding the annual increased flow from proposed new connections to the previous year annual average flow. Please note the following:

- The increased flows from new connections are calculated from the projected new EDUs connection summary in Table 4. The projected EDUs are multiplied by the unit flow of 268 gpd/EDU. The unit flow is based on the 2010 census data of 2.68 people per residence at 100 gallons per person.

- The previous year annual average flow consists of the past 5 year hydraulic annual average flow of 0.667 MGD.

The overall capacity of the Borough's sanitary sewer collection system is adequate for present and projected flows identified. Currently, there are no problematic sewered areas where conveyance capacity is being or will be exceeded within the next five years.

There are no known or reported sections of sewer which surcharge during dry or normal wet weather flow events.

6.4. DISCUSSION OF REPAIRED, REPLACED, OR REHABILITATED SEWERS

As part of the Boroughs ongoing maintenance program, potential repairs have been identified that will continue to maintain the sewer system in a good state of repair.

6.5. SANITARY SEWER SURCHARGES AND OVERFLOWS

There were no known sanitary surcharges or sanitary sewer overflows (SSO) within the Borough during 2018.

7. PUMPING STATIONS

No public or private sewage pump stations are owned or operated in the Borough.

8. INDUSTRIAL WASTES

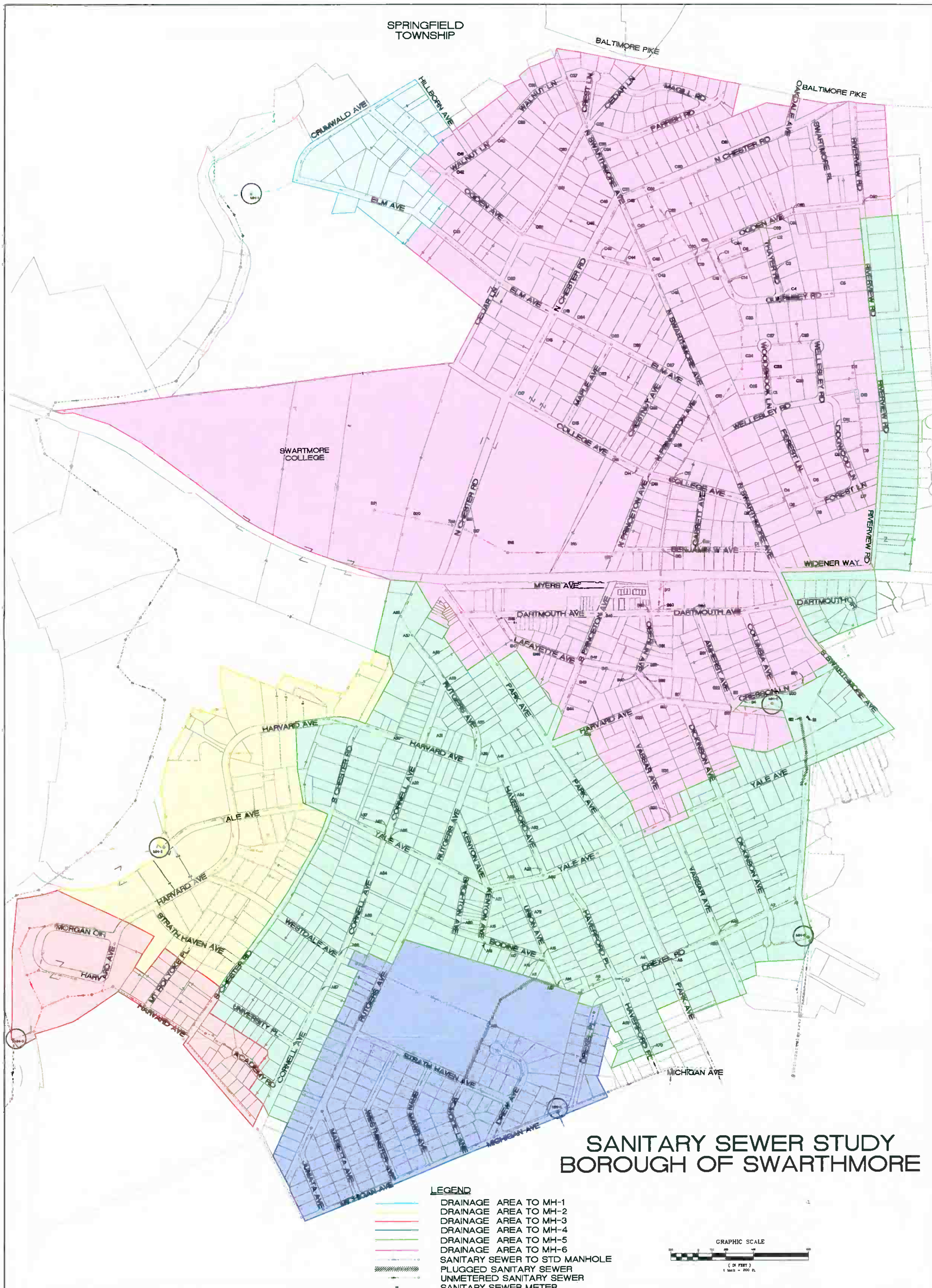
There are a small number of industrial users in the Borough. None of the users discharge an industrial waste to the system. Flows from these users (i.e. auto body shops) are domestic flows only.

9. PREVENTION OF OVERLOAD CONDITIONS

The Borough continues to maintain the sanitary sewer system. No overloads in the basin are anticipated.

FIGURES

FIGURE 1: 2018 Sewer Map



SPRINGFIELD TOWNSHIP
BALTIMORE PIKE
SWARTMORE COLLEGE
MYERS AVE
DARTMOUTH AVE
N CHESTER RD
S CHESTER RD
YALE AVE
HARVARD AVE
PARK AVE
MICHIGAN AVE
SANITARY SEWER STUDY
BOROUGH OF SWARTHMORE
LEGEND
DRAINAGE AREA TO MH-1
DRAINAGE AREA TO MH-2
DRAINAGE AREA TO MH-3
DRAINAGE AREA TO MH-4
DRAINAGE AREA TO MH-5
DRAINAGE AREA TO MH-6
SANITARY SEWER TO STD MANHOLE
PLUGGED SANITARY SEWER
UNMETERED SANITARY SEWER
SANITARY SEWER METER
GRAPHIC SCALE

APPENDICES

APPENDIX A

2018 Sewer Blockages

Blockages		
DATE	**Location**	**Description**
January 12, 2018	700 Block Yard Ave.	Sewer Debris
January 19, 2018	Dartmouth Cir., Dead End Man Hole	Plumber Working at Home Most of Day
March 7, 2018	6 Benjamin West Ave.	Sewer Debris
April 4, 2018	100 Block Rutgers Ave.	Grease
July 11, 2018	600 Block Havard Ave.	Grease
July 16, 2018	300 Block Dartmouth Ave.	Sewer Debris
September 3, 2018	15 Dogwood Lane	Root Ball
November 16, 2018	500 Block Michigan Ave.	Grease
November 25, 2018	100 Block Rutgers Ave.	Grease
December 5, 2018	100 Block Rutgers Ave.	Grease
December 8, 2018	200 Block Haverford Ave.	Grease, Feminine Products
December 25, 2018	300 Block Lafayette Ave.	Grease

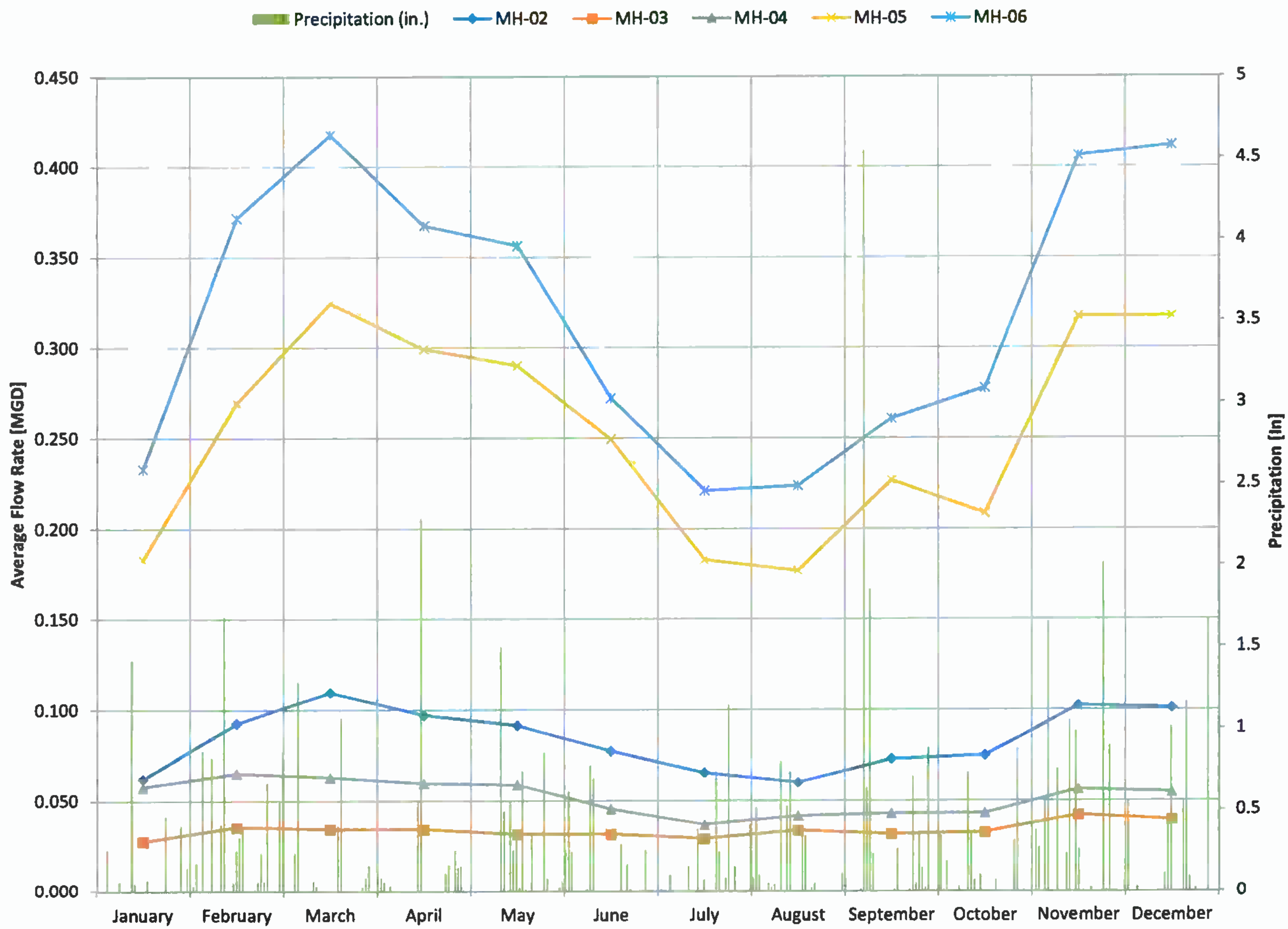
APPENDIX B

2018 Flow Data

BOROUGH OF SWARTHMORE
ANNUAL FLOWS 2018

Month	Meter Flows in MGD					Monthly Total [MGD]	Monthly Rain Total [In]
	MH-02	MH-03	MH-04	MH-05	MH-06		
January	0.062	0.028	0.057	0.183	0.233	0.562	2.85
February	0.093	0.035	0.065	0.269	0.372	0.834	6.02
March	0.110	0.034	0.063	0.324	0.418	0.949	4.74
April	0.097	0.034	0.059	0.299	0.367	0.857	3.94
May	0.091	0.031	0.059	0.290	0.356	0.828	5.21
June	0.077	0.032	0.045	0.249	0.272	0.675	3.34
July	0.065	0.029	0.037	0.183	0.221	0.535	3.06
August	0.060	0.034	0.042	0.177	0.224	0.535	4.11
September	0.073	0.031	0.043	0.227	0.261	0.634	9.76
October	0.075	0.032	0.043	0.208	0.278	0.636	3.08
November	0.102	0.042	0.056	0.317	0.406	0.923	9.03
December	0.101	0.039	0.054	0.317	0.412	0.924	5.71
Annual Average	**0.084**	**0.034**	**0.052**	**0.254**	**0.318**	**0.741**	**60.85**

BOROUGH OF ꞁRTHMORE
ANNUAL FLOWS 2018



Upper Providence Township

Upper Providence Township

KELLY&CLOSE
CONSULTING ENGINEERS & SURVEYORS

Charles J. Catania Jr., P.E.
Central Delaware County Authority
c/o Catania Engineering Associates, Inc.
520 W. MacDade Boulevard
Milmont Park, PA 19033

File: UPTSA 107-19

February 18, 2019

RE: 2018 Chapter 94 Report
UPTSA Farnum Road District

Dear Mr. Catania:

Pursuant to your request, enclosed are eight (8) copies of the Upper Providence Township Chapter 94 Report for the year 2018. The Report is formatted to answer your questions as presented in your letter.

If you have any questions or need additional information, please feel free to contact me.

Sincerely,

James P. Kelly P.E.
Authority Engineer

Enc.

cc: Pat Hall, UPTSA
File

Kelly & Close Engineers

1786 Wilmington Pike

Glen Mills, Pennsylvania 19342

610.358.9363 fax 610.358.9376

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Upper Providence Township Sewer Authority**	Permit No.:	**PA**
Mailing Address:	**935 North Providence Road**	Effective Date:	**n/a**
City, State, Zip:	**Media, Pa 19063**	Expiration Date:	**n/a**
Contact Person:	**James P. Kelly, P.E.**	Renewal Due Date:	**n/a**
Title:	**Borough Engineer**	Municipality:	**Upper Providence Township**
Phone:	**610-358-9363**	County:	**Delaware County**
Email:	**jpkelly@kellyengineers.com**	Consultant Name:	**Kelly & Close Engineers**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   n/a

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

   Check the appropriate boxes:

   ☒ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)

   ☐ List summarizing each extension or project attached (**Attachment**)

   ☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

   Comments:

The Farnum Road sewer district is essentially built out with all properties connected to public sewers. No sewer extensions were conducted within the last year. From year 2009 to the current date, the Sewer Authority awarded bids for the construction of the Low Pressure Sanitary Sewer Mains for Sewer Districts 1 through 9. All phases have been constructed. See attached map in Appendix A.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

   During the 2010 calendar year, a ProMag 53 Flowmeter was installed at the intersection of Farnum Road and Crum Creek Road. This flowmeter monitors all flows generated entering the Farnum Road CDCA district. During the 2012 calendar year, a ProMag 53 Flowmeter was installed at the intersection of Dog Kennel and Paxon Hollow Road. This flowmeter monitors all flows generated entering from the "Phases 5, 6, 7 and 8" CDCA districts.

   During the 2012 calendar year, a ProMag 53 Flowmeter was installed at the intersection of State Road and Crum Creek Road. This flowmeter monitors all flows generated entering from the "Phase 9" CDCA district. In an effort to maintain the system and diagnose sewer conditions, the Sewer Authority has implemented a 4 year program of television inspection and cleaning. In addition, the branches of the sanitary sewers located on Dyanna Lane, Dogwood Road and several private driveways and all future public sewers (Sewer Districts 5 through 9) are low-pressure systems that are free from the effects of Inflow and Infiltration.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

There is no apparent gravity main or low pressure sanitary sewer main which currently exceeds capacity and no known surcharges or SSO's occurred in this district. The Authority has taken measures to maintain the integrity of the system and reduce inflow and infiltration problems. As stated above, the Authority continues to implement the sewer cleaning program in order to maintain the integrity of the system. In addition, the Authority is planning to institute a service lateral inspection/rehabilitation program designed to eliminate potential sources of I&I such as failing laterals and illegal connections.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number –)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8)) N/A

a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

Check the appropriate boxes:

☐ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

CDCA

9. Existing or Projected Overload. N/A

Check the appropriate boxes:

- ☐ This report demonstrates an existing hydraulic overload condition.
- ☐ This report demonstrates a projected hydraulic overload condition.
- ☐ This report demonstrates an existing organic overload condition.
- ☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year. N/A

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**) N/A

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b)) N/A

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

R.T. Spielman, Operation Manageter UPTSA	R.T. Spielman Jr.
Name of Responsible Official	Signature
610-566-5376	2/11/19
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

James P. Kelly, P.E., Authority Engineer	J. P. Kelly
Name of Preparer	Signature
610-358--9363	2/15/19
Telephone No.	Date

Chapter 94
Municipal Wasteload Management
Annual Report

2018 Chapter 94 Annual Report
Farnum Road District Into C.D.C.A

For

Upper Providence Township Sewer Authority
Delaware County
935 North Providence Road
Media, PA 19063
(610) 566-5376

Prepared by:

KELLY & CLOSE ENGINEERS
CONSULTING ENGINEERS & SURVEYORS

1786 Wilmington Pike
Glen Mills, PA 19342
(610) 358-9363

February 15, 2019

Prepared for:

Upper Providence Township Sewer Authority
935 North Providence Road
Media, PA 19063

Ja. P. Kelly

James P. Kelly, P.E.
Kelly & Close Engineers

TABLE OF CONTENTS

ATTACHMENTS LIST

REPORT REQUIREMENTS

1. INTRODUCTION

This section should give a brief description of the sewer service area covered by the report. List all tributary municipalities that send sewage to the Wastewater Treatment Facility (WWTF), and list those portions of the service area that are owned/operated by other permittees.

