



Bureau of Environmental Cleanup & Brownfields



Frequent Mishaps and Solutions with Regulated Aboveground Storage Tanks in Pennsylvania

2014 NISTM PA CONFERENCE

Camp Hill, PA

April 3, 2014

Overview

- Common AST Inspection Violations
- AST System Maintenance
- Regulated Substances
- ASTs in Underground Vaults

➤ Common AST Inspection Violations

Exterior Deterioration Protection



➤ Common AST Inspection Violations

Exterior Deterioration Protection

Section 245.612(g) – The exterior of the tank system shall be protected by an appropriate coating or paint, which shall be maintained throughout the entire operational life of the tank system.



Common AST Inspection Violations

Tank Labeling



Common AST Inspection Violations

Tank Labeling

Section 245.612(i) – Tanks shall be labeled or marked in a manner consistent with industry standards and which provides for identifying the regulated substance stored from outside the containment area.



➤ Common AST Inspection Violations

Emergency Containment



➤ Common AST Inspection Violations

Emergency Containment

245.612(d) – Emergency containment must be sufficiently impermeable to contain any potential release for a minimum of 72 hours and until the release can be detected and fully recovered in an expeditious manner.



➤ Common AST Inspection Violations

Emergency Containment

Will it even hold rain for any period of time?



➤ Common AST Inspection Violations

Emergency Containment

Will a cement block wall hold the contents of a catastrophic release?



Common AST Inspection Violations

Emergency Containment - Excessive Vegetation

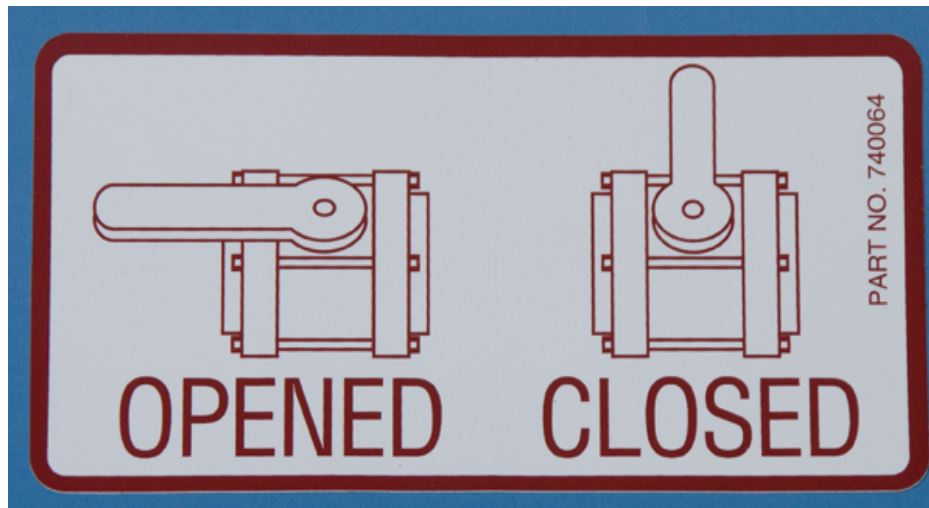
May 2013

July 2013



Common AST Inspection Violations

Emergency Containment - Valves



➤ Common AST Inspection Violations

Emergency Containment – Valves



➤ Common Inspection Violations

Emergency Containment – Structures to prevent accumulation of storm water.

What is wrong here?



➤ Common AST Inspection Violations

Emergency Containment – Integrity Inspection?
Single Walled UL 142 Tank with a Closed Top Dike



➤ Common AST Inspection Violations

Emergency Containment – Spill and Overfill protection?

Single Walled UL 142 Tank with Rain shields



Common AST Inspection Violations

Emergency Containment – Spill and Overfill protection?

