



April 19, 2021

Ms. Mishelle Noble-Blair, Regulatory Affairs Coordinator
Upper Occoquan Service Authority (UOSA)
14631 Compton Road
Centreville, Virginia 20121-2506

Subject: Application to Renew and Modify Micron's Industrial Wastewater Discharge Permit No. MAN006

Dear Ms. Noble-Blair:

Enclosed is Micron Technology, Inc.'s (MTV) application to renew and modify its existing permit to cover our future expansion project.

The application consists of the following:

1. UOSA Application Form
2. Appendix with additional information and referenced figures

If you have any questions concerning the data or information presented, please do not hesitate to contact me at (703) 530-2304, or Kyle Malone of my staff at (703) 396-1090.

Sincerely,

A handwritten signature in dark ink, appearing to read "Lazaro Gonzalez", with a large, stylized flourish extending from the bottom right.

Lazaro Gonzalez
Fab 6 Facilities Director

Enclosure

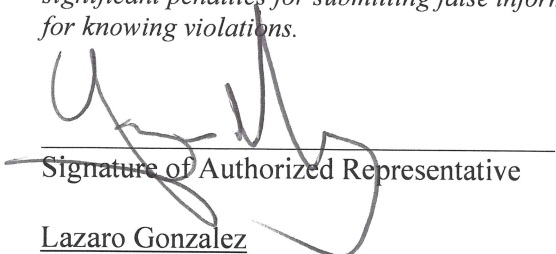


INDUSTRIAL WASTEWATER DISCHARGE PERMIT RENEWAL APPLICATION

PART A – GENERAL INFORMATION

- (1) Applicant's Business Name: Micron Technology, Inc.
- (2) Address of Facility Where Discharge Originates:
Street: 9600 Godwin Drive
City: Manassas State: VA Zip: 20110
- (3) Business Address: Same as above
- (4) Chief Executive Officer:
Name: Delbert Parks
- Duly Authorized Representative:
Name: Lazaro Gonzalez
- (5) Mailing Address: Same as above
- (6) Person To Be Contacted About This Application:
Name: Lazaro Gonzalez Title: Facilities Director Phone: (703) 530-2304

CERTIFICATION: *I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*



Signature of Authorized Representative

Lazaro Gonzalez
Printed Name

4/19/2020
Date

Facilities Director
Title



PART B – BUSINESS DESCRIPTION

Describe any changes or proposed changes from the previous permit application in the elements below. If no changes have occurred or are planned to occur, indicate it in the spaces provided below. (Reference additional pages if needed and attached).

- (1) **Business Activity:** Micron Technology, Inc. Virginia (MTV) has continued to manufacture semiconductor memory devices since the last permit modification in 2016; Refer to Figure B-1 in the Appendix for a general overview of manufacturing at MTV. The semiconductor industry continues to be dynamic, and the technologies are developing with more complexity with each advancement. In recent years MTV has experienced an increased demand for its portfolio of products, which has led to the current construction project to expand our facility. The current phase of the expansion project will include a new fabrication building and central utility plant, & bulk gas plant. Refer to Figure B-2 in the Appendix for the Site Plan.
- (2) **Standard Industrial Classification Code:** SIC 3674; NAICS 334413
- (3) **Pollution Control Permits issued to Applicant:** VADEQ NSPS Air Permit (72299, 10/23/19); UOSA Industrial Wastewater Discharge Permit (MAN006, 10/16/16); VPDES General Permit for Discharges of Stormwater Associated with Industrial Activity (VAR050907, 9/6/19); VPDES Construction General Permit (VAR10L594, 8/30/19); VPDES Construction General Permit (VAR10N196, 9/26/19); VPDES Construction General Permit (VAR10O361, 7/23/2020); VWP General Permit (WP-4-18-1321, 9/16/19); State Program General Permit (17-SPGP-01, 9/16/19)
- (4) **Products/Services:** Refer to the Business Activity section above.
- (5) **Description of Changes of all Wastewater Generating Operations:**
See Appendix for “Description of Changes of all Wastewater Generating Operations”
- (6) **Number of Employees:** ~1,950 (includes contractors)



PART C – SCHEMATIC FLOW DIAGRAM

Provide a schematic flow diagram for each activity generating wastewater, which has changed or it is proposed to change since the last permit application. If no changes have occurred or are planned to occur, indicate it in the spaces provided below.

Schematic flow diagrams are provided for boilers and cooling towers due to changes in quantity and/or chemical additions. Refer to Figure C1: Boilers and Figure C2: Cooling Towers in the Appendix. There are no other significant changes in previously provided flow diagrams.

PART D – BUILDING AND SITE LAYOUT

Provide building and site layout if changed or it is proposed to change since the last permit application. If no changes have occurred or are planned to occur, indicate it in the spaces provided below.

Refer to Figure B-2 in the Appendix for the Site Plan.

PART E – SOURCE WATER USE AND DISPOSAL

Provide a description of changes or proposed changes in source water, use and disposal information since the last permit application. If no changes have occurred or are planned to occur, indicate it in the spaces provided below.

There are no changes to source water, use, and disposal information

PART F – INDUSTRIAL WASTEWATER DISCHARGE VOLUME & CHARACTERISTICS – CHANGES FROM LAST PERMIT APPLICATION

Provide changes or proposed changes to industrial wastewater volume, flow rates, and characteristics since the last permit application. If no changes have occurred or are planned to occur, indicate it in the spaces provided below.

Proposed changes related to Part F are provided in section named “Proposed Changes to Industrial Wastewater Volume & Characteristics” in the Appendix.



PART G – INDUSTRIAL WASTE PRETREATMENT

Identify any changes or proposed changes to the industrial wastewater pretreatment system.

See section titled “Description of Changes of all Wastewater Generating Operations” in the Appendix for a description of changes to the system; refer to Figure G1: Wastewater Pretreatment System in the Appendix for an overview.



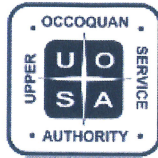
PART H – ADDITIONAL INFORMATION

Industrial users regulated by National Categorical Pretreatment Standards Promulgated by the USEPA shall complete these sections. Include all categorical standards that are applicable/not applicable if changed since the last permit application. If no changes have occurred or are planned to occur, indicate in the space provided below.

Category: 40 CFR Part 469: No changes have occurred with respect to National Categorical Pretreatment Standards since the last applications.

Pollutant	One Day Maximum		Monthly/Daily Average	
	Concentration Based Standard (mg/L)	Mass Based Standards (Specify Units)	Concentration Based Standard (mg/L)	Mass Based Standards (Specify Units)

(2) Alternate Limit Calculation: If an alternate concentration limit has been calculated using the combined stream formula, the adjusted limit along with all of the supporting data showing the calculation shall be provided to UOSA if changed or not previously provided. Attach additional sheets if necessary.



