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Alaska Department of Environmental Conservation Storage Tank Program

Underground Storage Tank Inspector *Reference Handbook*



March 2002

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Disclaimer

This manual is intended only as a "plain English" guidance to aid the public and Inspectors in understanding and implementing ADEC regulatory requirements. It is not intended to supplement or replace any statutory or regulatory requirements and does not create any enforceable rights at law or equity. In the event of any inadvertent conflict between this guidance and ADEC's statutes and regulations, the statutes and regulations shall control.

Cover photo: UST Operator Bill Tatsda (left) receives the State of Alaska's first UST Compliance Tag from ADEC's Bob Fultz, May, 2000, Ketchikan, Alaska

Important changes from the last edition

Based on the experience of the year 2001 inspection season, feedback from licensed inspectors and clarification of certain issues by ADEC and EPA, the following changes have been made to this edition of the Inspector Handbook:

2002 Changes

- ❑ Digital Images. Starting on 2002, ADEC asks that inspectors provide digital pictures of each inspection site. Pictures of ATGs, sumps, ALLDs, sensors, and other equipment will greatly help ADEC complete review of the inspection form.
- ❑ Visual Tags. Inspectors should make sure the starter tag or permanent tag is present for each tank and visible to the person delivery fuel.
- ❑ New Edition. *List of Leak Detection Evaluations for UST Systems, 9th Edition, November 21, 2001.* The list has been updated. Make sure you add the latest version provided by ADEC to your handbook.
- ❑ Automatic Tank Gauges. Inspector must now list specific probe information, and how often the scheduled tests run. Inspectors no longer need to verify water readings for ATGs. As well, inspectors must now review the system setup to make sure the ATG was programmed properly, including the exact percent program for detection and false alarm. Inspectors are now encouraged to stick the tank and compare the ATG readout as a means of testing the float probes.
- ❑ Stand-Alone Sump Sensors No Longer Allowed. Starting July 1, 2001, UST systems with pressurized piping are no longer permitted to have stand-alone sump sensors in lieu of an automatic line leak detector (ALLD). Any existing pressurized piping with no ALLD must be retrofitted with one.
- ❑ Standardized Probe and Sensor Maintenance. If an inspector is unsure about maintenance and calibration requirements for leak detection sensors and probes, ADEC suggests using the checklists found in latest edition (Version 9 of the List of Leak Detection Evaluations for Underground Storage Tank Systems by the National Leak Detection Work Group.
- ❑ Electronic ALLD 0.2 gph/Monthly Recordkeeping Requirement. Previous version of the inspection form did not have a place to document monthly or annual leak tests of electronic line leak detectors. The ALLD page now has a line for this topic.
- ❑ Interstitial Monitoring Sensors. Inspectors now need to visually inspect the sensor, and confirm the sensor is positioned at the lowest part of the system it is designed to monitor.
- ❑ ALLD Achieved Flow Rate. Inspectors must now list the flow rate (gph) of the ALLD for each pipe at which the device activates a shut-down, restriction, or alarm.

- ❑ ALLD testing. Most detailed information about ALLD testing is now provided: who can test, how to test, testing equipment and more.
- ❑ ATG 12 Months of Leak Detection Records. ADEC has combined the question of 12 months worth of records with the question of accuracy of those records. Inspectors must review the proper fill capacity and test duration of the leak detection history.
- ❑ Inspect drop tubes for sticks. Inspectors are now asked to verify that the overfill shut-off device is not inhibited by a stick inserted in the drop tube.
- ❑ Corrosion “expert” can now test. New UST laws will allow a corrosion expert to perform cathodic protection tests in lieu of being a state certified CP tester.
- ❑ Cathodic Protection Test Form. The CP test form has been significantly restructured but the basics questions are the same. The structure to soil test and the 100 millivolt shift test have been separated so they are both easier to read. As well, the continuity test has been separated out. Inspectors should use three reference call locations for the CP test. Inspectors must take continuity readings for impressed current, but are not required to do so for galvanic systems unless needed for diagnostic purposes.
- ❑ Starter Tags Gone. ADEC has eliminated starter tags. Newly installed USTs will get a permanent tag.

Handy Tip:

This handbook is meant to be a “living” notebook. Use it to maintain all of the information you need in one handy spot. Outdated material should be replaced with new material when it becomes available.

Please fill in

Your Name: _____

Company: _____

Address: _____

Phone: _____ Fax: _____

Date of Course: _____

Table of Contents

| | |
|--|-----------|
| Chapter 1: Introduction | 8 |
| Chapter 2: Summary of Inspection Regulations | 9 |
| General Points | 9 |
| Tank Tags | 10 |
| Failed Inspections | 11 |
| Chapter 3: Preparing for the Operations Inspection | 12 |
| How the Inspection Process Works | 13 |
| Recommended Tools: Suggested Equipment to Perform a Typical Inspection | 14 |
| Maintenance, Repairs, and Upgrades: What's the Difference? | 15 |
| Known or Suspected Releases (18 AAC 78.200 - 78.220) | 17 |
| Common Problems and Errors | 18 |
| Upgrade and Repair for Cathodic Protection Systems | 21 |
| Chapter 4: Filling Out the Inspection Report Form | 24 |
| Before Inspection Begins | 25 |
| Basic Information | 27 |
| Section 1: General Information | 30 |
| Section 2: Tank Temporarily Closed or Taken Out of Service | 32 |
| Section 3: Release Detection | 33 |
| Section 3: Release Detection Summary | 36 |
| Section 3.a: Automatic Tank Gauging (ATG) | 37 |
| Section 3.b: Interstitial Monitoring | 45 |
| Section 3.c: Inventory Control and SIR | 52 |
| Section 3.d: Tightness Testing | 58 |
| Section 3.e: Automatic Line Leak Detectors | 61 |
| Section 3.f: Safe Suction Piping | 67 |
| Manual Tank Gauging (Tanks only) | 68 |
| Section 4: Spill and Overfill Prevention | 72 |
| Section 5.a: Corrosion Protection Summary | 78 |
| Section 6: General Comments | 82 |
| Section 7: Certification | 82 |
| Section 8: Addendum | 84 |
| After Completing Inspection | 85 |
| Cathodic Protection Test | 86 |
| Other Forms | 92 |

| | |
|---|-------------------|
| Chapter 5: Overview of Certified Inspector | 93 |
| General (18 AAC 78.400 - 78.499) | 93 |
| Qualifications | 94 |
| Applications | 96 |
| Renewal | 96 |
| Impartiality | 96 |
| False Statements | 97 |
| Chapter 6: Tank Tags | 99 |
| Different Types of Tags | 99 |
| Permanent Tag Construction | 99 |
| Proper Display | 100 |
| Lost, Damaged, Stolen Tags | 100 |
| Chapter 7: Resources and References | 101 |
| Contact Information | 101 |
| Recommended Reading: | 102 |
| Internet Resources | 104 |
| <u>Operations Inspection Report Form</u> | Attached |

Chapter 1: Introduction

Through review of cleanup and compliance information, the Alaska Department of Environmental Conservation (ADEC) has observed numerous and repeated problems with the management of underground storage tank (UST) systems. These problems can be operational, such as improper performance of release detection, or equipment-related, such as tank failure or leakage. The problems are the result of poor operation and maintenance, initial installation or upgrade errors, general equipment failure, or a combination of the three.