Discuss the age of the WWTF and a general description of the wastewater treatment process. If available, a process diagram could be included in an appendix to the report.

BACKGROUND

The following Chapter 94-Municipal Wasteload Management 2018 Annual Report has been prepared for the Upper Providence Township Sewer Authority. The purpose of the report is to serve as an addendum to the Chapter 94 Report prepared for the Central Delaware County Authority (C.D.C.A.)/Delcora.

Upper Providence Township is currently serviced by three wastewater treatment plants. This report will focus solely on the C.D.C.A.

C.D.C.A. / Delcora – are located downstream of an interceptor in Crum Creek and the treatment plant is located on Highland Avenue in the City of Chester, on the banks of the Delaware River.

The collection system which conveys from Upper Providence Township into the C.D.C.A. system is comprised of an 8" PVC gravity main which follows Farnum Road and enters the Crum Creek Interceptor. Low pressure lines (2" SDR11 HDPE) from two tributary streets, Dyanna Lane and Dogwood Road, connect to that gravity line. In addition, two separate 8" PVC sanitary sewer mains on Crum Creek Road connect to C.D.C.A. through the Farnum Road line and the Nether Providence Township sanitary system.

There are no combined sewers in Upper Providence Township.

2. HYDRAULIC AND ORGANIC LOADINGS

Provide a line graph depicting the monthly average flows (in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph should include a line depicting the hydraulic design flow of the plant included in the Water Quality Management Part II Permit.

Provide a line graph depicting the monthly average organic loadings in pounds per day (lbs/day) BOD_5, for each month for the past 5 years and projecting the monthly average organic loading for the next 5 years. The graph should also include a line depicting the organic loading design (expressed in lbs/day) of the plant included in the Water Quality Management Part II Permit.

List the permitted capacities of your WWTF:

This section is non-applicable for Upper Providence Township. As stated above, the sewer flows from Upper Providence Township into either the Media WWTP, C.D.C.A WWTP or the Southwest Delco. Municipal Authority WWTP.

3. 5-YEAR HYDRAULIC AND ORGANIC LOADING PROJECTIONS

This section should provide a description of the basis for the hydraulic and organic loading 5-year projections, including the data and calculations that were used to determine them. Your projections should include the following elements:

N/A - No WWTP's are owned or operated by Upper Providence Township.

4. SEWER EXTENSIONS

This section should provide the following information:

a. A map showing all sewer extensions constructed within the past calendar year;
b. A map showing sewer extensions approved or exempted in the past year in accordance with the PA Sewage Facilities Act (35 P.S. §§ 750.1—750.20) and Chapter 71 (relating to administration of the sewage facilities program), but not yet constructed;
c. A map showing all known proposed projects which require public sewers but are in the preliminary planning stages.
d. A list summarizing each extension or project.

e. If a sewer extension approval or proposed project includes schedules for completing the project over time, the list should describe the projects projected build-out over time.

This section should clearly indicate whether or not each of the above requirements is applicable for the report's calendar year. For example, if no sewer extensions were constructed in the past calendar year, clearly indicate this in the report.

The Farnum Road sewer district is essentially built out with all properties connected to public sewers. No sewer extensions were conducted within the last year. From year 2009 to the current date, the Sewer Authority awarded bids for the construction of the Low Pressure Sanitary Sewer Mains for Sewer Districts 1 through 9. All phases of the project have been constructed. See attached map in Appendix A.

To date the following permits have been approved and pumps have been installed / inspected:

Phase 1:	**209 permits, 209 pumps**
Phase 2:	**184 permits, 184 pumps**
Phase 3:	**120 permits, 120 pumps**
Phase 4:	**79 permits, 77 pumps**
Phase 5:	**149 permits, 144 pumps**
Phase 6:	**158 permits, 158 pumps**
Phase 7:	**69 permits, 61 pumps**
Phase 8:	**126 permits, 125 pumps**
Phase 9:	**93 permits, 86 pumps**

As of January 10, 2018, approximately 1,187 permits have been approved and 1,164 pumps have been installed / inspected; connecting 98% of the customers to public sewer.

5. PROGRAM FOR SANITARY SEWER MONITORING, MAINTENANCE, AND REPAIR

This section should include a detailed discussion of the permittee's program for sewer system:

a. Monitoring;
b. Maintenance;
c. Repair;
d. Rehabilitation;
e. Routine and special activities;
f. Personnel and equipment used;
g. Sampling frequency;

h. Quality assurance;
i. Data analyses;
j. Infiltration/inflow (I/I) monitoring;
k. Maintenance and control of combined sewer regulators during the past year, where applicable.

Provide a detailed description of actual work conducted during the calendar year for each of the items noted above, including the findings of those efforts and any proposed follow-up work and/or investigations for the subsequent year.

Where flow monitoring has been conducted, provide an analysis of the flow-meter data. Have portions of the system shown evidence of I/I? What work is currently being conducted or proposed, to address excess flows?

During the 2010 calendar year, a ProMag 53 Flowmeter was installed at the intersection of Farnum Road and Crum Creek Road. This flowmeter monitors all flows generated entering the Farnum Road CDCA district.

During the 2012 calendar year, a ProMag 53 Flowmeter was installed at the intersection of Dog Kennel and Paxon Hollow Road. This flowmeter monitors all flows generated entering from the "Phases 5, 6, 7 and 8" CDCA districts.

During the 2012 calendar year, a ProMag 53 Flowmeter was installed at the intersection of State Road and Crum Creek Road. This flowmeter monitors all flows generated entering from the "Phase 9" CDCA district.

In an effort to maintain the system and diagnose sewer conditions, the Sewer Authority has implemented a 4 year program of television inspection and cleaning. In addition, the branches of the sanitary sewers located on Dyanna Lane, Dogwood Road and several private driveways and all future public sewers (Sewer Districts 5 through 9) are low-pressure systems that are free from the effects of Inflow and Infiltration.

6. CONDITION OF THE SEWER SYSTEM

This section requires a discussion of the condition of the sewer system, including portions where conveyance capacity is exceeded or will be exceeded in the next 5 years. It should include a discussion of those portions of the system where rehabilitation or cleaning is needed or underway to maintain the integrity of the system and prevent or eliminate:

a. Bypassing;

b. Combined sewer overflows;
c. Sanitary sewer overflows;
d. Excessive infiltration;
e. Other system problems.

Include a discussion of available existing and future capacity. The discussion should include the following:
f. The age of the sewer system.
g. The type of material of which the system is made (i.e., brick, vitrified clay, PVC, Orangeburg, etc.).
h. An analysis that determines whether the existing sewer lines are sized properly for the connected population.
i. A discussion of any portions of the system that should be repaired, replaced or rehabilitated, including a timeframe by which any proposed actions are expected to be completed.

Discuss any portions of the sewer system in which surcharging occurs:
j. How often does the system surcharge in each location?
k. What size storm events create surcharging sewer lines?
l. What is the cause of the surcharging?
m. Sewer systems that surcharge during wet weather indicate a lack of hydraulic capacity and are considered to be in a projected hydraulic overload. For such conditions, permittees should submit a CAP and CMP with the annual report, as required by 25 Pa Code § 94.22.

Provide a list of all SSOs that occurred during the calendar year, including their cause and location (a copy of the Southeast Regional Office's SSO Report Form submitted by the permittee is acceptable). SSOs related to wet weather should be discussed:
n. Explain if there is a history of SSOs at each reported location. If a trend of SSOs at specific locations during rain events is documented, this indicates a lack of hydraulic capacity and is considered a hydraulic overload condition.
o. Why are SSOs occurring at each location? Has a hydraulic analysis been conducted, and if so, what were the results and recommendations for corrective action?
p. Provide an analysis of flow metering that has been conducted.
q. Sewer systems that experience SSOs are considered to be in an existing hydraulic overload. A CAP and CMP should be submitted with the annual report, as required by 25 Pa Code § 94.21.

The Department strongly recommends that existing capacity be documented with flow meter data. Whether flow meters are already in place, or are proposed to be used throughout the system to gather flow data on sub-basin approach – existing capacity should be documented *with data that describes <u>actual</u> flow conditions during dry-weather and wet weather conditions:*

r. *Dry weather flows should be monitored to document baseline flows and for comparison purposes, to determine the extent of I/I within the collection and conveyance system.*

s. *Wet weather capacity should be determined by documenting the peak instantaneous (or peak hourly) flow rate as compared to the hydraulic carrying capacity of the sanitary sewer (i.e., Manning's equation).*

There is no apparent gravity main or low pressure sanitary sewer main which currently exceeds capacity and no known surcharges or SSO's occurred in this district. The Authority has taken measures to maintain the integrity of the system and reduce inflow and infiltration problems. As stated above, the Authority continues to implement the sewer cleaning program in order to maintain the integrity of the system.

In addition, the Authority is planning to institute a service lateral inspection/rehabilitation program designed to eliminate potential sources of I&I such as failing laterals and illegal connections.

7. SEWAGE PUMPING STATIONS

If applicable, this section should provide a discussion of the condition of sewage pump stations, including a comparison of the maximum pump rate with present maximum flows and the projected 2-year maximum flows for each station:

N/A-No regional pumping stations exist within the District.

8. INDUSTRIAL WASTES

If applicable, the report on industrial wastes (IW) should include:

a. *A copy of an ordinance or regulation governing IW.*

Upper Providence Township has no ordinance regarding Industrial flow.

b. *A discussion of the permittee's program for surveillance and monitoring of IW discharges to the sewer system during the past year.*

There are no known industrial wastes discharged into the Upper Providence Township sanitary system tributary to the CDCA WWTP.

c. *A discussion of specific problems in the sewer system or at the WWTF, known or suspected to be caused by IW discharges and a summary of steps being taken to alleviate or eliminate the problems.*

There are no known industrial wastes discharged into the Upper Providence Township sanitary system tributary to the CDCA WWTP.

d. *A list of any such industries known to be discharging wastes that create a problem and actions taken to prevent potential or recurring problems caused by the IW dischargers.*

Currently, there are no known Industrial wastes within the CDCA district system, therefore no measures have been taken to alleviate or eliminate industrial waste.

e. *Provide documentation regarding any actions taken against IW dischargers.*

N/A

9. CORRECTIVE ACTION PLAN

If an existing or projected overload condition has been identified at the WWTF or in a portion of the collection and conveyance system owned by any permittee within the WWTF's sewer service area, the respective permittee should provide a CAP and CMP in the Chapter 94 Report to address the overload condition as required under 25 Pa Code §§ 94.21 and 94.22. The attached CAP and CMP development guidelines should be referenced for preparation of these documents.

N/A

10. CALIBRATION REPORTS

As required by 25 Pa Code § 94.13, flow measuring, indicating, and recording equipment should be calibrated annually, and the calibration report should be included in the annual report submitted under § 94.12 (relating to annual report).

Any such equipment at the WWTF and/or within the collection and conveyance system should be calibrated (at a minimum) at this frequency. Calibration reports for each permittee's system should be included in the respective annual reports.

Calibration reports are available via CDCA, who currently owns and operates the flow meters. Flow data will also available via a web based database, upon completion.

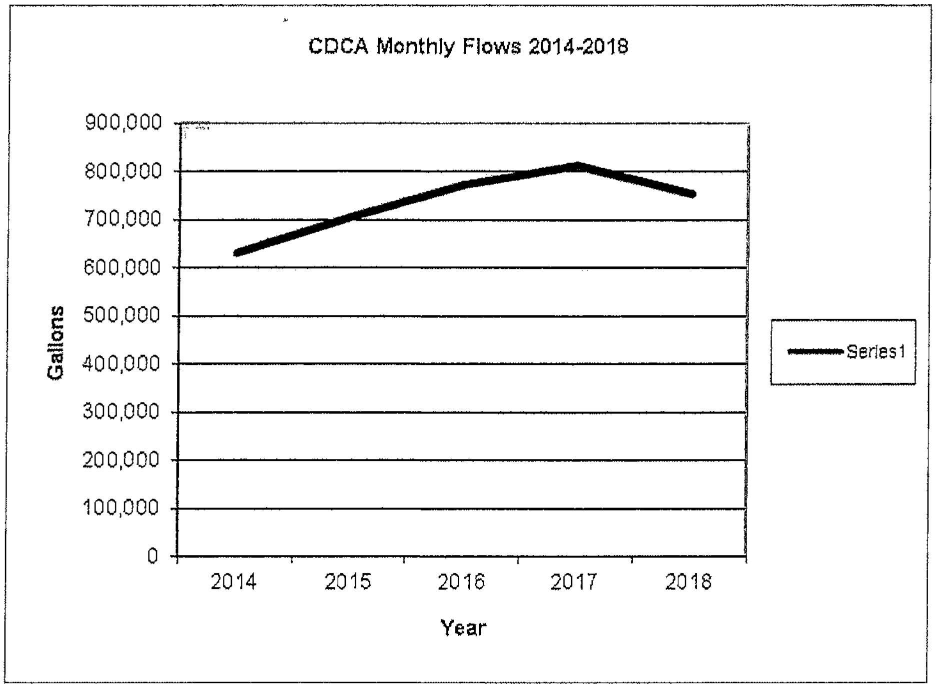
11. TRIBUTARY MUNICIPALITY REPORTS

Each tributary municipality (or authority) that is the permittee of its own collection and conveyance system, but which sends sewage flow to the WWTF submitting this report, must submit their respective information for inclusion in the WWTF's Chapter 94 Report. Each permittee's report should contain all of the information required in 25 Pa Code § 94.12 (Annual Report), excluding that information pertaining to a WWTF or industrial waste dischargers that would be inspected and/or regulated by the permittee of the WWTF. Include copies of any correspondence with tributary municipalities/authorities regarding acquisition of this information.

The reported number of CDCA users is 70 EDU's with an average GPD/EDU of 273.

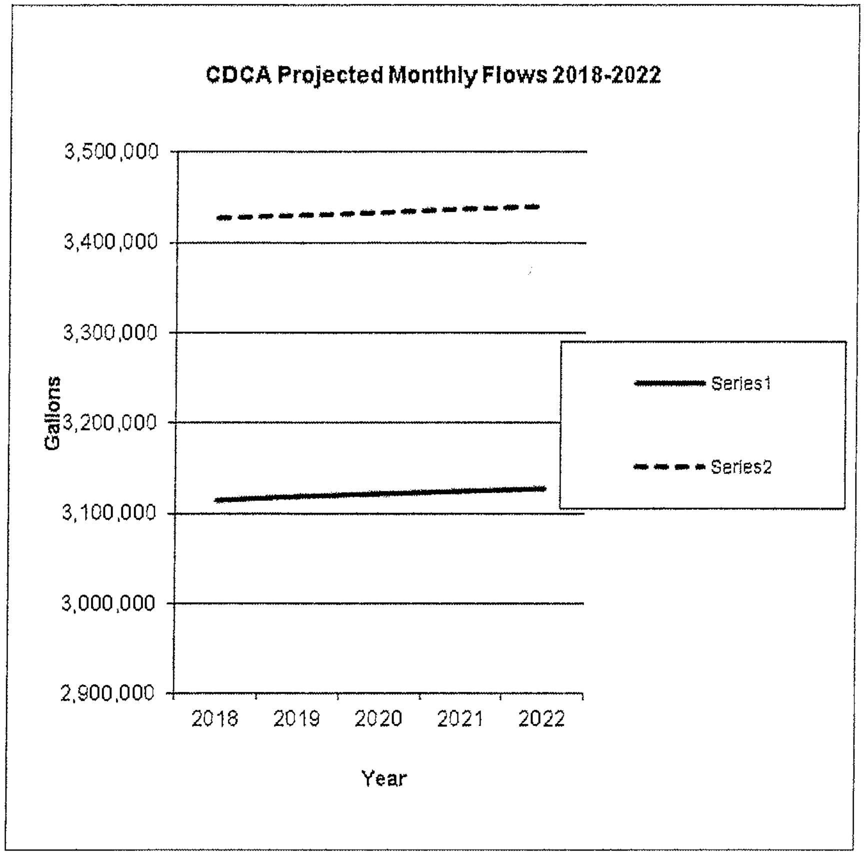
The average monthly flow into the CDCA system for 2018 was approximately 753,522 gallons with an estimated maximum monthly flow of 879,578 gallons. The average monthly flow data from 2014-2018 is as follows:

Year	Average Monthly Flow (GAL)
2014	630,465
2015	707,095
2016	771,786
2017	812,917
2018	753,522



Subsequent to the acceptance of Upper Providence Township as a member municipality of the CDCA, construction of several sewer extensions will significantly increase the number of connections to the system. Based on the current schedule, average monthly flows into the CDCA over the next five years are projected to increase as follows:

Year	Estimated Average Monthly Flow (GAL)	Estimated Max Monthly Flow (GAL)
2018	**3,115,000**	**3,426,500**
2019	**3,118,000**	**3,429,800**
2020	**3,121,000**	**3,433,100**
2021	**3,124,000**	**3,436,400**
2022	**3,127,000**	**3,439,700**


CDCA Projected Monthly Flows 2018-2022
3,500,000
3,400,000
3,300,000
3,200,000
3,100,000
3,000,000
2,900,000
Gallons
2018
2019
2020
2021
2022
Year
Series1
Series2

APPENDIX “A”

2018 CHAPTER 94 SEWER MAP

The current connections which flow into the CDCA sewers are listed below:

Farnum Road - 40
Dogwood Road - 8
Dyanna Lane - 6
Crum Creek Rd - 4 (Through CDCA MH at 297 Crum Creek Rd)
Crum Creek Rd - 6 (Through Nether Providence Twp. MH in Crum Creek Rd)
Dog Kennel Road - 4

Total current CDCA Users – 68

K&C
KELLY & CLOSE ENGINEERS
CONSULTING ENGINEERS & SURVEYORS
The Summit at Brandywine
1786 Wilmington Pike/Suite 300
Glen Mills, Pennsylvania 19342
610.358.9363 fax 610.358.9374

FARNUM ROAD SANITARY SYSTEM
C.D.C.A. 2018

UPPER PROVIDENCE TOWNSHIP
DELAWARE COUNTY, PENNSYLVANIA

SANITARY SEWER MAP

SHEET
1
of 1

* ALSO A FLOWMETER PRO-MAG 53 AT THE INTERSECTION OF FARNUM RD AND CRUM CREEK RD

Phase 1: 209 permits, 209 pumps
Phase 2: 184 permits, 184 pumps
Phase 3: 120 permits, 120 pumps
Phase 4: 79 permits, 77 pumps
Phase 5: 149 permits, 144 pumps
Phase 6: 158 permits, 158 pumps
Phase 7: 69 permits, 61 pumps
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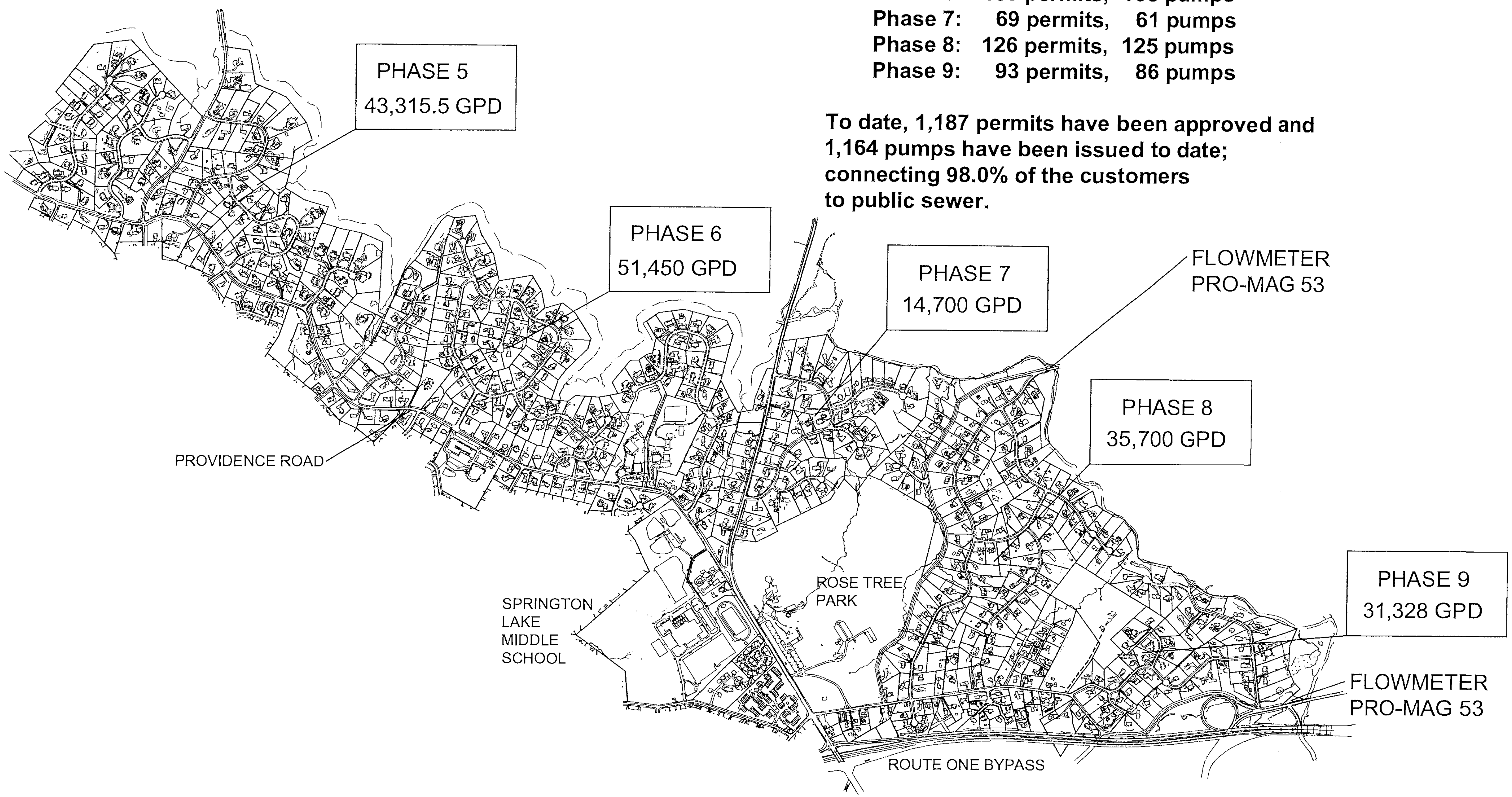
Phase 9: 93 permits, 86 pumps

To date, 1,187 permits have been approved and 1,164 pumps have been issued to date; connecting 98.0% of the customers to public sewer.



UPPER PROVIDENCE TOWNSHIP
CHAPTER 94 REPORT CDCA

UPPER PROVIDENCE TOWNSHIP
DELAWARE COUNTY, PENNSYLVANIA

2017 UPPER CRUM CDCA CHAPTER 94

SHEET 1 of 1

Darby Creek Joint Authority

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Darby Creek Joint Authority**	Permit No.:	**PA N/A**
Mailing Address:	**100 East 5th Street**	Effective Date:	**N/A**
City, State, Zip:	**Chester, PA 19013**	Expiration Date:	**N/A**
Contact Person:	**Daniel Kelly**	Renewal Due Date:	**N/A**
Title:	**Chairman**	Municipality:	**N/A**
Phone:	**610-876-5523**	County:	**Delaware**
Email:	**N/A**	Consultant Name:	**Catania Engineering Associates, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   Please note that the Chapter 94 Spreadsheet was used to show monthly average flows and projections; it is understood that this report is for a collection system only.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

   Check the appropriate boxes:

   ☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)

   ☐ List summarizing each extension or project attached (**Attachment**)

   ☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

   Comments:

   No sewer extensions were constructed or approved within the past calendar year. A copy of the sanitary sewer system.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

   See attachment.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

Based upon the video inspection program, the system is in fair to good condition. DCJA monitors capacity based upon the old PADEP capacity management plan.

A Flow Capacity Analysis was completed in 2018.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number –)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

   c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

Check the appropriate boxes:

☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

☐ This report demonstrates an existing hydraulic overload condition.
☐ This report demonstrates a projected hydraulic overload condition.
☐ This report demonstrates an existing organic overload condition.
☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Daniel Kelly	Daniel Kelly
Name of Responsible Official	Signature
610-876-5523	2-25-19
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Charles Catania Jr.
Name of Preparer

Signature

610-532-2884
Telephone No.

2/21/19
Date

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chapter 94 Spread
Sewage Treatment Pl

Reporting Year: 2018

Facility Name: Darby Creek Joint Authority

Permit No.:

Persons/EDU: 3.5

Existing Hydraulic Design Capacity: MGD
Upgrade Planned in Next 5 Years? Year:
Future Hydraulic Design Capacity: MGD

Existing Organic Design Capacity: lbs BOD5/day
Upgrade Planned in Next 5 Years? Year:
Future Organic Design Capacity: lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2014	2015	2016	2017	2018
January	0.69484	0.63355	0.56386	0.52581	0.52774
February	0.99607	0.6675	0.75348	0.55	0.74179
March	0.78097	0.78935	0.61347	0.54839	0.75774
April	0.829	0.676	0.58514	0.62333	0.701
May	0.88484	0.55935	0.6176	0.59677	0.65903
June	0.68	0.631	0.56106	0.54	0.66233
July	0.57742	0.58	0.51035	0.50645	0.54032
August	0.52194	0.48548	0.47821	0.49677	0.60065
September	0.51733	0.50833	0.48786	0.49	0.73867
October	0.49677	0.5229	0.46146	0.48065	0.63484
November	0.55433	0.527	0.47586	0.48667	0.89267
December	0.57	0.57935	0.51307	0.46774	0.83581

Annual Avg	0.67529269	0.59665278	0.55178396	0.52604839	0.69104845
Max 3-Mo Avg	0.86867972	0.71095161	0.65069784	0.58949821	0.78777061
Max : Avg Ratio	1.29	1.19	1.18	1.12	1.14
Existing EDUs				41,409.0	41,409.0
Flow/EDU (GPD)				12.7	16.7
Flow/Capita (GPD)				3.6	4.8
Exist. Overload?					

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2014	2015	2016	2017	2018
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					

Annual Avg					
Max Mo Avg					
Max : Avg Ratio					
Existing EDUs				41,409	41,409
Load/EDU					
Load/Capita					
Exist. Overload?					

Projected Flows for Next Five Years (MGD)

	2019	2020	2021	2022	2023
New EDUs	5.0	5.0	5.0	5.0	0.0
New EDU Flow	0.0001	0.0001	0.0001	0.0001	0
Proj. Annual Avg	0.60827	0.60837	0.60847	0.60857	0.60857
Proj. Max 3-Mo Avg	0.71992	0.72003	0.72015	0.72027	0.72027
Proj. Overload?					

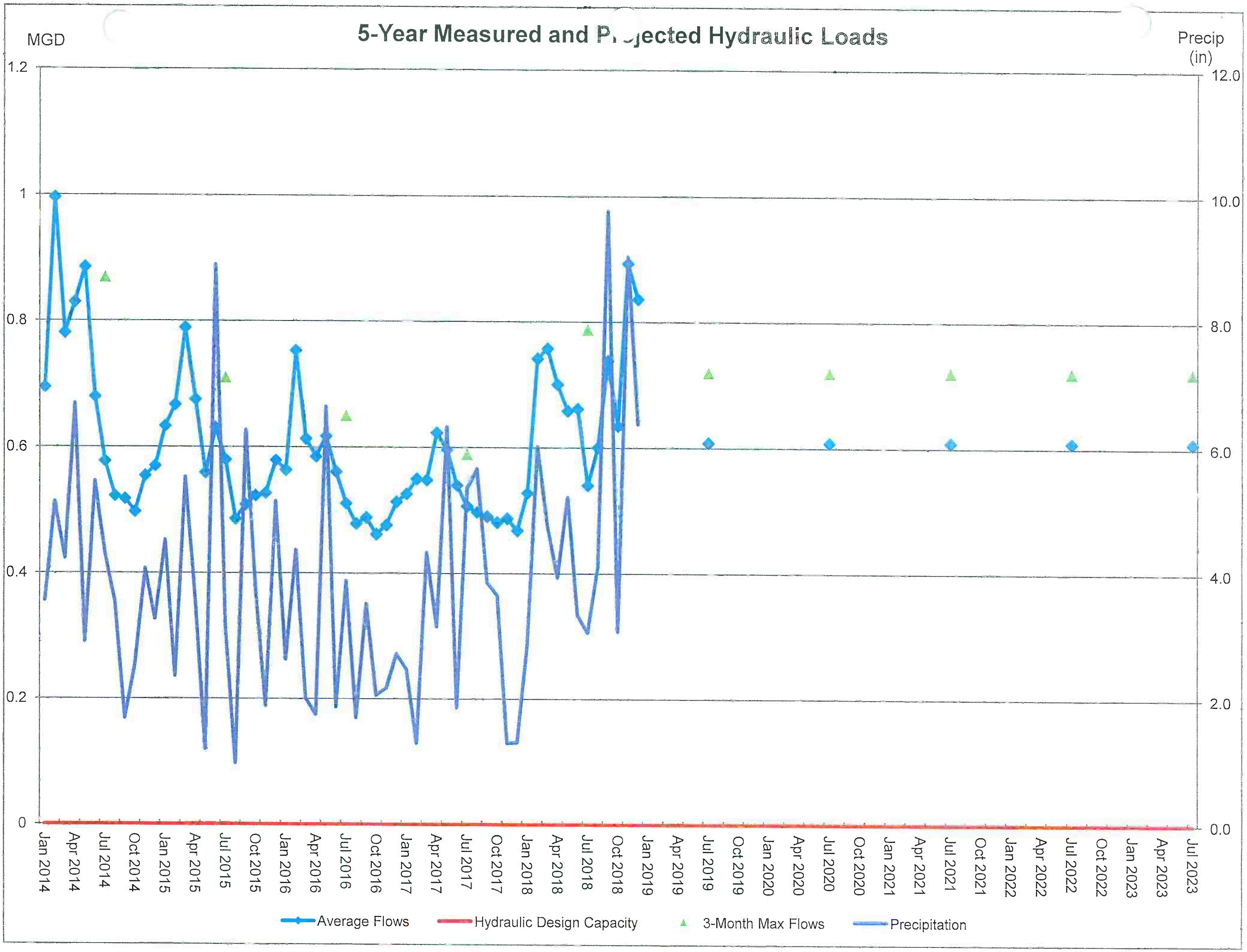
Projected BOD5 Loads for Next Five Years (lbs/day)

	2019	2020	2021	2022	2023
New EDUs	5	5	5	5	0
New EDU Load	2.920	2.920	2.920	2.920	0.000
Proj. Annual Avg	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Proj. Max Avg	#DIV/0!				
Proj. Overload?	#DIV/0!				

Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (Inches)

Month	2014	2015	2016	2017	2018
January	3.56	4.52	2.63	2.48	2.85
February	5.12	2.36	4.36	1.3	6.02
March	4.23	5.52	2.01	4.33	4.74
April	6.69	3.58	1.75	3.15	3.94
May	2.91	1.2	6.65	6.33	5.21
June	5.46	8.89	1.87	1.86	3.34
July	4.3	3.16	3.88	5.35	3.06
August	3.55	0.98	1.7	5.66	4.11
September	1.69	6.27	3.52	3.86	9.76
October	2.54	3.76	2.06	3.66	3.08
November	4.07	1.89	2.17	1.3	9.03
December	3.27	5.14	2.72	1.31	6.38


5-Year Measured and P... jected Hydraulic Loads
MGD
Precip (in)
1.2
1
0.8
0.6
0.4
0.2
0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 2014
Apr 2014
Jul 2014
Oct 2014
Jan 2015
Apr 2015
Jul 2015
Oct 2015
Jan 2016
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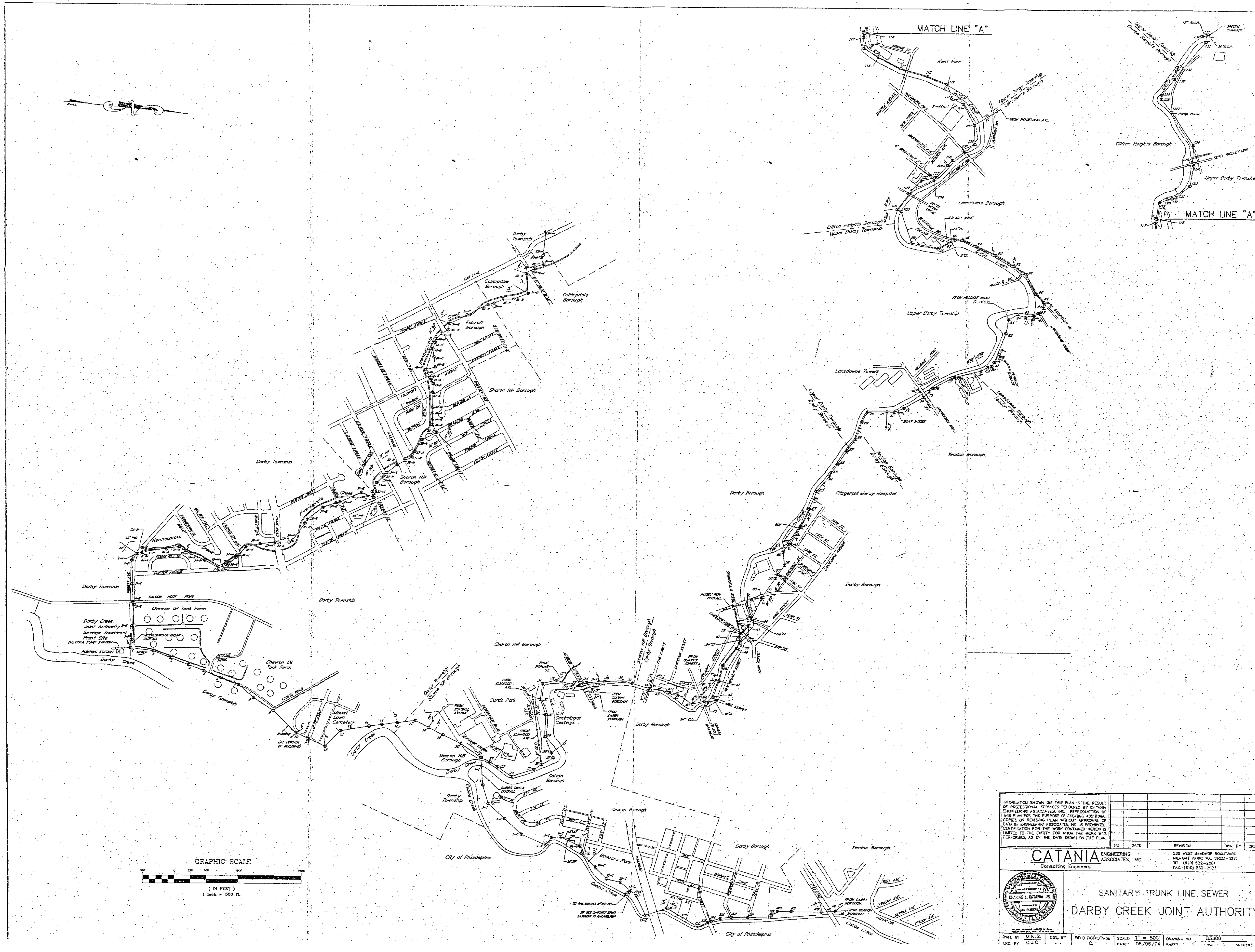
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Apr 2023
Jul 2023
Average Flows
Hydraulic Design Capacity
3-Month Max Flows
Precipitation



INFORMATION SHOWN ON THIS PLAN IS THE RESULT OF PROFESSIONAL SERVICES RENDERED BY CATANIA ENGINEERING ASSOCIATES, INC., REPRODUCTION OF THIS PLAN FOR THE PURPOSE OF CREATING ADDITIONAL COPIES OR REVISING PLAN WITHOUT APPROVAL OF CATANIA ENGINEERING ASSOCIATES, INC. IS PROHIBITED. CERTIFICATION FOR THE WORK CONTAINED HEREIN IS LIMITED TO THE ENTITY FOR WHOM THE WORK WAS PERFORMED, AS OF THE DATE SHOWN ON THE PLAN.

