

A Guide to Discharge Monitoring Reports

Frequently Asked Questions (FAQ) June 1, 2023

BACKGROUND

Discharge Monitoring Reports (DMRs) are reports submitted by permitted facilities that contain the results of self-monitoring for wastewater and industrial stormwater facilities as required by National Pollutant Discharge Elimination System (NPDES) permits and some Water Quality Management (WQM) permits. These reports are completed and submitted periodically to the Department of Environmental Protection (DEP) and other agencies such as river basin commissions, typically monthly, quarterly, semiannually, or annually. Except for conditions that meet requirements of the NPDES Electronic Reporting Rule ([eReporting Rule](#)), and approved by DEP, DMRs are required to be submitted electronically through DEP's GreenPort website (<https://greenport.pa.gov/>). In limited cases, DMRs may be submitted on paper and these facilities should follow monitoring and reporting instructions as required within their permit. General information contained in this document applies to electronic DMR reporting.

For further details about electronic reporting, including step-by-step instructions and troubleshooting, please see the [electronic DMR \(eDMR\) User Guide](#), available on DEP's website at www.dep.pa.gov/eDMR.

GENERAL APPLICABILITY

FAQ #1: Who must submit DMRs?

Any facility that has been issued a permit that requires the reporting of sample results must submit DMRs using a format or process established by the DEP. This generally includes sewage treatment plants and industrial facilities with a wastewater or stormwater discharge to surface waters. DMRs may also be required for WQM permits with land application of effluent. Facilities with an active permit, even if not currently discharging or constructed, must submit DMRs.

FAQ #2: Where are DMRs submitted?

DMRs must be submitted electronically through DEP’s GreenPort. See DEP’s website at www.dep.pa.gov/eDMR for information regarding eDMRs. If the submission cannot be completed electronically, a paper DMR must be submitted to The DEP Regional office that issued the permit.


FAQ #3: When are DMRs due?

In most cases, DMRs must be received by DEP by the 28th day of the month following the monitoring period. For example, a September monthly DMR (monitoring period of September 1st to September 30th) must be received by October 28th. Annual Chesapeake Bay reporting is due November 28th each year. Different due dates may apply for WQM permits.

FAQ #4: What if a DMR is submitted late?

It is a violation of the NPDES permit if a DMR is not received by the required due date. If an eDMR is submitted late, the eDMR system will automatically generate a non-compliance event. If submitted on paper, the permittee must include an explanation for the late submittal on the supplemental Non-Compliance Reporting Form (3800-FM-BCW0440) and send it in with the DMR. DEP may take escalating compliance actions to deal with chronic late submissions, up to and including penalties or revocation of the permit.

Example Non-Compliance Report for Late eDMR Submission:



3800-FM-BCW0440 12/2016
pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

NON-COMPLIANCE REPORT

Facility Name: ANYTOWN TWP WWTP Begin Date: 01/01/2023 End Date: 01/31/2023
 County: Anytown Township, Any County Municipality: Municipal WWTP Permit Number: PA0000000

Violation of Permit Effluent Limitations
 No Permit violations found

Sanitary Sewer Overflows and Other Unauthorized Discharges*
 No Unauthorized discharge violations found

Other Permit Violations*

Non-Compliance ID	Non-Compliance Type	Sampling Point	Parameter	Reported Value	Permit Limit	Comments
#####	Late DMR Submission					DMR was submitted late due to issues with staff turnover. Paper DMR was submitted to the regional office on 4/22/2023.

Comment Details

Comments	Operator Name	Operator Certification Number	Operator Contact Number
	Responsible Official	XXXX	(555)555-5555

SUBMISSION CONFIRMATION:
 *Pursuant to the Pennsylvania Electronic Transactions Act - Act 69, effective January 15, 2002, you are about to engage in an electronic transaction with the Commonwealth of Pennsylvania. You are submitting official information. You certify under penalty of law that this document and all attachments were prepared under your direction or supervision in accordance with a system designed to assure that qualified personnel gather and evaluate the information submitted. Based on your 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 your knowledge and belief, true, accurate and complete. You are aware that any false statement may be subject to substantial civil and criminal penalties, including 18 P.S. section 4904 (relating to unsworn falsification to authorities).

Submitted By: GreenportUserName Submitted By Full Name: Responsible Official
 Email Address: responsibleofficial@anytown.org Submitted Date: 04/22/2023

FAQ #5: Is it a violation if DMRs are not submitted?