In August 1999, ADEC adopted regulations that require the inspection of regulated UST systems every three years by a licensed, private inspector.

The results of the first two years of inspections in 2000-2001 showed some impressive results: of the over 800 tanks inspected, over 80% required some type of corrective measure before the UST passed inspection. By the end of 2001, over 1,300 individual problems were noted and corrected.

ADEC believes that routine inspections will save UST owners and operators considerable costs over time by:

- 1) preventing leaks and spills;
- 2) discovering small problems before they become large ones;
- 3) promoting good operation and maintenance practices; and
- 4) extending the overall life of UST systems.

This manual serves a number of purposes. First, it is designed to help introduce interested persons to the overall inspection program. It highlights inspector requirements, as well as the operation's inspection itself.

Second, this manual is required reading for those persons interested in becoming a certified UST inspector. Candidate inspectors are required to attend an ADEC-sponsored orientation class on inspection. This manual is a handout for this class.

Third, this manual is an excellent reference guide for use on the job site. We do not expect everyone to understand all the material in this handbook in one sitting. This manual can be brought to the job site as a resource to help ensure that inspections are done correctly.

Chapter 2: Summary of Inspection Regulations

This chapter outlines the key points of the Operation's Inspection program. Further detail on these points is provided in other chapters of this manual. See 18 AAC 78.015, 18 AAC 78.017, and 18 AAC 78.400.

General Points

- ❑ **Permanent Requirement.** An operation's inspection is required every three years for a regulated underground storage tank (UST) and associated piping. This requirement became effective August 15, 1999.
- ❑ **Tanks Requiring Inspection.** Inspection is required for tanks currently in service or temporarily out of service. Tanks permanently out of service do **not** require inspection.
- ❑ **Existing USTs.** First-time inspections are staggered over a three-year period from April 30, 2000 to August 31, 2002 for all tanks registered on or before June 1, 2000. The inspection date is assigned by regulation and determined by the ADEC facility identification number.
- ❑ **New USTs.** First time inspections for tanks registered after June 1, 2000, shall be required three calendar years after the date of tank registration. All new USTs automatically receive a permanent tag after the tank is registered.
- ❑ **Inspection.** An inspection means to examine, assess, test, and document release detection equipment, spill and overfill devices, and corrosion protection equipment, operations and record keeping.
- ❑ **“As-Is” Inspection.** An inspector should grade an inspection based on “as is” conditions when arriving on site. Any subsequent fixes should be noted as a follow-up.
- ❑ **Inspectors.** Only persons currently certified by the State of Alaska in UST Operation's Inspection may perform a UST inspection and sign the necessary paperwork. It is the responsibility of the owner or operator to hire or a certified inspector.
- ❑ **Cathodic Protection Testing.** A cathodic protection test can be done by an ADEC-certified UST inspector, a certified cathodic protection tester or a corrosion “expert”.
- ❑ **Rural Inspections.** Special allowances are provided to alter the inspection date for USTs in rural parts of the state where an inspection might otherwise not be available at a reasonable cost. Prior approval is required by ADEC.
- ❑ **Inspection Due Dates.** All inspections must be performed between April 30 and August 31 of the year inspection is due. Owners or operators have these 120 days to fix, repair or correct problems noted during the inspection.

- ❑ **Paperwork.** The owners or operators of a UST must submit an Operations Inspection Report form to ADEC signed by the inspector and the owner or operator. The report must be submitted to ADEC after inspection is complete and no later than September 30 of the year inspection is due.
- ❑ **Form Review.** Within 30 days of receiving the form and no later than October 31 of the year inspection is due, ADEC will review the Inspection form and mail the owner or operator a permanent tag for a tank that satisfactorily passes review.
- ❑ **Site Conditions Before and After Inspection.** With a few exceptions, such as record keeping history, a UST inspection focuses on checking actual site conditions at the time of inspection, not site conditions before and afterwards. Think of the inspection as a “snap-shot” in time.
- ❑ **Inspection Schedule.** The following schedule of events is to be followed on the year inspection is due.

| Step | Action | Date | |
|------|---|--|-------------------------------|
| 1 | Inspection due date no sooner than | April 30 | of the year inspection is due |
| 2 | Inspection due date no later than | August 31 | |
| 3 | Report form due to department no later than | September 30 | |
| 4 | Permanent tag provided for passed tanks | 30 days after receipt of passing inspection form | |
| 5 | Unless renewed, an existing tag expires | October 31 | |

Tank Tags

- ❑ **Posting.** Starting August 15, 1999, owners or operators must post a UST compliance tag for each tank that is currently in use and subject to inspection. This is a permanent requirement.
- ❑ **Permanent Tag.** ADEC provides a permanent tag for each UST after the inspection form has been approved. The permanent tag is good until next inspection in three years. All tags expire October 31 of the year inspection is due. New tanks installed after June 30, 2000, will receive a permanent tag after the new tank is registered with ADEC.
- ❑ **Taken Out of Use Tanks.** Tanks taken out of service or temporarily closed are not issued a starter tag. However, they must be inspected.
- ❑ **Visibility.** Tags must be placed in an area that is easily seen by the fuel distributor prior to delivery.

Failed Inspections

- ❑ **Notification.** Inspectors shall notify the owner or operator if a tank fails inspection.
- ❑ **No Tag.** ADEC will not provide a tag to a tank that failed inspection until the problems are corrected, and a subsequent inspection is passed.
- ❑ **Prohibited.** It is unlawful to receive petroleum into a UST without the proper tag. It is also unlawful to tamper with, remove or destroy a current tag, except as required by regulation.
- ❑ **Tag Return.** The owner or operator must return the current operating tag to ADEC no later than November 1 after failing the inspection.
- ❑ **Corrections.** A tank system that fails inspection may still pass if corrections are made afterwards, and so long as the system is not leaking. Owners and operators are encouraged to work with inspectors to correct problems. Any corrections made before, during or after inspection must be noted in the appropriate section under “corrections”.
- ❑ **Enforcement.** A UST system that is not tagged by November 1 of the year inspection is due may not receive product. ADEC will issue a compliance order by consent with a fine for each tank without a tag.
- ❑ **Disagreements.** If the owner or operator does not agree with the findings of the inspector, either party may call ADEC or EPA and ask for a second opinion.



