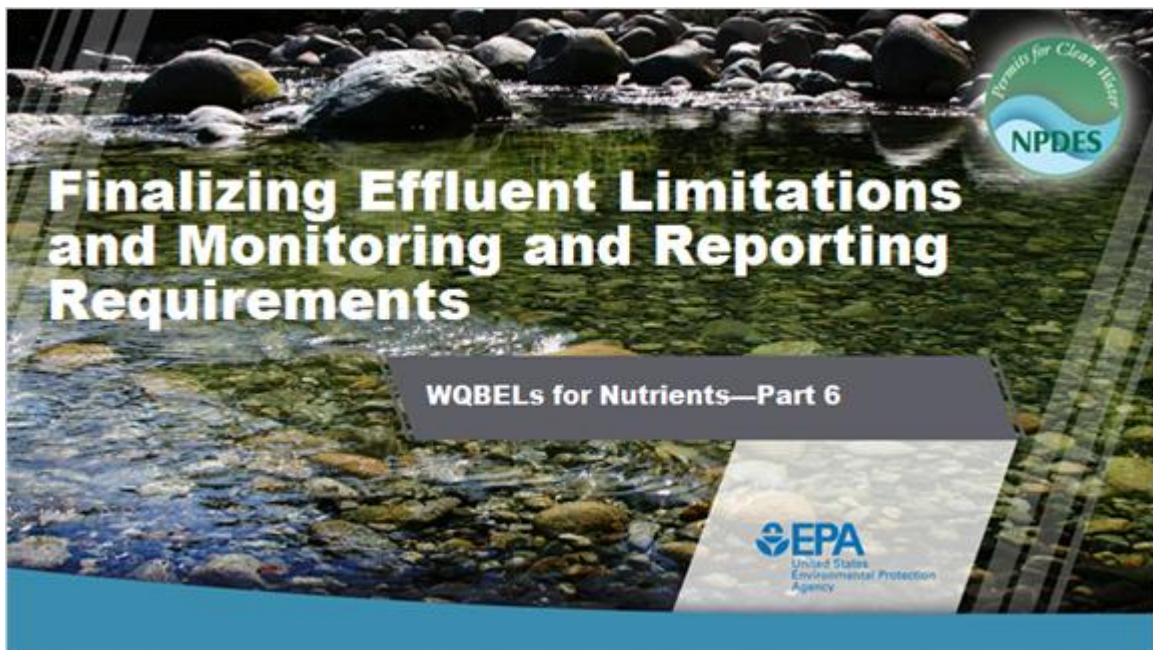


Finalizing Effluent Limitations and Monitoring and Reporting Requirements

1. Part 6: WQBELs for Nutrients-Part 6

1.1 Finalizing Effluent Limitations and Monitoring and Reporting Requirements



Notes:

Welcome to this presentation on effluent limitations for nutrients in National Pollutant Discharge Elimination System, or NPDES, permits.

This presentation is the last part of a six part section of the training on establishing water quality based effluent limitations or WQBELs for nutrients. This training is sponsored by the U.S. Environmental Protection Agency's Water Permits Division.

In this presentation we will finalize our permit and discuss some important monitoring and reporting considerations for nutrients.

Before we get started with the presentation, let's introduce our speakers, take care of a housekeeping item, and review where we are within the training series.

1.2 Presenters

Presenters

- **Nizanna Bathersfield**
Water Permits Division
US Environmental Protection Agency
Washington, DC
- **Frank Sylvester**
Water Permits Division
US Environmental Protection Agency
Washington, DC

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Notes:

Your speakers for this presentation are Nizanna Bathersfield and Frank Sylvester. Both speakers are with the Water Permits Division of the US Environmental Protection Agency in Washington, DC.

Now for our housekeeping item. I need to let you know that the materials used in this presentation have been reviewed by USEPA staff for technical accuracy; however, the views of the speakers are their own and do not necessarily reflect those of USEPA. NPDES permitting is governed by the existing requirements of the Clean Water Act and USEPA's NPDES implementing regulations. These statutory and regulatory provisions contain legally binding requirements. The information in this presentation is not binding. Furthermore, it supplements, and does not modify, existing USEPA policy, guidance, and training on NPDES permitting. USEPA may change the contents of this presentation in the future.

Let's take a look at where we are in the overall training series.