PART I – COMPLIANCE CERTIFICATION

(2) CERTIFICATION

We certify that the applicable National Categorical Pretreatment Standards as identified in this application are/are not being met on a consistent basis or are not applicable any longer.

Authorized Representative

Lazaro Gonzalez

Name (Type or Print)

[Signature]
Signature

Facilities Director

Title

4/19/2021

Date

Qualified Professional

KYLE MALONE

Name (Type or Print)

[Signature]
Signature

ENVIRONMENTAL MANAGER

Title

4/19/2021

Date

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Figure G1: Wastewater Pretreatment System

Appendix

Changes to Wastewater Generating Operations

Expansion

With regards to changes related to the new expansion, the project will generate additional industrial wastewater that is generally comparable to our existing operations. The expansion project will consist of two main wastewater collection systems: 1) Dilute Acid Waste (DAW), and 2) Concentrated Acid Waste (CAW). The new DAW and CAW collection systems for the Fab Expansion will gravity drain to new lift stations located at B300, which is the building for the new Central Utility Plant (CUP). DAW will be pumped to the existing industrial wastewater treatment plant (IWTP) along a trestle and CAW will be pumped across a trestle and connected to the existing B100 CAW lift station.

The existing IWTP, which consists of two systems, will support the additional expansion. Currently only one system operates at a time. Once wastewater is generated from the expansion project, then system #1 will primarily support the new expansion while system #2 will mainly support the existing operations. Upgrades are being made to facilitate the operation of both systems simultaneously including: 1) New lime and polymer pumps with distribution lines for clarifier #1, 2) Adding adjustable frequency drives to pumps, 3) New upgraded outlet piping to clarifier #1, 4) New valve and flow meter for clarifier #4, 5) New Lime piping and spare pump for system #2 lime delivery to neutralize and clarify, and 6) New spares for equipment, analyzers, and instruments.

Non-expansion related

Below are changes, unrelated to the expansion project, that have occurred since the most recent permit that was issued in October 2016.

On 5/4/2018 MTV submitted a letter request to cease operation of the DCW treatment system with regulatory analysis supporting this change. Tom Appleman confirmed with DEQ & EPA that the regulatory analysis was correct and communicated this to MTV in an email on May 30th, 2018. After Micron verified that copper loading would be within allocation, the DCW treatment system was decommissioned on 10/23/18. The final switch over was communicated to UOSA during the annual inspection on 10/30/31.

MTV requested from the City of Manassas to match UOSA's flow limits and received a letter granting the increase in flow on 4/17/19, which became effective on 5/1/19.

A new automated treatment system for process cooling water is being installed in the existing CUP. This is to improve performance of the system and is expected to reduce blowdown. A review was conducted to ensure molybdenum and bromide were not components of the chemicals being used. A similar system is planned to be used in the new CUP.

Appendix

Proposed Changes to Industrial Wastewater Volume & Characteristics

Analysis Notes – 10/12/2018 UPDATE

The data used throughout the analysis below is from February 2015 to January 2020 (last 5 years). Prior to analyzing the data, it was reviewed for stability over time. If the limit has changed in that time frame, only the most recent time frame was reviewed. The data used is stated for each parameter.

Each parameter was analyzed using the same method. A distribution was fit to the data (normal distribution) and the mean and standard deviation were calculated. Process control methods were utilized to estimate the max expected values for each parameter considering the current distribution of the data.

Assumptions:

- For concentration parameters, it was assumed that the concentrations would remain the same even with an increase in water usage
- Water usage is assumed to increase by 1.65 times (based on the current 2.3 MGD limit to the proposed 3.8 MGD limit)

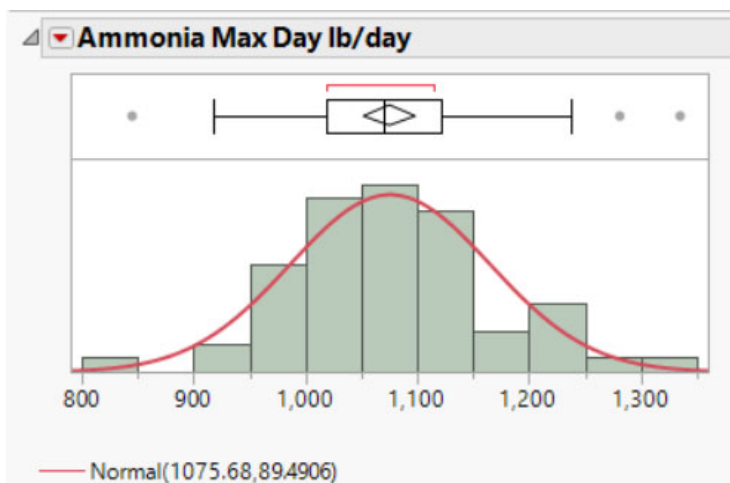
Appendix

Proposed Changes to Industrial Wastewater Volume & Characteristics (Cont.)

Ammonia – 10/12/2018 UPDATE

Micron's current permit limit for ammonia is a maximum daily limit of 1,355 pounds/day (ppd) and Micron analyzes ammonia in its discharge on a weekly basis.

Reviewing Micron's historical max daily ammonia discharge starting in August 2013 to July 2018. The max daily ammonia discharge has an average of 1076 ppd and a standard deviation of 89.5 ppd. Currently, the maximum ammonia discharge we would expect to see is 1,345 ppd. The maximum expected discharge was calculated using the Mean+3 Std.Dev.



Micron's water flow is expected to increase by a factor of 1.65 (2.3 to 3.8 MGD). Therefore, we would expect the max daily ammonia discharge average to be 1775. Assuming variation in ammonia discharge remains the same, we would expect to see a maximum of 2044 ppd of ammonia discharge.

Micron is requesting a maximum daily limit of 2044 ppd for ammonia.

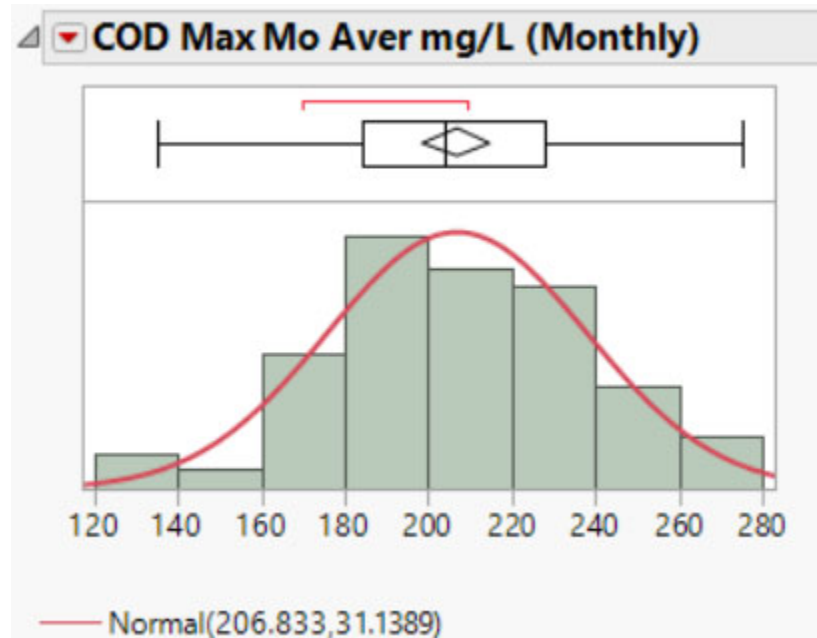
Appendix

Proposed Changes to Industrial Wastewater Volume & Characteristics (Cont.)

