

DER-25 / Petroleum Bulk Storage (PBS) Inspection Handbook

New York State Department of Environmental Conservation

DEC Program Policy

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I. Summary

This program policy provides guidance for New York State Department of Environmental Conservation (DEC) Division of Environmental Remediation (DER) staff on conducting inspections at Petroleum Bulk Storage (PBS) facilities to determine compliance with New York State (NYS, State) statutes [Environmental Conservation Law (ECL) Article 17, Title 10], PBS regulations [6 NYCRR Parts 612-614] and the United States Environmental Protection Agency federal Underground Storage Tank (UST) regulations [40 CFR Part 280]. The attached PBS Inspection Handbook addresses inspections for both underground and aboveground storage tank systems at PBS facilities.

II. Policy

It is the policy of DER to provide guidance and training to promote and achieve consistency and compliance with ECL Article 17, Title 10 and applicable federal and State regulations.

III. Purpose and Background

ECL Article 17, Title 10 sets standards and authorizes DEC to promulgate regulations. The PBS regulations have been in effect since December 27, 1985 (revised February 12, 1992). This guidance provides DER staff with consistent procedures for inspecting PBS facilities, as well as consistent interpretation and application of the PBS regulations. It also provides owners/operators of PBS facilities with a clear understanding of which compliance items DER staff will evaluate during PBS inspections.

IV. Responsibility

Responsibility for the PBS program is assigned to the Facility Compliance Section within DER's Bureau of Technical Support (BTS) in Central Office. This responsibility includes program oversight, regulatory interpretation, training, evaluation of new technologies, and technical support in connection with appeals. BTS is responsible for maintaining and updating this policy in DER, in consultation with the Office of General Counsel. DER program staff are responsible for implementing this policy, with input from other involved DEC Divisions.

V. Procedure

The PBS Inspection Handbook establishes procedures for DEC staff to follow when conducting a PBS inspection at a regulated facility.

VI. Related References

- Environmental Conservation Law Article 17, Title 10.
- Article 12 of the Navigation Law Section 170 et seq.
- 6 NYCRR Parts 612, 613 and 614. Petroleum Bulk Storage regulations. DEC. December 27, 1985; revised February 12, 1992.
- 40 CFR Part 280. Federal Underground Storage Tank regulations. United States Environmental Protection Agency. December 22, 1988.
- [DEC Petroleum Bulk Storage Inspection Form v. 4 \(7/1/2009\)](http://www.dec.ny.gov/docs/remediation_hudson_pdf/pbsinspfrm.pdf)
[http://www.dec.ny.gov/docs/remediation_hudson_pdf/pbsinspfrm.pdf]



New York State Department of Environmental Conservation
Division of Environmental Remediation

Petroleum Bulk Storage (PBS) Inspection Handbook

April 2011

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Appendices

- A. [Petroleum Bulk Storage Inspection Form v. 4 \(7/1/2009\)](#)
[http://www.dec.ny.gov/docs/remediation_hudson_pdf/pbsinspfrm.pdf]
- B. [Petroleum Bulk Storage Application](#)
[http://www.dec.ny.gov/docs/remediation_hudson_pdf/pbsrenewal.pdf]
and [Instructions](#) [http://www.dec.ny.gov/docs/remediation_hudson_pdf/pbsinstr.pdf]

References (not attached to this document)

1. 6 NYCRR Parts 612-614, Petroleum Bulk Storage regulations. DEC. December 27, 1985; revised February 12, 1992.
2. Article 12 of the Navigation Law Section 170 et seq.
3. 40 CFR Part 280, Federal Underground Storage Tank regulations. United States Environmental Protection Agency. December 22, 1988.
4. *DER-12: Application Review Policy for PBS and CBS Registration Applications*. DEC. October 14, 2005.
5. *DER-17: Guidelines for Construction Certification, 5-Year Certification, and Inspection of Secondary Containment Systems for Aboveground Petroleum Storage Tanks*. DEC. September 23, 2008 [Draft].
6. *Spill Guidance Manual*. DEC. August 7, 1990.
7. *The List of Leak Detection Evaluations for Storage Tank Systems*. National Work Group on Leak Detection Evaluations [NWGLDE]. www.nwglde.org

PBS Inspection Form Cross-Reference

[based on PBS Inspection Form v. 4 (7/1/2009)]

NOTE: This index provides the reader with a correlation between the inspection guidance and questions on the PBS Inspection Form, to direct the reader to specific pages that help answer a given inspection question. The index references inspection questions to the most applicable section(s) of the handbook. The reader should be sure to read materials around index points in order to best utilize these references.

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Introduction

Purpose & Organization

This handbook provides guidance for New York State Department of Environmental Conservation (DEC) Division of Environmental Remediation (DER) staff on conducting inspections at Petroleum Bulk Storage (PBS) facilities to determine compliance with New York State (NYS, State) statutes [Environmental Conservation Law (ECL) Article 17, Title 10; Article 12 of the Navigation Law (NL) Section 170 et seq.]; PBS regulations [6 NYCRR Parts 612-614]; and United States Environmental Protection Agency (EPA) federal Underground Storage Tank (UST) regulations [40 CFR Part 280].

This document is not intended to be a guide for local (i.e., delegated county agency) PBS requirements that may differ from DEC requirements. This document is not intended to address the federal requirements for spill prevention, control, and countermeasures required by the EPA in 40 CFR Part 112. However, underneath a Memorandum of Agreement with EPA (8/13/2002), DEC inspectors look for and determine compliance with the federal UST requirements of 40 CFR Part 280. While it is DEC's intention to periodically revise this handbook to remain current with State and federal statutory and regulatory changes, it remains the responsibility of the tank system owner and/or operator to ensure that they are in compliance with all applicable (i.e., local, State and federal) requirements.

The handbook is organized into three main sections – *Introduction*, *Underground Storage Tanks (USTs)* and *Aboveground Storage Tanks (ASTs)*. The *Introduction* contains information on program applicability (both DEC and EPA), as well as instructions on how an inspector should prepare for a field inspection. The storage tank sections are organized topically, not by regulatory requirements or by inspection form questions. For ease of use, there is an index included at the beginning of this handbook which cross-references the PBS Inspection Form [v. 4 (7/1/2009)] to relevant pages of this document. The cross-reference provides a quick and easy way to locate guidance on how to answer individual inspection questions. Regulatory requirements that are specific to EPA are indicated by EPA logo icons in the margin. Light bulb icons highlight items that readers may find particularly helpful. Standardized curative measures (referenced to corresponding PBS Inspection Form [v. 4 (7/1/2009)] questions) have been included to provide inspectors with guidance for the regulated community, so that compliance violations can be addressed consistently across the State.

Two appendices are attached to this handbook for the reader's use (hyperlinks and URLs are provided to the appropriate DEC web pages where the documents reside). If URLs change for those documents directly referenced by this handbook, they will be updated within this document to the fullest practicable extent. External documents not included as part of this handbook have also been cited for the reader's reference. Most of the photos contained in this handbook were taken by DEC staff at various locations throughout NYS.

Due to the general nature of this guidance, not every possible tank system configuration or compliance scenario can be identified or addressed without unnecessarily complicating the document. Site-specific conditions may necessitate the use of certain solutions and curative methodology not presented in this handbook. DEC reserves its right to use prosecutorial and enforcement discretion on a case-by-case basis. DEC also reserves its right to depart from this guidance in order to address site-specific issues or concerns. Owner/operators may not use this guidance as a defense in those cases. As of the date of this writing, DEC is in the process of revising PBS regulations. This will necessitate revisions to this guidance as necessary to conform to any new requirements.

General Applicability

DEC and EPA statutes and regulations have differences in the definition, interpretation and application of terms, including but not limited to those noted in the following table.

| Terms | DEC PBS Definition | EPA UST Definition |
|-----------|---|---|
| Petroleum | <p><i>“Petroleum” (ECL 17-1003(5)) means:</i></p> <p><i>a. crude oil and any fraction thereof;</i></p> <p><i>b. any mixture containing crude oil or any fraction thereof; and</i></p> <p><i>c. synthetic forms of lubricating oil, dielectric oils, insulating oils, hydraulic oils and cutting oils.</i></p> <p><i>This term shall not include:</i></p> <p><i>(1) hazardous waste defined pursuant to ECL 27-0903;</i></p> <p><i>(2) substances meeting the definition of hazardous substance pursuant to ECL 40-0105;</i></p> <p><i>(3) animal or vegetable oils that do not contain crude oil or fractions thereof; or</i></p> <p><i>(4) substances that are gases at standard temperature and pressure.</i></p> | <p><i>“Regulated substance” (40 CFR 280.12) means:</i></p> <p><i>(a) Any substance defined in section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 (but not including any substance regulated as a hazardous waste under Subtitle C), and</i></p> <p><i>(b) Petroleum, including crude oil or any fraction thereof that is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute). The term “regulated substance” includes but is not limited to petroleum and petroleum-based substances comprised of a complex blend of hydrocarbons derived from crude oil through processes of separation, conversion, upgrading, and finishing, such as motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.</i></p> |
| Tank | <p><i>Per ECL 17-1003(7), a “tank” is a stationary device designed to store petroleum, which is constructed of non-earthen materials that provide structural support. The term “tank” includes all associated pipes, lines, fixtures and other ancillary equipment. The term “tank” does not include septic tank; surface impoundment, pit, pond or lagoon; storm-water or wastewater collection system; flow-through process tank; or liquid trap or associated gathering lines directly related to oil or gas production and gathering operations.¹</i></p> | <p><i>Per 40 CFR 280.12, a “tank” is a stationary device designed to contain an accumulation of regulated substances and is constructed of non-earthen materials (e.g., concrete, steel, plastic) that provide structural support.</i></p> |
| New Tank | <p><i>“New tank” (for the purposes of this guidance) means a tank system for which installation has commenced after December 27, 1986.</i></p> | <p><i>“New tank system” (for the purposes of this guidance) means a tank system that will be used to contain an accumulation of regulated substances and for which installation has commenced after December 22, 1988.</i></p> |

¹ DEC has decided to exercise enforcement discretion at this time to not subject tanks storing product for operational purposes (e.g., transformers, hydraulic machines, etc.) to registration and the requirements of 6 NYCRR Parts 613 and 614 until such time as the regulations are revised. For further details, refer to the enforcement discretion memo found online at <http://www.dec.ny.gov/regulations/56495.html>.

| Terms | DEC PBS Definition | EPA UST Definition |
|-------------|---|---|
| Underground | <p><i>“Underground tank” (6 NYCRR 612.1(c)(29)) means any tank completely covered with earth or other material. Tanks in subterranean vaults accessible for inspections are considered aboveground tanks.</i></p> | <p><i>Per 40 CFR 280.12, an “underground” tank has a volume greater than 110 gallons and has 10% or more of its volume underground.</i></p> |
| Aboveground | <p><i>“Aboveground tank” (6 NYCRR 612.1(c)(1)) means any stationary tank which is not entirely covered with earth or other material, or any tank which can be inspected in a subterranean vault (including “underground, vaulted with access”).</i></p> | <p><i>“Aboveground” is the converse of “underground.” This is partially defined in 40 CFR 280.12 as an “underground area” (underground room, such as a basement, cellar, shaft or vault, providing enough space for physical inspection of the exterior of the tank situated on or above the surface of the floor).</i></p> |
| Facility | <p><i>“Facility” (ECL 17-1003(1)) means a single property or contiguous or adjacent properties used for a common purpose which are owned or operated by the same person on or in which are located:</i></p> <p><i>a. one or more stationary tanks which are used singularly or in combination for the storage or containment of more than one thousand one hundred (1,100) gallons of petroleum; or</i></p> <p><i>b. any tank whose capacity is greater than one hundred ten gallons (110) that is used for the storage or containment of petroleum, the volume of which is ten percent (10%) or more beneath the surface of the ground.</i></p> <p><i>This term shall not include:</i></p> <p><i>(1) facilities licensed under Article 12 of the Navigation Law;</i></p> <p><i>(2) facilities regulated under the Federal Natural Gas Act;</i></p> <p><i>(3) a heating oil tank used for on-premises consumption at the same site which is not interconnected to any other heating oil tank and is used to store or contain less than one thousand one hundred gallons (1,100) of petroleum unless such tank is located on a site that otherwise meets the definition of facility;</i></p> <p><i>(4) tanks eleven hundred (1,100) gallons or less used to store motor fuel (gasoline or diesel products) for non-commercial purposes (not for resale) at a farm or residence, unless such tank or tanks are located on a site that otherwise meets the definition of facility;</i></p> <p><i>{CONTINUED ON FOLLOWING PAGE}</i></p> | <p><i>EPA regulations regulate individual tanks and not storage facilities. As such, there is no EPA definition for “facility.”</i></p> |

| Terms | DEC PBS Definition | EPA UST Definition |
|---|---|---|
| Facility (cont'd) | <p>(5) tanks used to store or contain asphalt (however, tanks used to store or contain asphaltic emulsions are included);² or</p> <p>(6) tanks which have been permanently closed in accordance with regulations promulgated pursuant to ECL 17-1005.</p> | |
| Small Heating Oil Tanks for On-Premises Consumption | <p>Per ECL 17-1003(1)(b), with the exception noted below, this includes tanks storing numbers 1, 2, 4, 5 and 6 fuel oils, used oil (fuel), and kerosene which are:</p> <p>1) under 1101 gallons per tank; 2) used for on-premises consumption at the same site; and 3) not interconnected to any other heating oil tank. EXCEPTION: The preceding does not apply if the tanks are otherwise located at a facility.</p> | <p>Heating oil tanks used for on-premises consumption at the same site are not regulated under EPA regulations.</p> |
| Temporary Closure | <p>Per 6 NYCRR 613.9(a), the tank is emptied to its lowest draw-off point (tank still considered as active).</p> | <p>Per 40 CFR 280.71, the tank is not required to be emptied. If the tank is emptied, release detection is not required. If the tank is not emptied (i.e., the height of the product in the tank is greater than one inch), then release detection is required.</p> |
| Permanent Closure | <p>Per 6 NYCRR 613.9(b), the tank is emptied & either removed or closed in-place by filling it with a solid, inert material such as sand or concrete slurry. A site assessment may not be required but is <u>always</u> recommended.</p> | <p>Per 40 CFR 280.71, the tank must be emptied & either removed or closed in place by filling with an inert solid material. Per 40 CRF 280.72, a site assessment is <u>always</u> required.</p> |

² DEC has decided to exercise enforcement discretion at this time to not subject tanks storing asphaltic emulsions to registration and the requirements of 6 NYCRR Parts 613 and 614 until such time as the regulations are revised. For further details, refer to the enforcement discretion memo found online at <http://www.dec.ny.gov/regulations/56495.html>.

Please note the following special conditions in order to determine regulatory applicability for certain tank systems.

1. All used/waste oil tanks installed on or after December 27, 1986 at a regulated facility are subject to 6 NYCRR Part 614. Due to a law change (*Chapter 334 of the Laws of 2008*), used/waste oil tanks installed between December 27, 1986 and January 14, 1995 are now regulated and must have been brought into compliance or permanently closed by July 21, 2009.
2. All heating oil tanks installed on or after December 27, 1986 at a regulated facility are subject to 6 NYCRR Part 614.
3. AST systems that became newly regulated on July 21, 2008 and were installed in non-conformance with 6 NYCRR Part 614 after December 27, 1986 must have been retrofitted to be in compliance or permanently closed by July 21, 2009.
4. UST systems that became newly regulated on July 21, 2008 and were installed in non-conformance with 6 NYCRR Part 614 after December 27, 1986 that:
 - a. Did not have secondary containment, overfill prevention or a leak monitoring system must either have been brought into compliance or permanently closed by July 21, 2009.
 - b. Did not have corrosion resistance must have been permanently closed by July 21, 2009.

Inspection Preparation

In preparation for the inspection, the inspector should review the following documents.

1. Facility Information Report (FIR)
 - The inspector should :
 - Review the FIR for completeness and correctness per DER-12 (*Application Review Policy for PBS and CBS Registration Applications*);
 - Check for '00 – none' codes or blank entries that should be filled in;
 - Ensure that '99 – other' codes are explained;
 - Check for overdue registration, overdue tightness test, usage of groundwater or vapor wells as leak detection, and tank installation date (drives 6 NYCRR Part 614 applicability);
 - Check registration for information that seems to necessitate inspection follow-up (e.g., double-walled tanks installed in the 1970s or early 1980s, original sacrificial anodes for 20+ year-old tanks); and
 - Compare the registration information to regulatory requirements (please see tables below for detailed explanation of what to review). If the conditions specified in the tables are not met, the inspector must inspect those items/issues on-site.
2. Spill Response Program (SRP) database – The inspector should search the SRP database using the facility's physical address (**NOTE:** It may be better to start the search with the first few characters of the address and narrow down the search afterwards). If there are any open spills at the location, the inspector should review the applicable spill report(s).
3. Most recent inspection report – The inspector should note any area(s) of violation, compare them to the curative measures taken to address the violation(s), and review any available comments from the last inspection.
4. Files – The inspector should review the following documents:
 - The most recent tank tightness test reports and any other submitted reports;
 - Notice(s) of Violation and any curative measures taken;
 - Any substantial modifications; and
 - Variance request(s), if any, and DEC's response.

Enforcement records – If the inspector has access to enforcement records, the records should be reviewed for relevant information and to determine whether an enforcement action is still open. To the extent that this information is available, the inspector should discuss it with the assigned attorney prior to conducting the inspection. All Regional Attorneys & Regional Enforcement Coordinators (RECs) have access to this information.

Detailed Facility Information Report (FIR) Review

NOTE: The underlined and italicized text in the following tables corresponds to columns and codes, respectively, that are found in “Section B – Tank Information” of the PBS Bulk Storage Application, attached to this document.

| Underground Storage Tanks (USTs) – Tanks | |
|---|---|
| Tank Type | <ul style="list-style-type: none"> USTs <u>installed after 12/27/1986</u> cannot have <i>plastic</i> or <i>concrete</i> listed as <u>tank type</u>. |
| External Protection | <ul style="list-style-type: none"> USTs <u>installed after 12/27/1986</u> cannot have <i>none</i> listed as <u>tank external protection</u>. USTs with <u>tank type</u> of <i>steel/carbon steel/iron, galvanized steel alloy</i> or <i>stainless steel alloy</i> <u>installed after 12/27/1986</u> must have at least <i>original sacrificial anode, original impressed current</i> or <i>jacketed</i> listed as <u>tank external protection</u>. NOTE: Original sacrificial anodes for a UST installed in the 1980s or even the early 1990s may no longer be functional. USTs with <u>tank type</u> of <i>fiberglass coated steel</i> or <i>fiberglass reinforced plastic (FRP)</i> must have <i>fiberglass</i> listed as <u>tank external protection</u>. USTs with <u>tank type</u> of <i>plastic</i> cannot have <i>sacrificial anode</i> (either <i>original</i> or <i>retrofitted</i>) or <i>impressed current</i> (either <i>original</i> or <i>retrofitted</i>) listed for <u>tank external protection</u>. USTs with <u>tank type</u> of <i>urethane clad steel</i> must have <i>urethane</i> listed as <u>tank external protection</u>. |
| Secondary Containment | <ul style="list-style-type: none"> USTs <u>installed after 12/27/1986</u> must have <u>tank secondary containment</u>. USTs <u>installed after 12/27/1986</u> cannot have <i>diking (aboveground only), vault (w/access), remote impounding area, modified double-wall (aboveground only)</i> or <i>double bottom (aboveground only)</i> listed as <u>tank secondary containment</u>. |
| Leak Detection | <ul style="list-style-type: none"> Double-walled USTs <u>installed after 12/27/1986</u> must have <i>interstitial monitoring</i> (either <i>electronic</i> or <i>manual</i>) listed as <u>tank leak detection</u>. |
| Overfill Prevention | <ul style="list-style-type: none"> USTs <u>installed after 12/27/1986</u> must have <u>tank overfill prevention</u>. USTs <u>installed after 12/27/1986</u> cannot have <i>product level gauge (aboveground only)</i> listed as <u>tank overfill prevention</u>. USTs with a <i>suction dispenser</i> cannot have <i>float vent valve</i> listed as <u>tank overfill prevention</u>. |

