HELPFUL TIPS FOR COMPLETING THE WASTEWATER DISCHARGE MONITORING REPORT (DMR)

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INTRODUCTION

These supplemental clarifications are intended to aid wastewater facility permittees and their operators when completing DMRs that are submitted to the DEP. These tips are intended to clarify questions that frequently arise when completing DMRs and are to be used in conjunction with the "INSTRUCTIONS FOR COMPLETING THE WASTEWATER DISCHARGE MONITORING REPORT" attached to your facility's DMR. Additional questions regarding completion of the DMR should be directed to the appropriate District office.

DAILY DATA

Rule 62-620.200(10), F.A.C., defines "daily discharge" as the discharge measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. Typically, the calendar day (12:00 midnight – 11:59 p.m.) is used. However, this definition also allows a permittee to specify a 24-hour period that corresponds to staffing shifts as their reporting day. In any case, this definition of a 24-hour period is to be used consistently for purposes of reporting and should not vary from one day to another. This permit requirement may appear on the DMR as "daily" or as "daily, 24-hour."

REPORTING FLOW DATA

This section provides information on reporting flow data for domestic and industrial wastewater permits. Industrial wastewater permits may not have a Part B DMR. If not, think of "Part B" as the list of daily results for each month.

Daily Flow Data

If the DMR contains a Part B, record the total volume of effluent or reclaimed water discharged on each day during the month on the form. Each daily entry should be entered in the units specified on the DMR.

Even if the discharge only occurred during a portion of the day, enter the total volume discharged during that period on Part B of the DMR. As shown in EXAMPLE 1, if 2 million gallons were discharged over a 4 hour period on July 3, and the discharge ceased for the remainder of the day, you would still record "2" MGD for July 3 on Part B.

If no discharge occurred during the rest of July, enter "0" for those days on Part B of the DMR. EXAMPLE 1 shows how the flows would be entered on Part B for July,

EXAMPLE 1 – DAILY DATA OR "PART B"				
	Flow (mgd)	pH (Min)	Fecal Coliform Bacteria (#/100ml)	TRC (For Disinfect.) (mg/l)
Code	50050	00400	74055	50060
Mon. Site	EFF-1	EFA-1	EFA-1	EFA-1
1	0			
2	0			
3	2			
4	0			

if the only discharge were on the 3rd of July, as described in the paragraph above.

Monthly Average Flow Data

The monthly average flow is reported on Part A of the DMR form. Rule 62-600.200(50), F.A.C., defines "Monthly average daily flow" as the total volume of wastewater flowing into a wastewater facility during a calendar month, divided by the number of days in that month and expressed in MGD. To calculate the monthly average flow, sum the daily flow entries specified on the DMR for all days shown in Part B and divide by the total number of days in the month (typically 30 or 31).

As shown in EXAMPLE 2, if the discharge was intermittent (did not occur on one or more days during the month), the monthly average flow is calculated in exactly the same fashion as would be done for a continuous discharge (discharge on all days of the month). The daily flow entries (in MGD) would be summed for all days shown in Part B (including 0 for all days on which no discharge occurred). This total would be divided by the **total** number of days in the month (typically 30 or 31), **not** by the number of discharge days.

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EXAMPLE 2 – MONTHLY AVERAGE CALCULATION

For the values from Example 1 above, the monthly average
flow for July would be calculated as follows:

        2 MGD/ 31 observations = 0.06 MGD
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Three-Month Average Flow Data

The Three-Month Rolling Average (Rolling Quarterly) is reported on Part A of the DMR form, and is defined as the total volume of flow during a period of three consecutive months, divided by the number of days in this three-month period Rule 62-600.200(76), F.A.C. The three-month average may also be calculated by adding the three monthly average flows then dividing by 3.

Annual Average Flow Data

The annual average daily flow is also reported on Part A of the DMR form. In accordance with Rule 62-600.200(3), F.A.C., the annual average daily flow means the total volume of wastewater flowing into a wastewater facility during any consecutive 365 days, divided by 365 and expressed in units of MGD. However, unless specified otherwise in the permit, for practical purposes, the annual average flow may also be calculated as the rolling arithmetic mean of the 12 monthly averages. Using the values from EXAMPLES 1 and 2, if the monthly averages (in MGD) had been as follows: 1.0, 2.0, 0, 0, 0, 0, 0, 0, 0.5, 0, 0, 0.06, then the annual average would be the sum (3.56) divided by 12 which equals 0.3 MGD. On Part A of the DMR, the monthly and annual average flow would be reported as shown in EXAMPLE 3 below:

Parameter			Quantity or Loading	Units
Flow		Sample Measurement	0.3	
PARM Code 50050 Y Mon.Site No. EFF-1		Permit Requirement	1.0 (An.Avg.)	MGD
Flow		Sample Measurement	0.06	
PARM Code 50050 1 Mon.Site No. EFF-1		Permit Requirement	Report (Mo.Avg.)	MGD
		Sample Measurement		

Reporting Flow Summary:
- For monthly average flows, always divide the total volume for the month by the number of days in the month (usually 30 or 31).
- For annual average flows, always divide the sum of the 12 monthly averages by 12 months or the sum of the total volume for the year by 365 days.
- Use zeros for days or months of no discharge.
- Report in units as specified on the DMR.

