Helpful Tips for Completing the Underground Injection Control Monthly Operating Report (MOR)

Florida Underground Injection Control Program
Aquifer Protection Program
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INTRODUCTION

These instructions are designed to assist those responsible for collecting, formatting and submitting monthly operating data for Underground Injection Control (UIC) facilities permitted by the State of Florida. Many UIC facilities are required to submit monthly injection well and monitoring well data, which may include a variety of measurements and analyses made of physical properties, flow rates, water levels and chemical parameters. This document is intended to answer questions that may arise while completing the Monthly Operation Report (MOR) for an injection facility.

Chapter 62-528, F.A.C., requires that:

- The permittee shall submit monthly to the Department the results of all injection well and monitor well data required by the permit;
- The data be submitted no later than the last day of the month immediately following the month of record;
- The results shall be sent to the DEP District office responsible for issuing the permit; and
- A copy of the MOR is to also be sent to the Tallahassee DEP office.

In the interests of more efficient data analysis and data entry, a set of standardized templates was developed. Use of these templates is strongly encouraged. A set of individualized Excel spreadsheets will be generated for each facility as part of the permitting process. These spreadsheets will contain the monitoring sites and parameters necessary for meet the permitting requirements for each facility.

For questions specific to your facility's UIC forms, contact Mary Genung at 850-245-8656, Mary.Genung@dep.state.fl.us or Cathy McCarty at 850-245-8654, Cathleen.McCarty@dep.state.fl.us.

For more information about Florida's UIC Program, please see http://www.dep.state.fl.us/water/uic/index.htm

CLASS I and NON-ASR CLASS V REPORTING TEMPLATES

Reporting templates have been developed for reporting monitoring data from Class I and certain major non-ASR Class V injection well facilities. These reporting templates were designed for your facility to contain all of the monitoring data required by your permit. The following templates are available:

- **Monthly Summary** – Includes reporting month and year, total amounts injected, a brief summary of any issues encountered for the month, and the required certification and signatures
- **Operational Data –** One of these will be included, depending upon whether the facility injects one waste stream or multiple waste streams.
    - **Injection Well Operational Data –** This template is for wells that inject only one waste stream. Reports daily and monthly minimum, average and maximum for Injection Pressure and Injection Flow Rate. Reports daily and monthly injected flow rate.
    - **Multiple Stream Injection Well Daily Operational Data –** This template is for wells that inject more than one waste stream. Space is provided to report flow data for up to three waste streams. If additional streams are injected, a second reporting template will be provided. Reports daily and monthly minimum, average and maximum for Injection Pressure and Injection Flow Rate. Reports daily and monthly injected flow rate.
- **Injection Well Annular Pressure** – Reports daily and monthly maximum, minimum and average annular pressure. Space is provided on the template to record annular fluid or annular pressure added or removed.
- **Monitoring Well Daily Operational Data** – Reports maximum, minimum and average water levels or pressures for a single monitoring well.
- **Injectate Water Quality** –Reports results of chemical analyses and field parameter measurements for the injected fluid as required by the facility permit. This template will be pre-filled with parameter name, STORET code and reporting unit for each analyte.
- **Monitoring Well Water Quality Data** -- Reports results of chemical analyses and field parameter measurements for samples collected from monitoring wells as required by the facility permit. This template will be pre-filled with parameter name, STORET code and reporting unit for each analyte.
- **Specific Injectivity and Fall-Off Tests** – Reports data and results.

Each template provided to you will have the appropriate facility and well information pre-filled. Separate templates will be provided for each injection and monitoring well as needed. A workbook of Excel formatted templates will be made available to each facility. It is important that the forms be used as they are provided. Do not alter them, change the position of the tabs, or add any extra tabs not provided by FDEP. If there are errors in the forms or questions about their use, contact the Underground Injection Control Program in Tallahassee. If revisions to the forms are needed, they will be provided by the Tallahassee office.

The following sections will provide additional information on how to fill out these templates.

Figure 1: Class I and non-ASR Class V Monthly Summary Template

Monthly Summary

Facility Name
WACS Facility ID
UIC Permit No.

This report is for: Month _____ Year_____

Facility Total Injected Volume: _____ MG
Injection Well #1 Volume: _____ MG
Injection Well #2 Volume: _____ MG
Injection Well #3 Volume: _____ MG

☐ The injection well system experienced no issues this month with equipment, sampling or operation.

☐ The injection well system experienced the following issues this month with equipment, sampling or operation.

_____
_____
_____
_____
_____

Report any abnormal events, within 24 hours of their occurrence. (62-528.415(4) F.A.C.)

Comment Codes

C1 = Purging Monitoring Wells	C10 = Monitoring Well Recording Problems
C2 = DWI or Pump Station Shutdown	C11 = Readjusted Flow Rate to DWI/Switched Pumps
C3 = Power Outage/Restarted Pump	C12 = Installed Temporary Flow Meter or PSI Meter
C4 = SCADA System Restarted	C13 = Reinstalled Flow or PSI Meter
C5 = Maintenance to DWI Pump(s)	C14 = Pressure data from SCADA are unreliable. Used data from chart.
C6 = Read DWI Flow Meter Late/Early	C15 = SCADA pressure data verified and was used for this report.
C7 = Recalibrated DWI Flow or Level Meters	C16 = Pumps off part of the day
C8 = DWI Flow or PSI Meter Failure	C17 = No Data due to SCADA problems
C9 = UZMW/LZMW Transducer Meter failure	C18 = Injectivity Test Performed

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

NAME/TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE NO.
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	**DATE**

Monthly Summary Template Instructions

The Monthly Summary Template (Figure 1) provides a place to identify basic information about the report and includes the certification required by Chapter 62-528, F.A.C. Certain information on the template will be pre-filled, including Facility Name, WACS Facility ID, and UIC Permit Number.