Underground Storage Tanks (USTs) – Piping

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|-----------------------|--|
| Piping Type | <ul style="list-style-type: none"> • If <u>piping location</u> is indicated as <i>no piping</i>, then <u>piping type</u> must be indicated as <i>none</i>. • Piping <u>located aboveground</u> cannot have <i>fiberglass reinforced plastic (FRP), plastic or flexible piping</i> listed as <u>piping type</u>. |
| External Protection | <ul style="list-style-type: none"> • If <u>piping location</u> is indicated as <i>no piping</i>, then <u>piping external protection</u> must be indicated as <i>none</i>. • Piping <u>located aboveground</u> cannot have <i>sacrificial anode or impressed current (either original or retrofitted)</i> listed as <u>piping external protection</u>. • <u>Piping type</u> of <i>steel/carbon steel/iron, galvanized steel or stainless steel alloy</i> that is <u>located underground/on-ground</u> and <u>installed after 12/27/1986</u> must have <i>original sacrificial anode, original impressed current or jacketed</i> listed as <u>piping external protection</u>. |
| Secondary Containment | <ul style="list-style-type: none"> • If <u>piping location</u> is indicated as <i>no piping</i>, then <u>piping secondary containment</u> must be indicated as <i>none</i>. • Piping <u>located aboveground</u> cannot have <i>double-wall (underground only), excavation/trench liner system or flexible internal liner (bladder)</i> listed as <u>piping secondary containment</u>. • Piping <u>located underground/on-ground</u> cannot have <i>diking (aboveground only), vault (either w/ or w/o access), remote impounding area, flexible internal liner (bladder), modified double-wall (aboveground only), impervious underlayment or double bottom (aboveground only)</i> listed as <u>piping secondary containment</u>. |
| Leak Detection | <ul style="list-style-type: none"> • If <u>piping location</u> is indicated as <i>no piping</i>, then <u>piping leak detection</u> must be indicated as <i>none</i>. • Piping <u>located underground/on-ground</u> with a <i>submersible dispenser</i> must have <i>pressurized piping leak detector</i> listed as one form of <u>piping leak detection</u>. • Piping <u>located underground/on-ground</u> with a <i>submersible dispenser</i> must have two forms of <u>piping leak detection</u> for EPA-regulated USTs. • Piping <u>located underground/on-ground</u> with a <i>submersible dispenser</i> cannot have <i>exempt suction piping</i> listed as <u>piping leak detection</u>. • Piping <u>located underground/on-ground</u> with a <i>suction dispenser</i> cannot have <i>pressurized piping leak detector</i> listed as <u>piping leak detection</u>. |

Aboveground Storage Tanks (ASTs) – Tanks

| | |
|-----------------------|---|
| Tank Type | <ul style="list-style-type: none"> ASTs - Tank type must be one of the following: <i>steel/carbon steel/iron, galvanized steel alloy, stainless steel alloy, or steel tank in concrete.</i> [EXCEPTION: In limited situations, ASTs storing <i>used/waste oil</i> may have <i>plastic</i> listed as <u>tank type</u>.] |
| External Protection | <ul style="list-style-type: none"> ASTs <u>installed after 12/27/1986</u> must have <u>tank external protection</u>. ASTs cannot have <i>fiberglass, jacketed or wrapped (piping)</i> listed as <u>tank external protection</u>. ASTs <u>located on saddles, legs, stilts, rack or cradle</u> cannot have <i>sacrificial anode or impressed current (either original or retrofitted)</i> listed as <u>tank external protection</u>. ASTs <u>located in contact with soil or with 10% or more below ground and installed after 12/27/1986</u> must have <i>original sacrificial anode or original impressed current</i> listed as <u>tank external protection</u>. |
| Secondary Containment | <ul style="list-style-type: none"> ASTs <u>located in contact with soil or with 10% or more below ground and installed after 12/27/1986</u> must have <i>impervious underlayment or double bottom (aboveground only)</i> listed as <u>tank secondary containment</u>. ASTs with <u>tank capacity greater than or equal to 10,000 gallons</u> must have <u>tank secondary containment</u>. ASTs cannot have <i>double-wall (underground only), excavation/trench liner system or flexible internal liner (bladder)</i> listed as <u>tank secondary containment</u>. |
| Leak Detection | <ul style="list-style-type: none"> ASTs <u>located in contact with soil, in contact with an impervious barrier, or with 10% or more below ground and installed after 12/27/1986</u> must have <u>tank leak detection</u>. ASTs cannot have <i>vapor well, groundwater well, or in-tank system (AutoTankGauge)</i> listed as <u>tank leak detection</u>. |
| Overfill Prevention | <ul style="list-style-type: none"> ASTs cannot have <i>none or float vent valve</i> listed as <u>tank overfill prevention</u>. |

Aboveground Storage Tanks (ASTs) – Piping

| | |
|---|---|
| <p align="center">Piping Type</p> | <ul style="list-style-type: none"> • If <u>piping location</u> is indicated as <i>no piping</i>, then <u>piping type</u> must be indicated as <i>none</i>. • Piping <u>located aboveground</u> cannot have <i>fiberglass reinforced plastic (FRP), plastic or flexible piping</i> listed as <u>piping type</u>. |
| <p align="center">External Protection</p> | <ul style="list-style-type: none"> • If <u>piping location</u> is indicated as <i>no piping</i>, then <u>piping external protection</u> must be indicated as <i>none</i>. • Piping <u>located aboveground</u> cannot have <i>sacrificial anode or impressed current (either original or retrofitted)</i> listed as <u>piping external protection</u>. • <u>Piping type</u> of <i>steel/carbon steel/iron, galvanized steel or stainless steel alloy</i> that is <u>located underground/on-ground</u> and <u>installed after 12/27/1986</u> must have <i>original sacrificial anode, original impressed current or jacketed</i> listed as <u>piping external protection</u>. |
| <p align="center">Secondary Containment</p> | <ul style="list-style-type: none"> • If <u>piping location</u> is indicated as <i>no piping</i>, then <u>piping secondary containment</u> must be indicated as <i>none</i>. • Piping <u>located aboveground</u> cannot have <i>double-wall (underground only), excavation/trench liner system or flexible internal liner (bladder)</i> listed as <u>piping secondary containment</u>. • Piping <u>located underground/on-ground</u> cannot have <i>diking (aboveground only), vault (w/ or w/o access), remote impounding area, flexible internal liner (bladder), modified double-wall (aboveground only), impervious underlayment or double bottom (aboveground only)</i> listed as <u>piping secondary containment</u>. |
| <p align="center">Leak Detection</p> | <ul style="list-style-type: none"> • If <u>piping location</u> is indicated as <i>no piping</i>, then <u>piping leak detection</u> must be indicated as <i>none</i>. • Piping <u>located underground/on-ground</u> with a <i>submersible dispenser</i> must have <i>pressurized piping leak detector</i> listed as one form of <u>piping leak detection</u>. • Piping <u>located underground/on-ground</u> with a <i>submersible dispenser</i> cannot have <i>exempt suction piping</i> listed as <u>piping leak detection</u>. • Piping <u>located underground/on-ground</u> with a <i>suction dispenser</i> cannot have <i>pressurized piping leak detector</i> listed as <u>piping leak detection</u>. |

Double Fields (Columns Able to Accommodate Two Codes)

- A double field cannot have *none* listed along with other choices.
- If *original impressed current* is listed as tank or pipng external protection, then *retrofitted sacrificial anode* cannot also be listed.
- If *diking (aboveground only)*, *vault (w/ access)*, *remote impounding area* or *modified double-wall (aboveground only)* is listed as tank secondary containment, then *vault (w/o access)*, *double-walled (underground only)* or *excavation/trench liner system* cannot also be listed.
- If *vault (w/o access)*, *double-wall (underground only)* or *excavation/trench liner system* is listed as tank secondary containment, then *diking (aboveground only)*, *vault (w/ access)*, *remote impounding area* or *modified double-wall (aboveground only)* cannot also be listed.

General Approach to Inspection Follow-Up and Curative Measures³

This section presents DEC's approach to curing violations found at a facility during a PBS compliance inspection. (**NOTE:** This document does not address resultant enforcement and/or penalties, which accrue from the time of the violation until it has been cured.) If an inspection identifies violations, the inspector shall direct the owner/operator to develop a curative measures plan in accordance with the methods described in this document and the time frames indicated in the table below.

| Time Allowed to Cure Violations Found During a Facility Inspection | | |
|---|--------------------------------|--|
| Violation | Reference (6 NYCRR) | Maximum Time Allowed (calendar days, from date of NOV issuance) |
| Missing or inadequate secondary containment for ASTs | 613.3(c)(6)(i) | 120 |
| Ten-year inspection incomplete or inadequate | 613.6(b) | 120 |
| Cathodic protection for tank bottom missing or inadequate | 614.9(b) | 120 |
| Impermeable barrier under tank bottom missing or inadequate | 614.10 | 150 |
| All violations other than those listed above | 612-614 | 30 * |

* Including permanent closure of tank systems in accordance with 6 NYCRR 613.9(b).

If the curative measures will not be completed within the above time frames or will include curative methods not addressed in this document, the owner shall develop a *written* curative measures plan, which must be approved by DEC. The written curative measures plan will:

- identify the PBS facility;
- identify the violation(s) cited in the NOV;
- describe the proposed curative measure(s);
- provide the technical specifications and details for how the curative measure(s) and/or equipment upgrade(s) will be completed; and
- provide an implementation schedule for the proposed curative measure(s), including anticipated date of completion.

The inspector must decide whether additional measures are required between the time of issuance of the NOV and completion of the curative measure(s), according to the following:

³ DEC considered the following factors in defining responses to violations identified in this document. If a tank system is not tight or has non-functional or missing equipment, or the owner failed to conduct required tests or to maintain leak detection, then the tank system may need to be taken out of service until appropriate compliance documentation is submitted, reviewed and approved by DEC. In cases not meeting those conditions, this document identifies other appropriate courses of action, which may include tightness testing.

- If the tank system is known to be leaking, the owner must empty the tank until such time as repairs are conducted and the tank system is verified to be tight;
- [THIS SPACE RESERVED FOR PROVISIONS FROM DELIVERY PROHIBITION REGULATIONS]

In accordance with 6 NYCRR 613.7, when a leak of petroleum is suspected or appears probable, or where tests or inspections have not been performed, or where accurate inventory records are not kept and reconciled as required in 6 NYCRR 613.4, DEC may order the owner/operator to verify system integrity (including tightness and structural soundness). If the owner/operator fails to conduct such tests and inspections within ten (10) days, DEC may conduct tests and inspections to evaluate system integrity, or may direct the owner/operator to take the tank system out of service until documentation demonstrating system integrity has been submitted to DEC.

Due to the general nature of this guidance, not every possible tank system configuration or compliance scenario can be identified or addressed without unnecessarily complicating the document. Site-specific conditions may necessitate the use of certain solutions and curative methodology not presented in this handbook. DEC reserves its right to use prosecutorial and enforcement discretion on a case-by-case basis. DEC also reserves its right to depart from this guidance in order to address site-specific issues or concerns. Owner/operators may not use this guidance as a defense in those cases.

While this handbook provides guidance on federal regulatory requirements and general curative measures for violations of those requirements, EPA retains discretion for final acceptability of any of those curative measures.

Underground Storage Tanks (USTs)

I. Facility Information – Records Review

This section addresses questions 1, 2, 6, 12.9, 31 and 57 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to all petroleum storage facilities that are required to be registered under 6 NYCRR Part 612.

B. Regulatory Requirements

- The facility operator is required to display a current and valid registration certificate on the facility premises at all times. [6 NYCRR 612.2(e)]
- The facility owner is required to maintain accurate drawings or as-built plans for new UST systems (those installed after December 27, 1986). [6 NYCRR 614.7(d)]
- Tanks that are to be permanently closed must follow the requirements in 6 NYCRR 613.9(b) and (c).
- Closure site assessments must be conducted for all permanently closed EPA-regulated USTs and must follow the requirements set forth in 40 CFR 280.72.



C. Registration

1. New facilities, as well as new tanks at facilities, must be registered prior to being placed in service (i.e., receiving delivery of any petroleum product). Facility registration renewal applications must be filed prior to the expiration date on the registration. Registration must be renewed every five years from the date of the last valid registration. Facilities must be registered within thirty (30) days of a change of ownership. DEC must be notified within thirty (30) days prior to a substantial modification and registrations must be updated within thirty (30) days of that modification. The inspector should check to make sure that the:

- registration certificate is posted on the premises (the certificate itself states that it must be posted at the tank, at the entrance to the facility, or in the main office of the facility where the tanks are located);
- certificate is signed by the owner or authorized representative; and
- information reflected on the Facility Information Report (FIR) is current and correct (this includes accuracy of ownership, contact information, tank system information, operator, etc.).

2. Curative Measures

#1 & 2 – The owner must complete and submit a PBS registration application for initial registration/renewal, information correction, change of ownership, or substantial modifications. The owner or authorized representative must sign and post a valid registration certificate on the premises at all times. (NOTE: A registration certificate

cannot be considered valid without the owner's or the authorized representative's signature.) To demonstrate compliance with the posting requirement subsequent to an inspection, the owner must submit a photograph of the signed and posted certificate.

D. As-built Plans/Site Drawings

1. The inspector must make sure that facilities with USTs installed after December 27, 1986 meet the minimum requirements for accurate site drawings/as-built plans, as required by 6 NYCRR 614.7(d). The following serves to clarify the requirements for an accurate site drawing/as-built plan (as of the effective date of this Program Policy), as required by 6 NYCRR 614.7(d).

a. Site Sketch

- Facility structures
- Direction frame of reference (i.e., north arrow)
- Scale
- Tanks
 - Physical location or best approximation (indicate aboveground or underground)
 - Registration ID #
 - Size
- Piping
 - Physical location or best approximation (indicate aboveground or underground)
 - Location of check valves
 - Labels correlating to detail information below
- Dispensers
 - Physical location
 - Labels correlating to detail information below
- Other equipment
 - Transition sumps (if any)
 - Monitoring/recovery wells (if any)

b. Detail List / Specifications

- Tanks
 - Registration ID #
 - Capacity (design & working)
 - Material of construction
 - Internal protection (if any)
 - External protection (if any)
 - Product stored
 - Secondary containment
 - Leak detection method(s)
- Piping
 - Material of construction
 - External protection (if any)

- Product carried
- Secondary containment
- Leak detection method(s)
- Dispensers
 - Type (i.e., submersible, suction, gravity)

NOTE: The preceding detail information is not required to be listed directly on the as-built plan/site drawing, but it should be readily available.

c. Area Sketch

- Adjoining streets
- Significant neighboring structures

d. Certification Statement

- All information is accurate and complete, and the system has been installed in accordance with 6 NYCRR Part 614.

2. Actual as-built plans (provided by a contractor) will be required for new or substantially modified facilities as of the effective date of this Program Policy.

3. The following items are recommended (but not required) to be included on as-built plans:

- Geo-located centroid of facility (lat/long, UTM decimal format)
- Location of electrical conduits for reference during facility maintenance/upgrades

4. Curative Measure

#12.9 – The owner must have a qualified person (i.e., contractor or otherwise qualified facility personnel) determine the physical location, material of construction and other attributes of the tank system(s), and must submit an accurate site drawing in accordance with the minimum requirements listed above. If physical location of piping is not known, the contractor or qualified person must provide a best approximation. The site drawing must include a statement certifying under penalty of perjury that the information provided on the diagram is true to the best of the contractor’s knowledge and belief.

E. Structurally Repaired Tanks and Piping



1. Tank systems that have undergone structural repairs (e.g., internal tank lining, repair of loose fittings, etc.) must be tightness tested within thirty (30) days of repair completion per EPA requirements, unless an internal inspection has been completed or release detection equipment is in use. If the tank has been internally inspected, the inspector should review the inspection report. Refer to Chapter II (*Release Detection*) of this document for specifics on release detection records review. Per 6 NYCRR 614.6(i), any

tank that has undergone internal tank lining must be tightness tested prior to being returned to service.

2. Curative Measure



#31 – If no release detection equipment was in use at the time of structural repair and the tank has not been internally inspected, the repaired portion of the tank system must be tightness tested within thirty (30) days of the facility inspection and records must be submitted to DEC.

F. Permanently Closed Tanks

1. USTs that are permanently closed in-place must have all liquid and sludge removed from the tank and connecting lines. The tank must be rendered vapor-free. Connecting lines must be disconnected and removed or securely capped. Tanks that are closed in-place must be filled to capacity with a solid, inert material. The inspector should review the tank closure report to ensure that proper in-place closure procedures have been followed.



For EPA-regulated tanks that have been permanently closed (whether removed or closed in-place), a site assessment must have been conducted. If closure was conducted within the last three years, the inspector should review the site assessment report to verify that an adequate site assessment has been performed, i.e., that the environment around the tank system(s) has been evaluated for the presence of contamination.

2. Curative Measures

#6 – If a tank has not been properly closed in-place (i.e., not filled with a solid, inert material), DEC will allow up to thirty (30) days after the facility inspection for the tank to be either removed or filled with a solid, inert material. Any environmental contamination must be properly addressed (i.e., an approved remedial plan must be in place) prior to in-place closure.



#57 – If an acceptable site assessment has not been conducted, one must be conducted within thirty (30) days of the facility inspection and any petroleum contamination discovered must be appropriately addressed. Records must be submitted to DEC.

II. Release Detection

This section addresses questions 12.2, 12.3, 12.6, 13, 17 and 38-56 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to all DEC- and EPA-regulated underground storage tank systems, with the exception of tanks installed prior to December 27, 1986 storing #5 or #6 fuel oil.

B. Regulatory Requirements

- DEC-regulated USTs that were installed after December 27, 1986 are required to have secondary containment; the choice made for secondary containment will influence which release detection method will be appropriate. [6 NYCRR 614.4(a)]
 - Most tanks meet the secondary containment requirement by being double-walled. In these cases, the interstitial space of the double-walled tank must be monitored.
 - If an excavation liner or impervious underlayment is used for secondary containment, the space between the tank and secondary containment must be monitored using an observation well.
- Tank systems must be monitored for leaks at least weekly; leak detection systems must be inspected for operability monthly [6 NYCRR 613.5(b)(3)].
- Leak detection records must be maintained on the premises of the facility for at least one (1) year. [6 NYCRR 613.5(b)(4)]
- Monitoring wells must be marked [6 NYCRR 613.3(b)(4)] and secured [6 NYCRR 614.5(d)(4)].
- For tanks installed prior to December 27, 1986 that have been upgraded to meet EPA's corrosion protection standard, the release detection system must be upgraded to meet EPA requirements as indicated below. Regardless of the type of upgrade, such tanks must also meet DEC requirements for USTs installed prior to December 27, 1986.
- All USTs regulated by both DEC & EPA must have a release detection system [40 CFR 280.41(a)]. In the case of a small tank (≤ 1000 gallons), manual tank gauging (MTG) can be used by itself.
- All pressurized piping connected to EPA-regulated USTs must have two forms of leak detection – an automatic line leak detector (ALLD) and one of the following methods: annual line test, groundwater or vapor monitoring wells, interstitial monitoring or statistical inventory reconciliation (SIR). [40 CFR 280.41(b)(1)]
- Suction piping that has the check valve at the tank top must have one of the following leak detection methods: three-year line test, groundwater or vapor monitoring wells, interstitial monitoring or SIR [40 CFR 280.41(b)(2)]. This type of “non-exempt” suction system is known as American suction.





- Suction piping can be exempt from release detection requirements if there is only one check valve located directly under the dispenser and if the piping is sloped back to the tank [40 CFR 280.41(b)(2)]. This type of “exempt” suction system is known as European (or “safe”) suction.

The following table summarizes DEC and EPA requirements for tank release detection:

| Tank Regulated By: | Installation Date | Tank Release Detection Methods | | | | | |
|--------------------|--------------------|--------------------------------|---|--|---|-----|--|
| | | Tank Testing | Interstitial | ATG | MTG | SIR | Groundwater / Vapor Wells |
| DEC only | Pre - 12/27/1986 * | Required | | | | | |
| DEC & EPA | Pre - 12/27/1986 * | Required | One of these monitoring methods must also be used within 10 years of installation or corrosion protection upgrade | | | | |
| DEC & EPA | Post - 12/27/1986 | | Required for double-walled tanks | Allowed (if sec. cont. is vault or cut-off wall, or if pre-12/27/86 corrosion-resistant tank w/o sec. cont.) | Allowed for tanks ≤1000 gallons in size | | Required if secondary containment is impervious underlayment or excavation liner |

* Unless the tank meets standards for new construction at the time of installation, or was corrosion-resistant at the time of installation and has a leak monitoring system. In such cases, owners and operators need to follow the requirements for post-1986 tanks.

The following table summarizes DEC and EPA requirements for piping release detection:

| Piping Regulated By: | Piping Type | Piping Release Detection Methods | | | | |
|----------------------|----------------|---|--|--------------|-----|---------------------------|
| | | ALLD | Interstitial | Line Testing | SIR | Groundwater / Vapor Wells |
| DEC | Pressurized | Required | | | | |
| EPA | Pressurized | Required | One of these methods must also be used | | | |
| EPA | Suction | | One of these methods must be used | | | |
| EPA | Exempt Suction | No release detection required, but only if check valve is located below the dispenser and piping is sloped back to the tank | | | | |

KEY: ATG = automatic tank gauging; MTG = manual tank gauging;
SIR = statistical inventory reconciliation; ALLD = automatic line leak detector

C. Monthly Leak Detection System Operability Check

A monthly operability check is required for all leak detection systems. The operator must produce at least one year's worth of records demonstrating that this check has been performed. For all electronic monitoring systems, the operator must verify that all monitoring systems are fully powered and functional. Most often, records will be in the form of a printout from the monitoring console. Occasionally, an operator may maintain a log book or something similar.

D. Specific Leak Detection Methods

The inspector must review the information provided by the tank owner on the registration application to determine which of the listed leak detection methods are being used at a site. An owner is responsible for using and maintaining all release detection methods that are listed on the registration form, even if additional methods not required by the regulations are listed. Any release detection method that is not being used at the site should be removed from the PBS registration. DEC recognizes that 6 NYCRR 613.5(b)(1) states that *all* cathodic protection and leak detection systems must be monitored. DEC will use its enforcement discretion to only require monitoring of leak detection methods listed on a facility's PBS registration.

