

Permit Fact Sheet

General Information

Permit Number	WI-0060950-10-0
Permittee Name and Address	VILLAGE OF WYOCENA P O Box 913 165 E. Dodge St, Wyocena, WI 53969-0913
Permitted Facility Name and Address	Wyocena Wastewater Treatment Facility EASEMENT ROAD, NEQ, SWQ, & NWQ, SEQ, SEC 16, T12N, R10E, WYOCENA TWP, WYOCENA, WISCONSIN
Permit Term	October 01, 2026 to September 30, 2031
Discharge Location	NW ¼, SW ¼ & NW ¼, SE ¼, Section 16, T12N R10E
Receiving Water	Groundwaters of the Duck Creek and Rocky Run Watershed (LW20) in the Lower Wisconsin River Basin in Columbia County
Stream Flow (Q _{7,10})	N/A
Stream Classification	N/A
Discharge Type	Existing Continuous
Annual Average Design Flow (MGD)	0.122 MGD
Industrial or Commercial Contributors	None
Plant Classification	A4 - Ponds, Lagoons and Natural Systems; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Village of Wyocena owns and operates the Wyocena Wastewater Treatment Facility with an annual average design flow of 0.122 million gallons per day (MGD). Treatment consists of two aerated lagoons that discharge to three seepage cells. The lagoons were relined in 1999 with PVC liners. Effluent from the secondary lagoon flows continuously to any of the three soil absorption cells. There are five groundwater monitoring wells around the site that are monitored quarterly. Four wells were installed in 1996 and a new background well was installed in September 2011. All of the wells are within the Design Management Zone (DMZ).

Substantial Compliance Determination

After a desktop review of all discharge monitoring reports, groundwater monitoring reports, compliance schedule items, and a site visit on **July 28, 2026**, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Tanner Connors (DNR Basin Engineer) on **July 30, 2026**.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)
701	0.063 MGD in 2025	Representative influent grab samples shall be collected from the influent manhole prior to entering Lagoon #1. Flow meter located at the lift station near Lovers Lane.
001	0.063 MGD in 2025	Representative effluent samples shall be collected at the wet well.
002	No sludge removal 2021 – 2026	Representative sludge samples shall be collected from Lagoon #1.

Sample Point Designation For Groundwater Monitoring System			
System	Sample Pt Number	Well Name	Comments
Seepage Cells	805	MW-5 (805)	Sidegradient Non Point of Standards
	806	MW-6 (806)	Downgradient Non Point of Standards
	807	PW-6 (807)	Downgradient Non Point of Standards
	808	MW-7 (808)	Downgradient Non Point of Standards
	809	MW-8 (809)	Background upgradient Non Point of Standards

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	Weekly	Grab	
Suspended Solids, Total		mg/L	Weekly	Grab	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Total Kjeldahl		mg/L	Monthly	Grab	
Nitrogen, Ammonia (NH ₃ -N) Total		mg/L	Monthly	Grab	
Nitrogen, Organic Total		mg/L	Monthly	Calculated	

1.1.1 Changes from Previous Permit:

Influent limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section.

1.1.2 Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD₅ and total suspended solids is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate the percent removal requirements in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit.

Influent monitoring is needed to assess loading to the facility and treatment performance. The required parameters and sampling frequency are appropriate for a land treatment system as outlined in ch. NR 206, Wis. Adm. Code.

2 Land Treatment – Monitoring and Limitations

2.1 Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Total Daily	
BOD ₅ , Total	Monthly Avg	50 mg/L	Weekly	Grab	
Suspended Solids, Total		mg/L	Weekly	Grab	
pH Field		su	Weekly	Grab	
Nitrogen, Total Kjeldahl		mg/L	Monthly	Grab	
Nitrogen, Ammonia (NH ₃ -N) Total		mg/L	Monthly	Grab	
Nitrogen, Organic Total		mg/L	Monthly	Calculated	
Nitrogen, Nitrite +		mg/L	Monthly	Grab	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrate Total					
Nitrogen, Total		mg/L	Monthly	Calculated	
Solids, Total Dissolved		mg/L	Monthly	Grab	
Chloride		mg/L	Monthly	Grab	
Phosphorus, Total		mg/L	Monthly	Grab	

2.1.1 Changes from Previous Permit:

Effluent limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section.

2.1.2 Explanation of Limits and Monitoring Requirements

Effluent limitations are not included in this permit for total nitrogen or chloride. In accordance with s. NR 206.06, Wis. Adm. Code, no effluent limits for these parameters have been established for this site. A determination has been made by the Department that, at this site, the ch. NR 140 (Enforcement Standard) point of standards application is beyond the point at which groundwater flow discharges into surface water.

More information on the limitations can be found in the Groundwater Evaluation dated July 15, 2026 by Zach Watson.

3 Groundwater – Monitoring and Limitations

3.1 Groundwater Monitoring System for Seepage Cells

Location of Monitoring system: NEQ, SWQ & NWQ, SEQ, SEC 16, T12N, R10E, WYOCENA TWP

Groundwater Monitoring Well(s) to be Sampled: MW-5 (805), MW-6 (806), PW-6 (807), MW-7 (808), MW-8 (809)

Groundwater Monitoring Well(s) Used to Evaluate Background Groundwater Quality: MW-8 (809)

Groundwater Monitoring Well(s) Used for Point of Standards Application: None

Parameter	Units	Preventative Action Limit	Enforcement Standard	Frequency
Depth To Groundwater	feet	N/A	N/A	Quarterly
Groundwater Elevation	feet MSL	N/A	N/A	Quarterly
Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	23.5	23.5	Quarterly
Nitrogen, Ammonia Dissolved	mg/L	0.97	9.7	Quarterly
Nitrogen, Organic Dissolved	mg/L	2.2	N/A	Quarterly

Chloride Dissolved	mg/L	125	250	Quarterly
Phosphorus, Total Dissolved	mg/L	N/A	N/A	Quarterly
pH Field	su	8.8	N/A	Quarterly
Solids, Total Dissolved	mg/L	830	N/A	Quarterly
COD, Filtered	mg/L	N/A	N/A	Quarterly

3.1.1 Changes from Previous Permit:

Groundwater limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under “Explanation of Limits and Monitoring Requirements” below.

- Alternative concentration limit for nitrite + nitrate updated.
- Alternative concentration limit for chloride removed.
- Preventative action limit for pH, total dissolved solids and organic nitrogen updated.
- Chemical oxygen demand (COD) added to the monitoring requirements.
- Monitoring of total Kjeldahl nitrogen removed.

3.1.2 Explanation of Limits and Monitoring Requirements

Groundwater limits and requirements are determined in accordance with ch. NR 140, Wis. Adm. Code. Indicator parameter Preventive Action Limit (PAL) values are established per s. NR 140.20, Wis. Adm. Code. Alternative Concentration Limits as allowed under s. NR 140.28, Wis. Adm. Code, are established on a case-by-case basis.

For more information, please refer to the Groundwater Evaluation dated July 15, 2026 by Zach Watson.

4 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
002	B	Liquid	Fecal Coliform	Incorporation /Injection	Land Application	N/A - Lagoon Sludge
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No. Wyocena Waterworks public water supply wells BF381 and BF382 had Radium-226 sample results of 0.71 and 1.65 pc/l, respectively, in July 2026.						
If yes, special monitoring and recycling conditions will be included in the permit to track any potential						

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
problems in land applying sludge from this facility						
Is a priority pollutant scan required? No						
Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

4.1 Sample Point Number: 002- LAGOON SLUDGE

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Once	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Once	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Once	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Once	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Once	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Once	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Once	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Once	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Once	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Once	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Once	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Once	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Once	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Once	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Once	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
Nitrogen, Total Kjeldahl		Percent	Per Application	Composite	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Ammonium (NH ₄ -N) Total		Percent	Per Application	Composite	
Phosphorus, Total		Percent	Per Application	Composite	
Phosphorus, Water Extractable		% of Tot P	Per Application	Composite	
Potassium, Total Recoverable		Percent	Per Application	Composite	
PFOA + PFOS		ug/kg	Once	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once in 2028
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once in 2028
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

4.1.1 Changes from Previous Permit:

Sludge limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under “Explanation of Limits and Monitoring Requirements” below.

PCB – Sampling year updated.

PFAS – Monitoring is required once pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.

4.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k). Radium requirements are addressed in s. NR 204.07(3)(n).

List 2 Nutrient – Monitoring for list 2 (nutrients) is highly recommended at the same time as the monitoring of List 1 (metals) in year 2 of the permit (2026). Results will assist in the determination of the acres needed for land application of sludge should it be necessary. The number of acres needed is also required for the Land Application Management Plan Schedule (see schedules for more information). List 2 nutrient sampling is required when land application occurs.

PFAS – The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA has developed a draft risk assessment to determine future land application rates and released this risk assessment in

January of 2025. The department is evaluating this new information. Until a decision is made, the “Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS” should be followed

Collecting sludge data on PFAS concentrations from a wide range of wastewater treatment facilities will help protect public health from exposure to elevated levels of PFAS and determine the department’s implementation of EPA’s recommendations. To quantitate this risk, PFAS sampling has been included in this WPDES permit pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.

Change in form submittal – In prior permit reissuances when it has been noted in the application that sludge would not be removed during the permit term, the department required sampling during the second year of the permit term and the sludge characteristic report (3400-049) would be generated only during that year. Due to moving to electronic submittal of forms via Switchboard, forms 3400-049 (“Characteristics Report”), 3400-052 (“Other Methods of Disposal”) and 3400-055 (“Annual Land Application”) will now be generated by the department and the permittee will be required to submit all three reports each year of the permit term. This change was adopted to provide the permittee flexibility because many lagoon desludging projects can be unexpected, are delayed or staggered over multiple years. Additionally, it is used to officially report that no land application of sludge has occurred, and annual submittal of the forms is required per the standard requirements section.

