

Complying with Tank and Line Leak Detection Requirements Bureau of Weights and Measures WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION

#### TANK LEAK DETECTION

All new and existing tank systems shall be provided with leak detection that complies with ATCP 93.515. There are five common types of approved leak detection UST systems may use:

- Manual Tank Gauging
- Precision Tightness Testing,
- Automatic Tank Gauging (ATG)
  - Interstitial Monitoring (IM)
  - Statistical Continuous Automatic Leak Detection (SCALD)
  - Continuous Statistical Leak Detection (CSLD)
- Statistical Inventory Reconciliation (SIR)
- Interstitial Monitoring (IM).

All methods of tank leak detection for UST systems require consecutive, passing, monthly leak detection tests. If a tank leak detection system is providing inconsistent results, the department may require a precision tightness test to be performed.



#### LEAK DETECTION REPORT REQUIREMENTS

- Site information including the name of the business, the street address, and the municipality in which the site is located.
- Tank system information including the department-assigned tank identification number, the site identification number designated by the owner or operator, the tank capacity, the product in the tank, the type of pipe system, and whether there are pipe manifolds in the tank system.
- Test method information including the name of the method or equipment used, the material approval number as issued under s.ATCP 93.130, the date the test was performed, the threshold value used to declare a leak, the rate of volumetric change, whether the final result was a pass or fail, and the name and certification of the technician performing the test.



#### TANK LEAK DETECTION- MANUAL TANK GAUGING

- May be sole method for tanks up to 1,000 gallons for the life of the tank.
- Tanks 1,001-2,000 gallons may use if specific conditions are met. If the tanks are more than 10 years old, must also have monthly monitoring.
- Tanks 2,001 gallons and greater may not use manual tank gauging.
- Procedure requires a shutdown period of at least 36 hours or as listed in Table 93.515.
- No product can be placed into or withdrawn from the tank during shutdown period.
- 2 stick readings at the beginning and 2 at the conclusion of the shutdown period.
- I/8th inch requirement applies here too.



### TANK LEAK DETECTION- MANUAL TANK GAUGING (CONTINUED)

Table 93.515 Test Duration and Standards								
Nominal Tank Capacity	Minimum Test Duration	Weekly Standard (1 test)	Monthly Standard (average of 4 tests)					
550 gallons or less	36 hours	10 gallons	5 gallons					
551-1000 gallons, tank diameter of 48 inches	58 hours	12 gallons	6 gallons					
551-1000 gallons, tank diameter of 64 inches	44 hours	9 gallons	4 gallons					
551-1,000 gallons and using precision tightness testing every 5 years	36 hours	13 gallons	7 gallons					
1001-2000 gallons <sup>1</sup>	36 hours	26 gallons	13 gallons					
<sup>1</sup> Requires precision tightness testing every 5 years. This method is only all	owed until the tank is 10	years old.						



#### TANK LEAK DETECTION-TIGHTNESS TESTING

#### ATCP 93.515(4) Precision Tightness Testing:

- By a certified tank system tightness tester, using methods approved under 93.130 to perform precision tightness testing for tanks or piping.
- With permanently installed leak detection equipment as approved under 93.130 to perform precision tightness testing for tanks or piping. (Not generally used as the Material Approval for the equipment requires the tank to be 95% full in most cases)
- Where a certified tank system tightness tester is used, the tester shall include the date and the beginning and end times in the test results report.



#### TANK LEAK DETECTION-AUTOMATIC TANK GAUGE (ATG)

#### ATCP 93.515(5) Automatic Tank Gauging:

- No more than 30 days may elapse between monthly monitoring tests using an automatic tank gauge.
- Monthly monitoring tests shall have the capabilities specified in 93.130(3)(b).
- An automatic tank gauge shall be placed in the center of the tank and no closer than 12 inches from the fill pipe and the submersible pump.
- ATGs shall have a printer that provides specific information.
- ATGs shall be programmed to provide an audible and visual alarm in the event of a tank or line test failure.