Double Walled Aboveground Storage Tanks

Monitoring Gauge

OR Overfill Alarm



OR

Overfill Prevention

Device



AND

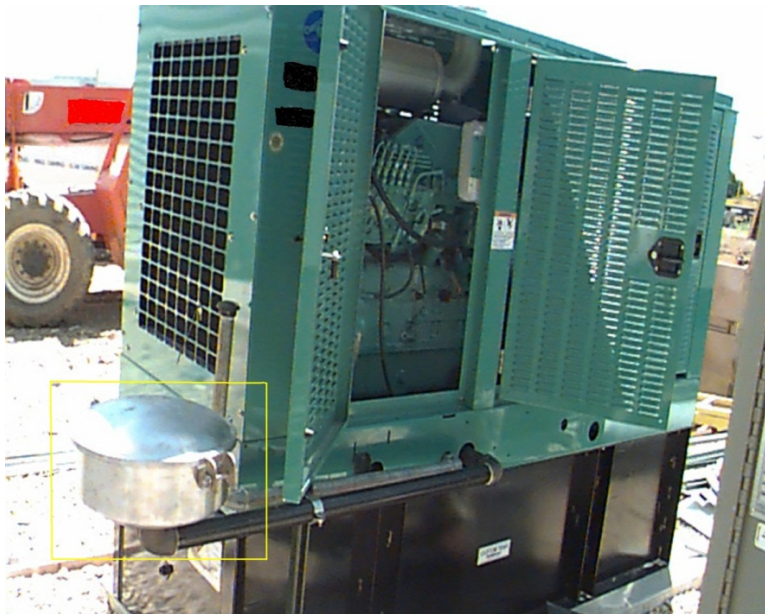
SHUT DOWN PROCEDURE

➤ Common AST Inspection Violations

Emergency Containment – Spill and Overfill protection?

Double Walled Aboveground Storage Tanks

Spill bucket at the fill point or containment at the remote fill

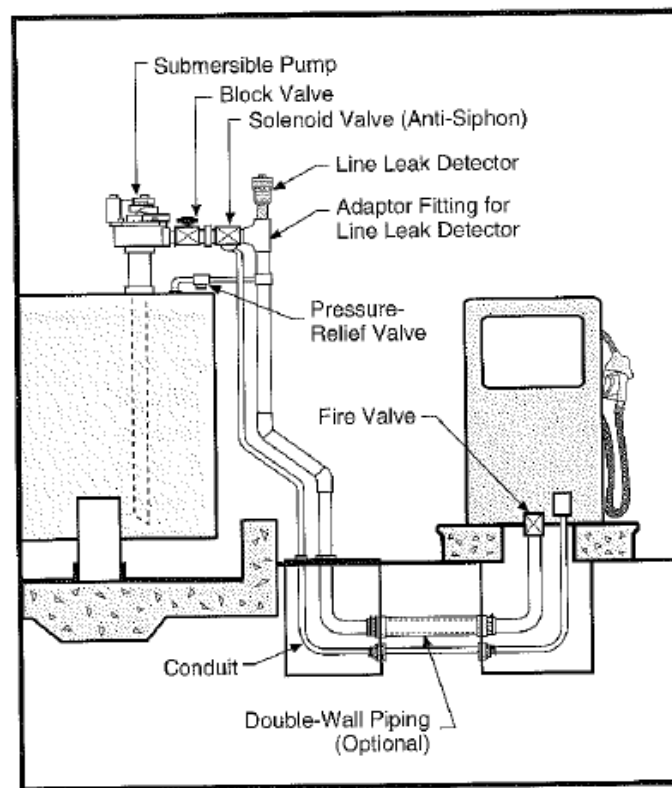


Common AST Inspection Violations

Emergency Containment – Spill and Overfill protection?

Double Walled Aboveground Storage Tanks

Block valves on product lines and anti-siphon / solenoid valve (typical arrangement)