To Be Completed by Facility:

1.

This report is for: Month _____ Year_____

Fill in the month and the year of the current Monthly Operating Report

2.

Facility Total Injected Volume: _____ MG
Waste Stream Volume #1: _____ MG
Waste Stream Volume #2: _____ MG
Waste Stream Volume #3: _____ MG

Fill in the total amount of fluid injected, for the month, in million gallons. If there was more than one waste stream, also list the total injected volume for each waste stream.

3.

☐**The Injection well system experienced no issues this month with equipment, sampling or operation**

☐**The injection well system experienced the following issues this month with equipment, sampling or operation:**

Check the appropriate box. If the injection well system did experience issues, use the comment codes to record the type of issue. If further explanation is needed, or the issue experienced is not in the code list, write a short description of the problem in the space provided. The comment codes can be used to indicate the type of issue encountered.

4.

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

This certification is required by Rule 62-528.340(4) for all reports and submittals. The certification must be signed by the Principal Executive Officer or authorized agent. Please sign and date the report, and include your title and telephone number.

Figure 2: Class I and non-ASR Class V Injection Well Physical Data Template

Injection Well -- Physical Data

Facility Name
WACS Facility ID
UIC Permit No.
WACS Testsite ID
WACS Testsite Name
Well Name

Month/Yr MM/YYYY	Injection Pressure (PSIg)			Injection Flow Rate (MGD)			Total Injected Volume (MG)
	Maximum	Minimum	Average	Maximum	Minimum	Average	
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							
31							
Monthly	Maximum	Minimum	Average	Maximum	Minimum	Average	Total
WACS Code	IWPMAX	IWPMIN	IWPAVG	IWRMAX	IWRMIN	IWRAVG	IWFTOT

Note: Record all operational data for the injection well per day. Unless the well was in operation for a full 24-hr period, the minimum flow rate should be entered as "0 MGD".

Injection Well Physical Data Template Instructions

Rule 62-528.425(1)(b) F.A.C., requires the installation and use of continuous indicating, recording and totalizing devices to monitor the flow rate and injection pressure for each Class I well. Rule 62-528.430(2)(b), F.A.C., requires that all Class I wells report daily readings of pressure and flow for each well, with monthly readings of average, maximum and minimum values.

The Injection Well Physical Data Template (Figure 2) reports the daily and monthly injection pressure, injection flow rate and total injected volume for each injection well. One template should be completed for each permitted injection well. If more than one waste stream is injected into a well, an alternate template, the Multiple Stream Injection Well Physical template, will be supplied to record the monthly monitoring data.

Parameters

- Month and Year of monitoring should be recorded where indicated.
- Injection pressure is reported in units of PSIg or pounds per square inch measured by gauge. Injection Pressure should be monitored by continuous recording devices, and daily average, minimum and maximum values recorded for each day of the month.
- Injection Flow Rate is reported in units of MGD (million gallons per day) or GPM (gallons per minute), as per the injection well permit requirement. Injection Flow Rate should also be monitored by continuous recording devices, and daily average, minimum and maximum values recorded for each day of the month. On any given day, if the well was not in operation for the full 24 hours, the minimum flow rate is “0 MGD or GPM”.
- Total Injected Volume is reported in units of MG or million gallons. This is the amount that is injected.
- Monthly Injection Pressure
    - Maximum Monthly Injection pressure is the highest value recorded of the daily maximum readings. Minimum Monthly Injection pressure is the lowest injection pressure value for the month.
    - Average Monthly Injection Pressure is the average of the daily average values.
- Monthly Injection Flow Rate
    - Maximum Monthly Injection flow rate is the highest value recorded of the daily maximum readings. The maximum monthly injection flow rate will always be greater than the average or minimum monthly flow rate, unless the well was not operated for the month.
    - Minimum Monthly Injection Flow Rate is the lowest injection flow rate for the month. If there was any day on which the well was not in operation for a full 24-hour period, this value should be “0 MGD’.
    - Average Monthly Injection Flow Rate is the average of the daily average values.
- Monthly Total Injected Volume is the sum of the daily total injected volume readings.
- WACS Codes are used by DEP staff for data entry and should be ignored.

Figure 3: Class I and non-ASR Class V Multiple Stream Injection Well Physical Data Template

Multiple Stream Injection Well Daily Operational Data

Facility Name | WACS Testsite ID
WACS Facility ID | WACS Testsite Name
UIC Permit No. | Well Name

Month/Yr.	Injection Pressure (PSIg)			Injection Flow Rate (MGD)			Injection Total Daily Vol (MG)	Injection Volume Stream 1 (MG)	Injection Volume Stream 2 (MG)	Injection Volume Stream 3 (MG)
MM/YYYY	Maximum	Minimum	Average	Maximum	Minimum	Average				
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										
31										
Monthly	Maximum	Minimum	Average	Maximum	Minimum	Average	Total	Total	Total	Total
WACS Code	IWPMAX	IWPMIN	IWPAVG	IWRMAX	IWRMIN	IWRAVG	IWFTOT			

Multiple Stream Injection Well Physical Data Template Instructions

Rule 62-528.425(1)(b) F.A.C., requires the installation and use of continuous indicating, recording and totalizing devices to monitor the flow rate and injection pressure for each Class I well. Rule 62-528.430(2)(b), F.A.C., requires that all Class I wells report daily readings of pressure and flow for each well, with monthly readings of average, maximum and minimum values.

The Multiple Stream Injection Well Physical Template reports the daily and monthly injection pressure, injection flow rate and total injected volume for those injection wells that receive wastewater from more than one source. An example would be an injection well that receives both effluent from a domestic wastewater facility and reject water from a demineralization operation.