NO.	DATE	REVISION	DWN. BY	CKD. BY

CATANIA ENGINEERING ASSOCIATES, INC.
Consulting Engineers
520 WEST MacDADE BOULEVARD
MILMONT PARK, PA. 19033-3311
TEL. (610) 532-2884
FAX. (610) 532-2923

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
CHARLES J. CATANIA, JR.
ENGINEER
No. 04587-E

SANITARY TRUNK LINE SEWER
DARBY CREEK JOINT AUTHORITY

DWN. BY M.N.G.	DSG. BY	FIELD BOOK/PAGE	SCALE 1" = 500'	DRAWING NO. 83800
CKD. BY C.J.C.		C.	DATE 08/06/04	SHEET 1 OF 1 SHEETS

Industrial Waste Report

DELCORA is currently responsible for issuance of Industrial Waste Permits to companies discharging to the Darby Creek Joint Authority. The regulation governing discharge of the industrial wastes as well as any program for surveillance and monitoring of industrial waste discharges is maintained by DELCORA. There have been no known problems from industrial waste discharges and no actions taken against industrial waste dischargers in the DCJA system during 2017. The following companies operate under an Industrial or Non-categorical Industrial Discharge Permit per DELCORA input this year:

a. Bullen Companies

   1640 Delmar Drive

   Folcroft, PA

   Average Permitted Flow – 2,000 GPD (Pesticide Chemicals)

b. Hydrol Chemical

   520 Commerce Drive

   Yeadon, PA 19050

   Average Permitted Flow – No Flow (Pesticide Chemicals)

c. Keystone Restoration Silversmiths

   100 Mill Street, Suite #3

   Clifton Heights, PA 19018

   Average Permitted Flow – 300 GPD (Metal Finishing)

d. Multiflex Plating Company

   109 Willows Avenue

   Collingdale, PA 19023

   Average Permitted Flow – 17,000 GPD (Metal Finishing)

e. Precious Metals Plating Co.

   21 South Chester Pike

   Glenolden, PA 19036

   Average Permitted Flow – 1,500 GPD (Electroplating)

f. Lyondell Chemical Worldwide, Inc.

   3801 West Chester Pike

   Newtown Square, PA 19073

   Average Permitted Flow – 110,000 GPD

g. Sun Logistics Partners L.P.

   Darby Creek Tank Farm

   Calcon Hook and Hook Roads

   Darby, PA 19023

   Average Permitted Flow – 60,000 GPD

Sanitary Sewer Monitoring Summary

The DCJA regularly monitors, maintains, and repairs its system. Line cleaning and video inspection are performed on regular intervals. The interceptor line and manholes are inspected annually and a system inspection is completed after each major storm event to monitor any irregularities within the system such as manhole damage, exposed pipe, or sinkholes over the sewer line. Emergency repair work is performed when required.

Monitoring and line cleaning is performed through video inspection and various line cleaning methods. Based on video from the inspections, a yearly Sanitary Sewer Assessment Report is created and a maintenance schedule is outlined. High priority, low priority, and I&I abatement issues are identified and addressed. The personnel and equipment used for routine monitoring, maintenance, repair, and rehabilitation is obtained through an outside contractor.

The DCJA, in coordination with DELCORA, instituted a system-wide flow metering system in 2006. A Flow Metering Quality Control Program which includes meter calibration and verification processes has been implemented. Standardized calibration of the flow metering equipment is performed by an outside contractor for DELCORA and calibration reports are available through DELCORA.

a. Monitoring and Maintenance: Contract forces are used for troubleshooting and routine maintenance. Using the video inspections, the Authority prioritizes the sewer system's needs and employs a multi-year program to treat structural deficiencies where necessary.

b. Repair and Rehabilitation: Interceptor maintenance was performed by A to U Services, Inc. Issues identified through the video monitoring and maintenance programs as well as problems that arose were addressed. The Authority maintains records of work performed, personnel and equipment utilized.

c. Flow Data Analysis, Quality Assurance, and I&I Monitoring: DELCORA has placed flow metering equipment throughout the DCJA service area. Locations of flow meters should be noted on individual township maps. CSL Services, Inc. has been obtained by DELCORA to calibrate and maintain the flow monitoring equipment throughout 2018.

Aldan Borough

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION

Permittee Name:	**Aldan Borough**	Permit No.:	**PA**
Mailing Address:	**One W. Providence Road**	Effective Date:	**n/a**
City, State, Zip:	**Aldan, Pa 19018**	Expiration Date:	**n/a**
Contact Person:	**Maurice P. (P.J.) Close, P.E.**	Renewal Due Date:	**n/a**
Title:	**Borough Engineer**	Municipality:	**Aldan Borough**
Phone:	**610-358-9363**	County:	**Delaware County**
Email:	**pjclose@kellyengineers.com**	Consultant Name:	**Kelly & Close Engineers**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   n/a

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)

☐ List summarizing each extension or project attached (**Attachment**)

☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

Aldan Borough contains no WWTP or pump stataions; only a collection and conveyance system. A map has been included in the attached Chapter 94 Report. There were no sewer extensions conducted in the past year nor are any extensions proposed within the next five years. The Borough is essentially built out, with all properties connected to public sewers.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

Aldan Borough continues to monitor/perform annual repair/rehabilitation to their sewer collection system. The Borough has a cleaning program to clean (quarterly) all sanitary sewer mains to ensure all mains are cleaned at least once every four (4) years. Aldan Borough continues to perform various I&I reduction methods to remove I&I sources. The Borough Engineer monitors and reviews DELCORA meter data on a monthly basis to analyze flow trends, effects of rainfall, assess effectivness of I&I rehab work and isolate problem areas. See attached Chapter 94 report for additional information.

Previously, night-time visual manhole inspections were performed in our Meter #2 Collection System to monitor flow and identify sanitary sewer areas that are in need of repair and or replacement. Aldan Borough utilized the inspections to prepare a seven 7-Year Master Plan for I&I Rehabilitation. The 7-Year Master Plan proposed the installation of CIPP Liners and Manhole Rehabilitation in seven segments in the Meter #2 Collection System.

Due to observed leaking and minor sinkholes in the paving at manholes #160 and #161 in Providence Road, the manholes were cement parged and new water tight manhole frames and covers were installed in 2018.

In 2019/2020, Aldan Borough intends to initiate a long-term I&I Rehabilitation Program for Year 1 (Meter #2 Collection System) based on the results of the 7-Year Master Plan.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

The Aldan Borough Sanitary Sewer System is a gravity collection sanitary sewer system that is in good working condition and is structurally sound with no known capacity problems. The public sewer lines are properly sized for the connected population. The connected population has stayed the same or decreased over the last 5 years. No growth, relative to a projected increase in sewer flows, is expected in the next 5 years. No known surcharges occur within the system and no SSOs occurred within Aldan Borough during the last permit year. See attached Chapter 94 report for additional information.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number –)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8)) N/A

a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

Check the appropriate boxes:

☐ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload. N/A

Check the appropriate boxes:

☐ This report demonstrates an existing hydraulic overload condition.
☐ This report demonstrates a projected hydraulic overload condition.
☐ This report demonstrates an existing organic overload condition.
☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year. N/A

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems). N/A

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b)) N/A

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Harry Short, Council President	Harry Short
Name of Responsible Official	Signature
610-721-7464	1/23/19
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Maurice P. (PJ) Close, P.E.	[signature]
Name of Preparer	Signature
610-358-9363	2/15/19
Telephone No.	Date

Chapter 94
Municipal Wasteload Management
Annual Report

2018 Chapter 94 Annual Report
Aldan Borough
Delaware County

Prepared By:

KELLY & CLOSE ENGINEERS
CONSULTING ENGINEERS & SURVEYORS
1786 Wilmington Pike / Suite 300
Glen Mills, PA 19342
Ph: 610-358-9363
Fax: 610-358-9376

Prepared For:
Aldan Borough, Delaware County
One W. Providence Road
Aldan, PA 19018

February 15, 2019

Preparer

Signature
Name: Maurice P. Close, P.E.
Company: Kelly & Close Consulting
Engineers & Surveyors

Permittee

Signature
Name: Harry Short, President
Permittee: Aldan Borough

Chapter 94
Municipal Wasteload Management
Annual Report

2018 Chapter 94 Annual Report
Aldan Borough
Delaware County

Prepared By:

KELLY & CLOSE ENGINEERS
CONSULTING ENGINEERS & SURVEYORS

1786 Wilmington Pike / Suite 300
Glen Mills, PA 19342
Ph: 610-358-9363
Fax: 610-358-9376

Prepared For:
Aldan Borough, Delaware County
One W. Providence Road
Aldan, PA 19018

February 15, 2019

Preparer	Permittee
______________________	______________________
Signature	*Signature*
Name	Name
Company:	Permittee

Table of Contents

1. INTRODUCTION

This section should give a brief description of the sewer service area covered by the report. List all tributary municipalities that send sewage to the Wastewater Treatment Facility (WWTF), and list those portions of the service area that are owned/operated by other permittees.

Discuss the age of the WWTF and a general description of the wastewater treatment process. If available, a process diagram could be included in an appendix to the report.

Aldan Borough contains no WWTP or pump stations. Within Aldan, there is only a collection and conveyance system. Accordingly, only responses relative to the collection system will be provided.

Aldan Borough's sanitary sewer collection system is a gravity system containing a total of 68,750 +/- LF of pipe, the majority of which is 8" and 12" VCP. Aldan Borough has a 3,000 LF 20" VCP interceptor along Lobbs Run, which discharges to the DCJA 48" RCP interceptor along Darby Creek.

As a result of 2 CDBG projects in 2008 and 2010, the upper 760 LF contains a 12" HDPE slip lining, the lower 2,240 LF contains a 16" HDPE slip lining and CIPP lining. The system also includes approximately 250 brick manholes and 4 pre-cast concrete manholes.

In 2015, Aldan Borough completed sanitary sewer rehabilitation within the Meter No. 3 Collection System. This project included the following:

- **Televise, inspect, clean and slip line 800 LF of pipe.**
- **Remove and replace water tight manhole frames & covers (9 manholes),**
- **Install fiber reinforced cementitious liners to manhole brick walls as well as replacement of missing grout & bricks (30 vertical feet),**
- **Install fiber reinforced cementitious liners to manhole benches (4 manholes)**

***Aldan Borough completed sanitary sewer rehabilitation within the Meter No. 3 Collection System.**

Due to observed leaking and minor sinkholes in the paving at manholes #160 and #161 in Providence Road, the manholes were cement parged and new water tight manhole frames and covers were installed in 2018.

All sewers are sanitary sewers only (no combined sewers). Refer to Appendix A "Aldan Borough – Sanitary Sewer Map", dated 1/10/2007 - latest revision 10/31/18, for a plan showing the location of the sewer mains and interceptor.

2. HYDRAULIC AND ORGANIC LOADINGS

Provide a line graph depicting the monthly average flows (in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph should include a line depicting the hydraulic design flow of the plant included in the Water Quality Management Part II Permit.

Provide a line graph depicting the monthly average organic loadings in pounds per day (lbs/day) BOD_5, for each month for the past 5 years and projecting the monthly average organic loading for the next 5 years. The graph should also include a line depicting the organic loading design (expressed in lbs/day) of the plant included in the Water Quality Management Part II Permit.

List the permitted capacities of your WWTF:

N/A – No WWTP's exist within Aldan Borough.

3. 5-YEAR HYDRAULIC AND ORGANIC LOADING PROJECTIONS

This section should provide a description of the basis for the hydraulic and organic loading 5-year projections, including the data and calculations that were used to determine them. Your projections should include the following elements:

N/A – No WWTP's exist within Aldan Borough.

4. SEWER EXTENSIONS

This section should provide the following information:

a. A map showing all sewer extensions constructed within the past calendar year;

b. A map showing sewer extensions approved or exempted in the past year in accordance with the PA Sewage Facilities Act (35 P.S. §§ 750.1—750.20) and Chapter 71 (relating to administration of the sewage facilities program), but not yet constructed;

c. A map showing all known proposed projects which require public sewers but are in the preliminary planning stages.

d. A list summarizing each extension or project.

e. If a sewer extension approval or proposed project includes schedules for completing the project over time, the list should describe the projects projected build-out over time.

This section should clearly indicate whether or not each of the above requirements is applicable for the report's calendar year. For example, if no sewer extensions were constructed in the past calendar year, clearly indicate this in the report.

N/A. There were no sewer extensions conducted in the past year nor are any extensions proposed within the next five years. The Borough is essentially built out, with all properties connected to public sewers.

5. PROGRAM FOR SANITARY SEWER MONITORING, MAINTENANCE, AND REPAIR

This section should include a detailed discussion of the permittee's program for sewer system:

a. Monitoring;
b. Maintenance;
c. Repair;
d. Rehabilitation;
e. Routine and special activities;
f. Personnel and equipment used;
g. Sampling frequency;
h. Quality assurance;
i. Data analyses;
j. Infiltration/inflow (I/I) monitoring;
k. Maintenance and control of combined sewer regulators during the past year, where applicable.

Provide a detailed description of actual work conducted during the calendar year for each of the items noted above, including the findings of those efforts and any proposed follow-up work and/or investigations for the subsequent year.

Where flow monitoring has been conducted, provide an analysis of the flow-meter data. Have portions of the system shown evidence of I/I? What work is currently being conducted or proposed, to address excess flows?

From an annual maintenance perspective, the following are programs Aldan Borough has in place:

Sump Pump/Illegal Connection Removal Program

Aldan Borough currently has a procedure for inspecting properties to determine whether a sump pump or illegal connection (i.e. floor drains or roof drains), discharges into the sanitary sewer system. By requiring the issuance of a Use & Occupancy (U & O) certificate, Borough Officials inspect both rental and owner-occupied units at the time of rental or sale. If an illegal connection or sump pump is identified, the U & O certificate is withheld until the connection is removed and such has been verified by the Borough Official. This requirement is documented in the Aldan Borough Code, Ordinance 396 and Chapter 181 "Property Maintenance".

System Annual Maintenance

In late 2012, Aldan Borough cleaned all the sanitary sewer mains located within the Borough. Since 2013, the Borough continues to clean the sanitary sewer mains on a quarterly basis. This quarterly schedule will ensure all of the mains are cleaned at least once every four (4) years.

Lateral Program & DELCORA Eastern Service Area Act 537 Plan Update

Along with other municipalities within DELCORA's Eastern Service Area, Aldan Borough will be participating in DELCORA's lateral program as part of the Act 537 Plan Update process. The Act 537 Plan update has been submitted by DELCORA to PADEP. Upon receipt of PADEP approval, Aldan Borough will adopt a lateral ordinance within one (1) year as required. The lateral program would generally consist of an Ordinance requiring property owners to televise, repair and/or replace damaged laterals experiencing I & I at the time of real estate transfer or as directed by the Borough.