Yes, failure to submit DMRs is a violation of the NPDES permit and associated state and federal laws. Failure to submit a DMR is considered a “significant violation” under federal rules.

FAQ #6: Do DMRs have to be signed, and if so, by whom?

Yes. As per 40 CFR 122.22(a), DMRs must be signed by a principal executive officer or an authorized agent as designated in writing by the principal executive officer. This authorization may be indicated on the eDMR registration form by granting “Certifier” account securities. This is a person who can verify the data being submitted are true and correct and were collected in accordance with the permit. Paper DMRs submitted to DEP should contain original signatures in ink. Submitting an eDMR or signing a DMR that contains fraudulent data is a violation of both federal and state law and can result in severe civil and criminal penalties including fines, imprisonment, and revocation of a permit and/or an operator’s license.

FAQ #7: May computer-generated DMRs and supplemental forms be used?

In the eDMR system, DMR reports are automatically generated using the requirements of the NPDES permit. DEP strongly recommends use of DEP’s approved supplemental reports available at www.dep.pa.gov/eDMR.

FAQ #8: We are required to use the electronic DMR system. Can I log in under someone else’s Greenport account or have multiple users access a shared office Greenport account?

Everyone who uses DEP’s eDMR system must have their own unique Keystone Greenport account. Secure your login information and DO NOT log in under someone else’s account to submit data. Group accounts are also not allowed. For additional information on completing eDMRs, including how to create a unique Keystone Greenport account for each user, please refer to the eDMR User Guide (www.dep.pa.gov/eDMR).

FAQ #9: My facility has not yet been constructed but my permit is issued. Do I need to submit DMRs?

Yes. All permittees with an active permit must submit DMRs even if the facility is not discharging or constructed. For more information, please see the discussion in FAQ #10 on “No Discharge” and NODI codes.

FAQ #10: Does the DMR need to be submitted if a sample could not be collected?

Yes. All permittees with an active permit must submit DMRs even if the facility was not discharging or constructed. DMRs must be submitted according to the reporting requirements in the permit. If there was no discharge for the entire reporting period, check the “No Discharge” box. If your permit allows for representative outfall sampling, the No Data Indicator (NODI) code “GG” should be used for the remaining non-representative outfalls, rather than “No Discharge.” See the discussion in FAQ #10 for more information.

FAQ #11: How should I report no discharge or missed samples?

If there was no discharge at all from an outfall during the monitoring period, check the “No Discharge” box on the eDMR.

If data are not available for a specific parameter for the entire monitoring period (e.g., a nitrogen sample was missed, or chlorine was not being used) do not leave the DMR blank. Instead, report one of the following NODI codes that apply to your situation; include an explanation with the DMR, as appropriate.

- E** Samples or results are not available due to analytical equipment failure, because a sample collection was overlooked, or samples could not be collected or analyzed (e.g., exceeded hold time) for the parameter during the reporting period. Use of this NODI code results in a violation.
- FF** No Data, not covered by NODI codes “E” or “GG.” Use in extenuating circumstances where the reason for the absence of data is not covered by NODI codes “E” or “GG.” Use of this NODI code results in a violation.
- GG** If the permit requires sample collection and analysis only under certain conditions and those conditions were not met during the monitoring period. This includes non-representative outfalls. Use of this NODI code does not result in a violation.

Note: When the “E” and “FF” NODI codes are used, a comment explaining the violation is required and the Non-Compliance Reporting Form ([3800-FM-BCW0440](#)) must accompany the DMR.

FAQ #12: My facility’s permit limits have changed in the middle of a monitoring period. What am I required to monitor and report?

The permit limits in effect at the end of the monitoring period are the limits that will be used for compliance assessment. Samples should be taken in accordance with those limits.

Example – A facility’s permit requires annual reporting for Total Nitrogen. In November, a permit renewal is issued, effective December 1st of that year. The permit renewal now includes annual reporting for E. Coli as well as Total Nitrogen. The permittee must also sample for E. Coli during the month of December and include results on the annual report for that year. If no E. Coli sample is taken, a NODI code would be reported for that parameter.

FAQ #13: What analysis and parameters are covered by accredited versus registered labs? What is the difference between accredited and registered labs?