1.3 Addressing Nutrient Pollution in NPDES Permits

Section	Parts
Introduction to Nutrients and NPDES Program	Part 1 — Overview of Nutrient Pollution and NPDES Permitting Part 2 — Overview of Effluent Limitations for Nutrients
WQBELs for Nutrients	Part 1 — Identifying the Applicable Water Quality Standards Part 2 — Interpreting Nutrient Criteria Part 3 — Selecting a "Reasonable Potential Analysis" Approach Part 4 — Selecting Critical Conditions and Determining the Need for WQBELs Part 5 — Calculating WQBELs Part 6 — Finalizing Effluent Limits and Monitoring Requirements
Tools for Flexibility	Part 1 — Permit Compliance Schedules and WQS Variances Part 2 — Watershed-based Permitting Part 3 — Water Quality Trading

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Notes:

This presentation is part six of the section of our training on water quality-based effluent limitations for nutrients. In parts one and two we looked at how we identified the applicable water quality standards and interpret nutrient criteria in those standards in order to use them for NPDES Permitting. In parts three, four, and five, we focused on determining the need for water quality-based effluent limits and calculating those limits.


In this presentation, we will wrap up our discussion on water quality-based effluent limits for nutrients by considering how we determine the final limits that are in place in our permit and how we establish appropriate monitoring and reporting requirements to accompany these limits. How about getting us started, Frank.

1.4 Determining Final Effluent Limitations

Determining Final Effluent Limitations




- If available, compare:
 1. WQBELs based on individual facility WLAs with
 2. WQBELs based on a TMDL or other watershed-based requirements with
 3. TBELs or other existing limitations
- Final calculated effluent limitations selected for the permit must ensure that all applicable technology and water quality standards are achieved.
- Final effluent limitations in the permit must meet **antidegradation** and **anti-backsliding** requirements



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Notes:

Okay.

After calculating all of the applicable effluent limitations we need a final check to see what limits will go in our limits table in the permit.

First, we need to check to see if any “facility-specific” water quality-based effluent limitations might be more or less stringent than limits that may have been developed based on a wasteload allocation from a total maximum daily load or watershed assessment designed to protect the receiving water or a downstream water body.


Also, we need to compare our most stringent water quality-based effluent limitations to any technology-based effluent limitations we calculated.

Ultimately, the most stringent limitations derived for each parameter using any of these approaches are the final effluent limitations for that parameter.


And last, but certainly not least, the final effluent limitations in the permit must also meet antidegradation and anti-backsliding requirements.

1.5 Antidegradation

Antidegradation




- Permit writers must consider the state's, tribe's, or territory's antidegradation policy when authorizing a new discharge or expansion of an existing discharge.
- Antidegradation policies should include implementation procedures for permit writers.



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Notes:

The antidegradation policy in a state's water quality standards requires new discharges and expansions of existing discharges to undergo an antidegradation review to determine whether those increased discharges are leading to degradation and, if so, whether that degradation is acceptable. If it is not, we might need to have more stringent requirements on the discharge from a previous permit.


We should have implementation procedures in place that show us how to apply our antidegradation policy in NPDES permits.

1.6 Anti-backsliding

Anti-backsliding




- Anti-backsliding requirements might prohibit less stringent limitations than those in the previous permit.
- Permit writers must complete an anti-backsliding analysis where new, calculated limitations would be less stringent than existing limitations.



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Notes:

Anti-backsliding requirements in the Clean Water Act and NPDES regulations may prohibit less stringent limitations than those in the previous permit.



We must complete an anti-backsliding analysis when calculating less stringent limitations than the limits in the previous permit for the same facility.

Based on the results of that analysis, we might be able to put newly calculated limits in the permit, or we might need to continue to include the more stringent limits from the existing permit.

1.7 Documenting Effluent Limitations in the Permit Record


Documenting Effluent Limitations in the Permit Record

- For TBELS, the following should be documented:
 - Applicable statutory and regulatory citations
 - Explanation of which technology standards apply
 - Method for determining the facility's production, flow, or other measures used to apply any applicable effluent limitations guidelines and standards (effluent guidelines), state treatment standards or case-by-case requirements
 - Calculation of effluent limitations (mass or concentration or both)



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Notes:

Let's take a look at how we would document our effluent limit calculations and determination of final effluent limitations in the permit record.

Where we have calculated technology-based effluent limitations, we need to document application of effluent guidelines or development of case-by-case limitations in the NPDES permit record, including in the fact sheet or statement of basis.



We should clearly identify the data and information used to determine the applicable effluent guidelines and how that information was used to derive effluent limitations for the permit. Alternatively, we should identify the rationale concluding that there are no applicable effluent guidelines for the industrial wastewater or pollutant discharge and how the available data and information were used in developing the case-by-case limitations.

The information in the record should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the NPDES permit properly incorporates effluent guidelines or how the case-by-case limitations comply with the Clean Water Act and EPA regulations.

1.8 Documenting Effluent Limitations in the Permit Record (cont.)


Documenting Effluent Limitations in the Permit Record (cont.)