REPORTING WATER QUALITY DATA

Unlike calculating flow averages, the definitions in Rules 62-620.200 and 62-600.740, F.A.C., indicate that averages for most pollutants (excluding fecal coliform, which will be discussed later), and their associated effluent limitations, are calculated based on the arithmetic mean of any samples collected during the period. That is, pollutant averages are generally calculated by dividing the sum of the concentrations or mass values by the number of individual measurements during a given period.

In accordance with Rule 62-620.610(18), F.A.C., when averaging results or determining other reporting values (e.g., maximums) for the DMRs, all observations obtained for a reporting period in accordance with DEP approved methods shall be used for each effluent quality parameter. Thus, even sample results that are in addition to the minimum monitoring requirements in a permit should be used to calculate the average, minimum, and maximum values for reporting to the Department.

Daily Effluent Quality Data

Daily effluent quality data is normally reported on Part B of the DMR on days during which a discharge to a particular reuse or disposal system occurred. If the permit requires "daily" sampling, the permittee should sample on each day that a discharge occurs. If discharge occurs on six days, the underlying measurement results should contain six entries – one for each day of discharge. If the permit requires weekly sampling, the permittee must sample on at least one day during which discharge occurred within each weekly period (e.g., a Sunday to Saturday period).

If there was no discharge during the course of a week, no entry would be made within that week. However, it is recommended that the permittee sample at the first occurrence of a discharge to ensure that required sampling is accomplished during the month.

Maximum (or Minimum) Values

Part B of the DMR should be completed, if required, before reporting data on Part A of the DMR, which contains the limits that were established in the permit. One type of limit is a maximum or minimum. Reporting this value doesn't require any calculation. For a particular parameter, review the values that were reported on Part B of the DMR for the entire month and report the highest number wherever it says "Max." If you see "Min" under a limit, report the lowest of all the values for that parameter. In some cases a minimum value may be reported by a laboratory as "below detection limit." In such cases, please see the section entitled "Below Detection Analytical results" later in this document.

If only one sample was taken during the monitoring period, and a Maximum and Minimum are required, report that value as the Max and Min. For example, if pH is only sampled once per day, record that value as the Min and Max for that day.

Weekly Average Effluent Quality Data

Rule 62-620.200(57), F.A.C., defines a "weekly average discharge limitation" as the maximum weekly average pollutant value allowed by the permit and calculated as the arithmetic mean of each reclaimed water or effluent sample collected on a separate day during a period of seven consecutive days. If only one sample is required per week, that sample result should be reported as the weekly average.

The following sections explain how to handle partial weeks at the end or beginning of a month and intermittent discharges.

Partial Weeks

For purposes of reporting on the DMR, Sunday through Saturday is commonly used as the week (i.e., the seven consecutive day period referred to in the rule). For situations where a partial week falls on the beginning or end of a month, the weekly average should be calculated by considering the partial week at the end of a month as part of the partial week on the following month.

As shown in EXAMPLE 4, let us consider the month of April 2011. The last full week of the month ended on Saturday, April 28. This month features a partial week at the end of the month, which ran from Sunday, April 29 through Monday, April 30.

EXAMPLE 4 – PARTIAL WEEKS

APRIL 2011

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

(Shaded area shows partial week at the end of the month. Those days should be used to calculate a weekly average in May, not April.)

Under this situation, the results for each day obtained on April 29 – 30 would be reported on Part B of the DMR for April. They would be compared to the daily maximum permit limits on the April DMR. They would be used to calculate the monthly average for April, which would be based on all observations during the April 1 – 30 period. For purposes of the April DMR, the observations obtained on April 29 – 30 would **not** be used to calculate a <u>weekly</u> average in April.

However, values obtained on April 29 – 30 would be used to calculate the weekly average for the week running from April 29 through May 5. This weekly average would be compared to the permit's weekly average limit as part of May's DMR.

Intermittent Discharges

If there was no discharge during the course of a day, week, or month, then no results or values would be used for calculations for the respective time periods.

For example, during April 2011, there were four weekly periods (Sunday through Saturday) that ended during that month and one partial week ending in the next month. The permit required daily samples. The facility discharged intermittently that month as follows: the first week there were two days of discharge, the second week the facility discharged every day, the third and fourth weeks there was no discharge, the fifth week there were two days of discharge.