The differences between accredited and registered labs are detailed in the [25 Pa. Code Chapter 252](#) environmental laboratory accreditation regulations. Wastewater facilities, including industrial wastewater treatment facilities, that test or analyze and report results for the 25 parameters listed in [Chapter 252.6\(f\)](#) and register with the DEP, are deemed to have accreditation-by-rule. Testing or analysis of all other parameters must be performed by an environmental laboratory accredited for each parameter. A wastewater facility lab that conducts both accredited-by-rule parameters and accredited parameters must apply for and receive accreditation. Searchable lists of registered labs and labs accredited for specific parameters (analytes), whether a facility lab or a commercial lab, can be accessed on the [Laboratory Reports page](#). To register or apply for accreditation or for more information, see the DEP Bureau of Laboratory’s [accreditation program page](#).

FAQ #14: Must all samples taken of the treatment plant's effluent be reported on the DMR?

All samples collected manually (e.g., grab), via composite sampling, or through continuous monitoring at compliance monitoring locations (e.g., an outfall) and analyzed using a method approved by the United States Environmental Protection Agency (EPA) ([40 CFR § 136](#)) at a laboratory accredited by or registered with DEP under [25 Pa. Code Chapter 252](#) for parameters listed in the permit must be reported on the DMR and factored into the calculations, even if these exceed the minimum sampling frequency required by the permit. For example, if the permit requires two fecal coliform samples per month and the facility has three samples analyzed, all three samples must be included in the calculation of the required statistical base (likely geometric mean for fecal coliform) and reported. Additionally, if a sample is split and sent to different laboratories for analysis, all analyzed results must be included in the calculations. Invalid samples, such as those that exceed holding times, should not be included.

FAQ #15: What if a sample is taken at a compliance monitoring location but not analyzed?

If a sample is taken at a compliance monitoring location but not analyzed (due to an issue at the lab, lost sample, etc.), it should not be included in the reported sampling frequency, nor in any calculations. The reason it was not analyzed should be included with the DMR submission as a comment or attachment. A non-compliance event will result if the sampling frequency is less than the permitted requirement.

FAQ #16: What if there is a violation of my permitted effluent limits or other permit conditions?

You are required to identify the violations and provide an explanation of what caused the violations and how the facility is correcting the situation that caused the violations. In the eDMR system, effluent violations are identified automatically, and the permittee must complete and acknowledge the Non-Compliance section of the eDMR.

Under [25 Pa. Code § 92a.41\(b\)](#), for other permit non-compliance events causing or threatening pollution – including but not limited to sanitary sewer overflows (SSOs), spills, unauthorized bypasses, or other unauthorized discharges or pollution incidents – permittees must comply with the immediate oral notification requirements of [25 Pa. Code § 91.33](#) (relating to incidents causing or threatening pollution). Oral notification is required as soon as possible, but no later than four hours after the permittee becomes aware of the incident causing or threatening pollution.

A written submission must also be provided within five days of the time the permittee becomes aware of the incident causing or threatening pollution and the submission must conform to the requirements of [40 CFR § 122.41\(i\)\(6\)](#). Submission of the electronic Non-Compliance Form using the eDMR system can be used to meet the 5-day written notification requirement of incidents but cannot be used to meet the immediate oral notification requirement. An additional report on the incident or plan of pollution prevention measures may also be required under [25 Pa. Code § 91.34](#) (relating to activities utilizing pollutants). Please refer to your permit for a full explanation of reporting requirements and to the [eDMR User Guide](#) for instructions on submitting the Non-Compliance Form ([3800-FM-BCW0440](#)) electronically.

FAQ #17: How should a malfunction of sampling equipment or analytical instrument be resolved and reported?

Instrument reliability should be documented in writing through calibrations per the manufacturer's instructions. If an instrument is not 100% reliable as demonstrated through calibration, then another approved method of sampling from [40 CFR § 136](#) should be used until the instrument can be repaired or replaced. As indicated above, all samples collected and analyzed using an EPA-approved method must be reported even if it results in a permit violation. If equipment or instrument malfunction is suspected to be the cause of a permit violation, it should be reported as such on the Non-Compliance Reporting Form ([3800-FM-BCW0440](#)) as directed above.

FAQ #18: What types of values are typically reported on DMRs?

Permits generally include limits on the concentration or amount of pollutants that can be discharged to waters of the Commonwealth. Permit limits represent the minimum or maximum concentration or amount of a pollutant that may be discharged over a specific period of time. "Statistical base" is the term used to describe the calculation completed to report your self-monitoring data. Below are common statistical bases and general definitions.