Individual fact sheets have been created to outline the common ATG systems. Several examples of leak detection tickets from the ATG can be found at: <a href="https://datcp.wi.gov/Pages/Programs\_Services/LeakDetectionStorageTanks.aspx">https://datcp.wi.gov/Pages/Programs\_Services/LeakDetectionStorageTanks.aspx</a>



#### TANK LEAK DETECTION-AUTOMATIC TANK GAUGE

- Interstitial monitoring is a leak detection method that entails the surveillance of the space between a tank system's walls and the secondary containment system for a change in the steady-state conditions.
- Statistical Continuous Automatic Leak Detection (SCALD) monitors the product level and temperature in the tank at idle times.
   The system will continue to monitor the tank until it has gathered enough data to conclude that the tank system is tight, or there is a possible leak.
- Continuous Statistical Leak Detection (CSLD) monitors the product level and temperature in the tank at idle times. The system
  will continue to monitor the tank until it has gathered enough data to conclude that the tank system is tight, or there is a possible
  leak.



## TANK LEAK DETECTION-INTERSTITIAL MONITORING (IM)

ATCP 93.515(7) Interstitial Monitoring: IM between an underground tank system and a secondary barrier immediately around it may be used only if the system is installed and maintained to detect a leak from any portion of the tank that could contain product, and the system meets <u>one</u> of the following requirements:

- System testing. Post-installation testing verifies the system operates in accordance with the manufacturer's specifications.
- Double-walled systems. The sampling or testing method shall be capable of detecting a leak through the inner or outer wall in any portion
  of the tank or piping that routinely contains product.
- Systems with internally fitted liners. Monitoring system shall be installed that is capable of detecting a leak between the inner wall of the tank and the liner. Liner shall be chemically compatible with the substance stored.
- Systems with a barrier in the excavation zone. Must meet additional requirements.
- Interstitial monitoring sensors. Shall be capable of providing an audible or visual alarm that needs manual operator action to silence.



#### EXAMPLE - INTERSTITIAL MONITORING (IM) REPORT





#### EXAMPLE - STATISTICAL CONTINUOUS AUTOMATIC LEAK DETECTION (SCALD)





#### EXAMPLE – CONTINUOUS STATISTICAL LEAK DETECTION (CSLD)





#### TANK LEAK DETECTION-STATISTICAL INVENTORY RECONCILIATION (SIR)

- Businesses using SIR must meet the requirements of 40 CFR ss. 280.43(h).
- A conclusive pass or fail must be obtained at least every 30 days.
- Daily product inventory records shall be kept current and on-site.
- Tank product level measurements shall be recorded using an electronic inventory probe or an ATG.
- Operator must have a process to submit data to the SIR vendor and receive results back within the 30-day monitoring period.
- If the result of the 30-day monitoring period is inconclusive or missing, another method of leak detection shall be used to determine a conclusive pass or fail for that monitoring period.



#### TANK LEAK DETECTION-STATISTICAL INVENTORY RECONCILIATION (SIR)-(CONTINUED)

- Operators using SIR shall review the vendor summary report within 24 hours of receipt. If the summary report indicates a failure, the operator shall take immediate action for assessing and responding to a leak or release.
- Statistical inventory reconciliation may not be used as a method of precision tightness testing.
- Before changing from another method of leak detection to statistical inventory reconciliation, the operator shall provide the department with proof that precision testing was performed within the previous 12 months, showing the tank system to be liquidtight.



#### LEAK DETECTION – RECORD KEEPING

ATCP 93.500(9)(b)4. RECORD KEEPING: Records may be kept electronically, provided they are in a format acceptable to the department.

- (c) I-16 Maintenance of records. Records shall be maintained for the following periods from the date of the most recent test, inspection or upgrade:
  - Monthly leak detection monitoring I year.
  - Annual precision tightness testing I year.



### LEAK DETECTION – REPORTS

ATCP 93.510(3)(a)1.Tanks shall be monitored at least every 30 days for leaks using one of the methods listed in 93.515, except as provided in subd. 2. and 93.500(1)(a).

- 2. Tanks installed prior to February 1, 2009, that have a capacity of 1,000 gallons or less may use manual tank gauging conducted in accordance with
   93.515(3) as the sole means of leak detection provided it is performed weekly.
  - Note: Under 93.500(1)(a), continuous electronic interstitial monitoring is generally required for all secondary containment installed on or after February 1, 2009.

(b) Failed tests. If a passing test using monthly monitoring is not achieved, the site shall be assessed for the presence of a release in accordance with 93.575 to 93.585.

(c) Inconsistent results. The authorized agent or the department may require a precision tightness test to be performed where any of the following events occur:

- I.A tank system is accumulating water for no apparent reason.
- 2.A leak detection method is providing erratic results.
- 3.A tank system is tested with multiple leak detection methods that show different results.



