Department of
Environment &
Conservation

2018 UST Rule Changes- Contractor Series

Release Detection

Dustin Turner and Don Taylor

September 2, 2021

Rule Change Webinar Series

- Sump testing & repairs: https://youtu.be/vtDbY8cF2MA
- Spill & overfill testing: https://youtu.be/_G--RLwT4TE
- Walkthrough inspections: September 9th @ 9/10est
- Generators/dual use tanks: September 16th @ 9/10est
- Webinar registration: https://www.tn.gov/environment/program-areas/ust-underground-storage-tanks/ust/new-rules.html

Disclaimer

The State of Tennessee does not endorse any specific brands, manufacturers, or vendors of equipment, products or services.

Any brand names mentioned or depicted of any equipment, products, or services in this presentation are used for illustrative purposes only and are neither endorsements nor recommendations for such equipment, products, or services and shall not be construed as such.

Today's agenda

- Important dates
- Testing of release detection (RD) components
- Test procedures and forms
- Tester/contractor requirements and certifications
- When tests fail

Important Dates

- Oct. 13, 2015 Effective date for EPA's federal rules

- Oct. 13, 2018 Due date date for systems installed **on or after** October 13, 2018

- Oct. 13, 2021 Due date for systems installed **prior to** October 13, 2018

1) The components

- Electrical and mechanical release detection components
  - Automatic Tank Gauges (ATGs)
  - Probes and sensors
  - Line leak detectors
  - Vacuum pumps and pressure gauges

2) Testing requirements

- The manufacturer's instructions;
- Nationally recognized code of practice; or
- Division requirements

3) Required annually

- Release detection components
- Line tightness test
- Annual walkthrough inspections

Definition of *annually*

: once a year **:** each year

Automatic Tank Gauges (ATGs)

- Alarms
- Verify system configuration
- Inspect tank probes

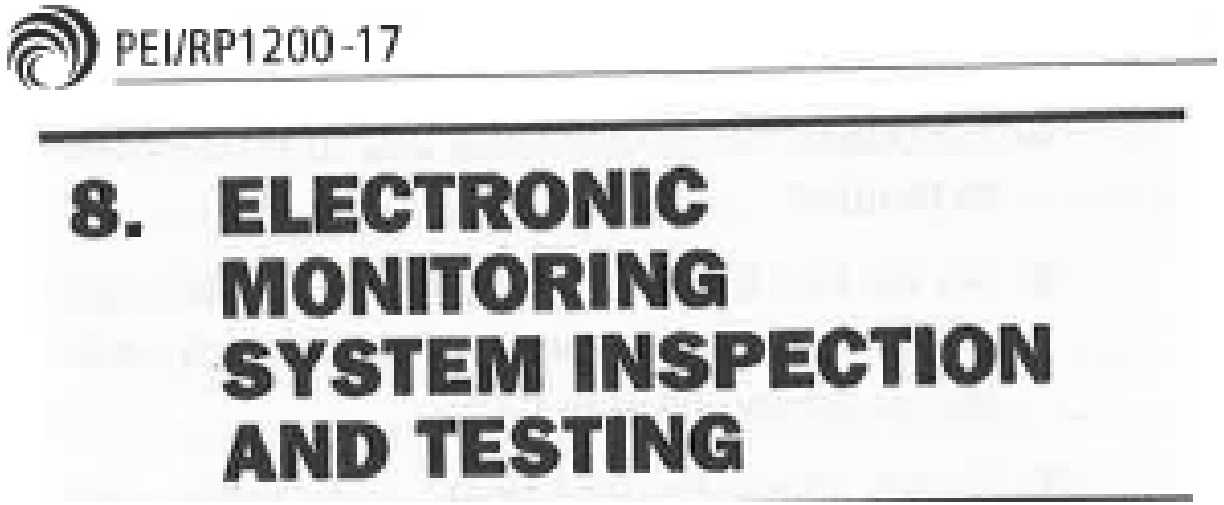

```
IN-TANK SETUP
- - - - - - - - - - - -

T 2:DIESEL
PRODUCT CODE     :       2
THERMAL COEFF    :.000450
TANK DIAMETER    : 120.00
TANK PROFILE     :  4 PTS
       FULL VOL  :  19947
  90.0 INCH VOL  :  16201
  60.0 INCH VOL  :   9974
  30.0 INCH VOL  :   3746
METER DATA       : YES
END FACTOR:          NONE
CAL UPDATE:  NEVER


FLOAT SIZE:       4.0 IN.

WATER WARNING    :    3.0
HIGH WATER LIMIT:     3.5

MAX OR LABEL VOL:  19947
OVERFILL LIMIT   :    90%
                 :  17952
HIGH PRODUCT     :    95%
                 :  18949
DELIVERY LIMIT   :    10%
                 :   1994

LOW PRODUCT      :   1500
LEAK ALARM LIMIT:     99
SUDDEN LOSS LIMIT:   999
TANK TILT        :  0.56
PROBE OFFSET     :  0.00
```

1) Manufacturer's test procedures

- Veeder Root's TLS-3XX Operators Manual (576013-610) section 31-1
- TLS-450 Setup and Operation Manual (577013-940): periodic maintenance checklist
- Franklin Fueling?
- OPW?

2) National code of practice

- PEI/RP 1200: Section 8 – Electronic monitoring system inspection and testing



3) TN's ATG test procedure: SIM Ch. 3.2

- Console inspection
  - Manufacturer and model number
  - Check alarms
  - Compare tank liquid levels to inventory
  - Dedicated circuit
  - Test battery backup

3) TN's ATG test procedure: SIM Ch. 3.2

- Data collection and review
  - Software version and test type
  - Inventory reports
  - Setup reports

```
IN-TANK SETUP
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TANK TILT        :    0.56
PROBE OFFSET     :    0.00

SIPHON MANIFOLDED TANKS
T#: NONE
LINE MANIFOLDED TANKS
T#: NONE

LEAK MIN PERIODIC:     20%
                 :    3989

LEAK MIN ANNUAL  :     20%
                 :    3989

PERIODIC TEST TYPE
                  STANDARD
```

In tank setup

- Thermal coefficient: Dsl .00045 Gas .0007 Kero .0005
- Leak min periodic: N/A for CSLD, required for static testing (see NWGLDE for tank size requirement)
- Tank profile: 1-point flat end. 4-point FG
- Water limit: max 1.5” conventional
  - 0.25” ethanol blends
- Climate factor: moderate
- Veeder-Root TLS-3XX Setup Manual (576013-623)
- TLS-450 Setup and Operation Manual (577013-940)

TN's ATG test procedure: SIM Ch. 3.2

- Probe inspection
  - Tank #, volume, diameter
  - Probe serial number
  - Cable/wire inspection

TN's ATG test procedure: SIM Ch. 3.2

- Float inspection
  - Move freely
  - Low product/high water alarms

Tampering with release detection equipment

- 68-215-120. Criminal penalties.
- (b) Any person who **knowingly tampers with or disables a release detection or prevention device associated with an underground storage tank**, or who knowingly causes or allows a release of petroleum into the environment in violation of this chapter, rules, regulations or orders of the commissioner or board **commits a Class E felony**; provided, however, that, if such release results in an expenditure for cleanup by any other person or from the fund, the offense shall be graded for such expenditure in the same manner as theft under § 39-14-105(a)(2)-(5).

TN's ATG test procedure: SIM Ch. 3.2

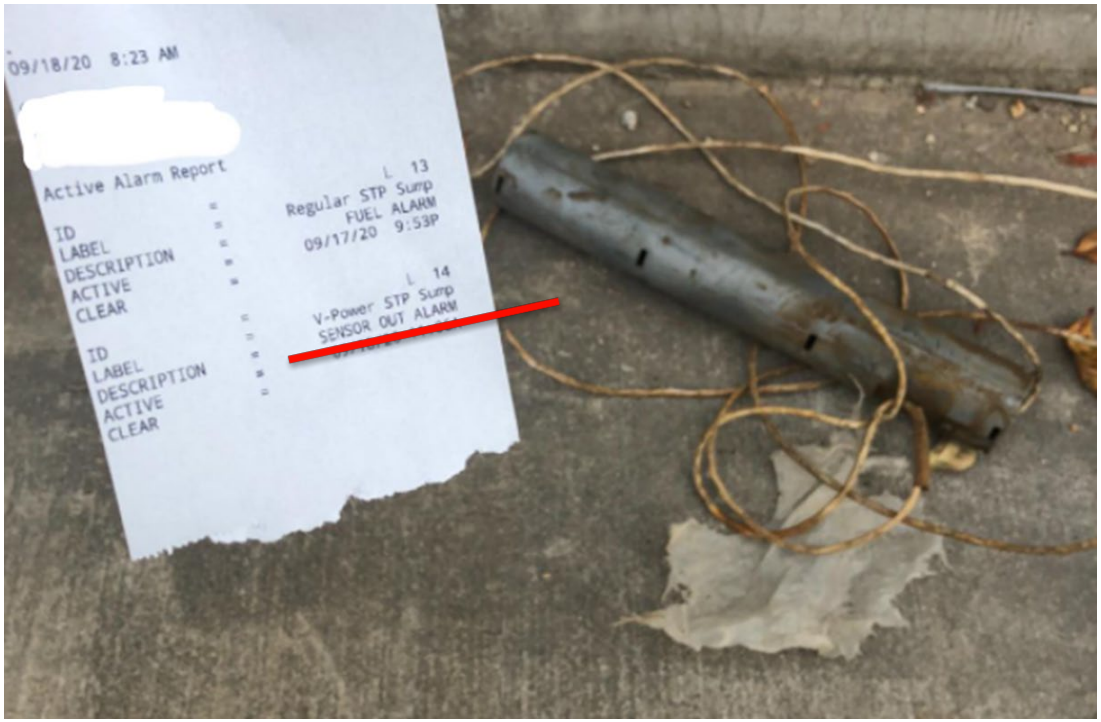
- Reinstall probe
  - Probe caps & cables
  - Check communication to the console