- Monthly average – also referred to as "average monthly," this is the arithmetic mean of all results over a calendar month for a specific pollutant.
- Weekly average – also referred to as "average weekly," this is the arithmetic mean of all results over a calendar week, from Sunday through Saturday, for a specific pollutant. The maximum weekly average value for the monitoring period is reported on the DMR.
- Daily maximum – also referred to as "maximum daily," this is the highest daily or highest daily average result for a specific pollutant over the entire reporting period covered by a DMR.
- Instantaneous maximum – also referred to as "IMAX" or just "maximum," this is the maximum result obtained by a grab sample for a specific pollutant over the entire reporting period covered by a DMR. The value may differ from the maximum daily result if more than one sample is collected daily.
- Instantaneous minimum – also referred to as just "minimum," this is the minimum result obtained by a grab sample for a specific pollutant over the entire reporting period covered by a DMR.
- Geometric mean – the calculation used for reporting fecal coliform for most NPDES permits, this is the average of a set of n sample results found by taking the n^{th} root of their product, used most often for bacteria limits and results.

$$\sqrt[n]{X_1 \cdot X_2 \cdot X_3 \cdot X_4 \cdot \dots \cdot X_n}$$

Refer to FAQ #25 "How is the geometric mean calculated for reporting bacteria results?" on page 9 for more information on calculating geometric means.

FAQ #19: How should continuously monitored samples be reported on the supplemental form if more than one statistical base is required?

The parameter should be entered multiple times on the supplemental form, once for each statistical base to be calculated.

Example – The permit requires both instantaneous maximum and instantaneous minimum be reported for pH. List pH on the supplemental form twice. In the first column, include the instantaneous maximum for each day. In the second column, include the instantaneous minimum for each day.

FAQ #20: May a permittee retain submitted DMRs, supplemental forms, and other required records electronically without retaining paper copies and still meet permit requirements?

Yes. Electronic records must be immediately available for inspection and conversion to hard copy format on demand. If electronic records will be maintained in lieu of hard copies, then the electronic records should be saved in at least two separate locations. For example, if a permittee decides to maintain only electronic records, they should be saved on the computer hard drive and on another media type such as disc, external hard drive, or cloud service. In all circumstances, the permittee is solely responsible for maintaining all records necessary to comply with the permit. Per 40 CFR § 122.41(j)(2), records must be kept on-site for a minimum of three (3) years, or five (5) years for sewage sludge (biosolids) use and disposal activities.

FAQ #21: Who should be contacted if errors are noticed on the eDMR form?

If the monitoring requirements that are displayed on the eDMR forms are not correct, please contact DEP's Helpdesk at 717-787-HELP (4357) immediately. Do not submit an eDMR with incorrect monitoring requirements.

FAQ #22: Can a mistake be corrected on a submitted DMR?

Yes. Submitted eDMRs can be corrected by revising the eDMR in GreenPort; instructions for doing so can be found in the [eDMR User Guide](#) at www.dep.pa.gov/eDMR. DEP cannot delete or reset a submitted eDMR. If data is entered on the wrong report, the report should be revised with the correct data when it becomes available. For instance, if a facility enters May data on the June report, the June report cannot be reset to blank/unsubmitted. When the June data becomes available, the existing report should be revised with the June data when those sample results are available.

FAQ #23: Who should be contacted if there are other questions about DMRs?

For additional questions not covered in this document, contact the Clean Water Program, Operations Section, of the regional DEP office that issued the permit. DEP regional contact numbers are:

Southeast Region – 484-250-5900

Northcentral Region – 570-327-3636

Northeast Region – 570-826-2511

Southwest Region – 412-442-4000

Southcentral Region – 717-705-4700

Northwest Region – 814-332-6945

For questions about applying to use the eDMR system, completing an eDMR, or problems encountered while using eDMR, contact the DEP Helpdesk at 717-787-HELP (4357).

DISCHARGE MONITORING REPORTS - CALCULATIONS

The following section provides answers to some common questions about calculating values for reporting on DMRs. In most cases, DEP’s Daily Effluent Monitoring Form ([3800-FM-BCW0435](#)) supplemental form completes these calculations for you; its use is highly recommended.

FAQ #24: How should statistical values be rounded for reporting purposes?

Statistical values reported on the DMR should be rounded to the same number of decimal places as the limit for the parameter in the permit. If the permit does not contain a limit but requests monitoring only, statistical values for concentration results should be rounded to the maximum number of decimal places in the data set as reported by the laboratory or the instrument used for analysis. If mass loads must be reported and there is no limit, round statistical values to the nearest whole number unless the calculated number is less than one, in which case the value should be rounded to one significant figure (e.g., 0.1, 0.05). If the number ends with 1, 2, 3, or 4, then round down. If the number being rounded ends with 5, 6, 7, 8, or 9, round the number up.