#### LEAK DETECTION REPORTS-(CONTINUED)

#### **IMPORTANT NOTE!**

Depending on the method of leak detection, and the approved equipment, there may be minimum product levels and minimum test times required to generate a valid test. If you are unfamiliar with the equipment, always check the material approval for what constitutes a valid test.

Example: A Gilbarco Veeder Root TLS 350 requires a minimum of tank volume and duration to complete a static test. This particular information can be found on Material Approval Number 20130002.



#### LEAK DETECTION REPORTS-(CONTINUED)

Maximum Tank Size1	Up to 15,000 gallo	ns
Software Version	N/A	
Minimum Tank Level (0.2 gph testing only- 0.1 gph testing must be performed at 95%)	Minimum product level is tank diameter as follows: Probe Working Length	based on
b. I gph testing must be performed at 55%)	(Tank ID in inches)	Level (in) <sup>2</sup>
	24 thru 26	9
	27 thru 36 37 thru 47	12 15
	48 thru 58	18
	70 thru 79	24
	91 thru 101	30
	102 thru 111 112 thru 122	33 36
	123 thru 133 134 thru 143	39 42
	144 thru 154	45
	166 thru 175	51
Waiting time between filling tank and test start <sup>3</sup> (Stabilization Time)	8 hours minimum (mont 8 hrs. 15 min. minimum gph)	54 hly -0.2 gph) (annual- 0.1
Waiting time between dispensing and test start	30 minutes minin	num
Minimum Test Period*	2 hours (0.2 gph test) 3 hours (annual- 0.1 gph)	1
Monthly and annual testing can only be performe manifolded together, an isolation valve (siphon bi the tanks individually.	d on one tank at a time. If two o reak) will have to be installed so	r more tanks ar as to separate
2 Minimum level from probe bottom is same as pro configuration where the probe touches the bottom	duct level in tank, assuming the n of the tank.	typical
There must be no delivery during waiting time. There must be no delivery or dispension during the	estino	



### LEAK DETECTION REPORTS (CONTINUED)

A facility is required to provide verifiable documentation.

With the exception of Interstitial monitoring, all methods of leak detection need the complete supporting documents for verification. Not only will you review the tank leak detection records from the ATG, SIR Reports, etc.; you will also review the inventory records. If you are completing a Fuel Quality inspection, you will review these records for IM as well.

I.Product Inventory Records

- A. Delivery Manifests
- B. Inventory Reconciliation
- C. Bills of lading from the delivery terminal



#### DELIVERY MANIFEST/BILL OF LADING





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#### DAILY PRODUCT INVENTORY RECORDS

Date         Start Stick         Delivered         Gallons         Book         End Stick Inventory         Over (+)         Mor           Gallons         Gallons         Pumped Inventory         Inches         Gallons I         Short (-)         D           1         1000.0         500.0         200.0         1300.0         60.0         1300.0         0.0         0           2         1300.0         0.0         1150.0         54.0         0.0         0         0	nth to Initials
Gallons         Gallons         LPumped         Inventory         Inches         Gallons         Short (-)         D           1         1000.0         500.0         200.0         1300.0         60.0         1300.0         0.0         0           2         1300.0         0.0         1150.0         54.0         0.0         0         0	
1 1000.0 500.0 200.0 1300.0 60.0 1300.0 0.0 0 2 1300.0 0.0 150.0 1150.0 54.0 0.000 0.0 0	ate
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5 765.0 0.0 260.0 505.0 40.0 505.0 0.0 0	.0 JS
6 505.0 500.0 100.0 905.0 57.0 905.0 0.0 0	.0 JS
7 905.0 0.0 0.0 905.0 46.0 800.0 -105.0 -10	)5.0 JD
8 800.0	
9	
10	



