pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0102547**
Facility Type	**Non-Municipal**	APS ID	**1009284**
Major / Minor	**Minor**	Authorization ID	**1301645**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Oak Springs MHP Inc.**	Facility Name	**Oak Springs MHP**
Applicant Address	PO Box 1922	Facility Address	Old US Route 19
	Cranberry Twp, PA 16066-0922		Cranberry Twp, PA 16066-0035
Applicant Contact	Mark Mashuda	Facility Contact	
Applicant Phone	(724) 452-4469	Facility Phone	
Applicant E Mail		Facility E Mail	
Client ID	57495	Site ID	450930
Municipality	Cranberry Township	County	Butler
Ch 94 Load Status	Not Overloaded	Connection Status	No Limitations
Application Received	January 2, 2020	EPA Waived?	Yes
Application Accepted	January 21, 2020	If No, Reason	

Application Purpose: NPDES sewage discharge permit renewal

Summary of Review

No open violations.

No changes proposed

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.

Approve	Deny	Signatures	Date
X		William H. Mentzer William H. Mentzer, P.E Environmental Engineering Specialist	December 8, 2021
X		Justin C. Dickey Justin C. Dickey, P.E. Environmental Engineer Manager	December 14, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.022
Latitude DP	40º 44'15.00"	Longitude DP	-80º 6' 47.00"
Latitude NHD	40º 43' 54.90"	Longitude NHD	-80º 6' 48.29"
Quad Name	Mars	Quad Code	1305
Wastewater:	treated sanitary wastewater		

Receiving Waters	Unnamed Tributary to Brush Creek	Stream Code	unknown
NHD Com ID	126220300	RMI	0.38
Drainage Area	25.8 acres (0.04 square miles)	Yield (cfs/mi^2)	0.048
Q_{7-10} Flow (cfs)	0.02773	Q_{7-10} Basis	Buffalo Creek
Elevation (ft)	1150.45	Slope (ft/ft)	
Watershed No.	20-C	Chapter 93 Class.	WWF
Existing Use	**statewide**	Existing Use Qualifier	none
Exceptions to Use	none	Exceptions to Criteria	none
Comments	First point of use Tributary 34832 RMI 0.66, drainage 0.59-sq mi and elevation 1070.7 ft		

Assessment Status	Impaired		
Cause(s) of Impairment	NUTRIENTS, SILTATION		
Source(s) of Impairment	agriculture, highway/road/bridge runoff (non-construction related)		
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)	7,0	default
Temperature (°C)	25	WWF default
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Pa American Water		
PWS Waters	Connoquenessing Creek	Flow at Intake (cfs)	NA
PWS RMI	0.0	Distance from Outfall (mi)	26.72

The
Changes Since Last Permit Issuance: The Beaver Falls Municipal Authority public water intake at Beaver River RMI 3.5 and 600miles downstream was replaced by Pa American public water intake at the mouth of the Connoquenessing Creek. This discharge should not affect any downstream public water use.

Other Comments: None

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Treatment Facility Summary				
Treatment Facility Name: Oak Springs MHP				
WQM Permit No.	**Issuance Date**			
1069405				
1073414				
1077405				
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Tertiary	Extended Aeration With Solids Removal	Hypochlorite	0.02
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.02	30.0	Not Overloaded	Aerobic Digestion	Other WWTP

Changes Since Last Permit Issuance: none

Treatment:
An extended aeration package treatment plant consisting of a 16,000-gallon aeration tank, a 3,400-gallon settling tank, and a 1,950-gallon sludge holding tank, aluminum sulfate feed for phosphorus control, a 750-gallon dosing tank, two 900 square foot intermittent sand filters, and tablet chlorination with an 1,800-gallon contact tank.

Design:

People	Flow					BOD5/TSS					
				Design		NPDES					NPDES
					Max						
#	gpccd	MGD	MGD	MGD	MGD	MGD	ppccd	PPD	mg/L	PPD	PPD
214	60	0.01284	0.013	0.015	0.019	0.02	0.09	19.26	180	19.8	30.0

For the NPDES permit the facility appears rerated at slightly above the maximum design.