For the month of April in EXAMPLE 5, the facility would have two weekly averages. For the first week, the two daily samples should be averaged. The second week the seven daily samples should be averaged. There is no weekly average for the third and fourth weeks. Since the fifth week ends in May, the values on April 29 – 30 would be used in the weekly average for the week of April 29 through May 5 and reported on the May DMR (See EXAMPLE 4).

The maximum of the two weekly averages for April would be reported on Part A.

EXAMPLE 5 – INTERMITTENT DISCHARGES

APRIL 2011

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

(Shaded areas show days of discharge.)

Monthly Average Effluent Quality Data

Rule 62-620.200(27), F.A.C., defines "monthly average discharge limitation" as the maximum monthly average pollutant value allowed by the permit and calculated as the arithmetic mean of each reclaimed water or effluent sample collected on a separate day during a period of 30 consecutive days. For example, if your permit requires samples to be obtained only once per month, but two samples are collected, then the monthly average is the sum of the results divided by the number of samples (in this case, two). Another example is if your permit requires samples to be obtained only once per month, and only one sample is obtained, then this result is reported as both the monthly average as well as the daily maximum for that month (or minimum depending on the parameter).

Annual Average Effluent Quality Data

Rule 62-620.200(2), F.A.C., defines "annual average discharge limitation" as the maximum annual average pollutant value allowed by the permit and calculated as the arithmetic mean of the 12 monthly average reclaimed water or effluent samples collected during any consecutive 12-month period. Alternatively, the annual average may be calculated as the arithmetic mean of the daily values over a 12-month period.

EXAMPLE 6 shows a 12-month period where there were three months of no discharge. If there is a month in which "no discharge" was reported, then the annual average is calculated based on the number of months that there was a discharge. On the monthly DMR for the monitoring period of May 1 – May 31, 2011, the annual average may be calculated based on the monthly averages for June 2010 – May 2011. If during the months of December 2010 – February 2011, there was no discharge, then the annual average will be calculated by adding the monthly averages for June – November 2010 and March – May 2011, and dividing by the number of months of discharge (i.e., 9).

EXAMPLE 6 – CALCULATING ANNUAL AVERAGES

June 2010	July 2010	August 2010	September 2010
October 2010	November 2010	December 2010	January 2011
February 2011	March 2011	April 2011	May 2011

(Shaded areas show months of discharge.)

Reporting Water Quality Data Summary:
- When calculating weekly average, divide by the number of samples, not the number of days.
- When reporting the weekly average on Part A, report the maximum of the weekly averages for the month.
- If only one sample was collected per week, report the highest value as the weekly average on Part A.
- For the monthly average, report the arithmetic average of the daily values for the calendar month. If only one sample was collected, report that value as the monthly average in addition to reporting it as the maximum or minimum. Do not include zero values for the days of no discharge when calculating the monthly average.
- For the annual average, report the arithmetic average of the monthly averages over the rolling 12-month period, or the arithmetic average of the individual values for the period. **Do not include zero values for the months of no discharge in the calculated annual average.**

REPORTING LOADING DATA

This section discusses how to calculate and report loading results. Loading limits are primarily expressed in the following ways:

- pounds per day,
- daily maximum,
- daily average,
- monthly average, and
- pounds per year.

Pounds Per Day Loading Data

The daily loading is calculated by combining the concentration data (from grab or composite samples, as specified in the permit) with the day's total flow to calculate the pounds per day loading in the discharge for each day of discharge.

To calculate the daily loading, consider EXAMPLE 7 for a facility with an intermittent discharge on only four days during the month. If you have flow and concentration data for four days in a month, first calculate the pounds per day loading on each of these four days. Pounds per day loading will be calculated only for days on which both flow and quality data are available.

EXAMPLE 7 – CALCULATING DAILY POUNDS PER DAY

[lbs/day] = [8.34] * [flow in MGD] * [concentration in mg/L]

Day	Total Flow (MGD)	Concentration (mg/L)	Daily Load (lbs/day)
1	2.88	1.60	38.4
2	1.44	3.70	44.4
3	1.92	2.2	35
4	2.4	2.5	50

The daily load for day 1 is calculated as the following:
Daily Load (Day 1) = 8.34 * (2.88 MGD) * (1.60 mg/L) = 38.4 lbs/day

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Daily Maximum Loading Data

Daily Maximum is the highest daily loading value within the monitoring period. The maximum of the daily values will be entered on Part A of the DMR. In EXAMPLE 7, the Daily Maximum would be value which was calculated for Day 4 (50 lbs/day).