Chemical Oxygen Demand (COD) Concentration Daily Max – 10/12/2018 UPDATE

Micron's current permit limit for COD is a maximum daily limit of 420 mg/L with a monthly average of 7,300 ppd. Micron analyzes COD in its discharge on a weekly basis.

COD data from August 2013 to July 2018.



The max daily COD has an average of 206.8 mg/L and a standard deviation of 31.1 mg/L. Currently, the maximum COD we would expect to see is 300 mg/L. However, due to process changes, Micron anticipates that COD concentrations will increase more than the current distribution calculations indicate.

Micron is requesting to keep the current COD limit of 420 mg/L.

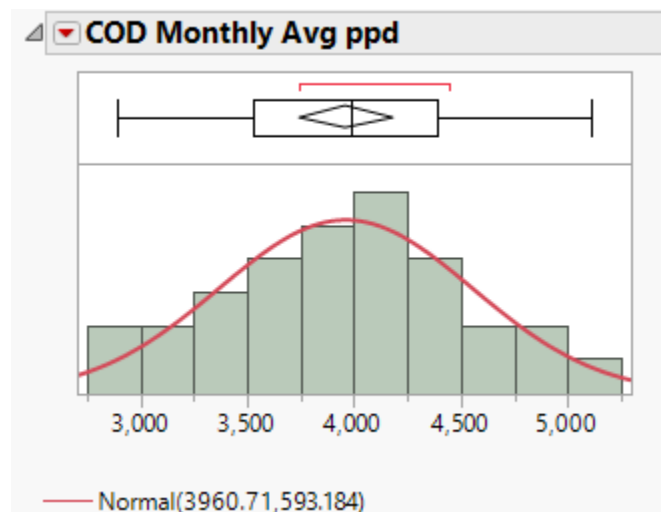
Appendix

Proposed Changes to Industrial Wastewater Volume & Characteristics (Cont.)

Chemical Oxygen Demand (COD) Loading Monthly Average – 10/12/2018 UPDATE

Micron's current permit limit for COD is a maximum daily limit of 420 mg/L with a monthly average of 7,300 ppd. Micron analyzes COD in its discharge on a weekly basis.

Micron's monthly average COD from January 2016 – June 2018 had an average of 3961 ppd and a standard deviation of 593 ppd. The highest monthly average COD we would expect to see is 5,740 ppd.



Micron's water flow is expected to increase by a factor of 1.65. Therefore, we would expect the average COD to be 6,535 ppd. Assuming variation in COD remains the same, we would expect to see a maximum monthly average COD of 8,314 ppd.

Micron is requesting a monthly average of 8,314 ppd for COD.

Appendix

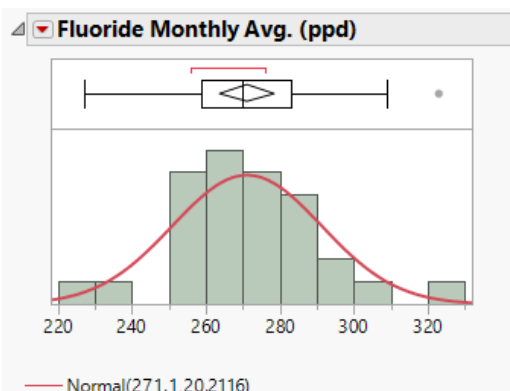
Proposed Changes to Industrial Wastewater Volume & Characteristics (Cont.)

Fluoride – 10/12/2018 UPDATE

Micron's current permit limit for fluoride is a monthly average of 350 ppd. Micron analyzes fluoride discharge on a weekly basis.

Please note that the permit limit was increased in 2016 from 309 ppd to 350 ppd. Therefore, the following analysis only considers data from January 2016 to June 2018. July 2018 data was excluded because it flagged as a statistically significant outlier at only 207 ppd.

Micron's monthly average fluoride discharge from January 2016 – June 2018 was 271 ppd with a standard deviation of 20.2 ppd. Currently, the maximum monthly average fluoride discharge we would expect to see is 331.6 ppd.



Micron's water flow is expected to increase by a factor of 1.65 (2.3 to 3.8 MGD). Assuming the variation in fluoride discharge remains the same, we would expect to see up to a maximum monthly average of 508 ppd of fluoride discharge. This is for the monthly average.

Micron is requesting a monthly average of 508 ppd for fluoride.

Appendix

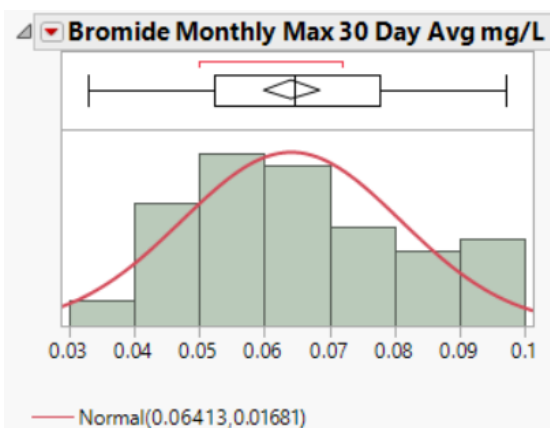
Proposed Changes to Industrial Wastewater Volume & Characteristics (Cont.)

Bromide – 10/12/2018 UPDATE

Micron's current permit limit for Bromide is a maximum 30-day rolling average for the month of 0.1 mg/L. Micron analyzes Bromide in its discharge on a daily basis.

Reviewing Micron's historical Bromide data for February 2015 to January 2020, the average concentration of Bromide is 0.059 mg/L and a standard deviation of 0.01729 mg/L. Currently, the maximum bromide concentration we would expect to see is 0.11 mg/L.

Micron is requesting to keep the current permit limit of 0.1 mg/L for bromide.



Appendix

Proposed Changes to Industrial Wastewater Volume & Characteristics (Cont.)