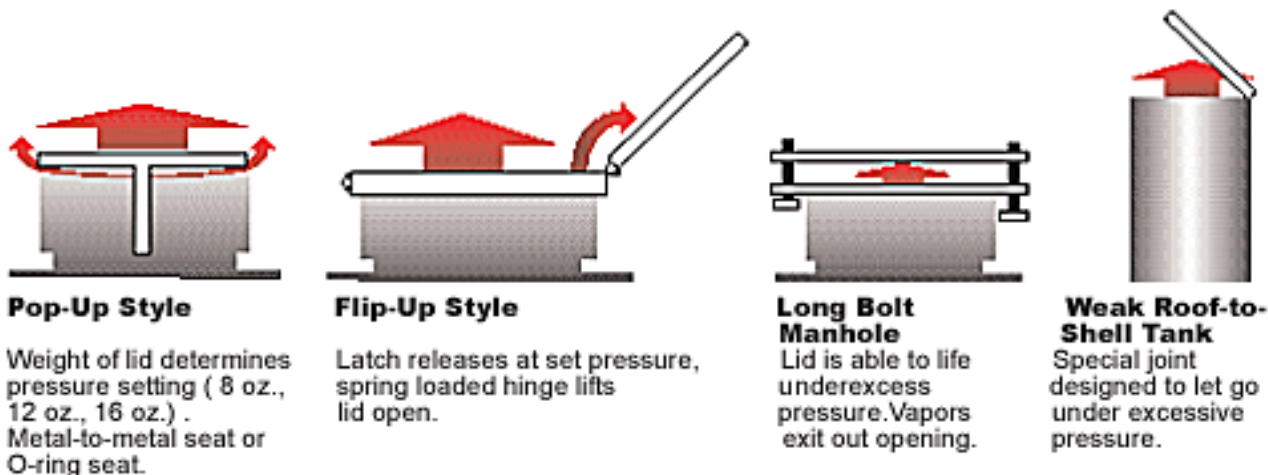
***Diagram from PEI RP200**

Common AST Inspection Violations

Performance and Design Standards – Emergency Venting

Common Problems

1. Inadequate design – too small, wetted area calculations
2. Not functioning – shear pin replaced, won't lift
3. Long bolt manholes – needs to have the ability to lift
4. Frangible roof – won't work for smaller diameter ASTs
5. Double walled tanks – Primary and secondary both need e-vents



Common AST Inspection Violations

Monthly Operation and Maintenance Checks



▶ AST Monthly Operations and Maintenance Checks

Monthly Operations and Maintenance Checks

1. A visual examination of the tank system for deterioration.
2. A check of the containment area for accumulation of water and removal of water as necessary.
3. Confirmation that containment drain valves are secured in the closed position when not in use.
4. Monitoring of the leak detection system.
5. A check of vents for restrictions.
6. A check of ancillary equipment for operational malfunctions.
7. An investigation of conditions that may be a fire or safety hazard, or pose an environmental hazard.
8. Observation for evidence of a release of regulated substance from the tank system.

AST Monthly Operations and Maintenance Checks

2630-FM-BECB0170 2/2012

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ENVIRONMENTAL CLEANUP AND BROWNFIELDS

**SAMPLE MONTHLY MAINTENANCE OPERATION CHECKLIST
FOR OWNERS OF SMALL ABOVEGROUND STORAGE TANKS**

ITEM	SYMBOL	REFERENCE
I. Visual Check for Deterioration		
Condition of tank exterior	S U	_____
Condition of aboveground piping	S U	_____
Condition of foundations and supports	S U	_____
Condition of containment structures	S U	_____
II. Containment Areas		
Level of standing water in containment	S U	_____
Drain Valves secured in a closed position	Y N	_____
Debris or fire hazard in containment	Y N	_____
III. Leak Detection System		
Leak detection system monitored	Y N	_____
Regulated Substance in containment area	Y N	_____
Evidence of release from tank	Y N	_____
Evidence of release from ancillary equipment including piping	Y N	_____
IV. Ancillary Equipment		
Overfill prevention device functioning properly (if installed)	Y N	_____
Valves functioning properly	Y N	_____
Vents clear of restrictions	Y N	_____
Gauge or monitoring device functioning properly (if installed)	Y N	_____
V. Safety Precautions		
Safety equipment in place and operative	Y N	_____
Fire extinguishers in place	Y N	_____
Safety precautions posted	Y N	_____
Tank system secured to prevent vandalism and unauthorized use	Y N	_____
Facility I.D.# _____ Inspection Completed By: _____ Date: _____		
Comments: _____		

<p align="center">Symbols</p> <p align="center">S - Satisfactory U - Unsatisfactory Y - Yes N - No</p>		

AST Monthly Operations and Maintenance Checks

Record Keeping Requirements

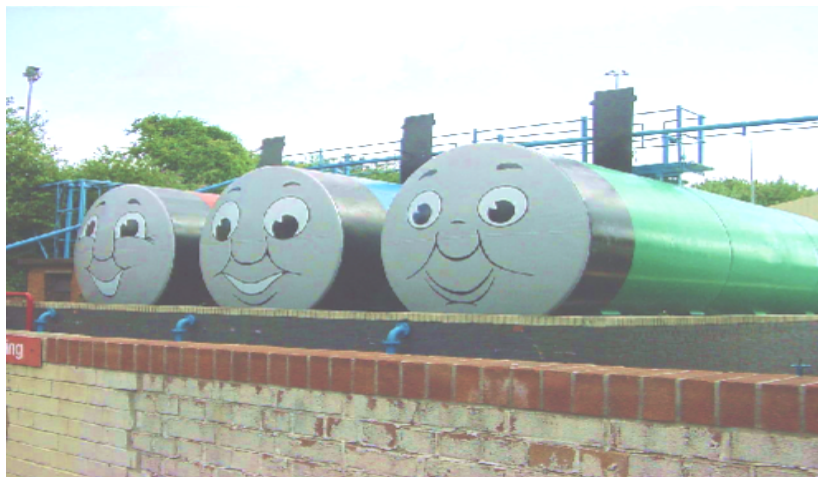
Monthly leak detection records and maintenance checklists shall be maintained for the previous 12 months.