Daily Average Loading Data

The daily average loading is calculated by multiplying the daily flow (MGD) by the average concentration (mg/L) of all the samples for that day, and multiplied by a constant, 8.34. If only

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one sample is taken per day, use that value as the average.

$$[\text{Avg lbs/day}] = [8.34] * [\text{flow MGD}] * [\text{avg concentration mg/L}]$$

Monthly Average Loading Data

If the permit only has a monthly average loading limit, the loadings don't need to be calculated daily. The average pounds per day loading is to be recorded on Part A of the DMR. In making this calculation, the average monthly flow will be used (see Monthly Average Flow section for guidance) and the average concentration (calculated by adding the individual values during the month and dividing by the total number of values in the month). EXAMPLE 8 shows how to calculate the average pounds per day for the month, using the same data as in EXAMPLE 7 and assuming no discharge on any other days in the month.

EXAMPLE 8 – CALCULATING MONTHLY AVERAGE POUNDS PER DAY

[average lb/day] = [8.34] * [average flow in MGD] * [average concentration in mg/L]

Average flow in MGD = (2.88 + 1.44 + 1.92 + 2.4)/31 = 8.64/31 = 0.288 MGD

Average conc. in mg/L = (1.60 + 3.70 + 2.2 + 2.5)/4 = 10/4 = 2.5 mg/L

Average lb/day = 8.34*0.288*2.5 = 6.0 lbs/day

Pounds Per Year Loading Data

The calculation for pounds per year is based on your permit requirements. For annual reporting requirements, the pounds per year can be calculated by totaling the monthly averages for the given calendar year. For monthly reporting, the calculation is based on a rolling monthly total.

REPORTING FECAL COLIFORM DATA

Fecal coliform values are reported on the DMR in a variety of ways, which are quite different from other effluent quality values that must be reported (e.g. percent less than detection, monthly geometric mean, monthly median value, etc.) The fecal coliform values that must be reported depend on the level of disinfection required as well as the monitoring frequency specified in the permit. Depending on the disinfection level required, fecal coliform values may be reported in several different ways. The following paragraphs clarify reporting for the various statistical bases.

Daily Fecal Coliform Data

Record daily observations of fecal coliforms on Part B of the DMR form. Observations less than detection should be recorded as "<1" (if the detection limit is 1/100 mL for Membrane Filter (MF) techniques) or "<2.2" (if the detection limit is 2.2/100 mL for Most Probable Number (MPN) techniques). On Part A of the DMR, record the maximum observation of fecal coliforms observed during the month.

Percent Less Than Detection

If you are required to report the percentage of fecal coliform observations that were less than detection during the month, count the number of observations for fecal coliforms on Part B that were less than detection, divide by the total number of fecal coliform observations during the month, multiply by 100%, and round to the nearest integer.

No More Than 10 Percent Value

In accordance with the basic and intermediate level disinfection requirements in Rules 62-600.440(4) and (6), F.A.C., your permit may state that no more than 10 percent of the samples during a period of 30 consecutive days shall exceed a certain number of fecal coliform values per 100 mL of sample. If this fecal coliform requirement is contained in your permit, then a 90th percentile value will be reported on the DMR. To report the 90th percentile value, list the fecal coliform values obtained during the month in ascending order. Report the value of the sample that corresponds to the 90th percentile (multiply the number of samples by 0.9). For example, for 30 samples, report the corresponding fecal coliform number for the 27th value of ascending order. See EXAMPLE 9 for finding and reporting the 90th percentile (no more than 10%) value. **NOTE: The 90th Percentile should not be reported as a percentage!**

EXAMPLE 9 – FINDING THE 90th PERCENTILE VALUE

Given: 10 values – 8, 4, 5, 20, 7, 6, 34, 22, 4, and 18, find the 90th percentile value.
Step 1. List the values in ascending order: 4, 4, 5, 6, 7, 8, 18, 20, 22, 34
Step 2. Multiply the number of samples by 0.9: $0.9*10 = 9$
Step 3. Report the 9th value from the series in Step 1 as the 90th percentile value: 22.

Monthly Geometric Mean

Rule 62-600.200(33), F.A.C., defines "Geometric mean" as the nth root of the product of n numbers. In other words, in order to calculate the geometric mean of n observations, each of the n values would be multiplied together and the resulting product will be raised to the $1/n$[th] power. Alternatively, the geometric mean can be calculated by taking the log_{10} transformations of the values and then calculating the arithmetic mean of the log_{10} values. The desired geometric mean can then be calculated by determining the inverse log_{10} of the calculated arithmetic mean. EXAMPLE 10 shows how to calculate a monthly geometric mean.

EXAMPLE 10 – GEOMETRIC MEAN CALCULATIONS

Given: 6 values – 3, 4, 5, 6, 7, and 8, calculate the geometric mean (x_g).

