pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0044911**
Facility Type	**Industrial**	APS ID	**6511**
Major / Minor	**Minor**	Authorization ID	**1405726**

NPDES PERMIT FACT SHEET INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER

Applicant and Facility Information

Applicant Name	**Land O Lakes Inc.**	Facility Name	**Land O Lakes – Carlisle Facility**
Applicant Address	405 Park Drive	Facility Address	405 Park Drive
	Carlisle, PA 17015-9270		Carlisle, PA 17015-9270
Applicant Contact	Jarrod Mohr	Facility Contact	Jarrod Mohr
Applicant Phone	(717) 486-2209	Facility Phone	(717) 486-2209
Client ID	94058	Site ID	443007
SIC Code	2023	Municipality	South Middleton Township
SIC Description	Manufacturing - Dry, Condensed, Exaporated Products	County	Cumberland
Date Application Received	August 4, 2022	EPA Waived?	Yes
Date Application Accepted	August 10, 2022	If No, Reason	
Purpose of Application	NPDES Permit Renewal		

Summary of Review

Land O Lakes Inc. (LOL) has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of the NPDES permit. The permit was last reissued on January 12, 2018 and expired on January 31, 2023.

Based on the review, it is recommended that the permit be drafted.

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		*Jinsu Kim* Jinsu Kim / Environmental Engineering Specialist	May 10, 2024
X		Maria D. Bebenek for Daniel W. Martin, P.E. / Environmental Engineer Manager	May 24, 2024
X		Maria D. Bebenek Maria D. Bebenek, P.E. / Program Manager	May 24, 2024

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.95
Latitude	40º 7' 53.81"	Longitude	-77º 11' 5.76"
Quad Name	Carlisle	Quad Code	1728
Wastewater Description:	IW Process Effluent with ELG		
Receiving Waters	Mountain Creek	Stream Code	63167
NHD Com ID	56407977	RMI	0.75
Drainage Area	46.2 mi^2	Yield (cfs/mi^2)	0.314
Q_{7-10} Flow (cfs)	14.5	Q_{7-10} Basis	See below comments
Elevation (ft)	514.3	Slope (ft/ft)	
Watershed No.	7-E	Chapter 93 Class.	TSF, MF
Existing Use	None	Existing Use Qualifier	N/A
Exceptions to Use	N/A	Exceptions to Criteria	N/A
Assessment Status	Attaining Use(s)		
TMDL Status	N/A	Name	N/A
Nearest Downstream Public Water Supply Intake	United Water Co.		
PWS Waters	Yellow Breeches Creek	Flow at Intake (cfs)	
PWS RMI	7.42	Distance from Outfall (mi)	24.5

Drainage Area

The discharge is to Mountain Creek at RMI 0.75. A drainage area upstream of the discharge point is estimated to be 46.2 sq.mi, according to the USGS StreamStats (https://streamstats.usgs.gov/ss/).

Streamflow

USGS gauging station no. 01571500 located on Yellow Breeches Creek approximately 3.1 miles above mouth also measures the hatchery flow and springs at Huntsdale resulting in a greater yield rate in the basin than actually exists. The proposed monthly hatchery discharge is 12.384 MGD during September when a monthly analysis of streamflows for Yellow Breeches Creek indicates Q7-10 flow is most likely to occur and the gage flow should be adjusted by subtracting the hatchery discharge as follows:

Gage flow = 87 – 12.384(1.547) = 67.842 cfs
Q7-10 runoff rate = (67.842)/ 216 = 0.314 cfs/sq.mi
Q30-10:Q7-10 = 94.3/87 = 1.084:1
Q1-10:Q7-10 = 81.7/87 = 0.939:1
Q7-10 = 46.2(.314) = 14.5 cfs

Mountain Creek

25 PA Code § 93.9o lists designated water use(s) for Mountain Creek (basin, Mt. Holly Springs to Mouth) as trout stocking & migratory fishes (TSF, MF). There is no existing use assigned to Mountain Creek. Mountain Creek is a tributary of Yellow Breeches Creek. Both Mountain Creek and Yellow Breeches Creek are not Class A Wild Trout streams[1]; no Class A Wild Trout Fishery is therefore impacted by the discharge. The discharge is located in a stream segment listed as attaining uses. Yellow Breeches Creek is special protection surface water (High Quality-Cold Water Fishes). Permit requirements will be developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing instream uses for both Mountain Creek and Yellow Breeches Creek are maintained and protected.

Public Water Supply Intake

The nearest downstream public water supply intake is the United Water Co. located on Yellow Breeches Creek at RMI 7.42 in Fairview Township, York County, located about 24.5 miles downstream of the discharge. Considering the distance and dilution, the discharge is not expected to affect this water supply.

[1] Both Mountain Creek and Yellow Breeches Creek are trout stocked streams and protected for trout natural reproduction but these streams are not considered as Class A Wild Trout waters according to PA Fish and Boat Commission.

Treatment Facility Summary

Treatment Facility Name: Land O Lakes

WQM Permit No.	Issuance Date
2177203 & 2180202	1980s
2196201	1996
2196201 99-1, 10-1, 12-1	05/21/1999, 06/14/2010, 07/19/2012
2196201	10/04/2019

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Industrial	Tertiary	Activated Sludge	No Disinfection	0.95

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.2	18625	Not Overloaded	Aerobic Digestion	Land Applied

General Description
LOL is an agricultural cooperative, focusing on manufacturing dairy products. The plant owned and operated by LOL is located at 405 Park Drive, Carlisle, PA 17015 and produces butters, milk powder and condensed milk products. These industrial activities are classified under the Standard Industrial Classification Codes of 2021 and 2023. The plant is designed to receive and process 6.0 million pounds of raw milk per day or about 180 million pounds of milk per month.

Source of Wastewater(s)
The major industrial processes used and associated with wastewater contributions include:

1. Raw Milk Processing
   Once raw milk is delivered, it is stored in one of twelve (12) storage silos. Delivery trucks are washed and sanitized at the cleaned-in-place systems in the receiving area. Wastewater from this area is directed to the on-site wastewater treatment plant. Stored raw milk is then processed through separation, pasteurization and evaporation prior to final product making processes. LOL first separates the cream from milk and then pasteurizes the cream and skim milk (evaporation). The pasteurized cream is cooled and stored prior to butter making. Evaporation process of skim milk produces condensed milk solids. Condensate of whey (COW) water is generated from the evaporation process.

2. Product Making
   Condensed milk solids from evaporation process are then converted to a dry form in the spray drying systems to produce condensed milk powder. Pasteurized cool cream as well as purchased cream is preheated and directed to the churning section to separate the fat and liquid (buttermilk). Processed buttermilk along with the purchased buttermilk is then processed further to produce buttermilk powder. Closed-loop cooling water system is utilized and blowdown of this system is generated occasionally and discharged to the onsite wastewater treatment facility. Wash water from cleaning equipment is also generated from these processes.

3. Product Packing and Warehousing
   All final products are stored and cooled prior to packaging/final shipment. The warehouse area consists of packaging materials, finished product packaging, freezer area, powder staging, and shipping. No process wastewater is expected from this area.

LOL indicated that about 40~50% of all flows treated at the wastewater treatment facility are COW water. Historically, COW water was not treated and was combined with effluent from the wastewater treatment plant prior to discharging into Mountain Creek. Due to biological growth in its effluent discharge piping as a result of the addition of COW water, treatment of COW water was determined to be necessary and therefore the Phase II improvement was proposed in 2012[2]. As a result, COW water is now combined with other wastewater at aeration stage for further treatment but it is still bypassing equalization tank, DAF units, and anoxic zone tank.