Draft ATG operability test form

- Search “TDEC UST” >
- New rules page >
- Draft forms
  - https://www.tn.gov/environment/program-areas/ust-underground-storage-tanks/ust/new-rules.html
- Alternative form: PEI RP 1200: Appendix C-7

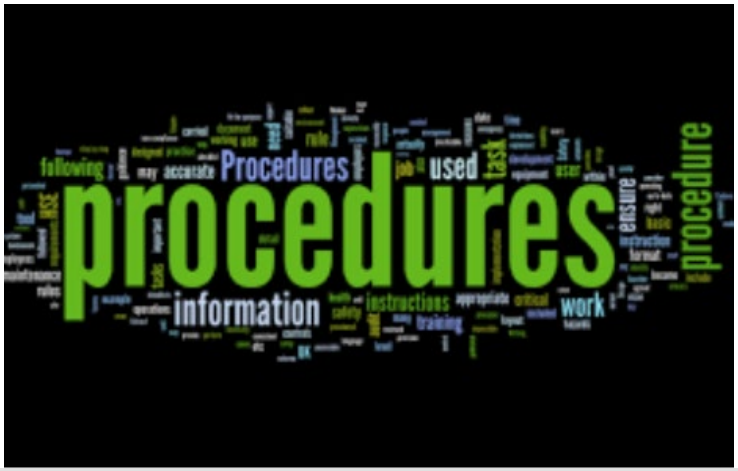
Interstitial Monitoring (IM) Sensor Testing

- Minimum testing requirements:
  - Inspect for residual buildup
  - Floats
  - Cables
  - Alarms



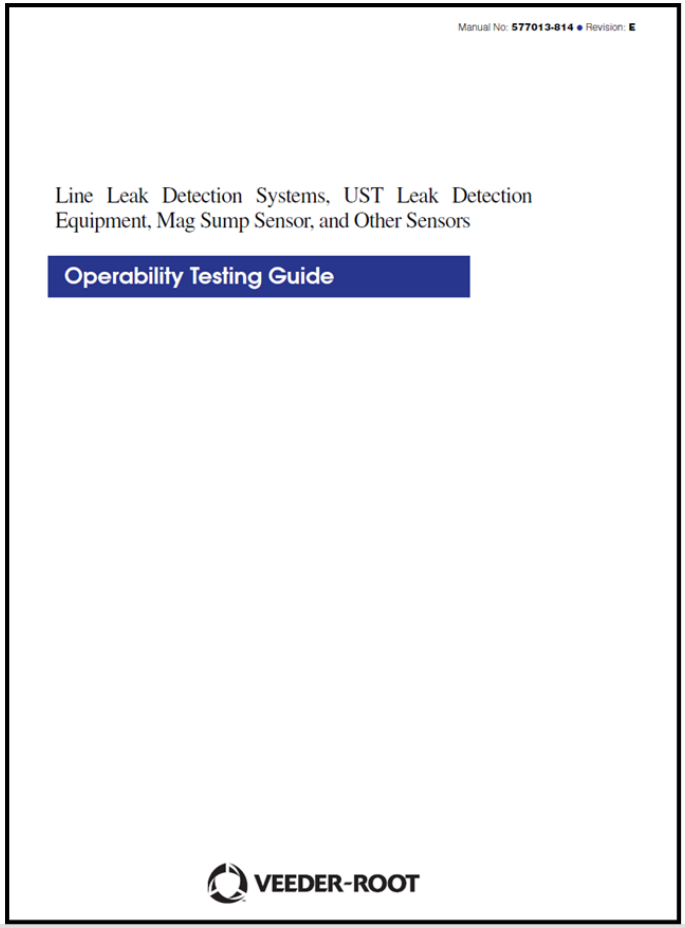
Sensor Testing Procedures

- Sensor manufacturer's test procedures
- Third party: PEI/RP 1200 - 8.3 sensor functionality testing
- **Required:** TN's CN-1339 Annual Electronic Interstitial Monitoring Test Report



Veeder Root's test procedures

- Veeder-Root manual # 577013-814



Testing procedures

- Non discriminating 794380-208

Non discriminating 794380-208

Testing Procedure C:

Piping Sump Sensors 794380-208, 794380-209, Interstitial Sensors 794390-420, 794380-430, 794390-460, Solid-State Pan Sensor 794380-321, and Solid State Sump Sensor 794380-351

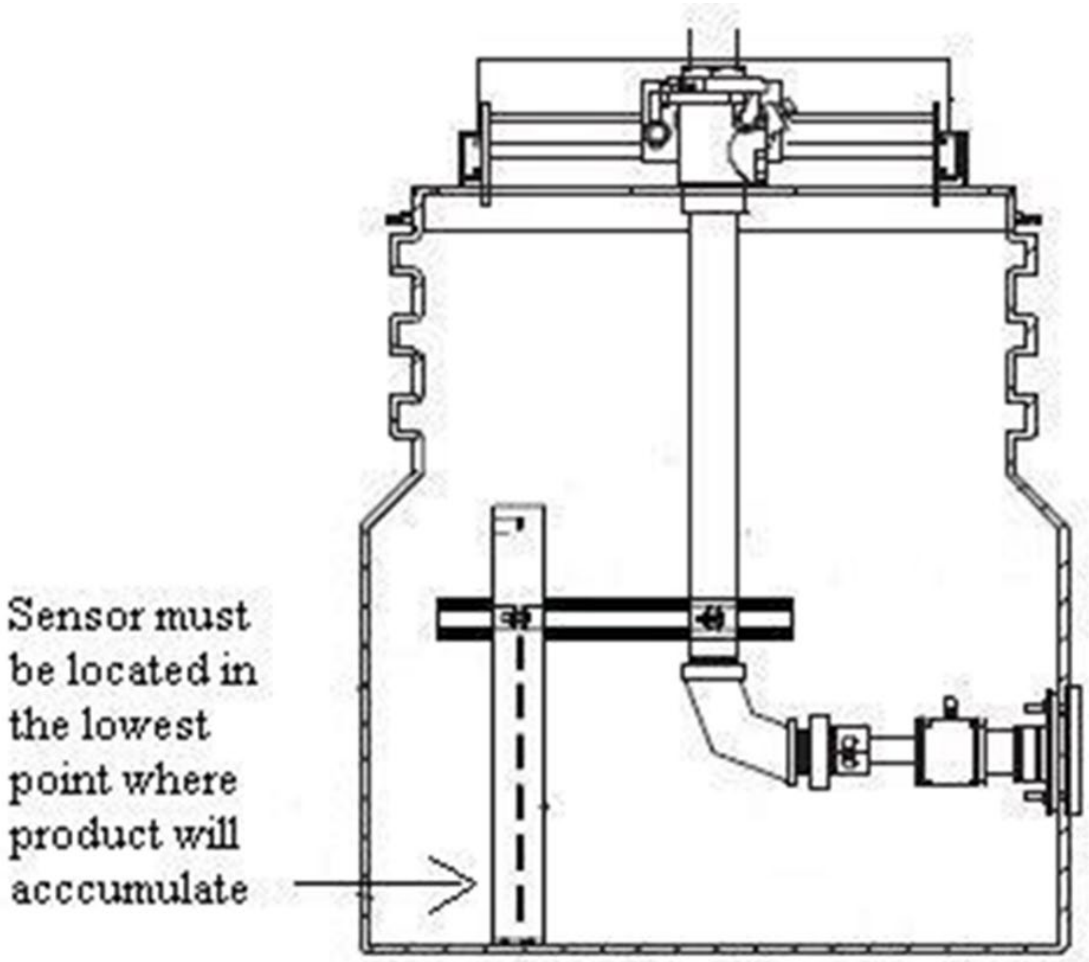
1. Fill one of the test containers with a minimum of 2 inches of water.
2. Remove sensor carefully from tank or containment area. Visually inspect the sensor for any damage as defined by sensor category in the Periodic Maintenance Checklist in the console's Operators manual, such as damage to the cable or to the sensor housing.
3. While holding the sensor vertically, place the sensor into the container until it is submerged. Test only one sensor per test container (multiple test containers may be used). Test times may run as long as 5 minutes depending upon console type and configuration. If the sensor does not issue a "Fuel" alarm after 5 minutes, the sensor has failed the test.
4. Remove the sensor from the test vessel after observing a response. Allow the sensor to completely dry off in order to clear the alarm. Document the alarm and proceed to the next step.
5. Press the Alarm/Test key on TLS-350 consoles, or touch the Alarm button twice on TLS-450 consoles to clear the alarm before moving on to the next sensor.
6. Reinstall the sensor(s) upon verification of proper operation.
7. Print the test history and console status for your records. This completes the test procedure. Report any performance concerns to Veeder-Root while on site.