5 Schedules

5.1 Chloride Source Reduction Measures (SRMs) for Groundwater Discharges

Required Action	Due Date
Chloride Reduction Plan: The permittee shall complete and submit for Department review and approval a chloride reduction plan (CRP). The CRP is an initial step toward controlling chloride and ensuring compliance with chloride limits based on applicable groundwater standards. The CRP shall evaluate all applicable source reduction measures (SRMs) and establish appropriate implementation activities for the SRMs. The CRP shall include a schedule for implementing the selected SRMs.	01/31/2027
Annual Progress Report: Once the chloride reduction plan (CRP) is approved by the Department, the permittee shall submit an annual progress report, under the authority of s. NR 205.07(1)(h), Wis. Adm. Code. If an SRM implementation date of an approved CRP is not met, this may constitute a violation of the permit. Submittal of the first annual progress report is required by the Date Due.	01/31/2028
Second Annual Progress Report: Submit progress report in implementing the chloride reduction plan (CRP).	01/31/2029
Third Annual Progress Report: Submit progress report in implementing the chloride reduction plan (CRP).	01/31/2030
Fourth Annual Progress Report: Submit progress report in implementing the chloride reduction plan (CRP).	01/31/2031

5.1.1 Explanation of Schedule

Wyocena WWTF needs to reduce the amount of chloride discharged to the seepage cell system. Wyocena WWTF should submit annual chloride reduction reports outlining the steps they have been and will be taking to address this problem.

5.2 Sludge Management Plan

A management plan is required for sludge removal.

Required Action	Due Date
Sludge Management Plan Submittal: The permittee shall submit a management plan for approval if removal of sludge will occur during this permit term. The plan shall demonstrate compliance with ch. NR 204 Wis. Adm. Code and at minimum address 1) How and where is sludge sampled; 2) Available sludge storage details and location(s); 3) How will the sludge be removed with details on volume, characterization and how the treatment plant will continue to function during the drawdown; 4) Describe the type of transportation and spreading vehicles and loading and unloading practices; 5) Identify approved land application sites, apply for needed sites, site limitations, total acres needed and vegetative cover management; 6) Specify record keeping procedures including site loading; 7) Address contingency plans for adverse weather and odor/nuisance abatement; and 8) Include any other pertinent information such as other disposal options that may be used or specifications of any pretreatment processes. Once approved, all sludge management activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes. No desludging may occur unless approval from the Department is obtained. Daily logs shall be kept that record where the sludge has been disposed. The plan is due at least 60 days prior to desludging.	

5.2.1 Explanation of Schedule

If the lagoons are to be de-sludged during this permit term a management plan is needed to show compliance with ch. NR 204, Wis. Adm. Code. There are outlines available to assist in plan development.

5.3 Land Treatment Management Plan

Required Action	Due Date
Land Treatment Management Plan Submittal: Submit a management plan to optimize the land treatment system performance and demonstrate compliance with ch. NR 206, Wis. Adm. Code. The land treatment system shall be operated in accordance with the approved management plan.	10/01/2027

5.3.1 Explanation of Schedule

Per NR 206.07(2)(h)(1), Wis. Adm. Code, a land treatment management plan is required.

Attachments

NR 140 Groundwater Evaluation Report date August 7, 2026

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Zachary Watson

Hydrogeologist

Date: August 7, 2026

CORRESPONDENCE/MEMORANDUM

DATE: August 7, 2026

TO: File

FROM: Zach Watson Hydrogeologist - SCR

SUBJECT: Groundwater Evaluation for Wyocena WWTF WI-0060950-09

General Information and Treatment System Description

The Village of Wyocena owns and operates the Wyocena Wastewater Treatment Facility with an annual average design flow of 0.122 million gallons per day (MGD). Treatment consists of two aerated lagoons that discharge to three seepage cells. The lagoons were relined in 1999 with PVC liners. Effluent from the secondary lagoon flows continuously to any of the three soil absorption cells. There are five groundwater monitoring wells around the site that are monitored quarterly. Four wells were installed in 1996 and a new background well was installed in September 2011. All of the wells are within the Design Management Zone (DMZ).

Table 1 – Monitoring Requirements and Limitations – Outfall 001 – Effluent to Seepage Cells

Parameter	Current and Proposed Permit WI-0060950-09 and WI-0060950-10		
	Limit Type	Limits and Units	Sample Frequency
Flow Rate		MGD	Total Daily
BOD5	Monthly Avg	50 mg/l	Weekly
Total Suspended Solids		mg/l	Weekly
pH Field		su	Weekly
Total Kjeldahl Nitrogen		mg/l	Monthly
Ammonia Nitrogen		mg/l	Monthly
Total Organic Nitrogen		mg/l	Monthly
Nitrite + Nitrate Nitrogen		mg/l	Monthly
Total Nitrogen		mg/l	Monthly
Total Dissolved Solids		mg/l	Monthly
Chloride		mg/l	Monthly
Total Phosphorus		mg/l	Monthly

Table 2 – Groundwater Monitoring System for Outfall 001 (Seepage Cell Treatment System)

Sample Point	Well Name	Current Permit and Proposed WI-0060950-09 and WI-0060950-10	
		Well Location	Well Designation
805	MW-5	*Sidegradient	Non-Point of Standards
806	MW-6	Downgradient	Non-Point of Standards
807	PW-6	Downgradient	Non-Point of Standards
808	MW-7	Downgradient	Non-Point of Standards
809	MW-8	Background	Non-Point of Standards

***Recommended changes from current permit**

Table 3 – Seepage Cell Groundwater Standards

Parameter	Current Permit WI-0060950-09		Proposed Permit WI-0060950-10	
	PAL	ES	PAL	ES
Depth to Groundwater	N/A	N/A	N/A	N/A
Groundwater Elevation	N/A	N/A	N/A	N/A
Nitrite+Nitrate Dissolved	12.3 mg/l	12.3 mg/l	*23.5 mg/l	*23.5 mg/l
Chloride Dissolved	180 mg/l	250 mg/l	*125 mg/l	250 mg/l
pH Field	6.7 – 8.7 su	N/A	*6.8 – 8.8 su	N/A
*Total Kjeldahl Nitrogen	N/A	N/A	N/A	N/A
Ammonia Dissolved	0.97 mg/l	9.7 mg/l	0.97 mg/l	9.7 mg/l
Organic Nitrogen Dissolved	2.3 mg/l	N/A	*2.2 mg/l	N/A
Total Dissolved Solids	770 mg/l	N/A	*830 mg/l	N/A
Dissolved Phosphorus	N/A	N/A	N/A	N/A
*Chemical Oxygen Demand	N/A	N/A	N/A	N/A

***Recommended changes for upcoming permit**

Hydrogeology

The bedrock below the site is Cambrian aged sandstones from the Mt. Simon formation to the Trempealeau Formation. Soil type is primarily Oshtemo loamy sand and Adrian muck dominates the shores of Duck Creek. The thickness of the unconsolidated materials above bedrock is approximately 50 – 100 feet (Trotta and Borman, 1978). The regional groundwater flows to the south towards Duck Creek (Water-table map of Columbia County, Wisconsin, 1974). Depth to groundwater is 6 – 13 feet below ground surface. Groundwater elevations range between 790 – 800 feet above mean sea level.

Land Treatment Effluent Quality and Loading Rates

The volume of effluent sent to the seepage cell treatment system remained relatively consistent at approximately 22 MG/yr. The concentration of chloride was variable and generally increased over the past five years from an average of 189 mg/l in 2021 to 332 mg/l in 2025. The concentration of chloride exhibited a seasonal trend where concentrations peaked in spring and reached lows in fall of each year. The total load of chloride discharged to the seepage cells increased from 35,446 lbs/yr in 2021 to 63,407 lbs/yr in 2025. The nitrogen discharged to the seepage cells is primarily in the form of ammonia with some component of nitrate and organic nitrogen. Approximately 1,800 – 2,700 lbs/yr of nitrogen was discharge to the seepage cells from 2021 – 2025. The concentration of phosphorus in the discharge remained mostly stable ranging from an average of 4.0 – 4.5 mg/l.

Table 4 – Annual Average Seepage Cell Effluent Concentrations (mg/l)

	Chloride	Ammonia Nitrogen	Nitrite + Nitrate	Organic Nitrogen	Phosphorus
2021	189	7.4	3.1	1.8	4.4
2022	219	7.4	2.4	1.3	4.3
2023	283	5.7	3.0	1.5	4.5
2024	305	6.9	3.2	0.9	4.0
2025	332	8.5	1.6	10.1	4.1

Table 5 – Annual Seepage Cell Loading Rates

Year	Total Flow (MG/yr)	Nitrogen (lbs/yr)	Chloride (lbs/yr)	Phosphorus (lbs/yr)
2021	22.5	2,233	35,466	826
2022	22.3	2,027	40,730	800
2023	21.7	1,810	51,217	814
2024	22.9	2,063	58,251	764
2025	22.9	2,655	63,407	783

Background Groundwater Quality

The 2009 groundwater evaluation identified that MW-5, the previous background monitoring well, was too close to the seepage cells and was impacted by the discharge. MW-5 was replaced by MW-8 as a background monitoring well following construction in 2011. Monitoring well MW-8 is located to the east of the seepage cells and is most often at a groundwater elevation that is lower than MW-5. However, it still serves as the most accurate indicator of upgradient unimpacted groundwater quality. The results for chloride at MW-8 are generally low averaging 25 mg/l over the past five years. The results for nitrite + nitrate are elevated and averaged 13.8 mg/l during the past five years. The results for organic nitrogen are low and mostly non-detect. The results for phosphorus and ammonia are non-detect.