Treatment Technology

[2] Design Engineer's Report for Phase 2 Upgrades to the Industrial Wastewater Treatment Plant; T. Bachman, April, 2012

About 0.924 MGD (actual long-term average) of process wastewater is treated at the current on-site wastewater treatment facility. Except COW water, all wastewater from evaporator will be directed to the lift station and then pumped to the wastewater treatment facility. Sanitary wastewater is sent to the local municipal sewage treatment facility (i.e., South Middleton Township WWTP). The current treatment process, according to the permit renewal application, is as follows:

Equalization tanks (2) → Dissolved Air Floatation (DAF) units (2) → Anoxic zone tank → Aeration Tank (2) → Clarifiers (2) → Sand filters → Post-equalization tank → discharge to Mountain Creek

The original treatment facility was constructed in 1980 (WQM Permit no. 2180202), consisting of an equalization tank, DAF unit, two (2) lagoons, and a clarifier. Four (4) aeration tanks, clarifier, and belt filter press were added in 1996 (WQM Permit no. 2196201) and a clarifier, aeration tank and two (2) aerobic digesters were additionally installed in 2000 (WQM Permit no. 2196201 99-1). As part of the Phase I improvements, the existing equalization tank was replaced with two (2) new equalization tanks and another DAF unit, post equalization tank and new chemical feed systems were added in 2010 (WQM Permit no. 2196201 10-1). The 2012 Phase II improvement consisted of replacing existing temporary sand filtration with four (4) new permanent continuous backwash sand filters, converting polishing clarifier to filter pump station and digester to aeration tank and finally installing additional chemical feed systems and back-up blower for the post equalization tank.

Aerobic digesters (2) and centrifuge are used for solids handling. Any solids generated from the wastewater treatment facility will be land applied. The wastewater treatment facility uses a number of chemical products for coagulation/flocculation/pH control/phosphorous removal. Sodium hypochlorite was previously used for filamentous control but is no longer being used.

A stormwater outfall collects stormwater drained from the existing retention basin. The discharge from this outfall occurs during extreme heavy rain event(s) into the surrounding farm fields.

Compliance History

Summary of DMRs: A summary of past 12-month DMRs is presented on the next page.

Summary of Inspections: 01/28/2022: Brandon Bettinger conducted an incident inspection following a COW water conveyance line break.

Other Comments: Since the last permit reissuance, the following effluent violations reported to DEP:

Date	Description	PARAMETER	Resulta	Limits	Units	SBC
5/29/2018	Late DMR Submission					
6/26/2018	Sample type not in accordance with permit					
4/22/2020	Effluent Limits	Ammonia-Nitrogen	10.6	4.5	mg/L	Average Monthly
4/22/2020	Effluent Limits	Ammonia-Nitrogen	139	71	lbs/day	Daily Maximum
4/22/2020	Effluent Limits	Ammonia-Nitrogen	15.3	9	mg/L	Daily Maximum
4/22/2020	Effluent Limits	Ammonia-Nitrogen	89	35	lbs/day	Average Monthly
5/20/2020	Effluent Limits	Ammonia-Nitrogen	119	35	lbs/day	Average Monthly
5/20/2020	Effluent Limits	Ammonia-Nitrogen	14.8	4.5	mg/L	Average Monthly
5/20/2020	Effluent Limits	Ammonia-Nitrogen	155	71	lbs/day	Daily Maximum
5/20/2020	Effluent Limits	Ammonia-Nitrogen	19.7	9	mg/L	Daily Maximum
11/24/2020	Effluent Limits	Ammonia-Nitrogen	2.8	1.5	mg/L	Average Monthly
11/24/2020	Effluent Limits	Ammonia-Nitrogen	20	11	lbs/day	Average Monthly
11/24/2020	Effluent Limits	Ammonia-Nitrogen	61	23	lbs/day	Daily Maximum
11/24/2020	Effluent Limits	Ammonia-Nitrogen	8.81	3	mg/L	Daily Maximum
3/24/2022	Effluent Limits	Ammonia-Nitrogen	11	4.5	mg/L	Average Monthly
3/24/2022	Effluent Limits	Ammonia-Nitrogen	163	71	lbs/day	Daily Maximum
3/24/2022	Effluent Limits	Ammonia-Nitrogen	19.9	9	mg/L	Daily Maximum
3/24/2022	Effluent Limits	Ammonia-Nitrogen	85	35	lbs/day	Average Monthly
4/25/2022	Effluent Limits	Ammonia-Nitrogen	11.6	9	mg/L	Daily Maximum
4/25/2022	Effluent Limits	Ammonia-Nitrogen	97	71	lbs/day	Daily Maximum

DEP's database shows there is one pending violation associated with this permittee or facility. A draft permit cover letter will indicate that the permit may not be finalized until all open violations are resolved/closed.

Effluent Data

DMR Data for Outfall 001 (from July 1, 2022 to June 30, 2023)

Parameter	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22
Flow (MGD) Average Monthly	0.9875	1.00564	0.98131	0.94928	1.02508	0.98169	0.98026	0.9429	0.94079	0.96303	0.96813	0.98347
Flow (MGD) Daily Maximum	1.14192	1.10341	1.16377	1.11762	1.15598	1.18947	1.1948	1.17476	1.09604	1.11372	1.07613	1.17783
pH (S.U.) Instantaneous Minimum	7.69	7.4	7.73	7.63	7.82	7.74	7.66	7.47	7.50	7.74	7.88	7.97
pH (S.U.) Instantaneous Maximum	8.68	8.24	8.36	8.45	8.27	8.22	8.27	8.3	8.31	8.49	8.33	8.42
DO (mg/L) Daily Minimum	7.92	8.17	8.19	8.67	8.54	8.38	8.59	8.59	8.41	7.05	7.2	7.34
Temperature (ºF) Average Monthly	79.5	76.8	74.3	69.94	69.9	70.3	69.3	71.5	74.5	80.6	83.8	83.1
Temperature (ºF) Daily Maximum	82.2	80.2	77.3	73.3	74.1	74.7	74.1	76.8	77.4	85.3	86	86.5
CBOD5 (lbs/day) Average Monthly	< 16	< 16	< 15	< 14	< 17	< 21	< 20	< 16	< 21	< 15	< 16	< 15
CBOD5 (lbs/day) Daily Maximum	< 17	< 17	< 17	< 18	< 18	41	34	22	40	< 16	< 17	18
CBOD5 (mg/L) Average Monthly	< 2.0	< 2	< 2.0	< 2.0	< 2.0	< 3	< 3.0	< 2.0	< 3.0	< 2.0	< 2.0	< 2.0
CBOD5 (mg/L) Daily Maximum	< 2.0	< 2	2.4	< 2.0	< 2.0	4.7	4.6	2.5	5.7	< 2.0	< 2.0	2.3
BOD5 (lbs/day) Industrial Influent Average Monthly	7836	8348	8663	6003	7898	8227	8283	7909	5707	7346	9093	7067
BOD5 (lbs/day) Industrial Influent Daily Maximum	10754	13148	15258	7928	10231	9237	9588	10250	7010	9230	11472	8175
BOD5 (mg/L) Industrial Influent Average Monthly	998	1013	1188	851	922	1148	1077	1045	791	981	1177	966
BOD5 (mg/L) Industrial Influent Daily Maximum	1360	1560	1840	994	1130	1380	1260	1410	958	1180	1540	1150
TSS (lbs/day) Average Monthly	< 14	15	13	< 12	< 18	32	14	15	14	< 13	< 8	< 8