Power method
x_g = $[3*4*5*6*7*8]^{1/6}$
x_g = $[20,160]^{1/6}$ = 5.22
x_g =   5 (rounded for reporting)

Log$_{10}$ method
$\log(x_g)$ = $\dfrac{[\log(3) + \log(4) + \log(5) + \log(6) + \log(7) + \log(8)]}{6}$

$\log(x_g)$ = $\dfrac{4.304}{6}$ = 0.717

x_g = $10^{[0.717]}$ = 5.22
x_g =   5 (rounded for reporting)

Monthly Median Value

For intermediate-level disinfection, permittees are required to report a monthly median value for fecal coliform in accordance with Rule 62-600.440(6)(c)2, F.A.C. See EXAMPLE 11 for how to find the median value.

EXAMPLE 11 – FINDING THE MEDIAN VALUE

Given: 10 values – 8, 4, 5, 20, 7, 6, 34, 22, 4, and 18, find the median value.
Step 1. List the values in ascending order: 4, 4, 5, 6, 7, 8, 18, 20, 22, 34
Step 2. If there are an odd number of values, find the middle value. If there are two middle values, average them: (7 x 8) / 2 = 7.5.
Step 3. Report the median value: 7.5.

Annual Average Fecal Coliform Value

For fecal coliform, the annual average is calculated as the arithmetic mean of any 12 consecutive "monthly values." For cases where the monthly geometric mean is being calculated, the geometric mean values are the "monthly values" and should be used to compute the annual average. For cases where the monthly median is being calculated, the median values are the "monthly values" and should be used to compute the annual average.

Reporting "Too Numerous to Count"

Laboratories should be encouraged to conduct the necessary dilution series in order to obtain a quantifiable result for reporting fecal coliform values. Instead of reporting "TNTC," laboratories should report the results as "> X," where X is the minimum number of colony forming units/100 mL based on the sample dilutions as determined following the method outlined in EPA

600/8-78-017. However, if your laboratory reports a fecal coliform observation as being "TNTC" (too numerous to count) do **not** enter "TNTC" on the DMR. In order to use this result (e.g. to calculate the geometric mean for the month), a value is needed for this observation.

When sampling for fecal coliforms, normally a laboratory will analyze a 1, 0.1, or 0.01 mL sample. When counting colonies, at least one or more of the sample volumes should result in filter plates with 20 to 80 coliform colonies. In cases where there are too many colonies for counting because of plate overgrowth, unless the laboratory specifically indicates the sample volume, a permittee may have to assume that a 1 mL sample volume was used. This assumption is within the normal sample size range specified by approved methods and is the size that is most favorable to the permittee. Additionally, the permittee or its laboratory should estimate the minimum number of colonies (e.g., 200 colonies) that formed. Based on these assumptions, the permittee may calculate coliform density as:

$$\frac{(200 \text{ colonies}) \times 100}{(1 \text{mL})} = 20,000 \text{ cfu/100mL}$$

Accordingly, when laboratories report TNTC, permittees should report and calculate averages using a default value of ">20,000," unless the laboratory can re-report the TNTC result as greater than another number calculated following the method as discussed above in EPA 600/8-78-017.

Some of the smaller facilities may only be required to sample monthly for fecal coliforms. Using 20,000 for a single TNTC observation will pose difficulties as the facility tries to meet the annual basic disinfection limit (200/100 mL). Even if the other 11 months had less than detectable levels of fecal coliforms, a month with a monthly geometric mean of 20,000 will cause the resulting annual arithmetic average to be 1,667/100 mL – an exceedance of the annual average permit limit. The permittee may perform additional sampling within the month to attain a more representative monthly average geometric mean.

REPORTING BIOSOLIDS DATA

Enter the amount in dry tons of biosolids hauled each month. For months that no biosolids were hauled, please enter "0". Submit the DMR monthly regardless of whether biosolids were hauled or not. Do not report or "carryover" quantities hauled from previous months.

Calculating Dry Tons for the Biosolids DMR

   A. If you know the percent total solids (from biosolids analyses results) and you know the volume (gallons or cubic yards) or weight (wet tons), use the following formulas to calculate dry tons:

   1) Dry tons = Wet tons x Percent Solids
      Example: 40 wet tons biosolids x 0.15 total solids =
                         6 dry tons biosolids

2) Dry tons = gallons biosolids x 8.34 lb/gallon x ton/2,000 lb x Percent Solids
   Example: 6,000 gal biosolids x 8.34 lb/gal x ton/2,000 lb x 0.04 total solids =
                1 dry ton biosolids

3) Dry tons = cubic yards wet biosolids x Y lb/cubic yard x ton/2,000 lb x Percent Solids
   (Y = site-specific bulk density of biosolids)
   Example: 20 cubic yards biosolids at 15% total solids and Y = 1800 lb/cubic yard;
                20 cu yds x 1,800 lb/cu yds x ton/2,000 lb x 0.15 total solids =
                2.7 dry tons of biosolids

B. If you do not have biosolids analyses results, you may estimate the percent total solids. Generally, liquid is approximately 1.5 - 2% total solids, and dewatered "cake" is approximately 15 - 20% total solids.