- For WQBELs, the following should be documented:
 - Applicable statutory and regulatory citations
 - Explanation of “reasonable potential” analyses and process for determining applicable wasteload allocations including:
 - Selected water quality model
 - Critical conditions
 - Dilution allowance or mixing zone
 - Process used to calculate water quality-based effluent limitations (sample calculations, spreadsheets)
 - Processes might be unique to nutrients



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Notes:



Just as with technology-based effluent limitations, we need to include in the fact sheet or statement of basis the statutory and regulatory citations for water quality regulations and an explanation of the process we used to calculate effluent limitations.

This process includes any reasonable potential analysis used to determine the need for water quality-based effluent limits, water quality modeling and calculations used to determine an appropriate wasteload allocation, and the process we used to actually calculate the effluent limits from the wasteload allocation.

1.9 Documenting Effluent Limitations in the Permit Record (cont.)


Documenting Effluent Limitations in the Permit Record (cont.)

- Final effluent limitations
 - Comparison of limits based on all applicable standards
 - Summary of basis for final effluent limitations



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Notes:

Finally, we should document the selection of final effluent limitations.



Here, we should explain the underlying basis for these limits (effluent guidelines, case-by-case requirements, state performance standards, or water quality criteria) and how the final limits meet all of the applicable technology and water quality standards, including our state antidegradation policy.

Also, if we conducted an anti-backsliding analysis, we need to document that process as well.

1.10 Importance of Good Documentation


Importance of Good Documentation

- Permits involving nutrients are likely to have significant public interest
- Procedures used to develop effluent limitations might be unique to nutrients
- Documentation establishes a permanent record of the basis for effluent limitations or for decisions not to include effluent limitations in the permit
- Provides a sound basis for future modifications and permits
- Used to defend the permit in an appeal



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Notes:

By committing to good documentation, we make sure that we have established a solid, permanent record of the basis for the conditions in the permit.

- Good documentation answers the question, “What were you thinking?”
- It explains the legal basis of the permit and provides a sound basis for future modifications and future permits.

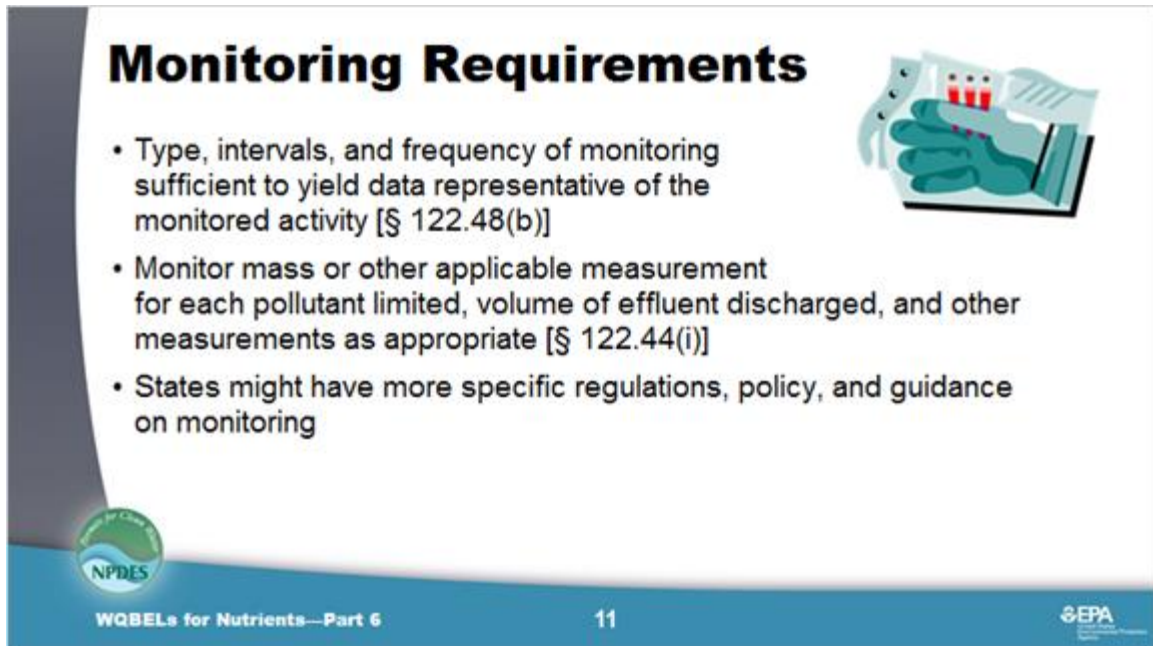
It also provides information on options for permit conditions that we might have considered, but decided not to use in the permit.

Good documentation requires us, as permit writers, to be organized and logical throughout the permit development process.