If more than three waste streams are injected through a single well, an additional worksheet will be available.

Parameters

- Month and Year of monitoring should be recorded where indicated.
- Injection pressure is reported in units of PSIg or pounds per square inch measured by gauge. Injection Pressure should be monitored by continuous recording devices, and daily average, minimum and maximum values recorded for each day of the month.
- Injection Flow Rate is reported in units of MGD or million gallons per day. Injection Flow Rate should also be monitored by continuous recording devices, and daily average, minimum and maximum values recorded for each day of the month. On any given day, if the well was not in operation for the full 24 hours, the minimum flow rate is “0 MGD”.
- Total Injected Volume is reported in units of MG or million gallons. This is the amount that is injected
- Injection Volume Stream 1 (2,3, etc) is the volume in units of MG of one of the waste streams to an injection well that injects fluid from multiple sources. Enter the daily flows for each waste stream into the appropriate columns.
- Monthly Injection Pressure
    - Maximum Monthly Injection pressure is the highest value recorded of the daily maximum readings. Minimum Monthly Injection pressure is the lowest injection pressure value for the month.
    - Average Monthly Injection Pressure is the average of the daily average values.
- Monthly Injection Flow Rate
    - Maximum Monthly Injection flow rate is the highest value recorded of the daily maximum readings. The maximum monthly injection flow rate will always be greater than the average or minimum monthly flow rate, unless the well was not operated for the month.
    - Minimum Monthly Injection Flow Rate is the lowest injection flow rate for the month. If there was any day on which the well was not in operation for a full 24-hour period, this value should be “0 MGD’.
    - Average Monthly Injection Flow Rate is the average of the daily average values.
- Monthly Total Injected Volume is the sum of the daily total injected volume readings. Space is provided for reporting the total monthly volume for the well and the total monthly volume for each individual injection stream. These volumes are reported in MG or million gallons.
- WACS Codes are used by DEP staff for data entry and should be ignored.

Figure 4: Class I and non-ASR Class V Injection Well Annular Pressure Template

Annular Pressure

Facility Name | WACS Testsite ID
WACS Facility ID | WACS Testsite Name
UIC Permit No. | Well Name

Month/Yr MM/YYYY	Annular Pressure (PSIg)			Annular Fluid Added or Removed (GAL)	Annular Pressure Added or Removed (PSIg)
	Maximum	Minimum	Average		
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					
31					
Monthly	Maximum	Minimum	Average		
WACS Code					

Comments:

Note: Use "+ " sign for annular fluid or annular pressure added; use "-" sign for annular fluid or annular pressure removed.

Injection Well – Annular Pressure Template Instructions

Class I wells are required to monitor the condition of the annulus between the tubing and the final or innermost string of casing, if there is an annulus (Rule 62-528.425(1)(b). The Injection Well – Annular Pressure Template reports daily and monthly maximum, minimum and average annular pressure, along with a record of annular fluid or pressure added or removed.

Parameters

- Month and Year of monitoring should be recorded where indicated.
- Annular pressure is reported in units of PSIg or pounds per square inch measured by gauge. Injection Pressure should be monitored by continuous recording devices, and daily average, minimum and maximum values recorded for each day of the month.
- Annular Fluid Added or Removed is reported in gallons (GAL) of fluid. Record any amounts of annular fluid added or removed for each day of the month. Additions should be preceded by a "+" sign; removals by a "-"sign.
- Annular pressure Added or Removed is reported in units of PSIg or pounds per square inch measured by gauge. Record any amounts of annular pressure added or removed for each day of the month. Additions should be preceded by a "+" sign; removals by a "-"sign.
- Monthly maximum annular pressure is the highest value recorded of the daily maximum readings.
- Monthly minimum annular pressure is the lowest annular pressure measured for the month.
- Monthly average annular pressure is the average of the daily average values.
- WACS Codes are used by DEP staff for data entry and should be ignored.

Figure 5: Class I and non-ASR Class V Monitoring Well Physical Data Template

Monitoring Well -- Physical Data

Facility Name:
WACS Facility ID:
UIC Permit No.:
Datum: ☐ NGVD 29 ☐ NAVD 88
☐ Other_____
Measuring Point At _____

WACS Testsite ID: Zone ____
WACS Testsite Name:
Zone Name:

☐ Upper ☐ Lower ☐ Other _____

Month/Year MM/YYYY	Water Level - FT or PSIg			Comments
	Maximum	Minimum	Average	
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				
31				
Monthly	**Maximum**	**Minimum**	**Average**	
Storet Number				

Monitoring Well Physical Data Template Instructions

According to Rule 62-528.450(1)(g), the permittee must be able to monitor the absence of fluid movement adjacent to the wellbore and the long-term effectiveness of the confining zone. To provide reasonable assurance that these conditions are being met, the permittee is required to provide for monitoring for pressure changes in the overlying aquifer. Facilities either provide for measurement of water levels in designated monitoring wells, or measure the pressure directly using pressure transducers.

The Monitoring Well Daily Operational Data template records the water levels or pressures as measured in the facility monitoring wells. Only one of the two types of measurements will be required for the form. A separate template should be completed for each well and/or monitoring zone. All water levels should be referenced to a vertical elevation or datum for consistency and to allow for the comparison of data from one month to the next.

Parameters

- Month and Year of monitoring should be recorded where indicated.
- Datum is the standard position or level from which measurements are made, The North American Vertical Datum of 1988 (NAVD 88) is the vertical control datum currently used to establish vertical elevations. NAVD 88 updates and replaces the National Geodetic Vertical Datum of 1929 (NGVD 1929). Some older facilities may not have converted their datum from NGVD 29 to NAVD 88), so both options are offered on this template. An “other” option is also given in case site vertical measurements are established using a local vertical datum.
- Measuring Point At: provides a space to write where the water level in the well is measured from. This is often the top of the casing, or some other readily identifiable point.
- Daily Water Levels are normally measured continuously, either in feet below a common datum or in pounds per square inch measured by gauge.
- Monthly Water Levels
    - Maximum Monthly Water Level is the highest value recorded of the daily maximum readings.
    - Minimum Monthly Water Level is the lowest value for the month.
    - Average Monthly Water Level is the average of the daily average values.
- Storet Numbers are used by DEP staff for data entry and should be ignored.

