pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southeast Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0050075**
Facility Type	**Non-Municipal**	APS ID	**1117318**
Major / Minor	**Minor**	Authorization ID	**1491352**

Applicant and Facility Information

Applicant Name	**Aqua PA Wastewater Inc.**	Facility Name	**Willistown Woods STP**
Applicant Address	762 W. Lancaster Avenue	Facility Address	1702 West Chester Pike
	Bryn Mawr, PA 19010-3402		West Chester, PA 19382-6660
Applicant Contact	Todd Duerr	Facility Contact	Kyle Roberts
Applicant Phone	(610) 520-6384	Facility Phone	(610) 520-6384
Client ID	62614	Site ID	255896
Ch 94 Load Status	Not Overloaded	Municipality	Willistown Township
Connection Status		County	Chester
Date Application Received	June 28, 2024	EPA Waived?	Yes
Date Application Accepted		If No, Reason	

Purpose of Application: Permit Renewal

Summary of Review

Applicant requests renewal of an NPDES permit to discharge treated sewage from Willistown Woods STP, serving Willistown Township to an Unnamed Tributary to Hunters Run.

The treatment process includes influent automatic fine screens, EQ tanks, aeration and MBR tanks, clarifiers, chemical feed systems, UV disinfection, and an aerated sludge holding tank.

Wastewater treatment chemicals listed in the application are: Polyaluminum Chloride (Coagulant – Phosphorus Reduction), Magnesium Hydroxide (Alkalinity/pH Adjustment), and Sodium Hypochlorite (Membrane Cleaning).

There are no anticipated upgrades to the treatment over the next five years other than maintaining or rehabbing existing equipment.

DMR review shows the discharge is in compliance with the permit effluent limitations. Facility was last inspected on 4/16/2024 and no violations were noted. No comments received from Operations Section.

Since there are no changes in the influent characteristics, discharge flow, stream designation and treatment process etc. all existing limits are recommended to carry over to the draft permit. New parameters E. Coli and TDS are included in the draft permit.

Existing influent monitoring for CBOD5 and TSS is continued in the draft permit.

Approve	Deny	Signatures	Date
X		*Sara Abraham* Sara Reji Abraham, E.I.T. / Project Manager	August 8, 2024
X		*Pravin Patel* Pravin C. Patel, P.E. / Environmental Engineer Manager	08/13/2024

Summary of Review

Sludge use and disposal description and location(s): Sludge is hauled away to other WWTP.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Act 14 Notifications:

Willistown Township - June 11, 2024

Chester County - June 11, 2024

Permit Conditions:

A. No Stormwater
B. Acquire Necessary Property Rights
C. Proper Sludge Disposal
D. Abandon STP when Public Sewer Become Available
E. Chlorine Optimization
F. Fecal Coliform Reporting
G. Operator Notification
H. TMDL/WLA Analysis
I. Develop O&M Plan
J. Solids Management

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.175
Latitude	39º 57' 52.02"	Longitude	-75º 30' 33.91"
Quad Name	West Chester	Quad Code	1941
Wastewater Description:	Treated Sewage Effluent		
Receiving Waters	Unnamed Tributary to Hunters Run (HQ-TSF, MF)	Stream Code	00675
NHD Com ID	25621222	RMI	0.60
Drainage Area	0.36 mi^2		
Q_{7-10} Flow (cfs)	0.104	Q_{7-10} Basis	PA USGS StreamStats (previous fact sheet)
Elevation (ft)	385	Slope (ft/ft)	3.7
Watershed No.	3-G	Chapter 93 Class.	HQ-TSF, MF
Exceptions to Use	None	Exceptions to Criteria	N/A
Assessment Status	Impaired		
Cause(s) of Impairment	cause unknown, flow regime modification, siltation		
Source(s) of Impairment	urban runoff/storm sewers		

Treatment Facility Summary

Treatment Facility Name: Willistown Woods STP

WQM Permit No.	Issuance Date
1500409	August 2, 2000
WQG02151201	June 28, 2012
1500409 (T1)	February 28, 2014
1518405 A-1	April 2, 2019

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Extended Aeration with Solids Removal	Ultraviolet	0.175

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.210	610	Not Overloaded	Holding Tank	Other WWTP

Compliance History

DMR Data for Outfall 001 (from July 1, 2023 to June 30, 2024)