Parameter	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22
TSS (lbs/day) Industrial Influent Average Monthly	2284	2271	1808	1792	1959	2779	2682	2373	1614	2229	2041	1840
TSS (lbs/day) Daily Maximum	25	20	15	22	32	48	19	28	17	24	< 9	9
TSS (lbs/day) Industrial Influent Daily Maximum	3954	2866	2150	2387	2897	3950	4374	3780	1887	3755	2980	2469
TSS (mg/L) Average Monthly	< 2.0	2	2.0	< 2.0	< 2.0	4	2.0	2.0	2.0	< 2.0	< 1.0	< 1.0
TSS (mg/L) Industrial Influent Average Monthly	291	275	256	262	228	398	337	316	225	295	266	250
TSS (mg/L) Daily Maximum	3.1	2.5	2.3	2.4	3.8	7.4	2.6	3.2	2.6	3.2	< 1.0	1.4
TSS (mg/L) Industrial Influent Daily Maximum	500	340	320	360	320	560	520	520	253	480	400	305
Nitrate-Nitrite (lbs/day) Daily Maximum	< 156	< 190	171	163	< 129	< 128	< 81	< 128	< 113	< 148	< 221	< 144
Nitrate-Nitrite (mg/L) Daily Maximum	< 18.6	23.6	24.69	24.61	< 15.6	< 19.1	< 10.4	< 19.8	< 16.10	< 18.9	< 27.3	< 17.8
Total Nitrogen (lbs/day) Daily Maximum	< 163	< 199	< 176	< 168	< 151	< 133	< 87	< 135	< 118	< 154	< 226	< 148
Total Nitrogen (mg/L) Daily Maximum	< 19.37	< 24.3	< 25.39	< 25.31	< 19.06	< 19.8	< 11.1	< 20.85	< 16.80	< 19.64	< 27.89	< 18.3
Ammonia (lbs/day) Average Monthly	< 0.8	< 0.8	< 0.7	< 0.7	< 0.9	< 0.7	< 0.8	< 0.8	< 0.7	< 0.7	< 0.8	< 0.7
Ammonia (lbs/day) Daily Maximum	< 0.8	< 0.9	< 0.8	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.8	< 0.8	< 0.9	< 0.8
Ammonia (mg/L) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.10	< 0.1	< 0.1	< 0.1
Ammonia (mg/L) Daily Maximum	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.10	< 0.1	< 0.1	< 0.1
TKN (lbs/day) Daily Maximum	8	8	9	< 6	27	< 31	14	14	13	6	8	12
TKN (mg/L) Daily Maximum	1.07	0.97	1.04	0.73	3.46	< 3.5	1.61	1.59	1.94	0.74	0.93	1.63
Total Phosphorus (lbs/day) Average Monthly	5.1	5.3	2.6	< 1.9	2.0	3.1	3.3	2.6	3.2	3.6	3.7	4.9

Parameter	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22
Total Phosphorus (lbs/day) Daily Maximum	7.0	7	4	3	3	6	6	5	5.0	5	4	6
Total Phosphorus (mg/L) Average Monthly	0.7	0.6	0.4	< 0.3	0.2	0.4	0.4	0.4	0.4	0.5	0.5	0.7
Total Phosphorus (mg/L) Daily Maximum	0.88	0.88	0.6	0.39	0.43	0.65	0.77	0.63	0.67	0.63	0.64	0.74

Existing Effluent Limits and Monitoring Requirements

Tables below summarize effluent limits and monitoring requirements specified in the existing permit:

Outfall 001 Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Temperature (deg F) (ºF) Aug 1 - Jun 30	XXX	XXX	XXX	Report	110	XXX	1/day	I-S
Temperature (deg F) (ºF) Jul 1 - 31	XXX	XXX	XXX	Report	91	XXX	1/day	I-S
CBOD5	79	158	XXX	10.0	20.0	25	2/month	24-Hr Composite
BOD5 Influent (3)	Report	Report	XXX	Report	Report	XXX	2/month	24-Hr Composite
Total Suspended Solids	79	158	XXX	10.0	20.0	25	2/month	24-Hr Composite
Total Suspended Solids Influent (3)	Report	Report	XXX	Report	Report	XXX	2/month	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	11	23	XXX	1.5	3.0	3.7	2/month	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	35	71	XXX	4.5	9.0	11	2/month	24-Hr Composite
Total Phosphorus	7.5	15	XXX	1.0	2.0	2.5	2/month	24-Hr Composite
Total Kjeldahl Nitrogen	XXX	Report	XXX	XXX	Report	XXX	1/month	24-Hr Composite
Nitrate-Nitrite as N	XXX	Report	XXX	XXX	Report	XXX	1/month	24-Hr Composite
Total Nitrogen (4)	XXX	Report	XXX	XXX	Report	XXX	1/month	Calculation

Outfall 002 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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Biochemical Oxygen Demand (BOD5)	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Nitrate-Nitrite as N	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab

Development of Effluent Limitations and Monitoring Requirements

Outfall No. 001 **Design Flow (MGD)** .95
Latitude 40º 7' 54.00" **Longitude** -77º 11' 6.00"
Wastewater Description: IW Process Effluent with ELG

Technology-Based Effluent Limitations

In accordance with 40 CFR §125.3, technology-based treatment requirements represent the minimum level of control that must be imposed to meet the best practicable control technology currently available (BPT) for conventional and other pollutants (i.e., some metals), best conventional pollutant control technology (BCT) for conventional pollutants, and available technology economically achievable (BAT) for toxic and other non-conventional pollutants. Where no technology-based effluent guidelines are available, case-by-case effluent limitations must be established under Section 402(a)(1)(B) of the Clean Water Act.

1) BOD5, Total Suspended Solids & pH

Pursuant to 40 CFR §122.44(a)(1) and Subpart A of 40 CFR §125, the discharge from LOL must meet technology-based requirements established based on effluent limitations guidelines and standards (ELGs) found in 40 CFR §405 (Dairy Products Processing Point Source Category), other federal and state standards in 40 CFR §133.102 and 25 Pa. Code §§92a.48, and 95.2, and/or a case-by-case determination using Best Professional Judgment (BPJ). Each of LOL's industrial processes is currently regulated by the following ELGs:

a) Dry Milk (40 CFR §405.105)

	Effluent Limitations (pounds per 100lb of BOD5 input)	
Parameter	**Daily Maximum**	**30-day Average**
BOD5	0.036	0.018
TSS	0.045	0.023
pH	6 to 9 SU	

b) Butter (40 CFR §405.45)

	Effluent Limitations (pounds per 100lb of BOD5 input)	
Parameter	**Daily Maximum**	**30-day Average**
BOD5	0.016	0.008
TSS	0.020	0.010
pH	6 to 9 SU	

c) Condensed Milk (40 CFR §405.95)

	Effluent Limitations (pounds per 100lb of BOD5 input)	
Parameter	**Daily Maximum**	**30-day Average**
BOD5	0.076	0.038
TSS	0.095	0.048
pH	6 to 9 SU	

The primary products are butter and powdered milk. Previously, DEP did not consider ELGs for condensed milk. This is because since both condensed milk and buttermilk are converted into dry milk products, only Subpart J of ELG 405 (40 CFR§405.100 through 107) were applied as opposed to Subpart I of ELG 405, which is applicable for condensed milk (i.e., 40 CFR§405.90 through 97). During a phone conversation with the permittee, the permittee has indicated that condensed milk is actually produced. As a result, DEP has determined to include ELGs for condensed milk. ELGs for dairy products express effluent limitations in terms of the "BOD5 input" which is defined as the biochemical oxygen demand of the materials entered into process. EPA's technical guidance indicated that the BOD5 content values of any given daily raw material can be determined by standard laboratory analysis and are reasonably consistent throughout most of the typical dairy and other raw materials.

As shown below, LOL provided the "raw material" data with BOD input for each of their products.