Compliance History

DMR Data for Outfall 001 (from May 1, 2020 to April 30, 2021)

Parameter	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20
Flow (MGD) Average Monthly	0.0160	0.0160	0.0164	0.0129	0.0129	0.0121	0.0192	0.0182	0.0198	0.0185	0.0189	0.0185
Flow (MGD) Daily Maximum	0.0188	0.0188	0.0212	0.0147	0.0147	0.0167	0.0291	0.0237	0.0212	0.0237	0.0212	0.0237
pH (S.U.) Minimum	6.4	6.0	6.2	6.0	6.2	6.3	6.3	6.3	6.6	6.5	6.5	6.1
pH (S.U.) Maximum	7.1	7.0	7.0	6.9	7.1	7.4	7.0	7.1	7.0	7.0	7.0	6.9
DO (mg/L) Minimum	6.2	7.0	6.9	6.5	6.7	6.2	6.0	6.0	6.0	7.0	6.0	5.0
TRC (mg/L) Average Monthly	0.24	0.22	0.31	0.38	0.39	0.34	0.35	0.217	0.12	0.17	0.14	0.18
TRC (mg/L) Instant Maximum	1.04	0.68	1.32	1.41	1.55	1.42	1.25	1.04	0.64	0.81	1.45	0.72
CBOD5 (mg/L) Average Monthly	3.0	3.0	4.3	4.6	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
TSS (mg/L) Average Monthly	3.0	5.5	4.5	10.7	6.0	4.0	4.5	3.5	3.0	3.0	3.0	7.0
Fecal Coliform (#/100 ml) Geometric Mean	1.41	4	49	2.45	21	2.4	4.8	17	45	34	2.45	57.4
Fecal Coliform (#/100 ml) Instant Maximum	2	10	2420	3	435	6	23	36	166	579	6.0	75
Total Nitrogen (mg/L) Average Monthly	14.2	17.4	20.7	16.95	20.3	22.2	17.8	14.2	10.9	10.6	7.57	13.9
Ammonia (mg/L) Average Monthly	0.275	0.23	0.65	0.86	0.36	0.34	0.295	0.205	0.41	0.285	0.34	0.29
Total Phosphorus (mg/L) Average Monthly	0.215	0.19	0.10	0.375	0.24	0.26	0.375	0.315	0.39	0.47	0.47	0.285

Summer median pH 6.8 SU

DMR Data for Outfall 001 (from December 1, 2018 to November 30, 2019)

Parameter	NOV-19	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18
Flow (MGD) Average Monthly	0.0163	0.0156	0.0122	0.0116	0.0145	0.0176	0.0158	0.0153	0.0185	0.0249	0.0192	0.0161
Flow (MGD) Daily Maximum	0.0212	0.0188	0.0147	0.0147	0.0263	0.0263	0.0237	0.0188	0.0237	0.0422	0.0237	0.0237
pH (S.U.) Minimum	6.5	6.5	6.5	6.2	6.5	6.5	6.6	6.5	6.0	6.0	6.0	6.0
pH (S.U.) Maximum	7.0	7.2	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
DO (mg/L) Minimum	8.0	5.0	8.0	5.0	7.0	6.0	7.0	4.0	4.0	5.0	4.0	4.0
TRC (mg/L) Average Monthly	0.31	0.25	0.18	0.22	0.21	0.295	0.22	0.31	0.36	0.37	0.249	0.21
TRC (mg/L) Instantaneous Maximum	1.03	1.42	1.00	0.69	1.49	0.54	0.98	0.83	**1.85**	**1.83**	0.81	0.58
CBOD5 (mg/L) Average Monthly	3.0	3.0	3.0	3.0	3.0	3.0	3.6	3.2	3.1	3.0	3.6	3.0
TSS (mg/L) Average Monthly	3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.5
Fecal Coliform (#/100 ml) Geometric Mean	18.6	4.12	220	7.5	1.73	1	1	36	224	3	2.24	282
Fecal Coliform (#100 ml) Instantaneous Maximum	345	17	2420	56	3.0	1	1	1300	980	9	5	549
Total Nitrogen (mg/L) Average Monthly	20.4	15.0	17.6	11.6	13.5	15.5	15.2	15.4	15.2	13.7	28.9	16.7
Ammonia (mg/L) Average Monthly	0.26	0.12	0.105	0.20	0.17	0.10	0.165	0.32	0.28	0.26	0.35	0.11
Total Phosphorus (mg/L) Average Monthly	0.59	0.75	0.56	0.76	0.60	0.445	0.34	0.275	0.27	0.26	0.265	0.48

Summer median and average pH 6.8-SU

Effluent Violations for Outfall 001, from: January 1, 2019 to: November 30, 2019

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TRC	03/31/19	IMAX	1.85	mg/L	1.6	mg/L
TRC	02/28/19	IMAX	1.83	mg/L	1.6	mg/L
Fecal Coliform	09/30/19	Geo Mean	220	CFU/100 ml	200	CFU/100 ml
Fecal Coliform	09/30/19	IMAX	2420	CFU/100 ml	1000	CFU/100 ml

Summary of Inspections: none filed

Other Comments: Cited on July 17, 2017 for pH, CBOD5, TRC ammonia self-monitoring violations from December 2015 to April 2017.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .022
Latitude 40º 44' 15.00" **Longitude** -80º 6' 47.00"
Wastewater Description: 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)
DO	4.0	Mg/L		BPJ

Comments: none

Water Quality-Based Limitations

A “Reasonable Potential Analysis” based on sewerage determined the following parameters were candidates for limitations: Phosphorus, CBOD5, TSS, Ammonia, Nitrogen, pH and DO.