Parameter	JUN-24	MAY-24	APR-24	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23
Flow (MGD) Average Monthly	0.1046	0.1102	0.1175	0.1133	0.1036	0.1060	0.1042	0.0961	0.0964	0.1008	0.0997	0.1019
Flow (MGD) Daily Maximum	0.1538	0.1347	0.1820	0.1556	0.1550	0.1909	0.1553	0.1279	0.0971	0.1428	0.1664	0.1426
pH (S.U.) Minimum	7.1	7.2	7.0	6.9	6.8	6.9	6.9	7.1	7.3	7.3	7.2	6.7
pH (S.U.) Maximum	7.7	7.6	7.6	7.6	7.6	7.9	7.5	7.8	7.8	7.9	8.0	7.9
DO (mg/L) Minimum	6.2	6.5	6.8	7.2	7.3	7.2	7.1	7.0	7.0	6.7	6.4	6.4
TRC (mg/L) Average Monthly	GG	GG	GG	GG	GG	GG	GG	GG	GG	GG	GG	GG
TRC (mg/L) Instantaneous Maximum	GG	GG	GG	GG	GG	GG	GG	GG	GG	GG	GG	GG
CBOD5 (lbs/day) Average Monthly	< 2	< 2	< 2	< 2	< 3	< 2	< 2	< 2	< 2	< 2	< 2	< 2
CBOD5 (lbs/day) Raw Sewage Influent Average Monthly	214	214	212	200	282	213	216	240	180	204	172	147
CBOD5 (mg/L) Average Monthly	< 2.0	< 2.0	< 2	< 2	< 3	< 2	< 2	< 2	< 2.0	< 2.0	< 2.0	< 2.0
CBOD5 (mg/L) Raw Sewage Influent Average Monthly	230	225	204	201	300	235	264	301	207	240	208	188
TSS (lbs/day) Average Monthly	< 1	2	1	< 3	< 1	1	1	1	2	< 2	2	< 1
TSS (lbs/day) Raw Sewage Influent Average Monthly	84	87	82	92	130	62	166	112	86	136	61	87
TSS (mg/L) Average Monthly	< 1	2	1	< 3	< 2	1	1	1	2	< 2	2	< 1

TSS (mg/L) Raw Sewage Influent Average Monthly	91	91	81	93	138	68	224	141	97	162	76	106
Fecal Coliform (No./100 ml) Geometric Mean	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1	< 1	< 1	< 1	< 1
UV Intensity (µw/cm²) Daily Minimum	4900	5870	5600	6470	5870	5950	5890	5680	5740	5600	5480	5280
Total Nitrogen (lbs/day) Average Monthly	< 43.25	< 40.46	< 43.62	< 41.63	< 37.64	< 38.18	< 33.43	< 30.65	< 43.72	< 37.89	< 37.97	< 36.49
Total Nitrogen (mg/L) Average Monthly	< 46.60	< 42.80	< 41.60	< 42.10	< 40.00	< 41.60	< 40.85	< 38.61	< 49.10	< 46.85	< 45.40	< 46.10
Ammonia (lbs/day) Average Monthly	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Ammonia (mg/L) Average Monthly	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Phosphorus (lbs/day) Average Monthly	0.6	0.5	0.7	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.5
Total Phosphorus (mg/L) Average Monthly	0.6	0.6	0.7	0.4	0.5	0.5	0.4	0.5	0.4	0.6	0.6	0.6

Compliance History

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .175
Latitude 39º 57' 51.56" **Longitude** -75º 30' 33.38"
Wastewater Description: Treated Sewage Effluent

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Proposed Limitations:

Parameter	Limit (mg/l)	SBC	Basis
CBOD5	8.5	Average Monthly	Existing limit **
NH3-N	0.9	Average Monthly	Existing Limit**
D.O	6.0	Inst. Max.	Existing Limit **
TSS	17	Average Monthly	Existing Limit (BAT)
Total Phosphorus	1.0	Average Monthly	Existing Limit (BAT)
TRC***	0.05	Average Monthly	Existing Limit
Total Nitrogen	Report	Average Monthly	Existing Limit / SOP
UV intensity	Report	Daily Minimum	Existing Limit / SOP

*All are existing limits. Original calculation conducted in 1999 is attached for reference.

**WQM 7.0 was conducted in the past and the recommended limits are less stringent than the existing limits (from previous fact sheet). Unable to locate the WQM report.

***Monitor only during the use of Chlorine.

E. Coli:

Quarterly monitoring is included in the draft permit according to the DEP SOP guidance (Chapter 92.a.61). This is a new requirement and is consistent with the requirements of other similar discharges in the area.