Downgradient Groundwater Quality

Downgradient groundwater quality is defined by the results from samples collected at MW-5, MW-6, PW-6 and MW-7. The results for chloride are elevated at these monitoring wells relative to MW-8 where concentrations most often fall between 150 – 450 mg/l. The results for nitrite + nitrate are highest at MW-5 and MW-6 and mostly non-detect at MW-7 and PW-6. Conversely, the results for ammonia are highest MW-7 and PW-6, lower at MW-6 and non-detect at MW-5. The results for ammonia at MW-7 have exhibited a slight decline over the past five years from approximately 10 mg/l to 6 mg/l. The results for ammonia at PW-6 have exhibited a more steady and consistent decline over the past ten years from approximately 8 mg/l to 3 mg/l. Phosphorus is most often 3 – 4 mg/l at MW-6 and 1 – 2 mg/l at PW-6.

Treatment System Impact to Groundwater Quality

The impact from the discharge on local groundwater quality is apparent when reviewing the results for chloride, ammonia and phosphorus. Monitoring wells MW-6 and PW-6 appear to be most impacted by the discharge to the seepage cell treatment system. The results at the downgradient monitoring wells exceeded the enforcement standard for chloride and ammonia during the current permit term and these results are clearly related to the seepage cell discharge. The concentrations of chloride and nitrogen observed at the groundwater monitoring wells are expected given the discharge concentrations, site hydrogeology and horizontal distances from the wells to the seepage cells. Wyocena WWTF has been granted variances for

chloride and nitrogen since at least 2003 due to the discharge partially contributing to surface water. The following are excerpts from prior permits regarding the variances for effluent limitations.

“Effluent limitations are not included in this permit for total nitrogen or chloride. In accordance with s. NR 206.06, Wis. Adm. Code, no effluent limits for these parameters have been established for this site, based on substantial compliance with ch. NR 140, Wis. Adm. Code requirements. A determination has been made by the Department that, at this site, the ch. NR 140 (Enforcement Standard) point of standards application is beyond the point at which groundwater flow discharges into surface water. Total nitrogen and chloride effluent limits are therefore not needed to assure compliance with NR 140 groundwater quality Enforcement Standards. Groundwater monitoring is required at this site to assure that the flow of groundwater into surface water will not cause surface water quality standards contained in chs. NR 102 to 105 to be attained or exceeded.”

“At this site the facility discharge plume flows into surface water before reaching the discharge site (ch. NR 140, Wis. Adm. Code, Enforcement Standard) point of standards application. This has allowed the Department to make a determination of compliance with NR 140 groundwater quality Enforcement Standards at the site. This determination was made during the Village's (NR 110) Facility Planning effort and allowed the Department to set alternative effluent limits (per NR 206.06) for the facility's discharge to seepage cells. Continued discharge site groundwater monitoring is required to document groundwater flow into surface water and to monitor both, the effectiveness of site soil treatment processes, and the quality of impacted groundwater flowing into surface water.”

While it is unlikely that the entire plume of impacted groundwater flows directly into the tributary, some portion of this impacted discharge does contribute to the tributary and does have the potential to negatively impact surface water quality. To provide some context on the potential impact that this discharge is having on the adjacent surface water body, Water Quality Based Effluent Limits were calculated for this discharge as if it were a direct discharge to the unnamed tributary of Duck Creek. The complete list of limitations and explanations is provided as an attachment to this report.

The monthly average limit for chloride was calculated to be 395 mg/l. Chloride concentrations in the discharge were above 395 mg/l fourteen times during the past ten years of monthly monitoring. There were a few results at MW-7 and PW-6 where the concentration of chloride was above 395 mg/l. It is expected that the groundwater contributing to the tributary would most often be below the 395 mg/l monthly average limit.

Monthly average limits for ammonia would be 3.0 – 5.8 mg/l, depending upon season. Ammonia concentrations in the discharge peak in spring to early summer to approximately 25 mg/l. Ammonia concentrations in groundwater at MW-6/PW-6 were most often between non-detect to 5 mg/l and 5 – 11 mg/l at MW-7. It is expected that the groundwater contributing to the tributary is at times above the monthly average limit during the summer when the ammonia limits are most restrictive.

Wyocena WWTF is located within the Wisconsin River TMDL. A waste load allocation of 137 lbs/yr of phosphorus was calculated for Wyocena WWTF if it were directly discharging to this tributary of Duck Creek. The 137 lbs/yr waste load allocation is approximately 15 – 20% of the actual amount discharged annually to the seepage cells (764 – 826 lbs/yr). Nearly 40% (~8.2 MG/yr) of the discharge would need to enter the tributary at a concentration of 2 mg/l to meet the waste load allocation of 137 lbs/yr. The total phosphorus equivalent effluent concentration was calculated to 0.37 mg/l. With groundwater concentrations of phosphorus routinely reported at 1 - 4 mg/l, it is expected that the concentration of groundwater contributing to the tributary is likely above the 0.37 mg/l by the time it reaches the interface of groundwater and surface water. Whether this discharge is contributing more than 137 lbs/yr is very difficult to determine.

Monitoring the tributary upstream, adjacent to, and downstream of the discharge will help further assess the immediate impact from the discharge on surface water quality.

Indicator Parameter PALs

Indicator Parameter PALs are developed following the procedures described in s. NR 140.20(2), Wis. Adm. Code and “Calculating Preventive Action Limits and Evaluating Groundwater Quality Exemptions for Groundwater Dischargers”. Indicator parameters do not have Enforcement Standards. The PAL for an indicator parameter is a benchmark for evaluating site specific trends. When significant increases in the trends are observed, the facility and the department’s response action under s. NR 140.24 Wis. Adm. Code should be to investigate the source of the compound. The indicator PALs for this facility were calculated using whichever of the two following methods provides a greater PAL.

- Σ [Background groundwater quality + (Standard Deviation of results x 3)]
- Σ [Background groundwater quality + Minimum Increase (NR 140.20 Table 3)]

Indicator parameter PALs for the current permit term were calculated using monitoring data from MW-3 during the prior permit term. The indicator parameter PALs for use in the upcoming permit WI-0060950-10 are presented in **Table 3** and were calculated using results MW-8 (June 1, 2021 – December 31, 2025).

Alternative Concentration Limits

Alternative concentration Limits (ACLs) can be developed and provided for a groundwater monitoring system to replace the PAL or ES (s. NR 140.28, Wis. Adm. Code). ACLs are provided if the conditions at the background monitoring well(s) indicate that it is appropriate. The methodology and considerations for developing and providing ACLs are outlined in the guidance document “Calculating Preventive Action Limits and Evaluating Groundwater Quality Exemptions for Groundwater Dischargers”. ACLs were calculated and provided in **Table 3** for nitrite+nitrate using results from MW-8 (June 1, 2021 – December 31, 2025). The data used in the calculation of the nitrite+nitrate ACL is provided below in **Table 6**.

Table 6 – Alternative Concentration Limit Data and Calculation

MW-8 (809)	
Date	Nitrite+Nitrate (mg/l)
6/14/21	8.3
9/13/21	9.2
11/8/21	10
3/14/22	9.4
6/13/22	12
9/12/22	16
11/7/22	20
3/13/23	25
7/17/23	21
9/11/23	3.6
11/13/23	13
3/11/24	15
7/29/24	12
9/30/24	10
11/18/24	16

3/17/25	14
6/30/25	15
8/11/25	16
10/13/25	16

Average (mg/l)	13.8
Standard Deviation (mg/l)	4.9
ACL (mg/l)	23.5

Conclusions, Recommendations and Schedule Requirements

- Remove Total Kjeldahl Nitrogen from the monitoring requirements for groundwater as organic nitrogen and ammonia are already reported.
- Add monitoring of chemical oxygen demand in groundwater to assess the oxygen demand in groundwater.
- Redesignate monitoring well MW-5 as sidegradient.
- Include a compliance schedule for a Land Treatment Management Plan
- The NR 206.06 Wis. Adm. Code variances for the chloride and total nitrogen effluent limits can be granted for the upcoming permit given there are no nearby downgradient receptors (private/public water supply wells), the spatial constraints for an adequately sized DMZ, and the hydrogeologic setting where some portion of the impacted groundwater discharges into the tributary of Duck Creek.
- Wyocena WWTF still needs to continue submitting annual chloride source reduction reports that provide realistic action items that will result in a meaningful reduction in the concentration of chloride discharged to the seepage cells.
- While Wyocena WWTF does have a variance for nitrogen, it should still work towards optimizing treatment and reducing the overall quantity of nitrogen discharged annually.
- Given the proximity of the seepage cells to the tributary of Duck Creek, the potential impact from the seepage cell discharge on surface water should be evaluated. It is proposed that water resources staff collect samples for chloride, ammonia, nitrite + nitrate, and phosphorus three times per year upstream, adjacent to and downstream of the discharge over the next four years to inform the development of the next groundwater evaluation and assessment of the impact of the discharge on local groundwater and surface water quality.

From: [Luck, Sarah D - DNR](#)
To: [Watson, Zachary T - DNR](#)
Subject: RE: Wyocena draft WQBELs
Date: Wednesday, August 5, 2026 10:16:46 AM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)

Hi Zach,

Below are the phosphorus mass calculations for Wyocena if they had been given a wasteload allocation in the Wisconsin River TMDL as a point discharger to surface water. The facility is located in Subbasin 3 of the Wisconsin River TMDL, and currently there are no other point source discharges in this subbasin (Grande Cheese Wyocena is in Subbasin 173).