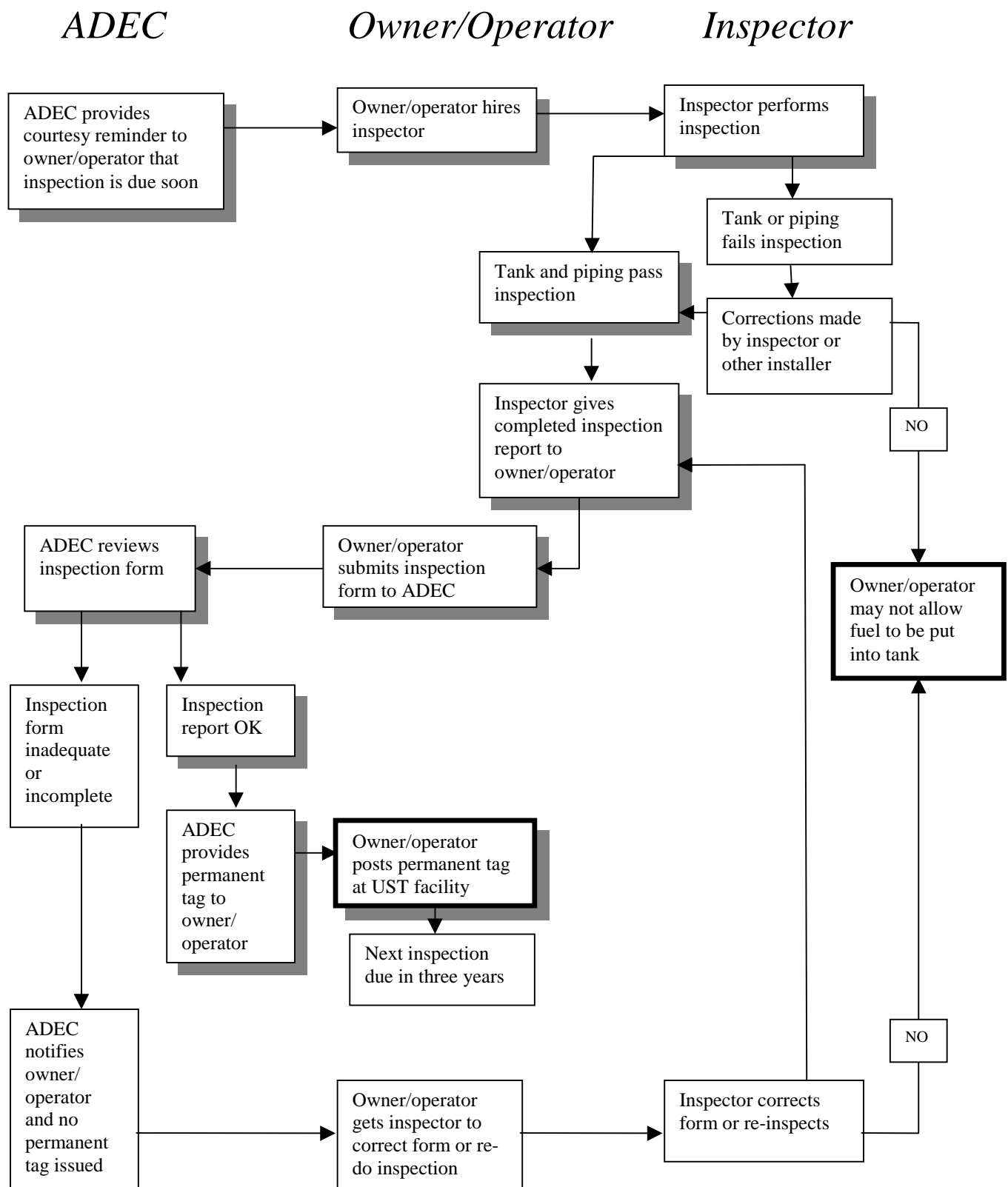
While performing an inspection, one inspector found a ladder inside the tank. Southcentral Alaska, 2001

Chapter 3: Preparing for the Operations Inspection

The following chapter provides a number of topics an inspector must understand prior to performing the operations inspection.

- ❑ **How the Inspection Process Works.** A flow chart showing all the steps of the inspection process and who is responsible for each step. This is valuable for first time inspectors.
- ❑ **Recommended Tools: Suggested Equipment Needed to Perform a Typical Inspection.** A suggested list of items to bring to the job site.
- ❑ **Maintenance, Repairs, Upgrades: What's the Difference?** When an inspector comes across something that needs fixing, is it an upgrade, repair or just routine maintenance? The difference is important because the laws on reporting requirements vary. Learn the different requirements for each.
- ❑ **Known or Suspected Releases.** Inspectors may come across a tank system that is leaking or one that has suspicious release detection readings. Know what to look for, how to respond, and who to contact.
- ❑ **Common Problems Checklist.** A number of routine or common problems can be found at a UST site. This simple checklist will help classify different types of problems.
- ❑ **Upgrade and Repair for Cathodic Protection Systems.** Two flowcharts describing the steps for upgrading or repairing cathodic protection systems that fail.

How the Inspection Process Works



Recommended Tools: Suggested Equipment Needed to Perform a Typical Inspection

The following is a list of equipment, materials, and tools that ADEC suggests an inspector have on hand prior to performing an inspection.

1. Source Materials

- ☐ ADEC Inspector Reference Handbook and ADEC Inspection Form
- ☐ EPA's "List of Leak Detection Evaluations for UST Systems," latest edition
- ☐ Blank UST registration form, and other ADEC forms as needed

2. Site-Specific Information These should be reviewed before arriving on-site.

- ☐ UST registration form (available from ADEC, the Internet or owner/operator)
- ☐ Known date of last tank or line tightness test (get copy of test in advance)
- ☐ Last 12 months of release detection records (in advance if possible)
- ☐ Last cathodic protection test results if steel tank or pipe
- ☐ Last annual automatic line leak detector test if pressurized pipe
- ☐ Copy of current operation tag
- ☐ Records of calibration tests, and facility operation's maintenance logs
- ☐ As built drawings, receipts, photographs, videos, and equipment warranties
- ☐ Previous inspection reports
- ☐ Copies of any spill reports

3. Basic Tool Box Items

- ☐ Automatic line leak detector testing device
- ☐ Folding tank gauge stick
- ☐ Fuel and water finding paste
- ☐ Long pry bar
- ☐ Tape measure, level and pressure gauges
- ☐ Small tools (screwdrivers, adjustable wrenches)
- ☐ Flashlight, marking pens, chalk
- ☐ *New: Digital camera*

4. Special Items for Cathodic Protection Testing

- ☐ Volt meter
- ☐ Copper-copper sulfate Reference Cell
- ☐ Insulated connector leads (30+ foot)
- ☐ Alligator clamps
- ☐ Water bottle

5. Safety Equipment

- ☐ Traffic safety cones
- ☐ Hard hats, gloves, boots
- ☐ Fire extinguisher, Safety glasses, face shield, ear plugs

Maintenance, Repairs, and Upgrades: What's the Difference?

An owner or operator of an underground storage tank (UST) must ensure that tank systems are properly maintained, repaired and upgraded. Exactly who can do each of these three tasks can differ slightly. This section will help UST inspectors understand the different requirements for each action. *See 3.f. of this manual for additional requirements about cathodic protection.*

1. Definitions

- ❑ **Maintenance:** The normal operational upkeep to prevent a UST from releasing petroleum. 18 AAC 78.995 (88)
- ❑ **Repairs:** *After a release has occurred*, to correct or restore a UST, or any part of a UST, that routinely contains petroleum, including repairs to the tank vessel, pipes, valves, fill pipes, or vents. 18 AAC 78.055 (d) and 18 AAC 78.499 (3).
- ❑ **Upgrades:** To add or retrofit cathodic protection systems, lining, spill and overflow controls, or similar systems to improve the ability of an underground petroleum storage tank system to prevent a release. AS 46.03.430 (d)(2).