TDS:

The discharge concentrations reported in the application are 872 mg/l (maximum) and 626 (minimum). Both are higher than the Water Quality Criterion 500 mg/l. Quarterly monitoring is included to collect more data.

Sampling results for Copper, Lead and Zinc are provided. Review shows no concern.

Anti-Backsliding

N/A

1/8/99
JHunt.

BG- WQ

PLEASE WRITE UP A REEVALUATION OF THE CHESTER CREEK LIMITS BASED ON:

Q_1 = 0.175 MGD w/ SET & w/o SET
Q_2 = 0.209 MGD " "

ALSO, PLEASE REEVALUATE P LIMIT FOR w/o SET SCENARIO. IT APPEARS THAT THE EXISTING P LOAD CAN BE CONSIDERED EVEN THOUGH THERE WAS NO PERMIT LIMIT. THIS WOULD BE CONSISTENT w/ HOW WE CONSIDERED CBOD, NH_3-N & TSS.

SEE PRELIM DATA ON EXISTING P LEVELS.

FROM WHAT I CAN TELL FROM THE FILE:

12/23/83 - ORIGINAL NPDES ISSUED FOR 0.064
2/6/85 - PLANT START UP
5/14/85 - RIDLEY CREEK REDESIGNATED TO HQ
12/9/87 - NPDES FOR 0.120 MGD

CHESTER CREEK FARMS STP PRE EXISTED THE WILLISTOWN WOODS/CHESTER STP. WAS FOR 0.032 MGD & DISCHARGED TO SAME STREAM NEARBY.

⇒ PLEASE DO BY MONDAY 1/11/99

Subject: Chesterdale 1/11/99
Preliminary Effluent Limits
0.175 & 0.209 mgd w/o SEJ & w/SEJ
From: Bill Gomen

The attached chart summarizes preliminary effluent limits. I used the same basic approach as in my earlier workup for other discharge flows, except for phosphorus.

In the previous workup I used the ambient instream concentration (WQN0179) as the effluent limit (0.2 mg/l) for phosphorus w/o SEJ, for the entire discharge flow - existing and proposed. In this workup I used 4 mg/l as a conservative value for phosphorus in the effluent for the "existing" 0.069 mgd (DEP grab samples ranged from 3.66 to 7.48 mg/l). After mass balance with limits from proposed flow, the results were > 1 mg/l (ABAT), & recommend holding the limit w/o SEJ to 1 mg/l.

For the w/SEJ scenario, I made an assumption that if the existing flow, prior to HQ, had a P limit it would have been 2 mg/l. After mass balance with ABAT the results were > 1 mg/l. Again I recommend holding limit to 1 mg/l.

CBOD5 (5/1-10/30)	mg/l	8.5	12.2	17.3	0.9	2.6	1.0	200/100 ml	6	6-9	0.045			Total 0.175 mgd.
	mg/l	13.6	23.7	17.3	1.7	5.1	1.0	↑	↑	↑	0.045			Total 0.175 mgd.
0.064 mgd existing 0.145 mgd new w/o SEJ	mg/l	7.4	10.5	16.1	0.8	2.3	1.0				0.045			Total 0.209 mgd.
0.064 mgd existing 0.145 mgd new w/ SEJ	mg/l	13.1	23.1	16.1	1.6	5.0	1.0				0.045			Total 0.209 mgd.
CBOD5 (11/1-4/30)													
Suspended Solids													
NH_3N (5/1-10/30)													
NH_3-N (11/1-4/30)													
Phosphorus as P													
Fecal Col.													
D.O.													
PH													
TRC (if chlorine used for disinfection)													

Total flows proposed: 0.175 mgd 0.175 − 0.064 = 0.111 mgd
0.209 mgd 0.209 − 0.064 = 0.145 mgd

Mass balance 0.064 mgd limits with limits for 0.111 mgd and 0.145 mgd w/o SEJ

$(0.064)(20)+\left(\frac{0.111}{0.145}\right)(1.88) = \left(\frac{0.175}{0.209}\right)(x)$

$x = \begin{matrix}8.5\\7.4\end{matrix}\}$ mg/l $CBOD_5$ (5/1-10/30)

$(0.064)(30)+\left(\frac{0.111}{0.145}\right)(3.76) = \left(\frac{0.175}{0.209}\right)(x)$

$x = \begin{matrix}12.2\\10.5\end{matrix}\}$ mg/l $CBOD_5$ (11/1-4/30)

$(0.064)(30)+\left(\frac{0.111}{0.145}\right)(10) = \left(\frac{0.175}{0.209}\right)(x)$