The baseline condition is determined to be 1.0 mg/L, which is typical for dischargers that have not had a phosphorus limit previously imposed. Table K-5 in Appendix K (snip below) directs that the TMDL reduction is 63% for Subbasin 3.

Table K-5. Annual Total Phosphorus Reductions from Baseline Conditions to Meet Local and Downstream Proposed Site-Specific Criteria.

TMDL Reach	Downstream Reservoir	Local Reduction (%)	Downstream Reduction (%)	Total Reduction (%)	Local Reduction (lbs./year)	Downstream Reduction (lbs./year)	Total Reduction (lbs./year)
1	Lake Wisconsin	0%	63%	63%	0	2,904	2,904
2	Lake Wisconsin	12%	51%	63%	465	1,991	2,456
3	Lake Wisconsin	0%	63%	63%	0	1,180	1,180

Mass load assuming baseline: $1.0 \text{ mg/L} * 0.122 \text{ MGD} * 8.34 = 1.02 \text{ lbs/day}$ (1.01748 rounded)

Apply the 63% reduction: $1.01748 \text{ lbs/day} * (1.00 - 0.63) = 0.38 \text{ lbs/day}$ (0.3764676 rounded)

WLA = $0.3764676 \text{ lbs/day} * 365 = \mathbf{137 \text{ lbs/yr}}$ (137.410674 rounded)

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, the Department has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL. Therefore, limits given to facilities included in the Wisconsin River TMDL are given monthly average mass limits and, if the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits are also included. The following equation shows the calculation of equivalent effluent concentration:

$$\begin{aligned}\text{TP Equivalent Effluent Concentration} &= \text{WLA} \div (365 \text{ days/yr} * \text{Flow Rate} * \text{Conversion Factor}) \\ &= 137.410674 \text{ lbs/yr} \div (365 \text{ days/yr} * 0.122 \text{ MGD} * 8.34) \\ &= 0.37 \text{ mg/L}\end{aligned}$$

Since this value is greater than 0.3 mg/L, the WLA should be expressed as a monthly average mass limit for total phosphorus, and no six-month average limit is required.

TP Monthly Average Permit Limit = daily WLA * monthly average multiplier

= 0.3764676 lbs/day * 1.90
= **0.72 lbs/day** (0.715288 rounded)

The multiplier used in the six-month average calculation was determined according to the implementation guidance. The default coefficient of variation (CV) of 0.6 is used. The CV, in addition to the monitoring frequency, are used to select the multiplier of 1.90. The current permit specifies phosphorus monitoring as once monthly; **if a different monitoring frequency is used, the limit should be reevaluated.**

Summary:

- A monthly average mass effluent limit of **0.72 lbs/day** is recommended for this discharge. For informational purposes, this limit is equivalent to a concentration of 0.70 mg/L at the facility annual average design flow of 0.122 MGD.
- An annual WLA of **137 lbs/yr** was calculated for this facility based on baseline conditions and a 63% reduction for the subbasin.
- Should Wyocena Wastewater Treatment Facility be given surface water limits, Wyocena WWTF will need to submit a written request to the Department for an allocation from the Wisconsin River TMDL reserve capacity.

Sarah Luck

Phone: (608) 843-3876

Sarah.Luck@Wisconsin.gov

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From: Watson, Zachary T - DNR <zachary.watson@wisconsin.gov>

Sent: Thursday, July 23, 2026 11:15 AM

To: Luck, Sarah D - DNR <Sarah.Luck@wisconsin.gov>

Subject: RE: Wyocena draft WQBELs

Hey Sarah,

Thanks so much for sending this to me. Super helpful. Is there any way to develop a phosphorus mass loading limit, either per year, month, day etc.? Or is there a way for me to simply generate that value and potentially do this in for future gw evals? I think that is the best metric to allow for me to make a comparison on the discharge/groundwater results.

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Zach Watson

Senior Hydrogeologist

Water Quality Bureau

Wisconsin Department of Natural Resources

1500 N Johns Street
Dodgeville, WI 53533
New Phone: 608-910-2822
Zachary.watson@wisconsin.gov

From: Luck, Sarah D - DNR <Sarah.Luck@wisconsin.gov>
Sent: Friday, July 17, 2026 4:11 PM
To: Watson, Zachary T - DNR <zachary.watson@wisconsin.gov>
Subject: Wyocena draft WQBELs

Hi Zach,

Here are some WQBEL estimates for the discharge to the Unnamed Tributary to Duck Creek (WBIC 1267100) in Columbia County. After seeing the aerial imagery, it looks like the seepage cells/drain tiles that drain east to west form the headwaters of the Unnamed Tributary. Given that, I think we could assume low flows of 0 cfs and a default WWSF community (I said LAL on the phone, but I think we should go with the default community classification until proven otherwise with a fish/biological survey).

Given these parameters, the following limits would apply for a surface water discharger (parameters with monitoring only are not included, nor is temperature):

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
BOD ₅ May – October November – April			5 mg/L 10 mg/L	5 mg/L 10 mg/L	-
TSS			10 mg/L	10 mg/L	-
pH	9.0 s.u.	6.0 s.u.			-
Dissolved Oxygen		7.0 mg/L			-
Ammonia Nitrogen April – May June – September October – March	Variable Variable Variable		11 mg/L 7.4 mg/L 15 mg/L	4.4 mg/L 3.0 mg/L 5.8 mg/L	1
Bacteria <i>E. coli</i>				126 #/100 mL geometric mean	2
Chloride	757 mg/L		395 mg/L	395 mg/L	
Arsenic	340 ug/L		150 ug/L	13 ug/L	3
Cadmium	59 ug/L		3.8 ug/L	3.8 ug/L	3
Chromium	4,400 ug/L		330 ug/L	330 ug/L	3
Copper	70 ug/L		41 ug/L	41 ug/L	3

Lead	360 ug/L		96 ug/L	96 ug/L	3
Nickel	1,100 ug/L		120 ug/L	120 ug/L	3
Zinc	340 ug/L		340 ug/L	340 ug/L	3
Phosphorus				TMDL mass limit	4

Footnotes:

1. Since effluent pH is not known, a table of the ammonia limits at different pH levels is given:

Effluent pH (s.u.)	Limit (mg/L)	Effluent pH (s.u.)	Limit (mg/L)	Effluent pH (s.u.)	Limit (mg/L)
6.0 ≤ pH ≤ 6.1	54	7.0 < pH ≤ 7.1	33	8.0 < pH ≤ 8.1	6.9
6.1 < pH ≤ 6.2	53	7.1 < pH ≤ 7.2	30	8.1 < pH ≤ 8.2	5.7
6.2 < pH ≤ 6.3	52	7.2 < pH ≤ 7.3	26	8.2 < pH ≤ 8.3	4.7
6.3 < pH ≤ 6.4	51	7.3 < pH ≤ 7.4	23	8.3 < pH ≤ 8.4	3.9
6.4 < pH ≤ 6.5	49	7.4 < pH ≤ 7.5	20	8.4 < pH ≤ 8.5	3.2
6.5 < pH ≤ 6.6	47	7.5 < pH ≤ 7.6	17	8.5 < pH ≤ 8.6	2.7
6.6 < pH ≤ 6.7	45	7.6 < pH ≤ 7.7	14	8.6 < pH ≤ 8.7	2.2
6.7 < pH ≤ 6.8	42	7.7 < pH ≤ 7.8	12	8.7 < pH ≤ 8.8	1.8
6.8 < pH ≤ 6.9	39	7.8 < pH ≤ 7.9	10	8.8 < pH ≤ 8.9	1.6
6.9 < pH ≤ 7.0	36	7.9 < pH ≤ 8.0	8.4	8.9 < pH ≤ 9.0	1.3

2. *E. coli* limits apply May through September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL
3. These are based on default hardness values and may change if receiving and effluent hardness were sampled.
4. Since this discharge is located within the Wisconsin River TMDL area, a TMDL mass limit would apply.

Thanks,
Sarah

Sarah Luck

Water Resources Engineer
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711
Phone: (608) 843-3876
Sarah.Luck@Wisconsin.gov



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Water Table Flow Map October 13, 2025 Wyocena WWTF (WI-0060950-09)

Site Location

165 E. Dodge St.
Wyocena, WI 93969

Legend

Water Table Contour
(10/13/2025 - 1' FAMS)