   Example: 1,000 gallons of 2% total solids was hauled.
                1,000 gal biosolids x 8.34 lb/gal x 0.02 total solids x ton/2,000 lb =
                     8,340 lbs
                2% of 8,340 lbs = .02 x 8,340 = 166.8 lbs
                166.8 lbs / 2,000 lbs =
                     0.0834 dry tons hauled

Biosolids Quantity Parameters: Landfilled vs. Transferred

Disposing of biosolids in a landfill is not the same as transferring biosolids to another facility for treatment. These are two separate items. All the use or disposal parameters are separate items and double entry of quantities should be avoided.

If a landfill and a biosolids treatment facility are co-located, enter the quantity as either landfilled or transferred, but not both. Choose the best option as practiced by the facility. For example, if hauling records indicate biosolids are sent to Facility X (biosolids treatment facility) located at Facility Q (landfill), the quantity should be entered on the DMR as "transferred," and "0" should be entered in the landfill cell.

REPORTING TOXICITY DATA

Whole effluent toxicity testing provides reasonable assurance that the effluent is not toxic to aquatic organisms in the receiving water. Tests are bioassays performed on two species, an invertebrate and a fish.

DMRs for whole effluent toxicity have several spaces for reporting test results for each species. The monitoring frequency for whole effluent toxicity testing varies. If submitting a DMR when toxicity testing is not required, fill in all of the reporting spaces as "MNR". When there are whole effluent toxicity results to report, the routine results are reported in the first space for each species. The additional spaces are reserved for additional follow-up testing if there is a failure in the routine test. If there are no additional follow-up test results to report, enter "MNR" in those spaces.

Chronic Toxicity Results

Chronic toxicity tests are bioassays lasting 6 to 8 days. The endpoint is a sub-lethal effect such as growth (or biomass) or reproduction. Toxicity results are reported as the IC25, which is the concentration of effluent that causes a 25 percent reduction in a biological response such as growth or reproduction when compared to a control response. The percent effluent equal to the IC25 is reported on the DMR for each species tested. When the bioassay results indicate that the effluent produces less than a 25% decrease in the biological response compared to the control, the IC25 result is reported on the DMR as "> 100%" effluent.

Acute Toxicity Results

Acute toxicity tests are 96 hour bioassays. The endpoint is mortality. Toxicity results are reported on the DMR as the LC50, which is the concentration of effluent where 50% of the test organisms die.

In a definitive acute test the effluent is diluted with laboratory control water and the bioassay is performed at multiple effluent concentrations, the percent effluent equal to the LC50 is determined and reported on the DMR for each species tested. When multiple samples are collected over a 24 hour period and tested separately, the lowest LC50 result is reported on the DMR for each species tested. When bioassay results indicate that there is less than 50% mortality in the undiluted effluent, the LC50 is reported on the DMR as "> 100%" effluent.

In a screen acute test the bioassay is performed on only one concentration of effluent. The concentration to be tested is specified in the permit; and it is described as a percentage, for example 100% effluent or 30% effluent. Depending upon the instructions in the permit, the results may be reported on the DMR as the LC50 > or < the % test concentration, or as the percent survival of test organisms. A result is reported on the DMR for each species tested.

When screen acute test results are to be reported on the DMR as the LC50, report
> % test concentration of effluent, when mortality is less than 50% of test organisms; or
< % test concentration of effluent, when mortality is greater than 50% of test organisms.

When multiple samples are collected over a 24 hour period and tested separately, report
> % test concentration of effluent, if all tests have less than 50% mortality; or
< % test concentration of effluent, if any test has greater than 50% mortality.

When screen test results are to be reported as percent organism survival, results are reported as the percent of test organisms that were alive at the end of the bioassay compared to the number that were tested. When multiple samples are collected over a 24 hour period and tested separately, the lowest percent survival result is reported on the DMR for each species tested.

REPORTING DATA FOR NEW PERMIT REQUIREMENTS

When calculating annual or three-month averages for new facilities or facilities with new monitoring requirements, data will likely not be available to calculate an average for all of the months during the period prior to operation. In such cases, the permittee should indicate that the limit is not applicable by entering "MNR" on the DMR to indicate "monitoring not required" this period. Once the facility has been in operation for the averaging period specified in the permit, the average result should be entered on the DMR.