1. Tank Internal Monitoring

a. Tank Tightness Testing [TTT] (question 17)

i. Tightness test reports will most often be reviewed in the office prior to conducting an inspection. When reviewing tightness test reports, the inspector should look for the following items in order to determine whether the test report(s) is/are acceptable:⁴

- Facility registration (PBS) number
- Date of test
- Tank ID number (same as on PBS registration)
- Test method is acceptable (i.e., on National Work Group on Leak Detection Evaluations [NWGLDE] list; found online at www.nwglde.org)
- Test method is conducted in accordance with manufacturer's instructions (i.e., NWGLDE protocol)
- Test is done on complete tank system (i.e., wetted portion, ullage portion, piping)
- Depth-to-water determination and site sketch (NOTE: Depth-to-water determination must be made within the tank backfill)
- Statement of technician's qualification
- Technician's address, signature and certification number
- Test pass/fail conclusion, including applicable calculations
- Date of test equipment calibration
- Certification that test complies with the requirements of 6 NYCRR 613.5(a)(6)

⁴ The inspector should follow this process when reviewing any submitted tightness test report.

ii. When the inspector is on-site, he should verify that the configuration of the tank system is appropriate for the test method being used. For example, there is no currently available volumetric test method that can fully evaluate a tank system containing pressurized piping. Therefore, for volumetric testing, a separate tank and line test must be conducted.

iii. Curative Measure

#17 – If no tightness test has been done on the tank and piping system for the past five years, it must be tested and a report must be submitted to DEC.

b. **Automatic Tank Gauge [ATG]** (questions 13, 38-40)

i. If the tank has an ATG (a.k.a., in-tank monitoring system) manufactured by VeederRoot, Gilbarco, OMNTEC, INCON, or EBW (AutoStik), the inspector can assume that the ATG is on the NWGLDE list. If the equipment is made by another manufacturer, the inspector needs to verify that it is listed with the NWGLDE. There are two types of ATG leak tests – the static leak test and the continuous in-tank leak detection system (CITLDS). Both types are acceptable, although not necessarily appropriate in all scenarios. For example, a static leak test would not be appropriate for tanks at a facility that operates around-the-clock, because there would not be enough system downtime to run a valid test.

When the inspector reviews an ATG test report, the inspector should take a copy (if the console is equipped with a printer) with him back to the office at his discretion to confirm that the ATG is conducting an appropriate test in accordance with the NWGLDE test protocol.

ii. **Static Leak Test (a.k.a., Shutdown Test)**

a) For a facility using an ATG for single-wall tanks, the inspector should check for a copy of the weekly test report (must show the ATG threshold for declaring a leak of 0.2 gph); any test that fails must be investigated as a suspected leak.

b) The inspector should examine the last four static ATG test reports in order to determine whether the ATG is testing the portion of the tank that routinely contains the highest level of product (i.e., the tank's normal high-fill level). If two or more tests reflect that the tank is being tested at significantly less than the tank's normal high-fill level, it is an indication that the tank is not being properly tested.

iii. **CITLDS**

There are two types of CITLDS. One aggregates data gathered during quiet time periods (i.e., between times of dispensing). The other is a continuous SIR system that continuously gathers data and reconciles it in the background.

The inspector should ask the owner/operator to verify system operability. This can be done by scrolling through the ATG console settings to show that it is running valid tests. Alternatively, the inspector can ask the owner/operator for the latest weekly system report showing that the system is functioning properly.

iv. **Curative Measures**

#13 – If weekly tests have not been conducted or if required records have not been maintained, the owner must start conducting weekly monitoring and must submit either weekly test results for the next four weeks (static system) or the latest monthly system report (CITLDS). If the ATG is not functioning, the owner must have it repaired or replaced and must begin conducting weekly monitoring, and must submit documentation as previously noted.



#38 – If the ATG is not on the NWGLDE list, the owner must either use another form of release detection and submit results to DEC, or must replace the ATG with one that is on the NWGLDE list and submit results to DEC.



#39 – If the ATG has not been set up properly, the owner must contact a contractor to properly set up the ATG.



#40 – If the ATG did not conduct a test while the tank contained the routinely highest level of product, either the ATG test must be re-conducted and documentation must be submitted to DEC, or a tightness test must be conducted and the results must be submitted to DEC.

c. **Manual Tank Gauging [MTG]** (questions 41-43)



i. Manual tank gauging is used mostly for waste oil tanks. The inspector should determine whether the tank size is appropriate for using MTG. MTG is only valid for tanks ≤ 1000 gallons. The following table provides the minimum MTG test duration for various tank sizes:

| Tank Size | Minimum Test Duration (hours) | Weekly Standard [1 test] (gallons) | Monthly Standard [4-test average] (gallons) |
|--|-------------------------------|------------------------------------|---|
| Up to 550 gallons | 36 | 10 | 5 |
| 551-1000 gallons (when tank diameter is 64") | 44 | 9 | 4 |
| 551-1000 gallons (when tank diameter is 48") | 58 | 12 | 6 |

- ii. The inspector should examine the facility's MTG records to determine whether the release detection method is being conducted correctly. Four measurements of the tank's contents must be taken weekly (two at the beginning and two at the end of at least a 36-hour period), during which nothing is added to or removed from the tank. The average of the two consecutive ending measurements is then subtracted from the average of the two beginning measurements to indicate the change in product volume. If the calculated change exceeds the weekly standard (see above table), the tank may be leaking. In addition, monthly averages of the four weekly test results must be compared to the monthly standard in the same way.
- iii. The inspector should verify that the equipment used for MTG is capable of 1/8-inch (1/8") measurement.
- iv. For a facility using MTG, the inspector should check for a copy of the last twelve (12) monthly reports of weekly stick readings and results and verify that the results of the test pass the threshold.
- v. Curative Measures

#41 – If the tank size is not appropriate for using MTG (see above table), the facility must utilize another form of release detection and must submit results to DEC.

#42 – If the MTG method is not being conducted correctly, it must either be conducted correctly and one month's records must be submitted to DEC, or a tightness test must be conducted and the results must be submitted to DEC. (A passing tightness test would indicate that MTG can safely be conducted.)

#43 – If the MTG equipment (i.e., gauging stick) is not capable of 1/8-inch (1/8") measurement, the facility must obtain new equipment and must begin properly conducting MTG.



- d. **Statistical Inventory Reconciliation [SIR]** (question 55)



NOTE: DEC does not recognize use of SIR as a standalone leak detection method. A second form of leak detection must be used to meet the leak detection requirement.

- i. The inspector should verify that the SIR method used by the facility is on the NWGLDE list.
- ii. For a facility using SIR, the inspector should check for the following:
 - A copy of the two most recent consecutive months and eight (8) of the last twelve (12) months of SIR results;
 - The reports should include documentation of monthly water checks;
 - Test reports do not indicate any potential reasons or possible solutions for any inconclusive results.

iii. Curative Measure

#55 – If the SIR method is not on the NWGLDE list, the facility must first conduct a tank tightness test. Another method of release detection must be utilized and results must be submitted to DEC.

2. **Interstitial Monitoring [double-walled tanks only]** (questions 13 and 51)

- i. Double-walled tanks may have either a dry or liquid-filled (i.e., brine) interstice. Monitoring requirements for double-walled tanks will depend on the type of interstice present.

For “dry” interstices, the inspector should have the operator demonstrate a check for the presence of water or product in the interstitial space. If the operator is using a manual method, he should demonstrate his procedure. If the operator is using an automatic method, he should demonstrate using the interstitial electronic monitoring console.

If product is found in a “dry” interstitial space, it can be presumed that the primary tank does not have integrity. If water is found in a “dry” interstitial space, there are two possibilities – the secondary containment may not have integrity or the water may be a result of surface runoff entering through a tank top sump.

For “wet” interstices, the inspector should have the operator demonstrate a check for a change in liquid level in the interstitial space. If the operator is using a manual method, he should demonstrate his procedure. If the operator is using an automatic method, he should demonstrate using the interstitial electronic monitoring console.

A primary tank can be presumed to not have integrity if there is a drop in the liquid level of a “wet” interstice with a simultaneous increase of liquid in the primary tank. If the liquid level changes in a “wet” interstice without a corresponding increase of liquid level in the primary tank, it is an indication that the secondary containment may not have integrity.

- ii. Due to the potential for complications resulting from the removal and re-installation of interstitial sensors, the inspector should *never* remove an interstitial sensor and should:

- Assume that the sensor in a tank's interstitial space is properly installed.
- Ensure that sensor checks are listed on the interstitial electronic monitoring report.
- Check for the presence of wires connecting the electronic monitoring console to the sensors.

iii. It should be noted that it may not be possible to manually monitor the interstice of some FRP tanks. In such cases, tanks should be equipped with wet (brine) or dry electronic interstitial monitoring. While it is technically possible to manually monitor a brine interstice, it is not common.

iv. Curative Measures

#13 – If the interstitial space on a double-walled tank is not being monitored for leaks, it must be.

#51 – If product is found in a tank's "dry" interstitial space (or if there is a drop of the liquid level in a "wet" interstice with a corresponding increase of liquid in the primary tank), a test for integrity must be conducted. If the interstice does not have integrity, the tank must either be repaired or permanently closed.

If water is found in a tank's "dry" interstitial space (or if there is a liquid level change in a "wet" interstice with no corresponding increase of liquid in the primary tank), a test for integrity must be conducted. If the interstice does not have integrity, the tank must be permanently closed.



3. Tank External Monitoring

The inspector must evaluate wells used for leak detection rather than other wells on-site, for example, product recovery or extraction wells. Monitoring wells used for release detection will be found within the tank backfill. If monitoring wells are contaminated, the inspector should recommend that the facility upgrade to a different release detection method. If product is present in a well, it must be reported to the NYS Spill Hotline (800-457-7362) within two (2) hours of discovery.

a. Groundwater Wells (questions 13, 47, 48, 50)

- If the owner claims groundwater wells as their method for leak detection, the inspector must review weekly monitoring records. Records must demonstrate that wells have been checked weekly, as well as the results of those checks. Records must be maintained on the premises for one (1) year.
- The inspector should verify that a monitoring well site assessment report exists and that it indicates that groundwater in the well(s) is never more than twenty (20) feet from ground surface. The inspector should also examine the well(s) for the presence of groundwater and have the operator demonstrate that it is twenty (20) feet or less from ground surface.

- iii. The inspector should verify that wells are properly positioned (i.e., according to the site assessment report) and that they appear to be functional. If the wells are contaminated, the inspector should recommend that the facility upgrade to a different release detection method.
- iv. The inspector should verify that monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.
- v. The inspector should ask the facility representative to demonstrate his groundwater monitoring method.
- vi. Curative Measures

#13 – If the facility is using monitoring wells for leak detection, and no records exist, monitoring must be conducted and a month of weekly monitoring reports must be submitted to DEC. As an alternative, the wells must be closed and another release detection method utilized.



#47 – If no site assessment report exists, a site assessment must be conducted and a report must be developed and submitted to DEC. As an alternative, the wells must be closed and another release detection method must be utilized.



#48 – If groundwater is not detectable in the monitoring wells, the wells must be closed and another release detection method must be utilized.



#50 – If groundwater wells are not properly designed or positioned, either new wells must be installed or another release detection method must be utilized.

b. Vapor Wells (questions 13, 47, 49, 50)

- i. If the owner claims vapor wells as their method for leak detection, the inspector must review weekly monitoring records. Records must demonstrate that wells have been checked weekly, as well as the results of those checks. Records must be maintained on the premises for one (1) year. If a significant increase in concentration above background vapor levels is present in a well, it must be reported to the NYS Spill Hotline (800-457-7362) within two (2) hours of discovery.
- ii. The inspector should verify that a monitoring well site assessment report exists and that it includes the location and number of vapor wells and background soil vapor levels, and indicates that a leak from the tank would be detectable within thirty (30) days.
- iii. The inspector should verify that the vapor well(s) is not affected by high groundwater. If a well is being affected by high groundwater, the inspector should answer “no” to inspection question #49.

- iv. The inspector should verify that wells are properly positioned (i.e., according to the site assessment report) and that the monitoring wells will detect releases within the excavation zone from any portion of the tank which routinely carries product.
- v. The inspector should verify that monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.
- vi. The inspector should ask the facility representative to demonstrate his vapor monitoring method.
- vii. Curative Measures

#13 – If the facility is using monitoring wells for leak detection, and no records exist, monitoring must be conducted and a month of weekly monitoring reports must be submitted to DEC. As an alternative, the wells must be closed and another release detection method utilized.



#47 – If no site assessment report exists, a site assessment must be conducted and a report must be developed and submitted to DEC. As an alternative, the wells must be closed and another release detection method must be utilized.



#49 – If vapor monitoring is affected by high groundwater, it is not a valid or effective release detection method and a new method must be utilized.



#50 – If vapor wells are not properly designed or positioned, either new wells must be installed or another release detection method must be utilized.

4. Piping Leak Detection Methods (questions 44-55)



a. Automatic Line Leak Detector [ALLD] (questions 53-54)

- i. EPA UST regulations (40 CFR 280.44(a)) require the use of an ALLD. NYS Fire Code 2206.7.7.1 clarifies that an electronic or mechanical in-line leak detector must be installed on the discharge side of the pump for remote pumping systems (i.e., pressurized product lines). The inspector must check to make sure that the ALLD is in place. EPA UST regulations require an annual functionality test of the ALLD. Electronic leak detectors require an annual system test. Both electronic and mechanical leak detectors require a leak to be simulated.

ii. Curative Measures

#53 – If the ALLD is not present on a pressurized line, it must be installed. If the ALLD is present but is not operational, it must be repaired or replaced.

#54 – If an annual functionality test of the ALLD has not been conducted, one needs to be conducted. If no records are present, an annual functionality test must be conducted and records must be submitted to DEC.

b. Line Testing (questions 44-46)

i. Since line test reports are not required to be submitted to DEC and are therefore not recorded in the UIS, the inspector may choose to obtain a copy of the report if line testing is used by the facility as a leak detection method. If reviewing line test reports in DEC's office, the inspector should look for the following items:

- Facility registration (PBS) number
- Date of test
- Tank ID number (same as on PBS registration)
- Test method is acceptable (i.e., on National Work Group on Leak Detection Evaluations [NWGLDE] list; found online at www.nwglde.org)
- Test method is conducted in accordance with manufacturer's instructions (i.e., NWGLDE protocol)
- Statement of technician's qualifications
- Technician's address, signature and certification number
- Test pass/fail conclusion, including applicable calculations.

ii. Curative Measures



#44 – If the line test used is not on the NWGLDE list, the line must be re-tested using an appropriate test method and results must be submitted to DEC.



#45 – If the line test has not been conducted according to manufacturer's instructions, the piping must be properly re-tested and a report must be submitted to DEC.



#46 – If line testing has not been conducted within the required time frame (1 or 3 years), a test must be conducted and a report must be submitted to DEC.



c. SIR (question 55)

Please refer to section D.1.d. above.

d. Interstitial Monitoring [double-walled piping only] (questions 13, 51-52)

- i.** The inspector should visually examine the tank top sump for integrity (i.e., no cracks, open seams, etc.). If the sump appears to not have integrity, proper piping release detection is not being conducted. **NOTE:** The tank top sump should also be considered to not have integrity when water is present.
- ii.** If the tank top sump is being manually monitored, the inspector should have the owner/operator demonstrate his inspection procedure and should also examine his inspection records.
- iii.** If the tank top sump is being electronically monitored, the inspector should check to see that the sensor is properly positioned, i.e., per the manufacturer's specification. (Note that to the greatest extent practicable, sensors should be positioned at the lowest point of the sump). The inspector should also ensure that sensor checks are listed on the electronic interstitial monitoring report.

iv. Curative Measures

#51 – If the double-walled piping does not have integrity, it must be replaced. If a tank top sump used for piping leak monitoring does not have integrity, it must either be repaired or replaced and documentation must be submitted to DEC.

#52 – If the sensor is not properly positioned in the tank top sump, it must be properly positioned and documentation must be submitted to DEC.

e. Groundwater/Vapor Wells (questions 13, 47-50)

Please refer to sections D.3.a. and D.3.b. above.

E. Release Detection Records (question 56)

EPA Significant Operational Compliance (SOC) measure clarifies that for each release detection method utilized, owners/operators can be considered to be in compliance if they have records for the two (2) most recent consecutive months and for eight (8) of the last twelve (12) months.

1. Tank Tightness Testing (TTT)

The inspector must review submitted TTT reports in the office prior to an inspection.

Curative Measure

#56 – If TTT has been conducted but no records have been maintained, or if inadequate records have been maintained, the facility owner must start maintaining records and must submit required documentation.

2. **Automatic Tank Gauge (ATG)**

a. **Static Leak Test**

The inspector must review the weekly ATG tank test reports.

Curative Measure

#56 – If static leak test records have not been maintained, or if inadequate records have been maintained, the facility owner must start maintaining records and must submit required documentation.

b. **Continuous In-tank Leak Detection System (CITLDS)**

The inspector must review the last four weeks of CITLDS test reports to verify that at least one test is being conducted per week. (**NOTE:** The owner must print and maintain the weekly CITLDS test reports or must maintain a log of weekly test results.)

Curative Measure

#56 – If CITLDS records have not been maintained, or if inadequate records have been maintained, the owner must submit test results for the next four weeks and must continue conducting weekly monitoring.



3. **Manual Tank Gauging (MTG)**

The inspector should review the last two months of MTG test results (both weekly tests and monthly calculations).

Curative Measure

#56 – MTG cannot be claimed as the method for leak detection at the facility if adequate records are not maintained. The facility owner must start performing MTG and maintaining records, and must submit required documentation.

If inadequate records have been maintained, the facility owner must start maintaining adequate records and must submit required documentation.



4. **Statistical Inventory Reconciliation (SIR)**

The inspector must review the last two months of SIR test results and determine if the records are adequate.

Curative Measure

#56 – SIR cannot be claimed as the method for leak detection at the facility if adequate records are not maintained. The facility owner must start maintaining records and must submit required documentation.

If inadequate records have been maintained, the facility owner must start maintaining records and must submit required documentation.

5. **Interstitial Monitoring**

The inspector should review the last two months of either manual logs or electronic interstitial monitoring to determine if the records are adequate.

The inspector should review records of monthly operability checks for electronic systems. For manual logs of electronic systems, the inspector should look for test date.

Curative Measure

#56 – Interstitial monitoring cannot be claimed as the method for leak detection at the facility if adequate records are not maintained. The facility owner must start maintaining records and must submit required documentation.

If inadequate records have been maintained, the facility owner must start maintaining records and must submit required documentation.

6. **Groundwater/Vapor Wells**

If the facility claims groundwater or vapor wells as leak detection, the inspector should review the last two months of weekly monitoring records to determine if they are adequate.

Curative Measure

#56 – Groundwater/vapor wells cannot be claimed as the method for leak detection at the facility if adequate records are not maintained. The owner must start maintaining records and must submit one month of weekly monitoring records.

If inadequate records have been maintained, the owner must submit one month of weekly monitoring records.

III. Inventory Monitoring

This section addresses questions 15 & 16 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to any underground storage tank and piping system, including federally-regulated USTs, except for the following:

- Tanks storing No. 5 or 6 fuel oil, or
- Tanks for which it can be demonstrated to DEC's satisfaction that it is technically impossible to perform inventory monitoring for the purpose of leak detection.

This section addresses compliance with inventory monitoring requirements for both metered and unmetered tank systems.

B. Regulatory Requirements

- Daily inventory records must be kept for all metered underground tank systems for the purpose of leak detection. [6 NYCRR 613.4(a)(1)]
- Records must include:
 - Tank bottom water level measurements;
 - Sales, use and deliveries;
 - On-hand inventory; and
 - Apparent daily losses or gains.
- Daily inventory records must be properly reconciled every ten (10) days. [ECL 17-1007]
- All inventory discrepancies must be investigated. If discrepancies cannot be explained within forty-eight (48) hours, a spill must be reported to the NYS Spill Hotline (800-457-7362), and the tank must be taken out of service until the cause is determined and corrective action can be taken. [6 NYCRR 613.4(d)]
- If a tank is unmetered or contains petroleum for consumptive on-premises use, an alternative to inventory monitoring may be used (e.g., annual tightness testing). [6 NYCRR 613.4(a)(2)]
- Inventory records must be maintained for at least five (5) years. [6 NYCRR 613.4(c)(1)]

C. Metered Tanks

Daily inventory records must reflect the amount of product in the tank system, as well as the amount of product delivered and dispensed. Daily tank water bottom measurements must also be recorded. If no water is found in a tank, a zero reading must be recorded. Daily losses or gains must be reconciled every ten (10) days to determine the overall loss or gain of product (discrepancy) from a UST system. A calculation must also be performed to determine the allowable variance threshold in any given set of 10-day records. The allowable variance is calculated as three-quarters of one percent (0.0075) of

the largest of either: a) the tank volume, b) the amount of product delivered, or c) the amount of product dispensed. The absolute value of the discrepancy must be compared to the allowable variance to determine whether any further investigation is required. Additionally, operators must look for any recurring accumulation of water in USTs.