	Incoming Raw Milk (2017-2021)	BOD Input (2017-2021)
5-year Average Annual (lbs)	~147,382,950	~17,137,552
5-year Maximum Monthly (lbs)	172,173,814	20,020,211
5-year Maximum Total Annual (lbs)	1,859,365,364	216,205,275

It is noteworthy that EPA development document for EGLs for diary product processing finalized in 1974 has consistently provided examples of calculating technical-based effluent limits (TBELs) using the average volume of raw materials being processed. Both EPA Permit Writer's Manual as well as DEP technical guidance no. 362-0400-001 also recommend generally using average values to calculate TBELs. Based on this, average raw milk data will be considered. Consequently, the following TBELs have been calculated:

a) Dry Milk (40 CFR §405.105)

	Effluent Limitations	
Parameter	**Daily Maximum**	**30-day Average**
BOD5	6169 (17,137,552*0.01*0.036)	3084 (17,137,552*0.01*0.018)
TSS	7711 (17,137,552*0.01*0.045)	3941 (17,137,552*0.01*0.023)
pH	6 to 9 SU	

b) Butter (40 CFR §405.45)

	Effluent Limitations	
Parameter	**Daily Maximum**	**30-day Average**
BOD5	2742 (17,137,552*0.01*0.016)	1371 (17,137,552*0.01*0.008)
TSS	3427 (17,137,552*0.01*0.020)	1713 (17,137,552*0.01*0.010)
pH	6 to 9 SU	

c) Condensed Milk (40 CFR §405.95)

	Effluent Limitations (pounds per 100lb of BOD5 input)	
Parameter	**Daily Maximum**	**30-day Average**
BOD5	13024 (17,137,552*0.01*0.076)	6212 (17,137,552*0.01*0.038)
TSS	16280 (17,137,552*0.01*0.095)	8226 (17,137,552*0.01*0.048)
pH	6 to 9 SU	

2) Total Residual Chlorine

Under 25 Pa Code §92a.48(b), DEP regulates discharge levels of Total Residual Chlorine (TRC) from **facilities or activities using chlorination**. The facility does not use chlorine to disinfect the wastewater; however, a number of chemical additives which will be discussed later in this report currently utilized by LOL throughout the plant for sanitizing and cleaning purpose(s) comprise chemical compounds such as sodium hypochlorite or chloride. Regardless of the magnitude of usage rates or dilution factor, TRC is a pollutant of concern for any facility using chlorinated products that are expected to be introduced into the wastewater which ultimately discharged into surface waters of the Commonwealth. Accordingly, a 30-day average Best Available Technology (BAT) effluent limit of 0.5 mg/L found in 25 Pa Code §92a.48(b)(2) has been taken into consideration.

All above-referenced technology-based effluent limits apply, subject to water quality analysis and BPJ where applicable.

Water Quality-Based Effluent Limitations

DEP generally develops water quality-based effluent limits (WQBELS) through the application of in-stream water quality models for those pollutants that are considered pollutants of concern.

1) CBOD5, NH3-N and Dissolved Oxygen (DO)

WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate permit requirements for CBOD5, NH3-N and DO. DEP's technical guidance no. 391-2000-007 describes the technical methods contained in the model for conducting wasteload allocation analyses and for determining recommended limits for point source discharges. A multiple discharge analysis is necessary as there are a number of facilities located in the close vicinity of the facility's discharge that have similar effluent characteristics. During the previous permit renewal review process, the analysis included Ahlstrom filtrations LLC (PA0008486; 0.75 MGD), Mt. Holly Springs Specialty Papers (PA0008150; 2.304 MGD); Mt. Holly Springs WWTP (PA0023183; 0.83 MGD). Except for the design flow of Mt. Holly Springs Specialty Papers, no changes have occurred since the last permit renewal. The design flow of Mt. Holly Springs Specialty Papers has decreased from 2.304 MGD to 1.5 MGD. WQM 7.0 model was utilized using this information as well as information obtained from the previous permit renewal and Ahlstrom's recent permit renewal. The model output shows that existing limits are still protective of water quality. See Appendix for model input and output.

2) Temperature
Thermal impact is expected as a result of COW water and other cooling water discharges from this facility. Accordingly, the level of thermal impact needs to be controlled. DEP's Thermal Discharge Analysis Excel Spreadsheet was utilized. the spreadsheet showed that effluent limits needed for July, August and September. Past DMR data shows that the facility should be able to meet these limits.

3) Total Residual Chlorine
DEP TRC_CALC worksheet is utilized to determine if a WQBEL is needed. The worksheet indicated that no WQBEL is necessary at this time. See Appendix for model input and output.

DEP's Toxic Management Spreadsheet was utilized to evaluate toxic pollutants of concern and develop permit requirements for such pollutants. The spreadsheet output recommends a routine monitoring for Total Selenium based on the effluent concentration of 12 ug/L which is the maximum value out of 6 datasets.

Best Professional Judgment (BPJ) Effluent Limitations

1) CBOD5, Total Suspended Solids, NH3-N and Total Phosphorus
Prior to 2010, LOL discharged treated wastewater into the portion of Mountain Creek that is split from the main branch starting at RMI 0.67 (i.e., this portion of the stream was repeatedly identified as the "mill race" in previous documentations). Historically, DEP assumed this portion receives about 26% of flow from the main branch and potentially considered an intermittent stream.

DEP Water Pollution Biologist has conducted an aquatic biological investigation in 2002 in response to compliant and inspection, particularly focusing on this stream segment. This investigation revealed that the macroinvertebrate community was negatively impacted by the discharge and the discharge has seriously degraded the receiving water. Following the investigation, the NPDES permit was renewed with assigning internal monitoring points to properly distinguish the water quality between process wastewater and COW water.

Another aquatic biological investigation performed by DEP Water Pollution Biologist in July 2008 also revealed that the discharge is having a dramatic impact on the receiving water and the stream is presently effluent dominated and the heavy organic load has severely impacted the creek. A meeting was held in September 2008 to discuss possible treatment and discharge options due to the conditions of the receiving water. At that time, the treatment plant upgrade as well as a new discharge to Mountain Creek just upstream of split was proposed. The original treatment plant built in 1980s was then upgraded to include new Dissolved Air Floatation (DAF) units and clarifiers to enhance solids removal as well as removal of organic materials. Phase I project was approved in 2010 and Phase II project was approved in 2012.

DEP previously determined that TBELs calculated based on federal ELGs or state technology standards are still not sufficient enough to prevent further stream degradation and more stringent limits than WQBELs produced by the in-stream model were also needed. Ultimately, BPJ effluent limits of 10 mg/L for CBOD5, 10 mg/L of TSS, 1.0 mg/L of Total Phosphorus and 1.5 mg/L of NH3-N were previously established in the permit renewal. While the basis of these limits was not clearly defined in previous documentations (other than previous fact sheets indicated these limits were "specified by Lee McDonnell, former Program Manager during April 6, 2009 meeting with LOL"), these limits are still appropriate, in the opinion of DEP, to protect existing water quality of Mountain Creek. The new treatment process and control techniques applied at the on-site treatment facility in 2010 and 2012 are adequate enough to achieve compliance with these limits (40 CFR §§§125.3(d)(3)(i), (ii), and (iii)) as the facility has not had any effluent violations associated with these parameters since 2010. Further, because there is no change in process or industrial activities, no additional cost or energy use is expected to operate the existing treatment facility in order to achieve compliance with these limits (40 CFR §§§125.3(d)(3)(iv), (v), and (vi)). Accordingly, continuation of BAT BPJ limits is still warranted. It is noteworthy that these limits are evidently equivalent to Anti-Degradation Best Available Combination of Technologies (ABACT) requirements described in DEP's guidance no. 391-0300-002 which are designed to regulate point source discharges located in the special protection watershed. These limits are therefore needed once again to protect and maintain existing uses of Yellow Breeches Creek, a main stem of Mountain Creek.

2) Dissolved Oxygen
A minimum of 5.0 mg/L for D.O. is an existing effluent limit and will remain unchanged in the draft permit as recommended by DEP's SOP. This requirement has also been assigned to other major sewage facilities in the region. 5.0 mg/L is taken directly from 25 Pa. Code § 93.7(a) (i.e., water quality criteria for TSF waters) and it is also determined to be appropriate according to water quality modeling.