Permits involving requirements on nutrients are likely to draw significant interest from the public, which can lead to questions or even permit challenges. The permit is defended on the basis of what is included in the permit record, so if it isn’t documented, it doesn’t exist for purposes of defending the permit.

The bottom line is that with all permit conditions, but especially where we might be implementing some unusual or new procedures for nutrients, we must document our work.

1.11 Monitoring Requirements



The slide features a title 'Monitoring Requirements' in bold black text. To the right of the title is an illustration of a hand holding a test tube with red liquid. Below the title is a bulleted list of three points. At the bottom left is a circular logo with 'NPDES' and 'National Pollutant Discharge Elimination System'. At the bottom center is the number '11'. At the bottom right is the EPA logo.

Monitoring Requirements

- Type, intervals, and frequency of monitoring sufficient to yield data representative of the monitored activity [§ 122.48(b)]
- Monitor mass or other applicable measurement for each pollutant limited, volume of effluent discharged, and other measurements as appropriate [§ 122.44(i)]
- States might have more specific regulations, policy, and guidance on monitoring

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Notes:

Now, let's turn to another part of the permit that accompanies the effluent limitations we calculated—monitoring and reporting requirements.

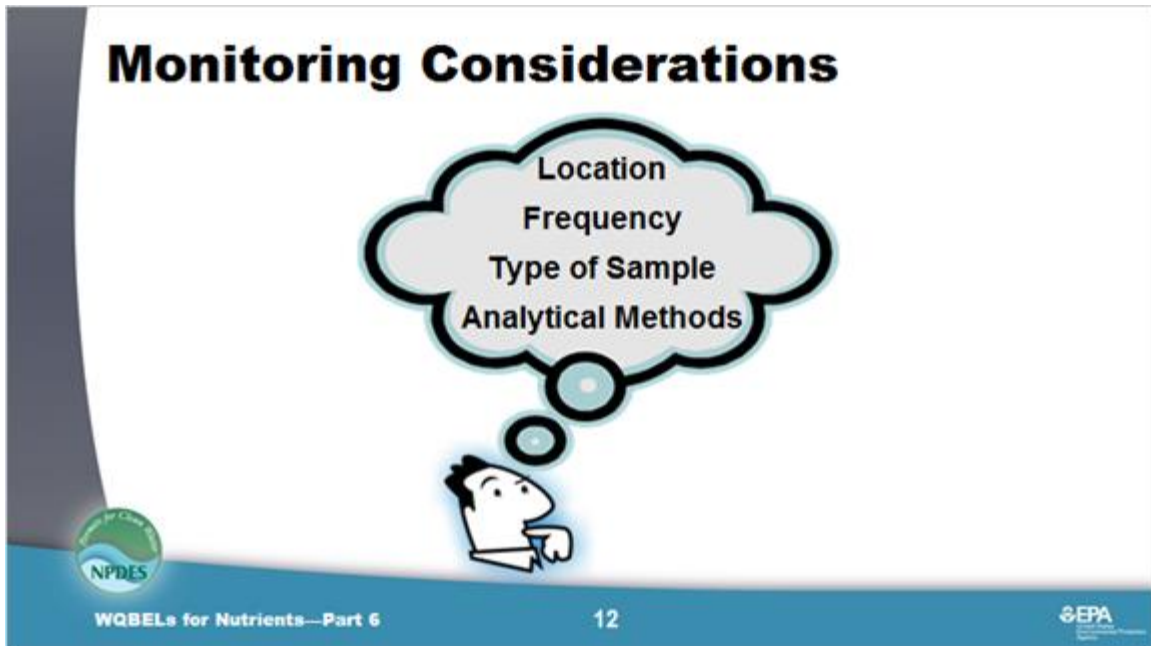
There are several regulatory requirements for the monitoring and reporting conditions included in NPDES permits.

The NPDES regulations at 40 CFR 122.48(b) stipulate that permits must specify the monitoring type, intervals, and frequency of monitoring sufficient to yield data representative of the monitored activity.

Other regulations at 40 CFR 122.44(i) require permittees to monitor the mass (or other applicable measurement) for each pollutant limited in the permit; monitor the volume of effluent discharged from each outfall; and provide other measurements as appropriate, such as pollutants in internal waste streams or intake water.

In addition, states may have more specific regulations, policy, and guidance for establishing monitoring requirements in NPDES permits.

1.12 Monitoring Considerations




Notes:


Four important considerations for establishing monitoring requirements are listed on this slide: location, frequency, sample type, and analytical methods. Each of these factors is important to the permit writer's decision-making when it comes to establishing monitoring requirements.