TN's CN-1339 IM Test Report

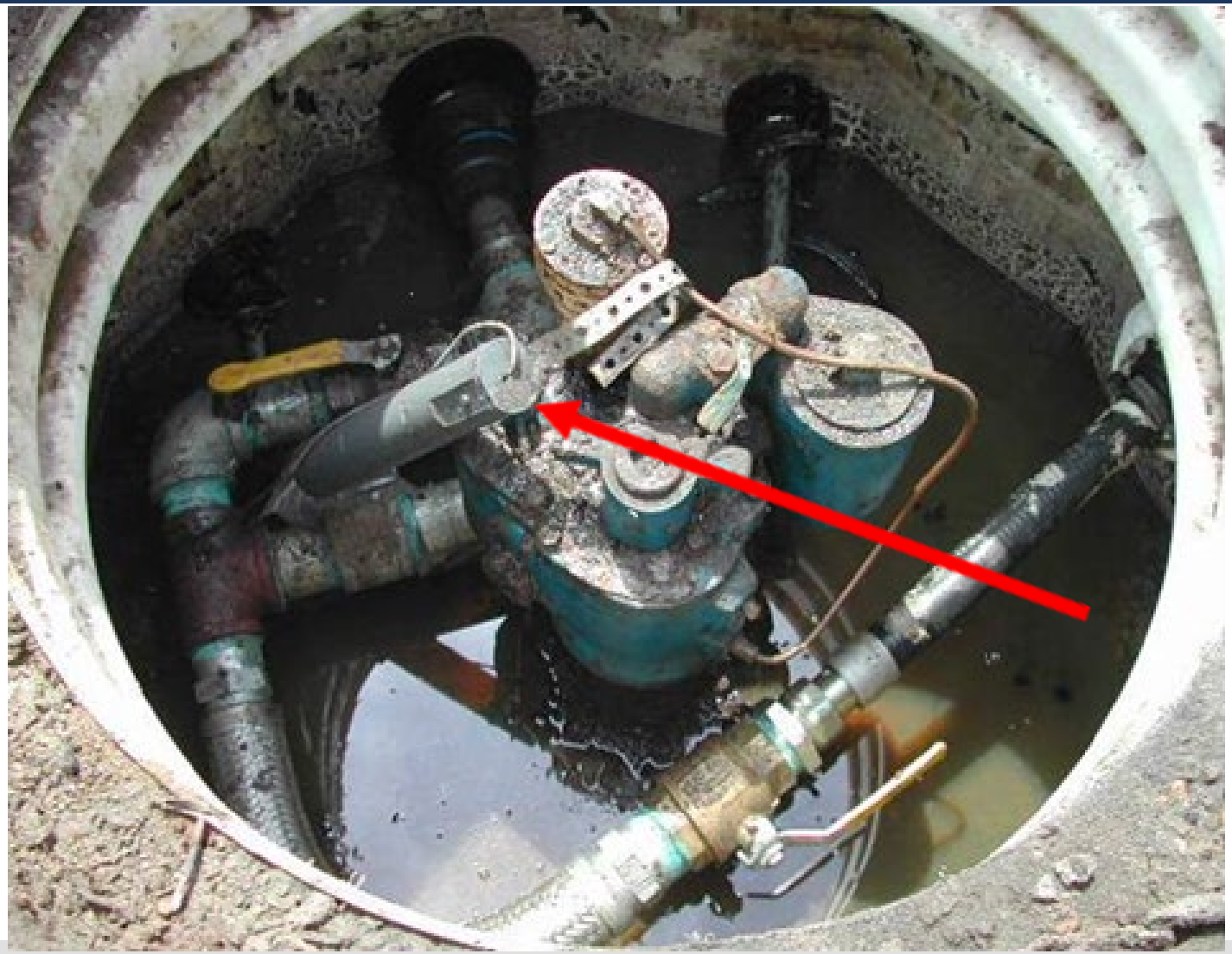
- Search "TDEC UST" > Forms & Guidance > Operational compliance

IV. ELECTRONIC INTERSTITIAL MONITORING TEST PROCEDURE	
Check Completed	Task
☐	Monitoring console is operational, no current active alarms. Activate "test" or "diagnostic" mode if applicable.
☐	Sensors are present and installed at proper level to detect a release in all appropriate locations.
☐	Sensors alarm when activated (immersed in appropriate liquid or other applicable method).
☐	Simulated alarm condition causes the appropriate response indicated in the section above.
☐	Document the simulated alarms in the facility's alarm history report records as "annual functional test".
☐	Inspect all secondary containment sumps: no evidence of leaks, appear to be liquid tight.
☐	Inspect all sump inlets and boots connected to the piping where liquid enters the sump, free of obstructions.
☐	Inspect tank sump covers to ensure gaskets and seals are installed properly to prevent surface water intrusion.