I & I Rehabilitation Program

From a system I&I Study, monitoring and repair perspective, the following summarizes activities since 1997:

- In 1997, the Borough performed an I&I Study, 50% of which was funded by DELCORA.

- In 2002, the Borough approved the Delaware County Act 537 Sewage Facilities Plan Update – Eastern Plan of Study.

- In July 2002, the Borough prepared an I&I Abatement Program, as required by the approved Act 537 Program. This was a 20-year plan to reduce excessive I&I through a process of manhole and sewer repairs. (DCJA was previously furnished a copy of the I&I Abatement Program, complete with maps).

- Between the period of 1997 to 2002, six (6) sections of sewer lines have been repaired to remove I&I sources (Laurel Avenue, Lobb's Run Interceptor (twice), Providence Road, Magnolia Avenue and East Rively Avenue.)

- In April 2000 and November 2001, the Borough installed 125 plastic manhole inserts (just under ½ of the Borough's 254 total manholes). The inserts were strategically placed at low points in streets, along street curblines, in lawns and along streams, creeks and swales.

- From 2002 to present, the Borough has performed an annual manhole rehabilitation program to seal leaking manholes. We have currently completed the southern ½ of the Borough (south of Providence Road).

- In 2008, the Borough initiated a contract to clean and televise the entire system area tributary to DELCORA Meter 3 (see attached Sanitary Sewer Map for location). Meter 3 readings indicated a significant infiltration problem which was further substantiated by video inspection. Due to the close proximity of the Lobb's Run interceptor to Lobb's Run Creek, the interceptor is highly susceptible to infiltration. A TV inspection assisted in identifying a water main break that was introducing clean water into the sanitary system. The break was subsequently repaired and appears to have contributed to a significant reduction in Meter 3 monthly flows. The Borough also performed several system wide night-time infiltration surveys in an effort to identify potential problem areas.

- In 2010, the Borough completed the Phase I - Lobb's Run Interceptor Rehabilitation which consisted of slip-lining approximately 2,000 LF of existing 20" VCP. The project utilized fuse-welded polyethylene pipe to reduce infiltration and correct structural deficiencies which existed within the line. The upper 760 LF contains a 12" slip lining and the lower

1,240 LF contains a 16" slip lining. The project also included rehabilitation of the interceptor manholes.

- In 2011, the Borough completed the Phase II – Lobb's Run Interceptor Rehabilitation which consisted of cured in place lining of approximately 1,000 linear feet of remaining existing 20" VCP Lobb's Run Sanitary Sewer Interceptor and rehabilitation of interceptor manholes. After completion of Phase II, the entire interceptor was either slip lined or CIPP lined and all manholes rehabilitated.

- In January and November of 2011, Aldan Borough's Engineer conducted night-time infiltration and inflow inspections to locate flows entering into the sanitary sewer system. The inspections were initiated due to high flow meter recordings, particularly in the meter #2 area as well as suspected leaks in the meter #3 area. Based on the report results, the Borough is determining which areas of the system to target for sewer rehabilitations, and plans to perform rehabilitation over the next 5 years, as funding allows.

- In 2012, Aldan Borough completed the rehabilitation of two (2) aging brick manholes. One manhole was located at the intersection of Springfield and Clifton Avenue and the second manhole was located on Woodlawn Avenue at the intersection of Woodlawn Avenue and Wayne Avenue. The manholes were excavated and courses of brick were replaced and reset. The interior and exterior of both manholes was parged. In addition, both benches were rebuilt and parged to ensure the benches were watertight.

- In 2015, Aldan Borough completed an I&I Rehabilitation Project for selected sewer mains within our Meter No. 3 Collection System. This work consisted of televising, inspecting, cleaning and slip lining of 800 LF of pipe as well as removing and replacing water tight frames & covers, installing fiber reinforced cementitious liners to manhole brick walls/benches as well as replacement of missing grout & bricks.

- In 2016, based on previous night-time manhole inspections within the Meter #2 Collection System, Aldan Borough prepared a seven 7-Year Master Plan for I&I Rehabilitation. The 7-Year Master Plan proposed the installation of CIPP Liners and Manhole Rehabilitation in various sewer segments within the Meter #2 Collection System.

- **In 2018, due to observed leaking and minor sinkholes in the paving at manholes #160 and #161 in Providence Road, the manholes were cement parged and new water tight manhole frames and covers were installed in 2018.**

- **In 2019/2020, Aldan Borough intends to initiate a long-term I&I Rehabilitation Program for Year 1 (Meter #2 Collection System) based on the results of the 7-Year Master Plan.**

- **Aldan Borough is committed to continuing the I&I remediation program to reduce system flow and bring I&I rates within reasonable tolerances. The Aldan Borough Engineer monitors and reviews DELCORA meter data on a monthly basis to analyze flow trends, effects of rainfall, assess effectiveness of I & I rehab work and isolate problem areas.**

6. CONDITION OF THE SEWER SYSTEM

This section requires a discussion of the condition of the sewer system, including portions where conveyance capacity is exceeded or will be exceeded in the next 5 years. It should include a discussion of those portions of the system where rehabilitation or cleaning is needed or underway to maintain the integrity of the system and prevent or eliminate:

a. Bypassing;
b. Combined sewer overflows;
c. Sanitary sewer overflows;
d. Excessive infiltration;
e. Other system problems.

Include a discussion of available existing and future capacity. The discussion should include the following:

f. The age of the sewer system.
g. The type of material of which the system is made (i.e., brick, vitrified clay, PVC, Orangeburg, etc.).
h. An analysis that determines whether the existing sewer lines are sized properly for the connected population.
i. A discussion of any portions of the system that should be repaired, replaced or rehabilitated, including a timeframe by which any proposed actions are expected to be completed.

Discuss any portions of the sewer system in which surcharging occurs:

j. How often does the system surcharge in each location?
k. What size storm events create surcharging sewer lines?
l. What is the cause of the surcharging?

m. Sewer systems that surcharge during wet weather indicate a lack of hydraulic capacity and are considered to be in a projected hydraulic overload. For such conditions, permittees should submit a CAP and CMP with the annual report, as required by 25 Pa Code § 94.22.

Provide a list of all SSOs that occurred during the calendar year, including their cause and location (a copy of the Southeast Regional Office's SSO Report Form submitted by the permittee is acceptable). SSOs related to wet weather should be discussed:

n. Explain if there is a history of SSOs at each reported location. If a trend of SSOs at specific locations during rain events is documented, this indicates a lack of hydraulic capacity and is considered a hydraulic overload condition.

o. Why are SSOs occurring at each location? Has a hydraulic analysis been conducted, and if so, what were the results and recommendations for corrective action?

p. Provide an analysis of flow metering that has been conducted.

q. Sewer systems that experience SSOs are considered to be in an existing hydraulic overload. A CAP and CMP should be submitted with the annual report, as required by 25 Pa Code § 94.21.

The Department strongly recommends that existing capacity be documented with flow meter data. Whether flow meters are already in place, or are proposed to be used throughout the system to gather flow data on sub-basin approach – existing capacity should be documented with data that describes actual flow conditions during dry-weather and wet weather conditions:

r. Dry weather flows should be monitored to document baseline flows and for comparison purposes, to determine the extent of I/I within the collection and conveyance system.

s. Wet weather capacity should be determined by documenting the peak instantaneous (or peak hourly) flow rate as compared to the hydraulic carrying capacity of the sanitary sewer (i.e., Manning's equation).

The Aldan Borough Sanitary Sewer System is a gravity collection sanitary sewer system. The system is in good working condition and is structurally sound with no known capacity problems. As stated previously, television inspections and night-time surveys have been utilized to identify areas in need of corrective action, to address I & I. Rehabilitation efforts will continue to address I & I.

The total system consists of approximately 254 manholes, and associated gravity sewer main, all ranging in age from 70-100 years old. The majority of the manholes are brick manholes and the majority of the sewer main is 8 inch VCP.

There are no combined sewers and no pump stations within the Aldan Borough System.

The public sewer lines are properly sized for the connected population.

The connected population has stayed the same or decreased over the last 5 years. No growth, relative to a projected increase in sewer flows is expected in the next 5 years. No known surcharges occur within the system and no SSOs occurred within Aldan Borough during the last permit year.

7. SEWAGE PUMPING STATIONS

If applicable, this section should provide a discussion of the condition of sewage pump stations, including a comparison of the maximum pump rate with present maximum flows and the projected 2-year maximum flows for each station:

N/A – No pump stations exist within Aldan Borough.

8. INDUSTRIAL WASTES

If applicable, the report on industrial wastes (IW) should include:

a. A copy of an ordinance or regulation governing IW.
b. A discussion of the permittee's program for surveillance and monitoring of IW discharges to the sewer system during the past year.
c. A discussion of specific problems in the sewer system or at the WWTF, known or suspected to be caused by IW discharges and a summary of steps being taken to alleviate or eliminate the problems.
d. A list of any such industries known to be discharging wastes that create a problem and actions taken to prevent potential or recurring problems caused by the IW dischargers.
e. Provide documentation regarding any actions taken against IW dischargers.

To our knowledge, all sewage which discharges into the system is domestic in nature. No "industrial waste"

discharges into the system, therefore no pre-treatment of the waste is required.

9. CORRECTIVE ACTION PLAN

If an existing or projected overload condition has been identified at the WWTF or in a portion of the collection and conveyance system owned by any permittee within the WWTF's sewer service area, the respective permittee should provide a CAP and CMP in the Chapter 94 Report to address the overload condition as required under 25 Pa Code §§ 94.21 and 94.22. The attached CAP and CMP development guidelines should be referenced for preparation of these documents.

N/A

10. CALIBRATION REPORTS

As required by 25 Pa Code § 94.13, flow measuring, indicating, and recording equipment should be calibrated annually, and the calibration report should be included in the annual report submitted under § 94.12 (relating to annual report).

Any such equipment at the WWTF and/or within the collection and conveyance system should be calibrated (at a minimum) at this frequency. Calibration reports for each permittee's system should be included in the respective annual reports.

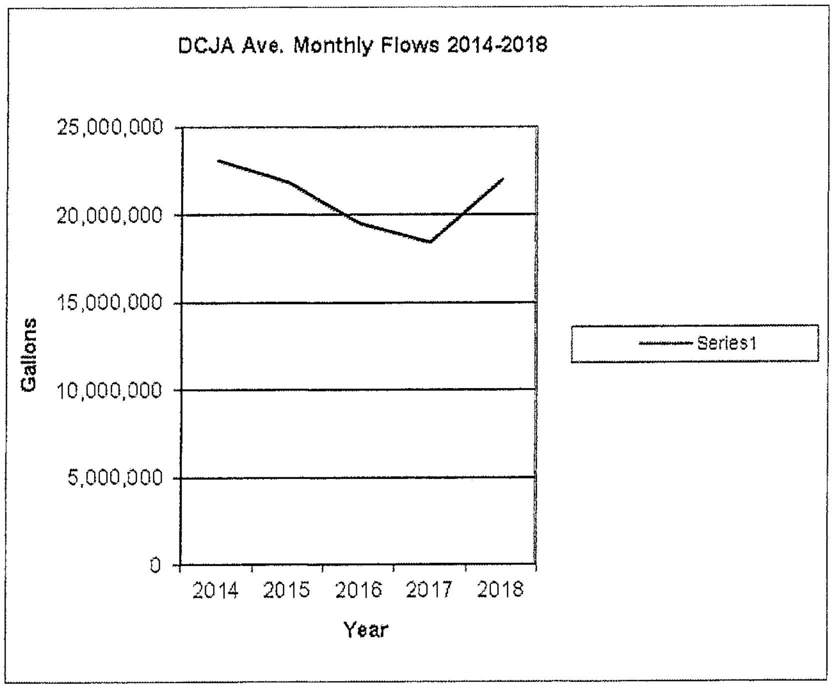
N/A All flow measuring and recording equipment is owned and maintained by DELCORA.

11. TRIBUTARY MUNICIPALITY REPORTS

Each tributary municipality (or authority) that is the permittee of its own collection and conveyance system, but which sends sewage flow to the WWTF submitting this report, must submit their respective information for inclusion in the WWTF's Chapter 94 Report. Each permittee's report should contain all of the information required in 25 Pa Code § 94.12 (Annual Report), excluding that information pertaining to a WWTF or industrial waste dischargers that would be inspected and/or regulated by the permittee of the WWTF. Include copies of any correspondence with tributary municipalities/authorities regarding acquisition of this information.

Average monthly flows, as provided by DELCORA metering data in the last five years are as follows:

Year	Average Monthly Flow (GAL)	Est. Annual Rainfall (in.)
2014	23,113,524	48.32
2015	21,833,000	47.00
2016	19,538,273	36.00
2017	18,400,000	46.00
2018	22,025,000	61.00



In 2018, the average metered flow for Aldan Borough was 22,025,000 gallons per month with a maximum metered flow of 32,111,000 gallons per month in March. There are 1,911 EDU's connected to the DCJA system. Average and maximum monthly flows are based on 2018 meter readings from the two (2) DELCORA meters installed in the Borough. Flows exclude estimated flows from all known outside connections to the system.

I & I removal resulting from the Lobb's Run Interceptor project appears to have reduced monthly average flows from 2014 to 2017. Due to significant rainfall in 2018 (approximately 15-20 inches above normal), the average monthly and peak monthly flows increased above last year. We expect flows to reduce in 2019 to normal rates with a normal annual rainfall trend. The

Borough Engineer continues to monitor all metered flow data from DELCORA to confirm that the Lobbs Run Interceptor project continues to provide long term I & I reductions.

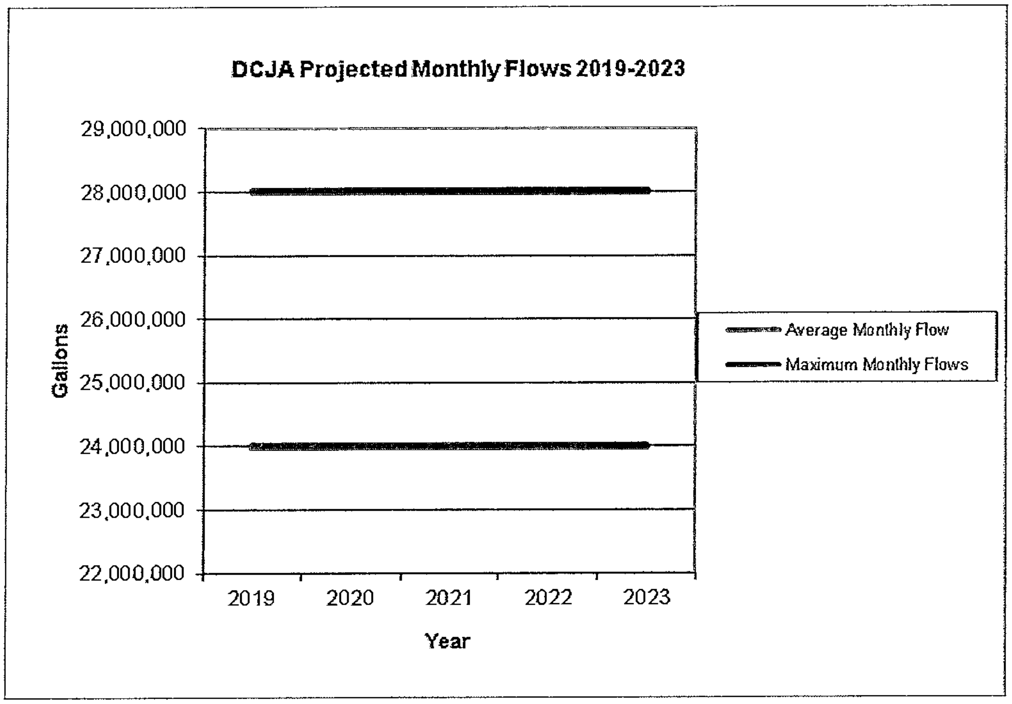
Based on the 2000 DCPD census data, the population of Aldan Borough decreased by 5.18% since 1990. The 2010 census indicated that the population of the Borough again decreased by 3.7%. Since 2000, the Borough has occasional small land development and subdivisions, however, in almost all cases, existing connections are used, resulting in no net increase in flows or connections. Increases in population and land development are not expected within the next 5 years and therefore should have little effect on the hydraulic loading of the sanitary system.

For the 5 year future projections, we anticipate average monthly and maximum monthly flows will be similar to the previous 5 years. It should be noted that this year's average monthly flow was below the projected average monthly flows of 24,000,000 gallons. In the event that the average monthly flows for the 2019 calendar year continues to stay below the projection of 24,000,000 gallons, we will re-evaluate lowering the average projected monthly flows accordingly for next year's report.