2. Maintenance

The owner or operator, a manufacturer representative, a general contractor, or a certified tank worker/inspector can do maintenance of a UST system. Maintenance can include cleaning overfill buckets, adjusting overfill alarms, or re-spooling the paper for an automatic tank gauge printer. Maintenance does not include work that requires replacing a major piece of equipment like a sacrificial anode.

3. Repairs

According to UST law, repair means repairing a tank or pipe that is leaking or has leaked. Owners or operators must ensure the following:

- ❑ **Certified Worker Used:** A person certified in UST Installation or Inspection must perform or supervise any repair work.
- ❑ **Standards Followed:** Repairs must be done in accordance with national standards:
 - a. National Fire Protection Association Standard 30, *Flammable and Combustible Liquids Code*, 1993 Edition;
 - b. American Petroleum Institute Recommended Practice 2200, *Repairing Crude Oil, Liquefied Petroleum Gas, and Product Pipelines*, Third Edition, May 1994
 - c. American Petroleum Institute Recommended Practice 1631, *Interior Lining of Underground Storage Tanks*, Third Edition, April 1992; and
 - d. National Leak Prevention Association Standard 631, *Entry, Cleaning, Interior Inspection, Repair and Lining of Underground Storage Tanks*, 1991.

- ❑ **Repaired Equipment Tested:** Repaired tanks and pipes must be tightness tested within 30 days after repairs. Testing must be performed by a person currently certified by the State of Alaska in Tank Tightness Testing. Tightness testing is not required if:
 - a) the tank is internally inspected and
 - b) the tank has automatic tank gauging, interstitial monitoring or statistical inventory reconciliation (SIR) as a form of monthly monitoring.

Records Maintained: The owner or operator must keep records of each repair done for the remaining operating life of the system.

4. **Upgrades:**

An upgrade can include adding or replacing the following devices to existing tanks: Spill Prevention, Overfill Prevention, Release Detection, and/or Cathodic Protection. In order to perform an upgrade, Owners and Operators must ensure the following.

- ❑ **Certified Worker Used:** Only a person certified in UST Installation or Operations Inspection may perform or supervise upgrade work done on a UST system.
- ❑ **Work Performed:** Upgrade work must be done in accordance with upgrading requirements found in 18 AAC 78.030.
- ❑ **Registration Form Updated:** The owner or operator shall file a registration form (which includes upgrading) to ADEC within 30 days after upgrading. The form must be signed by the certified worker performing the upgrade and the owner or operator.

Known or Suspected Releases (18 AAC 78.200 - 78.220)

If you observe any of the following conditions, you must report it as a known or suspected release:

- ☐ Presence of free product (liquid petroleum); soil contamination; surface or groundwater contamination; or petroleum vapors in sewer, basement, or utility lines;
- ☐ Sudden loss of petroleum;
- ☐ Unexplained water in the tank or piping;
- ☐ If the results of your release detection system show a release; or
- ☐ Erratic behavior of the dispenser.

You do not need to report a suspected release if:

- ☐ The monitoring device reporting the suspected release is found to be defective and is immediately repaired, calibrated, or replaced; **and**
- ☐ Additional monitoring does not confirm the initial result of a release.

| What to Report and When | | |
|--|------------------------------|------------------------|
| What you discover | When you must report to ADEC | Who to contact |
| Any release of 55 gallons or greater | Immediately | Regional Response Team |
| Below ground release of any amount | Within 24 hours | Regional Response Team |
| Above ground release to land between 10-55 gallons | Within 24 hours | Regional Response Team |
| Above ground release to waters of the State that cause sheen | Within 24 hours | Regional Response Team |
| Above ground release of less than 10 gallons | Within 7 days | Regional Response Team |
| Any unusual operating conditions: <ul style="list-style-type: none"> <input type="checkbox"/> The presence of free product (liquid petroleum); soil contamination; surface or groundwater contamination; or petroleum vapors in sewer, basement, or utility lines. <input type="checkbox"/> Erratic behavior of the dispenser <input type="checkbox"/> Sudden loss of petroleum <input type="checkbox"/> Unexplained water in the tank or piping | Within 7 days | Regional UST Office |
| Any release detection results that indicate a release may have occurred. | Within 7 days | Regional UST Office |
| Two consecutive months of "Inconclusive" readings on SIR, ATG, or Inventory Control release detection | Within 7 days | Regional UST Office |
| When in doubt, play it safe and report it immediately | | |

| Who to contact in the event of a known or suspected release based on location of incident | |
|--|--|
| Regional Response Team | Regional UST Office |
| <ul style="list-style-type: none"> <input type="checkbox"/> Anchorage phone: 269-3063 fax: 269-7648 <input type="checkbox"/> Fairbanks phone: 451-2121 fax: 451-2362 <input type="checkbox"/> Juneau phone: 465-5340 fax: 465-2237 <p>Outside normal business hours: 1-800-478-9300</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Anchorage phone: 269-7500 fax: 269-7507 <input type="checkbox"/> Fairbanks phone: 451-2100 fax: 451-2187 <input type="checkbox"/> Juneau phone: 465-5200 fax: 465-5218 <input type="checkbox"/> Soldotna phone: 262-5210 fax: 262-2294 |

Common Problems and Errors

The following is a list of potential problems at UST facilities. The problems can be related to the equipment, operation or record keeping of the UST system. Use this list to help diagnose the UST system and see if any of these common problems are noted during inspection.

Release Detection

Automatic Tank Gauging

- ☐ not running a test at least once a month,
- ☐ not programmed properly,
- ☐ not responding to alarms,
- ☐ not having an ATG that is serviceable,
- ☐ not following maintenance and calibration schedules,
- ☐ not enough product in tank, or test time too short, to perform a valid test,
- ☐ not third party evaluated for large tanks,
- ☐ no documentation available,
- ☐ probe not functioning, not connected,
- ☐ probe incompatible with console,
- ☐ out of paper, paper jammed, or ink illegible,
- ☐ power or warning lights burned out, or
- ☐ no log of results for the last 12 months.
- ☐ Having two consecutive months of Invalid leak detection results and not reporting it as a suspected release to ADEC.

Interstitial Monitoring

- ☐ not keeping a written log of the monthly checks (manual),
- ☐ not keeping a printed copy of monthly leak detection records (electronic)
- ☐ sensor not present (electronic),
- ☐ sensor not functioning (electronic),
- ☐ sensor placed too high in sump to be effective,
- ☐ sensor submerged in product or water,
- ☐ sensor removed from tank interstice,
- ☐ water in interstice
- ☐ no maintenance or calibration of sensors,
- ☐ interstitial riser tube for tank not tight or not connected to tank top,
- ☐ sensor only form of leak detection for pressurized piping,
- ☐ sensor not positioned in lowermost portion of piping run, or
- ☐ not testing or measuring every 30 days.