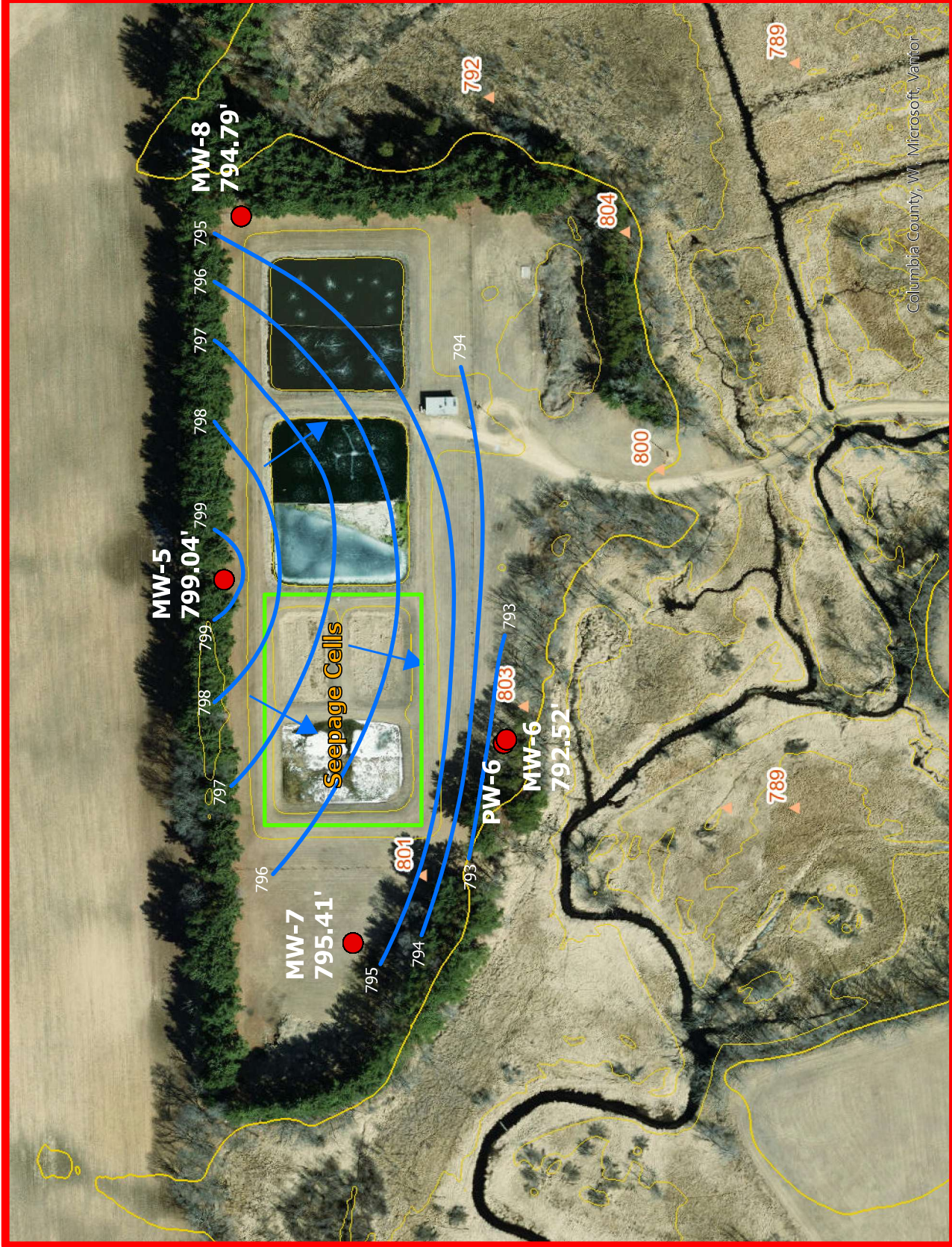
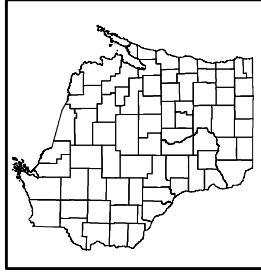
Groundwater Flow
Direction

Approximated
discharge area

Notes

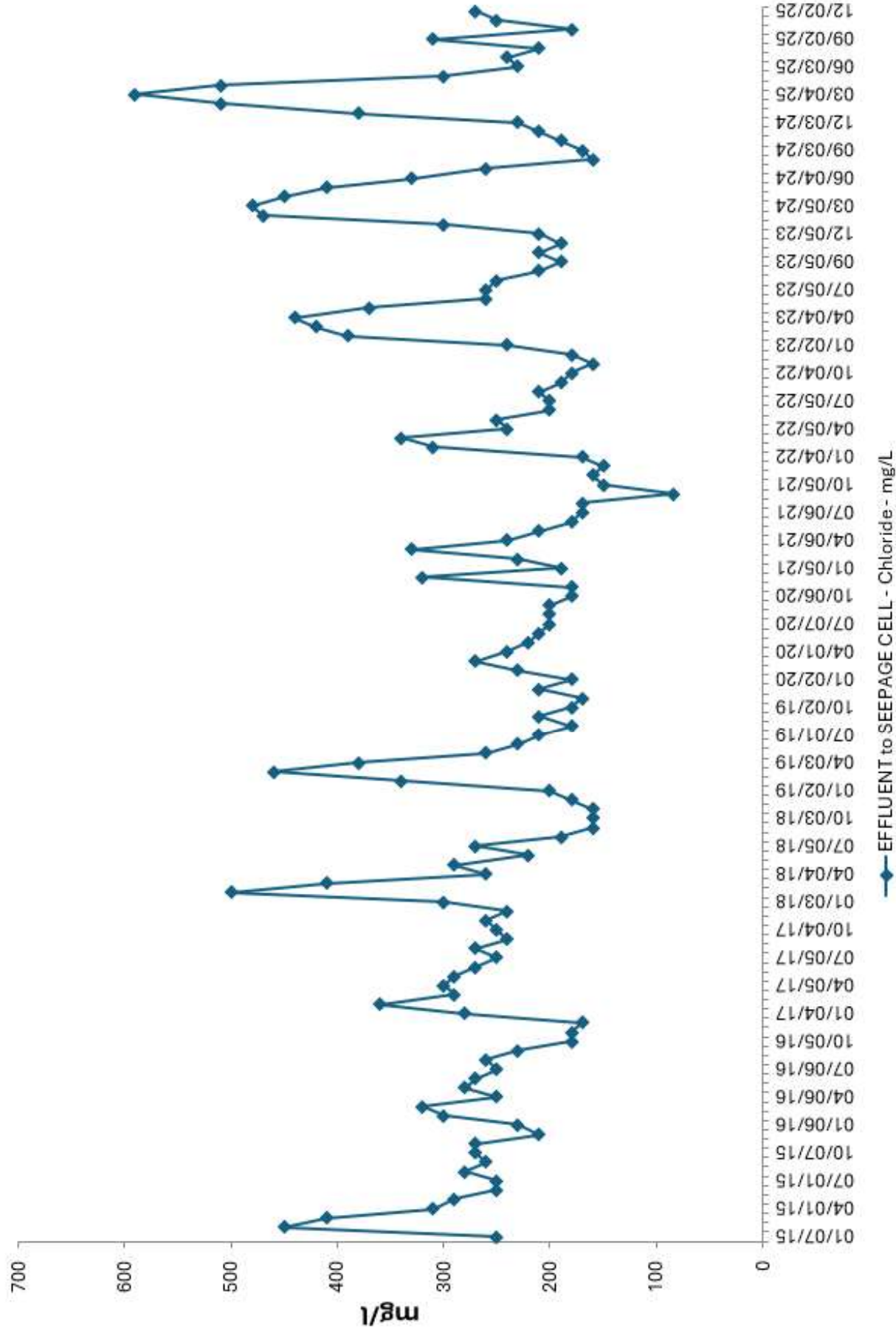
Water table contours are hand drawn using the reported elevations in feet above mean sea level collected on October 13, 2025.

Created By: watsoz
Date: 3/31/2026

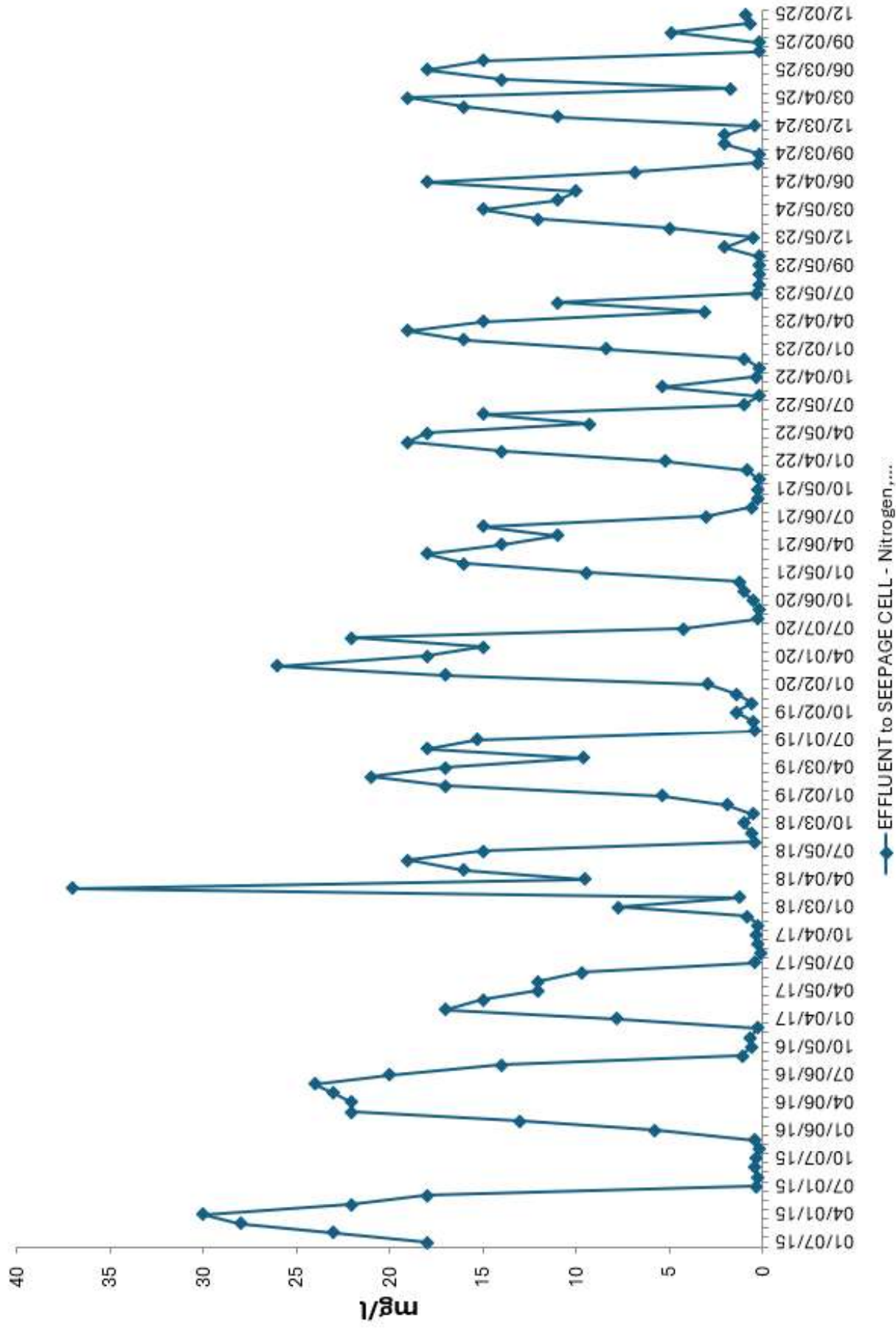


DISCLAIMER: This map is a user generated static output from the Wisconsin Department of Natural Resources. The contents herein are for reference purposes only and may or may not be accurate, current, or otherwise reliable. No liability is assumed for the data delineated herein either expressed or implied by the Wisconsin DNR or its employees. All land application must meet NR 113, NR 204, and NR 214 Wis. Adm. Code.