3) Total Residual Chlorine
25 Pa Code §92a.48(b)(3) requires dechlorination or discontinuation of chlorination if the discharge is to an Exceptional Value water or to a High Quality water. The discharge is to Mountain Creek which is not classified as a special protection water. The discharge is however located about less than a mile from the mouth of Mountain Creek. Mountain Creek is a tributary of Yellow Breeches Creek that is classified as a High Quality water. Currently, none of upstream point source dischargers including Ahlstrom filtrations LLC (PA0008486), Mt. Holly Springs Specialty Papers (PA0008150) and Mt. Holly Springs WWTP (PA0023183) is required to monitor for TRC. These facilities however either do not utilize chemical additives that contain chlorine[3] or utilize an ultraviolet disinfection system in lieu of chlorine to disinfect its wastewater. Therefore, no TRC is expected from any of these upstream dischargers. In order to prevent any potential adverse impact to existing quality of Yellow Breeches Creek, LOL must continuously demonstrate until the discontinuation of above-mentioned chemical additives that the facility does not contribute TRC to Mountain Creek. Accordingly, the existing Part C condition will continue to be included in the permit.

"Upon request by DEP, effluent samples shall be collected for Total Residual Chlorine (TRC). Samples shall be analyzed by a field instrument or analytical laboratory that uses the EPA-approved analytical method(s). The discharge shall not contain a TRC concentration level that is higher than the lowest minimum level measured by a field instrument or analytical laboratory."

Additional Considerations

1) Flow Monitoring
The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii).

2) Mass Load Limitations
Mass load effluent limitations are calculated using a formula: Design Flow (MGD) x Concentrations (mg/L) x Conversion Factor of 8.34. Calculated mass load limits based on BPJ concentrations limits are more stringent than TBELs calculated by federal ELGs.

3) Total Dissolved Solids (TDS)
TDS and its associated solids including Bromide, Chloride, and Sulfate have become statewide pollutants of concern. The need of monitoring requirement of these pollutants is considered based upon the criteria specified in 25 Pa. Code § 95.10 and the following January 23, 2014 DEP Central Office Directive:

For point source discharges and upon issuance or reissuance of an individual NPDES permit:

-Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lbs/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, sulfate, chloride, and bromide. Discharges of 0.1 MGD or less should monitor and report for TDS, sulfate, chloride, and bromide if the concentration of TDS in the discharge exceeds 5,000 mg/L.

- Where the concentration of bromide in a discharge exceeds 1 mg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for bromide. Discharges of 0.1 MGD or less should monitor and report for bromide if the concentration of bromide in the discharge exceeds 10 mg/L.

The sample result shows that effluent contains a TDS concentration level of 1150 mg/L. As a result, the requirement to monitor these parameters will be included in the permit.

4) Chesapeake Bay Tributary Strategy
When DEP first developed the state Chesapeake Bay Tributary Strategy for point source discharges, LOL was not considered a significant bay discharger. Based on the current sample results, LOL is still a non-significant bay discharger, discharging less than 75 lbs/day of Total Nitrogen (TN) or 25 lbs/day of Total Phosphorus (TP). Accordingly, there is no need to assign a wasteload allocation (WLAs) to this discharge. The supplement to WIP recommends monthly Total Nitrogen (TN) and Total Phosphorus (TP) monitoring for non-significant industrial facilities that are involved with food processing. Since LOL is currently monitoring TP and NH3-N on a weekly basis to meet effluent limits, no additional requirement is necessary for TP and NH3-N. A monthly monitoring requirement for TN as well as its constituents (i.e., TKN & Nitrate-Nitrite) will be included in the draft permit.

[3] Due to chlorination in the polishing pond, monitoring for TRC was previously required for Mt. Holly Springs Specialty Papers but this requirement was removed during the 2014 NPDES permit renewal review process since the facility discontinued its use (Fact Sheet dated May 14, 2014).

5) Chemical Additives
The following chemical additives currently used at the plant are expected to be present in the effluent:

Chemical Additive	Purpose	Maximum Usage (GPD)	Predicted Effluent Concentration (mg/L)	Allowable Effluent Concentration (mg/L)
Vortexx	Sanitizing	65.0	0.01877	0.04
2171 Gen Cleaning	Cleaning	60.0	0.00384	0.01
XY-12	Sanitizing	3.0	0.00155	2.4
SC 205	Cleaning	20.0	0.01921	0.16
Defoamer S	Defoamer	15	0.080	0.3
Enforce LP	Cleaning	5.0	0.00474	0.02
Monacid NP	Cleaning	1.0	0.00002	0.29
Envirocid	Cleaning	425	0.00806	0.02
Quorum Clear IV	Sanitizing	35	0.05615	0.0037
Exelerate CIP	Cleaning	62	0.00158	0.09
AC 103	Cleaning	750	0.03674	0.3
Principal	Cleaning	95	0.03174	0.013
Synergex	Sanitizing	7.48	0.06484	0.21
Exelerate HS	Cleaning	62	0.00158	0.09
Ultrasil 76	Cleaning	34	0.00116	0.09
Accomplish	Passivization	20	0.00043	0.78
Ultrasil 91	Cleaning	4	0.01636	0.898
Ultrasil 02	Cleaning	2	0.0495	0.081
Oxonia Active	Sanitizing	2	0.00042	0.08
Nalco 7408	Scavanger	4	0.03321	0.703
Ultrasil 67	Cleaning	2.5	0.02581	0.023

These chemical additives have been added to DEP's Approved List of Chemical Additives. Predicted effluent concentrations of these chemical additives are calculated by mass balancing with the permitted discharge flow[4]. The results indicated that none of chemical additives.

6) Monitoring Frequency and Sample Types
Unless specified otherwise above, sample types for all existing parameters will remain unchanged and are consistent with DEP technical guidance no. 362-0400-001.

7) Influent BOD5 and Total Suspended Solids Monitoring
Previously, monitoring of influent BOD5 and Total Suspended Solids levels was determined to be necessary to determine wastewater characteristics and monitor plant loading. This is a reasonable approach and will remain unchanged in the permit.

7) Stormwater Monitoring
During extreme heavy rain event, stormwater will be discharged from the stormwater basin through Outfall 002. Based on a recent phone conversation with the permittee. There has not been any discharge from this basin. The existing requirements will continue to be included in the permit.

8) Anti-Degradation
Due to the fact that Yellow Breeches Creek is classified as a high-quality special protection water and the discharge is located at RMI 0.75 of Mountain Creek (a tributary of Yellow Breeches Creek), special protection water requirements should be considered. As mentioned above, BPJ limits for CBOD5, TSS, and NH3-N are consistent with Anti-Degradation Best Available Combination of Technologies (ABACT) requirements listed in DEP's guidance (391-0300-002). TP limit is also a BPJ limit that was included in the permit to reduce phosphorus contribution to the growth in the stream. Therefore, it is determined that effluent limits have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses for both Mountain Creek and Yellow Breeches Creek are maintained and protected. No additional requirement is needed at this time.

[4] Conservatively, effluent concentration of a chemical additive as a whole product was considered regardless of chemical reactions potentially occurring throughout the treatment process.

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	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
Temperature (ºF) Jan 1 - Jun 30	XXX	XXX	XXX	Report	110	XXX	1/day	I-S
Temperature (ºF) Jul 1 - 31	XXX	XXX	XXX	Report	100	XXX	1/day	I-S
Temperature (ºF) August 1-15	XXX	XXX	XXX	Report	98.8	XXX	1/day	I-S
Temperature (ºF) August 16-31	XXX	XXX	XXX	Report	110	XXX	1/day	I-S
Temperature (ºF) September 1-15	XXX	XXX	XXX	Report	110	XXX	1/day	I-S
Temperature (ºF) September 16-30	XXX	XXX	XXX	Report	108	XXX	1/day	I-S
Temperature (ºF) Oct 1 – Dec 31	XXX	XXX	XXX	Report	110	XXX	1/day	I-S
CBOD5	79	158	XXX	10.0	20.0	25	2/month	24-Hr Composite
BOD5 Industrial Influent	Report	Report	XXX	Report	Report	XXX	2/month	24-Hr Composite
TSS Industrial Influent	Report	Report	XXX	Report	Report	XXX	2/month	24-Hr Composite
TSS	79	158	XXX	10.0	20.0	25	2/month	24-Hr Composite