Figure 6: Class I and non-ASR Class V Injection Well Chemical Data Template

Injection Well Chemical Data

Facility Name | WACS Testsite ID | Waste Stream: ☐ Domestic ☐ Industrial

WACS Facility ID | WACS Testsite Name | ☐ Reclaimed Water ☐ Mixed

UIC Permit No. | Well Name | ☐ Demineralization Concentrate ☐ Other _____

Sample Date	Sample Time	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name
		STORET Code	STORET Code	STORET Code	STORET Code	STORET Code	STORET Code	STORET Code	STORET Code	STORET Code
MM/DD/YYYY	00:00	Reporting Unit	Reporting Unit	Reporting Unit	Reporting Unit	Reporting Unit	Reporting Unit	Reporting Unit	Reporting Unit	Reporting Unit

Note: Please attach laboratory data sheets

Injection Well Chemical Data Template Instructions

One of the monitoring requirements for the operation of an injection well is analysis of the injected fluids. Rule 62-528.425(1)(a) stipulates that the analysis occur at a frequency specified in the permit to yield representative data on the characteristics of the injected fluids. The sampling frequency and the individual chemical substances to be analyzed are specified in the UIC permit. The Injectate Water Quality Data template was developed to easily organize the analysis results.

Parameters

- The Waste Stream pick list indicates what type of effluent is being tested. This is particularly important for facilities with more than one waste stream. Separate pages may be provided for each waste stream.
- Sample Date is the date on which the sample was taken.
- Sample Time is the time at which the sample was taken. This is important to fill out if more than one sample was collected on the same day.
- Parameter Name will be pre-filled on the template. This is the name of a field parameter or chemical or biological substance for which the sample was analyzed
- STORET Code will also be pre-filled on the template. This is an internal number used in the DEP database.
- Reporting Unit will also be prefilled on the template. These are the units of measurement for the parameter analyzed. Be careful to report the results in the units specified, i.e. mg/L instead of µg/L.
- A Comments field is provided for any comments or qualifiers concerning the water quality data results.

Figure 7: Class I and non-ASR Class V Monitoring Well Chemical Data Template

Monitoring Well Chemical Data

Facility Name | WACS Testsite ID | Zone: ____ | ☐ Upper

WACS Facility ID | WACS Testsite Name | ☐ Lower

UIC Permit No. | Zone Name | ☐ Other _____

Sample Date	Sample Time	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name
		STORET Code	STORET Code	STORET Code	STORET Code	STORET Code	STORET Code	STORET Code	STORET Code	STORET Code
MM/DD/YYYY	00:00	Reporting Unit	Reporting Unit	Reporting Unit	Reporting Unit	Reporting Unit	Reporting Unit	Reporting Unit	Reporting Unit	Reporting Unit

Note: Attach laboratory data sheets

Monitoring Well Chemical Data Template Instructions

One of the monitoring requirements for the operation of an injection well is to monitor the aquifers to ensure the absence of fluid movement adjacent to the well bore and to assess the long-term effectiveness of the confining zone. Rule 62-528.425(1)(g) requires that monitor wells be sampled periodically and that the frequency of sampling and the constituents analyzed be specified in the permit and representative of the monitored activity. Results are reported on the Monitoring Well Water Quality Data template.

Parameters

- The Zone check box is provided to indicate which zone in the monitoring well was sampled. A separate Monitoring Well Water Quality Data template should be filled out for each zone of each well.
- Location of Sampling Point provides space for a brief description of where the sample was drawn (i.e. raw water tap).
- Sample Date is the date on which the sample was taken.
- Sample Time is the time at which the sample was taken. This is important to fill out if more than one sample was collected on the same day.
- Parameter Name will be pre-filled on the template. This is the name of a field parameter or chemical or biological substance for which the sample was analyzed
- STORET Code will also be pre-filled on the template. This is an internal number used in the DEP database.
- Reporting Unit will also be prefilled on the template. These are the units of measurement for the parameter analyzed. Be careful to report the results in the units specified, i.e. mg/L instead of µg/L..
- A Comments field is provided for any comments or qualifiers concerning the water quality data results.
- WACS Codes are used by DEP staff for data entry and should be ignored.

Figure 8: Specific Injectivity and Fall-off Tests Template

Municipal and Municipal/WTP Wells -- Specific Injectivity and Fall-Off Tests						
Facility Name			WACS Testsite ID		Test Date: MM/DD/YYYY	
WACS Facility ID			WACS Testsite Name			
UIC Permit No.			Well Name			
	Test 1: Specific Injectivity Test	**Time**	**Injection Rate (GPM)**	**Wellhead Pressure (PSIg)**	**Totalizer Reading (Gallons)**	**Comments**
1	**Start test:** Shut-in well for one hour.					
2	Record Wellhead Pressure after 1-hour shut-in period.					
3	Start Test -- Start flow to the well. Begin 15-minute injection period once a constant rate of injection has been established.					
4	Stop Test -- Note final readings before ceasing flow.					
	Specific Injectivity Results					**Units**
5	Gallons injected = Final totalizer minus initial totalizer or as calculated from flow rate					Gallons
6	Time of test = 15 minutes unless otherwise noted		15			Minutes
7	GPM = Line 5 divided by line 6					Gallons per Minute
8	ΔPSI = Pressure Line 4 - Pressure Line 2					PSIg
9	**Specific Injectivity** = Line 7 divided by Line 8					**GPM/Δ PSI**
	Test 2: Fall-off Test	**Elapsed Time (minutes)**	**Injection Rate (GPM)**	**Wellhead Pressure (PSIg)**	**Comments**	
Start Test: Immediately after conducting the Specific Injectivity test, Start the Fall-off test.		0				
		0.5				
		1				
		1.5				
Flow and Pressure data at the beginning of the test should be the same as those recorded at the end of the Specific Injectivity test. Enter these values at Elapsed Time equals 0.		2				
		2.5				
		3				
		3.5				
		4				
		4.5				
		5				
Start recording fall-off pressure at Wellhead. Record wellhead pressure at 30-second intervals for 10 minutes.		5.5				
		6				
		6.5				
		7				
		7.5				
End Test: Record any comments on the test in the Comment field.		8				
		8.5				
		9				
		9.5				
		10				