1.13 Nutrient Monitoring Considerations

Nutrient Monitoring Considerations

- **Monitoring location** depends on type of monitoring and site-specific conditions at the facility TN TP
- Where state regulations, policies, or guidance on **monitoring frequency and sample type** are not available for nutrients, a permitting authority may consider
 - Monthly or more frequent monitoring
 - Composite samples

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Notes:

The specific location for monitoring largely depends on the type of monitoring, type of facility, and site-specific conditions at that facility. You can find more information on selecting a monitoring location in EPA’s online NPDES Permit Writers’ Training.

Many states have policies addressing monitoring frequency and sample type. However, if our state does not have such a policy, or if it does not address nutrients, we might consider requiring monthly or more frequent effluent monitoring for nutrients using composite sampling, especially for larger facilities.

A composite sample is composed of two or more discrete aliquots and might be taken as discrete sequential samples or combined into a single, large sample.

A composite sample allows us to see how nutrients in the discharge vary over the sampling period because of changes over time in the flow or in the concentration of nutrients. The composite provides a representative picture of the discharge over time.

1.14 Nutrient Monitoring Considerations

Nutrient Monitoring Considerations

- Use *analytical methods* found in 40 CFR Part 136 for analysis where available TN TP
- Calculate total nitrogen
 - Use Part 136 methods for TKN and nitrate + nitrite
 - Add TKN and nitrate + nitrite
- Load limitations require accurate *flow monitoring*

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Notes:

With regard to analytical methods, 40 CFR 136 provides test methods for orthophosphate, total phosphorus, and various nitrogen species.


Orthophosphate and total phosphorus are common forms of phosphorus that often are monitored based on requirements in NPDES permits.

Monitoring for various forms of nitrogen such as total Kjeldahl nitrogen (or TKN), nitrate, and nitrite can be used to measure total nitrogen.


Also, keep in mind that we need accurate flow monitoring to calculate the effluent loading to compare to any load limitations in the permit.

1.15 Reporting Requirements

Reporting Requirements




- Reporting requirements must be established on a case-by-case basis with the frequency dependent on the nature and effect of the discharge, but in no case less than once a year [§ 122.44(i)(2)]
- Permittees required to report [§ 122.22(b)] :
 - Monitoring results as required in permit [§ 122.41(l)(4)]
 - Data for pollutants monitored more frequently than required if using approved methods [§ 122.41(l)(4)(ii)]



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Notes:

The NPDES regulations also require periodic reporting.

40 CFR 122.44(i)(2) states that reports must be required at a frequency based on the nature and effect of the discharge, but in no case less than once per year.

Usually major facilities with continuous discharges will be required to report results monthly, while minors or episodic dischargers may be required to report less frequently, perhaps quarterly or based on the occurrence of a discharge.

An NPDES permit must require that the permittee provide monitoring data for all pollutants that are limited in the permit. Permit standard conditions require that reported data be collected and analyzed in accordance with EPA approved methods. The permit standard conditions also require the permittee to certify that all monitoring data are collected in accordance with required procedures and are representative of the regulated discharge.

The permit must also require that all data collected using approved test methods be reported. This requirement in 40 CFR 122.41(l)(4)(ii) prevents the permittee from sampling until it gets favorable results, and then reporting only those favorable results. As long as the results are

representative of the discharge, the facility can monitor more frequently than required and must report all of the resulting data.

1.16 What Format is Used for Reporting?

What Format is Used for Reporting?

- **Discharge Monitoring Reports (DMR) [§ 122.41(l)(4)(i)]**
 - authorized programs may substitute agency name, address, and logo in place of EPA's
 - permitting authority may require additional reporting
- **Electronic Reporting Rule**
 - **Phase 1:** permittees must submit DMRs electronically starting **12/21/16** (e.g., via state eDMR or EPA NetDMR)
 - **Phase 2:** general permit reports and other NPDES program reports must be electronically submitted starting **12/21/20**
 - Authorized programs electronically submit information to EPA and data are available to the public through EPA's website (ECHO)

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Notes:

Monitoring results must be reported using a Discharge Monitoring Report (or DMR). 40 CFR 122.41 (l)(4)(i) requires monitoring results to be reported on the DMR or forms provided or specified by the Director.

The DMR provides a reporting format that ensures that facility compliance data are submitted in a uniform manner to facilitate compliance review and data entry into state and federal databases. The form also incorporates the required certification statement and signature of the person authorized to provide the report.

States are encouraged to use the EPA DMR form, but can alter the format and require additional reporting to conform to state requirements.

EPA has promulgated an electronic reporting rule, effective December 21, 2015, that will be phased in over a five-year period.

In Phase 1 (one year after the effective date), EPA and authorized permitting agencies also begin to receive DMR information from permittees. EPA also will electronically receive program data, including DMRs and other compliance-related information, from authorized permitting agencies.