Sodium – 10/12/2018 UPDATE

Micron's current permit limit for sodium is a monthly average of 140 mg/L. Micron has agreed to the 100 mg/L limit as previously discussed with the UOSA Board of Directors.

Appendix

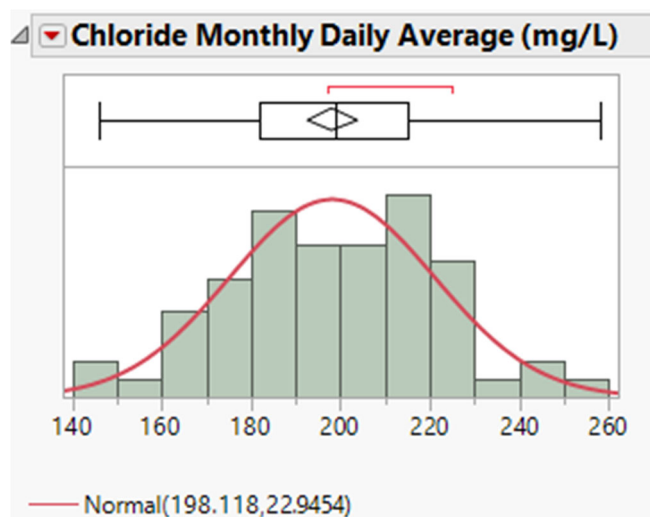
Proposed Changes to Industrial Wastewater Volume & Characteristics (Cont.)

Chloride Monthly Average Concentration – 9/9/2019 Update

Micron's current permit limit for chloride is a monthly average of 550 mg/L. Micron analyzes chloride in its discharge on a weekly basis.

Micron's historical monthly averages of chloride data from August 2013 to July 2019 is normally distributed. The monthly average chloride discharge has an average of 198.1 mg/L and a standard deviation of 23.3 mg/L. Assuming variation in chloride discharge with expanding, we expect to see a maximum of 337.9 mg/L that was calculated using the Mean+6*Std. Dev.

Micron is requesting a monthly average of 350 mg/L for chloride discharge.



Appendix

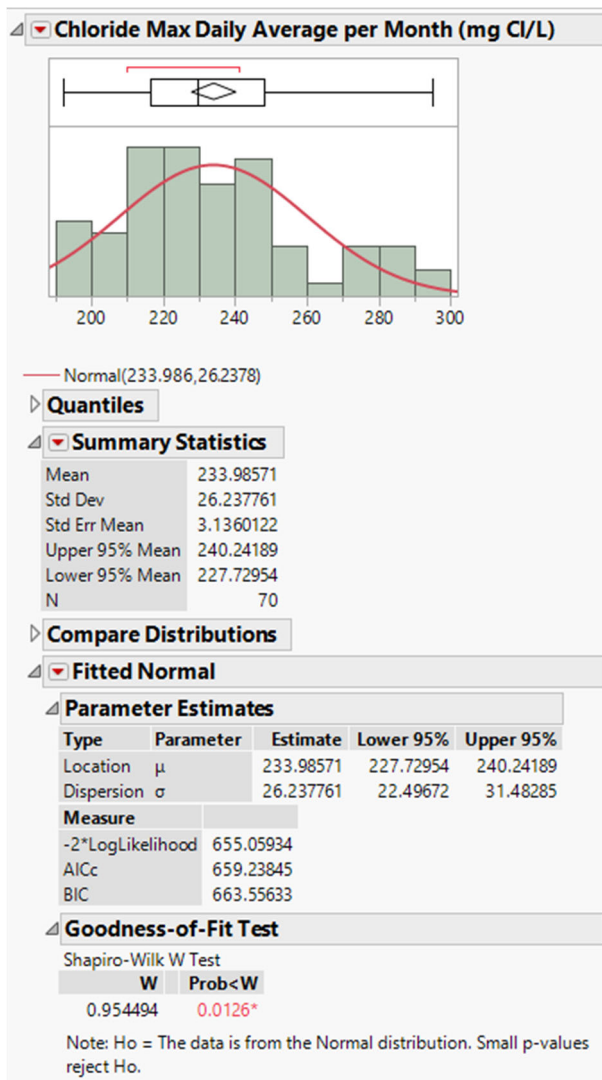
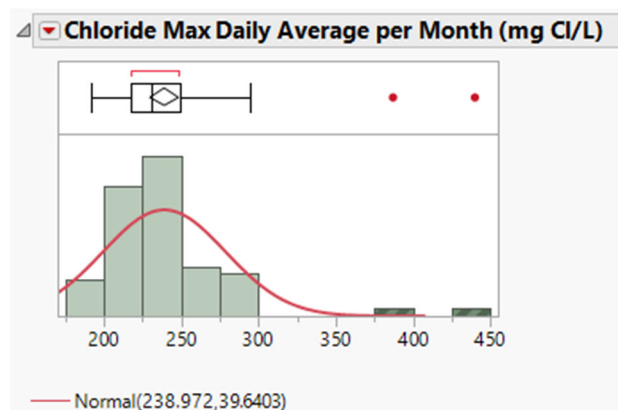
Proposed Changes to Industrial Wastewater Volume & Characteristics (Cont.)

Chloride Daily Max Concentration – 9/9/2019 Update

Micron's current permit limit for chloride is a daily maximum of 650 mg/L. Micron analyzes chloride in its discharge on a weekly basis.

A distribution of Micron's historical daily maximum chloride discharges from August 2013 through July 2019 are shown in the 1st chart below. There are two outliers: one in August 2018 (440) and the other in April 2019 (387). When these data points are removed, the data does not show a normal distribution (see 2nd chart).

Micron is requesting to keep the current chloride daily max limit of 650 mg/L due to outliers observed in the past year.



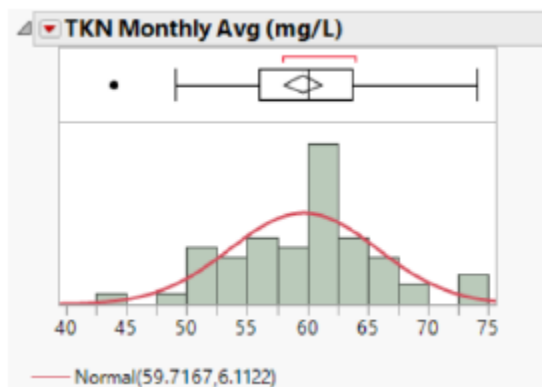
Appendix

Proposed Changes to Industrial Wastewater Volume & Characteristics (Cont.)

Total Kjeldahl Nitrogen (TKN) - 3/31/2020 Update

Micron's current permit limit for TKN is a monthly average of 75 mg/L, which equals 1564 ppd at 2.5MGD and 2377 ppd at 3.8 MGD. Current permit states a sample frequency of monthly for TKN.