Figure 9: Water Treatment Plant and Industrial Wells -- Fall-Off Test

WTP and Industrial Wells -- Fall-Off Test

Facility Name | WACS Testsite ID | Test Date: MM/DD/YYYY
WACS Facility ID | WACS Testsite Name
UIC Permit No. | Well Name

Fall-off Test	Elapsed Time (minutes)	Injection Rate (GPM)	Wellhead Pressure (PSIg)	Comments
Start Test: Record initial readings at Elapsed time equals zero and start the Fall-off test.	0			
	0.5			
	1			
	1.5			
Start recording fall-off pressure at Wellhead. Record wellhead pressure at 30-second intervals for 10 minutes.	2			
	2.5			
	3			
	3.5			
	4			
	4.5			
	5			
	5.5			
	6			
	6.5			
	7			
	7.5			
End Test: Record any comments on the test in the Comment field.	8			
	8.5			
	9			
	9.5			
	10			

WTP and other industrial wells: All Class I wells have an annual pressure fall-off requirement (62-528.430(2)(d)). For WTP and industrial wells, only a pressure fall-off test is required. This will require the injection operation to shut down and the fall-off measured as shown above.

Instructions

1. After a period of constant flow to the well, start the test by recording the initial time, injection rate, well head pressure and totalizer reading at elapsed time equals zero.
2. Shut in the well.
3. Record Wellhead pressure at 30-second intervals for 10 minutes.
4. Conclude the test after 10 minutes. Make notes as needed.

Specific Injectivity and Fall-Off Tests Template Instructions

Municipal-only wells: A quarterly specific injectivity test is required by 62-528.430(2)(b)1.b. (monthly during operational testing). A fall-off test should be run as part of the test (62-528.430(2)(d)). The procedure for shutting the well in prior to and after the 15-minute injection period should be followed.

WTP and municipal (blended) wells: This situation should be treated the same as for a municipal-only well with the option for the facility to either maintain injection of WTP concentrate during the two shut-in periods (thereby shutting off just the WWTP/WRF effluent flow during the two shut-in periods) or to shut off all effluent flow (concentrate as well as effluent) during the two shut-in periods. Either method will satisfy the quarterly specific injectivity test requirement under 62-528.430(2)(b)1.b. However, once per year all flow must be shut off for a pressure fall-off test as per 62-528.430(2)(d). Whatever procedure is proposed to and accepted by DEP should be consistent.

Specific Injectivity Test

Place the date of the test in the space provided. Use the totalizer to calculate flow rate. If the meter is not sensitive enough, the flow meter readings may be used to calculate the flow rate.

The test sequence should be performed as is indicated on the form.

1. Start by shutting off flow to the well at the well head. Pumps and well valve should be off. Once all flow has ceased record the test starting time on line 1.
2. Wait for a period of one hour, and record the ending time, flow rate, pressure and totalizer reading on line 2. During the entire shut-in period, there should be NO INJECTION to the well.
3. The shut-in period is followed by injection of water into the well for a period of 15 minutes. Start flow to the well by opening the valve at the well head/starting the pumps. Starting time for the 15-minute injection period begins once a constant rate of injection has been established.
4. Record the time, injection rate, well head pressure and totalizer reading on line 3.
5. After 15 minutes of injection, record time, injection rate, wellhead pressure and totalizer readings on line

Next, proceed to the 10 minute pressure fall-off phase.

Fall-Off Test for Municipal Only Injection Wells

Immediately after conducting the Specific Injectivity Test, start the Fall-off test.

1. Use the readings recorded on Line 4 at the end of the Specific Injectivity Test as the initial readings for the Fall-off test. Enter these values at elapsed time equals 0.
2. Shut in the well.
3. Record Wellhead pressure at 30-second intervals for 10 minutes.

At the conclusion of all testing, calculate the specific injectivity, GPM/ΔPSI, as indicated.

Fall-Off Test Only

1. After a period of constant flow to the well, start the test by recording the initial time, injection rate, well head pressure and totalizer readings at elapsed time equals zero.
2. Shut in the well.
3. Record well head pressure at 30-second intervals for 10 minutes.
4. Conclude the test after 10 minutes. Make notes as needed.