Inventory records must be maintained for five years. While the regulations do not specify where the records must be stored, it is recommended that an operator maintain the three most recent 10-day records on-site, at a minimum. Thirty days of records will usually provide a good assessment of the operator's ability to properly conduct inventory reconciliation. If no inventory records are present on-site, operators should be required to submit the last three to six sets of 10-day records to DEC (inspector's discretion). If no records exist, operators must submit the next three sets of 10-day records after the inspection. (NOTE: Inventory records do not necessarily have to be maintained on a form provided by DEC.) Electronic records are acceptable, but they must show that daily records have been reconciled every ten (10) days, and the records must address all the requirements of Section 613.4.



Copies of inventory records can be obtained from the facility and analyzed in the office. The inspector does not always have to make a compliance determination in the field.

1. Common Issues

a. Product Level Measurements

Regardless of the method of data collection (i.e., electronic gauging or manually sticking the tank), it is essential that the operator obtain accurate daily product level measurements. If using an electronic system, the operator must ensure that it is set up to measure to at least the nearest tenth of an inch (0.10"). To simplify data collection, the operator should use the volumetric measurement (gallons) provided by the electronic console. Manual stick readings should be taken to the nearest one-eighth inch (1/8"). Gauging sticks must be in good shape (ends intact with plastic tip, legible markings, etc.) and should be able to measure to the nearest 1/8". Product level data should be obtained when no dispensing is occurring. Usage (totalizer) readings must be obtained at the same time that product level measurements are obtained.

Readings are not taken to the nearest 1/8" – This type of error is usually found when an operator is manually gauging the tank. Typically, any given set of 10-day records should have about half of the readings in 1/8" (1/8, 3/8, 5/8, 7/8) increments.

Calibration – Product dispenser meters at retail facilities must be calibrated. This can be verified by checking the dispensers for a Bureau of Weights and Measures sticker (Department of Consumer Affairs [DCA] sticker in NYC). Dispensers at non-retail facilities are not required to be calibrated, but it is strongly recommended that they be so in order for inventory monitoring to be properly conducted.

Temperature – Product level errors can occur when the temperature of the product in a delivery tanker is significantly different from the temperature of product in the receiving tank. In order to minimize these types of errors, operators should use stick readings (either manual or electronic) to calculate the amount delivered rather than delivery ticket figures, when conducting inventory monitoring.

b. Calculations

When reviewing inventory monitoring records, the inspector should spot-check for errors in the arithmetic and confirm that proper calculations are being used to determine allowable variances. Contributing factors for such errors are:

Invalid tank chart – If manual stick readings are being taken, a proper tank chart must be used. Many tank charts only read to the nearest one-half inch (1/2”). If a tank chart does not read in 1/8” increments, the operator must still take stick readings at that level of accuracy and then interpolate the tank chart to obtain the correct volume figure. The inspector should spot-check records to ensure that proper interpolation has been conducted.



Most tank manufacturers make proper tanks charts available (1/8” increments) and may have custom tank charts to compensate for tank tilt. Operators should contact their tank manufacturer to obtain such charts.

Blending – Many gas stations blend high and low octane at the dispenser to achieve mid-grade. If inventory records show a steady gain in one grade and a loss in another, either the blending formula (% low-grade vs. % high-grade) or the blending unit beneath the dispenser may be the cause of the discrepancy. The inspector should compare the records for high and low octane to find off-setting losses and gains.

Arithmetic – These types of errors are fairly common with operators who manually perform inventory reconciliation. The inspector should spot-check records to ensure that proper arithmetic calculations have been performed.

Other – The inspector should check for readings or calculations that appear to be fabricated, for example, stick readings that occur more than once but correspond to different product volumes.

c. Proper Reconciliation

Time frame – Inventory records in New York must be reconciled every ten (10) days, regardless of the length of the month. Ten-day periods may extend from one month to the next. Rolling 10-day periods are also acceptable. The inspector should verify that each reconciliation time period is for ten calendar days. Federal regulations require that inventory records be reconciled on a 30-day basis. Many operators reconcile on a weekly basis while others split each month into three 10-day periods – days 1-10, 11-20, and 21-



28 to 31. In the case of the last period of the month, a rolling 10-day period would overlap months.



Operators who are in compliance with State inventory monitoring requirements (10-day reconciliation) are also in compliance with federal inventory monitoring requirements (monthly reconciliation).

NOTE: DEC may issue an enforcement discretion memo which will allow for inventory monitoring at facilities not engaged in the resale of petroleum to be conducted on a less than every calendar-day basis, given certain express conditions.

Manifold tanks – Tanks that are manifolded together or have manifolded product piping must be treated as one tank system. Inventory records must account for product levels in all inter-connected tanks.

Compartmented tanks – Tanks that are split into multiple compartments must be treated as individual tanks. Inventory records must be maintained as if each compartment is a separate tank.

Blending – For facilities that blend product (i.e., regular and premium unleaded gasoline blended to produce mid-grade gasoline), inventory reconciliation must be conducted for each tank separately.

Exceedance – The inspector should examine a minimum of three sets of 10-day records for each tank to look for an exceedance of the largest of the allowable variances. If exceedances are not discovered in three sets of records, the inspector may choose to keep looking to ensure that any exceedance has been properly investigated. If exceedances are discovered, the inspector should examine those records to see if there are any trends (toward loss or gain).

d. Discrepancy (Exceedance) Investigations

The inspector should closely examine records for any 10-day period with an exceedance. Operators *must* maintain a written record of any investigations and subsequent determination of cause.

The first step in investigating a discrepancy should be to check arithmetic. An operator must ensure that readings were properly taken and recorded. If all the readings and math appear to be correct, the operator must then visually check for leaks. A visual inspection must include all accessible parts of a tank system, including piping and dispenser units. If the investigation does not reveal a cause for the discrepancy, DEC may require the owner/operator to conduct a tank and/or line test. ***If there is an uninvestigated or unexplained exceedance for any reason, it is considered a violation.***

The inspector should recognize several factors which can lead to inventory discrepancies.

Temperature – Product levels in tanks will change as ground temperature fluctuates. Product will expand when it is warmer and contract when it is cooler, thereby changing its volume in the tank. This phenomenon will occur near the time of the deliveries. The inspector should pay particular attention to recorded inventory between deliveries.

Blending – If one tank consistently shows a loss or gain of product while another shows a consistent off-setting of that lost or gained volume (see previous discussion of blending), it is considered a violation because it is an uninvestigated exceedance.

Tank tilt – Tanks are almost never placed in the ground perfectly level. If the owner/operator asserts that an inventory discrepancy is due to tank tilt, the inspector should review records for a longer time period to verify the explanation. The operator should subsequently obtain a new tank chart (from a tank contractor) that addresses the tank tilt.

Tank flexion – Single-wall FRP tanks flex when product is delivered. (Double-walled FRP tanks also flex, but not nearly as much.) Due to this factor, discrepancies may be evident on inventory records for multiple days after a delivery. In order for this to be cited as a valid cause for discrepancies, enough inventory data will need to exist to show a recovery in product level.

Calibration – Like any other gauge, electronic monitoring systems need to be calibrated in order to function properly. Dispensing meters may also go out of calibration, leading to incorrect readings of volume dispensed. Consistent losses or gains can be indicative of meters being out of calibration.

Delivery/receipt errors – Improper deliveries (over, short, or cross-deliveries [delivery of product to the wrong tank]) will appear on inventory records as a substantial loss or gain on the day of the delivery. Where an investigation is warranted, the operator should check delivery receipts for stick readings both before and after the delivery.

2. Curative Measures

#15.1, 15.2, 15.5, 15.6 – The operator must submit the next three sets of properly reconciled and investigated 10-day records after the inspection, showing no discrepancies (or having appropriately investigated any discrepancies). If there is no operable leak detection for a tank system and/or no inventory records have been maintained, DEC may order the operator to also conduct a tank system tightness test.

#15.3, 15.4 – The operator must submit documentation that he has obtained the appropriate gauging equipment or has had the meter calibrated.

#15.7 – The operator must first ensure that appropriate leak detection measures are in place. If the tank system does not have leak detection, the inspector should require the UST system to be tested and documentation submitted to DEC. If there is leak detection and there is no evidence of a problem based on current inventory records, the inspector should advise the operator that further exceedances must be investigated.

D. Metered Tanks – Consumptive Use On-Premises

Operators with metered tanks that contain product for consumptive use on-premises have the option of conducting 10-day inventory monitoring or using one of the alternative methods listed below.

E. Unmetered Tanks

Operators with unmetered tanks must use an alternative form of inventory monitoring. This can take the form of an annual standpipe analysis, annual tightness test, or some other method acceptable to DEC.

1. Single-wall USTs

For unmetered tanks installed prior to December 27, 1986, there are a few alternative inventory monitoring options available. One option is to conduct an annual standpipe analysis. This method of testing is only valid for tanks with capacities less than 3000 gallons. (For tanks with capacities greater than 3000 gallons, another option must be used.) Because this is an overfill test method (greatly increasing the potential for a spill), ***it is not recommended that a standpipe test be used to meet the requirements of 6 NYCRR 613.4(a)(2).***

Another method of alternative inventory monitoring for unmetered tanks is an annual tightness test. This is, by far, the most commonly selected option for meeting the requirements of 6 NYCRR 613.4(a)(2).

For tanks that are only used during the heating season, an alternative inventory monitoring method is to manually monitor the level of product in the tank in the off-season. The only caveat is that the tank must contain product to its normal high-fill level. The tank must then be gauged once a week for a minimum of four consecutive weeks, and records to that effect must be maintained. Because the product in the tank is not being consumed, the product level should be constant. A variance of $\pm 1/2$ " during the four weeks would be considered acceptable.

Manual tank gauging (MTG) is a fourth alternative inventory monitoring method for unmetered tanks. For more information on MTG, please refer to Chapter II (Release Detection). Automatic tank gauging (ATG) is yet another alternative inventory monitoring method.

2. Double-walled USTs

For unmetered tanks installed after December 27, 1986, the tank system must meet standards for new construction, including secondary containment and leak monitoring. The tank leak monitoring system will indicate whether any problems exist with the tank. (Vapor or groundwater monitoring is not acceptable for this purpose.) The piping system may need to be checked for leaks, depending on the type of system. NOTE: Heating oil tank systems (i.e., tank and piping) that were not installed in conformance with 6 NYCRR Part 614 must be brought into compliance with 6 NYCRR 614 or permanently closed.

a. Pressurized/Gravity Piping

Acceptable alternatives to inventory monitoring include weekly interstitial monitoring (for double-walled pipe) or annual line testing. This also applies to pressurized feed and return lines connected to boilers.

b. Suction Piping

Suction piping is exempt from inventory monitoring requirements if a check valve is located at the end-use point. If the check valve is located at the tank top, inventory monitoring must be conducted in the same manner as for pressurized piping.

3. Curative Measure

#16 – If no inventory monitoring is being conducted (and no alternative is being used), the tank system must be tightness tested and documentation must be submitted to DEC. An acceptable method of leak detection must subsequently be implemented to meet the inventory monitoring requirement. If the alternative inventory monitoring method indicates a potential problem, it must be reported to the NYS Spill Hotline (800-457-7362) as a possible release. Follow-up investigation may include an acceptable tightness test (as identified in Chapter II of this document) and/or a sub-surface investigation.

IV. Corrosion Protection – Records Review

This section addresses questions 12.1, 12.5, 14 and 33-37 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to any State-regulated steel UST system with cathodic protection (CP) that is not subject to tightness testing (per 6 NYCRR 613.5(a)(2)). This section is also applicable to federally-regulated steel UST systems with CP and/or internal lining.

Underground tanks can be constructed of steel, fiberglass or steel clad/jacketed with a non-corrodible material (e.g., FRP, urethane, HDPE). Underground piping can be constructed of steel/galvanized steel, copper, FRP or other non-corrodible thermoplastics. Tanks and/or piping systems that have metal in direct contact with soil require CP. (NOTE: Copper⁵ and steel/galvanized steel are not inherently corrosion-resistant and therefore do require CP.)

B. Regulatory Requirements

- Cathodic protection systems must be evaluated annually. If a CP system fails, protection must be restored within thirty (30) days. Any tank or pipe with a CP system that has not been restored will be considered unprotected and must be tightness tested within one (1) year of discovery of the CP failure and every five (5) years thereafter. [6 NYCRR 613.5(b)(2)]
- Monitoring records for CP systems must be maintained at the facility for at least one (1) year. [6 NYCRR 613.5(b)(4)]
- Tanks installed after December 27, 1986 must be corrosion resistant. [6 NYCRR 614.3(d), (e) and (f)]
- Underground piping systems installed after December 27, 1986 must be corrosion resistant. [6 NYCRR 614.14(a)]
- Owners are required to keep a copy of the manufacturer’s guarantee for a tank interior lining for the life of the tank. [6 NYCRR 614.6(a)]
- All CP systems must continuously provide protection to the portion of the tank and piping that routinely contains product. [40 CFR 280.31(a)]
- A qualified CP tester⁶ must evaluate the CP system on a federally-regulated UST within the first six (6) months after installation and every three (3) years thereafter. [40 CFR 280.31(b)] NOTE: The NYS requirement for annual evaluation of CP



⁵ Empirical evidence has shown that copper piping in direct contact with concrete is especially an issue, and it therefore must be isolated or cathodically protected.

⁶ A “qualified CP tester” is a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. At a minimum, such persons must have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems. [40 CFR 280.12]



systems meets the three-year federal evaluation requirement, if the testing has been conducted by a qualified CP tester.

- Impressed current systems must be checked for operability every sixty (60) days. [40 CFR 280.31(c)]
- EPA-regulated USTs that have been upgraded with an internal lining must have the lining inspected within ten (10) years of installation and every five (5) years thereafter [40 CFR 280.21(b)(1)(ii)].

C. CP – Galvanic (Sacrificial Anode) Systems

A galvanic CP system consists of sacrificial anodes affixed to the UST during manufacturing and provides dedicated wiring for an inspection station installed near the surface of the ground. (This also includes fiberglass-coated steel tanks (e.g., ACT-100) that are installed with CP.) Galvanic systems have limited life spans during which the sacrificial anode will continue to degrade as it protects the tank or piping. When the anode is no longer capable of protecting the tank or piping, the tank or piping will start to corrode.

Tank systems that were installed unprotected and have been retrofitted with CP are not recognized by the State as corrosion resistant and must be periodically tightness tested. In such cases, annual CP monitoring is recommended but is not required for compliance with NYS law. Federally-regulated USTs are considered corrosion resistant if the tank or piping has been installed or retrofitted with a CP system, which must be monitored every three (3) years with records maintained.

1. CP Survey Report Details

Note that the annual CP survey does not have to be performed by a certified CP tester. The CP survey report must contain the following items:

- Test date, PBS #, tank registration ID #, facility address;
- A site diagram with testing locations properly marked;
- Tester's name, signature, qualifications⁷ and contact information;
- A description of weather at the time the test was conducted;
- A description of soil conditions;
- A report on structure-to-soil potential on all protected tanks, piping and flex connectors;
- A report on the electrical continuity of the system (tanks, product lines, flex connectors, vent lines, conduits and other tank system equipment); and
- A written statement on the operating status of the CP system, any recommendations and any repairs conducted within the past year.

⁷ Adequate qualifications include formal training (i.e., NACE, STI, or other nationally recognized cathodic protection certification programs) or equivalent training and experience acceptable to DEC.

a. DEC Requirements

An annual report as detailed above is required by the State.

b. EPA Requirements

Galvanic systems must be inspected within six (6) months of installation and every three (3) years thereafter. The report should contain the details noted above.



2. Determining the Adequacy of the Annual Report

- The structure-to-soil potential must be evaluated for all protected tanks, piping and flex connectors. The goal is to test the entire system, but in most cases a minimum of three (3) readings per tank (one at each end of the tank along its center line, and a third in the middle of the tank) is sufficient for this test. A minimum of one reading per piping run and one reading for every flex connector not isolated from contact with the soil is also required. Depending on the size of the tank, more test points may be necessary.
- Electrical continuity of the system (tanks, product lines, flex connectors, vent lines, conduits and other tank system equipment) must be evaluated to ensure that the tank system is properly electrically isolated from all other structures.
- All valid CP readings⁸ must be included in the annual report.
- To be considered as providing adequate cathodic protection, the system must be able to achieve a minimum protection of -850mV; any reading less negative than -850mV must be investigated, repaired and/or re-evaluated as necessary.
- All CP tests shall be conducted in accordance with NACE Standard RP0285, RP0169, or another nationally recognized CP standard.
- CP tests must not be performed on frozen soil or through a concrete or asphalt pad.
- All physical changes that have been made to the site or to the CP system since installation that could impact CP monitoring must be clearly noted and taken into consideration.

3. Curative Measures

#12.1 – If a bare steel tank was installed after December 27, 1986, it must be permanently closed in accordance with 6 NYCRR 613.9.

#12.5 – If bare steel piping was installed after December 27, 1986, it must be replaced. Alternatively, the tank system must be permanently closed in accordance with 6 NYCRR 613.9.

⁸ Valid CP readings meaningfully represent site conditions. Refer to NACE Standard TM0101-2001 (*Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Tank Systems*) for further clarification on valid CP readings.

#14.1, 14.2 (including failure to monitor CP on either the tank or piping) – If a cathodically protected tank/pipe has not been tested annually, the owner must conduct a test of the CP system and must submit the necessary documentation. If the CP system is determined to be providing adequate protection, the tank/pipe is considered to have been continuously protected. If the CP system is determined to not be providing adequate protection, the inspector shall direct the owner to retain a contractor to evaluate whether the tank system has enough structural integrity for the CP system to be repaired or the tank system must be permanently closed. Results of the evaluation must be submitted to DEC for assessment and subsequent direction to the owner.

#14.3 – If the CP system has been tested and monitored as required, but records are not available at the time of inspection, the owner is required to submit copies of the test reports to DEC. If copies of test reports are not available, the owner must have the CP system re-tested and documentation must be submitted to DEC.

#14.4 – In the vast majority of cases where annual CP monitoring has been performed but indicates that the system has failed, the following will apply.

If the CP system on a UST installed prior to December 27, 1986 fails, the CP system must be repaired within thirty (30) days of an indication of CP system failure (i.e., failed CP test report). If the CP system does not have a passing test result within the last twelve (12) months, the inspector shall direct the owner to retain a contractor to evaluate whether the tank system has enough structural integrity for the CP system to be repaired or the tank system must be permanently closed. If the CP system is not repaired, the tank system must be tightness tested within one (1) year of discovery of the failure and every five (5) years thereafter.

If the CP system on a UST installed after December 27, 1986 fails, the CP system must be repaired within thirty (30) days of an indication of CP system failure (i.e., failed CP test report), or the tank must be temporarily closed until the CP system is repaired. If the CP system does not have a passing test result within the last twelve (12) months, the inspector shall direct the owner to retain a contractor to evaluate whether the tank system has enough structural integrity for the CP system to be repaired or the tank system must be permanently closed.

NOTE: CP system repairs must be accomplished within thirty (30) days of indication of system failure. If the system is not repaired within thirty (30) days, it is a violation. For situations in which a CP system fails and documentation shows that it had been properly monitored annually, if the CP system is restored as soon as is practicable (i.e., not to exceed one hundred twenty (120) days), the tank system will not need to be periodically tightness tested.

#14.5 – If adequate CP monitoring has not been performed, the owner must conduct another CP test on the tank/piping and must submit the results to DEC.



#32 – If a cathodically protected tank or its piping was structurally repaired, and the CP system was not tested/inspected within six (6) months of the repair, the CP system must be tested and a report documenting that the system is providing adequate protection must be submitted to DEC.



#33.1 – If buried metal piping components (such as swing joints, flex-connectors, siphon lines for manifold tank system, etc.) are not isolated from the ground or cathodically protected, the components must be isolated or replaced and documentation must be submitted to DEC. The inspector shall direct the owner to retain a contractor to evaluate whether the piping components can be isolated or whether they must be replaced.



#33.2 – For a tank or piping that does not meet new tank/piping standards for corrosion, the tank/piping must be upgraded to meet the current acceptable corrosion protection standards. (**NOTE:** The curative measure for inspection question 12.1 above may preclude a corrosion protection upgrade.) A proposal to conduct the upgrade must be submitted to DEC at least thirty (30) days before installation.



#33.3 – If a steel tank has not been internally lined, or if a metal tank or piping has not been previously retrofitted with CP, the tank or piping must be permanently closed.



#34.1 – If the CP system has not been tested within the required time frame, the CP system must be tested and the report documenting that the system is providing adequate protection must be submitted to DEC.



#34.2 – If the CP system installed on a UST does not provide adequate protection or fails, the CP system must be repaired or replaced within thirty (30) days of failure or the tank must be temporarily closed until the CP system is repaired or replaced.



#34.3 – For any cathodically-protected steel UST system installed after 12/27/1986, except those regulated by DEC prior to 7/21/2008 and installed between 12/27/1986 and 7/21/2008, refer to curative measures for inspection question #14 above. For all other cathodically-protected steel UST systems, if a CP system fails and the owner is not conducting or has not completed appropriate repairs, he or she must investigate the failure and either repair or replace the CP system.