Micron's monthly average TKN discharge from February 2015 through January 2020 was 58.7 mg/L with a standard deviation of 6.1 mg/L. A 3sigma the maximum monthly average TKN limit equates to 78 mg/L.



Micron's monthly average TKN discharge from February 2015 through January 2020 was 58.7 mg/L with a standard deviation of 6.1 mg/L. A 3sigma the maximum monthly average TKN limit equates to 78 mg/L.

Micron requests a permit limit of 78 mg/L for TKN.

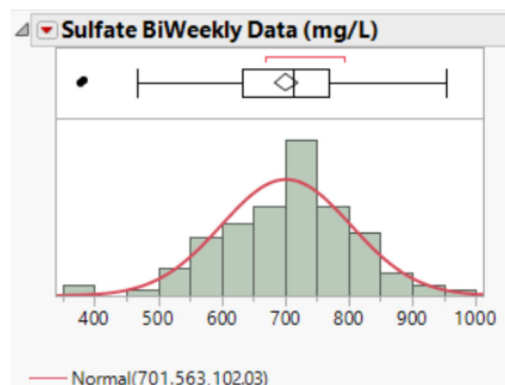
Appendix

Proposed Changes to Industrial Wastewater Volume & Characteristics (Cont.)

Sulfate – 3/24/2021 UPDATE

Micron's current permit limit for sulfate is a maximum daily limit of 1,000 mg/L and sampled at a bi-weekly frequency.

The most recent analysis Micron provided to UOSA was on 3/31/2020. It contained Micron's historical sulfate concentration data from February 2015 through January 2020, the max daily sulfate concentration has an average of 701.6 mg/L and a standard deviation of 102.0 mg/L. A 3sigma maximum daily sulfate limit would equate to 1,008 mg/L.



Since late 2018 Micron has had 3 occurrences (953 mg/L on 12/4/18; 976 mg/L on 6/30/20; & 994 mg/L on 3/9/21) of sulfate results that were within 5% of Micron's current 1,000 mg/L limit. High results have been contributed to periods when one or more of the following has occurred: 1) Increased usage from tools that apply sulfuric acid to individual wafers, 2) Decrease in demand for spent sulfuric acid that Micron collects for vendors that purchase it as a substitute for a product, 2) Increased use of sulfuric acid for onsite pretreatment neutralization that typically coincides with equipment chemical flushings.

Due to the factors stated above and as previously discussed on a conference call on 3/24/2021, Micron requests a maximum daily permit limit of 1,500 mg/L for sulfate and to add a monthly average permit limit of 1,250 mg/L for sulfate. Additionally, Micron requests that sulfate monitoring frequency be increase from bi-weekly to weekly.

Appendix

Proposed Changes to Industrial Wastewater Volume & Characteristics (Cont.)

Flow

As previously discussed, Micron requests the following for flow limits:

- Monthly Average Flow of 3.8 MGD
- Daily Maximum Flow of 6.0 MGD

pH

Micron requests that language be added to the permit to clarify the reporting of low or high pH events when an effluent divert valve is activated. As previously discussed and agreed upon verbally during the 10/30/2018 UOSA site inspection, the pH is to be averaged from the point the divert valve is closed to one-minute prior. Micron was asked to include a request within this application for there to be documentation added to the permit regarding this matter.

PFAS

As discussed previously with Mishelle Noble-Blair, UOSA Regulatory Affairs Director, each year Micron will provide UOSA with a copy of its Toxic Release Inventory (TRI) report.