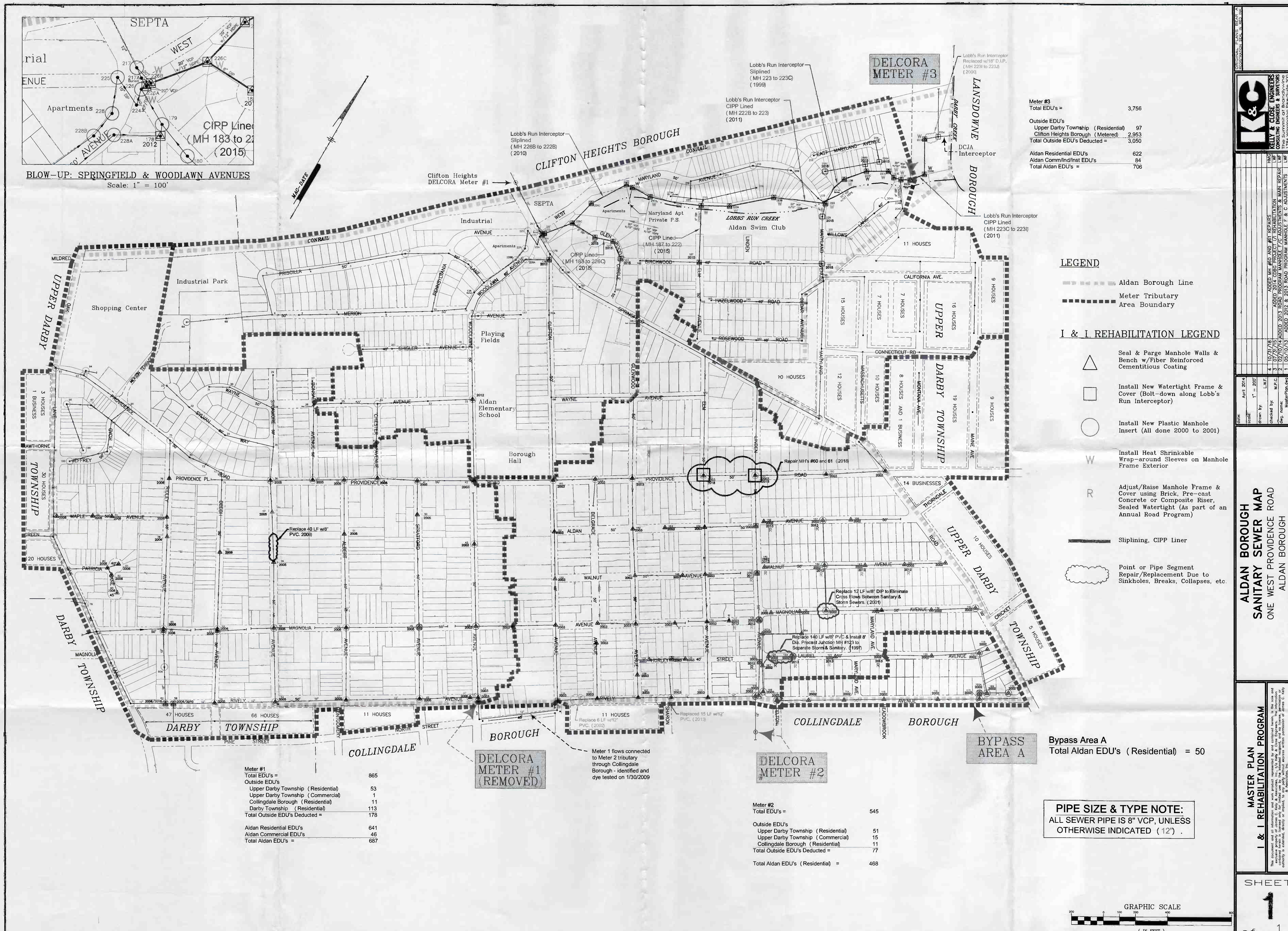
It is the Borough's goal to have flows reduced each year as a result of continuing I & I rehabilitation work. Continuing I & I rehabilitation work will free-up sewer capacity to avoid additional or future sewer overflows or basement backups and creates a more efficient sanitary sewer system.

It is noted, actual annual future flows will also be dependent on annual rainfall in any given year. Future average monthly flows for the next five years are projected as follows:

Year	Average Monthly Flow (GAL)	Maximum Monthly Flow (GAL)
2019	24,000,000	28,000,000
2020	24,000,000	28,000,000
2021	24,000,000	28,000,000
2022	24,000,000	28,000,000
2023	24,000,000	28,000,000


DCJA Projected Monthly Flows 2019-2023
29,000,000
28,000,000
27,000,000
26,000,000
25,000,000
24,000,000
23,000,000
22,000,000
Gallons
2019
2020
2021
2022
2023
Year
Average Monthly Flow
Maximum Monthly Flows

APPENDIX A
Aldan Sewer Map



ALDAN BOROUGH
SANITARY SEWER MAP
ONE WEST PROVIDENCE ROAD
ALDAN BOROUGH
DELAWARE COUNTY, PENNSYLVANIA
MASTER PLAN
I & I REHABILITATION PROGRAM
KELLY & CLOSE ENGINEERS
CONSULTING ENGINEERS & SURVEYORS
The Summit at Brandywine
1786 Wilmington Pike/Suite 300
Glen Mills, Pennsylvania 19342
610.358.9363 fax 610.358.9376
date: April 2014
scale: 1" = 200'
drawn by: L.W.F.
checked by: M.P.C.
dwg. name: MasterPlan.dwg
project no.: AB-130
4 10/31/18 ADDED MH #60 AND #61 REPAIRS HMG
3 07/31/15 ADDED 2014 CDBG PROJECT I/I REHABILITATION LWF
2 02/10/14 ADDED 2013 ROAD PROGRAM MANHOLE F/C ADJUSTMENTS & MAIN REPAIR LWF
1 05/10/13 ADDED 2012 & 2013 ROAD PROGRAM MANHOLE F & C ADJUSTMENTS LWF
REV. DATE DESCRIPTION BY
This document and all information and work product represented by and contained herein, is the sole and exclusive property of James C. Kelly & Associates, Inc., t/a Kelly & Close Engineers. The information contained herein is licensed only for limited use by the intended recipient, and no license, permission or authority is extended, directly or implied, to any party without express written permission of James C. Kelly & Associates, Inc.
Copyright, 2012, James C. Kelly & Associates, Inc. All rights reserved
SHEET 1 of 1
BLOW-UP: SPRINGFIELD & WOODLAWN AVENUES
Scale: 1" = 100'
CIPP Lined (MH 183 to 2 (2015)
LEGEND
Aldan Borough Line
Meter Tributary Area Boundary
I & I REHABILITATION LEGEND
Seal & Parge Manhole Walls & Bench w/Fiber Reinforced Cementitious Coating
Install New Watertight Frame & Cover (Bolt-down along Lobb's Run Interceptor)
Install New Plastic Manhole Insert (All done 2000 to 2001)
W Install Heat Shrinkable Wrap-around Sleeves on Manhole Frame Exterior
R Adjust/Raise Manhole Frame & Cover using Brick, Pre-cast Concrete or Composite Riser, Sealed Watertight (As part of an Annual Road Program)
Sliplining, CIPP Liner
Point or Pipe Segment Repair/Replacement Due to Sinkholes, Breaks, Collapses, etc.
Meter #3
Total EDU's = 3,756
Outside EDU's
Upper Darby Township (Residential) 97
Clifton Heights Borough (Metered) 2,953
Total Outside EDU's Deducted = 3,050
Aldan Residential EDU's 622
Aldan Comm/Ind/Inst EDU's 84
Total Aldan EDU's = 706
Meter #1
Total EDU's = 865
Outside EDU's
Upper Darby Township (Residential) 53
Upper Darby Township (Commercial) 1
Collingdale Borough (Residential) 11
Darby Township (Residential) 113
Total Outside EDU's Deducted = 178
Aldan Residential EDU's 641
Aldan Commercial EDU's 46
Total Aldan EDU's = 687
Meter #2
Total EDU's = 545
Outside EDU's
Upper Darby Township (Residential) 51
Upper Darby Township (Commercial) 15
Collingdale Borough (Residential) 11
Total Outside EDU's Deducted = 77
Total Aldan EDU's (Residential) = 468
Bypass Area A
Total Aldan EDU's (Residential) = 50
PIPE SIZE & TYPE NOTE:
ALL SEWER PIPE IS 8" VCP, UNLESS OTHERWISE INDICATED (12").
DELCORA METER #3
DELCORA METER #2
DELCORA METER #1 (REMOVED)
BYPASS AREA A
Meter 1 flows connected to Meter 2 tributary through Collingdale Borough - identified and dye tested on 1/30/2009
Clifton Heights DELCORA Meter #1
CLIFTON HEIGHTS BOROUGH
LANSDOWNE BOROUGH
UPPER DARBY TOWNSHIP
DARBY TOWNSHIP
COLLINGDALE BOROUGH
Lobb's Run Interceptor Sliplined (MH 226B to 222B) (2010)
Lobb's Run Interceptor Sliplined (MH 223 to 223C) (1999)
Lobb's Run Interceptor CIPP Lined (MH 222B to 223) (2011)
Lobb's Run Interceptor CIPP Lined (MH 223C to 223I) (2011)
DCJA Interceptor
LOBBS RUN CREEK
Aldan Swim Club
Maryland Apt Private P.S.
CIPP Lined (MH 187 to 222) (2015)
CIPP Lined (MH 183 to 226C) (2015)
Industrial Park
Shopping Center
Playing Fields
Aldan Elementary School
Borough Hall
Repair MH's #60 and 61 (2018)
Replace 40 LF w/8" PVC. 2006)
Replace 12 LF w/8" DIP to Eliminate Cross Flows Between Sanitary & Storm Sewers. (2001)
Replace 140 LF w/8" PVC & Install 8' Dia. Precast Junction MH #123 to Separate Storm & Sanitary. (1997)
Replace 6 LF w/12" PVC. (2002)
Replaced 15 LF w/12" PVC. (2013)
GRAPHIC SCALE
(IN FEET)
1 inch = 200 ft.

Clifton Heights Borough

Chapter 94
Municipal Wasteload Management
Annual Report

2018 Chapter 94 Annual Report
DCJA Report
Clifton Heights Borough
Delaware County

Prepared By:

K&C
KELLY & CLOSE ENGINEERS
CONSULTING ENGINEERS & SURVEYORS

1786 Wilmington Pike / Suite 300
Glen Mills, PA 19342
Ph: 610-358-9363
Fax: 610-358-9376

Prepared For:
Clifton Heights Borough, Delaware County
30 S. Springfield Road
Clifton Heights, PA 19018

February 15, 2019

J. P. Kelly

James P. Kelly, P.E.
Kelly & Close Engineers

Table of Contents

ATTACHMENTS LIST

INTRODUCTION

This section should give a brief description of the sewer service area covered by the report. List all tributary municipalities that send sewage to the Wastewater Treatment Facility (WWTF), and list those portions of the service area that are owned/operated by other permittees.

Discuss the age of the WWTF and a general description of the wastewater treatment process. If available, a process diagram could be included in an appendix to the report.

Clifton Heights Borough contains no WWTP or Pump Stations. Within Clifton Heights Borough, there is only a Collection System. Accordingly, only responses relative to the Collection System will be provided.

Clifton Heights Sewer System is a gravity collection sanitary system. The total system consists of 254 manholes and 62,709 linear feet of sewer main. 248 manholes and 61,969 LF of sewer main are tributary to the DCJA Interceptor. (The remaining 6 brick manholes and 740 LF of pipe are tributary to the Muckinapates Interceptor.) The majority of the DCJA system consists of approximately 57,807 LF of 8" VCP and approximately 1,874 LF of 10" VCP all ranging in age from 70-100 years old. The balance of the system includes 2,221 LF of 8" plastic pipe and 67 LF of 8" cast iron pipe ranging in age from 1-30 years old. There are no combined sewers and no pump stations within the system.

A map showing the location of the sewer mains is attached in Appendix A.

HYDRAULIC AND ORGANIC LOADINGS

Provide a line graph depicting the monthly average flows (in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph should include a line depicting the hydraulic design flow of the plant included in the Water Quality Management Part II Permit.

Provide a line graph depicting the monthly average organic loadings in pounds per day (lbs/day) BOD_5, for each month for the past 5 years and projecting the monthly average organic loading for the next 5 years. The graph should also include a line depicting the organic loading design (expressed in lbs/day) of the plant included in the Water Quality Management Part II Permit.

List the permitted capacities of your WWTF:

Annual Average (AA) Capacity
Hydraulic Design Capacity (or "max month") – if applicable
Organic Design Capacity

Discuss the hydraulic loading of your WWTF including, at a minimum:

N/A – No WWTP's exist within Clifton Heights Borough.

5-YEAR HYDRAULIC AND ORGANIC LOADING PROJECTIONS

This section should provide a description of the basis for the hydraulic and organic loading 5-year projections, including the data and calculations that were used to determine them. Your projections should include the following elements:

N/A – No WWTP's exist within Clifton Heights Borough.

SEWER EXTENSIONS

This section should provide the following information:

a. A map showing all sewer extensions constructed within the past calendar year;
b. A map showing sewer extensions approved or exempted in the past year in accordance with the PA Sewage Facilities Act (35 P.S. §§ 750.1—750.20) and Chapter 71 (relating to administration of the sewage facilities program), but not yet constructed;
c. A map showing all known proposed projects which require public sewers but are in the preliminary planning stages.
d. A list summarizing each extension or project.
e. If a sewer extension approval or proposed project includes schedules for completing the project over time, the list should describe the projects projected build-out over time.

This section should clearly indicate whether or not each of the above requirements is applicable for the report's calendar year. For example, if no sewer extensions were constructed in the past calendar year, clearly indicate this in the report.

N/A. There were no sewer extensions conducted in the past year nor are any extensions proposed within the next five years. The Borough is essentially built out, with all properties connected to public sewers.

PROGRAM FOR SANITARY SEWER MONITORING, MAINTENANCE, AND REPAIR

This section should include a detailed discussion of the permittee's program for sewer system:

a. Monitoring;
b. Maintenance;
c. Repair;
d. Rehabilitation;
e. Routine and special activities;
f. Personnel and equipment used;
g. Sampling frequency;
h. Quality assurance;
i. Data analyses;
j. Infiltration/inflow (I/I) monitoring;
k. Maintenance and control of combined sewer regulators during the past year, where applicable.

Provide a detailed description of actual work conducted during the calendar year for each of the items noted above, including the findings of those efforts and any proposed follow-up work and/or investigations for the subsequent year.

Where flow monitoring has been conducted, provide an analysis of the flow-meter data. Have portions of the system shown evidence of I/I? What work is currently being conducted or proposed, to address excess flows?

Clifton Heights continues to utilize a database of the sanitary system in order to analyze the recorded conditions and prioritize repairs. Available flow meter data is reviewed regularly to monitor inflow and infiltration. The Clifton Heights Borough Engineer also monitors and reviews DELCORA meter data to analyze flow trends and effects of rainfall, assess effectiveness of I & I rehab work and isolate problem areas.

The Borough utilities TV inspection reports and flow meter data as a means to identify areas in need of repair, giving high priority to structural deficiencies and areas susceptible to inflow and infiltration. Cured-in-place pipe re-lining has been the rehabilitation method of choice, effectively addressing both infiltration and structural concerns. In 2016, 485 linear feet of sanitary sewer piping was repaired with cured-in-place lining as well as the rehabilitation of two (2) manholes along Broadway Avenue (Between Glenwood Avenue and Holly Avenue).

The Borough owns a jet-vac machine and the highway department continues to clean the sanitary mains on an as-needed basis.

CONDITION OF THE SEWER SYSTEM

This section requires a discussion of the condition of the sewer system, including portions where conveyance capacity is exceeded or will be exceeded in the next 5 years. It should include a discussion of those portions of the system where rehabilitation or cleaning is needed or underway to maintain the integrity of the system and prevent or eliminate:

a) Bypassing;
b) Combined sewer overflows;
c) Sanitary sewer overflows;
d) Excessive infiltration;
e) Other system problems.

Include a discussion of available existing and future capacity. The discussion should include the following:

f. The age of the sewer system.
g. The type of material of which the system is made (i.e., brick, vitrified clay, PVC, Orangeburg, etc.).
h. An analysis that determines whether the existing sewer lines are sized properly for the connected population.
i. A discussion of any portions of the system that should be repaired, replaced or rehabilitated, including a timeframe by which any proposed actions are expected to be completed.

Discuss any portions of the sewer system in which surcharging occurs:

j. How often does the system surcharge in each location?
k. What size storm events create surcharging sewer lines?
l. What is the cause of the surcharging?
m. Sewer systems that surcharge during wet weather indicate a lack of hydraulic capacity and are considered to be in a projected hydraulic overload. For such conditions, permittees should submit a CAP and CMP with the annual report, as required by 25 Pa Code § 94.22.

Provide a list of all SSOs that occurred during the calendar year, including their cause and location (a copy of the Southeast Regional Office's SSO Report Form submitted by the permittee is acceptable). SSOs related to wet weather should be discussed:

n. Explain if there is a history of SSOs at each reported location. If a trend of SSOs at specific locations during rain events is documented, this indicates a lack of hydraulic capacity and is considered a hydraulic overload condition.

o. Why are SSOs occurring at each location? Has a hydraulic analysis been conducted, and if so, what were the results and recommendations for corrective action?

p. Provide an analysis of flow metering that has been conducted.

q. Sewer systems that experience SSOs are considered to be in an existing hydraulic overload. A CAP and CMP should be submitted with the annual report, as required by 25 Pa Code § 94.21.