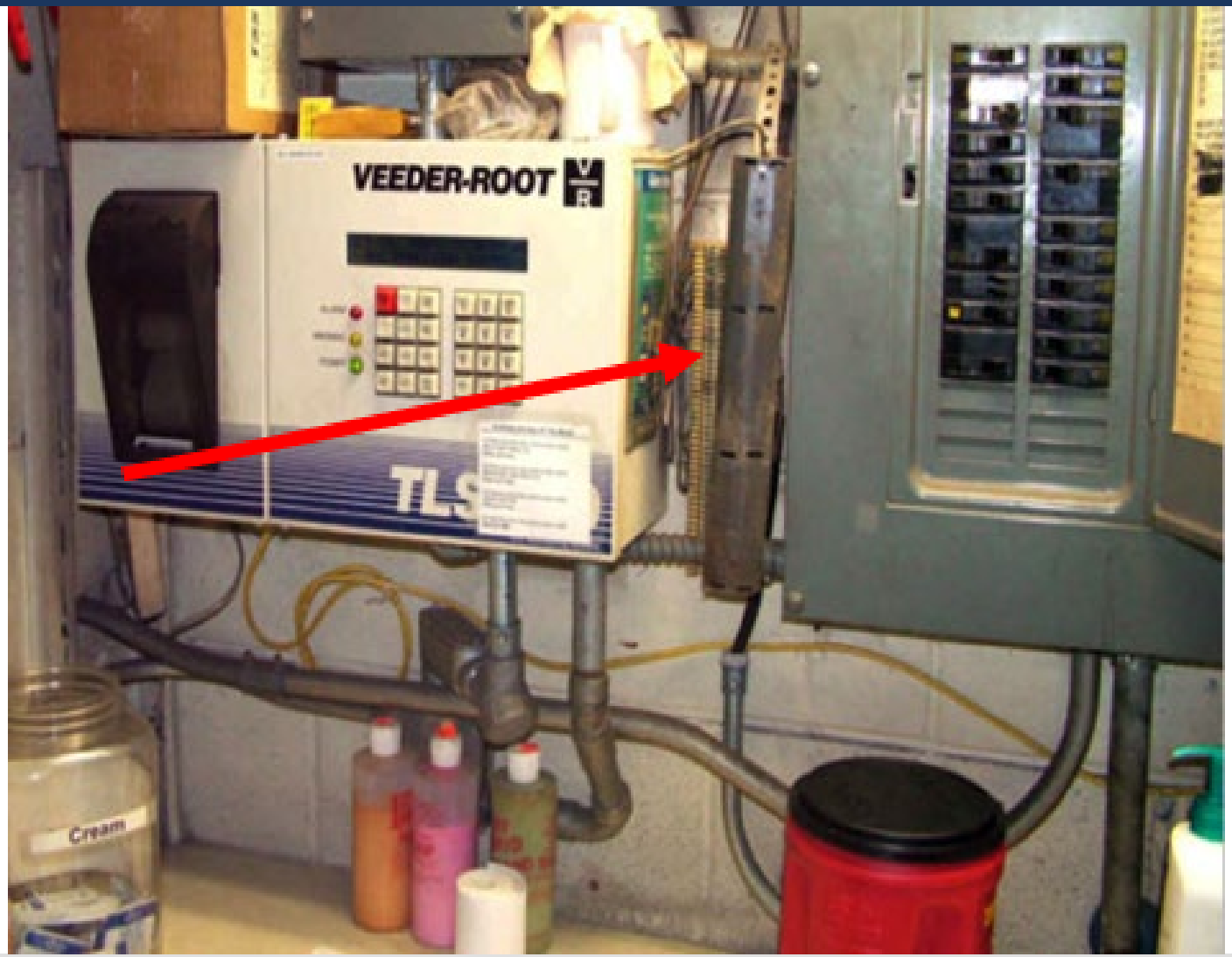
Sensor location



Sensor location



Sensor location



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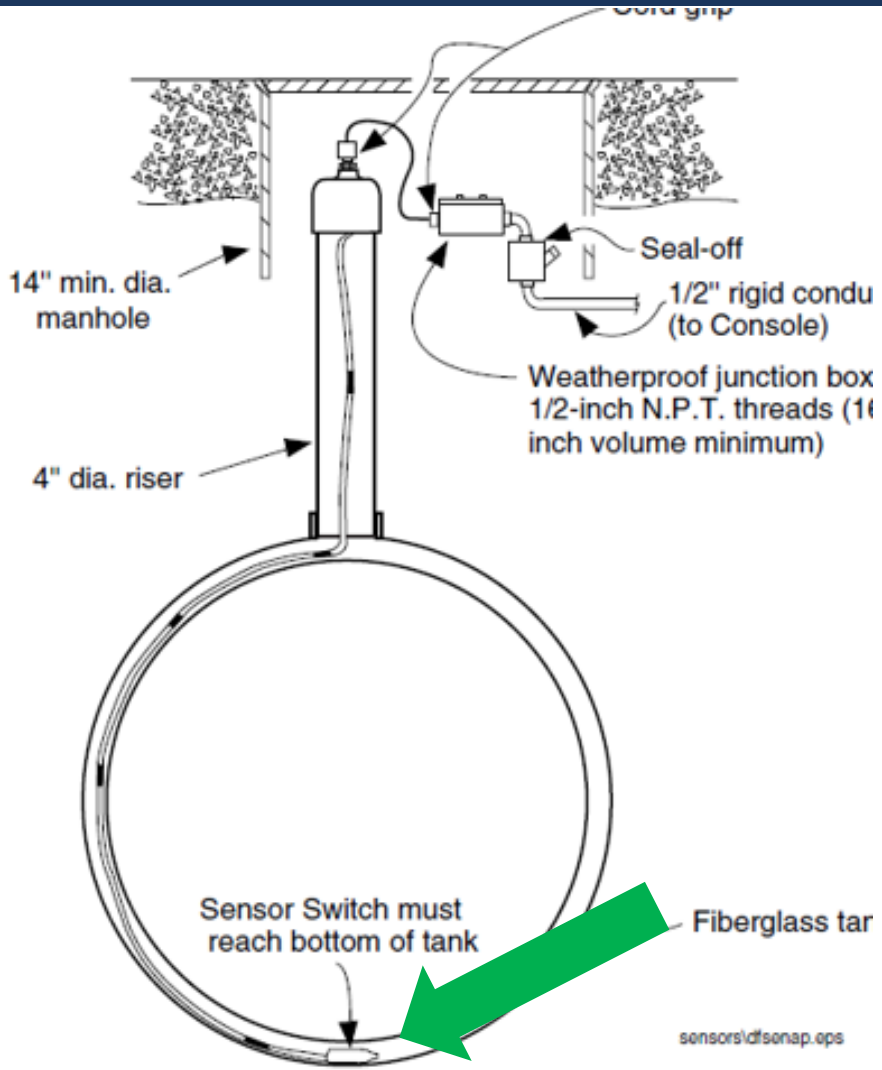


Sensor location

Interstitial monitoring: Common problems

- Fuel in sumps or interstitial area
- Report as suspected release unless:
  - Fuel is immediately removed,
  - immediately repaired,
  - alarm does not reoccur, and
  - no evidence that fuel escaped containment.
- Immediately is with 72 hours

Interstitial monitoring: Common problems

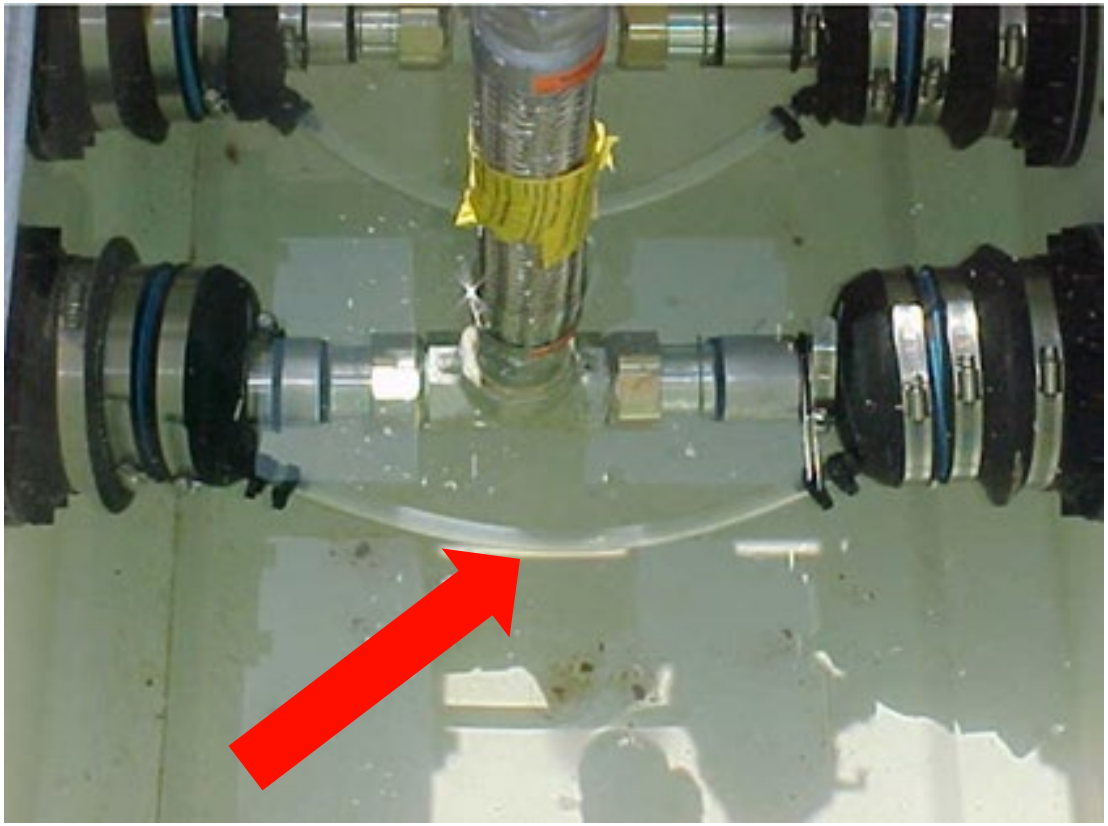
- Water intrusion

Interstitial monitoring: Common problems

- Water intrusion
- Report as suspected release
  - Unless repaired within 30 days
  - Additional monitoring does not indicate water recurrence
- Immediately (72 hours) investigate and resolve alarms