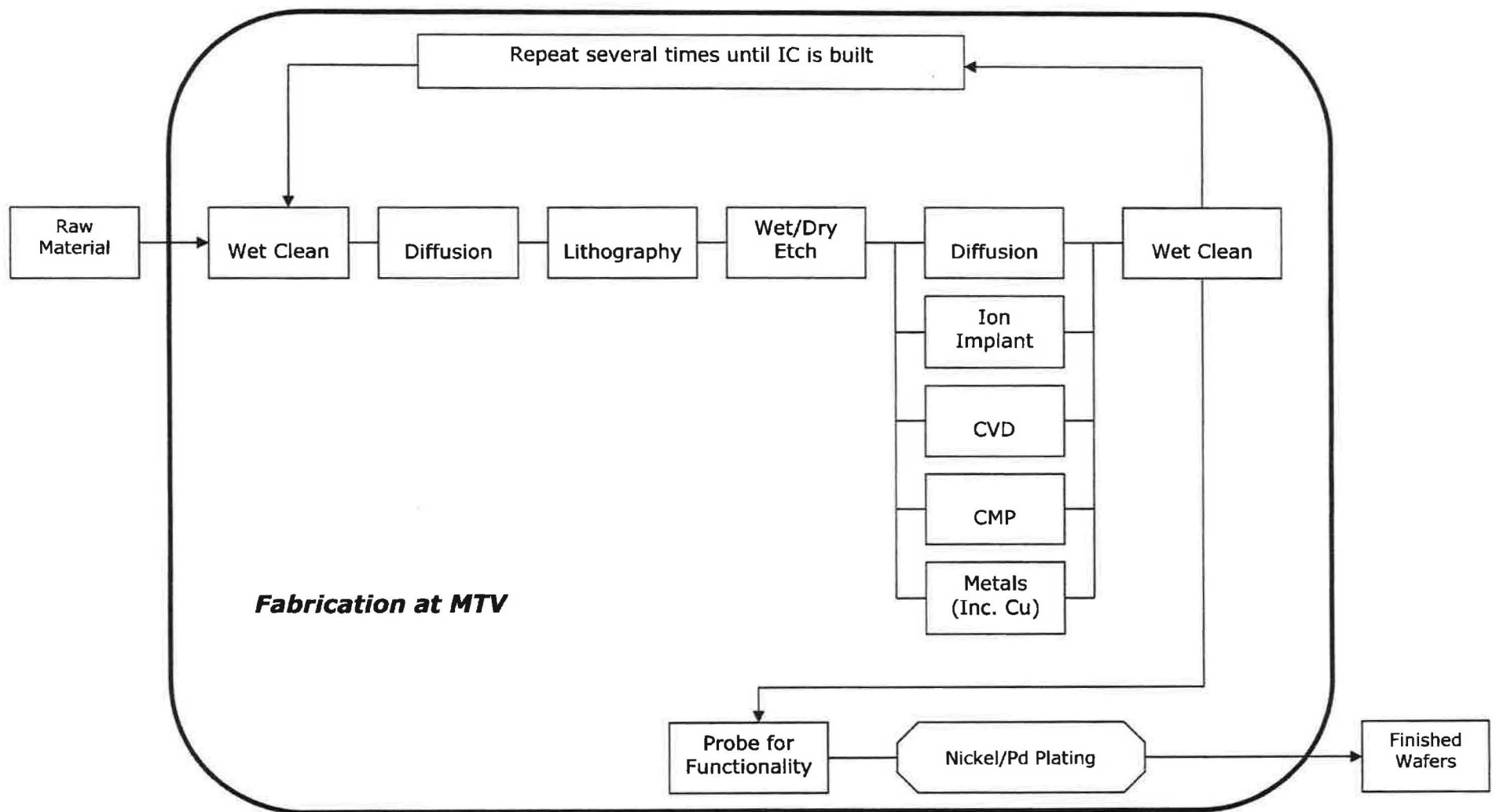
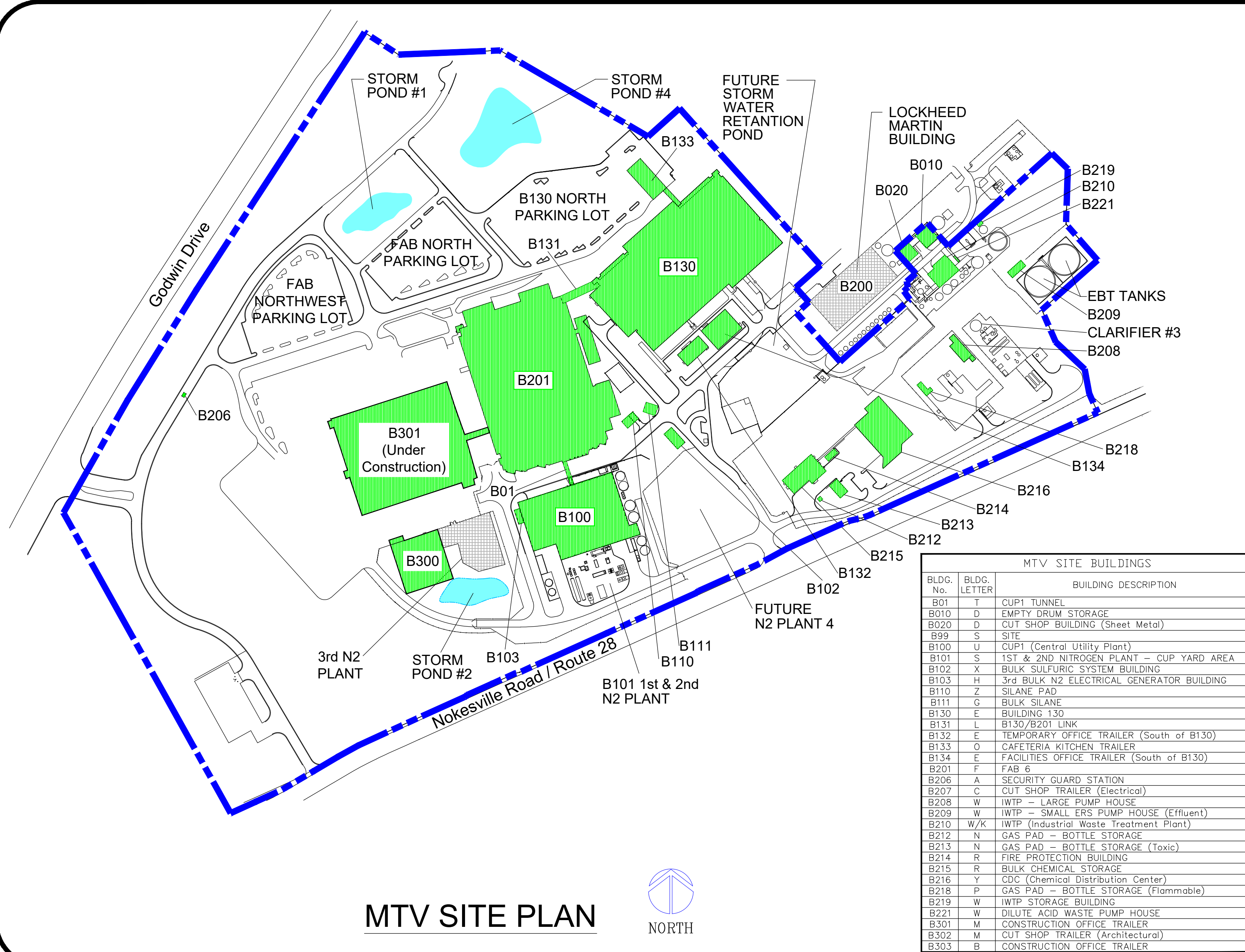


Figure B-1
Manufacturing Overview

Figure B2 - Site Plan



MTV SITE BUILDINGS		
BLDG. No.	BLDG. LETTER	BUILDING DESCRIPTION
B01	T	CUP1 TUNNEL
B010	D	EMPTY DRUM STORAGE
B020	D	CUT SHOP BUILDING (Sheet Metal)
B99	S	SITE
B100	U	CUP1 (Central Utility Plant)
B101	S	1ST & 2ND NITROGEN PLANT – CUP YARD AREA
B102	X	BULK SULFURIC SYSTEM BUILDING
B103	H	3rd BULK N2 ELECTRICAL GENERATOR BUILDING
B110	Z	SILANE PAD
B111	G	BULK SILANE
B130	E	BUILDING 130
B131	L	B130/B201 LINK
B132	E	TEMPORARY OFFICE TRAILER (South of B130)
B133	O	CAFETERIA KITCHEN TRAILER
B134	E	FACILITIES OFFICE TRAILER (South of B130)
B201	F	FAB 6
B206	A	SECURITY GUARD STATION
B207	C	CUT SHOP TRAILER (Electrical)
B208	W	IWTP – LARGE PUMP HOUSE
B209	W	IWTP – SMALL ERS PUMP HOUSE (Effluent)
B210	W/K	IWTP (Industrial Waste Treatment Plant)
B212	N	GAS PAD – BOTTLE STORAGE
B213	N	GAS PAD – BOTTLE STORAGE (Toxic)
B214	R	FIRE PROTECTION BUILDING
B215	R	BULK CHEMICAL STORAGE
B216	Y	CDC (Chemical Distribution Center)
B218	P	GAS PAD – BOTTLE STORAGE (Flammable)
B219	W	IWTP STORAGE BUILDING
B221	W	DILUTE ACID WASTE PUMP HOUSE
B301	M	CONSTRUCTION OFFICE TRAILER
B302	M	CUT SHOP TRAILER (Architectural)
B303	B	CONSTRUCTION OFFICE TRAILER

GENERAL NOTES

LEGEND

MTV BUILDING STRUCTURES

MTV PROPERTY LINE

No.	Revision/Issue	Date
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9600 GODWIN DRIVE
MANASSAS, VA 20108

Building:

MTV
SITE PLAN

Space Planner:	File Name:
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Drawn by:	Sheet:
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Date: 1.05