D. CP – Impressed Current Systems

An impressed current CP system usually provides electrodes with a much longer life span than a galvanic system. This type of system includes a rectifier that converts the alternating current power source to direct current, which is properly calibrated to provide the required protection. Since power is delivered to the electrode and is not generated by the degradation of the electrode, the power supply may be recalibrated to provide additional power when needed, as long as the electrodes are still functional.

Tank systems that were installed unprotected and have been retrofitted with CP are not recognized by the State as corrosion resistant and must be tightness tested. In such cases,

annual CP monitoring is recommended but is not required. Federally-regulated USTs are considered corrosion resistant if the tank or piping has been installed or retrofitted with a CP system.

1. CP Survey Report Details

An annual as well as a 60-day report is required for impressed current systems. The CP survey report must contain the same items as noted in section C.1 above. In addition, it must also contain a report on the structure-to-soil potential for rectifier instant-off readings.

2. Determining the Adequacy of the Annual Report

- The structure-to-soil potential must be evaluated for all protected tanks, piping and flex connectors. The goal is to test the entire system, but in most cases a minimum of three (3) readings per tank (one at each end of the tank along its center line, and a third in the middle of the tank) is sufficient for this test. A minimum of one reading per piping run and one reading for every flex connector not isolated from contact with the soil is also required. Depending on the size of the tank, more test points may be necessary.
- Electrical continuity of the system (tanks, product lines, flex connectors, vent lines, conduits and other tank system equipment) must be evaluated to ensure that all structures in the system are electrically connected.
- The structure-to-soil potential for rectifier instant-off readings must be evaluated. For polarization readings not meeting the -850 mV requirement, a report on 100 mV polarization decay is required.
- A written statement on the operating status of the CP system, the tester's recommendations, and any repairs conducted within the past year must be included.
- All CP tests shall be conducted in accordance with NACE Standard RP0285, RP0169, or another nationally recognized CP standard.



3. 60-day Report (federally-regulated USTs only)

This report is for impressed current systems only and is simply documentation that the owner/operator has inspected their system for operability every sixty (60) days. The inspection includes rectifier readings (voltage, amperage) and bonding cable connections. The required documentation must include comments and notes on problems or required repairs. The federal regulations require that the three (3) most recent inspection reports must be available at the site. 6 NYCRR 613.5(b)(4) requires that cathodic protection monitoring records be maintained on-premises for at least one year, but it is recommended that all reports be maintained indefinitely. The amperage variance of the 60-day test result must not be more than twenty percent (20%) when compared to the baseline⁹ reading of the annual survey.

⁹ The baseline is the amount of amperage required to protect the system from corrosion. This is usually determined by a qualified technician during the annual CP survey.

4. Curative Measures

#14.4 – If the CP system on a UST installed prior to December 27, 1986 fails, the CP system must be repaired within thirty (30) days of an indication of CP system failure (i.e., non-operational rectifier). If the CP system does not have a passing test result within the last twelve (12) months, the inspector shall direct the owner to retain a contractor to evaluate whether the tank system has enough structural integrity for the CP system to be repaired or the tank system must be permanently closed. If a repair is deemed appropriate and the CP system is not repaired, the tank system must be tightness tested within one (1) year of discovery of the failure and every five (5) years thereafter.

If the CP system on a UST installed after December 27, 1986 fails, the CP system must be repaired within thirty (30) days of an indication of CP system failure (i.e., non-operational rectifier), or the tank must be temporarily closed until the CP system is repaired. If the CP system does not have a passing test result within the last twelve (12) months, the inspector shall direct the owner to retain a contractor to evaluate whether the tank system has enough structural integrity for the CP system to be repaired or the tank system must be permanently closed.

NOTE: CP system repairs must be accomplished within thirty (30) days of indication of system failure. If the system is not repaired within thirty (30) days, it is a violation. For situations in which a CP system fails and documentation shows that it had been properly monitored annually, if the CP system is restored as soon as is practicable (not to exceed one hundred twenty (120) days), the tank system will not need to be periodically tightness tested.



#35.1, 35.3 – If the inspector determines that the CP system has not been operated continuously either because the rectifier is not operational or the clock indicates that power has been turned off, the owner must investigate the situation and repair or replace the rectifier. If the CP system does not have a passing test result within the last twelve (12) months, the inspector shall direct the owner to retain a contractor to evaluate whether the CP system can be repaired or the tank system must be permanently closed.



#35.2 – If the inspector determines that the rectifier does have continuous electrical power, the owner must ensure that the rectifier remains continuously supplied with power, or must install an alternative method of corrosion protection. If the CP system does not have a passing test result within the last twelve (12) months, the inspector shall direct the owner to retain a contractor to evaluate whether the CP system can be repaired or the tank system must be permanently closed.



#36 – If the impressed current system has not been inspected every sixty (60) days or there are less than three (3) 60-day reports on-site, the owner must inspect the CP system within fourteen (14) days of DEC's inspection and every sixty (60) days thereafter, and must submit two (2) of three (3) consecutive inspection reports.

E. Corrosion Protection – Internal Tank Lining

An underground steel tank may be reconditioned by using a compatible interior coating (lining) installed under the direction of the lining manufacturer or a certified representative. *The lining must be compatible with any material stored in the tank.* The manufacturer or representative must guarantee the owner in writing that the coating will not fail, crack, separate, or deteriorate and that the tank will not leak for a period of ten (10) years. EPA-regulated USTs are considered corrosion resistant if the tank has been upgraded with an internal lining. Such tanks must have the lining inspected within ten (10) years of installation and every five (5) years thereafter. The lining inspection report must contain the following items:

- Test date, PBS #, tank registration ID #, facility address;
- Tester's name, signature, qualifications¹⁰ and contact information;
- Site diagram;
- Liner manufacturer's written guarantee; and
- The 10-year or 5-year inspection report, recommendations, and/or required repairs.

1. Determining the Adequacy of the Report

Most lining inspection results are pass/fail. It is very difficult to estimate the expected useful life of an internal liner. In most instances, the lining inspector can only determine the liner condition at the time of inspection. He may not be able to predict the remaining useful life of the liner with a high level of accuracy.

In order for a liner to be considered as having “passed inspection,” it must have the following properties:

- Properly bonded to the tank;
- No “holidays” (i.e., discontinuities in the liner);
- Continues to meet hardness requirements; and
- Has a dry film thickness of 100 mils or greater.

For the 10-year and subsequent 5-year inspections the lining must be either visually inspected or inspected using a procedure acceptable to EPA. Acceptable procedures include the use of video camera inspection techniques that have been evaluated in the Ken Wilcox Associates publication “*Recommended Practice for Inspecting Buried Lined Steel Tanks Using a Video Camera.*”

At a minimum, the liner should have a dry film thickness of 100 mils or greater. Where possible, a liner hardness test should be performed using a Barcol hardness tester or other acceptable instrument to determine that the lining has maintained a hardness that meets

¹⁰ Adequate qualifications include formal training, (e.g., National Leak Prevention Association 631 or other nationally recognized lining certification programs) or equivalent experience acceptable to DEC.

manufacturer specifications. An internal inspection of the surface continuity of the tank's interior should be performed using a holiday detector with a silicon brush electrode. A tank tightness test may also be performed as part of the final evaluation.

2. Curative Measures (EPA)



#37.1 – If internally lined tanks fail a liner inspection, the owner must render the tank temporarily out-of-service and repair the liner, or permanently close the tank.



#37.2 – If internally lined tanks are inspected but the inspection procedure is inadequate or otherwise unacceptable to DEC, the owner must propose an acceptable inspection procedure and must re-inspect the tank.

V. Facility Information – Physical Inspection

This section addresses questions 3, 5-8, 12.7, 15.4 and 57 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section applies to all underground tanks at PBS facilities.

B. Regulatory Requirements

- All PBS tanks at a facility must be registered. [6 NYCRR 612.2(a)(1)]
- Monitoring wells must be marked [6 NYCRR 613.3(b)(4)] and secured [40 CFR 280.43(e)(7) and 40 CFR 280.43(f)(8)].
- Out-of-service tanks must be properly closed. [6 NYCRR 613.9]
- The discharge of petroleum is prohibited. [Nav. Law 12-173.1]
- Any person with knowledge of a spill is required to report it to DEC within two (2) hours of discovery. [6 NYCRR 613.8]
- Pressurized motor fuel dispensers must be equipped with shear valves. [6 NYCRR 613.3(c)(1)]
- Suction piping systems cannot be equipped with more than one check valve. [6 NYCRR 614.14(g)(4)]
- Closure site assessments must be performed for federally-regulated USTs. [40 CFR 280.72]



C. Monitoring Wells

All monitoring wells at a facility must be marked and secured to prevent delivery of product to the wells. If a facility claims monitoring wells as a leak detection method on its PBS registration, those wells must be checked weekly and a log must be maintained. The inspector should have the facility operator check those wells for the presence of product. All spills must be reported to the NYS Spill Hotline at 800-457-7362.

Curative Measure

#3 – If monitoring/observation wells are not marked and secured, the owner must ensure that they are made so and must submit documentation to DEC.

D. Unregistered Tanks

All PBS tanks at a facility must be registered. Often, unregistered tanks storing heating oil, lube oil or waste oil are discovered during an inspection. (Sometimes, these tanks will store products regulated under the CBS program. In these cases, the inspector should verify that the tank is registered under CBS.) The inspector should ascertain whether all petroleum tanks at a facility that need to be registered are in fact properly registered. If they are not, the facility owner must submit a modified PBS registration application.

E. Properly Closed Tanks

The inspector should determine whether tanks that are no longer in use at a facility have been properly closed. For temporarily out-of-service tanks, product must be removed from the tank and piping system to the lowest draw-off point. Temporarily out-of-service (TOS) tanks must also be protected from flotation. Fill lines, gauge openings, or pump lines must be capped or plugged to prevent unauthorized use or tampering. Note that TOS tanks are subject to **all** requirements of 6 NYCRR Parts 612 and 613 (e.g., registration, inventory monitoring and leak detection requirements).

Tanks that are out-of-service for thirty (30) days or more but are not permanently closed are considered to be TOS and must either meet all of the above requirements or be permanently closed. The NYS Fire Code states in 3404.2.13.1.3 that all tanks that have been TOS for over a year at a non-operating facility must be permanently closed. If, in the course of an inspection, the inspector encounters a tank that has been TOS for over a year at a non-operating facility, it should be considered as not properly permanently closed.

For tanks permanently closed in-place, liquid and sludge must be removed from the tank and any connecting lines and the tank must be rendered free of petroleum vapors. Connecting lines must be emptied, disconnected or removed, or securely capped or plugged. Underground tanks must be completely filled with a solid, inert material (e.g., sand or concrete slurry). Note that all voids within the tank must be filled.

NOTE: If it is not apparent from the FIR that closed in-place tanks are on-site, the inspector should look for abandoned vent pipes and other unexplained piping. Physical areas that are similar to tank pads also provide evidence of tanks.

Curative Measures

#6 – If a tank is not properly permanently closed, the owner must do so and must submit documentation to DEC.

#7 – If a tank is not properly temporarily closed, the owner must do so and must submit documentation to DEC.

#57 – If no site assessment was performed for tanks permanently closed within the last three (3) years (only required for federally-regulated USTs), the owner must have one performed and must submit documentation to DEC.



F. Unreported Spills

Per Section 1.1 of the *DEC Spill Guidance Manual*¹¹, a spill is reportable unless it meets **all** of the following conditions:

- The spill is known to be less than five (5) gallons;

¹¹ The *DEC Spill Guidance Manual* can be found online at <http://www.dec.ny.gov/regulations/2634.html>.

- The spill is contained and under the control of the spiller;
- It has not impacted and will not reach the lands or waters (including groundwater) of the State; and
- It is cleaned up within two (2) hours of discovery.

Product in a spill bucket (unless it meets the above four conditions) is considered reportable because it is outside of its normal containment (i.e., the tank) and the integrity of the spill bucket may not be known. (If the inspector discovers product in a spill bucket, he should ask the facility operator when the last delivery occurred in order to determine if it is more than two (2) hours-old.) Any obvious environmental impacts, such as gross staining, dead vegetation, etc. is also considered reportable.

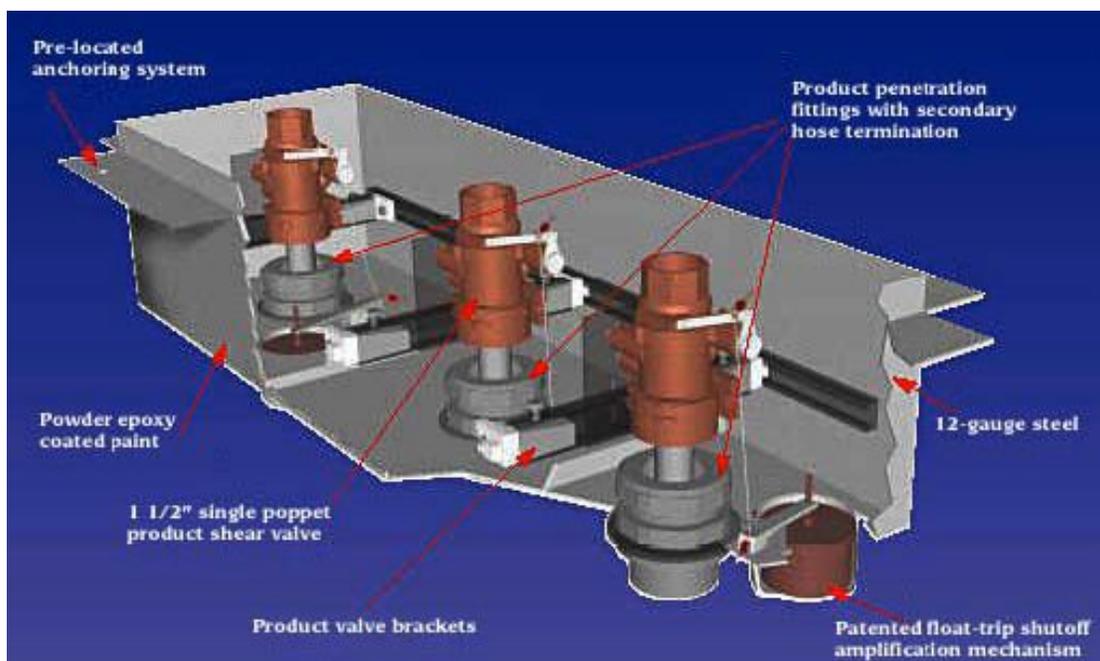
Curative Measure

#8 – All non-emergency spills discovered during an inspection (whether by a facility representative, DEC contractor or DEC inspector) may be categorized under one Spill Number. All spills must be reported to the NYS Spill Hotline at 800-457-7362.

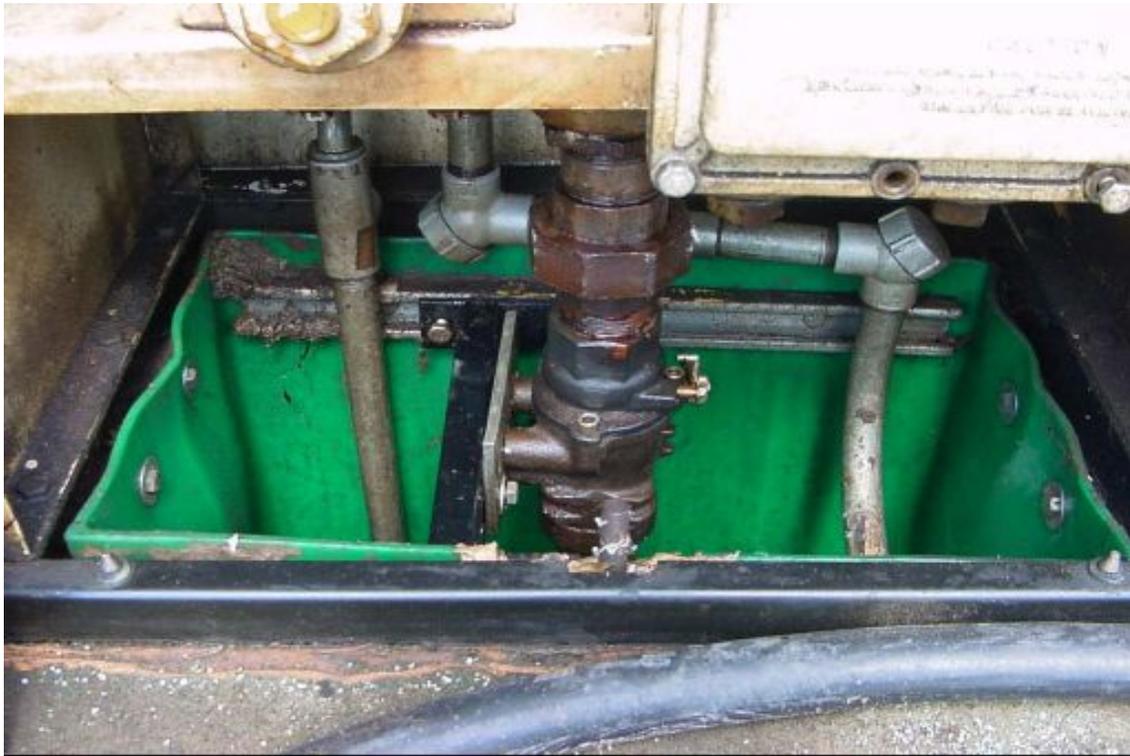
G. Dispensers

1. Shear Valves

Shear valves (pressurized piping only) must be rigidly affixed to the concrete form underneath a dispenser. They must not be tampered with or otherwise rendered inoperative (wedged open with wood, tied open with wire, etc.). Proper installation of the shear valve also includes ensuring that the shear section of the valve is within one-half inch (1/2") of the top of the concrete form, and secured in accordance with the manufacturer's specifications.



The following photo shows a properly positioned and anchored shear valve in a dispenser pan:



The following photo illustrates the dramatic and unfortunate consequences of not having a properly positioned and anchored shear valve:



Curative Measure

#5 – If a motor fuel dispenser with pressurized piping is not equipped with a shear valve, the tank must be taken out of service and shear valves must be installed. The owner must submit applicable documentation to DEC. If shear valves are inoperative, the owner must replace them. If they are improperly installed, the owner must have a contractor remedy the situation. Confirming documentation must be submitted to DEC in all cases.

2. Check Valves

There must be no more than one check valve on a suction piping system. If the check valve is at the tank top, the line requires leak detection. If the check valve is at the dispenser, the line is exempt from leak detection. It may be difficult for the inspector to determine the location of the check valve because some check valves are in-line and are not readily identifiable. If this is the case, the facility owner must provide documentation of the check valve's location. If documentation is not available, the facility owner must have a contractor determine where the check valve is located and the owner must submit documentation to DEC.

Curative Measure

#12.7 – If there is more than one check valve in a suction piping system, the owner must procure a contractor to remove the extra check valve(s), repair the line (if necessary) and conduct a line tightness test. Substantiating documentation must be submitted to DEC.

3. Meters

Product dispenser meters at retail facilities must be calibrated. This can be verified by checking the dispensers for a Bureau of Weights and Measures sticker (Department of Consumer Affairs [DCA] sticker in NYC) current to within the last twelve months. Dispensers at non-retail facilities are not required to be calibrated, but it is strongly recommended that they be so in order for inventory monitoring to be properly conducted.

Curative Measure

#15.4 – If a dispenser meter is not properly calibrated, the owner/operator must have a contractor properly calibrate the meter and must submit documentation to DEC.

VI. Fill Ports & Tank Pad Layout

This section addresses questions 3, 10-11, 12.8 and 28 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to any underground storage tank system, including federally-regulated USTs.

B. Regulatory Requirements

- All fill ports must be permanently marked to identify the product inside a tank. [6 NYCRR 613.3(b)]
- All gauges, valves, and other spill prevention equipment must be kept in good working order. [6 NYCRR 613.3(d)]
- Underground tanks installed after December 27, 1986 must have a label permanently affixed to the fill port providing the information required by 6 NYCRR 614.3(a)(2).
- Spill prevention equipment is required for federally-regulated USTs. [40 CFR 280.20(c)(i)]

C. Fill Port Color Coding

The facility owner or operator must permanently mark all fill ports through color and symbol codes to identify the product inside a tank. Symbols to be used include a circle for gasoline products and vapor recovery lines, a hexagon for other distillates, and a contrasting border to indicate fuel extenders such as alcohol.

The following color coding should be used for vapor recovery sump covers:

- An orange ring to designate coaxial vapor recovery; and
- A filled-in orange circle to designate dual-point vapor recovery.