Statistical Inventory Reconciliation (SIR)

- ☐ having two consecutive months of "inconclusive" results and not reporting it to ADEC,
- ☐ not using a third party approved vendor,
- ☐ not collecting data according to vendor's instructions, or
- ☐ not following SIR vendor's recommendations to improve daily readings.

Inventory Control

- ☐ doing reconciliation math wrong,
- ☐ not gauging the tank every operating day,
- ☐ not gauging the tank through a drop tube and not using a tank gauge stick calibrated to 1/8 of an inch increments,
- ☐ gauge stick worn down at bottom or too short to measure full height of tank,
- ☐ not checking for water once a month and writing it down,
- ☐ not recording all deliveries,
- ☐ not reconciling at the end of the month (this is what tells you if you have a leak) or doing calculations wrong,
- ☐ not testing the dry portion of the tank (ullage test) while conducting the required annual tightness test,
- ☐ not reconciling deliveries with fuel receipts, or
- ☐ not having calibrated dispenser (totalizer).

Manual Tank Gauging

- ☐ not gauging the tank at required times, or
- ☐ not reconciling at the end of the month (this is what tells you if you have a leak).

Tightness Testing

- ☐ using a volumetric test and not having the product level in the tank at the level which routinely contains product when the test is performed,
- ☐ not using a currently certified UST tightness tester,
- ☐ not using a tightness test method approved by a third-party,
- ☐ not doing a line tightness test every year, or
- ☐ not doing a tank tightness test every five years.

Automatic Line Leak Detectors

- ☐ not installed or installed incorrectly,
- ☐ not maintained or calibrated,
- ☐ not tested annually (mechanical),
- ☐ not meeting standard of 3 gph leak rate at 10 psi,
- ☐ not having documentation of the monthly 0.2 gph test (electronic), or
- ☐ not functioning.

Spill and Overfill Problems

- ❑ someone not measuring the tank before each delivery to ensure there is enough room in the tank,
- ❑ someone not monitoring the entire fuel transfer,
- ❑ no external alarm for an overfill alarm system (alarm should be able to be heard by the delivery driver – alarm does not serve its purpose if it only sounds inside the building),
- ❑ alarm disconnected,
- ❑ alarm sensor set higher than 90%,
- ❑ overfill float set higher than 95%,
- ❑ inventory stick inserted in fill pipe during delivery to by-pass overfill device,
- ❑ dirt, trash or water/snow in spill bucket,
- ❑ spill bucket damaged or cracked and not liquid-tight,
- ❑ ball float valve installed on a tank that receives pressurized deliveries, has remote fill ports, or uses suction piping with air eliminators, or
- ❑ ball float valve under vent pipe damaged.

Cathodic Protection

- ❑ galvanic anode not activated at installation,
- ❑ system not turned on,
- ❑ no cathodic protection on metallic piping,
- ❑ not doing and recording system monitoring every 60 days (impressed current only),
- ❑ not conducting a cathodic protection test within six months following the installation of the cathodic protection system,
- ❑ not conducting a cathodic protection test every three years thereafter,
- ❑ fill or vent pipe not dielectrically isolated from STI-P3 tank,
- ❑ not correcting system if system fails,
- ❑ not having a reliable test center to conduct the CP test,
- ❑ faulty wiring (improper burial depth or construction or damaged wires) for impressed current,
- ❑ impressed current rectifier tampered with, or
- ❑ irregular or non-uniform readings for impressed current.

Upgrade and Repair for Cathodic Protection Systems

One of the more complicated problems encountered during an inspection will probably be a UST with a faulty or failed cathodic protection system. A cathodic protection system may fail for a number of reasons including:

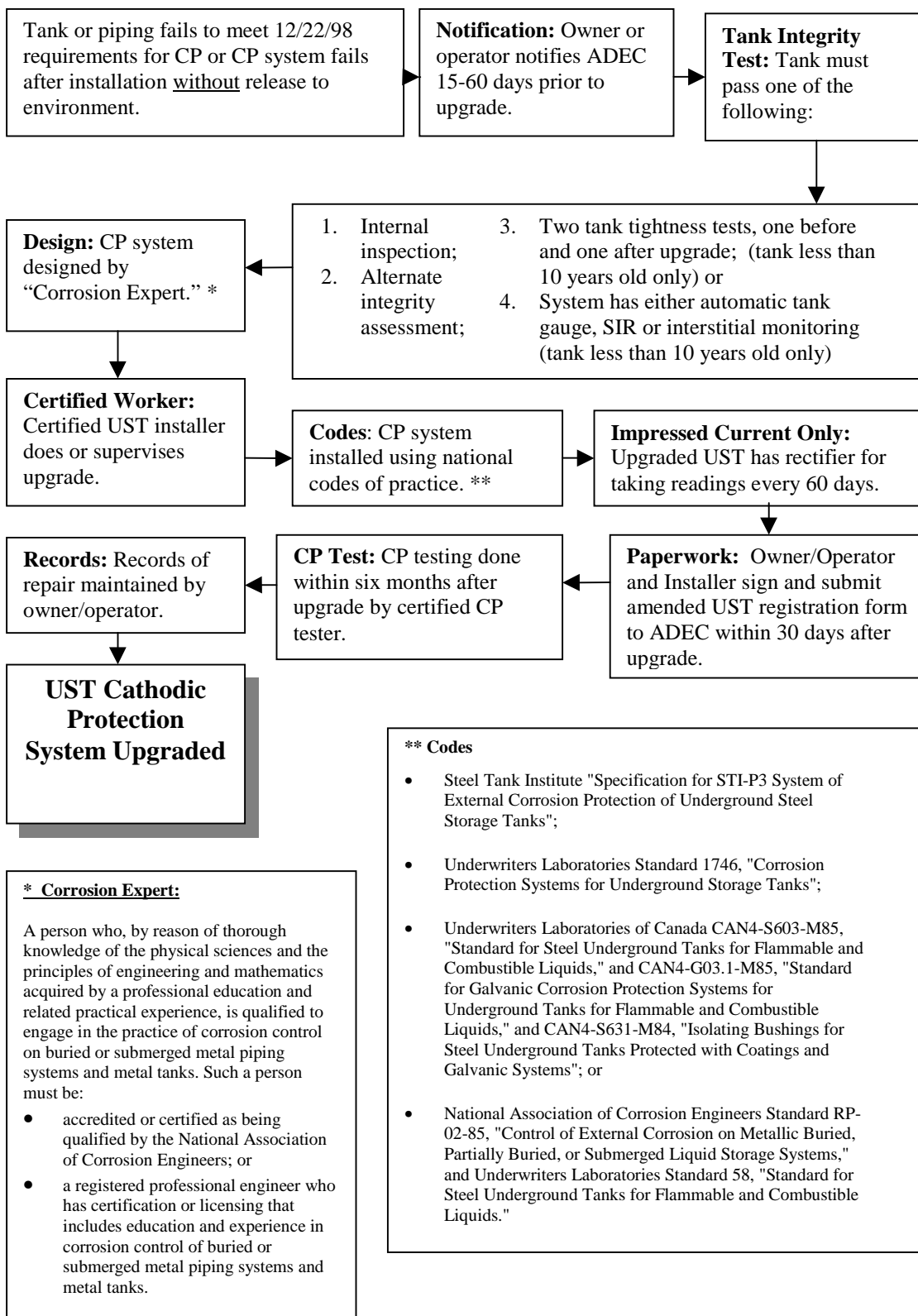
- ❑ Improper backfill material
- ❑ Failure of electrical isolation (like a cracked dielectric bushing)
- ❑ Failure to activate galvanic anode
- ❑ Improperly designed impressed current system
- ❑ Wiring failure between anodes and rectifier
- ❑ Faulty rectifier
- ❑ Improperly installed anode
- ❑ Direct contact of dissimilar metals

If a cathodic protection system requires upgrading (inadequate electrical coverage) or repair (the tank rusted through), an inspector has authority to direct upgrade or repair actions, so long as certain conditions are met. Refer to the following two flowcharts which describe the process for each.