Example 1 – A permit includes an average monthly limit of 3.0 mg/L for ammonia-nitrogen with weekly monitoring. The results for a monitoring period are 2.10 mg/L, 3.52 mg/L, 2.71 mg/L, and 3.56 mg/L. The average value is 2.9725 mg/L. The result should be “rounded up” and reported as 3.0 mg/L on the DMR to match the number of decimal places in the permit limit. If there was no permit limit, the result should be reported as 2.97 mg/L since two decimal places were reported by the laboratory.

Example 2 – A permit includes an average monthly mass loading limit of 100 lbs./day for total suspended solids (TSS) with monitoring twice monthly. The TSS concentration results for a monitoring period are 15 mg/L and 5 mg/L, with average flows on the days of sampling of 1.0 million gallons per day (MGD) and 1.5 MGD, respectively. The mass load for the first sample is 125.1 lbs./day, and the load for the second sample is 62.55 lbs./day. The average of the two mass loads is 93.825 lbs./day. Report the value 94 lbs./day on the DMR since the limit is written as a whole number.

FAQ #25: How is the geometric mean calculated for reporting bacteria results?

For those currently calculating geometric mean manually, an “Operator Tools” spreadsheet is available to calculate geometric mean, which can be found on the DEP Wastewater Operator Resources webpage at [Wastewater Operator Resources \(pa.gov\)](#).

A geometric mean is obtained by calculating the n^{th} root of the product of a group of n values. Use the following equation:

$$\sqrt[n]{X_1 \cdot X_2 \cdot X_3 \cdot X_4 \cdot \dots X_n}$$

Where n = the number of analysis results and X_n = the value of the n^{th} analytical result. Note: If any value of X_n is zero, substitute “1” for the calculation.

For example, five samples were analyzed; their results were 20, 300, 400, 500, and 0. The geometric mean is calculated as:

$$\sqrt[5]{20 \cdot 300 \cdot 400 \cdot 500 \cdot 1} = \sqrt[5]{1,200,000,000} = (1,200,000,000)^{1/5} = 65$$

Report all “non-detect” (e.g., < 2) and “too numerous to count” (TNTC) (e.g., > 2,000) results on DMR supplemental forms as reported by the laboratory. Do not report “TNTC” on supplemental forms, but instead report a value qualified with the “>” symbol. Where a data set includes one or more “non-detect” and/or TNTC results, calculate the geometric mean by ignoring qualifying symbols, but report the value with the symbol.

If a data set includes both “>” and “<” qualifiers, the “>” qualifier takes precedence for reporting. Contact the laboratory for all “non-detect” and TNTC results to obtain the following information: maximum volume filtered for “non-detect” results, and minimum volume filtered for TNTC results and a calculated “>” value using that volume. Discuss what actions the laboratory will be taking to ensure that the facility does not continue to receive “non-detect” and TNTC results. Note that DEP considers a DMR with reported values qualified by the “>” symbol for bacteria parameters to be non-compliance.

Example 1 – Four results are determined: < 2, 10, 20, and 30. The geometric mean should be reported as: $< (2 \cdot 10 \cdot 20 \cdot 30)^{0.25} = < 10$. Specify the maximum volume filtered for the < 2 result in the DMR comments.

Example 2 – Three results are determined: < 2, 1,000, and > 2,000. The geometric mean should be reported as: $> (2 \cdot 1,000 \cdot 2,000)^{0.333} = > 158$.

FAQ #26: How is the “10% rule” for fecal coliform determined?

The “10% rule,” displayed in eDMR as “90% of samples,” is determined within the eDMR system by finding the number of samples that constitute 90% of the sampling results performed during the reporting period. No more than 10% of samples may exceed the maximum value.

Example 1 – 20 samples are collected and analyzed. The two highest samples can be excluded when reporting. If the highest of the remaining 18 samples is over the maximum value, it is a violation.

Example 2 – Four samples are collected and analyzed. Since excluding one of these samples results in 25% of samples excluded, all four samples must be included in the maximum determination.

FAQ #27: How is the weekly average calculated for reporting on DMRs?