REPORTING DATA FROM CONTINUOUS MONITORING EQUIPMENT

Strip Chart Recorders

The following applies to strip chart recorders, circular chart recorders, and other recording devices that do not feature computerized data acquisition and storage.

Maximum and Minimum Values

Visually inspect each day's record (chart) and select the highest value recorded on the chart and record this as the "daily maximum" for that day. In a similar fashion, the lowest value recorded on the chart will be selected and reported as the "daily minimum" for each day.

Daily Averages

Visually inspect each day's record (chart) and select values recorded on the chart at exactly each hour during the day (12:00 a.m., 1:00 a.m., 2:00 a.m… through 11:00 p.m.) The resulting 24 values will be used to calculate the daily average (sum the 24 values and divide by 24). Record this value as the daily average on Part B of the DMR. Note: other data on the chart will not be used in the calculation of the daily average.

Computerized Data Logging Systems

The following applies to continuous monitoring equipment that feature computerized data logging or recording (this may be in addition to a paper chart recorder).

Data Polling

It is imperative that the computer system polls the continuous monitoring instrument at relatively frequent intervals. The intervals should be uniform throughout the day. In general, it is recommended that the time between successive polling of an instrument be no more than 5 minutes. If an instrument were polled once every 5 minutes, the computer would record 288 observations during each day. If an instrument were polled once each minute, a total of 1,440 observations would be made each day. Observations between pollings will be ignored.

Maximum and Minimum Values

The computer will be used to identify the maximum and minimum values during the day from the number of logged observations during the day (if the instrument is polled once every minute, the 1,440 observations would be reviewed by the computer). The highest and lowest values obtained from the logged observations would be recorded on Part B of the DMR form as the "daily maximum" and "daily minimum," respectively.

Daily Averages

The computer will be used to calculate the daily average. This will be based on the logged observations. If a one-minute polling interval were used, the 1,440 observations obtained during the day would be summed and divided by 1,440 to obtain the daily average, which will be recorded on Part B of the DMR.

Data Handling Features of Some Meters

It is also important to note that some meters are equipped with data handling features that can be programmed in an "on or off" mode. The rejection feature is to counter transient sample conditions or readings that are not representative of the quality of the effluent (e.g. spikes). In addition, many meters have the ability to record the results of an average signal response rather than instantaneous signal responses. Often, this feature is an integral part of the metering device's ability to dampen signal noise, which might otherwise cause spurious or inaccurate readings from the device. These features should be used in accordance with the equipment manufacturer's guidelines so the continuous monitoring results will be representative of the actual discharge.

SAMPLE COLLECTION

General Sampling

There are two general methods for collecting samples for analysis: grab and composite samples. The permit specifies the method of sampling required for each parameter. A grab sample is a single sample event that is used to capture the conditions at the moment the sample is collected. A composite sample is collected over time, and reflects the average characteristics during the compositing period.

Please refer to the DEP Standard Operating Procedures as adopted by DEP QA Rule 62-160, F.A.C. for sampling requirements. http://www.dep.state.fl.us/water/sas/sop/sops.htm

Composite Sampling

Composite sampling should be limited to the period of discharge and should be representative of the period of discharge. If a sampling device varies the sample volume or the number of samples based on the flow, the total volume collected can be considered as representative of the period of discharge. This is true as long as the sampler does not collect subsamples during periods of no flow.

Frequency of Analysis

Samples should be collected, analyzed, and reported at a minimum as often as required by the permit. If more samples are taken than required and are sampled in accordance with DEP approved methods, they are required to be reported on the DMRs.

The facility should ensure that samples are taken during discharge events within each monitoring period. If a facility discharges during a monitoring period, the facility is required to sample regardless of a sampling schedule.

NOTE: Missed sampling events cannot be made up during a subsequent monitoring period.

SIGNIFICANT FIGURES

When reporting averages on your DMR, the same number of significant figures should be shown in the average as is contained in the least precise data point being averaged (i.e., the data point having the smallest number of significant figures). See EXAMPLE 12 for how to report a value after rounding.

EXAMPLE 12 – SIGNIFICANT FIGURES

- The lab reported the following weekly values in mg/L: 5.0, 5.25, 4.95, and 5.134.
- The monthly average before rounding is 5.0835 mg/L.
- The monthly average should be reported on Part A of the DMR as 5.1 mg/L.

Rounding

Follow customary rules when rounding data. When rounding, anything 5 or greater should be rounded up, and anything less than 5 should be rounded down.

BELOW DETECTION ANALYTICAL RESULTS

Often, laboratory results indicate that a parameter is below either a practical quantification limit (PQL) or a method detection limit (MDL). In these cases, the DMR Instructions provide direction on both reporting these results as well as calculating averages where needed, consistent with Rule 62-4.246, F.A.C.