The following colors & symbols are explicitly required by the PBS regulations:

| | |
|-------------------------------------|-------------------------------------|
| <i>High-grade unleaded gasoline</i> | <i>Red circle w/ white cross</i> |
| <i>Mid-grade unleaded gasoline</i> | <i>Blue circle w/ white cross</i> |
| <i>Low-grade unleaded gasoline</i> | <i>White circle w/ black cross</i> |
| <i>Vapor recovery</i> | <i>Orange circle</i> |
| <i>Diesel</i> | <i>Yellow hexagon</i> |
| <i>#1 fuel oil</i> | <i>Purple hexagon w/ yellow bar</i> |
| <i>#2 fuel oil</i> | <i>Green hexagon</i> |
| <i>Kerosene</i> | <i>Brown hexagon</i> |



Products not specifically listed in 6 NYCRR 613.3(b)(2) (e.g., used/waste oil, E85, biodiesel, and #4 & #6 fuel oil) must be otherwise clearly identified at the fill port. While not required by the PBS regulations, many facilities choose to be consistent with the color and symbol codes found in *API Recommended Practice 1637* when identifying such products. Other facilities choose to identify product stored in a tank via lettering at the fill port. Either approach is acceptable.

DEC recommends that owners/operators use the following colors & symbols:

| | |
|----------------------------------|--|
| <i>Used oil / waste oil</i> | <i>Purple square</i> |
| <i>#4 fuel oil</i> | <i>Green hexagon w/ black or white '4'</i> |
| <i>#6 fuel oil</i> | <i>Green hexagon w/ black or white '6'</i> |
| <i>Ultra low sulfur diesel</i> | <i>Yellow hexagon w/ black 'U'</i> |
| <i>Ultra low sulfur kerosene</i> | <i>Brown hexagon w/ black 'U'</i> |
| <i>Alcohol-blended fuels</i> | <i>Bronze "home plate" symbol w/ black lettering, e.g., 'E85'</i> |
| <i>Biodiesel</i> | <i>Bronze hexagon w/ yellow outer band & black or white lettering, e.g., 'B20'</i> |
| <i>Monitoring well</i> | <i>Black equilateral triangle on white background</i> |

Monitoring wells must also be properly marked and secured. They must, at a minimum, be marked with the words "monitoring well," but they may also be color-coded as noted above.

NOTE: Fill port color coding should be considered to be in compliance as long as the colors are readily identifiable (e.g., paint may be worn or faded as long as there is no possibility for misinterpretation of product type).



The photo at left shows a properly color-coded regular unleaded (containing a fuel extender) fill port with coaxial vapor recovery. The photo at right shows a properly color-coded mid-grade unleaded (containing a fuel extender) fill port with dual-point vapor recovery.



D. Tank Pad Layout

The photo at left shows a typical tank pad layout, including color-coded product and vapor recovery fill port covers. The photo at right shows a properly marked and secured monitoring well cover.



E. Fill Port Catch Basins

Fill port catch basins (a.k.a., spill buckets) are required for federally-regulated USTs and must be maintained per State requirements. There should be no product, water, or debris in spill buckets. Any product found in a spill bucket is a reportable incident and a violation unless it can be shown that a delivery to that fill port occurred within the last two hours (see also Section V.F. above). If water or debris is present in a spill bucket, it must be removed.

F. Part 614 (Post-1986) Tank Label

These labels are required for USTs installed after December 27, 1986 and are strongly recommended for older tanks. The regulatory requirement is for one label to be affixed directly to the tank itself and for another to be affixed at the fill port.

According to subdivision 614.3(a), the following information is required:

- A manufacturer's statement that, "This tank conforms with 6NYCRR Part 614";
- The standard of design by which the tank was manufactured;
- The petroleum products and percentages of volume of petroleum additives which may be stored permanently and compatibly within the tank, or reference to a list available from the manufacturer which identifies products compatible with all tank materials;
- The year in which the tank was manufactured;
- A unique identification number;
- The dimensions, design & working capacity and model number of the tank;

- The name of the tank manufacturer; and
- The date of installation.

Tank labels must be affixed directly onto or next to fill ports. Labels can be considered to be “permanently affixed” if they are mounted with zip ties, wire clamps, wire ties, etc. The photos below show acceptable tank labels.



G. Curative Measures

#3 – If monitoring/observation wells are not marked and secured, the owner must mark and secure the wells and submit documentation of compliance to DEC.

#10 & #28 – If fill port catch basins are not properly maintained (i.e., accumulation of product, accumulation of water or debris), the operator must remove any product, water, or debris that is in the catch basin during the inspection.

#11 – If the fill port is not properly color-coded to identify the product in the tank, the owner must do so and submit documentation to DEC.

#12.8 – If there is no 6 NYCRR Part 614 (post-1986) tank label, the owner must affix one and must submit documentation to DEC.

VII. Tank Top & Dispenser Sumps

This section addresses questions 4, 9, 13 and 51-53 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to any underground storage tank system that has tank top sumps, including federally-regulated USTs.

B. Regulatory Requirements

- All spill prevention equipment is required to be kept in good working order. [6 NYCRR 613.3(d)]
- Weekly leak monitoring is required. [6 NYCRR 613.5(b)(3)]

C. Physical Inspection

The inspector should physically inspect tank top and dispenser sumps for evidence of defects (e.g., cracks, separations, holes) and proper maintenance. Sumps must be free of all liquids & debris and all components must be functioning normally.

1. Interstitial Monitoring

For facilities that use an electronic probe for continuously monitoring the piping interstice, the inspector should check the sensor status at the electronic monitoring console. He should review an incident/mitigation report for each alarm event.

Electronic sensors can be either discriminating or non-discriminating. A discriminating sensor can distinguish between product and water, while a non-discriminating sensor can only detect the presence of liquid (cannot distinguish between product and other liquids).

2. Probes/Sensors

The inspector should physically identify the sensor in the sump and inspect to see if it has been properly positioned. The sensor should be installed per manufacturer's requirements. In the vast majority of cases, the sensor will need to be within an inch of the sump bottom, if not directly on the bottom. The sensor should also be positioned at the deepest part of the sump.

The inspector should have the facility representative verify the sensor's functionality. (For example, float sensors can be manually actuated by turning them upside down.) If the facility representative cannot demonstrate that the sensor is operational, the inspector should request that a contractor verify the sensor's operability. If the sump contains water and no alarm is triggered, the facility representative must ensure that the problem with the sensor is rectified as soon as practicable, not to exceed thirty (30) days.



The photo at left shows a properly positioned sump sensor.

3. Manual Monitoring of Pipe Interstice (double-walled pipe only)

If the facility representative manually inspects the sump as part of the piping leak detection, the inspector should request a demonstration of the operator's sump inspection routine. This is to verify that the operator is familiar with the manual inspection procedure.

4. Line Leak Detector (LLD)

An LLD is a device that is usually fitted to the submersible turbine pump (STP) and either stops or restricts product flow when a leak is detected. The detectors fall into two main categories, mechanical and electronic. Electronic LLDs may also be found elsewhere in the piping system (i.e., dispenser or transition sump).

The inspector should open the sump and visually identify the LLD. If the inspector and the facility representative cannot identify the LLD, the owner must either submit documentation from a contractor that an LLD is present or must install an LLD.

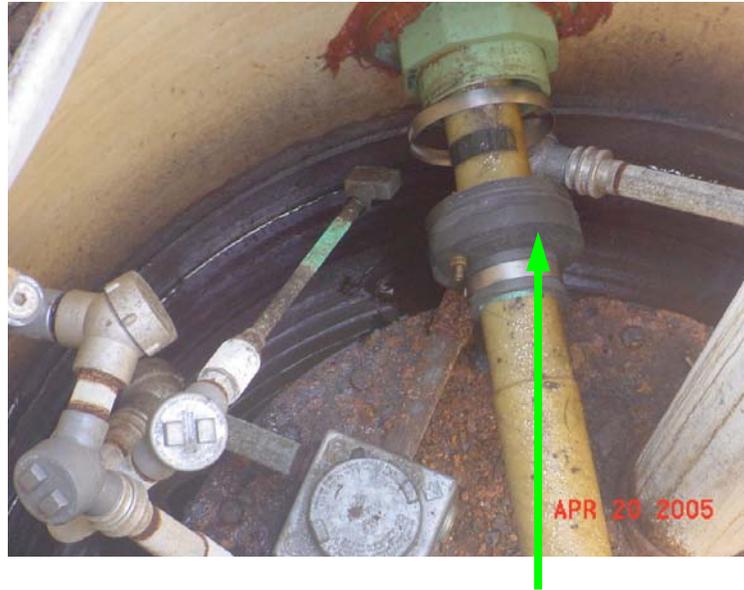


These two photos show different types of electronic LLDs mounted on top of STPs.



5. Boots

Boots (also known as reducer boots or test boots) are fitted to the end of double-walled piping to allow for pressure testing of secondary piping. During normal operation, the boots must be pulled back from the sump wall or must have an open nipple to allow any fluid that leaks into the interstitial space to be detected by liquid sump sensors or other means of monitoring. The inspector should inspect the boot of the double-walled pipe that opens to the sump to make sure it is either pulled back or has an open nipple.



These two photos show test boots that have been properly pulled back after piping was tested.



6. Curative Measures

#4 & #9 – If there is an accumulation of product in a tank top or dispenser sump, the facility must report it as a spill and must clean the sump. If a tank top or dispenser sump has not been properly maintained (accumulation of water/debris), the facility must maintain it. In both cases, confirmatory documentation must be submitted to DEC.

#13 – If no leak monitoring is being performed, the facility must perform weekly leak monitoring and must submit documentation to DEC. If no records are being maintained, the facility must begin maintaining documentation and must submit it to DEC.



#51 – If a tank top sump is determined to not have integrity, it must either be repaired or replaced; documentation must be submitted to DEC.



#52 – If the sensor in the tank top sump is not properly positioned, it must be and documentation must be submitted to DEC.



#53 – If the ALLD is not present on a pressurized line, it must be installed. If the ALLD is present but is not operational, it must be repaired or replaced.

VIII. Overfill Prevention

This section addresses questions 12.4, 29 and 30 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

Overfill prevention is required for all State-regulated USTs installed after December 27, 1986 and all federally-regulated USTs that receive deliveries of more than 25 gallons at one time.

B. Regulatory Requirements

- Facilities must be equipped with overfill prevention equipment. [6 NYCRR 614.14(g)(1); 40 CFR 280.20(c)(1)(ii)]
- Overfill prevention equipment must be properly operated and maintained. [6 NYCRR 613.3(d)]
- The owner/operator must ensure that the amount of product to be delivered will fit into the available empty space in the tank and ensure that the transfer operation is monitored constantly to prevent overfilling. If the owner/operator is not on the premises or not in control of the transfer, the carrier is responsible for transfer activities. [6 NYCRR 613.3(a)]

C. Types of Overfill Prevention

1. Automatic Shutoff



The owner/operator cannot use an automatic shutoff device for overfill prevention if the UST receives pressurized deliveries (unless the UST is specifically designed to receive pressurized deliveries).

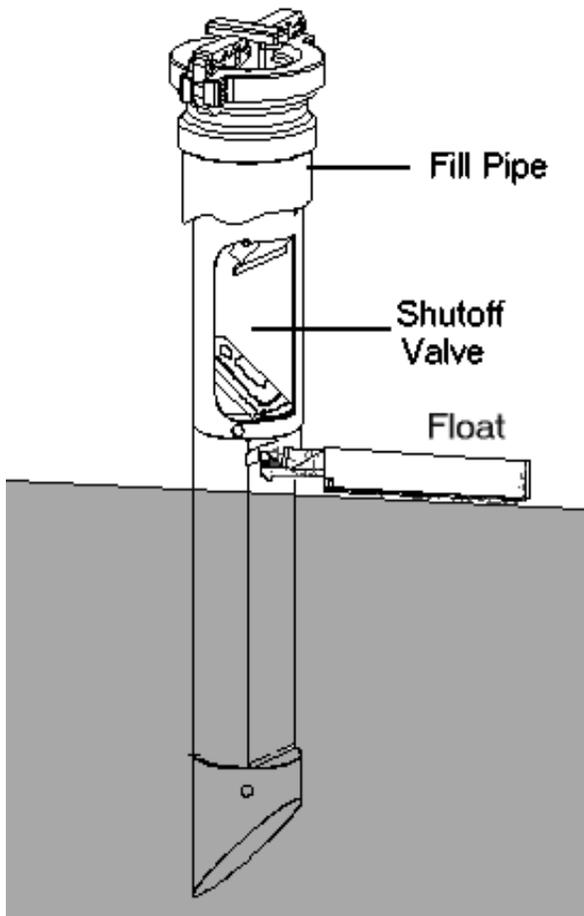
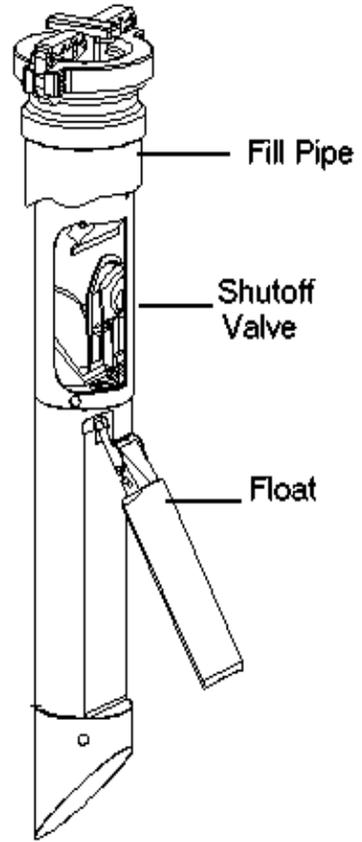
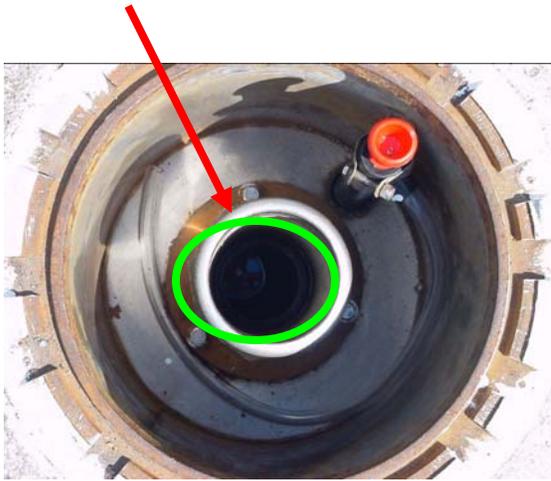
The automatic shutoff device is a mechanical device installed in line with the drop tube within the fill pipe riser. This device will slow down and then stop the delivery when the tank has been filled to 95% capacity. This device has one or two valves (a.k.a., flapper valves) that are operated by a float mechanism. The inspector should make sure that:

- There is a flapper valve installed by looking down the fill pipe (see below illustrations and photo);
- The flapper drop tube is in good condition and is set at 95% (verified by installation records, a contractor, or field observation¹²);
- The flapper valve is operational. There should be no obstruction in the fill pipe that would keep the float mechanism from working (e.g., a gauging stick jammed into the fill port); and
- The device is not otherwise tampered with.

¹² “Field observation” means measuring the height of the flapper valve within the tank and comparing it to a tank chart or electronic system.

The diagram at right shows an automatic shutoff device installed in a fill pipe. Note that the shutoff valve is open when the float is down.

The photo below shows an open automatic shutoff valve as seen from above.



The diagram at left shows an automatic shutoff device that has been activated through increasing product level in the tank causing the float to rise and close the shutoff valve.



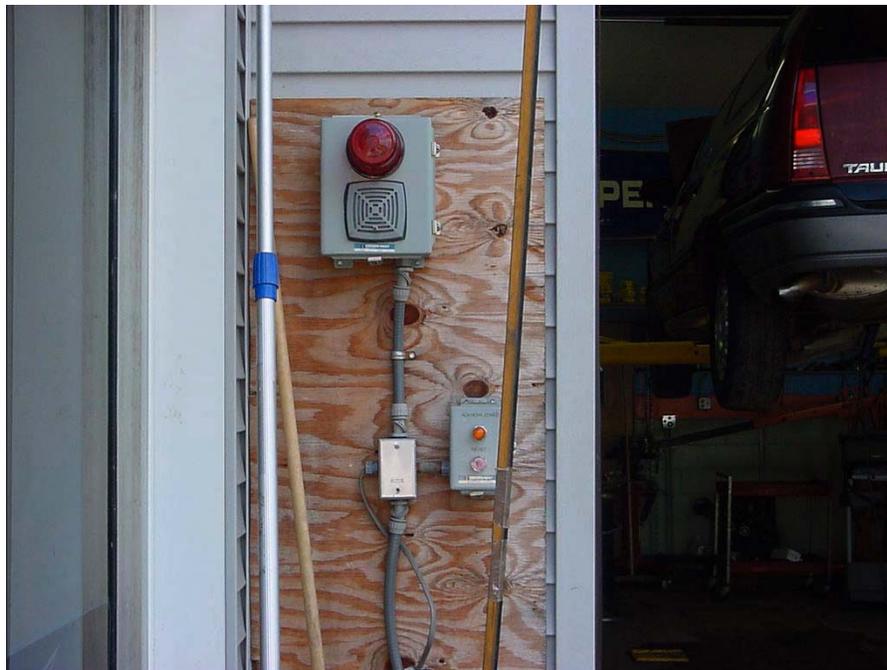
Overfill alarms must be located so that they are audible or visible to the delivery driver.

2. High-Level Alarm

The high-level alarm is typically part of an electronic release detection system. The high-level alarm device activates an audible and/or visual warning to delivery drivers when the tank is either 90% full or is within one minute of being overfilled. This device has no mechanism to shut off or restrict flow. Therefore, the driver may have only one minute to stop the flow of fuel to the tank. The inspector should:

- Ensure that the alarm can be heard and/or seen from where the tank receives delivery.
- Make sure that the electronic device and probe are operating properly by reviewing delivery receipts to determine if deliveries have shown that product levels have exceeded 90%, and also by checking the alarm history. If the product level has never exceeded 90%, the inspector can assume that the overfill alarm is functioning properly. If the facility is using a threshold other than 90% (i.e., delivery is stopped when the tank is within one minute of being overfilled), the owner/operator must demonstrate to the inspector that the threshold is appropriate.
- Make sure that the control system (i.e., the electronic monitoring console) indicates that the alarm has been set to 90% of tank capacity.
- Make sure the alarm is fully operational by asking the operator to activate it. If the alarm is designed such that there is no mechanism to manually activate it, the inspector can assume that the alarm is operational by an absence of other evidence of overfills.

If the facility does not have an electronic (in-tank) monitoring system, the inspector should look for installed equipment to ensure that the overfill alarm is actually installed (e.g., an alarm annunciator, as pictured below).





If any of the following conditions apply, a ball float valve **cannot** be used for overfill prevention:

- UST receives pressurized deliveries.
- UST system has suction piping.
- UST system has single point (coaxial) Stage I vapor recovery. (Refer to 6 NYCRR Part 230 for detailed requirements for Stage I vapor recovery.)
- UST system has dual-point Stage I vapor recovery (unless there is both a ball float on the vent and the Stage I, or the Stage I vapor recovery is tee'd off after the ball float).

3. Ball Float Valve

The ball float valve (a.k.a., float vent valve) is installed in the vent pipe of the tank and restricts vapor flow out of an underground tank as the tank gets close to being full. As the tank fills, the ball in the cage rises, thereby restricting the flow of vapor out of the tank. Restricting vapor flow restricts the rate at which product can flow into the tank. The ball float valve is set at a depth which will restrict vapor flow during delivery at 90% of the underground tank capacity. Alternatively, the ball float valve can be set at a depth such that once the ball is seated, the delivery driver has thirty (30) minutes until the tank overfills.

The photo at right shows a typical ball float valve.



For a ball float valve to work properly, the top of the tank must be airtight so that vapor cannot escape from the tank.

The inspector should ensure that the ball float is present by:

- Examining the tank top for the extractor fitting; or
- Asking for evidence of installation of the ball float valve (i.e., as-built plans). If the owner does not have as-built plans showing the presence of a ball float valve, the inspector should request that a contractor be retained to extract the ball float valve. Photo documentation must be sent to DEC.

The inspector should make sure the ball float valve is operational by:

- Ensuring that the drain valve on the catch basin is not broken or impaired by debris, thereby causing the drain valve to act as a second vent;
- Verifying that product piping is not suction (i.e., product line must be pressurized); and
- Confirming that no Stage I vapor recovery is present, as follows:
 - No coaxial vapor recovery, or
 - No dual-point vapor recovery (unless there is both a ball float valve on the vent and the Stage I vapor recovery, or the Stage I is tee'd off the vent after the ball float valve).

D. Curative Measures

#12.4 – If a tank was installed after December 27, 1986 with no overflow prevention, the owner must install one of the systems described above and submit documentation to DEC.



#29 – If the overflow prevention device is not present for all tanks receiving 25 gallons or more at one time, the owner must install an overflow prevention system and submit documentation to DEC.



#30 – If the overflow prevention device is not operational for all tanks receiving 25 gallons or more at one time, the owner must repair the device and submit documentation of the repair to DEC.

IX. Cathodic Protection – Physical Inspection

This section addresses questions 32, 33.1, 33.3 and 35 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to any State-regulated steel UST system (tank or piping) with cathodic protection (CP), that is not subject to tightness testing under 6 NYCRR 613.5(a). This section is also applicable to federally-regulated steel UST systems that are installed or retrofitted with CP.

Cathodic protection is not required if the material used for tank or piping external protection is inherently corrosion-resistant (e.g., FRP, urethane, HDPE). Galvanized steel and copper are not inherently corrosion-resistant and therefore do require CP.