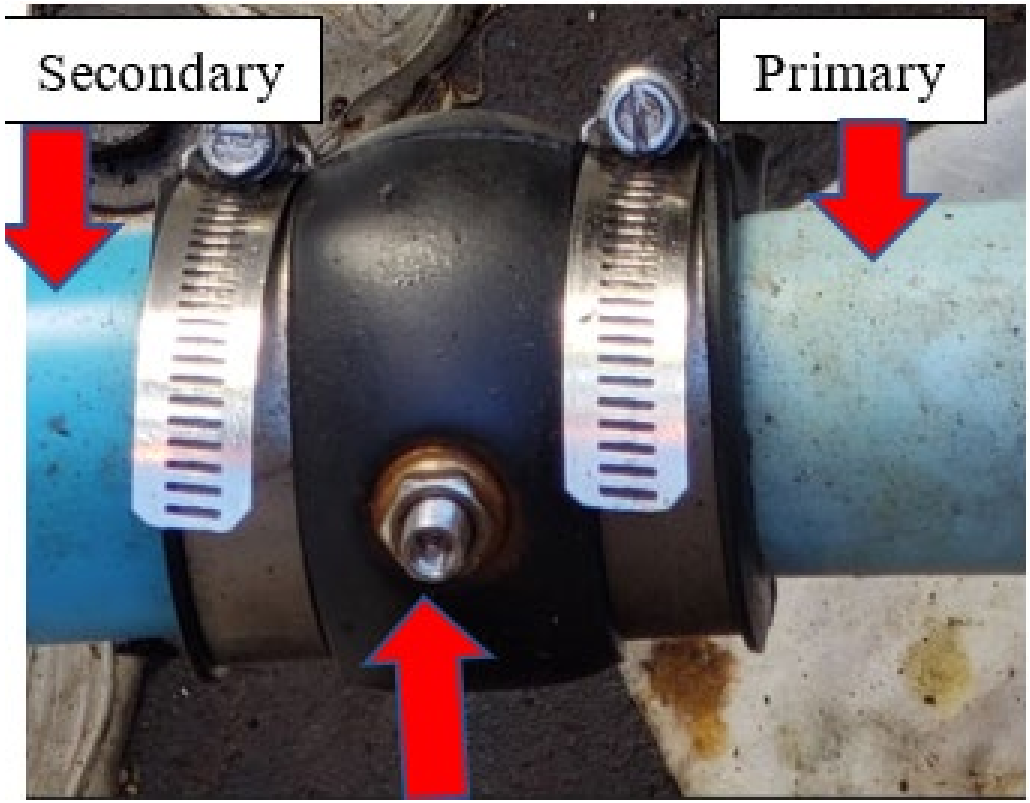
Interstitial monitoring: Common problems

- Isolation of piping interstice



Interstitial monitoring: Common problems

- Isolation of piping interstice



Automatic line leak detector testing

- Must simulate a leak
- Methods which **1) alert the operator** to the presence of a leak by restricting or shutting off the flow of petroleum through piping or triggering an audible or visual alarm may be used only if they detect leaks of **2) three gallons per hour at ten pounds per square inch line pressure within one hour**. An annual test of the operation of the leak detector shall be **3) conducted in accordance with guidance provided by the Division**.

Automatic line leak detector testing

1. LLD alerts the operator
2. Simulating a leak 3 gph leak @10psi
3. Test required to be conducted in accordance with Division's guidance

- Test procedure found in SIM Ch. 3.5 Pressurized Piping
- Google “TDEC UST”
  - Forms & Guidance
    - Standardized Inspections and Technical Chapters
- Ch. 3.5 pressurized piping

1) Line leak detector alerts operator

- Restricting or shutting off flow
- Triggering audible or visual alarm

LLD test form

- Piping information
- Length
- STP cycles off
- LLD compatibility
  - LLD manufacture's instructions
  - NWGLDE listing

Piping Material: (**ST**, **FRP**, **Flex** Plastic)
Piping Manufacturer
Pipe Diameter (inches)
Length of Pipe (ft)
Type of Product: **Gas**, **Diesel**, **Kerosene**, Other
LLD Manufacturer:
LLD Model:
LLD Serial #:
LLD compatible with product/piping type? (Y/N)
STP cycles on/off properly? (Y/N)

LLD compatibility

- Franklin: **Gasoline,** Diesel, flex piping
- Red Jacket: **Gasoline "FX1V"** **Diesel"FX1DV"**

LLD compatibility

- Gas LLD on diesel product line ✓
- Diesel LLD on gasoline product line ✗

Mechanical LLD test form

V. MECHANICAL LINE LEAK DETECTOR (MLLD) TEST DATA					
➢ The test must be conducted with the LLD installed in the UST system during the test as during normal operation. ➢ The test requires the simulation of a leak in the UST system piping equivalent to 3 gallons per hour (gph) at 10 pounds per square inch (psi), which is equivalent to 189 mL/min. ➢ The test must be conducted at the dispenser located at the furthest point above or away from the LLD. ➢ Each product line above shall correspond with the tank # assigned on the most recent UST Notification Form.					
Full Pump Pressure (psi)					
Holding Pressure (psi)					
Metering Pressure (psi)					
Bleedback (gallons)					
Opening Time (sec)					
Leak Rate Test (gph)					
LLD remains in Slow Flow over 30 Seconds? (Y/N)					

Electronic LLD test form

VI. ELECTRONIC LINE LEAK DETECTOR (ELLD) TEST DATA					
➢ If required by the ELLD manufacturer, this test shall only be conducted by a certified technician. ➢ The ELLD must shut off flow or have an audible or visual alarm and must detect a leak equivalent of 3.0 gph at 10psi. ➢ The technician or tester must verify programmable pump and ELLD settings such as piping type and length. ➢ Each ELLD must be tested for a minimum of 15 minutes. ➢ Attach copies of line leak setup from the monitoring console to this report if applicable.					
ELLD Setup Correct? (Y/N)					
Simulated Leak Equivalent to 3.0 gph @ 10 psi? (Y/N)					
Simulated leak initiated an audible or visual alarm? (Y/N)					
Simulated leak initiated submersible pump shutdown? (Y/N)					
# of dispensing cycles before STP shutdown:					

ELLD setup

- Verify piping type
- Piping length accurate with 30%
- Shutdown/alarm rate: 3 gph
- 0.1 annual/0.2 monthly

```
PRESSURE LINE LEAK SETUP

Q1:

TYP: ENVIROFLEX PP1501
LINE LENGTH: 200 FEET
0.20 GPH TEST: ENABLED
0.10 GPH TEST: ENABLED
SHUTDOWN RATE: 3.0 GPH
LOW PRESSURE SHUTOFF: NO
LOW PRESSURE:  0 PSI

T1:
DISPENSE MODE:
    STANDARD
SENSOR: NON-VENTED
PRESSURE OFFSET: 0.0 PSI
```

When components fail

- Sensors, ATGs, and probes
  - **30 days** to repair
- Failed line leak detector test:
  - Shut down line until replaced

	VII. LLD TEST RESULTS		
PASS/FAIL			
Newly installed LLD? (Y/N) If Yes, re-test			

Recordkeeping requirements

- Maintain records for 3 years
- 2022 - previous year
- 2023 - previous two years
- 2024 - previous three years

Tester certifications and requirements

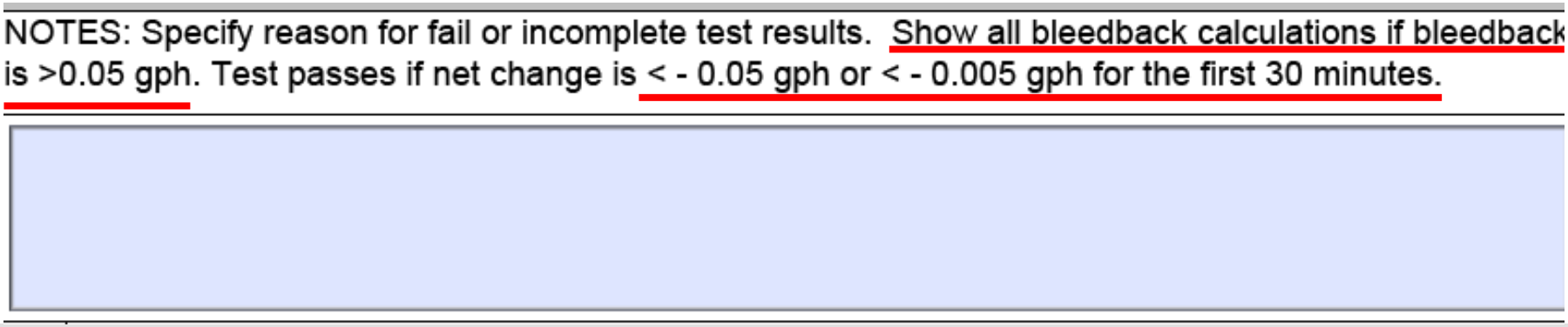
- Techs holding Veeder-Root technician certifications (level 2/3) are approved to preform system tests.
- Line leak detector manufactures may require tester to be certified to test
- Other manufacturers may vary
- Consult with manufacturer prior to testing
- Certification is required if available

Forms

- ATG form: draft
- Annual I.M. sensor test form: no change
- Revised LLD/LTT: complete
- New tank tightness test form: complete
- Submit alternative form requests to Don.Taylor@tn.gov