AST Monthly Operations and Maintenance Checks

Other Items to Consider

- Aboveground storage tank grounding/bonding /lightning protection
- Fuel monitoring (check for presence of water/microbes)!
- Cathodic Protection Rectifiers
- Thermal and pressure relief systems
- Insulated ASTs – check for areas of moisture, external corrosion
- Follow-up on Unsatisfactory and/or Required items



Common AST Inspection Violations

The Numbers from 2013...

1,237 Aboveground Storage Tank Integrity Inspections in PA

- **129 Monthly Maintenance Check Violations**
- **553 Performance/Design standards Violations (paint, label, vents, etc.)**
- **104 AST Containment Violations**

These violations are not comprehensive of all AST violations identified in 2013, and some ASTs identified in the numbers above had multiple violation types.

Regulated Substances

Hazardous substances

• **defined as hazardous in Section 101(14) of CERCLA, but not waste under Subtitle C of RCRA**

- **1.0% or greater concentration as stated on MSDS**

Highly hazardous Substance

- **10 pound or less reportable quantity in AST >1,100-gallons**
- **1.0% or greater concentration as stated on MSDS**

Petroleum substance – 1.0% or greater concentration on MSDS

Carcinogenic substance – 0.1% or greater concentration on MSDS

Mixtures – cumulative concentrations of all regulated substances $\geq 1.0\%$

Trade Secret or Proprietary Substances – regulated, unless provided to Department for review and determined to be non-regulated.

> Regulated Substances

Some Fertilizer and Pesticide/Herbicide Tanks could contain petroleum compounds and/or the following hazardous substances:

- ethylene glycol (antifreeze) – check your shops too!
- acetic acid
- naphthalene
- sodium hydroxide (NaOH)
- ammonia (NH₃)
- potassium hydroxide (KOH)
- phosphoric acid

***Regulated when stored in ASTs > 250-gallons in capacity, and when > 1,100-gallons on a farm used solely to store substances that are used to facilitate crop production.**

Regulated Substances

Asphalt ASTs

Regulated when:

>250-gallons in capacity, (petroleum) liquid at 60° F and 14.7 psia, or contains hazardous substances (i.e. coal tar)

- asphalt cutback
- asphalt emulsions
- sealers
- road oils
- coal tar-based ($\geq 1\%$ by weight) products

➤ Regulated Substances

Asphalt Tanks

Common exemptions: non-stationary, non-liquid (most asphalt cement)



➤ Previously Unregistered ASTs

Solutions

- **Register the AST with the PADEP Division of Storage Tanks**
 - Tanks that do not require integrity inspections can be installed by PADEP-certified tank handler (AMMX or AMNX)
 - Petroleum and Hazardous substance ASTS < 5,000-gallons in capacity
 - Tanks that require integrity inspections should get inspected by PADEP-certified tank inspector (IAM or IAF)

➤ Previously Unregistered ASTs

Solutions (continued)

- PADEP-certified tank installer or inspector must sign off on Storage Tanks Registration / Permitting Application Form to register AST.
- All deficiencies identified by inspector/installer must be corrected prior to issuing operating permit.
- All past annual storage registration fees must be paid by facility from installation date.
- Enforcement possible for operating unregistered, regulated AST without a permit.

> Previously Unregistered ASTs

Other Potential Requirements

Site Specific Installation Permits (SSIPs)

- New large AST facility**
- New large AST at existing facility**
- Highly hazardous substance tanks/field const. USTs**

Spill Prevention Response Plans (SPRPs)

- Required for large AST facilities**
- Downstream user notification requirement**

Common Exempt ASTs

- Heating Oil tanks (onsite use) $\leq 30,000$ gallons
- Non-stationary tanks
- Non-commercial motor fuel tanks $\leq 1,100$ gallons
- Tanks regulated under Oil and Gas Act
- Most Aboveground Waste/Used Oil Tanks
- Flow-through or process tank
- Pressure Vessel
- Tanks regulated under Surface Mining Regs. (Coal)
- Equipment or machinery that contains regulated substances for operational purposes

➤ ASTs in Underground Vaults

Must be able to physically enter the vault to inspect the tank and ancillary equipment.