Phosphorus is limited to 2.0-mg/L in the Connoquenessing Creek basin above Slippery Rock Creek.

The first point of use is estimated to be at the drainage swale confluence with un-named tributary 34832 at RMI 0.66.

Chlorine should be adequately controlled through technology. Natural in stream reduction should achieve aquatic life protection levels prior to achieving perennial stream conditions.

The following limitations were determined through water quality modeling (output files attached):

Parameter		Limit (mg/l)			SBC		Model	
BOD5			10.0	20.0	NA		25.0	50.0
Ammonia	Summer		2.0	4.0	NA		3.09	6.18
DO		4.0		4.0	NA	4.0		

Comments: With no reported ammonia and CBOD5 violations anti-backsliding is appropriate.

Best Professional Judgment (BPJ) Limitations

Comments: Applied to DO. *1/year E.Coli monitoring added per the SOP for Establishing Effluent Limitations for Individual Sewage Permits.* *JCD*

Anti-Backsliding

Applies to ammonia.

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" (362-0400-001), 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	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	10.0	XXX	20.0	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	10.0	XXX	20.0	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E.Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	6.0	XXX	12	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	2.0	XXX	4	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001 after disinfection

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
20C	34832	Trib 34832 of Brush Creek	**1.040**	1150.45	0.04	0.00000	0.00	☐

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.048	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Oak Springs	PA0102547	0.0330	0.0330	0.0330	0.000	25.00	6.80

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	25.00	0.10	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
20C	34832	Trib 34832 of Brush Creek	**0.660**	1070.70	0.59	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.048	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Oak Springs	PA0202547B	0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	8.24	8.24	0.00	0.00
NH3-N	25.00	0.10	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
20C	34832	Trib 34832 of Brush Creek	**0.000**	1002.90	1.76	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.048	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20C	34832	Trib 34832 of Brush Creek

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (ºC)	Analysis pH
Q7-10 Flow												
1.040	0.00	0.00	0.00	.0511	0.03975	.373	1.45	3.89	0.10	0.238	25.00	6.81
0.660	0.03	0.00	0.03	.0511	0.01946	.339	3.67	10.83	0.06	0.631	25.00	6.86
Q1-10 Flow												
1.040	0.00	0.00	0.00	.0511	0.03975	NA	NA	NA	0.10	0.239	25.00	6.80
0.660	0.02	0.00	0.02	.0511	0.01946	NA	NA	NA	0.06	0.682	25.00	6.84
Q30-10 Flow												
1.040	0.00	0.00	0.00	.0511	0.03975	NA	NA	NA	0.10	0.236	25.00	6.81
0.660	0.04	0.00	0.04	.0511	0.01946	NA	NA	NA	0.07	0.590	25.00	6.88

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	95.00%	Use Balanced Technology	☑
D.O. Goal	3		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20C	34832	Trib 34832 of Brush Creek

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
1.040	Oak Springs	NA	50	12.85	21.64	2	57
0.660	Oak Springs	NA	NA	12.51	NA	NA	NA

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
1.040	Oak Springs	NA	25	1.45	3.09	2	88
0.660	Oak Springs	NA	NA	1.43	NA	NA	NA

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
1.04	Oak Springs	25	25	3.09	3.09	4	4	0	0
0.66	Oak Springs	NA	NA	NA	NA	NA	NA	NA	NA

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20C	34832	Trib 34832 of Brush Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
1.040	0.033	25.000	6.806
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.452	0.373	3.891	0.098
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.17	1.494	2.98	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
4.154	31.864	Owens	NA
Reach Travel Time (days)			
0.238			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.024	23.11	2.91	5.06
0.048	22.10	2.84	5.54
0.071	21.14	2.77	5.81
0.095	20.21	2.71	5.99
0.119	19.33	2.64	6.12
0.143	18.49	2.58	6.23
0.166	17.68	2.52	6.32
0.190	16.91	2.45	6.41
0.214	16.17	2.40	6.49
0.238	15.46	2.34	6.56