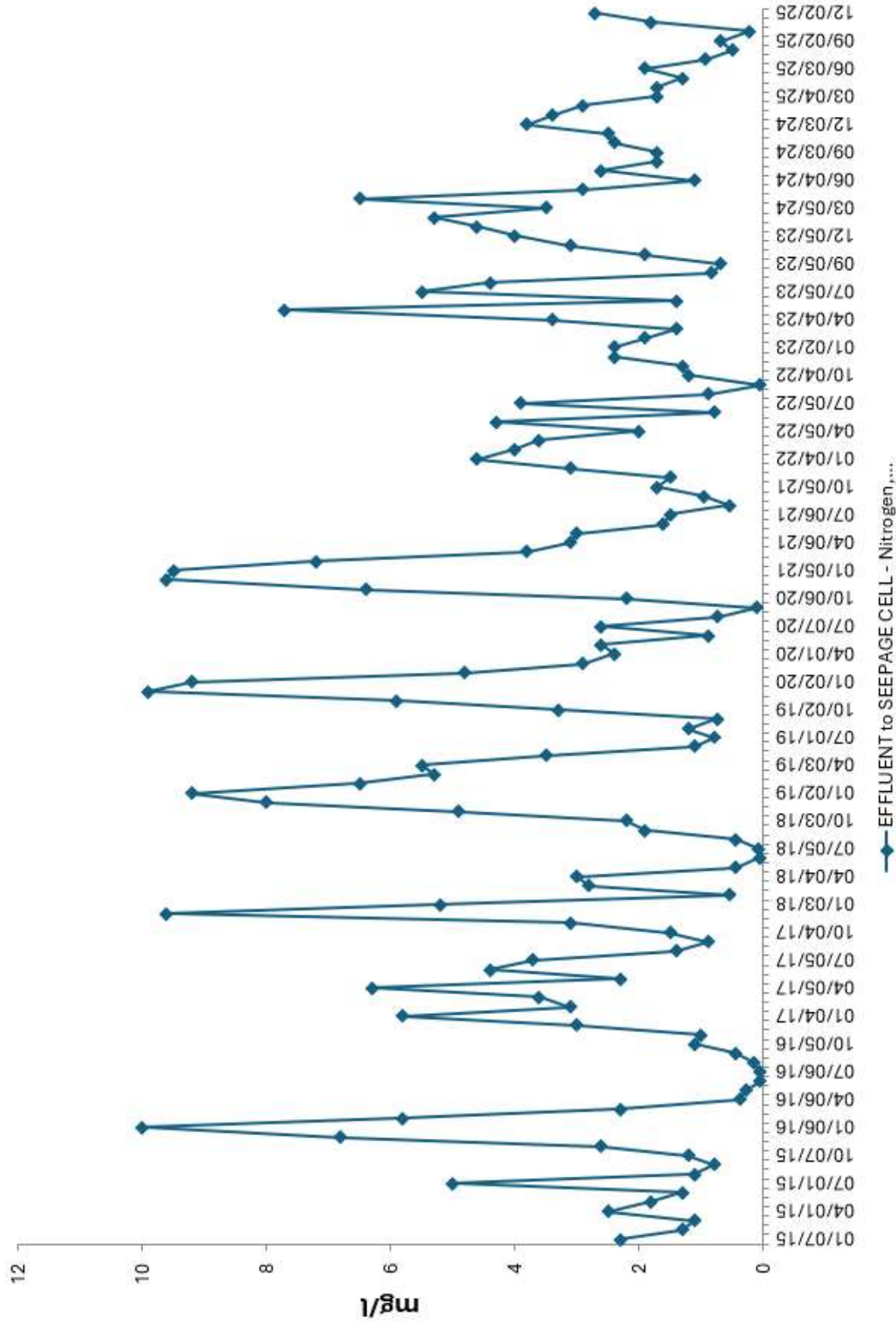
Wyocena WWTF - Effluent Chloride



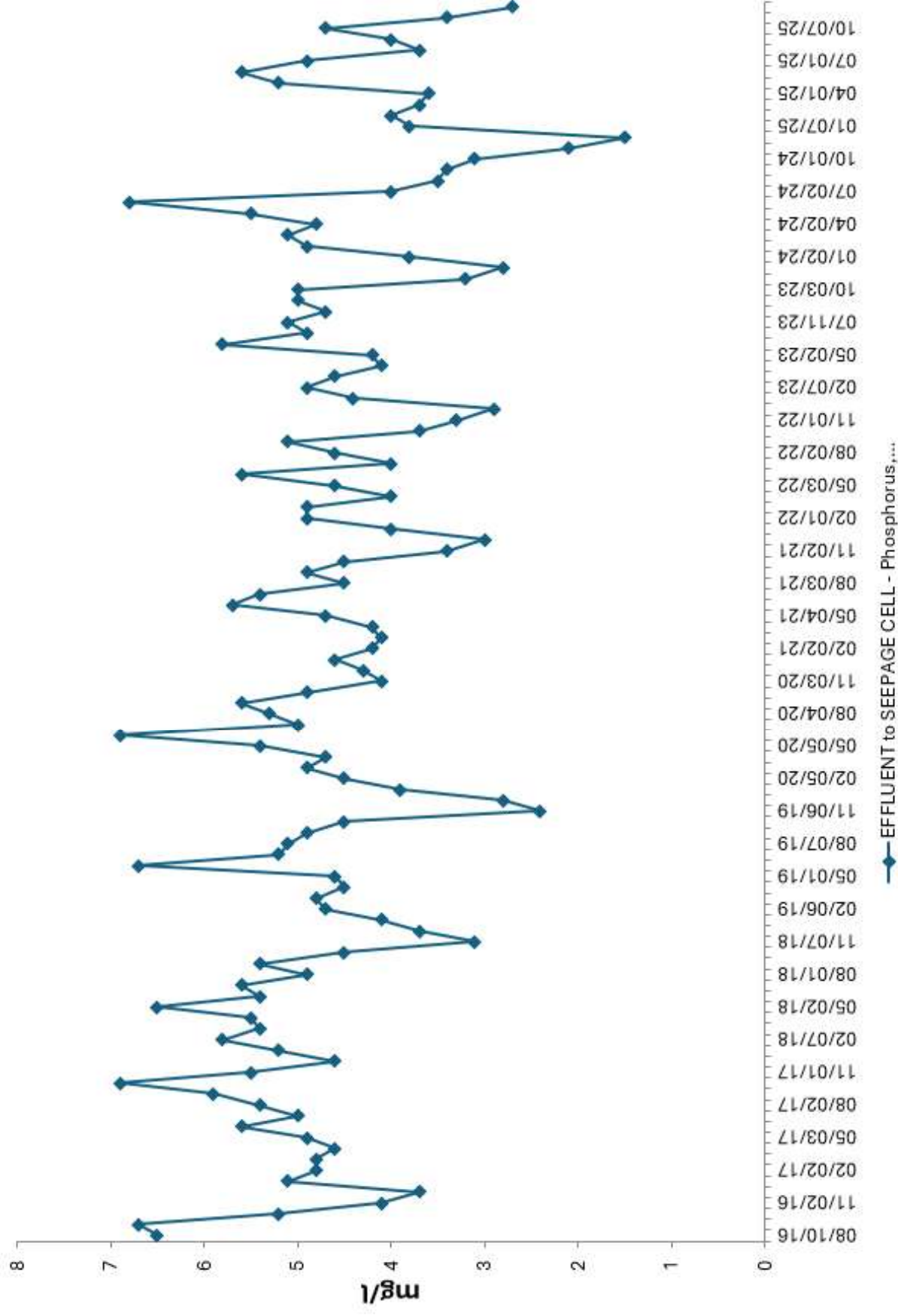
Wycena WWTF - Effluent Ammonia



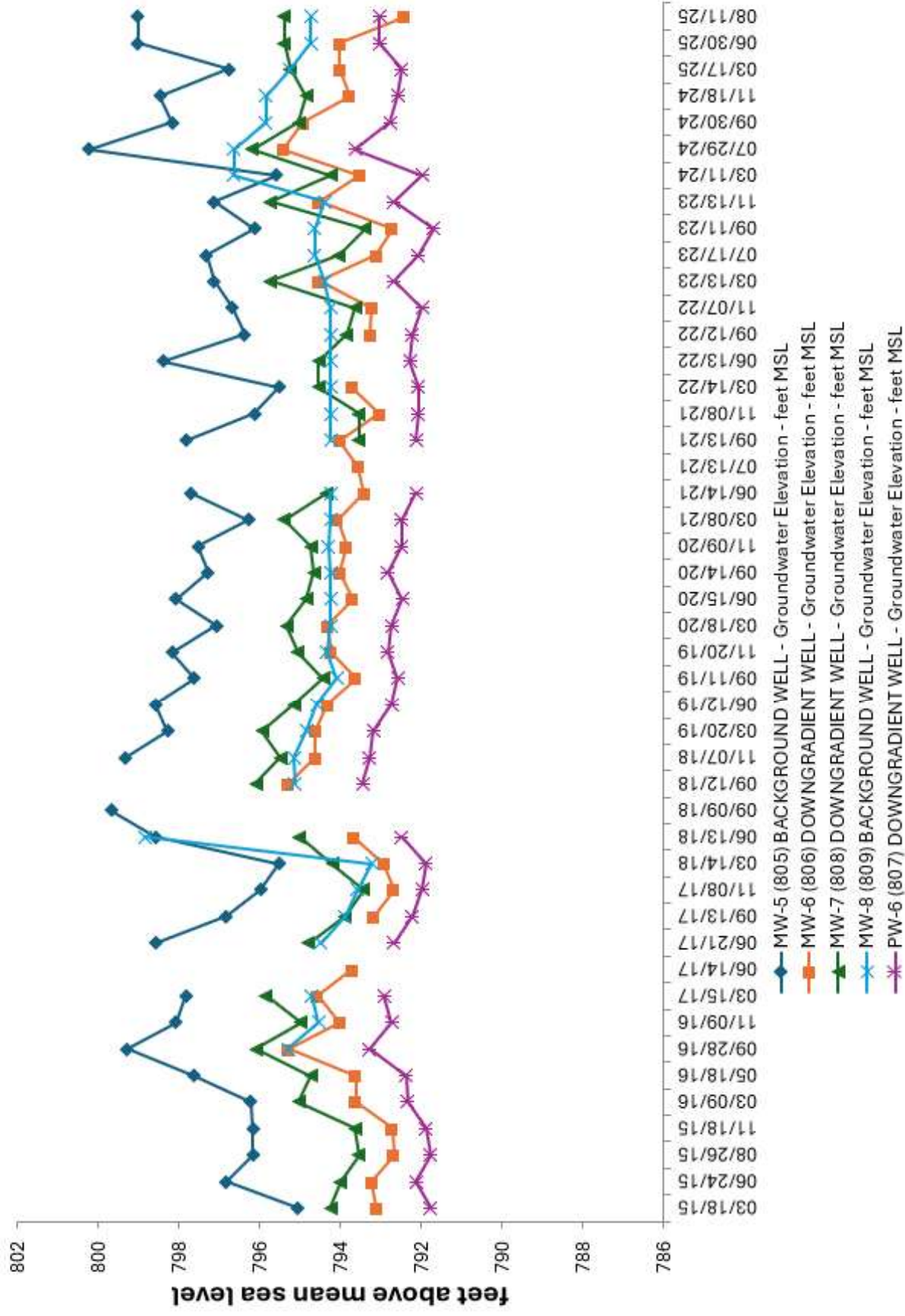
Wyocena WWTF - Effluent Nitrite + Nitrate