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	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Nitrate-Nitrite	XXX	Report	XXX	XXX	Report	XXX	1/month	24-Hr Composite
Total Nitrogen	XXX	Report	XXX	XXX	Report	XXX	1/month	Calculation
Ammonia Nov 1 - Apr 30	35	71	XXX	4.5	9.0	11	2/month	24-Hr Composite
Ammonia May 1 - Oct 31	11	23	XXX	1.5	3.0	3.7	2/month	24-Hr Composite
TKN	XXX	Report	XXX	XXX	Report	XXX	1/month	24-Hr Composite
Total Phosphorus	7.5	15	XXX	1.0	2.0	2.5	2/month	24-Hr Composite
Total Selenium	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
Total Dissolved Solids	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
Sulfate	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
Chromide	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
Bromide	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite

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 002, 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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
BOD5	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
COD	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
TSS	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Nitrate-Nitrite	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab

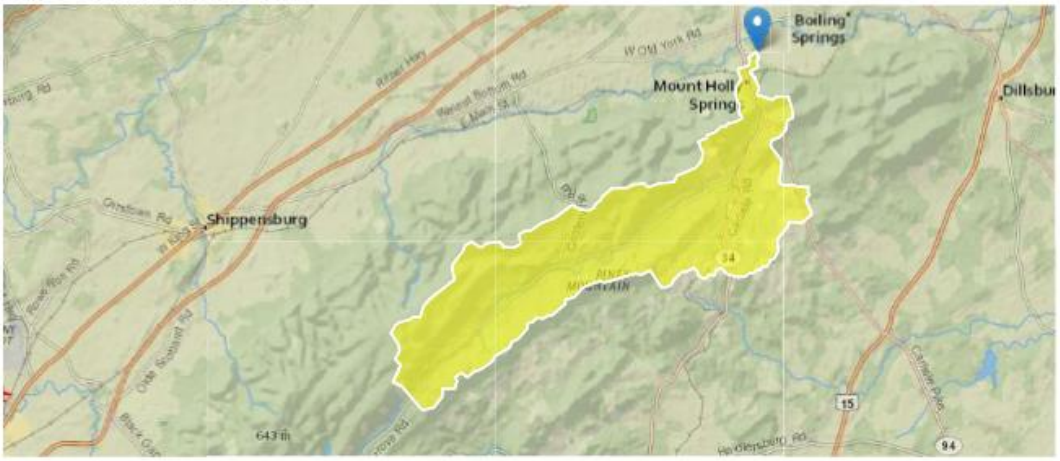
Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☐	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
☐	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other:

Attachments

8/28/23, 8:44 AM StreamStats

StreamStats Report

Region ID: PA
Workspace ID: PA20230828121958368000
Clicked Point (Latitude, Longitude): 40.13222, -77.18447
Time: 2023-08-28 08:20:24 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	14.47	percent
DRNAREA	Area that drains to a point on a stream	46	square miles
PRECIP	Mean Annual Precipitation	41	inches
ROCKDEP	Depth to rock	5	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.21	miles per square mile

Low-Flow Statistics

Low-Flow Statistics Parameters [100.0 Percent (46 square miles) Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	46	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	41	inches	35	50.4
STRDEN	Stream Density	1.21	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	5	feet	3.32	5.65
CARBON	Percent Carbonate	14.47	percent	0	99

https://streamstats.usgs.gov/ss/ 1/2

Low-Flow Statistics Flow Report [100.0 Percent (46 square miles) Low Flow Region 2]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	11.5	ft^3/s	38	38
30 Day 2 Year Low Flow	13.9	ft^3/s	33	33
7 Day 10 Year Low Flow	7.15	ft^3/s	51	51
30 Day 10 Year Low Flow	8.49	ft^3/s	46	46
90 Day 10 Year Low Flow	11.3	ft^3/s	36	36

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.16.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

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
07E	63167	MOUNTAIN CREEK	3.180	585.00	44.40	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	0.313	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	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
Ahlstrom	PA0008486	0.5690	0.5690	0.5690	0.000	26.00	7.30

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	18.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	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
07E	63167	MOUNTAIN CREEK	**2.140**	547.00	45.60	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	0.313	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	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
Specialty Paper	PA0008150	1.5000	1.5000	1.5000	0.000	23.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	23.90	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	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
07E	63167	MOUNTAIN CREEK	**1.780**	540.00	46.00	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	0.313	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	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
Mt. Holly	PA0023183	0.7000	0.7000	0.7000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	20.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	2.50	0.00	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
07E	63167	MOUNTAIN CREEK	**0.750**	514.30	46.20	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	0.313	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	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
Land O'Lakes	PA00449110	0.9500	0.9500	0.9500	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	10.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	1.50	0.00	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
07E	63167	MOUNTAIN CREEK	**0.000**	490.50	47.60	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	0.313	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	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	0.00	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 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07E	63167	MOUNTAIN CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
3.180	0.569	20.357	7.013
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
45.480	0.768	59.256	0.423
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.95	0.506	1.01	0.720
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.050	20.162	Tsivoglou	5
Reach Travel Time (days)			
0.150			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.015	2.93	1.00	8.19
0.030	2.91	0.99	8.19
0.045	2.89	0.98	8.19
0.060	2.86	0.97	8.19
0.075	2.84	0.96	8.19
0.090	2.82	0.95	8.19
0.105	2.80	0.94	8.19
0.120	2.78	0.93	8.19
0.135	2.75	0.92	8.19
0.150	2.73	0.91	8.19

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.140	2.069	20.701	7.011
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
51.123	0.779	65.614	0.439
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
5.53	1.045	2.34	0.739
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.766	11.209	Tsivoglou	5
Reach Travel Time (days)			
0.050			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.005	5.50	2.33	7.75
0.010	5.47	2.32	7.74
0.015	5.44	2.31	7.73
0.020	5.41	2.30	7.72
0.025	5.38	2.29	7.71
0.030	5.35	2.29	7.71
0.035	5.32	2.28	7.70
0.040	5.29	2.27	7.69
0.045	5.27	2.26	7.69
0.050	5.24	2.25	7.68

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07E	63167	MOUNTAIN 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 (°C)	Analysis pH
Q7-10 Flow												
3.180	13.90	0.00	13.90	.8802	0.00692	.768	45.48	59.26	0.42	0.150	20.36	7.01
2.140	14.27	0.00	14.27	3.2007	0.00368	.779	51.12	65.61	0.44	0.050	20.70	7.01
1.780	14.40	0.00	14.40	4.2836	0.00473	.785	51.31	65.4	0.46	0.136	20.66	7.01
0.750	14.46	0.00	14.46	5.7533	0.00601	.793	51.55	64.99	0.49	0.093	20.61	7.01
Q1-10 Flow												
3.180	8.89	0.00	8.89	.8802	0.00692	NA	NA	NA	0.34	0.189	20.54	7.02
2.140	9.13	0.00	9.13	3.2007	0.00368	NA	NA	NA	0.36	0.061	20.99	7.02
1.780	9.21	0.00	9.21	4.2836	0.00473	NA	NA	NA	0.39	0.163	20.91	7.01
0.750	9.25	0.00	9.25	5.7533	0.00601	NA	NA	NA	0.42	0.110	20.82	7.01
Q30-10 Flow												
3.180	18.90	0.00	18.90	.8802	0.00692	NA	NA	NA	0.50	0.128	20.27	7.01
2.140	19.41	0.00	19.41	3.2007	0.00368	NA	NA	NA	0.51	0.043	20.54	7.01
1.780	19.58	0.00	19.58	4.2836	0.00473	NA	NA	NA	0.53	0.118	20.51	7.01
0.750	19.67	0.00	19.67	5.7533	0.00601	NA	NA	NA	0.56	0.082	20.48	7.01

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	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07E	63167	MOUNTAIN 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
3.180	Ahlstrom	15.74	50	15.74	50	0	0
2.140	Specialty Paper	15.94	50	15.22	50	0	0
1.780	Mt. Holly	16.76	5	15.35	5	0	0
0.750	Land O'Lakes	16.76	3	15.49	3	0	0