E-reporting will help permitting authorities realize a significant reduction in reporting burden and cost savings due to electronic reporting from facilities rather than having to enter paper reporting into data systems. The final rule also makes facility-specific information, such as inspection and enforcement history, pollutant monitoring results, and other data required by permits accessible to the public through EPA's website.

1.17 Nutrient Reporting and Compliance Considerations

Nutrient Reporting and Compliance Considerations *TN TP*

- Concentration and mass limitations
 - Reporting in units consistent with limitations
 - Specify how mass loads are calculated
- Limit definitions
 - Maximum daily limitation (MDL), average monthly limitation (AML) and average weekly limitation (AWL) defined in the NPDES regulations [§ 122.2]
 - Annual average and seasonal average limitations should be defined in the permit
 - Beginning and ending dates of season or annual period
 - Method of determining compliance

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Notes:

How data are reported is an important factor in our ability to determine compliance with nutrient effluent limits established in the permit. For example, we should require permittees to report discharge monitoring data for pollutants in units consistent with effluent limitations. Where the permit includes mass loading limitations, the permit also should specify the flow measurement that the permittee must report and use to calculate mass loading.

In addition to how permittees report their data, compliance determination is also affected by how limitations are expressed in the permits.

- The permit should be consistent with the definitions of maximum daily limitation, average monthly limitation and average weekly limitation in 40 CFR 122.2.
- Since there are no regulatory definitions of annual average and seasonal average limitations , we will need to define them directly in the permit.
- The permit should clearly indicate the beginning and ending date of compliance periods as well as clearly defining methods of determining compliance.

1.18 Nutrient Reporting and Compliance Considerations

Nutrient Reporting and Compliance Considerations TN TP

- Interim reporting for annual or seasonal limits
- Provides opportunities to assess whether the facility is on track to comply with the annual or seasonal limits
- May be accompanied by other requirements
 - Threshold value that triggers additional reporting if exceeded
 - Reporting on measures taken to ensure compliance with annual or seasonal limits

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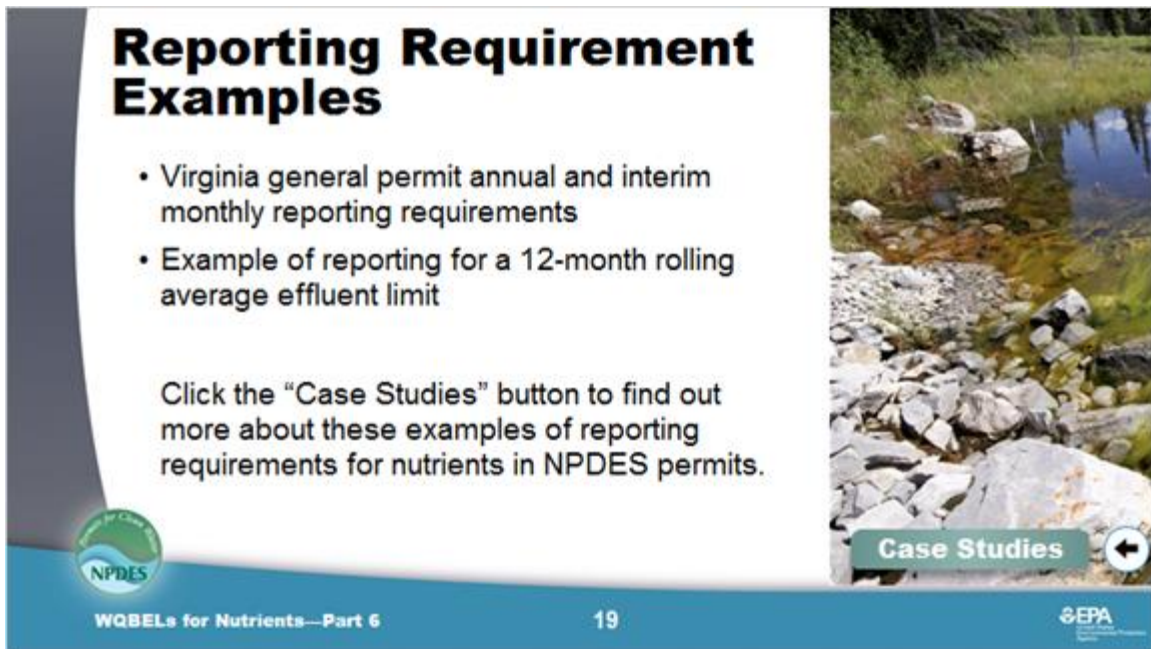
Notes:

Other reporting and compliance considerations when developing nutrients requirements are to make sure the reporting frequencies are appropriate for the effluent limitations and that interim reporting requirements are included for longer term limits.

For annual or seasonal limits, we can include interim reporting, such as monthly reporting.