AQUIFER STORAGE AND RECOVERY (ASR) REPORTING TEMPLATES

Five templates have been developed for reporting monitoring data from ASR injection and monitoring wells. The following templates are available:

- **Monthly Summary** – Includes reporting month and year, injection phase(s) with start and end dates and times, a brief summary of any issues encountered for the month, and the required certification and signatures.
- **Class V ASR Injection Well Operational Data--** Reports daily and monthly minimum, average and maximum for Injection or Recovery Pressure and Injection or Recovery Flow Rate. Reports daily and monthly recharge, recovery or cumulative storage volume.
- **Class V ASR Injection Well Water Quality Data** -- Reports results of chemical analyses and field parameter measurements for the injected, stored or recovered fluid as required by the facility permit. This template will be pre-filled with parameter name, STORET code and reporting unit for each analyte.
- **Class V ASR Monitoring Well Water Level Data --** Reports maximum, minimum and average water levels or pressures for a single monitoring well along with injection phase for each day.
- **Class V ASR Monitoring Well Water Quality** -- Reports results of chemical analyses and field parameter measurements for samples collected from monitoring wells as required by the facility permit. Injection phase is identified for each sample. This template will be pre-filled with parameter name, STORET code and reporting unit for each analyte.

Each template provided to you will have the appropriate facility and well information pre-filled. Separate templates will be provided for each injection and monitoring well as needed. A workbook of Excel formatted templates will be made available to each facility. It is important that the forms be used as they are provided. Do not alter them, change the position of the tabs, or add any extra tabs not provided by FDEP. If there are errors in the forms or questions about their use, contact the Underground Injection Control Program in Tallahassee. If revisions to the forms are needed, they will be provided by the Tallahassee office.

The following sections will provide additional information on how to fill out these templates.

Figure 10: Class V ASR Monthly Summary Template

Monthly Summary

Facility Name:

WACS Facility ID:

UIC Permit No.:

This report is for: Month _____ Year_____

ASR Phases	Start Date and Time	End Date and Time

☐ The ASR well system experienced no issues this month with equipment, sampling or operation.

☐ The ASR well system experienced the following issues this month with equipment, sampling or operation.

_____

_____

_____

Report any abnormal events, within 24 hours of their occurrence. (62-528.415(4) F.A.C.)

Comment Codes

C1 = Purging Monitoring Wells
C2 = DWI or Pump Station Shutdown
C3 = Power Outage/Restarted Pump
C4 = SCADA System Restarted
C5 = Maintenance to DWI Pump(s)
C6 = Read DWI Flow Meter Late/Early
C7 = Recalibrated DWI Flow or Level Meters
C8 = DWI Flow or PSI Meter Failure
C9 = UZMW/LZMW Transducer Meter failure
C10 = Monitoring Well Recording Problems
C11 = Readjusted Flow Rate to DWI/Switched Pumps
C12 = Installed Temporary Flow Meter or PSI Meter
C13 = Reinstalled Flow or PSI Meter
C14 = Pressure data from SCADA is unreliable. Used data from chart.
C15 = SCADA pressure data verified and was used for this report.
C16 = Pumps off part of the day
C17 = No Data due to SCADA problems
C18 = Injectivity Test Performed

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

NAME/TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE NO.
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	**DATE**

Monthly Summary Template Instructions

The Monthly Summary Template provides a place to identify basic information about the report and includes the certification required by Rule 62-528, F.A.C. Certain information on the template will be pre-filled, including Facility Name, WACS Facility ID, and UIC Permit Number.
To Be Completed by Facility:

1.

This report is for: Month _____ Year_____

Fill in the month and the year of the current Monthly Operating Report

2.

Injection Phases	Start Date and Time	End Date and Time

For each injection phase, list the start date and time and the end date and time. Injection phases include recharge, storage and recovery.

3.

☐The Injection well system experienced no issues this month with equipment, sampling or operation

☐The injection well system experienced the following issues this month with equipment, sampling or operation:

Check the appropriate box. If the injection well system did experience issues, use the comment codes to record the type of issue. If further explanation is needed, or the issue experienced is not in the code list, write a short description of the problem in the space provided. The comment codes can be used to indicate the type of issue encountered.

4.

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

This certification is required by Rule 62-528.340(4) for all reports and submittals. The certification must be signed by the Principal Executive Officer or authorized agent. Please sign and date the report, and include your title and telephone number.

Figure 11: Class V ASR Well Physical Data Template

ASR Well Physical Data Injection Well

Facility Name:	**Well Name:**
WACS Facility ID:	**WACS Testsite ID:**
UIC Permit No.:	**WACS Testsite Name:**

Month/Yr	Daily Recharge Volume	Daily Recovery Volume	Cumulative Storage Volume	Injection/Recovery Flow Rate (GPM)			Injection Pressure (PSIg)		
	MG	MG	MG	Maximum	Minimum	Average	Maximum	Minimum	Average
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									
31									
Monthly	Total	Total	Total	Maximum	Minimum	Average	Maximum	Minimum	Average
STORET	ASRWRW	ASRWVR	ASRWSV	IWRMAX	IWRMIN	IWRAVG	IWPMAX	IWPMIN	IWPAVG

Note: Record all operational data for the injection well per day. Unless the well was in operation for a full 24-hr period, the minimum flow rate should be entered as "0 MGD".

Figure 12: ASR Well Physical Data -- Well #1 of Multiple Well System

ASR Well Physical Data -- Well #1 of Multiple Well System

Facility Name:	**Well Name:**
WACS Facility ID:	**WACS Testsite ID:**
UIC Permit No.:	**WACS Testsite Name:**

Month/Yr	Daily Recharge Volume	Daily Recovery Volume	Cumulative Storage Volume	Injection/Recovery Flow Rate (GPM)			Injection Pressure (PSIg)		
	MG	MG	MG	Maximum	Minimum	Average	Maximum	Minimum	Average
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									
31									
Monthly	Total	Total	Total	Maximum	Minimum	Average	Maximum	Minimum	Average
STORET	ASRWRW	ASRWVR	ASRWSV	IWRMAX	IWRMIN	IWRAVG	IWPMAX	IWPMIN	IWPAVG
Combined Total Volume Recovered (ASRTVR)					Combined Total Volume Injected (ASRTRV)				
Total Cummulative Storage Total (TCVASR)									

Note: Record all operational data for the injection well per day. Unless the well was in operation for a full 24-hr period, the minimum flow rate should be entered as "0 MGD".