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
3.180	Ahlstrom	1.85	25	1.85	17.04	2	32
2.140	Specialty Paper	1.85	17.31	1.82	11.8	2	32
1.780	Mt. Holly	1.89	2.5	1.82	2.5	0	0
0.750	Land O'Lakes	1.89	1.5	1.82	1.5	0	0

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)		
3.18	Ahlstrom	18	18	17.04	17.04	5	5	0	0
2.14	Specialty Paper	23.9	23.9	11.8	11.8	5	5	0	0
1.78	Mt. Holly	20	20	2.5	2.5	5	5	0	0
0.75	Land O'Lakes	10	10	1.5	1.5	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07E	63167	MOUNTAIN 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)
3.180	Ahlstrom	PA0008486	0.569	CBOD5	18		
				NH3-N	17.04	34.08	
				Dissolved Oxygen			5

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)
2.140	Specialty Paper	PA0008150	1.500	CBOD5	23.9		
				NH3-N	11.8	23.6	
				Dissolved Oxygen			5

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)
1.780	Mt. Holly	PA0023183	0.700	CBOD5	20		
				NH3-N	2.5	5	
				Dissolved Oxygen			5

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)
0.750	Land O'Lakes	PA00449110	0.950	CBOD5	10		
				NH3-N	1.5	3	
				Dissolved Oxygen			5

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **Land O Lakes** NPDES Permit No.: **PA0044911** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Industrial Waste**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.95	116	7						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		1150									
	Chloride (PWS)	mg/L		162									
	Bromide	mg/L	<	2.2									
	Sulfate (PWS)	mg/L		482									
	Fluoride (PWS)	mg/L	<	0.45									
Group 2	Total Aluminum	µg/L		220									
	Total Antimony	µg/L	<	1.5									
	Total Arsenic	µg/L		2									
	Total Barium	µg/L	<	5									
	Total Beryllium	µg/L	<	0.5									
	Total Boron	µg/L	<	51									
	Total Cadmium	µg/L	<	0.1									
	Total Chromium (III)	µg/L		3.3									
	Hexavalent Chromium	µg/L		0.29									
	Total Cobalt	µg/L	<	1									
	Total Copper	µg/L	<	0.83									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L		5									
	Dissolved Iron	µg/L	<	41									
	Total Iron	µg/L	<	72									
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L	<	10									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		13									
	Total Phenols (Phenolics) (PWS)	µg/L		36									
	Total Selenium	µg/L		12									
	Total Silver	µg/L	<	0.8									
	Total Thallium	µg/L	<	2									
	Total Zinc	µg/L		12									
	Total Molybdenum	µg/L		3.8									
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										
	Carbon Tetrachloride	µg/L	<										

Group 3	Chlorobenzene	µg/L											
	Chlorodibromomethane	µg/L	<										
	Chloroethane	µg/L	<										
	2-Chloroethyl Vinyl Ether	µg/L	<										
	Chloroform	µg/L	<										
	Dichlorobromomethane	µg/L	<										
	1,1-Dichloroethane	µg/L	<										
	1,2-Dichloroethane	µg/L	<										
	1,1-Dichloroethylene	µg/L	<										
	1,2-Dichloropropane	µg/L	<										
	1,3-Dichloropropylene	µg/L	<										
	1,4-Dioxane	µg/L	<										
	Ethylbenzene	µg/L	<										
	Methyl Bromide	µg/L	<										
	Methyl Chloride	µg/L	<										
	Methylene Chloride	µg/L	<										
	1,1,2,2-Tetrachloroethane	µg/L	<										
	Tetrachloroethylene	µg/L	<										
	Toluene	µg/L	<										
	1,2-trans-Dichloroethylene	µg/L	<										
	1,1,1-Trichloroethane	µg/L	<										
	1,1,2-Trichloroethane	µg/L	<										
	Trichloroethylene	µg/L	<										
	Vinyl Chloride	µg/L	<										
Group 4	2-Chlorophenol	µg/L	<										
	2,4-Dichlorophenol	µg/L	<										
	2,4-Dimethylphenol	µg/L	<										
	4,6-Dinitro-o-Cresol	µg/L	<										
	2,4-Dinitrophenol	µg/L	<										
	2-Nitrophenol	µg/L	<										
	4-Nitrophenol	µg/L	<										
	p-Chloro-m-Cresol	µg/L	<										
	Pentachlorophenol	µg/L	<										
	Phenol	µg/L	<										
	2,4,6-Trichlorophenol	µg/L	<										
Group 5	Acenaphthene	µg/L	<										
	Acenaphthylene	µg/L	<										
	Anthracene	µg/L	<										
	Benzidine	µg/L	<										
	Benzo(a)Anthracene	µg/L	<										
	Benzo(a)Pyrene	µg/L	<										
	3,4-Benzofluoranthene	µg/L	<										
	Benzo(ghi)Perylene	µg/L	<										
	Benzo(k)Fluoranthene	µg/L	<										
	Bis(2-Chloroethoxy)Methane	µg/L	<										
	Bis(2-Chloroethyl)Ether	µg/L	<										
	Bis(2-Chloroisopropyl)Ether	µg/L	<										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<										
	4-Bromophenyl Phenyl Ether	µg/L	<										
	Butyl Benzyl Phthalate	µg/L	<										
	2-Chloronaphthalene	µg/L	<										
	4-Chlorophenyl Phenyl Ether	µg/L	<										
	Chrysene	µg/L	<										
	Dibenzo(a,h)Anthrancene	µg/L	<										
	1,2-Dichlorobenzene	µg/L	<										
	1,3-Dichlorobenzene	µg/L	<										
	1,4-Dichlorobenzene	µg/L	<										
	3,3-Dichlorobenzidine	µg/L	<										
	Diethyl Phthalate	µg/L	<										
	Dimethyl Phthalate	µg/L	<										
	Di-n-Butyl Phthalate	µg/L	<										
	2,4-Dinitrotoluene	µg/L	<										
	2,6-Dinitrotoluene	µg/L	<										
	Di-n-Octyl Phthalate	µg/L	<										

	1,2-Diphenylhydrazine	µg/L	<											
	Fluoranthene	µg/L	<											
	Fluorene	µg/L	<											
	Hexachlorobenzene	µg/L	<											
	Hexachlorobutadiene	µg/L	<											
	Hexachlorocyclopentadiene	µg/L	<											
	Hexachloroethane	µg/L	<											
	Indeno(1,2,3-cd)Pyrene	µg/L	<											
	Isophorone	µg/L	<											
	Naphthalene	µg/L	<											
	Nitrobenzene	µg/L	<											
	n-Nitrosodimethylamine	µg/L	<											
	n-Nitrosodi-n-Propylamine	µg/L	<											
	n-Nitrosodiphenylamine	µg/L	<											
	Phenanthrene	µg/L	<											
	Pyrene	µg/L	<											
	1,2,4-Trichlorobenzene	µg/L	<											
Group 6	Aldrin	µg/L	<											
	alpha-BHC	µg/L	<											
	beta-BHC	µg/L	<											
	gamma-BHC	µg/L	<											
	delta BHC	µg/L	<											
	Chlordane	µg/L	<											
	4,4-DDT	µg/L	<											
	4,4-DDE	µg/L	<											
	4,4-DDD	µg/L	<											
	Dieldrin	µg/L	<											
	alpha-Endosulfan	µg/L	<											
	beta-Endosulfan	µg/L	<											
	Endosulfan Sulfate	µg/L	<											
	Endrin	µg/L	<											
	Endrin Aldehyde	µg/L	<											
	Heptachlor	µg/L	<											
	Heptachlor Epoxide	µg/L	<											
	PCB-1016	µg/L	<											
	PCB-1221	µg/L	<											
	PCB-1232	µg/L	<											
	PCB-1242	µg/L	<											
	PCB-1248	µg/L	<											
	PCB-1254	µg/L	<											
	PCB-1260	µg/L	<											
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<											
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												