A weekly average is calculated by the sum of all daily discharges (concentrations or loads) measured during a calendar week (i.e., Sunday to Saturday), divided by the number of daily discharges measured during that week. Report the maximum weekly average value on DMRs.

Example – Seven samples were collected and analyzed for the month of June. One of these samples was reported as “ND” or “non-detect”. The laboratory’s minimum detection limit is 0.05 mg/L so the ND result is reported as <0.05 mg/L. Additionally, the minimum detection limit of 0.05 is used in the calculation of the average. Then, add all of the sampling results together for that parameter for the week and divide by the number of samples for the week. Qualifiers like less-than signs are ignored for the calculation but are carried through to the reported result.

Parameter		Flow	CBOD5	
Stage		1	1	
Day	Date	MGD	Q	mg/L
Sun	6/11/2023	1.0		0.1
Mon	6/12/2023	1.0	<	0.05
Tues	6/13/2023	1.0		0.52
Wed	6/14/2023	1.0		0.51
Thu	6/15/2023	1.0		0.34
Fri	6/16/2023	1.0		0.87
Sat	6/17/2023	1.0		0.6

Example: CBOD5 Week 1 Average Calculation

$$\frac{0.1+0.05+0.52+0.51+0.34+0.87+0.06}{7}$$

↓

$$0.43$$

↓

$$<0.43$$

FAQ #28: Months do not always begin on a Sunday and end on a Saturday; how should weekly average values account for this?

Weekly average values are based on a calendar week of Sunday to Saturday. The first week of the month, for reporting purposes, always begins on a Sunday, and the last week of the month always ends on a Saturday. When a week is split between two months, the weekly average value for that week will be reported with the month containing the most days of that week.

Example – November 1 is a Wednesday. The first week of November would include, for the purpose of calculating weekly averages, Sunday, October 29, Monday, October 30, and Tuesday, October 31. November 30 is a Thursday. The last week of November would include Friday, December 1 and Saturday, December 2. Therefore, five weeks would be considered for November: October 29 – November 4 (Week 1), November 5 – 11 (Week 2), November 12 – 18 (Week 3), November 19 – 25 (Week 4), and November 26 – December 2 (Week 5).

FAQ #29: How is the monthly average calculated for reporting on DMRs?

A monthly average is calculated by the sum of all daily discharges measured during a calendar month, divided by the number of daily discharges measured during the month. All samples collected and analyzed during the month must be included in the calculation.

Example – Five samples are collected and analyzed for the month of June. Three of these samples were reported as “ND” or “non-detect”. The laboratory’s minimum detection limit is 0.05 mg/L so the ND results are reported as <0.05 mg/L. Additionally, the minimum detection limit of 0.05 is used in the calculation of the average. Then, add all of the sampling results together for that parameter for the month and divide by the number of samples for the month. Remember that qualifiers like less-than signs are ignored for the calculation but are carried through to the reported result.

Parameter			CBOD5	
Stage			1	
Week	Day	Date	Q	mg/L
1	Sun	1/1/2023		
	Mon	1/2/2023	<	0.05
	Tues	1/3/2023		
	Wed	1/4/2023		
	Thu	1/5/2023		
	Fri	1/6/2023		
	Sat	1/7/2023		
2	Sun	1/8/2023		
	Mon	1/9/2023	<	0.05
	Tues	1/10/2023		
	Wed	1/11/2023		
	Thu	1/12/2023		
	Fri	1/13/2023		
	Sat	1/14/2023		
3	Sun	1/15/2023		
	Mon	1/16/2023		
	Tues	1/17/2023		
	Wed	1/18/2023		
	Thu	1/19/2023		0.41
	Fri	1/20/2023		
	Sat	1/21/2023		
4	Sun	1/22/2023		
	Mon	1/23/2023	<	0.05
	Tues	1/24/2023		
	Wed	1/25/2023		
	Thu	1/26/2023		
	Fri	1/27/2023		
	Sat	1/28/2023		
5	Sun	1/29/2023		
	Mon	1/30/2023		0.42
	Tues	1/31/2023		

ignored for the calculation but are carried through to the reported result.

Example: Monthly Average Calculation

$$\frac{0.05+0.05+0.41+0.05+0.42}{5}$$

↓

$$0.196$$

↓

$$<0.196$$

FAQ #30: How is the average mass load calculated in terms of pounds (lbs.) per day?