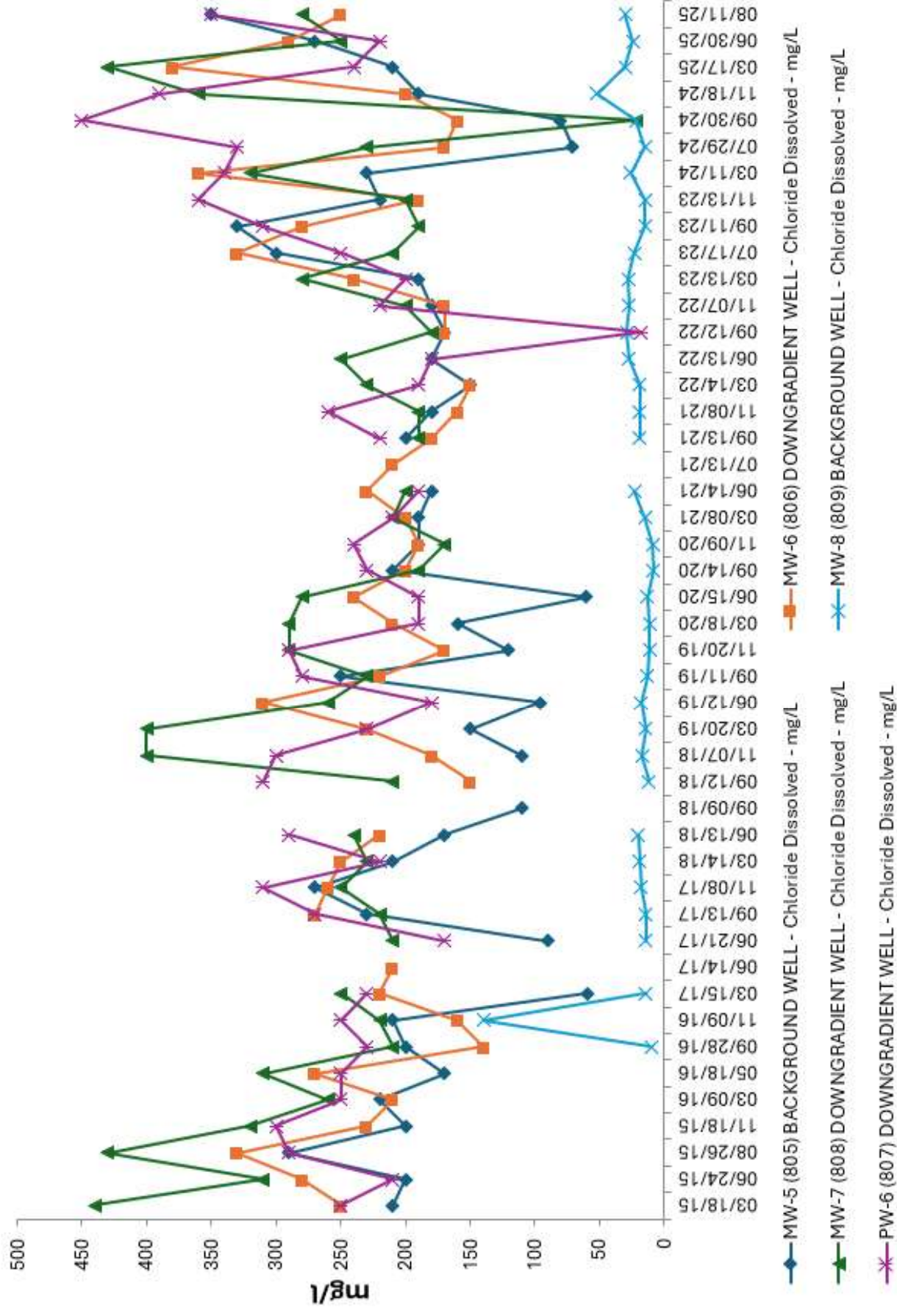
Wyocena WWTF - Effluent Phosphorus



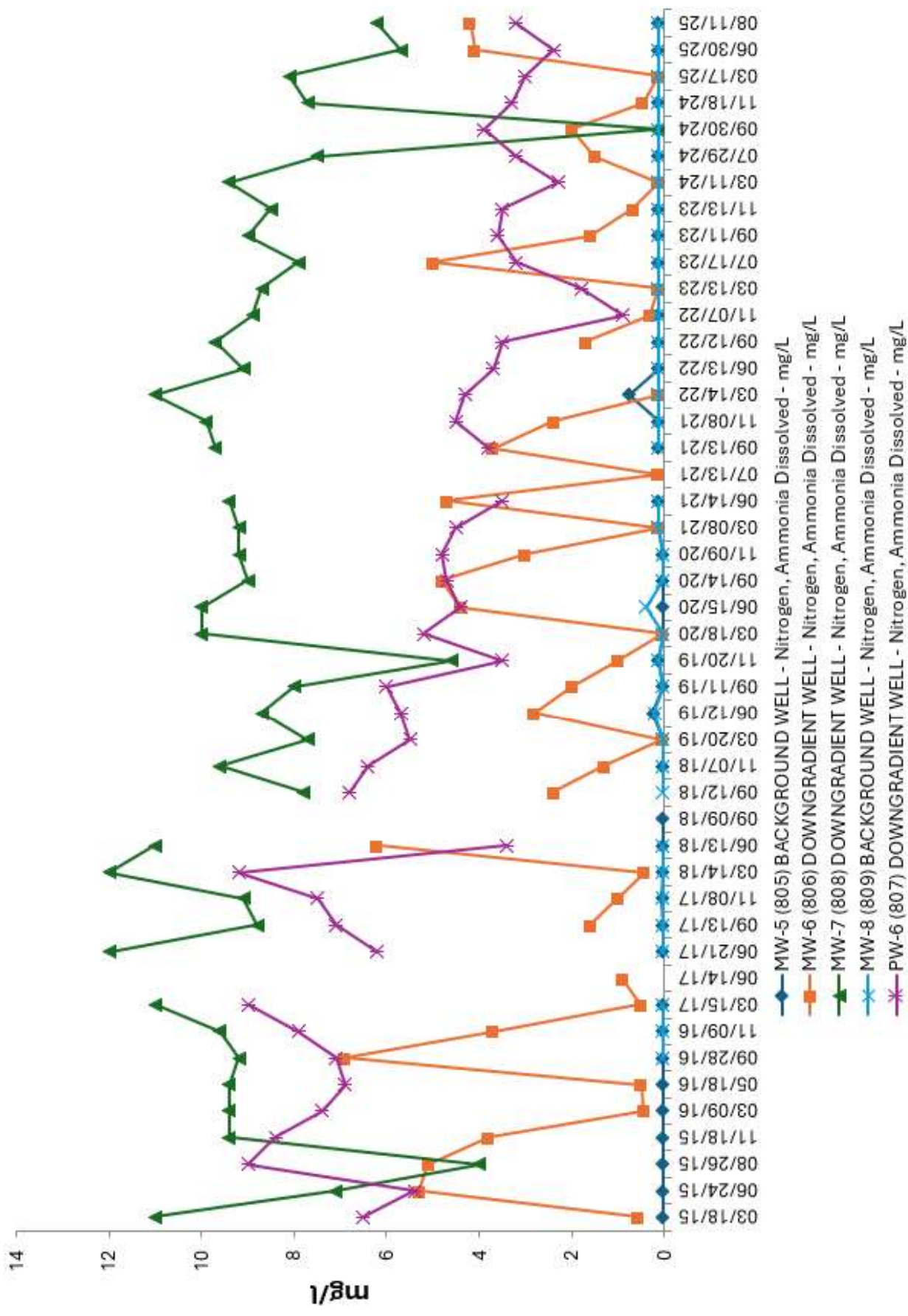
Wyocena WWTF - Groundwater Elevation



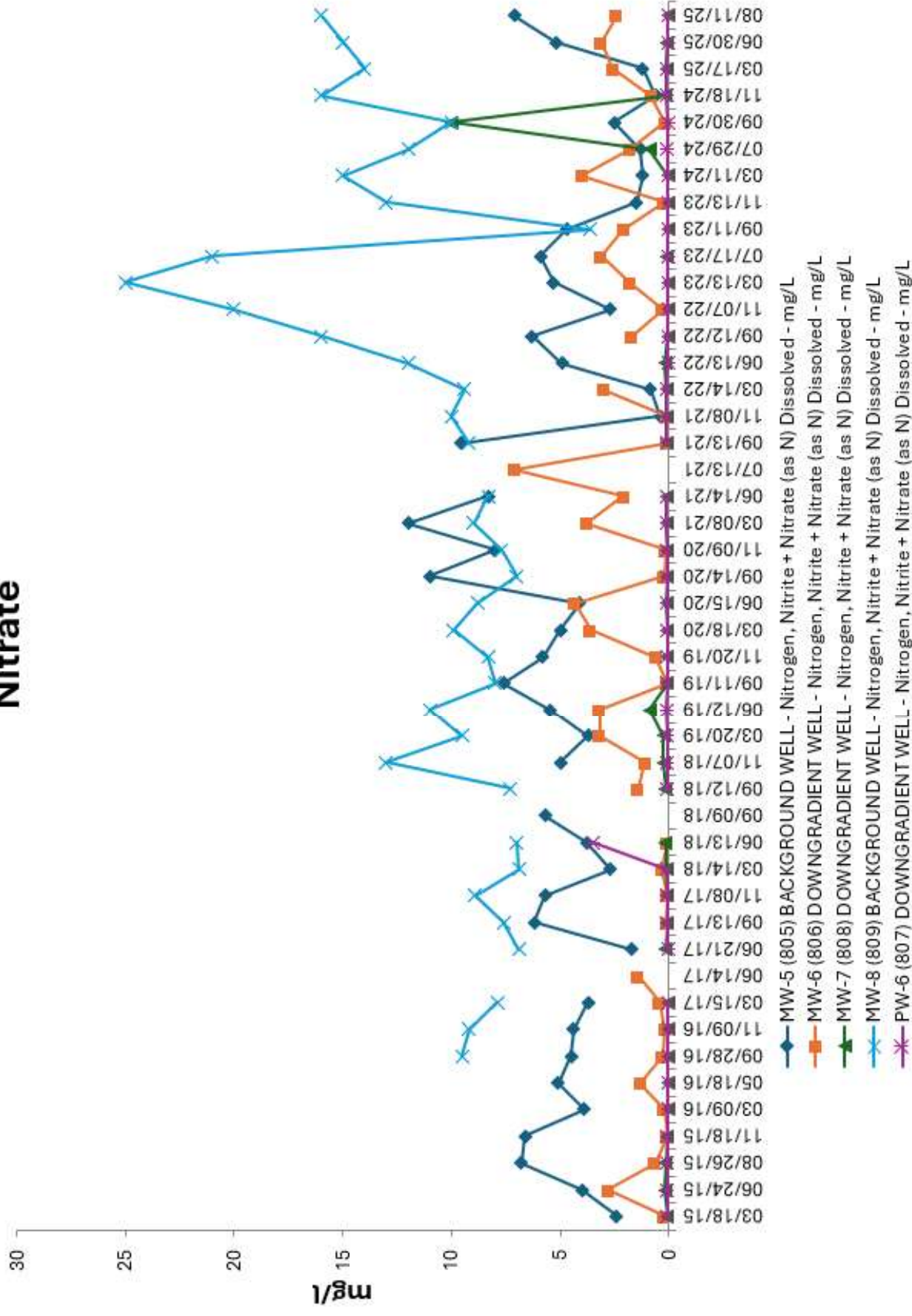
Wycena WWTF - Groundwater Monitoring Wells Chloride