➤ ASTs in Underground Vaults

**If you cannot physically enter the underground vault, it must meet Underground Storage Tank requirements. ASTs can not be utilized as USTs, & vice versa; USTs can not be used as ASTs!!!
(NFPA 30, PA L & I)**



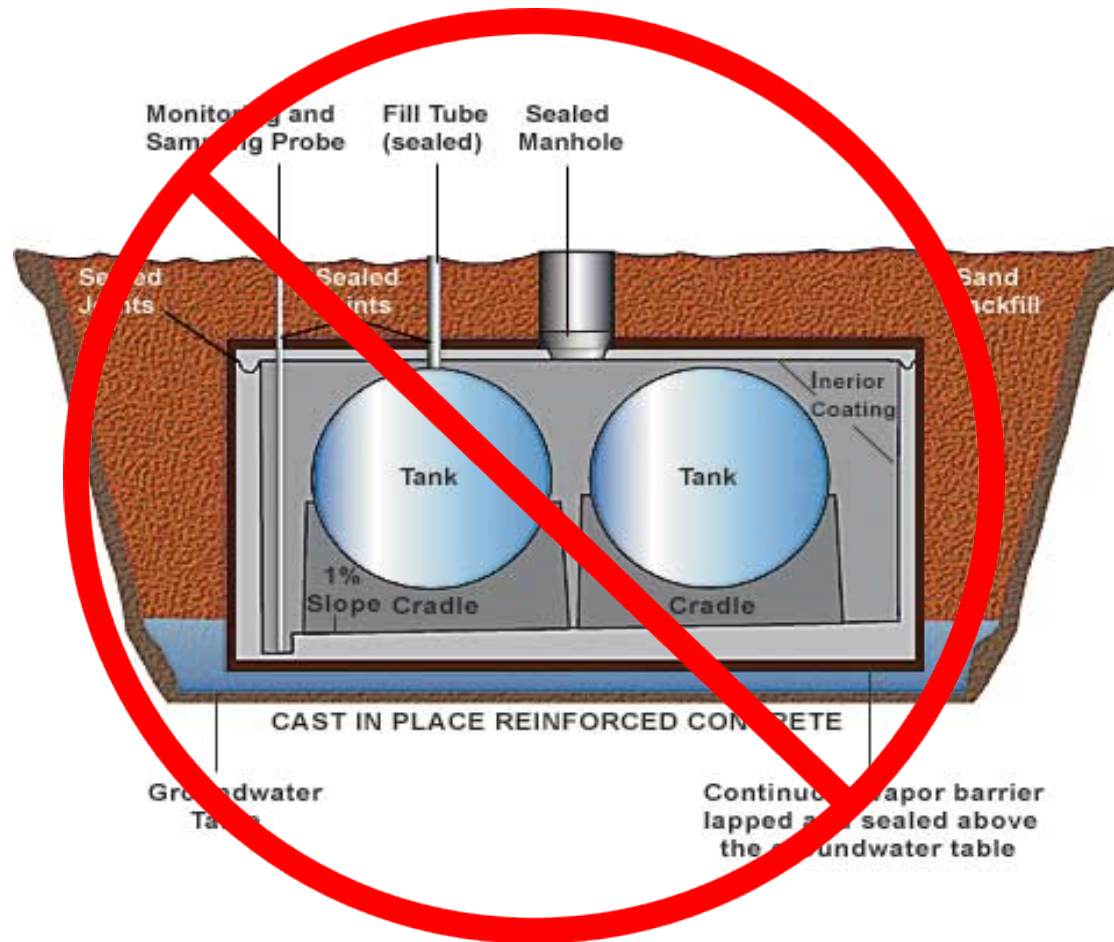
➤ ASTs in Underground Vaults

ASTs installed after 10/11/1997 with piping distribution systems used to dispense Class I or II motor fuels for resale must be provided with release detection equivalent to underground piping release detection addressed in Section 245.445 and equipped with a continuous leak detection system capable of detecting vapors and liquids. The detection system must activate an alarm that automatically shuts down the dispensing system if a release occurs.



▶ ASTs in Underground Vaults

A tank must be in its own vault. Adjacent vaults may share a common wall.





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