Class V ASR Injection Well Physical Data Template Instructions

The Injection Well Operational Data Template reports the daily and monthly injection pressure, injection flow rate and total injected volume for each injection well. One template should be completed for each permitted injection well.

Parameters

- Month and Year of monitoring should be recorded where indicated.
- Injection pressure is reported in units of PSIg or pounds per square inch measured by gauge. Injection Pressure should be monitored by continuous recording devices, and daily average, minimum and maximum values recorded for each day of the month.
- Injection Flow Rate is reported in units of MGD million gallons per day or GPM (gallons per minute), as per the injection well permit requirement. Injection Flow Rate should also be monitored by continuous recording devices, and daily average, minimum and maximum values recorded for each day of the month. On any given day, if the well was not in operation for the full 24 hours, the minimum flow rate is "0 MGD or GPM".
- Total Injected Volume is reported in units of MG or million gallons. This is the amount that is injected
- Monthly Injection Pressure
    - Maximum Monthly Injection pressure is the highest value recorded of the daily maximum readings.
    - Minimum Monthly Injection pressure is the lowest injection pressure value for the month.
    - Average Monthly Injection Pressure is the average of the daily average values.
- Monthly Injection Flow Rate
    - Maximum Monthly Injection flow rate is the highest value recorded of the daily maximum readings. The maximum monthly injection flow rate will always be greater than the average or minimum monthly flow rate, unless the well was not operated for the month.
    - Minimum Monthly Injection Flow Rate is the lowest injection flow rate for the month. If there was any day on which the well was not in operation for a full 24-hour period, this value should be "0 MGD or GPM'.
    - Average Monthly Injection Flow Rate is the average of the daily average values.
- Monthly Total Injected Volume is the sum of the daily total injected volume readings.
- WACS Codes are used by DEP staff for data entry and should be ignored.

Figure 13: Class V ASR Well Chemical Data Template

ASR Well Chemical Data

Facility Name: **Well Name:**
WACS Facility ID: **WACS Testsite ID:**
UIC Permit No.: **WACS Testsite Name:**

Sample Date	Sample Time	ASR Stage -- Indicate one per sample	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name
		Recharge = IN Storage = ST Recovery = RE	STORET CODE	STORET CODE	STORET CODE	STORET CODE	STORET CODE	STORET CODE	STORET CODE	STORET CODE	STORET CODE	STORET CODE	STORET CODE
MM/DD/YYYY	0:00		UNIT	UNIT	UNIT	UNIT	UNIT	UNIT	UNIT	UNIT	UNIT	UNIT	UNIT

Note: Attach laboratory data sheets

Comments:

Class V ASR Injection Well Chemical Data Template Instructions

One of the monitoring requirements for the operation of an injection well is analysis of the injected fluids. Rule 62-528.425(1)(a) stipulates that the analysis occur at a frequency specified in the permit to yield representative data on the characteristics of the injected fluids. The sampling frequency and the individual chemical substances to be analyzed are specified in the UIC permit. The Class V Injection Well Water Quality Data template was developed to easily organize the analysis results.

Parameters

- Sample Date is the date on which the sample was taken.
- Sample Time is the time at which the sample was taken. This is important to fill out if more than one sample was collected on the same day.
- Recharge/Storage/Recovery indicates the injection phase of the well. Please check one box per day. On days of transition between phases, check the box for the longest duration for that day (i.e. If recharge took place for 18 hours, ten 6 hour of storage, indicate “recharge.”)
- Parameter Name will be pre-filled on the template. This is the name of a field parameter or chemical or biological substance for which the sample was analyzed
- STORET Code will also be pre-filled on the template. This is an internal number used in the DEP database.
- Reporting Unit will also be prefilled on the template. These are the units of measurement for the parameter analyzed. Be careful to report the results in the units specified, i.e. feet instead of inches or meters.
- A Comments field is provided for any comments or qualifiers concerning the water quality data results.
- WACS Codes are used by DEP staff for data entry and should be ignored.

Figure 14: Class V ASR Monitoring Well Physical Data Template

ASR Monitoring Well -- Physical Data

Facility Name: WACS Testsite ID: Zone ____

WACS Facility ID: WACS Testsite Name:

UIC Permit No.: Zone Name:

Datum: ☐ NGVD 29 ☐ NAVD 88

☐ Other_____ ☐ Upper ☐ Lower ☐ Other _____

Measuring Point At: _____

Month/Year MM/YYYY	ASR Stage -- Indicate one per sample	Water Level - FT or PSIg			
	Recharge = IN Storage = ST Recovery = RE	Maximum	Minimum	Average	Comments
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					
31					
Monthly		Maximum	Minimum	Average	

Monitoring Well Physical Data Template Instructions

According to Rule 62-528.450(1)(g), the permittee must be able to monitor the absence of fluid movement adjacent to the wellbore and the long-term effectiveness of the confining zone. To provide reasonable assurance that these conditions are being met, the permittee is required to provide for monitoring for pressure changes in the overlying aquifer. Facilities either provide for measurement of water levels in designated monitoring wells, or measure the pressure directly using pressure transducers.

The Monitoring Well Water Level Data template records the water levels or pressures as measured in the facility monitoring wells. A separate template should be completed for each well and/or monitoring zone. All water levels should be referenced to a vertical elevation or datum for consistency and to allow for the comparison of data from one month to the next.