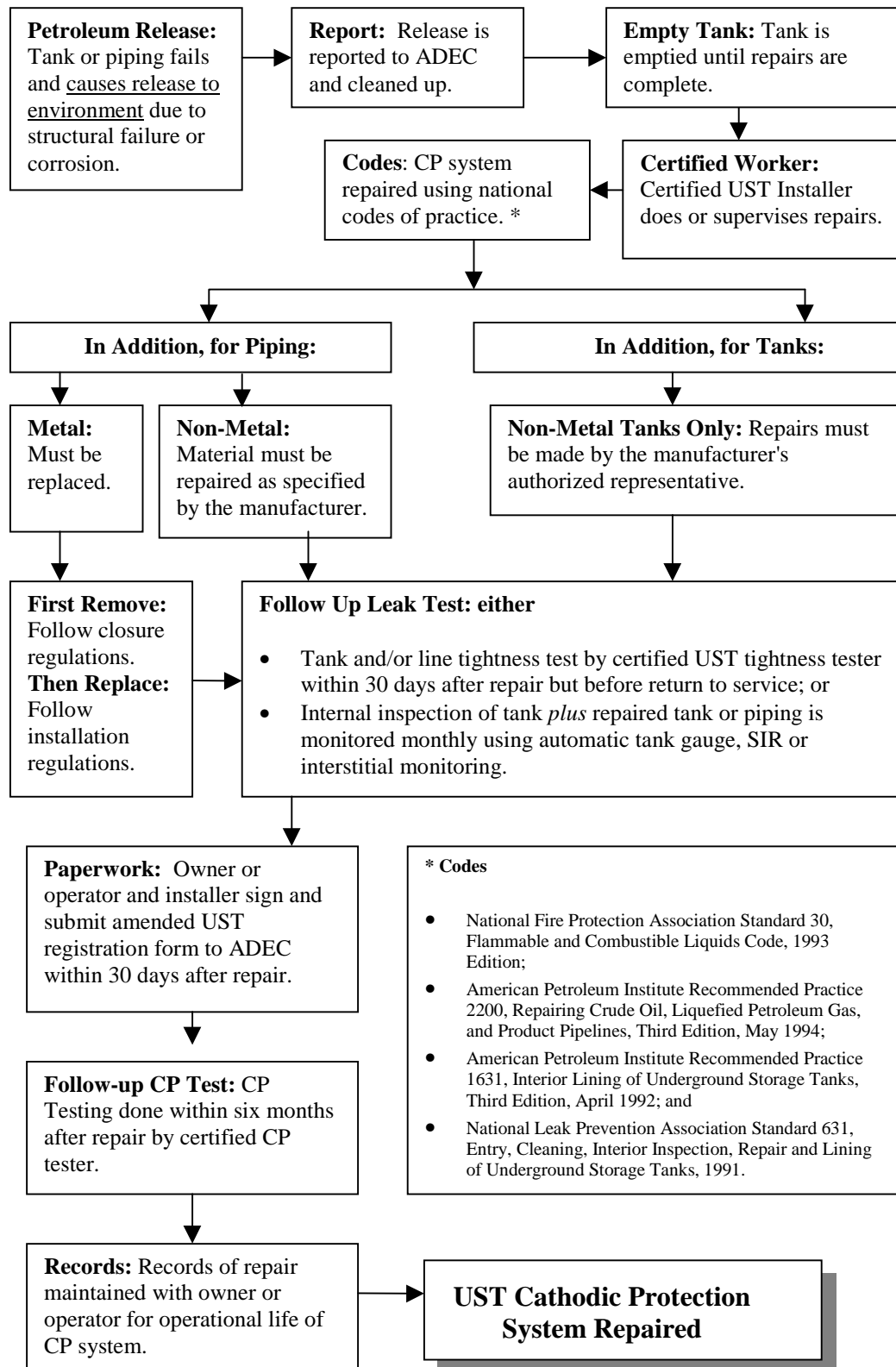
A note for STI-P3 Tanks

If a tank fails a cathodic protection test and is a Steel Tank Institute tank (STI-P3), ADEC suggests you contact STI for technical advisement before repairing or upgrading. Call STI at 847-438-8265.

Upgrading Cathodic Protection Tank or Piping



Repairing Cathodic Protection on Tank or Piping after a Release to the Environment



Chapter 4: Filling Out the Inspection Report Form

The following chapter is provided to help an inspector fill out the Inspection Report Form. See 18 AAC 78.017. Inspectors can refer to this chapter while on site performing the inspection.

This chapter is organized to provide a page-by-page, line-by-line description of everything required on the form. An inspector who has a question about a particular item on the form can look at a detailed explanation in this chapter.



Meet the operator first. A thorough review of the UST operator's paperwork and records beforehand will help the inspector know what problems to look for.

Before Inspection Begins

- ❑ **Papers Ready.** Prior to arriving at the site, ask the owner or operator to have ready any and all paperwork on the UST system. See Page 14 for a list of recommended documents to have ready. If the owner or operator does not have appropriate documentation, the owner or operator should research the information with previous property owner or operator, the tank installer or ADEC.
- ❑ **Planning Ahead.** Prior to arriving at the site, discuss the inspection with the person you will meet at the site. Explain that you will need access to the entire tank system (all sump lids, covers, hatches) and will need to speak with the person responsible for the tank operation and record keeping. Describe what records you will need to see, especially if records are kept at a different location. This will save time on the day of the inspection. Ensure that the tank operator will be available to demonstrate or explain the currently used release detection method.
- ❑ **Meet the Operator While On Site.** Third party inspections are most effective if you work with the operator, the person most familiar with the UST system. Contact the operator before showing up on site. Plan on having the operator present during your inspection.
- ❑ **Release Detection Records.** The most common problem experienced by Alaska UST inspectors is the lack of release detection records. Inspectors should make an extra effort to ensure the records are present and organized when arriving on-site for the first time.
- ❑ **Registration Information.** If possible, get a copy of the UST registration information on file with ADEC. Information is also available from the ADEC web page at <http://www.state.ak.us/dec/dspar/stp/search.htm>.
- ❑ **Report Submittals.** ADEC will only accept original inspection reports. It is the responsibility of the owner or operator to ensure the original Inspection Report Form is filed with ADEC.