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
0.660	0.033	25.000	6.861
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
3.667	0.339	10.830	0.064
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
10.98	1.325	1.59	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.123	28.691	Owens	3
Reach Travel Time (days)			
0.631			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.063	9.89	1.49	7.21
0.126	8.90	1.40	7.32
0.189	8.01	1.31	7.41
0.252	7.21	1.23	7.50
0.316	6.49	1.15	7.58
0.379	5.84	1.08	7.65
0.442	5.26	1.01	7.72
0.505	4.73	0.95	7.78
0.568	4.26	0.89	7.83
0.631	3.84	0.83	7.88

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20C	34832	Trib 34832 of Brush Creek

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
1.040	Oak Springs	PA0102547	0.033	CBOD5	25		
				NH3-N	3.09	6.18	
				Dissolved Oxygen			4

1A	B	C	D	E	F	G	H	I	J	K	L	M
	Discharger		Oak Spring STP						Thursday, December 9, 2021			
	Site		Oak Spring STP					Revised	Thursday, December 9, 2021			
	Municipality		Cranberry Township									
	County		Butler									
	NPDES Permit		PA0102547									
	0.5											
2					**TRC EVALUATION**							
3	Input appropriate values in B4:B8 and E4:E7											
4	0.0282		**= Q stream (cfs)**			**0.5**	**= CV Daily**					
5	0.0330		**= Q discharge (MGD)**			**0.5**	**= CV Hourly**					
6	30		**= no. samples**			**1**	**= AFC_Partial Mix Factor**					
7	0.3		**= Chlorine Demand of Stream**			**1**	**= CFC_Partial Mix Factor**					
8	0		**= Chlorine Demand of Discharge**			**15**	**= AFC_Criteria Compliance Time (min)**					
9			**= BAT/BPJ Value**			**720**	**= CFC_Criteria Compliance Time (min)**					
	0		**= % Factor of Safety (FOS)**				**=Decay Coefficient (K)**					
10	Source		Reference	AFC Calculations				Reference	CFC Calculations			
11	TRC		**1.3.2.iii**	WLA afc = 0.195				**1.3.2.iii**	WLA cfc = 0.183			
12	PENTOXSD TRG		**5.1a**	LTAMULT afc = 0.373				**5.1c**	LTAMULT cfc = 0.581			
13	PENTOXSD TRG		**5.1b**	LTA_afc= 0.073				**5.1d**	LTA_cfc = 0.106			
14												
15	Source					Effluent Limit Calculations						
16	PENTOXSD TRG		5.1f			AML MULT = 1.231						
17	PENTOXSD TRG		5.1g			LIMIT (mg/l) = 0.090			AFC			
18						X LIMIT (mg/l) = 0.293						

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...**
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...**
	...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**

(0.011/EXP(-K*CFC_tc/1440))+(((CFC_Yc*Qs*0.011)/(1.547*Qd)....
....*EXP(-K*CFC_tc/1440)))+Xd+(CFC_Yc*Qs*Xs/1.547*Qd))*(1-FOS/100)

	Chlorine Required			=	perennial	Chlorine Demand	+ Chlorine Residual
Stream	Reach/Node			2	1	2	
Stream	Flow	Conditions			dry	perennial	
Stream	Code				unknown	34832	
	Function						
Samples					30	30	
reach	outfall		RMI		0.38	0.66	
	Reach End		RMI		0	0	
reach			feet		2006.4	3484.8	
drainage			sq miles		0.04	0.59	
TRC	limitation	average	mg/L		0.020	0.090	
		maximum	mg/L		0.050	0.293	
elevation		modelled	feet		1150.45	1070.7	
elevation		modelled	feet		1070.7	1002.9	
slope		modelled	foot/foot		0.040	0.019	
low flow			cfs/sq mi		0.048	0.048	
discharge			mgd		0.0330	0.0330	
Runoff	Period		hours		24.000	24.000	

Dry stream discharge. Discharge adjusted for 16-hour runoff. TRC reviwed at outfall and estimated perennial streaam conditions. Stream chlorine is expected to naturally abated prior to reaching perennial flow conditions.

stream	flow		cfs	0.00191	0.02821
stream	flow		MGD	0.001236	0.018231
stream	flow	total	MGD	0.034236	0.051231
stream	chlorine	demand	mg/L	0.4	0.3
discharge	discharge	demand	mg/L		
stream	Total Stream/Waste		ratio	1.0	1.6

permitted	TRC	mean	BAT	0.5	0.5
permitted	TRC	maximum	BAT	1.6	1.6