Scale:	
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Figure C1: Boilers

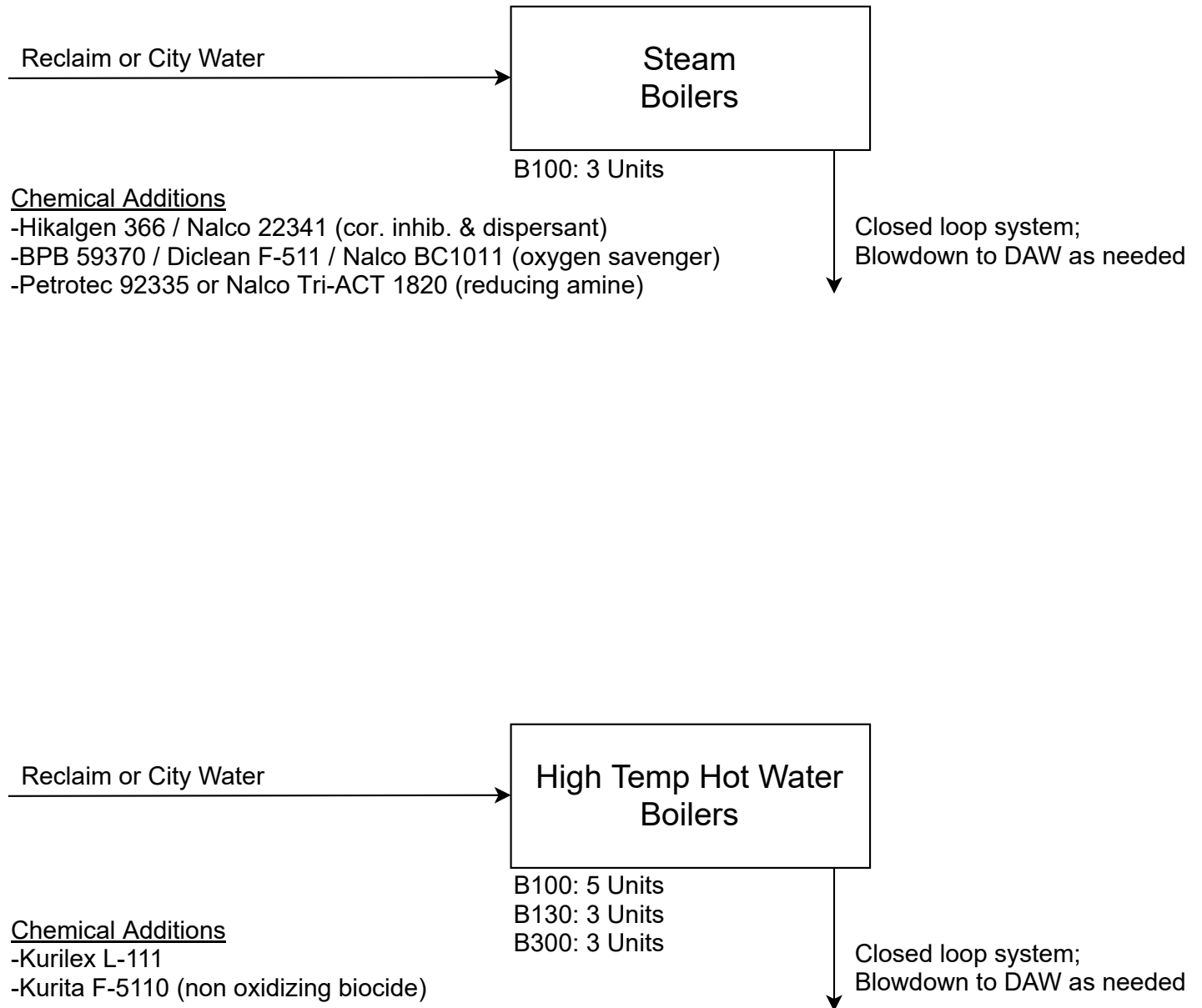


Figure C2: Cooling Towers

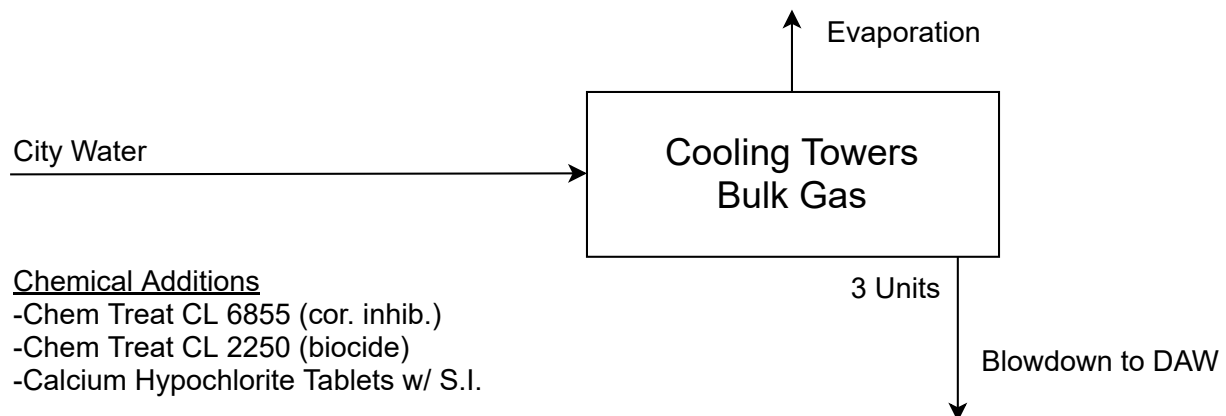
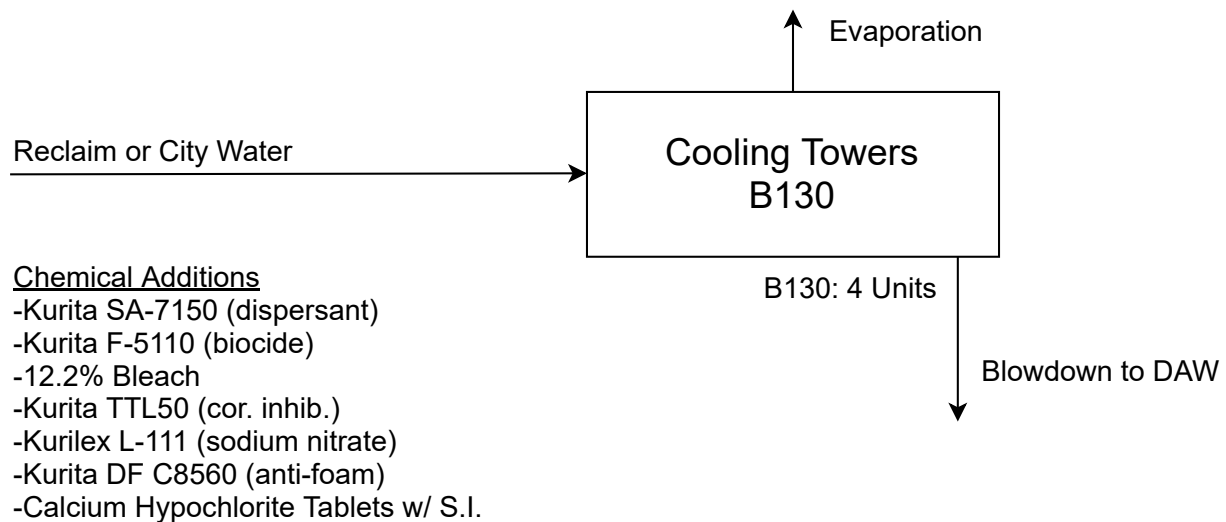