Find UST Information On-Line

<http://www.state.ak.us/dec/dspar/stp/search.htm>

Get a complete facility report on-line

The screenshot shows a web browser window titled "Facility Report - Microsoft Internet Explorer". The address bar displays the URL: <http://www.dec.state.ak.us/dspar/stp/search.asp?FacilityID=440>. The page features a map of Alaska on the left and navigation links on the right: [New Facility Search](#), [New Owner Search](#), and [New LUST Site Search](#).

Alaska Underground Storage Tank
Facility Summary Report

Facility Summary for Facility ID #440

Owner Information

| Owner Name | Mailing Address | City | State | Zip |
|-------------|-----------------|-----------|-------|-------|
| Phil Carbey | P.O. BOX 80701 | Fairbanks | AK | 99708 |

Facility Information

| Fac. ID | Location Name | Location Street Address | Location City | Zip |
|---------|---------------|-------------------------|---------------|-------|
| 440 | Gald Hill | 3040 PARKS HWY | Fairbanks | 99709 |

Tank Information - Tank 1

| ADEC Tank ID | Owner Tank ID | Status | Closure Status | Installed | Age |
|--------------|---------------|------------------------|--------------------------|-----------|-----|
| 1 | 1 | Permanently Out of Use | Tank removed from ground | 5/14/70 | 32 |

| Product | Capacity | Tank Material Construction | Secondary Containment Option | Tank Release Detection: <*(note can be more than one option)> |
|----------|----------|-----------------------------|------------------------------|---|
| Gasoline | 4000 | Asphalt Coated or Bare None | Not Listed | Not Listed |

| Pipe Material Construction | Secondary Containment Option | Piping Type | Piping Release Detection |
|----------------------------|------------------------------|-------------|--------------------------|
|----------------------------|------------------------------|-------------|--------------------------|

<http://www.state.ak.us/dec/dspar/stp/search.htm>

Basic Information (All Pages)

This section summarizes general information about the UST Inspection Report form. It also explains some definitions that will help inspectors know what is required in an inspection.

- ❑ **Inspection due date.** All USTs must be inspected for the first time on the schedule provided below:

| Initial Inspection Requirements | | | |
|---------------------------------------|--|------|---|
| Last Digit of ADEC Facility ID Number | For a UST registered on or before June 1, 2000 | | For a UST registered after June 1, 2000 |
| | Inspection Due | | Year Inspection Due |
| 1 | April 30-August 31 | 2000 | The third calendar year after registration. |
| 2 | | 2000 | |
| 3 | | 2000 | |
| 4 | | 2000 | |
| 5 | | 2001 | |
| 6 | | 2001 | |
| 7 | | 2001 | |
| 8 | | 2002 | |
| 9 | | 2002 | |
| 0 | | 2002 | |

- ❑ **Multiple Registration Dates:** If a UST facility has tanks that were installed and registered at different dates, an inspection must be done on the *earliest date* of all tanks. Example: Facility 456 has one tank and has an inspection due in summer 2001, 2004, 2007, etc. The owner installs another tank in 2002. Both tanks must be inspected in 2004.
- ❑ **Facility Visit.** A facility visit is not an optional part of the inspection. An inspector must be physically present to perform the inspection to the standards of practice listed in 18 AAC 78.455.
- ❑ **Filling Out the Report.** The inspection report should be filled out completely. Use ink that will not run; do not use pencil.
- ❑ **Filling Out Each Page.** On the bottom of each page, both the inspector and the owner or operator must initial and date each page. By initialing and dating each page, this testifies that the inspector has filled out each page and the owner or operator has read each page. **ADEC will not accept pages without signature or initial.** Inspectors should explain the entire report to the owner, preferably in person.

- ❑ **Owner's Maintenance of Records.** The owner or operator is permitted to keep his/her records at a site other than the storage tank facility. A storage location other than the facility does not remove the inspector's obligation to view those records. Arrangements should be made with the owner or operator to have the records supplied, or for the inspector to visit the alternate storage site. An inspection is not complete until the records are reviewed.
- ❑ **Shaded Questions.** If a question is in a shaded box, it is considered to be an item of "significant operational compliance" and must pass inspection. A question that is not in a shaded box does not necessarily have to pass but certain restrictions may apply.
- ❑ **Report Form Version.** The inspector should only use the most current version of the "Operations Inspection Report" form. ADEC will provide all inspectors with the most current version, *but it is up to the inspector to have the most current report form.* The most current form is available on ADEC's Storage Tank web page at <http://www.state.ak.us/dec/dspar/stp/forms.htm>.
- ❑ **Unregistered Tanks.** If an unregistered UST subject to UST regulations is discovered during the inspection, it must be inspected with the other tanks. Indicate on the form any unregistered, regulated tanks. *Make sure the owner or operator files an amended UST registration form as soon as possible.*
- ❑ **Compartmentalized Tanks.** A compartmentalized tank is considered a single tank; each compartment is not considered to be a separate tank. However, when filling out the form, in some cases both compartments must be inspected such as when an ATG has a probe in each tank. When that is the case, designate each compartment and provide a separate inspection for each. Example: Tank #1 has two compartments, one gasoline and one diesel. The gasoline side would be Tank 1A and the diesel compartment would be 1B.
- ❑ **Emergency Power Generator/Heating Oil Tanks.** A UST that stores diesel fuel used solely for emergency power generation is regulated by ADEC, although these tanks are not required to have release detection. A UST that stores heating oil that is consumed on the premises is **not** regulated by ADEC. A UST used for the dual purpose of on-premises consumption and emergency power generation is **not** regulated by ADEC.
- ❑ **Multiple Piping Systems.** When a tank system has more than one type of piping system (ie: UST has both pressurized and suction piping), use all applicable sections of the inspection report form. Each separate pipe run must be inspected and listed separately on the inspection form.

- ❑ **Verification of Compliance.** Third Party inspection compliance is based in part on answering a series of questions for each type of device or operation for leak detection, spill/overfill prevention and corrosion protection. Most questions are answered with either Yes or No. Answer a question with Yes only if the item is in compliance at the time of inspection with no adjustment or correction. If anything is done to fix a piece of equipment or correct an operating procedure, then answer the question with a No. If the answer is No, describe it in the area at the bottom of the page under Deficiencies and Corrections.
- ❑ **“Deficiencies.”** At the bottom of each section there is a place to note any compliance problems found during inspection. Even if the problem is fixed before completion of inspection, any deficiency should be noted. This section must always be filled out if any problem is noted, even one that does not cause the failure of an inspection.
- ❑ **“Corrections.”** At the bottom of each section there is a place to note any corrections made during inspection. This section should be only used when a correction is actually done during inspection. Corrections are not recommendations: they are problems or deficiencies that have been fixed and *completed* during an inspection. Problems or deficiencies that have been fixed after inspection, but prior to submitting of the inspection form to ADEC should be listed in Section 8 Addendum.
- ❑ **“Further Recommendations.”** At the bottom of each section there is a place to note any suggested recommendations based on the results of the inspection. Recommendations are suggestions to increase the overall performance of certain UST equipment.
- ❑ **Digital Photos.** In 2000, a number of inspectors provided digital images of the sites they inspected. Images included sumps, sensors, ATGs, ALLDs, voltage readings during a cathodic protection test, and other general site pictures. In 2002, inspectors are asked to start submitting digital pictures along with the existing inspection report. Preferred file format is JPG or GIF. BMP files tend to be too large. ADEC asks that image files be labeled and submitted on a floppy disc.