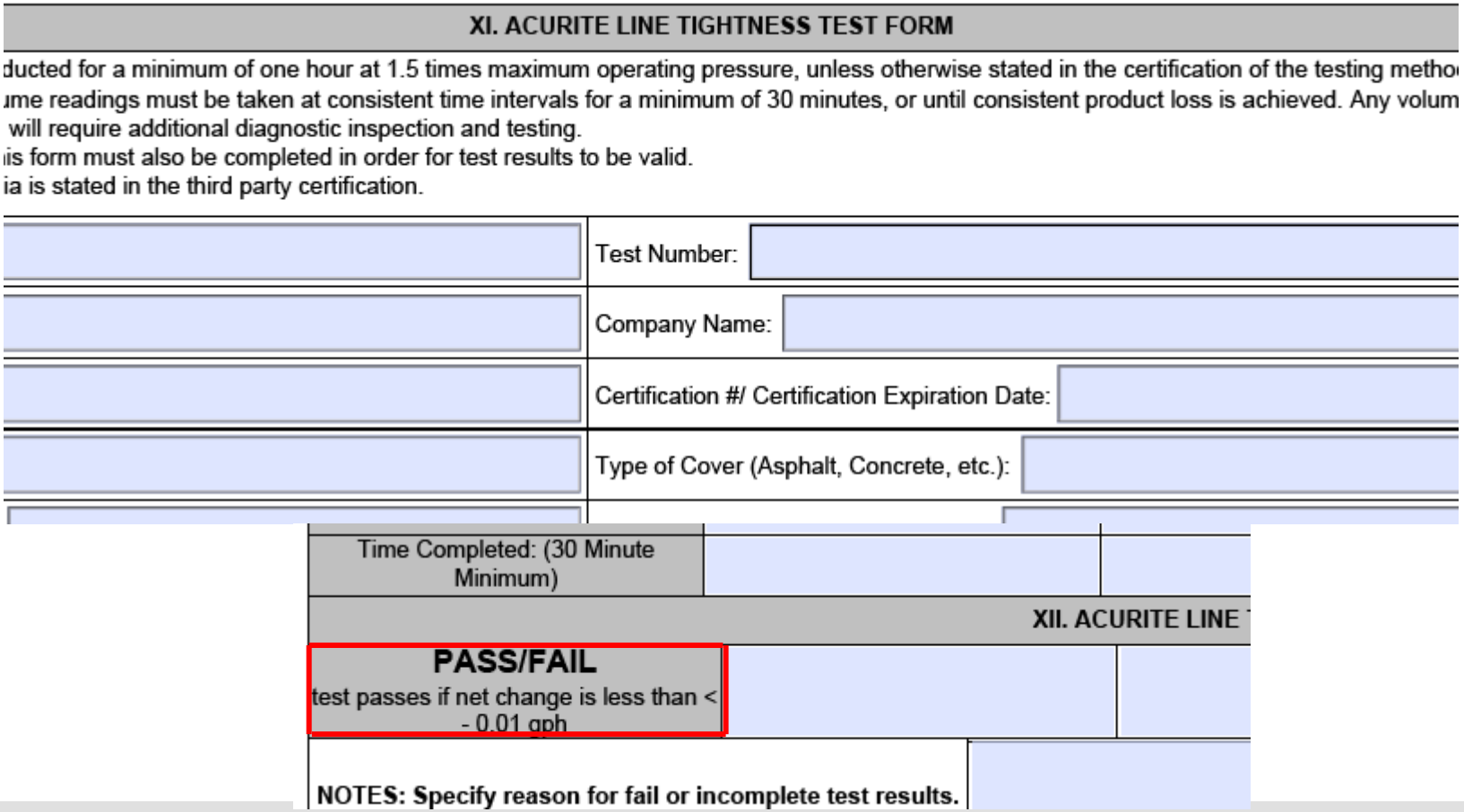
Updated Petro Tite form

- Minimum 30 minutes (two 15 minute readings) if leak less than 0.005 gph
- Minimum 1 hour (four 15 minute readings) is > 0.005 gph for the first 30 minutes
- Allowable bleedback calculations required if bleed back is less than 0.05 gph.


NOTES: Specify reason for fail or incomplete test results. Show all bleedback calculations if bleedback is >0.05 gph. Test passes if net change is < - 0.05 gph or < - 0.005 gph for the first 30 minutes.

Acurite form

- Leak threshold 0.01 gph



XI. ACURITE LINE TIGHTNESS TEST FORM

ducted for a minimum of one hour at 1.5 times maximum operating pressure, unless otherwise stated in the certification of the testing metho
ume readings must be taken at consistent time intervals for a minimum of 30 minutes, or until consistent product loss is achieved. Any volum
will require additional diagnostic inspection and testing.
is form must also be completed in order for test results to be valid.
ia is stated in the third party certification.

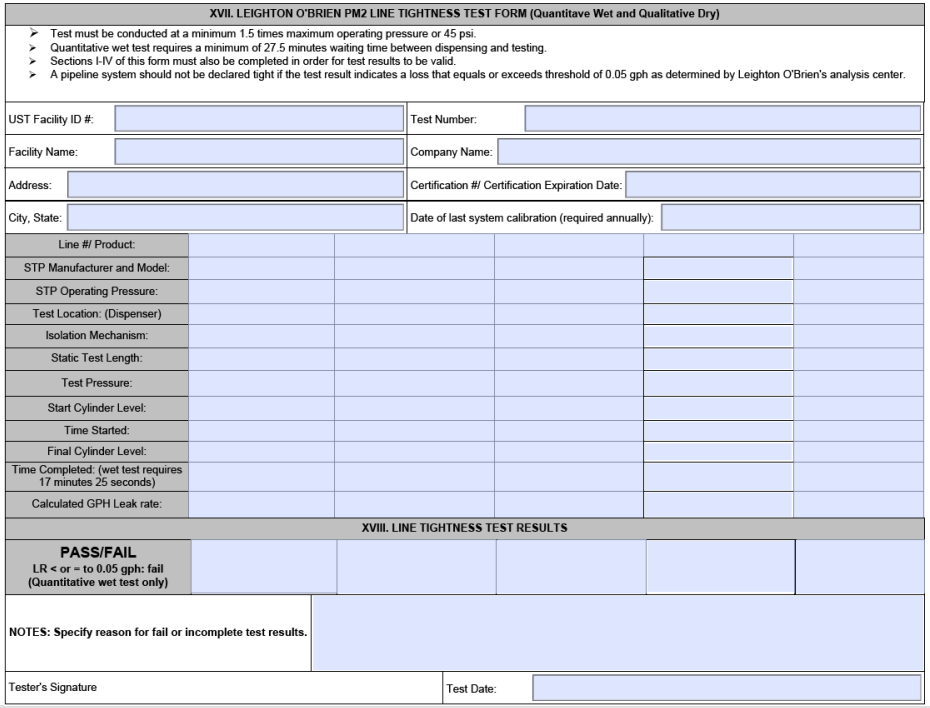
	Test Number:	
	Company Name:	
	Certification #/ Certification Expiration Date:	
	Type of Cover (Asphalt, Concrete, etc.):	
	Time Completed: (30 Minute Minimum)	

XII. ACURITE LINE

PASS/FAIL test passes if net change is less than < - 0.01 gph	
NOTES: Specify reason for fail or incomplete test results.	

Other line test forms

- Estabrook: no changes
- Tanknology: no changes
- New Leighton O' Brien wet/dry form



XVII. LEIGHTON O'BRIEN PM2 LINE TIGHTNESS TEST FORM (Quantitave Wet and Qualitative Dry)

- Test must be conducted at a minimum 1.5 times maximum operating pressure or 45 psi.
- Quantitative wet test requires a minimum of 27.5 minutes waiting time between dispensing and testing.
- Sections I-IV of this form must also be completed in order for test results to be valid.
- A pipeline system should not be declared tight if the test result indicates a loss that equals or exceeds threshold of 0.05 gph as determined by Leighton O'Brien's analysis center.