DMR Instructions

When reporting analytical results that fall below a laboratory's reported method detection limits or practical quantification limits, the following instructions should be used:

1. Results greater than or equal to the PQL shall be reported as the measured quantity.

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2. Results less than the PQL and greater than or equal to the MDL shall be reported as the laboratory's MDL value. These values shall be deemed equal to the MDL when necessary to calculate an average for that parameter and when determining compliance with permit limits.

3. Results less than the MDL shall be reported by entering a less than sign ("<") followed by the laboratory's MDL value, e.g. < 0.001. A value of one-half the MDL or one-half the effluent limit, whichever is lower, shall be used for that sample when necessary to calculate an average for that parameter. Values less than the MDL are considered to demonstrate compliance with an effluent limitation.

See EXAMPLE 13 for reporting and averaging values below detection limits.

EXAMPLE 13 – Results Below Detection Limits

The lab reported the following weekly values:

T	< MDL
I	between MDL and PQL
MDL	0.50 mg/L
PQL	2.0 mg/L
Limit	3.0 mg/L

    0.50 T mg/L
    1.3 I mg/L
    0.50 T mg/L
    2.1 mg/L

Results
- The maximum result should be reported as 2.1 mg/L.
- The monthly average for the values would be calculated using half the MDL value for 0.50 T, and the MDL value of 0.50 for the 1.3 I result as follows:

$$\text{average} = \frac{[0.25 + 0.50 + 0.25 + 2.1]}{4} = 0.78 \text{ mg/L}$$

DATA QUALIFIER CODES

Data qualifier codes help serve as indicators of special circumstances that may be associated with data or results that are being reported. Laboratories are required to use the data qualifier codes listed in Table 1 of Chapter 62-160, F.A.C., when reporting wastewater analysis. However, these codes are only to be transferred onto Part B of the DMR as part of your results. Where appropriate, only the data qualifier codes listed in the "Instructions for Completing the Wastewater Discharge Monitoring Report" that came with your current permit may be used.

SUBMITTING YOUR DMRS

Important things to remember when submitting your DMRs:

- Submit DMRs only once per monitoring period, unless they are resubmittals. If resubmittals are sent, label DMRs at the top as "RESUBMITTAL," and circle or highlight the data that was corrected or added.

- Make sure to fill out the entire DMR, including signatures, dates, correct monitoring periods, all data cells, etc.

- Contact the district if the DMR issued does not match the permit requirements so the issue can be addressed.

- Do not alter the DMR that was issued with the permit without approval from the district.

- Quarterly, semi-annual, and annual reports should NOT be submitted monthly.

- Make sure non-monthly DMRs shows the correct monitoring period.

Common Non-Monthly DMRs and Due Dates

Non-Monthly DMR	Monitoring Period	Due Date
First Quarter	January 1 – March 31	April 28
Second Quarter	April 1 – June 30	July 28
Third Quarter	July 1 – September 30	October 28
Fourth Quarter	October 1 – December 31	January 28
Semi-Annual (first half)	January 1 – June 30	July 28
Semi-Annual (second half)	July 1 – December 31	January 28
Annual	January 1 – December 31	January 28

TABLE OF ACRONYMS AND ABBREVIATIONS

$CBOD_5$	Carbonaceous Biochemical Oxygen Demand
cfu	Colony-forming unit (used as a measure of fecal coliform)
DMR	Discharge Monitoring Report
F.A.C.	Florida Administrative Code
IC25	The concentration of effluent that causes a 25 percent reduction in a biological response such as growth or reproduction when compared to a control response.
LC50	Lethal Concentration of the effluent (as a percent of the whole or 100% effluent) which results in the mortality of 50% of the test population for the multi-concentration (definitive) test.
LWWD	Limited Wet Weather Discharge
MDL	Method Detection Limit
MF	Membrane Filter (technique for measuring fecal coliforms)
mg/L	Milligrams per Liter
MGD	Million Gallons per Day
MPN	Most Probable Number (technique for measuring fecal coliforms)
n	Number of values or observations
NOD	Code used on the DMR to denote "No discharge from/to site"
NOEC	no observed effect concentration (pertaining to toxicity)
Part A	Part of the DMR used for reporting effluent or reclaimed water summary data
Part B	Part of the DMR used for reporting daily sample results
Part C	Part of the DMR previously used for reporting limited wet weather discharge data (no longer used)
Part D	Part of the DMR used for reporting ground water monitoring data
PQL	Practical Quantification Limit
SDF	Stream Dilution Factor
s.u.	standard units (for pH)
TKN	Total Kjeldahl Nitrogen
TNTC	Too Numerous To Count (for fecal coliforms)
WET	Whole Effluent Toxicity
x_g	Geometric Mean (technique for averaging fecal coliform data)