Such reporting can be accompanied by requirements such as a threshold value that triggers additional reporting when exceeded and reporting on measures taken to ensure compliance with annual or seasonal limits.

1.19 Reporting Requirement Examples



Reporting Requirement Examples

- Virginia general permit annual and interim monthly reporting requirements
- Example of reporting for a 12-month rolling average effluent limit

Click the “Case Studies” button to find out more about these examples of reporting requirements for nutrients in NPDES permits.

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Case Studies

The slide features a background image of a rocky stream with green algae. A blue bar at the bottom contains the NPDES logo, the title 'WQBELs for Nutrients—Part 6', the slide number '19', the EPA logo, and a 'Case Studies' button with a right-pointing arrow.

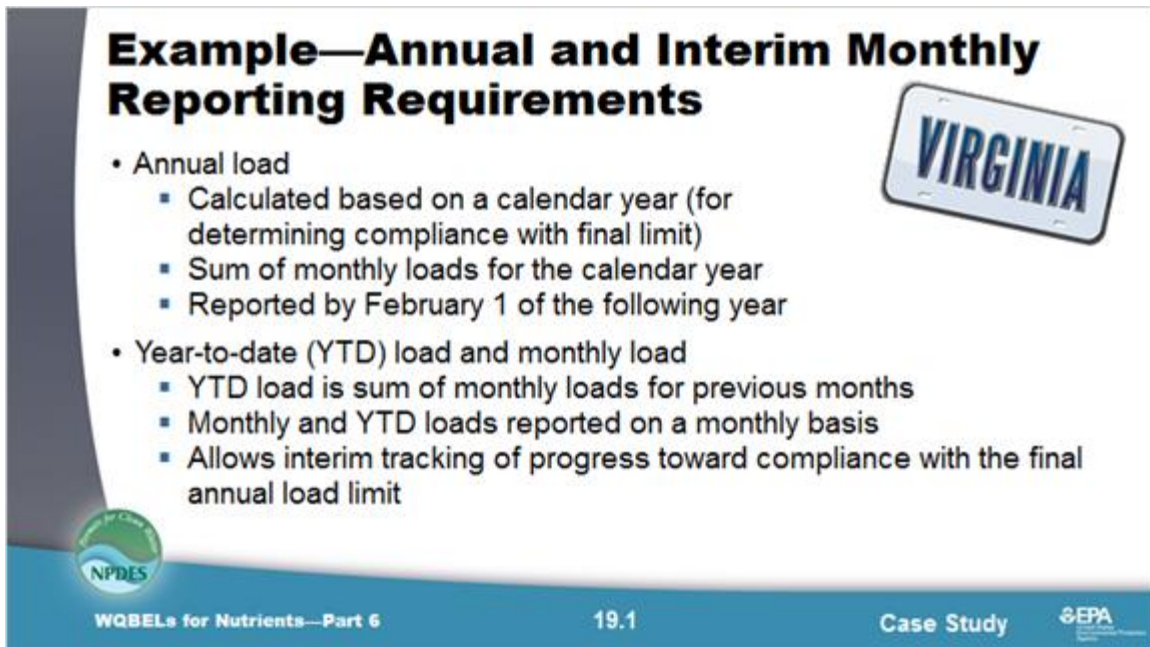
Notes:

To illustrate some of the concepts we have been discussing, we have provided two examples of reporting requirements for nutrients.

If you would like to view examples of reporting requirements for nutrients in Virginia’s general permit for the Chesapeake Bay watershed and a hypothetical example of reporting requirements associated with a 12-month rolling average limit, continue to the next slide.



Otherwise, skip to [Slide 22](#).


1.20 Example—Annual and Interim Monthly Reporting Requirements



Example—Annual and Interim Monthly Reporting Requirements

- Annual load
 - Calculated based on a calendar year (for determining compliance with final limit)
 - Sum of monthly loads for the calendar year
 - Reported by February 1 of the following year
- Year-to-date (YTD) load and monthly load
 - YTD load is sum of monthly loads for previous months
 - Monthly and YTD loads reported on a monthly basis
 - Allows interim tracking of progress toward compliance with the final annual load limit

WQBELs for Nutrients—Part 6 19.1 Case Study 

Notes:

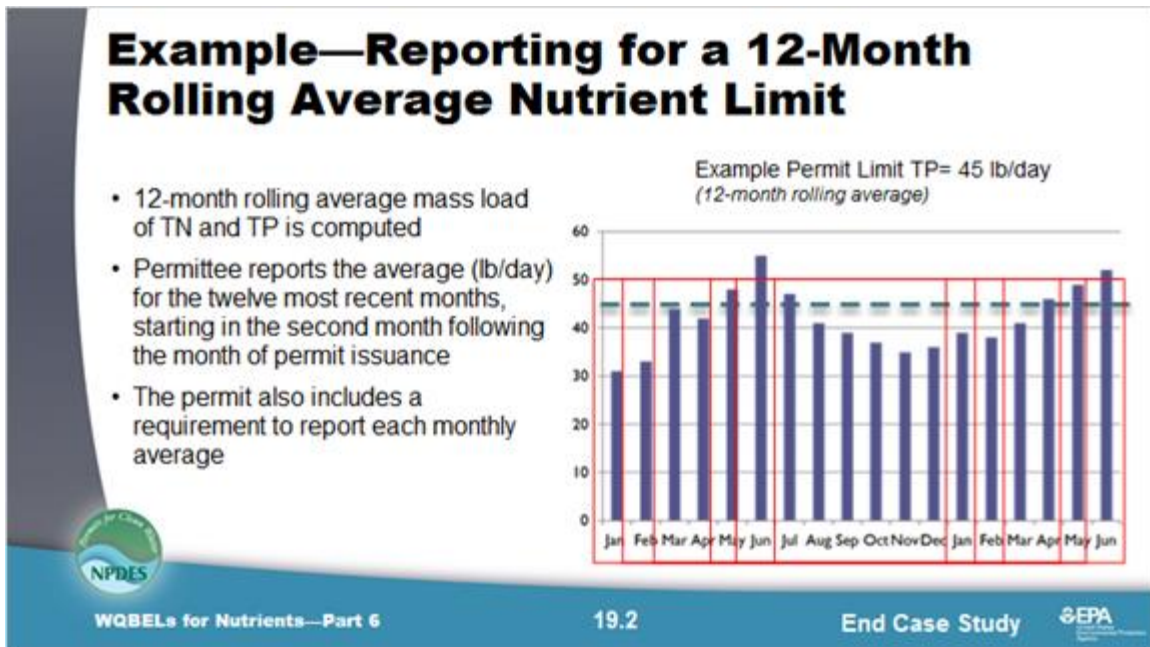
This slide provides an example of annual and interim reporting from Virginia’s watershed-based permit for discharges of nutrients in the Chesapeake Bay watershed.

The permit includes annual effluent limitations for nutrients, but it also includes monthly reporting, which allows the Virginia Department of Environmental Quality and the permittee to track progress toward meeting the annual limits.

The annual load is calculated as the sum of monthly loads based on a calendar year and reported by February 1st of the following year.

Interim reporting includes the monthly load and the year-to-date load for the previous months.

1.21 Example—Reporting for a 12-Month Rolling Average Nutrient Limit



Notes:

Here is another example of monitoring when a limit is expressed as an annual average, but in this hypothetical example the limit is a 12-month rolling average mass-loading limit rather than a calendar year average.

You can see here how compliance is based on the average of the 12 most recent months.



Consequently, each individual monthly average “follows” the discharger for that 12-month period. That means, for example, that the higher monthly averages shown on the slide for May, June, and July will affect the reported 12-month average for multiple months.

1.22 Documenting, Monitoring, and Reporting Requirements in the Permit Record

Documenting, Monitoring, and Reporting Requirements in the Permit Record


Document in the fact sheet or statement of basis:

- Appropriate regulatory citations for monitoring and reporting requirements
- Basis for decisions on location, monitoring frequency, sample type and analytical methods
- Rationale for increases or decreases in monitoring frequency or other changes from the previous permit
- Purpose of special studies or other monitoring that is in addition to self-monitoring to demonstrate compliance with effluent limits



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Notes:

We'll conclude this presentation with a reminder that, just as with effluent limitations, we should document in the fact sheet or statement of basis the rationale for monitoring and reporting requirements, including:



- The appropriate regulatory citations,
- The basis for our decisions on those four major considerations we discussed—location, monitoring frequency, sample type, and analytical methods—particularly for new monitoring requirements,
- The rationale for any increases or decreases in monitoring frequency or other changes that have been made from the previous permit, and
- The purpose of any special studies or other requirements that go beyond routine self-monitoring for compliance with effluent limitations.

1.30 Feedback and Other Presentations

Feedback and Other Presentations

Questions or comments?
npdes_nutrients@epa.gov

Join us for other online presentations on
**Addressing Nutrient Pollution
in NPDES Permits**
<https://www.epa.gov/npdes/npdes-training>

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Notes:

Congratulations on completing the quiz and this presentation!

If you have questions or comments on this presentation or any part of this training curriculum, you can email npdes_nutrients@epa.gov.

Remember, you will find all NPDES online training presentations, under the “Training” section of [USEPA’s NPDES website](https://www.epa.gov/npdes).

Thanks again for joining us!