B. Regulatory Requirements

- Cathodic protection systems must be evaluated annually. If a CP system fails, protection must be restored within thirty (30) days. Any tank or pipe with a non-working CP system will be considered unprotected and must be tightness tested within one (1) year of discovery of the failure of the CP system and every five (5) years thereafter. [6 NYCRR 613.5(b)(2)]
- Tanks installed after December 27, 1986 must be corrosion resistant. [6 NYCRR 614.3(d), (e) and (f)]
- Underground piping systems installed after December 27, 1986 must be corrosion resistant. [6 NYCRR 614.14(a)]
- All CP systems must continuously provide protection to the portion of the tank and piping that routinely contains product. [40 CFR 280.31(a)]
- A qualified CP tester¹³ must evaluate the CP system within the first six (6) months after installation and every three (3) years thereafter. [40 CFR 280.31(b)] NOTE: The NYS requirement for annual evaluation of CP systems meets the three-year federal evaluation requirement, if the testing has been conducted by a qualified CP tester.
- Impressed current systems must be checked for operability every sixty (60) days. [40 CFR 280.31(c)]



C. Galvanic (Sacrificial Anode) Systems

Galvanic systems are more common than impressed current systems for original installations. If there is concrete or asphalt directly above a UST, the inspector should check for CP test ports, since accurate CP readings cannot be obtained through concrete

¹³ A “qualified CP tester” is a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. At a minimum, such persons must have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems. [40 CFR 280.12]

or asphalt. The absence of a CP test port can be cause for concern. Although DEC does not require installation of permanent CP test ports, it is an industry practice to install permanent CP test ports around tanks. The absence of such ports may be an indication that previous CP tests were not conducted properly.

ASIDE: Evidence for retrofitted CP can include saw cuts made in concrete or asphalt. This will indicate spots where anodes have been buried.

1. Buried Metal Piping Components

The inspector should check under dispensers, at the tank top, and inside buildings at wall penetrations to determine whether there are unprotected metal piping components in direct contact with soil. The inspector should also assess whether any copper piping is in direct contact with concrete, which is known to corrode copper.

2. Repairs to Damaged Parts of Cathodically Protected UST System

The inspector should examine the areas directly above and around a tank system to identify potential repairs to damaged parts of the tank system that are cathodically protected. If evidence of repairs is found, the inspector should confirm with facility personnel that repairs were, in fact, conducted. If repairs were made, the CP system must have been tested within six months of the repair.

3. Curative Measures



#32 – If an EPA-regulated UST system was structurally repaired and the CP system was not tested within six (6) months of the repair, the CP system must be tested and results must be submitted to DEC.



#33.1 – If unprotected metal piping components are in direct contact with soil, those components must either be isolated from the soil (via a sleeve or corrosion-resistant pipe) or equipped with cathodic protection. The same applies for copper piping in direct contact with concrete.



#33.3 – EPA-regulated steel UST systems installed prior to December 22, 1988 that have not been retrofitted with CP must be removed.

D. Impressed Current Systems

1. Rectifier

Impressed current systems are less common in general than galvanic systems, but are more common for retrofits. Impressed current CP systems are equipped with rectifiers, which indicate the amount of current being provided to the tank system. Unlike galvanic CP systems, which require electrical isolation of tank system components, all tank system components on impressed current systems must be made electrically continuous (i.e., all

components must be in electrical connection with each other). Many rectifiers are equipped with either an ammeter or voltmeter, and sometimes both. Some rectifiers only have green and red indicator lights. For such systems, the red light will be lit if insufficient current is being supplied to the tank system. If neither light is lit, the inspector should have the facility representative verify that power is being provided to the system. A contractor may need to be contacted for this.

The inspector should check voltage and/or amperage readings and compare those readings to the baseline readings from the most current annual CP survey. The observed readings should be within 20% of the baseline readings. (NOTE: Baseline readings are based on the initial design of the CP system, not the most recent annual survey.) If the rectifier indicates a zero reading, no current is being supplied to the tank system (i.e., the tank system is unprotected).

The inspector should verify that the impressed current rectifier is connected to a dedicated circuit, is receiving power and is not connected to a power supply that can be easily deactivated (e.g., light switch, power strip, etc.).

The inspector should verify that the rectifier has been in continuous operation since the system was initialized. This can be done by determining when the system was first activated and calculating the number of hours from that time until the date of inspection. This number should be compared to the clock on the rectifier to verify that the system has provided continuous protection. (The rectifier clock records the number of hours that the rectifier has been in continuous operation.) For ease of calculation, there are 8760 hours in a year. Therefore, if an impressed current system has been active for ten years, the rectifier clock should indicate 87,600 hours of operation.



Above left – impressed current rectifier; above right – rectifier with both voltmeter & ammeter.

2. Buried Metal Piping Components

The inspector should check under dispensers and at the tank top to determine whether there are unprotected metal piping components in direct contact with soil. The inspector should also assess whether any copper piping is in direct contact with concrete, which is known to corrode copper.

3. Repairs to Damaged Parts of Cathodically Protected UST System

The inspector should examine the areas directly above and around a tank system to identify potential repairs to damaged parts of the tank system that are cathodically protected. If evidence of repairs is found, the inspector should confirm with facility personnel that repairs were, in fact, conducted. If repairs were made, the CP system must have been tested within six months of the repair.

4. Curative Measures



#32 – If an EPA-regulated UST system was structurally repaired and the CP system was not tested within six (6) months of the repair, the CP system must be tested and results must be submitted to DEC.



#33.1 – If unprotected metal piping components are in direct contact with soil, those components must either be isolated from the soil (via a sleeve or corrosion-resistant pipe) or equipped with cathodic protection.



#33.3 – EPA-regulated steel UST systems installed prior to December 22, 1988 that have not been retrofitted with CP must be closed.



#35.1, 35.3 – If the inspector determines that the CP system has not been operated continuously either because the rectifier is not operational or the clock indicates that power has been turned off, the owner must investigate the situation and repair or replace the rectifier.



#35.2 – If the inspector determines that the rectifier does have continuous electrical power, the owner must ensure that the rectifier remains continuously supplied with power, or must install an alternative method of corrosion protection.

X. Miscellaneous – Physical Inspection

This section addresses questions 7, 15.3 and 43 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to any underground storage tank system, including federally-regulated USTs.

B. Regulatory Requirements

- Tanks must be properly temporarily out-of-service (TOS). [6 NYCRR 613.9(a)]
- Product level readings must be taken to the nearest one-eighth inch (1/8"). [40 CFR 280.43(a)(2)]

C. Temporarily Out-of-Service [TOS] Tanks

USTs that are TOS for 30 days or more must have all product removed from the tank to the lowest draw-off point. Fill lines, gauge openings, or pump lines must be capped or plugged. The inspector should check to see whether USTs have been properly temporarily closed in accordance with these requirements. Tanks that are TOS must still comply with all other operating requirements (i.e., treated as if they are active) and must be registered as TOS on the facility's PBS registration.

The inspector should also check to see whether there are any abandoned tanks on-site (i.e., tanks that have not been properly permanently closed).

D. Tank Gauging Stick

If a facility is manually gauging its USTs, the gauging stick(s) must be maintained in good working order. The inspector should check to see whether the gauging stick is whole (i.e., not broken or worn) and is capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth inch (1/8").

E. Curative Measures

#7 – If there are any abandoned tanks on-site (i.e., tanks that have not been properly permanently closed), they must be properly permanently closed and documentation must be submitted to DEC.

#15.3 – If the facility does not have equipment capable of 1/8" measurement, such equipment must be obtained; proper records must be maintained and submitted to DEC.

#43 – If the facility is not gauging tanks to the nearest 1/8", they must begin to do so and documentation must be submitted to DEC.



Aboveground Storage Tanks (ASTs)

XI. Facility Information – Records Review

This section addresses questions 1, 2, 19 and 20 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to all registered petroleum storage facilities that have aboveground storage tanks (ASTs).

B. Regulatory Requirements

- The facility operator is required to display a current and valid registration certificate on the facility premises at all times. [6 NYCRR 612.2(e)]
- Tanks no longer in service must be permanently closed per the requirements listed in 6 NYCRR 613.9(b).
- ASTs must be inspected monthly. [6 NYCRR 613.6(a)]
- Any AST with a capacity 10,000 gallons or greater (or any AST less than 10,000 gallons which could reasonably be expected to discharge to waters of the State) must have a detailed 10-year inspection [6 NYCRR 613.6(b)], except for:
 - Tanks which are entirely aboveground, such as tanks on racks, cradles or stilts;
 - Tanks storing No. 5 or No. 6 fuel oil; or
 - Tanks installed in conformance with the standards for new construction set forth in 6 NYCRR 614.8 through 614.11. [6 NYCRR 613.6(b)(2)]
- Monthly and 10-year inspection reports must be maintained (and made available to DEC upon request) for at least ten (10) years from the date of inspection. [6 NYCRR 613.6(c)]

C. Registration

1. Facility registration must be renewed every five (5) years from the date of the last valid registration. Facilities must be registered within thirty (30) days of a change of ownership. DEC must be notified within thirty (30) days prior to a substantial modification and registrations must be updated within thirty (30) days after a substantial modification. The inspector should check to make sure that:
 - The registration certificate is posted at the facility (the certificate itself states that it must be posted at the tank, at the entrance to the facility, or in the main office where the tanks are located);
 - The certificate is signed; and
 - The information reflected on the Facility Information Report (FIR) is current and correct (this includes accuracy of ownership, contact information, tank system information, etc.).

2. Curative Measures

#1 & 2 – The owner must complete and submit a PBS registration application for initial registration/renewal, information correction, change of ownership, or substantial modification. The owner must also sign and post a valid registration certificate on the premises at all times. (NOTE: A registration certificate cannot be considered valid without the owner’s signature.) To demonstrate compliance with the posting requirement subsequent to an inspection, the owner must submit a photograph of the signed and posted certificate.

D. Monthly Inspections

1. The goal of the monthly inspection is to visually verify that the tank’s integrity, leak detection, cathodic protection and other monitoring or warning systems (including overfill protection) are functioning and operating as designed. The tank must also be evaluated for proper labeling and fill ports must be evaluated for proper color coding.

a. Double-walled Tanks

A thorough inspection of the external tank is sufficient for monthly inspection purposes, provided that the owner monitors the interstitial space of the tank on at least a monthly basis.

b. Insulated Tanks

For tanks greater than 10,000 gallons that are insulated (storing materials such as #6 fuel oil, asphalt, etc.), DEC recommends an internal inspection every ten years. This will allow inspection of the primary tank. Alternatively, the insulation may be temporarily removed to allow inspection of the tank shell.

c. Concrete-Encased Tanks

The monthly inspection of a concrete-encased tank should include a thorough inspection of the concrete for cracks, leaks and general integrity.

2. Inspection Report

The monthly inspection report must contain the facility inspector’s name, signature, and date of inspection. The inspector should check the monthly inspection report for required and suggested repairs. He or she should also verify that required repairs were performed and that suggested repairs are evaluated and planned in accordance with 6 NYCRR 613.6(d). The monthly inspection report must evaluate the following items:

- Exterior surfaces of tanks, pipes, valves and other equipment for leaks and maintenance deficiencies;

- Cracks, areas of wear, corrosion and thinning, poor maintenance and operating practices, excessive settlement of structures, separation or swelling of tank insulation, malfunctioning equipment and structural and foundation weaknesses; and
- All leak detection systems, cathodic protection monitoring equipment, or other monitoring or warning systems which are in place at the facility.

3. Curative Measure

#19 – If a monthly inspection was not conducted within the required time frame, an inspection must be conducted and a report must be submitted to DEC.

If the monthly inspection was performed but does not meet the requirements of 6 NYCRR 613.6(a), the inspector should advise the facility owner or operator of the requirements. An inspection must be conducted and a report must be submitted to DEC.

If recommended repairs were not performed, a written explanation of why they were not performed or a schedule for performing the recommended repairs must be submitted to DEC.

E. 10-Year Inspections

1. Except as set forth below, any AST with a capacity of 10,000 gallons or more, or any AST with a capacity less than 10,000 gallons which could reasonably be expected to discharge petroleum to the waters of the State, must have a detailed 10-year inspection.

2. Exemptions

Tanks that meet the following criteria are exempt from a 10-year inspection:

- Tanks which are entirely aboveground, such as tanks on racks, cradles or stilts;
- Tanks storing No. 5/6 fuel oil or asphaltic emulsions; or
- Tanks installed in conformance with the standards for new construction set forth in 6 NYCRR 614.8 through 614.11. These requirements include, for example, the operating requirements of 6 NYCRR Part 613, cathodic protection, and impermeable barriers for tank bottoms, painting of tank surfaces, etc. (NOTE: Any AST [pre-1986 or post-1986] that is installed in conformance with the aforementioned standards for new construction, is exempt from the 10-year inspection requirement.)

3. Inspection Report

The 10-year inspection report must contain the facility inspector's name, signature, and the date of inspection. The 10-year inspection report must include and/or evaluate the following items:

- Thorough inspection of the tank foundation, bottom & shell, and piping connections;

- Visual inspection for corrosion or failure of internal tank surfaces and difficult to reach areas that have not otherwise been scanned;
- Removal, transportation and disposal of sludge was conducted in a manner consistent with all applicable state and federal laws;
- A tightness test of all connecting underground pipes was performed (refer to http://www.nwglde.org/methods/line_tt.html and http://www.nwglde.org/methods/large_diameter_pipe.html for a listing of piping test methods);
- Inspection of internal coatings for any signs of failure of the coating system (such as cracks, bubbles, blisters, peeling, curling or separation) was conducted; and
- The 10-year inspection report contains the facility inspector's name, signature, and date of inspection.

All *required* repairs must be conducted. In addition, all recommended repairs should be performed. (NOTE: *Recommended* repairs that have not been performed are not to be considered violations.)

Ten-year inspection by tightness test – A tightness test may be conducted in lieu of the 10-year inspection if the tank is less than 5000 gallons in capacity and does not have a manway.

4. Inspector Qualifications

In order to be considered a qualified 10-year inspector, current certification under API 653 or STI SP001, or a valid and current NYS P.E. registration, with appropriate training and experience in AST inspections, is required.

5. Curative Measure

If there is a portion of the tank system that has not been inspected, it must be inspected and a report must be submitted to DEC. If a tank is past due for inspection, it must be inspected and a report must be submitted to DEC.

If recommended repairs were not performed, a written explanation of why it was not performed and a work plan for performing the recommended repairs must be submitted to DEC.

Where a 10-year inspection or tightness test has not been conducted within the required time frame (ten years), the inspection/test results must be submitted to DEC within ninety (90) days. If a release from the tank appears likely (i.e., the tank is in such poor condition that a release may have occurred or is in imminent danger of occurring), the tank must be temporarily taken out of service, a 10-year inspection must be performed and a report must be submitted to DEC. The facility may put the tank back into service only after DEC has reviewed and accepted the inspection report.

XII. Facility Information – Physical Inspection

This section addresses questions 3 and 6-8 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to all registered petroleum storage facilities that have aboveground storage tanks (ASTs).

B. Regulatory Requirements

- Monitoring wells must be marked [6 NYCRR 613.3(b)(4)] and secured (e.g., bolted or locked).
- Out-of-service tanks must be properly closed. [6 NYCRR 613.9]
- The discharge of petroleum is prohibited. [Article 12 of the Navigation Law Section 173(1)]
- Any person with knowledge of a spill is required to report it to DEC within two (2) hours of discovery. [6 NYCRR 613.8]

C. Monitoring Wells

All monitoring wells at a facility must be marked and secured to prevent delivery of product to the wells. The inspector should have the facility operator check those wells for the presence of product. All spills must be reported to the NYS Spill Hotline at 800-457-7362.

Curative Measure

#3 – If monitoring/observation wells are not marked or secured, the owner must ensure that they are made so and must submit documentation to DEC.

D. Properly Closed Tanks

The inspector should determine whether tanks that are no longer in use at a facility have been properly closed. For temporarily out-of-service tanks, product must be removed from the tank and piping system to the lowest draw-off point. Temporarily out-of-service (TOS) tanks must also be protected from flotation. Fill lines, gauge openings, or pump lines must be capped or plugged to prevent unauthorized use or tampering. Note that TOS tanks are subject to *all* requirements of 6 NYCRR 612 and 613 (i.e., registration and leak detection requirements). The PBS registration must identify the tank as temporarily out-of-service.

Tanks that are no longer in service but are not permanently closed are considered to be TOS and must either meet all of the above requirements or be permanently closed. The NYS Fire Code states in 3404.2.13.2.3 that all ASTs at non-operating facilities that have been TOS for over a year must be permanently closed. If in the course of an inspection,

the inspector encounters a tank that has been TOS for over a year, it should be considered as not properly permanently closed.

For tanks permanently closed in-place, liquid and sludge must be removed from the tank and any connecting lines. The tank must be rendered free of petroleum vapors, and provisions must be made for natural breathing of the tank to ensure that it remains vapor-free. Connecting lines must be disconnected and removed, or securely capped or plugged. Manways must be securely fastened in place. ASTs must be stenciled with the date of permanent closure. Additionally, ASTs must be protected from flotation.

Curative Measures

#6 – If a tank is not properly permanently closed, the owner must do so and must submit documentation to DEC, including an updated PBS registration.

#7 – If a tank is not properly temporarily closed, the owner must do so and must submit documentation to DEC, including an updated PBS registration.

E. Unreported Spills

Per Section 1.1 of the *DEC Spill Guidance Manual*¹⁴, a spill is reportable unless it meets *all* of the following conditions:

- The spill is known to be less than five gallons;
- The spill is contained on an impermeable surface and under the control of the spiller;
- It has not impacted and will not reach any lands or waters of the State; and
- It is cleaned up within two hours of discovery.

Product in secondary containment (unless it meets the above four conditions) is considered reportable because it is outside of its normal containment (i.e., the tank). (If the inspector discovers product in secondary containment, he should ask the facility operator when the last delivery occurred in order to determine if it is more than two hours old.) Any obvious environmental impacts, such as gross staining, dead vegetation, etc. is also considered reportable.

Curative Measure

#8 – All non-emergency spills discovered during an inspection (whether by a facility representative, DEC contractor or DEC inspector) may be categorized under one Spill Number. All spills must be reported to the NYS Spill Hotline at 800-457-7362.

¹⁴ The *DEC Spill Guidance Manual* can be found online at <http://www.dec.ny.gov/regulations/2634.html>.

XIII. Corrosion Protection

This section addresses questions 18.2, 18.3 and 18.4 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to all aboveground storage tank (AST) systems installed after December 27, 1986 and any AST system that is exempt from 10-year inspection requirements by meeting the new construction standards set forth in 6 NYCRR 614.8 through 614.11.

B. Regulatory Requirements

- Tank bottoms which rest on or in the ground must be cathodically protected. [6 NYCRR 614.9(b)(1)]
- Exterior surfaces of ASTs must be protected with paint or must have an equivalent coating system designed to prevent corrosion and deterioration. [6 NYCRR 614.9(c)]
- Any tank designed to rest on the ground must have a double bottom or an impervious barrier such as a concrete pad or a cutoff barrier. [6 NYCRR 614.10]

C. Tank Shell

1. Tanks with Only a Primer Coat of Paint

ASTs are required to have a *complete* surface coating (i.e., a primer coat, a bond coat and two or more final coats of paint). Alternatively, they may have an equivalent coating system designed to prevent corrosion and deterioration (discussed in detail below).

2. Rusty Tanks

If an inspector encounters rusty tanks at a site, he should advise the facility owner/operator to do more than simply re-paint it. For example, tanks that look like the one in the below photo must be sandblasted before re-painting.



3. Equivalent Coating Systems

a. Insulated Tanks

Some tanks are externally protected with insulation (e.g., foam) so that heated product contained in the tank will remain fluid. The inspector should ensure that the *entire* external surface of the tank is insulated to protect the tank from corrosion. To the extent possible, the inspector will determine whether the insulation system prevents water from accumulating between the insulation and the tank shell.

b. Concrete-Encased Tanks

Concrete-encased tanks are steel tanks that are protected by a concrete encasement (e.g., Convault). The inspector should check for cracks in and around the concrete casing to ensure integrity.

4. Curative Measure

#18.2 – Owners/operators of tanks that do not have a surface coating must ensure that such tanks are adequately coated. Photo documentation of the curative measure must be submitted to DEC within thirty (30) days. (NOTE: For practical purposes, it may be necessary to allow a facility to wait for a period of favorable weather/season in order to implement this curative measure.)

D. Tanks In Contact With Soil

Tank bottoms which rest on or in soil must be cathodically protected with sacrificial anodes or an impressed current system which is designed, fabricated and installed in accordance with recognized engineering practices. The inspector should check to ensure that the rectifier is present and activated on an impressed current system.

Curative Measure

#18.3 – Tanks with bottoms resting on or in soil without cathodic protection must be immediately taken out of service. The tank must either be raised off the ground or retrofitted with cathodic protection. If the latter is chosen, owners/operators must retain a contractor to ensure that the bottoms of such tanks are evaluated for structural soundness and appropriately retrofitted with cathodic protection. Such tanks may not be returned to service without documentation of both structural soundness and cathodic protection installation being submitted to DEC.