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Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Land O Lakes, NPDES Permit No. PA0044911, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Mountain Creek**

No. Reaches to Model: 1

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	063167	0.75	514.3	46.2			Yes
End of Reach 1	063167	0	490.5	47.6			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	0.75	0.313										100	7		
End of Reach 1	0	0.313													

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	0.75														
End of Reach 1	0														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Land O Lakes, NPDES Permit No. PA0044911, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | All | Inputs | Results | Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.556 Analysis Hardness (mg/l): 102.47 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	4,850	
Total Antimony	0	0		0	1,100	1,100	7,114	
Total Arsenic	0	0		0	340	340	2,199	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	135,812	
Total Boron	0	0		0	8,100	8,100	52,385	
Total Cadmium	0	0		0	2.062	2.19	14.1	Chem Translator of 0.943 applied
Total Chromium (III)	0	0		0	581.283	1,840	11,896	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	105	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	614	
Total Copper	0	0		0	13.752	14.3	92.6	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	66.322	84.2	545	Chem Translator of 0.787 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	10.7	Chem Translator of 0.85 applied
Total Nickel	0	0		0	478.018	479	3,098	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	3.355	3.95	25.5	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	420	
Total Zinc	0	0		0	119.632	122	791	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 48.585 PMF: 1 Analysis Hardness (mg/l): 101.48 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	2,385	
Total Arsenic	0	0		0	150	150	1,626	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	44,442	
Total Boron	0	0		0	1,600	1,600	17,343	
Total Cadmium	0	0		0	0.249	0.27	2.97	Chem Translator of 0.908 applied
Total Chromium (III)	0	0		0	75.009	87.2	945	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	113	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	206	
Total Copper	0	0		0	9.069	9.45	102	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	16,259	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.557	3.24	35.1	Chem Translator of 0.789 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	9.82	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.655	52.8	572	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	54.1	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	141	
Total Zinc	0	0		0	119.615	121	1,315	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 48.585 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Fluoride (PWS)	0	0		0	2,000	2,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	60.7	
Total Arsenic	0	0		0	10	10.0	108	
Total Barium	0	0		0	2,400	2,400	26,015	
Total Boron	0	0		0	3,100	3,100	33,602	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	300	300	3,252	

Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	10,839	
Total Mercury	0	0		0	0.050	0.05	0.54	
Total Nickel	0	0		0	610	610	6,612	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	2.6	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 19.862 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

		Mass Limits		*Concentration Limits*						
Model Results	Pollutants	AML	MDL	AML	MDL	Units	Governing	WQBEL	Comments	

Pollutants	(lbs/day)	(lbs/day)	AML	MDL	MAX	Units	WQBEL	Basis	Comments
Total Selenium	Report	Report	Report	Report	Report	µg/L	54.1	CFC	Discharge Conc > 10% WQBEL (no RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Fluoride (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	3,109	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	108	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	26,015	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	17,343	µg/L	Discharge Conc < TQL
Total Cadmium	2.97	µg/L	Discharge Conc < TQL
Total Chromium (III)	945	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	67.5	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	206	µg/L	Discharge Conc < TQL
Total Copper	59.4	µg/L	Discharge Conc < TQL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	3,252	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	16,259	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	35.1	µg/L	Discharge Conc < TQL
Total Manganese	10,839	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.54	µg/L	Discharge Conc < TQL
Total Nickel	572	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Silver	16.4	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	2.6	µg/L	Discharge Conc < TQL
Total Zinc	507	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS

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Instructions | *Inputs*

Facility: **Land O' Lakes**

Permit No.: **PA0044911**

Stream Name: **Mountain Creek**

Analyst/Engineer: **Jinsu Kim**

Stream Q7-10 (cfs)*: **14.5**

Outfall No.: **001**

Analysis Type*: **TSF**

Facility Flows

Semi-Monthly Increment	Intake (Stream) (MGD)*	Intake (External) (MGD)*	Consumptive Loss (MGD)*	Discharge Flow (MGD)
Jan 1-31		0.95		0.95
Feb 1-29		0.95		0.95
Mar 1-31		0.95		0.95
Apr 1-15		0.95		0.95
Apr 16-30		0.95		0.95
May 1-15		0.95		0.95
May 16-31		0.95		0.95
Jun 1-15		0.95		0.95
Jun 16-30		0.95		0.95
Jul 1-31		0.95		0.95
Aug 1-15		0.95		0.95
Aug 16-31		0.95		0.95
Sep 1-15		0.95		0.95
Sep 16-30		0.95		0.95
Oct 1-15		0.95		0.95
Oct 16-31		0.95		0.95
Nov 1-15		0.95		0.95
Nov 16-30		0.95		0.95
Dec 1-31		0.95		0.95

Stream Flows

Q7-10 Multipliers (Default Shown)	PMF	Seasonal Stream Flow (cfs)	Downstream Stream Flow (cfs)
3.2	1.00	46.40	47.87
3.5	1.00	50.75	52.22
7	1.00	101.50	102.97
9.3	1.00	134.85	136.32
9.3	1.00	134.85	136.32
5.1	1.00	73.95	75.42
5.1	1.00	73.95	75.42
3	1.00	43.50	44.97
3	1.00	43.50	44.97
1.7	1.00	24.65	26.12
1.4	1.00	20.30	21.77
1.4	1.00	20.30	21.77
1.1	1.00	15.95	17.42
1.1	1.00	15.95	17.42
1.2	1.00	17.40	18.87
1.2	1.00	17.40	18.87
1.6	1.00	23.20	24.67
1.6	1.00	23.20	24.67
2.4	1.00	34.80	36.27

Thermal Limits Spreadsheet
Version 1.0, April 2024

Temperature

Ambient Stream Temperature (ºF)*
34.2
32
39.9
46.7
52.4
62.2
58.4
82.3
79.7
82.3
84
78.9
77.4
75.2
57.5
52.7
50.6
45.2
35.15

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Thermal Limits Spreadsheet
Version 1.0, April 2024

Instructions | *TSF Results*

Recommended Limits for Case 1 or Case 2

Semi-Monthly Increment	**TSF** Target Maximum Stream Temp. (°F)	**Case 1** Daily WLA (Million BTUs/day)	**Case 2** Daily WLA (°F)
Jan 1-31	40	N/A -- Case 2	110.0
Feb 1-29	40	N/A -- Case 2	110.0
Mar 1-31	46	N/A -- Case 2	110.0
Apr 1-15	52	N/A -- Case 2	110.0
Apr 16-30	58	N/A -- Case 2	110.0
May 1-15	64	N/A -- Case 2	110.0
May 16-31	68	N/A -- Case 2	110.0
Jun 1-15	83.3	N/A -- Case 2	110.0
Jun 16-30	80.7	N/A -- Case 2	110.0
Jul 1-31	83.3	N/A -- Case 2	100.1
Aug 1-15	85	N/A -- Case 2	98.8
Aug 16-31	87	N/A -- Case 2	110.0
Sep 1-15	84	N/A -- Case 2	110.0
Sep 16-30	78	N/A -- Case 2	108.4
Oct 1-15	72	N/A -- Case 2	110.0
Oct 16-31	66	N/A -- Case 2	110.0
Nov 1-15	58	N/A -- Case 2	110.0
Nov 16-30	50	N/A -- Case 2	110.0
Dec 1-31	42	N/A -- Case 2	110.0

Date	Version
4/3/2024	1.0

Change(s)
Original

TRC_CALC

1A	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	14.5	= Qstream (cfs)		0.5	=CV Daily	
5	0.95	= Qdischarge (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	0.5	= 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 = 3.166		1.3.2.iii	WLA cfc = 3.079
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 1.180		5.1d	LTA_cfc = 1.790
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500		BAT/BPJ	
18			INST MAX LIMIT (mg/l) = 1.635			

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)**