The Department strongly recommends that existing capacity be documented with flow meter data. Whether flow meters are already in place, or are proposed to be used throughout the system to gather flow data on sub-basin approach – existing capacity should be documented with data that describes actual flow conditions during dry-weather and wet weather conditions:

r. Dry weather flows should be monitored to document baseline flows and for comparison purposes, to determine the extent of I/I within the collection and conveyance system.

s. Wet weather capacity should be determined by documenting the peak instantaneous (or peak hourly) flow rate as compared to the hydraulic carrying capacity of the sanitary sewer (i.e., Manning's equation).

Clifton Heights Sewer System is a gravity collection sanitary system. The total system consists of 254 manholes and 62,709 linear feet of sewer main. 248 manholes and 61,969 LF of sewer main are tributary to the DCJA Interceptor. (The remaining 6 brick manholes and 740 LF of pipe are tributary to the Muckinapates Interceptor.) The majority of that system consists of approximately 57,807 LF of 8" VCP and approximately 1,874 LF of 10" VCP all ranging in age from 70-100 years old.

The balance of the system includes 2,221 LF of 8" plastic pipe and 67 LF of 8" cast iron pipe ranging in age from 1-30 years old. There are no combined sewers and no pump stations within the system. It appears that the public sewer lines are properly sized for the connected population. The connected population has remained the same and no growth relative to a projected increase in sewer flows is expected within the next 5 years. No know surcharges occur within the system and no SSOs occurred within Clifton Heights during the last permit year.

The Borough does not anticipate exceeding the available pipe capacity, but is committed to reducing the overall flow volume and potential for sewer breaks and/or backups. By maintaining a comprehensive system database, in conjunction with flow meter monitoring, regular maintenance, and a long term repair plan, the

Borough has been proactive in ensuring the continued service of an aging utility.

SEWAGE PUMPING STATIONS

If applicable, this section should provide a discussion of the condition of sewage pump stations, including a comparison of the maximum pump rate with present maximum flows and the projected 2-year maximum flows for each station:

Not applicable, no pump station exists within Clifton Heights Borough.

INDUSTRIAL WASTES

The following is a potential list of Industrial establishments, which we are aware of, that discharge into the DELCORA sewer system. The estimated flow generated from each facility is also listed.

- **Heights Cleaners 1000 GPD**
- **Clifton Industrial Center 1538 GPD**
- **M.F. William's Funeral Home 700 GPD**
- **William Lombardo Funeral home 700 GPD**
- **Bowers Auto Body 300 GPD**
- **Clifton Car Wash 3000 GPD**
- **Clifton Gas & Wash 1500 GPD**
- **Good Year Service Center 300 GPD**
- **Conti's Garage 300 GPD**
- **Ace Metal Inc. 200 GPD**
- **Keenan Auto Body 300 GPD**
- **Hillside Nursery 300 GPD**

Currently there is no data available as to the nature of the waste produced. It is unknown at this time, if any of the above establishments actually discharge industrial waste.

If applicable, the report on industrial wastes (IW) should include:

a. A copy of an ordinance or regulation governing IW.
b. A discussion of the permittee's program for surveillance and monitoring of IW discharges to the sewer system during the past year.

Clifton Heights incorporates DELCORA's Rules and Regulations in their ordinance, by reference. However, since the Borough is unaware of any industrial waste discharges, there has been no pretreatment or surveillance / monitoring during the past year.

c. A discussion of specific problems in the sewer system or at the WWTF, known or suspected to be caused by IW discharges and a summary of steps being taken to alleviate or eliminate the problems.

At this time there are no known specific problems caused by industrial wastes.

d. A list of any such industries known to be discharging wastes that create a problem and actions taken to prevent potential or recurring problems caused by the IW dischargers.

At this time there are no known specific problems caused by industrial wastes.

e. Provide documentation regarding any actions taken against IW dischargers.

N/A

CORRECTIVE ACTION PLAN

If an existing or projected overload condition has been identified at the WWTF or in a portion of the collection and conveyance system owned by any permittee within the WWTF's sewer service area, the respective permittee should provide a CAP and CMP in the Chapter 94 Report to address the overload condition as required under 25 Pa Code §§ 94.21 and 94.22. The attached CAP and CMP development guidelines should be referenced for preparation of these documents.

N/A

CALIBRATION REPORTS

As required by 25 Pa Code § 94.13, flow measuring, indicating, and recording equipment should be calibrated annually, and the calibration report should be included in the annual report submitted under § 94.12 (relating to annual report).

Any such equipment at the WWTF and/or within the collection and conveyance system should be calibrated (at a minimum) at this frequency. Calibration reports for each permittee's system should be included in the respective annual reports.

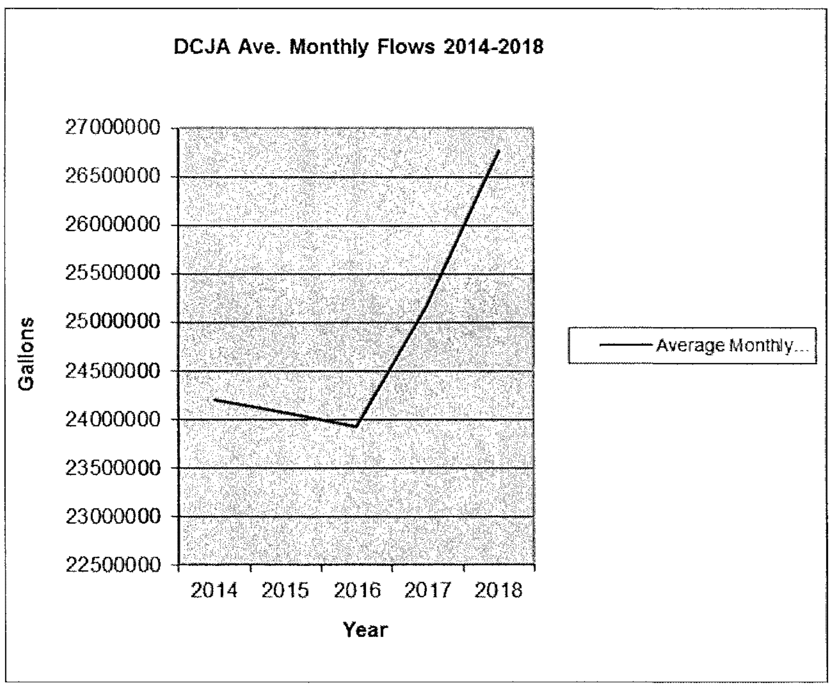
N/A

TRIBUTARY MUNICIPALITY REPORTS

Each tributary municipality (or authority) that is the permittee of its own collection and conveyance system, but which sends sewage flow to the WWTF submitting this report, must submit their respective information for inclusion in the WWTF's Chapter 94 Report. Each permittee's report should contain all of the information required in 25 Pa Code § 94.12 (Annual Report), excluding that information pertaining to a WWTF or industrial waste dischargers that would be inspected and/or regulated by the permittee of the WWTF. Include copies of any correspondence with tributary municipalities/authorities regarding acquisition of this information.

Average monthly flows reported to DCJA in the last five years are as follows:

Year	Average Monthly Flow (GAL)	Estimated Annual Rainfall (in.)
2014	**24,196,136**	**48.33**
2015	**24,072,754**	**47.00**
2016	**23,927,062**	**32.60**
2017	**25,180,000**	**46.00**
2018	**26,768,660**	**61.00**

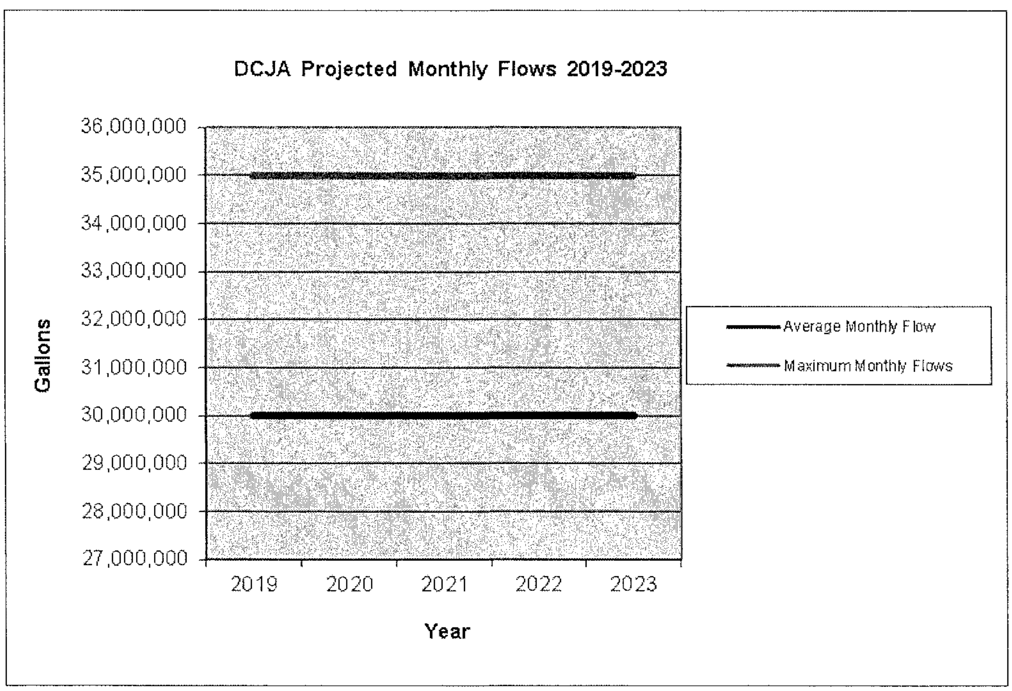


Based on Delcora flow meter data the average monthly flow in 2018 was 26,768,660 gallons and the maximum monthly flow was 30,975,912 gallons in the month of March. Average and maximum monthly flows are based on reading from 3 meters installed in the Borough.

For the 5 year future projections, we anticipate average monthly and maximum monthly flows will be the same or very similar to the 2018 flows. However, it is the Borough's goal to have flows reduced each year as a result of ongoing I & I rehabilitation work. It is noted actual annual future flows will be dependent on annual rainfall in any given year.

The estimated total number of residential, commercial, and industrial connections to the DCJA system is 2,975, equal to approximately 3,491 EDU's. The expected population change in the Borough over the next 5 years is negligible, resulting in no net increase in flows or connections. Increases in population and land development are not expected within the next 5 years and therefore should have little effect on the hydraulic loading of the sanitary system. Future average monthly and maximum monthly flows for the next 5 years are projected as follows:

Year	Average Monthly Flow (GAL)	Maximum Monthly Flow (GAL)
2019	30,000,000	35,000,000
2020	30,000,000	35,000,000
2021	30,000,000	35,000,000
2022	30,000,000	35,000,000
2023	30,000,000	35,000,000



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Clifton Heights Borough**	Permit No.:	**PA**
Mailing Address:	**30 S. Springfield Road**	Effective Date:	**n/a**
City, State, Zip:	**Clifton Heights, Pa 19018**	Expiration Date:	**n/a**
Contact Person:	**James P. Kelly, P.E.**	Renewal Due Date:	**n/a**
Title:	**Borough Engineer**	Municipality:	**Clifton Heights Borough**
Phone:	**610-358-9363**	County:	**Delaware County**
Email:	**jpkelly@kellyengineers.com**	Consultant Name:	**Kelly & Close Engineers**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   n/a

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)

☐ List summarizing each extension or project attached (**Attachment**)

☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

Clifton Heights Borough contains no WWTP or pump stataions; only a collection system for a total of 254 manholes, 62,709 LF of sewer main. 248 Manholes and 61,969 LF of sewer main are tributary to the DCJA Interceptor and 6 manholes and 740 LF of pipe are tributary to the Muckinapates Interceptor. A map has been included in the attached Chapter 94 Report. There were no sewer extensions conducted in the past year nor are any extensions proposed within the next five years. The Borough is essentially built out, with all properties connected to public sewers.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

Clifton Heights Borough continues to monitor/perform annual repair/rehabilitation to their sewer collection system. The Borough utilizes TV inspection reports and flow meter data to identify areas in need of repair. Clifton Heights continues to utilize a database of the sanitary sewer system to analyze recorded conditions and prioritize repairs. The available flow meter data is reviewed regularly to monitor inflow and infiltration. The Borough owns a jet-vac machine to clean sanitary mains on an as needed basis. In 2016, 485 linear feet of sanitary sewer piping was replaced with cured-in-place lining as well as the rehabilitation of two (2) manholes along Broadway Avenue (between Glenwood Avenue and Holly Avenue).

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

The Clifton Heights Borough Sanitary Sewer System is a gravity collection sanitary sewer system that is in good working condition and is structurally sound with no known capacity problems. The public sewer lines are properly sized for the connected population. The connected population has stayed the same or decreased over the last 5 years. No growth, relative to a projected increase in sewer flows, is expected in the next 5 years. No known surcharges occur within the system and no SSOs occurred within Clifton Heights Borough during the last permit year. See attached Chapter 94 report for additional information.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7)) N/A

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number –)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8)) N/A

a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

Check the appropriate boxes:

☐ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload. N/A

Check the appropriate boxes:

- ☐ This report demonstrates an existing hydraulic overload condition.
- ☐ This report demonstrates a projected hydraulic overload condition.
- ☐ This report demonstrates an existing organic overload condition.
- ☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year. N/A

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems). N/A

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b)) N/A

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

John J. Perfetti	[signature]
Name of Responsible Official	Signature
610-623-1000	2/15/19
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

James P. Kelly, P.E.	J. P. Kelly
Name of Preparer	Signature
610-358-9363	2-15-19
Telephone No.	Date

KELLY & CLOSE ENGINEERS

APPENDIX "A"

CLIFTON HEIGHTS BOROUGH

SANITARY SEWER MAP
CLIFTON HEIGHTS BOROUGH
DELAWARE COUNTY, PENNSYLVANIA

SHEET 1 of 1

Collingdale Borough

Stantec

1060 Andrew Drive Suite 140, West Chester PA 19380-5602

February 15, 2019
File: 176710004

Attention: Charles Catania, Jr., P.E.
Darby Creek Joint Authority
c/o Catania Engineering Associates, Inc.
520 W. MacDade Blvd.
Milmont Park, PA 19033

Dear Mr. Catania,

Reference: 2018 Chapter 94 Report – Borough of Collingdale

Enclosed please find six (6) copies of Collingdale Borough's Annual Chapter 94 Report.

If you have any questions or require additional information, please contact our office.

Sincerely,

PE
Senior Principal
Phone: 610 840 2506
Fax: 610 840 2501
Eileen.Nelson@stantec.com

Attachment

c. John Hewlings, w/enclosures
Barbara Bonnett, DELCORA (3 copies)

hlb v:\1907\active\176710004\docs\ltrs\ch.94\2018\let_darby creek joint auth.docx

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION

Permittee Name:	**The Borough of Collingdale**	Permit No.:	**PA**
Mailing Address:	**800 MacDade Blvd.**	Effective Date:	
City, State, Zip:	**Collingdale, PA 19023**	Expiration Date:	
Contact Person:	**John Hewlings**	Renewal Due Date:	
Title:	**Borough Manager**	Municipality:	**Borough of Collingdale**
Phone:	**(610) 586-0500**	County:	**Delaware**
Email:	**johnhewlings@yahoo.com**	Consultant Name:	**Stantec**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   See attached

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)

☐ List summarizing each extension or project attached (**Attachment**)

☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

No sewer extensions completed or planned

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

See attached

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

See attached

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number –)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

Check the appropriate boxes:

☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

☐ This report demonstrates an existing hydraulic overload condition.
☐ This report demonstrates a projected hydraulic overload condition.
☐ This report demonstrates an existing organic overload condition.
☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

John Hewlings, Collingdale Borough Manager
Name of Responsible Official

Signature

610- 586-0500
Telephone No.

2/14/2019
Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Eileen M. Nelson, Stantec	Eileen M. Nelson
Name of Preparer	Signature
610-840-2506	**2/15/19**
Telephone No.	Date

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT INSTRUCTIONS

This form has been developed to promote consistency in the development of annual municipal wasteload management reports ("Chapter 94 reports") required by 25 Pa. Code § 94.12. At least two copies of the complete report must be submitted to the appropriate regional office of the Department of Environmental Protection (DEP) by March 31.

Enter the calendar year that the report covers at the top of the form. Check the appropriate box to indicate whether the permittee is the owner/operator of a publicly owned treatment works (POTW) or other sewage treatment facility, or is the owner/operator of a sewage collection system that is tributary to a POTW owned/operated by a different entity.

General Information

Record the name of the permittee, the permittee's full mailing address, the permittee's contact person and this person's title, phone number and email address. Also record the permit number (NPDES or WQM), the effective date of permit coverage, the expiration date of permit coverage (if applicable), the date by which an application or NOI is due for reissuance (renewal) (if applicable), the municipality and county where the sewage treatment facility or collection system is located, and the name of the consultant (company name), if any, who assisted in the preparation of the form.