#### DAILY PRODUCT INVENTORY RECORDS

	(	Delivery should match shipping manifest. Gallons Pumped should match sales reports.					corresponding Inventory Ticket from the ATG (if used).			
Date Start St		ck Delivered Gallons Book End Stick Inventory				Over (+)	Month to	Initials		
	Gallons	Gallons	Pumped	Inventory	Inches	Gallons	Short (-)	Date		
1	1000.0	500.0	200.0	1300.0	60.0	1300.0	0.0	0.0	JS	
2	1300.0	0.0	150.0	1150.0	54.0	1150.0	0.0	0.0	JS	
3	1150.0	0.0	300.0	850.0	48.0	850.0	0.0	0.0	JS	
4	850.0	0.0	85.0	765.0	44.0	765.0	0.0	0.0	JS	
5	765.0	0.0	260.0	505.0	40.0	505.0	0.0	0.0	JS	
6	505.0	500.0	100.0	905.0	57.0	905.0	0_	0.0	JS	
7	905.0	0.0	0.0	905.0	46.0	800.0	-105.0	-105.0	JD	
8	800.0									
9										
10										
11	What could have happened here?							I	I	



#### LINE LEAK DETECTION

#### All Pressurized Underground lines require Automatic Line Leak Detectors!

ATCP 93.515(8)(b) Automatic line leak detectors. Underground piping systems serving a storage tank with a submersible pump or pressurized booster pump shall be provided with an automatic line leak detector that alerts the operator to the presence of a leak by restricting or shutting off flow from the pump, when it detects leaks of 3 gallons per hour at 10 pounds per square inch line pressure within 1 hour.

- If a facility that requires Automatic Line Leak Detection does NOT have it installed, it shall be immediately shut down / Red Tagged.
- Safe suction systems or above ground lines generally do <u>not</u> require line leak detectors.



#### LINE LEAK DETECTORS



## Mechanical Line Leak Detector

## Electronic Line Leak Detector





## Mechanical Line Leak Detector



#### LINE LEAK DETECTORS-MECHANICAL







### LINE LEAK DETECTORS-MECHANICAL (MLLD)





#### LINE LEAK DETECTORS-ELECTRONIC (ELLD)







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#### LINE LEAK DETECTORS-ELECTRONIC (ELLD)







#### LINE LEAK DETECTOR INSTALLATION

# Line Leak Detector Installation or Upgrade shall be documented on form TR-WM-133 (formerly ERS-9 LD).

CI I I I I I I I I I I I I I I I I I I	STORAGE TANK LEAK DETECTION INSTALLATION UPGRADE APPLICATION / NOTIFICATION	Bureau of Weights & Measures Permit & Licensing Section P.O. Box 7837 Madison, WI 53718-7837 262-523-3044
NSTRUCTIONS: This form is to be s submittal for new installations, or subi or upgrade of existing methods, equip equipment, submit this form within fiv	Ibmitted to the Department of Agriculture, Trade & Consu- nitted independently for conversions of existing systems f ment or software along with the respective startup tests ( e days of installation to DATCP at the address in the upper	Imer Protection (DATCP) along with the plan from one leak detection methodology to another ATG) or precision test (SIR). For existing er right corner of this page.
Personal inform OWNER INFORMATION Customer ID#	ation you provide may be used for secondary purposes [F PROJECT INFORMATION Site ID# Facility ID#	Privacy Law, s. 15.04(1)(m)]. CONTRACTOR INFORMATION Customer ID#
Personal inform DWNER INFORMATION Customer ID# Vame	ation you provide may be used for secondary purposes [F PROJECT INFORMATION Site ID# Facility ID# Facility Name	Privacy Law, s. 15.04(1)(m)]. CONTRACTOR INFORMATION Customer ID# Contractor Name
Personal inform DWNER INFORMATION Customer ID# Vame Company Name	ation you provide may be used for secondary purposes [F PROJECT INFORMATION Site ID# Facility ID# Facility Name Site Address	Privacy Law, s. 15.04(1)(m)]. CONTRACTOR INFORMATION Customer ID# Contractor Name Number and Street
Personal inform OWNER INFORMATION Customer ID# Name Company Name Vumber and Street	ation you provide may be used for secondary purposes [F PROJECT INFORMATION Site ID# Facility ID# Facility Name Site Address City Village Town of:	Privacy Law, s. 15.04(1)(m)]. CONTRACTOR INFORMATION Customer ID# Contractor Name Number and Street City, State, Zip Code
Personal inform OWNER INFORMATION Customer ID# Name Company Name Vumber and Street Dity. State. Zip Code	ation you provide may be used for secondary purposes [F PROJECT INFORMATION Site ID# Facility ID# Facility Name Site Address City Village Town of: County	Privacy Law, s. 15.04(1)(m)]. CONTRACTOR INFORMATION Customer ID# Contractor Name Number and Street City, State, Zip Code Contact Person
Personal inform OWNER INFORMATION Customer ID# Name Company Name Number and Street Dity. State. Zip Code Telephone Number Fax Number	ation you provide may be used for secondary purposes [F PROJECT INFORMATION Site ID# Facility ID# Facility Name Site Address City Village Town of: County Fire Dept. Providing Fire Coverage FDID#	Privacy Law, s. 15.04(1)(m)]. CONTRACTOR INFORMATION Customer ID# Contractor Name Number and Street City, State, Zip Code Contact Person Telephone Number: E-mail:



WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION

#### LINE LEAK DETECTION (CONTINUED)

ATCP 93.510 (4) Leak detection for piping. (a) Pressurized piping. Underground piping that conveys regulated substances under pressure shall comply with all of the following requirements unless all of the piping is visible:

- 1. The system shall be equipped with an automatic line leak detector in accordance with s.ATCP 93.515 (8) (b).
- 2. 2. Single-wall piping systems shall have at least one of the following leak detection methods:
  - a. An annual precision tightness test.
  - b. Monthly monitoring to the 0.2 gallon per hour rate.
- 3. Double-wall piping systems shall use one of the leak detection methods in subd. 2., or statistical inventory reconciliation, or continuous interstitial monitoring, except as provided in s.ATCP 93.500(1)(a). Note: Under section s.ATCP 93.500 (1) (a), continuous electronic interstitial monitoring is generally required for all secondary containment installed on or after February 1, 2009.
- 4. 4. If a passing test using monthly monitoring is not achieved, the site shall be assessed for the presence of a release in accordance with ss. ATCP 93.575 to 93.585.



#### LINE LEAK DETECTION – (CONTINUED)

The Method of Leak Detection must match what is recorded on the site's Permit to Operate (PTO) Application. The facility must provide ONE of the following:

- Consecutive .20 gph Monthly Line Leak Test results.
- Monthly Line Interstitial Monitoring.
- .10 gph Annual Line Leak Test Results if the ATG is approved to complete that test.
- If the ATG equipment <u>is not</u> capable of detecting a .10 gph leak the facility is required to maintain records of the monthly .20 gph or an annual .10 gph precision piping test recorded on form TR-WM-125 (formerly form ERS-10778 LT).
- The annual functionality test for the line leak detectors shall be recorded on TR-WM-124 (formerly ERS-10778 LLD). This test must include inducing a .30 gph @ 10PSI leak on the mechanical or electronic line leak detector.



# EXAMPLE - CONSECUTIVE .20 GPH MONTHLY LINE LEAK TEST RESULTS





WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION

### LINE LEAK DETECTION (CONTINUED)

Wisconsin Department Bureau of Weights and M P O Box 7837 Madison (608) 224-4942 ELECTRONIC/MECHANICAL AU	of Agriculture, Trade and Cons leasures WI 53707-7837	sumer Protection	Wis. Admin. Code §ATCP 93.515	Wisconsin I Bureau of Wo (608) 224-49	Department of Ag eights and Measure 7 Madison, WI 53 42 SS TEST	riculture, Trade an ss 3707-7837 REPORT	d Consumer Pr	otection	rpt arnes use and
Personal information you provide may be used for p	urposes other than that for which it was or	iginally collected (s. 15.04(1)(	m) Wis. Stats.).	Personal information you provide n	nav be used for purpose	s other than that for whic	h it was originally col	lected (s. 15.04/1)/I	m) Wis. Stats.).
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is form is used to document testing and servicing	of underground line leak detection and is p	provided to the tank system of	wner/operator. Owner/operator	EMAIL		WI CERTIFICATION #	WORK	ORDER #	
rech's Manufacturer	5.000(a).	Test Equipment /Type							
ertification Number:	Exp. Date:	(used for test)		TYPE OF TESTING EQUIPMENT	-				
roduct			1	Brand:		Model:		Material Appro	oyal #:
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dal-				Product Type					
A/EL				Dump Manufacturer				1	



#### LINE LEAK DETECTION – (CONTINUED)

ATCP 93.510(4)(b) – Suction piping. Different requirements than pressurized piping.

• Standard suction piping equipped with monthly interstitial monitoring will provide passing monthly reports or a passing precision tightness test every three years.





# Thank You!



#### Bureau of Weights and Measures

DATCPWMCompliance@wisconsin.gov

WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION (DATCP)