E. On-Grade Tanks

Tanks that are designed to rest on-grade must be constructed with a double bottom or must be underlain by an impermeable barrier (e.g., concrete pad or cutoff barrier). If an impermeable barrier is used, it must have a permeability rate to water equal to or less

than 1×10^{-6} cm/sec and must not deteriorate in an underground environment or in the presence of petroleum.

To confirm that a tank has an impermeable barrier, the inspector should ask the owner/operator to verify that the barrier meets the aforementioned permeability standard. To confirm that a tank has a double bottom, the inspector should check for the presence of tell-tales/monitoring ports. (NOTE: *Either* a double bottom or an impermeable barrier is required; not both.)

Curative Measure

#18.4 – Tanks that are resting on-grade with no impermeable barrier must be upgraded. If the tank appears likely to have a release to the environment (i.e., the tank is in such poor condition that a release may have occurred or is in imminent danger of occurring), it must be immediately taken out of service. The owner/operator may retain a contractor to retrofit the tank with a double bottom. Alternatively, the owner/operator may retain a contractor to lift the tank and install an impermeable barrier beneath it. In either case, appropriate documentation must be submitted to DEC before the tank can be returned to service.

XIV. Leak Monitoring

This section addresses question 18.5 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to any aboveground storage tank (AST) system that is exempt from 10-year inspection requirements by meeting the new construction standards set forth in 6 NYCRR 614.8 through 614.11.

B. Regulatory Requirements

- Any tank which is designed to rest on the ground must be underlain by a double bottom or an impermeable barrier. [6 NYCRR 614.10]
- Tanks must have leak monitoring between the tank bottom and the impermeable barrier. [6 NYCRR 614.11]

C. Collection Pipes or Channels¹⁵

Perforated gravity collection pipes or channels in a concrete foundation pad may be used to monitor for leaks either visually or electronically. **NOTE:** Use of observation wells or other soil or groundwater monitoring systems beneath an impermeable barrier is *not* an acceptable leak monitoring system.

D. Weep Holes

Some concrete-encased ASTs in basements (prevalent in New York City) use weep holes at the bottom of the concrete encasement for detecting leaks. Weep holes are traditionally visually monitored. This is an acceptable form of leak monitoring if the weep holes are kept open.

E. Curative Measure

#18.5 – If there is no ability to monitor for leaks between the tank and the impermeable barrier, the tank must be immediately temporarily closed. The owner/operator must either retain a contractor to provide leak monitoring capability for the tank or the tank must be permanently closed.

¹⁵ While it is recognized that the use of channels is allowed by the PBS regulations, it is not a recommended practice due to the possibility of enhanced corrosion.

XV. Secondary Containment

This section addresses questions 21 and 22 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to all aboveground storage tanks (ASTs) which have a capacity of 10,000 gallons or greater, or which, if less than 10,000 gallons, could be reasonably expected to discharge petroleum to the waters of the State.

B. Regulatory Requirements & Guidance

- A secondary containment system must be installed around any AST which has a capacity of 10,000 gallons or greater, or which, if less than 10,000 gallons, could be reasonably expected to discharge petroleum to the waters of the State. [6 NYCRR 613.3(c)(6)]
- DEC Program Policy DER-17 (*Guidelines for Construction Certification, 5-Year Certification, and Inspection of Secondary Containment Systems for Aboveground Petroleum Storage Tanks*)

C. Secondary Containment Performance Requirements

1. Design – A detailed explanation of the performance requirements listed below is provided in DEC Program Policy DER-17 (*Guidelines for Construction Certification, 5-Year Certification, and Inspection of Secondary Containment Systems for Aboveground Petroleum Storage Tanks*). The following is a brief summary of the main performance requirements:

a. Volume

Per DER-17, DEC considers the minimum acceptable volume for a secondary containment system to be the greater of either:

- 110% of the largest tank or interconnected tanks in the containment area; or
- The entire capacity of the largest single tank plus sufficient room for freeboard to contain precipitation. “Sufficient freeboard” means enough volume to contain precipitation from a 25-year storm event.

The DEC inspector should ask the owner/operator for documentation showing the calculation of the volume provided by the containment area.

b. Compatibility

Per DER-17, the overriding consideration in the selection of material used for a secondary containment system liner is its chemical resistance to the product being stored. Chemical resistance refers to the ability of a material to retain its physical strength and

chemical barrier properties during and after direct contact with the product. All materials used for lining a secondary containment system must be resistant to hydrocarbon mixtures. DEC presumes that geomembrane liners, concrete, and steel are all compatible with petroleum storage. (NOTE: The majority of geosynthetic clay liners are *not* compatible with alcohol/ethanol storage unless they are specifically modified/prepared for storing alcohols.) DEC also presumes that asphalt that is not protected with a hydrocarbon-resistant material is not compatible with petroleum storage.

c. Permeability

Petroleum products have different viscosities; therefore containment systems will have different permeability rates depending on the product stored. As such, DEC has developed product-specific permeability rates (depending on the viscosity and storage temperature of the product) that will provide adequate protection to the environment. These permeability rates are listed in DER-17, and are provided here for convenience. NOTE: It is recommended (but not required) that these permeability rate guidelines be followed:

| Product | Permeability Limit (cm/sec) (permeability with respect to water) |
|-------------|---|
| Gasoline | 1×10^{-7} |
| #2 Fuel Oil | 1×10^{-6} |
| #4 Fuel Oil | 3×10^{-6} |
| #6 Fuel Oil | 1×10^{-5} |

Where different products are stored in the same secondary containment area, the secondary containment should be constructed to the standard of the lightest product (i.e., product with the lowest viscosity) stored. If a petroleum product that is not listed in DER-17 is stored in a given containment area, the containment should be constructed to the standard of the closest most stringent listed petroleum product.

The DEC inspector should ask the facility owner/operator for documentation that the secondary containment system meets the above guidance. If the permeability of the system is uncertain, DER-17 provides detailed guidance on methods for evaluating containment system permeability. The inspector should also ask the facility owner/operator how often the facility needs to remove stormwater from the secondary containment system. If stormwater does not need to be removed regularly, the permeability of the containment system is questionable. Please note that the facility may be required to have a SPDES discharge permit from DEC's Division of Water.

d. Structural Integrity

The structural integrity of the secondary containment system can be evaluated in four main ways:

- A visual inspection of suspected areas of degradation, e.g., cracks (can be caused by trees and other vegetation), erosion, differential settlement, equipment damage, etc.;
- Observation of whether the system retains stormwater;
- Condition of designed penetrations and connections, e.g., piping chases, liner connections to foundations, etc.; and
- Material-specific failure modes, e.g., desiccation of clay liners (see DER-17 for details).

Stormwater retention after a storm event is the crudest method of assessing the integrity of a secondary containment system. The inability of a secondary containment system to retain water after a storm event indicates a gross failure of the system. However, the presence of stormwater is not evidence of proper performance of the system. The owner/operator is responsible for determining the specific methods and procedures needed for evaluating the integrity of the containment system, taking into consideration the type of liner, construction material, age of the liner and usage history of the system.

The DEC inspector should ask the facility owner/operator how often the facility needs to remove stormwater from the secondary containment system. If the frequency and amount of precipitation in the geographical area of the facility indicate that stormwater should be accumulating in the containment system but is not, this may indicate a failure of the containment system.

e. Containment Sloped Away from Tank

Secondary containment must be constructed such that any release of product from a tank will drain away from the tank.

2. Dike Drain Valves

Dike drain valves must be locked in the closed position. They may only be opened to drain stormwater from the secondary containment system and must be closed and locked once such activities are completed.

3. Rain Shields

Because releases from the top of an AST (e.g., overfills) would not be contained within the secondary containment system if rain shields are employed, DEC considers the use of rain shields to be a violation of secondary containment requirements, unless secondary containment is specially designed to segregate stormwater and petroleum from the tank (i.e., via use of a modified double-walled tank).

4. Floor Drains

Secondary containment is required for ASTs located inside buildings with floor drains, or if the building itself will not provide adequate secondary containment for releases.

D. Modified Double-Walled Tanks

Traditional double-walled ASTs by themselves do not provide containment for spills from the tank top, including overfills and leaks from tank top connections. Modified double-walled AST designs address spills from the tank top by providing either an oversized interstitial space or a separate containment chamber within the primary tank, into which spills from the tank top are directed. Either type of design must provide containment for at least twenty percent (20%) of the tank volume. Some manufacturers who have designed tanks to this standard include Highland Tank, Armor Cast, SuperSafe and Modern Welding Co. NOTE: This tank design is acceptable for any size AST.

E. Secondary Containment for Tanks Less Than 10,000 Gallons¹⁶

Any AST with a capacity of less than 10,000 gallons that is in close proximity to waters of the State is required to either have secondary containment or utilize a design/technology such that a discharge is not reasonably expected to occur. Facilities within 500 horizontal feet of the following resources are considered to be in close proximity to ground or surface waters:

- Perennial or intermittent stream;
- Public or private well;
- Primary or principal aquifer as defined in USGS Water Resource Investigation Reports 87-4274, 87-4275, 87-4276, 87-4122, 88-4076, and Appendix C;
- Wetlands as defined in 6 NYCRR Part 664;
- Lake/pond, estuary, etc.; or
- Storm drain.

1. For tanks that are within 500 horizontal feet of the above resources, DEC requires that a storage tank and its associated equipment be designed to prevent discharges from occurring or that a dike system be installed to prevent such discharges from reaching the environment. Discharges from a tank system may occur due to:

- Overfills from the fill port, vent and/or emergency vent;
- Spills at the fill port from the delivery hose;
- Leaks from valves, pumps or other connections to the tank;
- Flow from valves left open either by accident or by vandals;
- Vehicular traffic that could contact the tank and cause it to rupture;

¹⁶ The PBS regulations are currently undergoing revision. The language set forth in this section is consistent with current DEC guidance and regulation. Please note that the requirements for secondary containment may be modified in the new regulations.

- Flooding and flotation;
- Fires around the tank that could cause the tank to weaken, rupture or overflow; and
- Vandalism with ballistics.

Any AST with a capacity of less than 10,000 gallons which does not have diking but has been designed to prevent spills due to the reasons listed above will be considered to be in compliance with 6 NYCRR 613.3(c)(6)(i). If an owner/operator opts to not install diking, the tank must be designed and installed to prevent spills from each potential spill cause. While the causes listed above are the most frequent reasons for a spill, it should be understood that spills may occur due to other reasons such as structural failure of a tank, damage to equipment from icing and so on. It is the owner's responsibility to ensure that a tank without diking is fully protected from *all* dangers. Conversely, it is not necessary to protect a tank from flooding, ballistics, vehicle damage, etc. if the tank is not exposed to those dangers.

2. The PBS regulations (specifically, 6 NYCRR 613.3(d)) require that all spill prevention equipment must be maintained in good working order. This applies to alternatives to secondary containment as well.

F. Curative Measures

#21 – If a tank that requires secondary containment does not have it, a plan for providing containment and a schedule must be submitted to DEC within thirty (30) days. (Alternatively, for tanks <10,000 gallons, the owner may alter the tank system design/installation to address those factors previously identified in section D.1. such that secondary containment is not required.) If a tank that requires secondary containment does not have it and a release appears likely, the tank must be immediately temporarily closed until such time that adequate secondary containment is provided. If secondary containment cannot be provided, the tank must be permanently closed. If secondary containment has not been properly designed, the owner/operator must temporarily close the tank and retain a contractor to re-design the secondary containment to the satisfaction of DEC. If secondary containment (or equipment, in the case of tanks <10,000 gallons) has not been maintained, the owner/operator must remedy the situation and provide documentation of proper maintenance to DEC.

#22 – If dike drain valves are unlocked, the owner/operator must lock the dike drain valves. If there is no valve on a dike discharge pipe, the tank must be temporarily closed until such time that a valve is installed. Compliance documentation must be provided to DEC.

XVI. Overfill Prevention

This section addresses question 23 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to all aboveground storage tank (AST) systems. Please note that only one of the following overfill prevention systems is required for a given tank.

B. Regulatory Requirements

- All aboveground petroleum tanks must be equipped with either a liquid-level gauge [6 NYCRR 613.3(c)(3)(i)], a high-level warning alarm, a high-level liquid pump cutoff controller, or an equivalent device [6 NYCRR 613.3(c)(3)(iii)].
- The owner/operator must ensure that the amount of product to be delivered will fit into the available empty space in the tank and ensure that the transfer operation is monitored constantly to prevent overfilling. If the owner/operator is not on the premises or not in control of the transfer, the carrier is responsible for transfer activities. [6 NYCRR 613.3(a)]

C. Level Gauge

The inspector should verify that the gauge is present and operational, and that the readout is capable of being used by a delivery person to determine how much product can be safely delivered to the tank.

D. Vent Whistles

Vent whistles are installed at the vent pipe and function by sounding to indicate that the tank is filling. The whistle stops when the tank is full. This type of alarm system is commonly used for home heating oil tanks where the vent is located near the fill port. Because the whistle is not loud, it is not suitable in noisy locations or where the carrier is not close enough to hear the whistle under all conditions.

If a facility is using a vent whistle for an AST, the inspector should evaluate whether it is an appropriate overfill prevention method for the particular site conditions.

E. High-Level Alarms / Controllers

High-level alarms come in a wide variety of configurations. They can be as simple as a float switch connected to an annunciator or warning light. They can also be part of another system such as an inventory monitoring system, or an automatic shutoff system combined with audible and visual alarms. All of these devices are acceptable as long as they have an alarm located near the delivery point where the driver can be alerted to a high-level condition and take appropriate measures to stop the delivery of product to the

tank. The inspector should request that the facility representative test the system, where physically possible, to demonstrate the alarm's operability.

F. Curative Measure

#23 – If no overflow prevention system is present, the facility must install one within thirty (30) days. If the overflow prevention system is inoperable, it must be repaired or replaced and documentation must be submitted to DEC within thirty (30) days.

XVII. Labeling

This section addresses questions 11 and 24 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to all aboveground storage tank (AST) systems.

B. Regulatory Requirements

- All fill ports must be permanently marked to identify the product stored inside a tank. [6 NYCRR 613.3(b)]
- The design capacity, working capacity and identification number of any AST must be clearly marked on the tank and at the gauge. [6 NYCRR 613.3(c)(3)(ii)]

C. Tank ID Number

Each AST at a registered facility is required to have a unique identification number. This number must be clearly marked on the tank and at the gauge. (Note that one label can suffice in most situations.) This is usually done by marking with paint or by placarding.

D. Design & Working Capacity

Each AST at a registered facility is required to have its design and working capacity clearly marked on the tank and at the gauge. This is usually done by marking with paint or by placarding.

E. Fill Port Color Coding

The facility owner or operator must permanently mark all fill ports through color and symbol codes to identify the product inside a tank. Symbols to be used include a circle for gasoline products, a hexagon for other distillates, and a contrasting border to indicate fuel extenders such as alcohol.

The following colors & symbols are explicitly required by the PBS regulations:

| | |
|-------------------------------------|-------------------------------------|
| <i>High-grade unleaded gasoline</i> | <i>Red circle w/ white cross</i> |
| <i>Mid-grade unleaded gasoline</i> | <i>Blue circle w/ white cross</i> |
| <i>Low-grade unleaded gasoline</i> | <i>White circle w/ black cross</i> |
| <i>Diesel</i> | <i>Yellow hexagon</i> |
| <i>#1 fuel oil</i> | <i>Purple hexagon w/ yellow bar</i> |
| <i>#2 fuel oil</i> | <i>Green hexagon</i> |
| <i>Kerosene</i> | <i>Brown hexagon</i> |

Products not specifically listed in 6 NYCRR 613.3(b)(2) (e.g., used/waste oil, E85, biodiesel, and #4 & #6 fuel oil) must be otherwise clearly identified at the fill port. While not required by the PBS regulations, many facilities choose to be consistent with the color and symbol codes found in *API Recommended Practice 1637* when identifying such products. Other facilities choose to identify product stored in tank via lettering at the fill port. Either approach is acceptable.

DEC recommends that owners/operators use the following colors & symbols:

| | |
|----------------------------------|--|
| <i>Used oil / waste oil</i> | <i>Purple square</i> |
| <i>#4 fuel oil</i> | <i>Green hexagon w/ black or white '4'</i> |
| <i>#6 fuel oil</i> | <i>Green hexagon w/ black or white '6'</i> |
| <i>Ultra low sulfur diesel</i> | <i>Yellow hexagon w/ black 'U'</i> |
| <i>Ultra low sulfur kerosene</i> | <i>Brown hexagon w/ black 'U'</i> |
| <i>Alcohol-blended fuels</i> | <i>Bronze "home plate" symbol w/ black lettering, e.g., 'E85'</i> |
| <i>Biodiesel</i> | <i>Bronze hexagon w/ yellow outer band & black or white lettering, e.g., 'B20'</i> |

NOTE: Fill port color coding should be considered to be in compliance if the colors are readily identifiable.

F. Curative Measures

#11 – If the fill port is not properly color-coded to identify the product in the tank, the owner/operator must rectify the deficiency and submit documentation to DEC within thirty (30) days.

#24 – If the tank is not labeled and/or not marked at the gauge, the owner/operator must remedy the situation and submit documentation to DEC within thirty (30) days.

XVIII. Valves

This section addresses questions 25-27 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to all aboveground storage tank (AST) systems.

B. Regulatory Requirements

- All tanks which cause a gravity head on a motor fuel dispenser must be equipped with a device such as a solenoid valve capable of stopping flow in case of piping or dispenser hose failure. [6 NYCRR 613.3(c)(2)]
- All fill pipes leading to a pump-filled tank must be equipped with a properly functioning check valve or equivalent device which provides automatic protection against backflow. A check valve is required only when the piping arrangement of the fill pipe is such that backflow from the receiving tank is possible. [6 NYCRR 613.3(c)(4)]
- Each tank connection through which petroleum can normally flow must be equipped with an operating valve capable of stopping all flow through the connection. [6 NYCRR 613.3(c)(5)]

C. Determination of Operability

The inspector should note that valves are to be considered inoperable when they are obviously deteriorated and cannot be shown to be operable. If a valve *appears* to be in working condition, the inspector should assume that the valve is operable. If the inspector is unsure of the operability of the valve, the operator must demonstrate its operability.

D. Shutoff (Solenoid) Valves

Tanks which cause a gravity head on a dispenser (i.e., product level is above the level of the dispenser) are required to be equipped with a device such as a solenoid valve which is positioned adjacent to, and downstream from, the operating valve. The valve must be installed and adjusted so that liquid cannot flow by gravity from the tank in case of piping or dispenser hose failure.

The inspector should check for the presence of a solenoid valve. Because solenoid valves are electrically actuated, this can be verified by looking for an electrical line leading to the valve. If this cannot easily be done, the owner/operator must submit documentation that verifies the presence of the valve. NOTE: When solenoid valves fail, they fail in a closed position.

E. Check Valves

Backflow from the receiving tank is only possible in remote fill situations. The inspector should check for the presence of a check valve for all pump-filled ASTs that have remote fills. Check valves are found near the hose connection of a remote fill pipe. (NOTE: A manually operated valve is *not* an acceptable substitute for an automatic check valve on a remote fill line.)

F. Operating Valves

All piping going to and from an AST is required to be equipped with an operating valve to control the flow of product. The inspector should check for the presence of an operating valve on all fill lines and product lines.

G. Curative Measures

#25-27 – If required valves are not present, the owner/operator must have them installed, and documentation must be submitted to DEC.

XIX. Miscellaneous

This section addresses question 18.1 of PBS Inspection Form v. 4 (7/1/2009).

A. Applicability

This section is applicable to all aboveground storage tank (AST) systems installed after December 27, 1986.

B. Regulatory Requirements

- All ASTs installed after December 27, 1986 must be constructed of welded steel. [6 NYCRR 614.9(a)]

C. Tanks Not Welded Steel

All ASTs installed after December 27, 1986 must be constructed of welded steel and must meet or exceed one of the design and manufacturing standards listed in 6 NYCRR 614.9(a).

Some heating oil ASTs (e.g., Roth tanks) have been constructed per the UL 2258 standard. These tanks do not technically meet the design and construction standards listed in 6 NYCRR 614.9(a) because the technology was developed after the PBS regulations became effective. DEC has opted to exercise enforcement discretion with regard to Roth tanks only. (NOTE: Other manufacturers have designed tanks to the UL 2258 standard, but only Roth has been issued an enforcement discretion letter.)

Curative Measure

#18.1 – If an AST installed after December 27, 1986 is not constructed of welded steel, it must be permanently closed. (For an exception to this, refer to paragraph about Roth tanks above.)

D. Emergency Venting

All ASTs require both a normal and an emergency vent. Emergency venting is defined in the American Petroleum Institute (API) Standard 2000 (*Venting Atmospheric & Low-Pressure Storage Tanks*) as “the venting required when an abnormal condition ... exists either inside or outside of a tank.” Required sizes for emergency vents on common tank sizes can be determined by referring to such publications as *Venting Guide for Aboveground Storage Tanks* (2001, Morrison Bros. Co., Dubuque, IA). The same document provides descriptions and diagrams of types of emergency vents.