Chapter 94 Report Components

This section requests responses to 12 questions that, if applicable, must be addressed for a complete Chapter 94 report. Questions 1 – 9 and 12 come directly from the Chapter 94 regulations, i.e., 25 Pa. Code §§ 94.12(a)(1) – 94.12(a)(9) and 94.13(b). Some questions request that you check an appropriate box, attach the information requested, and specify the attachment number, while responses to other questions may be entered directly on the form.

For Questions 1 and 2, permittees may use DEP's Chapter 94 Spreadsheet to satisfy 25 Pa. Code §§ 94.12(a)(1) and 94.12(a)(2), respectively. DEP encourages use of the Chapter 94 Spreadsheet to provide consistency in the format and calculations associated with hydraulic and organic load evaluations (see www.depweb.state.pa.us/chapter94). If the Chapter 94 Spreadsheet was used, check the appropriate box(es) and attach printouts of the data and graphs to the Chapter 94 report. If this report is being used for a collection system only, these graphs are not needed.

For Question 6, if the permittee checks the box that there were capacity-related bypasses or SSOs during the report year, in general the box for existing hydraulic overload in Question 9 should be checked. If the permittee checks the box in Question 6 because surcharging occurred during the report year, in general the box for projected hydraulic overload in Question 9 should be checked.

For Question 8, if the permittee has an EPA-approved pretreatment program, attachment of an annual pretreatment report as required in an NPDES permit will satisfy the requirement for an industrial waste report.

For Question 10, if a permit requires a "Sewage Sludge Management" inventory, check the appropriate box if the inventory is attached to the Chapter 94 report.

For Question 11, if an NPDES permit (individual permit or, for satellite collection systems, PAG-06 General NPDES permit coverage) requires an Annual CSO (Status) report, attach the CSO report to the Chapter 94 report and check the appropriate box.

Certification

In accordance with 25 Pa. Code § 94.12(a), both the individual who prepared the report and (a responsible official of) the permittee must sign the report. The term "responsible official" for a municipality is a principal executive officer or ranking elected official.

Questions on the completion of Chapter 94 reports may be directed to DEP's Bureau of Point and Non-Point Source Management at (717) 787-8184 or to the appropriate DEP regional office (contact information available by visiting DEP's website, www.depweb.state.pa.us, and selecting Regional Resources).

SUPPLEMENTAL REPORT INFORMATION

SECTION 1, 2 AND 3. FLOWS, 5-YEAR ORGANIC AND HYDRAULIC LOADING PROJECTIONS

The sewer service area in this report includes the majority of Collingdale Borough as well as tributary Municipalities as shown on the attached DELCORA METER AND EDU PLAN. The neighboring tributary municipalities that convey sewage to the DELCORA interceptor through the Borough boundaries and meters include the Borough of Aldan and Darby Township. In addition, sewage from several areas of the Borough are conveyed out of the Borough to neighboring municipality's metered areas; including Darby Township, the Borough of Glenolden, the Borough of Aldan and the Borough of Folcroft. Bypass area no. 1 drains sewage to an interceptor through the Borough of Folcroft. A graph showing the monthly average hydraulic loadings for the previous five years is attached. There are four (4) meters that generated the monthly average data shown on the graph. The locations of the meters and areas that flow to the meters are shown on the DELCORA METER AND EDU PLAN. Through DELCORA's metering plan, approximately 97% percent of the Borough's sewer is directly metered. The remaining unmetered areas flows are estimated using the average volume per EDU from the metered portions of the Borough.

There are currently 3,041 connections from the Borough to Darby Creek Authority.

Information regarding estimated flow was gathered from two sources; the water usage provided by Aqua PA for 2018 and from the DELCORA metering program. This difference is in part attributed to rainfall derived infiltration and inflow (RDII) throughout the system. There was no significant change in flows from 2017, when metered flows were 1.11 MGD, to 2018 where the metered flows are 1.13 MGD.

The Borough's costs for sewage treatment are based on metered flows. The Borough has been analyzing and developing methods to reduce flows including by performing television videos of the systems, reviewing flow data and planning, designing, and completing rehabilitation projects. The Borough has already experienced a reduction in flows since 2016 and anticipates more reductions by their continual commitment of implementing these activities.

The BOD loading is based on a figure of 0.17 lbs. per equivalent person applied to wastewater usage. The total suspended solids loading is based on 0.22 lbs. per equivalent person applied to water usage. An equivalent person is equal to a flow of 100 GPD. Based on this information, the hydraulic and organic loading for 2018 are as follows:

Table A 2018 Hydraulic and Organic Loading

	Aqua PA	DELCORA
Average Daily Flow- Gallons	418,405	1,132,565
Average Monthly Flow- Gallons	12,726,475	34,448,859
Maximum Monthly Flow- Gallons	13,481,067	39,151,033

Organic Loading (BOD)	711 lbs./day	N/A
Suspended Solids	920 lbs./day	N/A

There were no replacement connections in 2018 and one is projected within the next five years for the new Wawa Market which is currently under construction. This also involves the elimination of flows from three residential properties and a funeral home for no net increase. The March 2013 DVRPC Analytical Data Report of Regional, County, and Municipal Population and Employment Forecasting indicates the population of the Borough will not experience any significant change in over the next five years. Flow projections using a 5-year adjusted annual flow using the DELCORA metering data have been calculated (Tables B, C, and D). These calculations use the flat-line method for projected adjusted annual flow (Table B). The flat-line method is applicable since the Borough is built-out, there are no EDUs based on past / projected connections and there is no population growth expected. For the flat-line method, the adjusted average annual flow for the past five years is the same as the actual average over the past five years. One EDU in the calculations is equivalent to 250 GPD.

Table B Adjusted Annual Flow

Year	AA Flow in MGD	Max. Monthly Flow in MGD	All projects connected	Adjusted AA Flow in MGD
2014	1.044	1.466	0.0	1.044
2015	1.024	1.260	0.0	1.024
2016	1.188	1.425	0.0	1.188
2017	1.111	1.313	0.0	1.111
2018	1.133	1.267	0.0	1.133
Total	**5.500**	**6.731**	**Total**	**5.500**
5 Yr. Avg.	**1.100**	**1.346**	**5 Yr. Adj. Avg.**	**1.100**

The hydraulic ratio of 1.22 calculated for the past five years is based on the ratio of the average maximum monthly flow of 1.346 MGD to the average annual flow of 1.100 MGD (Table B).

The projected annual average flow is the same as the current average annual flow of 1.100 MGD since there are no connections anticipated to increase the flow (Table C). The projected maximum monthly flows are calculated by multiplying the annual average flows by the hydraulic ratio for each year (Table C).

Table C- Projected Annual Flow

Year	Previous Year's Annual Average Flow	New EDUs	Increased Flow (MGD)	Projected Annual Average Flow (MGD)	Projected Max Month Flow (MGD)
2019	1.100	0	0	1.100	1.346
2020	1.100	0	0	1.100	1.346
2021	1.100	0	0	1.100	1.346

2022	1.100	0	0	1.100	1.346
2023	1.100	0	0	1.100	1.346

The flat-line approach has also been used to project the Organic Loading Projections over the next five years. Table D shows calculations for the average organic loading over the past five years.

Table D- Average Organic Loadings Past Five Years

Year	Organic Loading Lbs. per Day
2014	742
2015	732
2016	732
2017	712
2018	711
Total:	**3629**
Average:	**726**

Average annual BODs loadings are projected over the next five years using the average loadings for the past five years. The maximum monthly flow BODs loading projections are calculated by multiplying the hydraulic ratio of 1.22 by the average loadings (Table E).

Table E- Organic Loading Projections

Year	Average Annual BODs Loading Projections (lbs/day)	Maximum Monthly BODs Loading Projections (lbs/day)
2019	726	886
2020	726	886
2021	726	886
2022	726	886
2023	726	886

SECTION 4. SEWER EXTENSIONS

No extensions were constructed in 2018. No sewer extensions are projected within the next year.

SECTION 5. PROGRAM FOR SANITARY SEWER MONITORING, MAINTENANCE AND REPAIR

Borough personnel are responsible for routine monitoring, maintenance, and repair of the sewer systems. This includes periodic flushing and cleaning using a Jet-Vac combination cleaner truck.

In 2018, the Borough continued to monitor their sewer system and investigate areas within the system by contracting with A to U to perform cleaning and videos at various locations. The Borough also through public bidding awarded a Maintenance Contract to A to U Services in 2017 to address some of the areas investigated as well as to handle emergency repairs of the sanitary system as they arise. A to U investigated over 3600 linear feet of sewer main. Areas investigated which were rehabilitated per the Maintenance Contract include:

- Sharon Avenue, from MacDade Boulevard to Andrews Avenue. 285 linear feet of 8-inch main was cleaned, televised, and inspected. 15 linear feet of main was replaced.
- Bedford Avenue and Collingdale Avenue. Parged manhole no. 43 where infiltration was found after dye testing.

The Borough uses Duke's Root Control to remove root masses and other obstructions via a chemical treatment process. Root masses prevent proper flow of sewage and adversely impact the structural integrity of the sewer piping. In 2018, the Borough did not use Duke's services but will continue to in the future when needed.

The design of the DCED PA Small Water & Sewer Program Sanitary Sewer Improvements project was completed in 2018, was bid and awarded in early 2019 and construction is scheduled to be complete within the first half of 2019. The Borough was awarded additional matching funds for this project through the FY 2018 CDBG Program. The project includes the following work to address deteriorated and damaged portions of the sanitary system that have been contributing to RDII:

- Hansen Place and Lafayette Avenue. Rehabilitate the sanitary system within the roadways on Hansen Place between manholes 25 and 27 and on Lafayette Avenue between manholes 15 and 15B for a total of 878 linear feet of 8-inch gravity sewer main and 6 manholes lined.
- Pusey Run. Rehabilitate between manholes 166 and 182A a total of 1297 linear feet of 18 and 24-inch gravity sewer main and 7 manholes lined.

A map showing the locations of the completed and planned work referenced in this section is attached.

SECTION 6. CONDITION OF THE SEWER SYSTEM

The gravity mains are generally in good condition. Collingdale Borough has three (3) main collection and conveyance systems that discharge to Darby Creek Joint Sewer Authority's system as illustrated on the enclosed Sanitary Sewer Map. There are no combined sewers.

The pipe lengths, diameters, materials and age are as follows:

Length (mi)	Diameter	Material	Age
0.24	8-inch	PVC Pipe- SDR 35	1997, 2006
0.10	12-inch	PVC Pipe- SDR 35	2006,2012
0.01	6-inch	Terra Cotta	Unknown
9.77	8-inch	Terra Cotta	Unknown
0.16	8-inch	CIPP	2009-2010
0.24	10-inch	Terra Cotta	Unknown
0.16	10-inch	CIPP	2009-2010
0.24	12-inch	Terra Cotta	Unknown
0.10	12-inch	CIPP	2010,2012
0.69	15-inch	Terra Cotta	Unknown
0.16	15-inch	CIPP	2010
0.28	18-inch	Terra Cotta	Unknown

The Borough has implemented a plan to maintain the integrity of their sanitary sewer collection and distribution system by rehabilitating portions of the system where problems have been encountered. See section 5 of this report regarding the Borough's projects that have been completed / pursued as part of this plan and the benefits achieved / expected with these projects.

No sanitary sewer overflows occurred in the Borough during 2018.

SECTION 7. SEWAGE PUMPING STATIONS

No pump stations exist within the Borough's control.

SECTION 8. INDUSTRIAL WASTES

Industrial dischargers report directly to DELCORA. The Borough has adopted DELCORA's standards and regulations. The Borough has 2 industrial dischargers:

- Penn Panel and Box Co. (#2dc-03-03)
- Multiflex Plating Co

All Monthly Discharge Reports are provided directly to DELCORA as part of their permit requirement. There have been no problems observed or reported regarding industrial waste discharges.

SECTION 9. CORRECTIVE ACTION PLAN

There have been no existing or projected overload conditions identified in the collection and conveyance system.

SECTION 10. SEWAGE SLUDGE MANAGEMENT INVENTORY

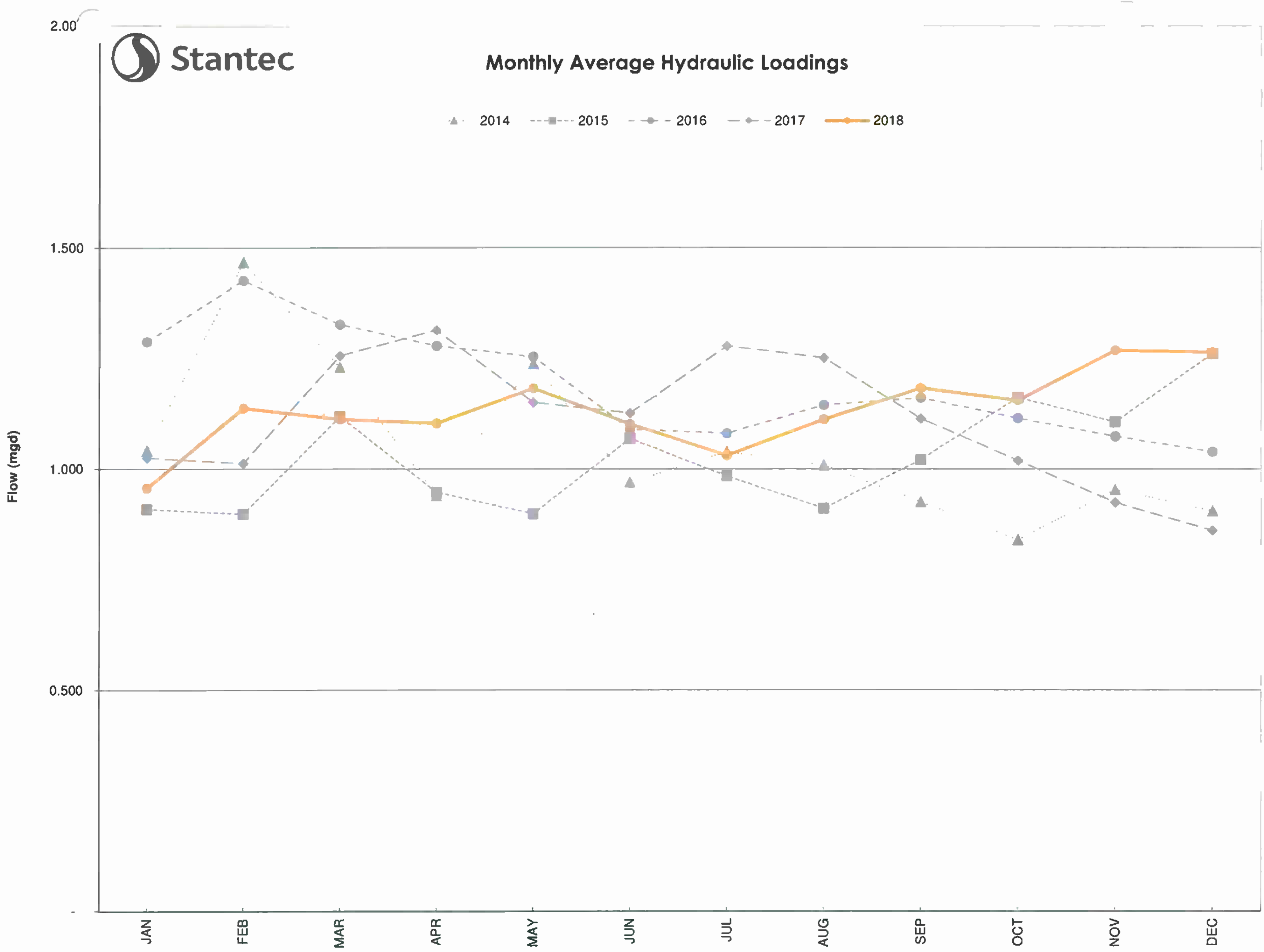
Not applicable for a collection system and therefore, no action required by Collingdale Borough for this item.

SECTION 11. CSO REPORT

Not applicable for a collection system and therefore, no action required by Collingdale Borough for this item.

SECTION 12. CALIBRATION REPORTS

The flow metering equipment has been installed and is being maintained by DELCORA's consultant, CSL Services, Inc., and they will be providing calibration reports. Therefore, no action required by Collingdale Borough for this item.


Stantec
Monthly Average Hydraulic Loadings
2014
2015
2016
2017
2018
Flow (mgd)
2.00
1.500
1.000
0.500
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC

Stantec

1060 Andrew Drive Suite 140
West Chester PA 19380
Tel 610 840 2500
www.stantec.com

Legend

Notes

1	2017 CHAP 94 REPORT	CKK	MJK	18.02.16
Revision		By	Appd	YY MM DD

File Name sewmap2017-no meters.dwg

Dwn Chkd Dsgn YY MM DD

Permit-Seal

Client/Project

BOROUGH OF COLLINGDALE

COLLINGDALE, PA

Title

SEWER MAP

Project No. 176710004

Scale

Drawing No.

Sheet 1 of 1

Revision