Wyocena WWTF - Groundwater Monitoring Wells Ammonia

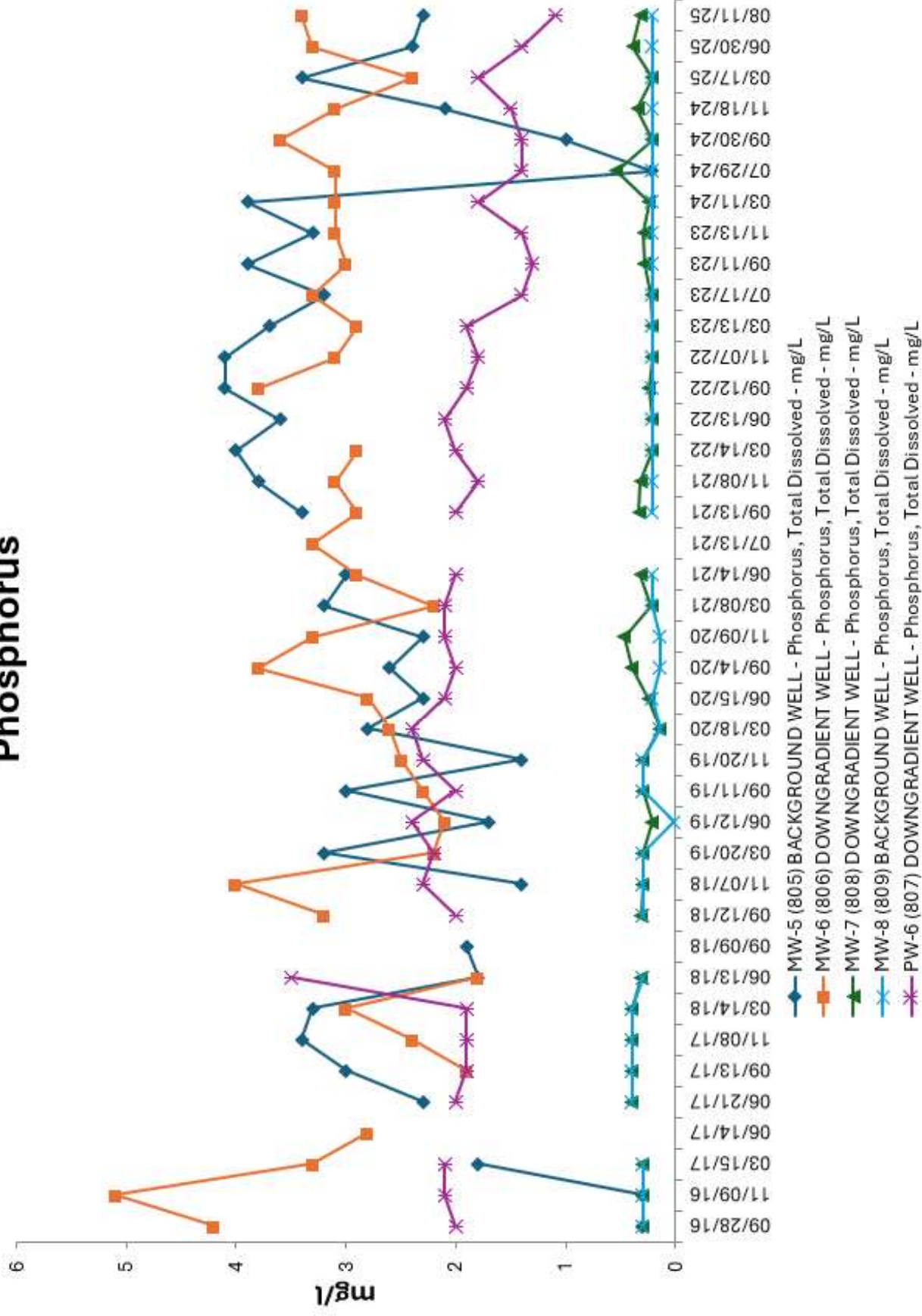


Wyocena WWTF - Groundwater Monitoring Wells Nitrite + Nitrate



Wyocena WWTF - Groundwater Monitoring Wells

Phosphorus



Wyocena WWTF - Groundwater Monitoring Wells Total Dissolved Solids