UST Facility ID #:		Test Number:	
Facility Name:		Company Name:	
Address:		Certification #/ Certification Expiration Date:	
City, State:		Date of last system calibration (required annually):	

Line #/ Product:					
STP Manufacturer and Model:					
STP Operating Pressure:					
Test Location: (Dispenser)					
Isolation Mechanism:					
Static Test Length:					
Test Pressure:					
Start Cylinder Level:					
Time Started:					
Final Cylinder Level:					
Time Completed: (wet test requires 17 minutes 25 seconds)					
Calculated GPH Leak rate:					

XVIII. LINE TIGHTNESS TEST RESULTS

PASS/FAIL **LR < or = to 0.05 gph: fail (Quantitative wet test only)**					

NOTES: Specify reason for fail or incomplete test results.	
Tester's Signature	Test Date:

New tank tightness test form

- TDEC UST > UST Forms & Guidance > Operational Compliance

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Underground Storage Tanks
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 12th Floor
Nashville, Tennessee 37243

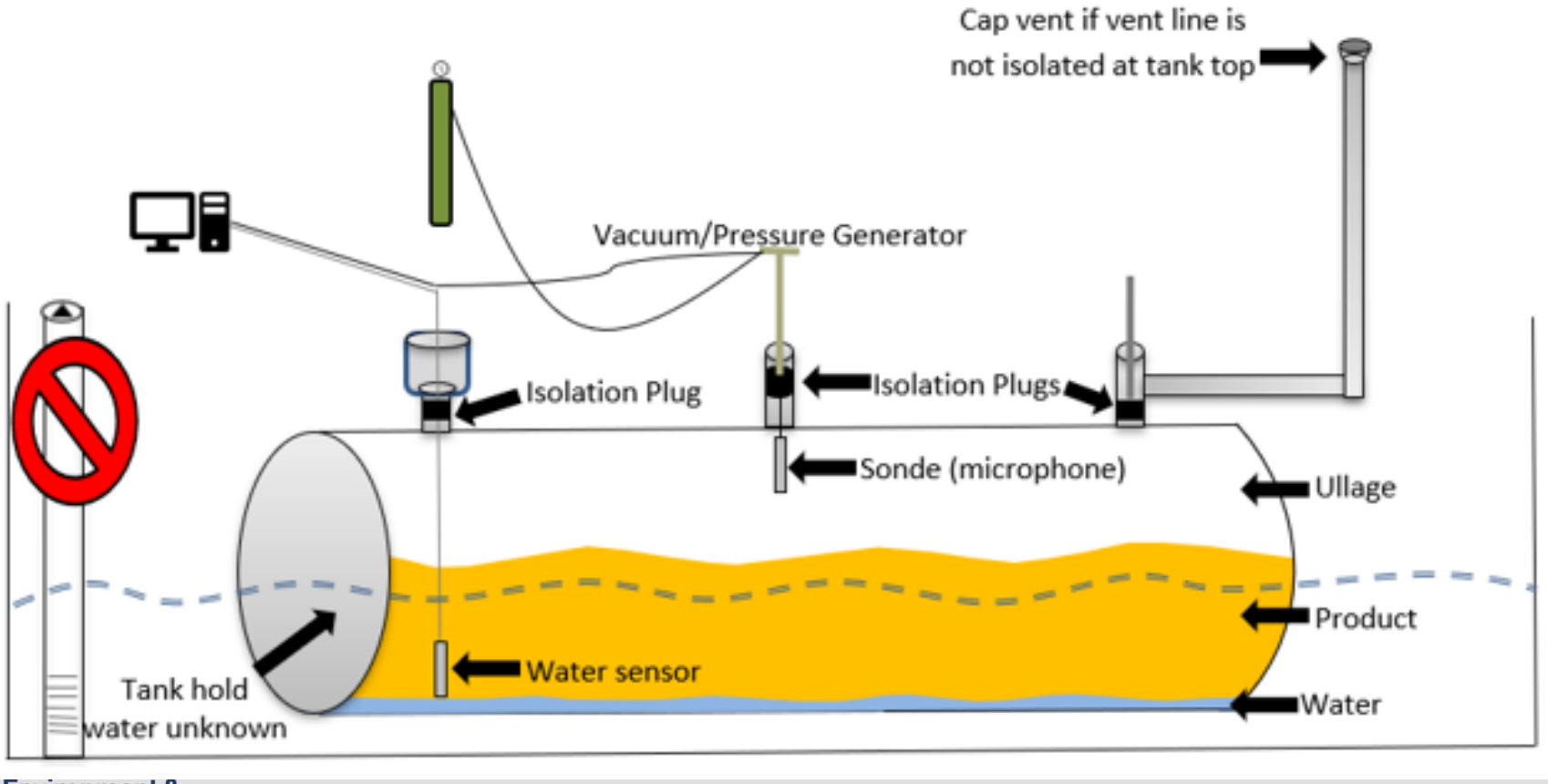
TANK TIGHTNESS TESTING REPORT

- All applicable sections of this report must be legibly completed in their entirety, documenting all results of the tightness testing. Attach all reports, graphs or documentation generated by the test device.
- For tank installation and repairs, the owner/operator of the underground storage tank (UST) system is to maintain a copy of this report for the operational life of the system. Tests conducted for release **detection** shall be **maintained** until the next test is conducted.