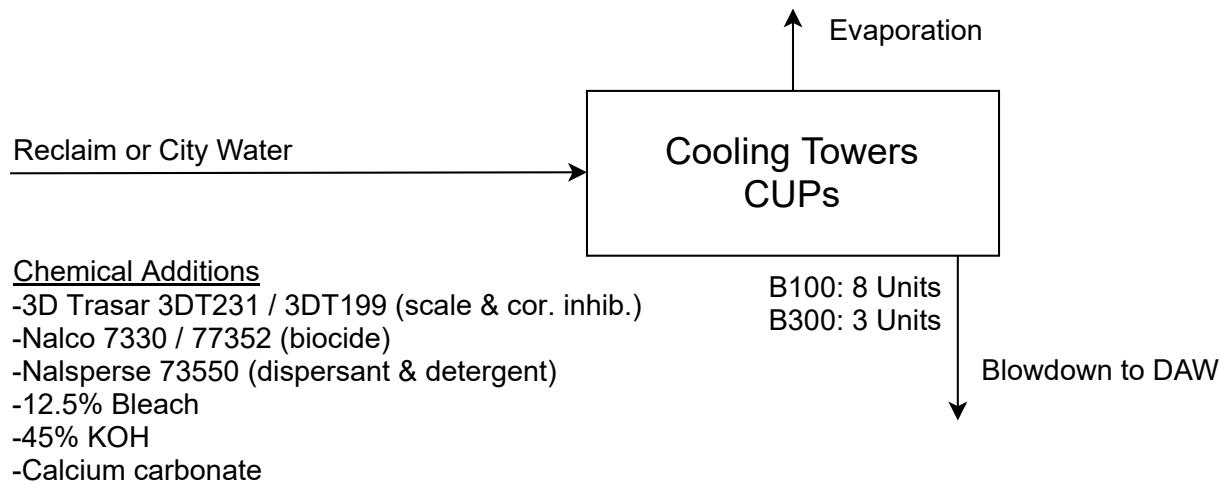
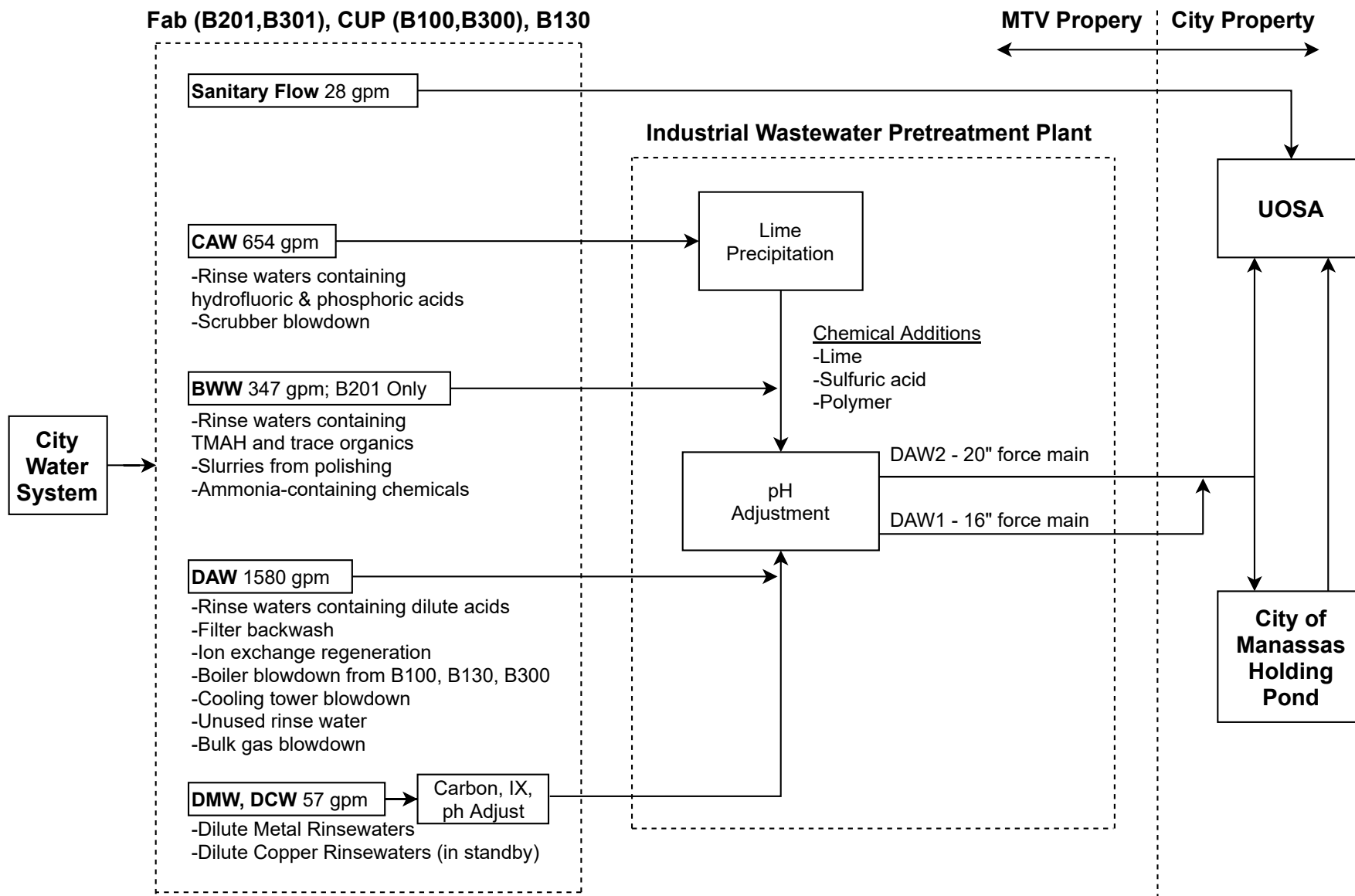


Figure G1: Wastewater Pretreatment System



Note: All water flows are estimated gallons per minute (gpm) based on current flow scaled to proposed limits