Calculate the daily load in lbs./day by multiplying the daily average concentration of the parameter (in mg/L) by the flow (in MGD) on the same day and a conversion factor of 8.34. Then sum the daily loads during the reporting period (e.g., month) and divide by the number of daily loads in that period (i.e., the number of samples).

Example – A facility is required to collect two samples per month for TSS analysis and report the average monthly load. If the concentration of TSS is 10 mg/L in one sample and the 24-hour flow on the day of sampling is 1.0 MGD, the daily load is 83.4 lbs./day (i.e., 10 mg/L • 1.0 MGD x 8.34). If the concentration of TSS is < 2.0 mg/L (i.e., non-detect) in the second sample and the 24-hour flow on the day of sampling is 1.0 MGD, the daily load is < 16.7 lbs./day (i.e., 2.0 mg/L • 1.0 MGD • 8.34, using the “<” symbol for the statistical result). The average monthly load is < 50.1 lbs./day (i.e., (83.4 lbs./day + 16.7 lbs./day) / 2, using the < symbol for the statistical result).

Note: For calculating an average weekly load, sum the measured daily loads during the week (i.e., Sunday to Saturday) and divide by the number of daily loads for the week.

FAQ #31: How is the total mass load calculated in terms of pounds (lbs.)?

Some permits require facilities to report the total load, which is different than the average load. To calculate the total load for a month, sum the daily loads (i.e., daily concentration • daily flow • 8.34) for the month, then divide by the number of measured loads, and then multiply by the number of days in the month.

Example – If four weekly samples are collected during the month of May and the daily loads are determined to be 100 lbs./day, 125 lbs./day, 150 lbs./day, and 175 lbs./day, the total load would be 4,262.5 lbs., calculated as:

$$\frac{(100 + 125 + 150 + 175) \text{ lbs/day}}{4} \cdot 31 \text{ days} = 4,262.5 \text{ lbs}$$

FAQ #32: What flow should be used to determine mass loads?

This depends on the sample types and frequencies of parameters and flow as specified in the permit. For example:

- Where the sample type for the parameter is “grab” and the sample frequency for flow is “1/day,” use the instantaneous flow result (in MGD) observed at the time the grab sample is collected to calculate the mass load. If the sample frequency for flow is “continuous,” use the 24-hour totalized flow result (from 12 a.m. to 12 a.m.), if possible, to calculate the mass load.
- Where the parameter sample type is “8-hour composite” and the sample frequency for flow is “1/day,” measure flow during the eight-hour compositing period and use this flow result to calculate the mass load. If the sample frequency for flow is “continuous,” use the 24-hour totalized flow result on the day in which the eight-hour composite sample is collected.
- Where the sample type for the parameter is “24-hour composite” and the sample frequency for flow is “continuous,” the compositing period should match the flow measurement period. Ideally

this period would be 12 a.m. to 12 a.m. If this is not possible and a different period is chosen (e.g., 8 a.m. to 8 a.m.), the 24-hour composite sample result and totalized flow result should be reported on the day the compositing period ends.

Example – A composite sampler is set up at 8 a.m. on Tuesday and the last aliquot is collected at 8 a.m. on Wednesday. This composite sample should be recorded as Wednesday’s sample and the holding time for laboratory analysis begins at 8 a.m. on Wednesday.

FAQ #33: How should results below detection limits be reported and how are statistical values calculated with a data set that includes non-detect results?

Laboratories will generally have, for most parameters, a Quantitation Limit (QL) and a Detection Limit (DL). *Detection Limit* is defined in [25 Pa. Code Chapter 252](#) (relating to environmental laboratory accreditation) as “The lowest concentration or amount of the target analyte that can be identified, measured and reported with confidence that the analyte concentration is not zero.” *Quantitation Limit* is defined in Chapter 252 as “The minimum concentration or activity of the component, compound, element or isotope that can be reported with a specified degree of confidence. Typically, it is the concentration that produces a signal ten standard deviations above the reagent water blank signal.” The QL is typically a higher value than the DL. The QL is sometimes referred to as the “reporting limit.”

If a facility receives a report with a parameter value listed as “non-detect,” “ND,” or qualified by a less than (<) symbol, it indicates that the laboratory has verified that the parameter value is less than the QL and is reporting the value as a “non-detect” result. For DMR reporting purposes, DEP prefers the following approach to handling non-detect results:

1. Report the actual value reported by the laboratory on supplemental reporting forms. The value reported should be the QL for non-detect results. Estimated values (i.e., values flagged with a “J” qualifier by the laboratory) should not be used for compliance purposes.