$x = \begin{matrix}17.3\\16.1\end{matrix}\}$ mg/l Susp. Solids

$(0.064)(2)+\left(\frac{0.111}{0.145}\right)(0.24) = \left(\frac{0.175}{0.209}\right)(x)$

$x = \left(\frac{0.88}{0.78}\right)$ mg/l NH_3N (5/1-10/30)

$(0.064)(6)+\left(\frac{0.111}{0.145}\right)(0.72) = \left(\frac{0.175}{0.209}\right)(x)$

$x = \left(\frac{2.65}{2.34}\right)$ mg/l NH_3N (11/1-4/30)

$(0.064)(4)+\left(\frac{0.111}{0.145}\right)(0.2) = \left(\frac{0.175}{0.209}\right)(x)$

* (assumed in discharge as text book typical, but not limited in the permit) $x = \begin{matrix}1.6\\1.4\end{matrix}\}$ mg/l Phos as P (however, no limit or treatment for P exists; recommend ABAT of 1 mg/l)

$(0.064)(5)+\left(\frac{0.111}{0.145}\right)(6) = \left(\frac{0.175}{0.209}\right)(x)$

$x = \begin{matrix}5.6\\5.7\end{matrix}\}$ mg/l D.O.

Fecal 200/100 ml PH 6-9 TRC also are applicable

* If lowest DEP grab was used (3.66) "x" would be: 1.46 (at 0.175 mgd), 1.26 (at 0.209 mgd)
If highest DEP grab was used (7.48) "x" would be: 2.86 (at 0.175 mgd), 2.43 (at 0.209 mgd)

Mass balance 0.064 mgd limits with limits for 0.111 mgd and 0.145 mgd w/SEF (ABAT)

$(0.064)(20)+\left(\frac{0.111}{0.145}\right)(10) = \left(\frac{0.175}{0.209}\right)(x)$

$x = \begin{matrix}13.6\\13.1\end{matrix}$ } mg/l $CBOD_5$ (5/1-10/30)

$(0.064)(30)+\left(\frac{0.111}{0.145}\right)(20) = \left(\frac{0.175}{0.209}\right)(x)$

$x = \begin{matrix}23.7\\23.1\end{matrix}$ } mg/l $CBOD_5$ (11/1-4/30)

$(0.064)(30)+\left(\frac{0.111}{0.145}\right)(10) = \left(\frac{0.175}{0.209}\right)(x)$

$x = \begin{matrix}17.3\\16.1\end{matrix}$ } mg/l Susp Solids

$(0.064)(2)+\left(\frac{0.111}{0.145}\right)(1.5) = \left(\frac{0.175}{0.209}\right)(x)$

$x = \left(\frac{1.68}{1.65}\right)$ mg/l NH_3N (5/1-10/30)

$(0.064)(6)+\left(\frac{0.111}{0.145}\right)(4.5) = \left(\frac{0.175}{0.209}\right)(x)$

$x = \left(\frac{5.1}{5.0}\right)$ mg/l NH_3N (11/1-4/30)

$(0.064)(2)+\left(\frac{0.111}{0.145}\right)(1.0) = \left(\frac{0.175}{0.209}\right)(x)$

initial permit had no P limit, but 2.0 mg/l would have been used before stream was designated HQ

$x = \left(\frac{1.4}{1.3}\right)$ mg/l Phos as P

(however, no limit or treatment for P exists ∴ recommend ABAT of 1 mg

D.O. = 6 mg/l
Fecal Coliform 200/100 ml
pH 6-9
TRC

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Daily Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	6.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.05	XXX	0.12	See Permit	Grab
CBOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
CBOD5 Nov 1 - Apr 30	18	XXX	XXX	12	XXX	24	1/week	24-Hr Composite
CBOD5 May 1 - Oct 31	12	XXX	XXX	8.5	XXX	17	1/week	24-Hr Composite
TSS	25	XXX	XXX	17	XXX	34	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab

Outfall 001, Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Daily Minimum	Average Monthly	Maximum	Instant. Maximum		
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
UV Intensity (µw/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Metered
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Ammonia Nov 1 - Apr 30	3.6	XXX	XXX	2.5	XXX	5	1/week	24-Hr Composite
Ammonia May 1 - Oct 31	1.3	XXX	XXX	0.9	XXX	1.8	1/week	24-Hr Composite
Total Phosphorus	1.5	XXX	XXX	1.0	XXX	2	1/week	24-Hr Composite

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