Parameters

- Month and Year of monitoring should be recorded where indicated.
- Datum is the standard position or level from which measurements are made, The North American Vertical Datum of 1988 (NAVD 88) is the vertical control datum currently used to establish vertical elevations. NAVD 88 updates and replaces the National Geodetic Vertical Datum of 1929 (NGVD 1929). Some older facilities may not have converted their datum from NGVD 29 to NAVD 88), so both options are offered here. An “other” option is also given in case site vertical measurements are established using a local vertical datum.
- Measuring Point At: provides a space to write where the water level in the well is measured from. This is often the top of the casing, or some other readily identifiable point.
- Recharge/Storage/Recovery indicates the injection phase of the well. Please check one box per day. On days of transition between phases, check the box for the longest duration for that day (i.e. If recharge took place for 18 hours, ten 6 hour of storage, indicate “recharge.”)
- Daily Water Levels are normally measured continuously, either in feet below a common datum or in pounds per square inch measured by gauge.
- Monthly Water Levels
    - Maximum Monthly Water Level is the highest value recorded of the daily maximum readings.
    - Minimum Monthly Water Level is the lowest value for the month.
    - Average Monthly Water Level is the average of the daily average values.
- WACS Codes are used by DEP staff for data entry and should be ignored.

Figure 15: Class V ASR Monitoring Well Chemical Data Template

ASR Monitoring Well Chemical Data

Facility Name: **WACS Testsite ID:** **Zone: ____** ☐ Upper

WACS Facility ID: **WACS Testsite Name:** ☐ Lower

UIC Permit No.: **Zone Name:** ☐ Other _____

		ASR Stage -- Indicate one per sample	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name	Parameter Name
Sample Date	**Sample Time**	**Recharge = IN Storage = ST Recovery = RE**	**STORET CODE**	**STORET CODE**	**STORET CODE**	**STORET CODE**	**STORET CODE**	**STORET CODE**	**STORET CODE**	**STORET CODE**	**STORET CODE**	**STORET CODE**	**STORET CODE**
MM/DD/YYYY	0:00:00		**UNIT**	**UNIT**	**UNIT**	**UNIT**	**UNIT**	**UNIT**	**UNIT**	**UNIT**	**UNIT**	**UNIT**	**UNIT**

Note: Attach laboratory data sheets

Comments:

Class V ASR Monitoring Well Chemical Data Template Instructions

Rule 62-528.615(1)(a) requires monitoring of Aquifer Storage and Recovery wells. Frequency of monitoring is determined by the location of the well, the nature of the injected fluid, and where applicable, the requirements of two rules governing the disposal of domestic wastewater, Chapters 62-600 and 62-601, F.A.C. Results are reported on the Class V ASR Monitoring Well Chemical Data template.

Parameters

- The Zone check box is provided to indicate which zone in the monitoring well was sampled. A separate Monitoring Well Water Quality Data template should be filled out for each zone of each well.
- Location of Sampling Point provides space for a brief description of where the sample was drawn (i.e. raw water tap).
- Sample Date is the date on which the sample was taken.
- Sample Time is the time at which the sample was taken. This is important to fill out if more than one sample was collected on the same day.
- Recharge/Storage/Recovery indicates the injection phase of the well. Please check one box per day. On days of transition between phases, check the box for the longest duration for that day (i.e. If recharge took place for 18 hours, ten 6 hour of storage, indicate “recharge.”)
- Parameter Name will be pre-filled on the template. This is the name of a field parameter or chemical or biological substance for which the sample was analyzed
- STORET Code will also be pre-filled on the template. This is an internal number used in the DEP database.
- Reporting Unit will also be prefilled on the template. These are the units of measurement for the parameter analyzed. Be careful to report the results in the units specified, i.e. feet instead of inches or meters.
- A Comments field is provided for any comments or qualifiers concerning the water quality data results.
- WACS Codes are used by DEP staff for data entry and should be ignored.

SAMPLING AND ANALYSIS

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. Grab sampling is appropriate for water well sampling. A composite sample is collected over time, and reflects the average characteristics during the compositing period. Composite samples are generally appropriate for waste stream characterization.

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 Monthly Operating Reports (MORs).

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.

Computerized Data Logging Systems

The following applies to continuous monitoring equipment that feature computerized data logging or recording.

Data Polling

To ensure representative data, it is important for the computer system to poll the continuous monitoring instrument at relatively frequent intervals that are uniform throughout the day. In general, the time between successive polling of an instrument should be no more than 15 minutes. If an instrument were polled once every 15 minutes, the computer would record 96 observations during 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 every 15 minutes, the 96 observations would be reviewed by the computer). The highest and lowest values obtained from the logged observations are

recorded on the Injection Well Operation Data template 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 15 minute polling interval were used, the 96 observations obtained during the day would be summed and divided by 96 to obtain the daily average, which will be recorded on the Injection Well Operational Data template.

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.

DATA REPORTING

The following tips help provide consistency in data reporting.

Significant Figures

When reporting averages on your MOR, 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 1 for how to report a value after 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.

Example 1: Significant Figures

SIGNIFICANT FIGURES

- The data system reported the following weekly values as water level in feet: 5.0, 5.25, 4.95, and 5.134.
- The monthly average before rounding is 5.0835 feet.
- The monthly average should be reported on the Monthly Operating Report as 5.1 mg/L.

Below Detection Limits 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 MOR instructions provide direction on both reporting these results as well as calculating averages where needed, consistent with Rule 62-4.246, F.A.C.

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.

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 a water quality standard assuming the testing method is appropriate for the parameter.

See EXAMPLE 2 for reporting and averaging values below detection limits.

Example 2: Results below Detection Limits

Results Below Detection Limits

The lab reported the following weekly values:		
0.50 T mg/L	T	< MDL
1.3 I mg/L	I	between MDL and PQL
0.50 T mg/L	MDL	0.50 mg/L
2.1 mg/L	PQL	2.0 mg/L
	Limit	3.0 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. These codes should be reported on the MOR when they are part of the results received from the laboratory.