Example – Enter “<” into the Qualifier (Q) column of the Daily Effluent Monitoring Form ([3800-FM-BCW0435](#)) for non-detect results. Do not enter “<” on this form for detected results.

2. Do not report zeroes or “non-detect” for statistical values on the DMR.

Example – Use the less than (<) symbol on DMRs instead of “0” or “ND.”

3. Ignore the less than (<) symbol and calculate statistics (both concentration and load) based on detected results and the reporting limit(s) for non-detect results. Where there is at least one non-detect result in a data set, include the less than (<) symbol with the statistical result.

Example – The average statistical value for a data set with three results of < 1.0, 2.0, and < 3.0 is < 2.0 for DMR reporting purposes.

4. For reporting average values where you have all non-detect (<) results, report the result in this format on the DMR: “< QL” (where QL is the actual value as indicated by the laboratory). If the QL varies between samples, use the average QL for the period.

Example – The average statistical value for a data set with three results of < 1.0, < 2.0, and < 3.0 is < 2.0 for DMR reporting purposes.

5. For reporting maximum daily values on DMRs, report the maximum value for the period, including the value of the QL(s) for non-detects. If the maximum value was a non-detect, report the QL in this format: “< QL.”

Example – The maximum daily statistical value for a data set with three results of < 1.0, 2.0, and < 3.0 is < 3.0 for DMR reporting purposes.

If the permit requires different procedures, adhere to permit requirements.

FAQ # 34: How are concentrations and loads calculated for Total Nitrogen?

The concentration of Total Nitrogen (TN) in a sample is determined by the sum of concentration results for Nitrite-Nitrogen (NO₂-N), Nitrate-Nitrogen (NO₃-N), and Total Kjeldahl Nitrogen (TKN). Where one of the components of TN has a result of non-detect, ignore the less than (<) symbol for the calculation, but include it in statistical results.

For the purpose of certifying and verifying TN credits under Pennsylvania’s Nutrient Trading Program (see 25 Pa. Code § 96.8), the current version of DEP’s Annual Chesapeake Bay Spreadsheet **must** be used. Here, the less than (<) symbol for total monthly loads is also ignored. For more information and instructions, visit www.dep.pa.gov/nutrient_trading.

Note: TKN results should, by definition, be higher than ammonia-nitrogen (NH₃-N). However, in rare instances when NH₃-N results are higher than TKN due to laboratory analysis variance, DEP recommends using the NH₃-N result to calculate TN.

Example – A permit requires that two samples be collected per month for TN. The permit requires that the total monthly load be reported on the DMR. Sample 1 is collected on a day in June in which the average flow is 0.5 MGD. Sample 1 is analyzed, and the following results are obtained: NO₂-N + NO₃-N = < 1.0 mg/L, TKN = 10 mg/L. Sample 2 is collected on a different day in June in which the average flow is 0.6 MGD. Sample 2 is analyzed and the following results are obtained: NO₂-N + NO₃-N = 2.0 mg/L, TKN = < 5.0 mg/L.

The relevant statistical values for TN are calculated as follows:

$$\begin{aligned} \text{Sample 1 Concentration: } &< 11.0 \text{ mg/L} \\ &< 1.0 \text{ mg/L} + 10 \text{ mg/L} = < 11.0 \text{ mg/L} \\ \text{Sample 1 Load: } &< 45.9 \text{ lbs./day} \\ &< 11.0 \text{ mg/L} \times 0.5 \text{ MGD} \times 8.34 = < 45.9 \text{ lbs./day} \\ \text{Sample 2 Concentration: } &< 7.0 \text{ mg/L} \\ &2.0 \text{ mg/L} + < 5.0 \text{ mg/L} = < 7.0 \text{ mg/L} \\ \text{Sample 2 Load: } &< 35 \text{ lbs./day} \\ &< 7.0 \text{ mg/L} \times 0.6 \text{ MGD} \times 8.34 = < 35 \text{ lbs./day} \\ \text{Average Monthly Concentration: } &< 9.0 \text{ mg/L} \\ &(< 11.0 \text{ mg/L} + 7.0 \text{ mg/L}) / 2 = < 9.0 \text{ mg/L} \\ \text{Total Monthly Load: } &< 1,214 \text{ lbs.} \\ &(< 45.9 \text{ lbs./day} + < 35 \text{ lbs./day}) / 2 \times 30 \text{ days in June} = < 1,214 \text{ lbs.} \end{aligned}$$