I. UST FACILITY		II. UST OWNER	
UST Facility ID #:		Name/Company:	
Facility Name:		Address:	

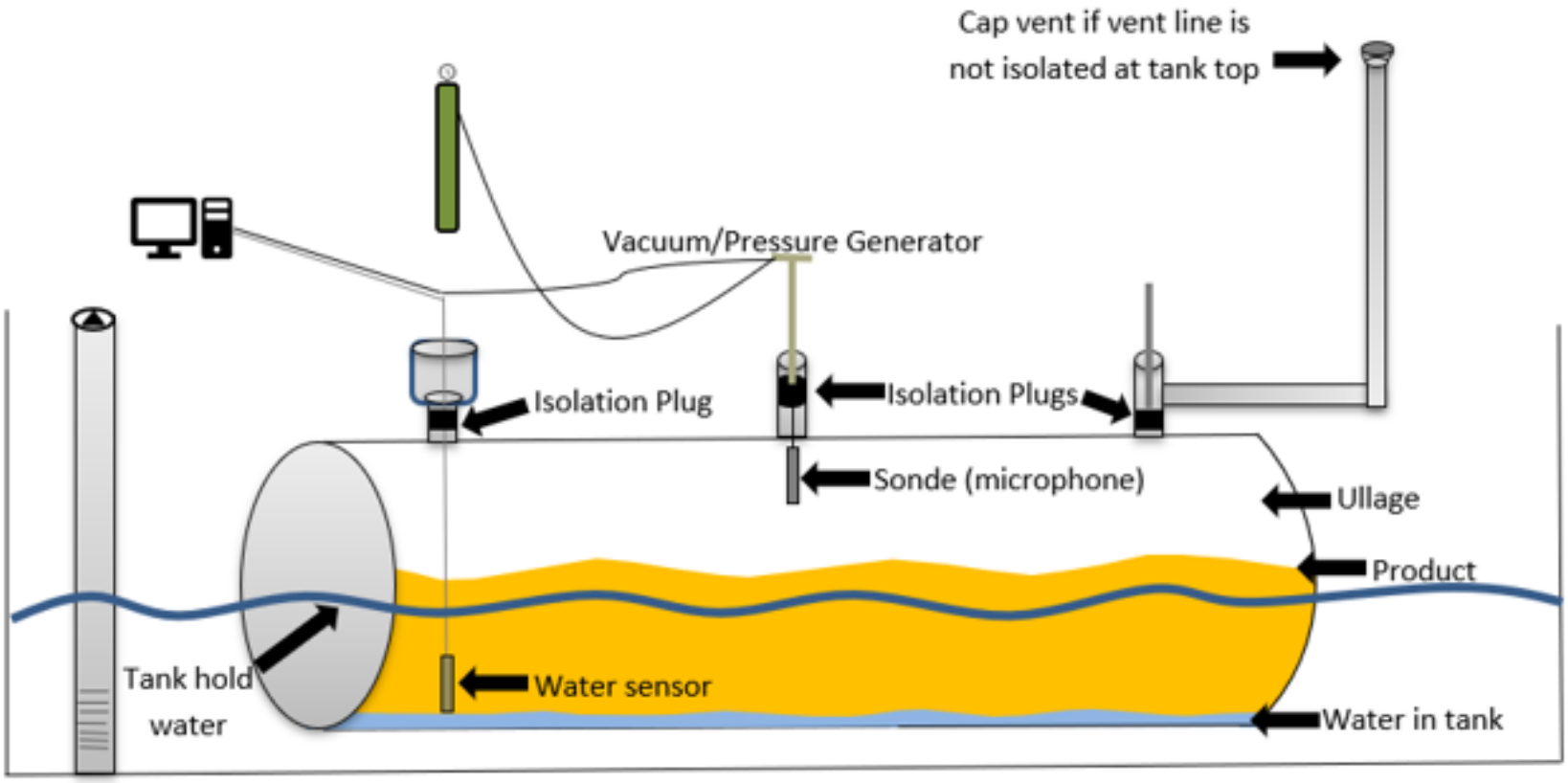
Non volumetric testing & tank pit water

- Estabrook, Triangle, & Mesa: Water sensor required if pit water is **unknown**



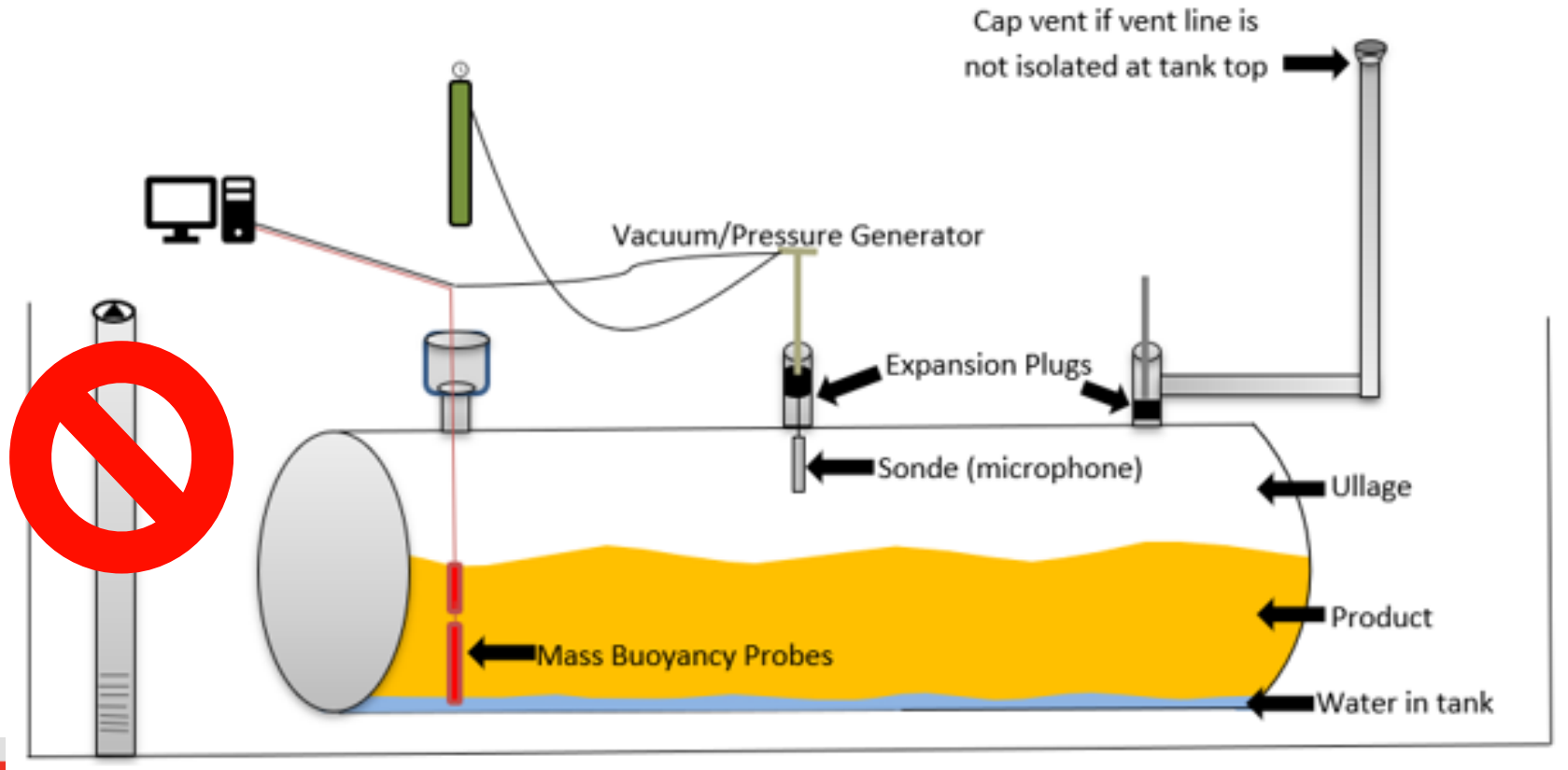
Non volumetric testing & tank pit water

- Estabrook, Triangle, & Mesa: Water sensor required if pit water is **in contact with tank**



Volumetric tank testing & tank pit water

- Alert & Leighton O' Brien underfill methods: Two tests required if GW is **unknown**

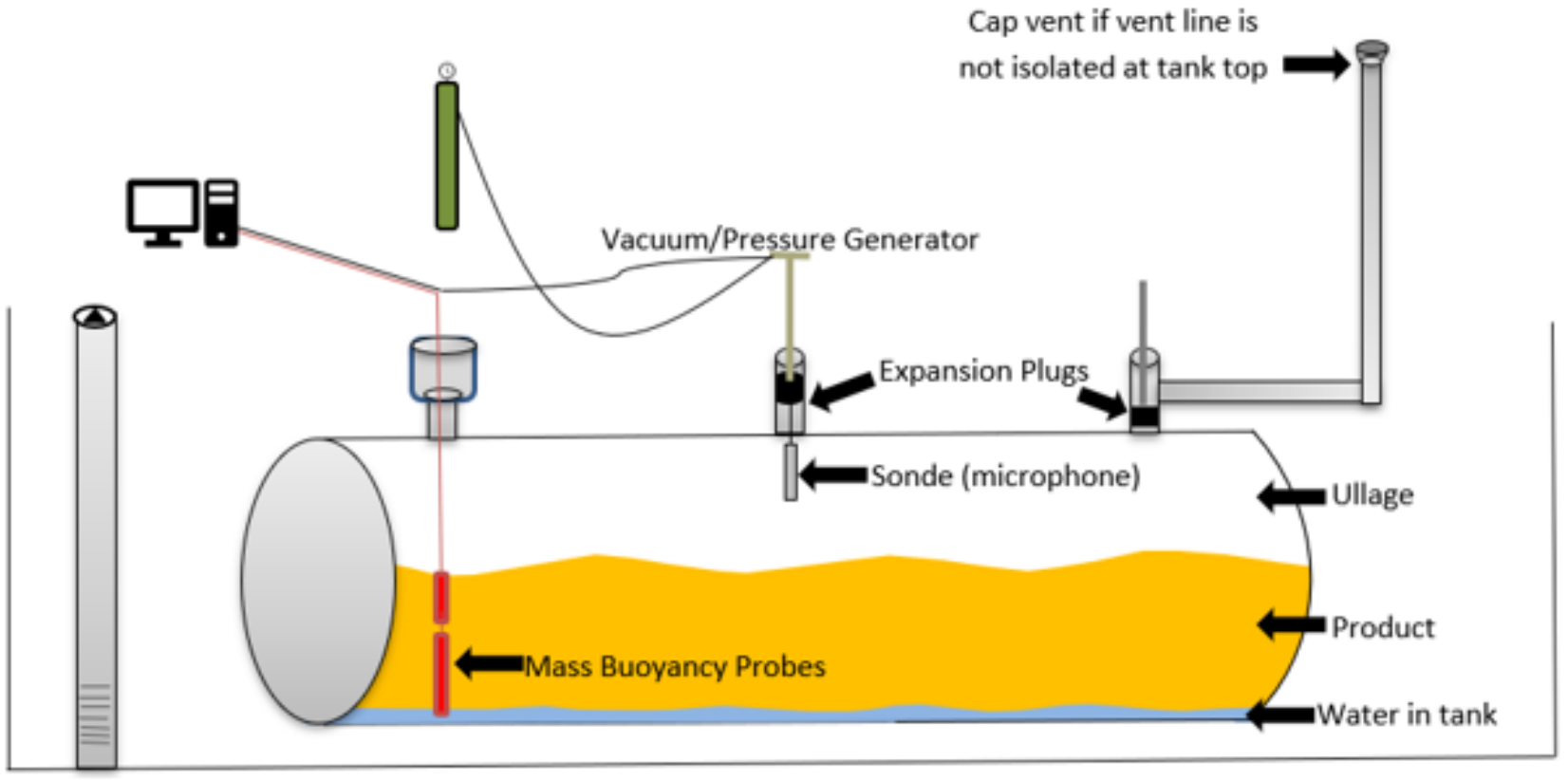


Volumetric tank testing & tank pit water

- Alert & Leighton O' Brien underfill methods: Two tests required if GW is **unknown**
- Leighton O Brien: 1.5 pressure differential
  - Wet and dry test methods
- Alert 0.5 pressure differential
- Two tests: 1st at atmosphere. 2nd under pressure/vacuum.

Volumetric test testing & tank pit water

- Tanknology & Triangle underfill: Depth to tank pit water must be determined.



Resources and outreach

- UST webpage
  - Google “TDEC UST”
  - Click on first listing
  - New rules link top center
  - https://www.tn.gov/environment/program-areas/ust-underground-storage-tanks/ust/new-rules.html
- Monthly newsletter
  - Send name and email to: Mitzie.Berry@tn.gov to subscribe
- Send feedback to Tanks.UST@tn.gov

Announcements

- Upcoming Webinars
  - Walkthrough Inspections
    - September 9, 2021 @ 10 ET/ 9 CT
  - Emergency Generators / Dual Use Systems
  - September 16, 2021 @ 10 ET/ 9 CT
- Webinar registration: https://www.tn.gov/environment/program-areas/ust-underground-storage-tanks/ust/new-rules.html

Thank you for your participation

- Dustin Turner
  - (423) 500-8157
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  - Don.taylor@tn.gov