Section 1: General Information

This section should be straightforward. List the current information provided by the owner or operator and see if it matches the information in the ADEC records. If not, the owner or operator must fill out an amended Registration form and provide it to ADEC.

- ❑ **Facility Name Information.** Include information on the facility: name, street location, city and phone number.
- ❑ **Operator Name Information.** Include information on the UST operator: Name, phone, fax and e-mail in case ADEC must contact the operator.
- ❑ **Owner Name Information.** Include the UST owner information including name, mailing address, city, state, zip code and phone number.
- ❑ **Mailing Address for Compliance Tags.** If the tags are to be mailed to somewhere other than the owner mailing address, please specify.
- ❑ **ADEC Facility ID Number.** Include the ADEC facility identification number. The number should be located on the UST starter tag, on file with the owner or operator, or available upon request from ADEC.
- ❑ **Date of Inspection.** List the date the inspection was *completed* for each tank.
- ❑ **Inspector Name.** Include the name of the licensed third party inspector who performed the inspection.
- ❑ **All applicable tanks registered.** Confirm that all tanks are registered with the State of Alaska before continuing inspection. If an unregistered tank is discovered, contact ADEC immediately for instructions.
- ❑ **Current UST compliance tags visible to the delivery driver?** Confirm that a starter tag or permanent tag is visible to the person delivering fuel to the tank. By the end of 2002, all starter tags will expire.
- ❑ **Tank Numbering System.** Tank identification numbers are very important; they allow ADEC to properly track each tank at the facility. Care must be exercised during the inspection to use the tank numbers shown on the registration form. **Only use the tank number that ADEC assigned.** When tanks are closed at a facility, the old numbers remain in the computer system and are not reassigned.
- ❑ **Owner Tank ID#.** A number of UST operators in Alaska have their own identifying number system for their USTs. List the owner's tank ID # if different than ADEC's number.
- ❑ **Status.** List whether the tank is active (currently in use) or temporarily out of use.

- ❑ **Capacity.** List the actual capacity for each tank based on available records.
- ❑ **Product.** List the current product type for each tank. Be specific in case you have two identical tanks and you are unsure how to assign a tank ID number.
- ❑ **Tank Construction Material.** List the type of material the tank is constructed of. Options include bare steel, cathodically protected steel, fiberglass, or fiberglass clad-steel.
- ❑ **Compartment Tank.** Check "Yes" if the tank is a compartment tank. An inspector should assign a tank number designation for each compartment of the tank and use that designation throughout the form. Example: Tank 4 is a 3-compartment, 20,000-gallon UST. The tank contains regular unleaded (8,000 gallon, super-unleaded (8,000 gallon) and diesel (4,000 gallon). The designation should be regular unleaded 4A, super-unleaded 4B, and diesel 4C.
- ❑ **Double Wall Tank.** Answer Yes or No whether the tank is double wall.
- ❑ **Piping Type.** List whether each pipe run is suction or pressurized.
- ❑ **Pipe Construction Material.** List the type of material the pipe is constructed of. Options include bare steel, cathodically protected steel, fiberglass, or flexible non-metal.
- ❑ **Double Wall Pipe.** Answer Yes or No whether the pipe is double wall or in secondary containment.
- ❑ **Multiple Pipe Runs per Tank.** Answer Yes if the tank has more than one section of piping that routinely contains product. List each pipe separately: Pipe 1A, 1B, 1C, 2A, 2B, etc.
- ❑ **Emergency Power Generator UST.** Answer Yes if the tank serves an emergency power generator.
- ❑ **Site Sketch.** On page 2, include a simple but complete site sketch of the UST system. The sketch should include the following items:

| | |
|--|---|
| <p>(T) Tanks (including all compartments) with ADEC tank ID #s</p> <p>(P) Product piping</p> <p>(PS) Piping sumps</p> <p>(D) Dispensers</p> <p>(A) Alarms</p> <p>(ATG) Automatic tank gauge consoles</p> <p>(RCT) Rectifiers</p> <p>(AN) Impressed current anodes</p> <p>(S) Structure Contact Points for CP</p> | <p>(R) Reference cell locations</p> <p>↑ North arrow</p> |
|--|---|

Section 2: Tank Temporarily Closed or Taken Out of Service

Use this section to provide information about a tank that is temporarily closed or taken out of service *but not permanently closed*. See 18 AAC 78.020 and 78.085. Skip this section if all tanks are currently in use. If a tank taken out of service is noted or discovered during inspection, it must be inspected.

- ❑ **Temporary Closure.** A tank is temporarily closed when the owner or operator stops using it but the tank still contains product. However, product is no longer periodically added to the tank or removed. As long as a system contains product, the owner or operator must perform a valid form of release detection on both the tank and piping, as well as performing cathodic protection testing. *An inspector must perform a complete inspection including, as applicable, release detection, spill and overfill prevention, and corrosion protection.*
- ❑ **Taken Out of Service:** A tank is taken out of service when it is completely empty, i.e., less than an inch of regulated substance in the tank, but not permanently closed. *An inspector must perform a complete inspection including, as applicable, release detection, spill and overfill prevention, corrosion protection.*
- ❑ **Release Detection.** Even though a tank taken out of service is not required to have release detection, release detection is required as part of the inspection. The tank and piping must pass inspection to be put back into use.
- ❑ **Spill and Overfill.** Even though a tank taken out of service is not required to have spill and overfill devices, a tank cannot pass inspection without spill and overfill devices. Tanks that receive less than 25 gallons of petroleum per delivery are exempt for spill and overfill inspection.
- ❑ **Less than 1" product.** If the tank contains more than one inch of product it is in use. In this case the owner or operator should contact ADEC immediately for guidance.
- ❑ **Vented and locked.** A tank taken out of service must be secure. That means the tank vent pipe should be open and the fill pipe locked.
- ❑ **Potentially Abandoned Tanks.** An exhaustive search of a large property is not necessary. Report when indicators, such as, extra vent pipes, unused dispensers, etc. are readily apparent. It is not within the scope of an inspection to search for all possible closed-in-place or abandoned tanks. However, if a tank is observed that is not on the ADEC UST registration database, it should be noted in the inspection.

Section 3: Release Detection

This section should be filled out to provide supporting inspection information about the release detection system. Release detection methodology is lengthy, varied and potentially confusing. Also refer to 18 AAC 78.060, 78.065, 78.070 and 78.075. See the end of this chapter for different types of release detection forms.

All Pages: General Considerations

- ❑ **Filling Out Applicable Pages.** An inspector needs only to fill out the pages that are applicable based on the type or types of release detection present or in use at the UST. However, an inspector must use the check box at the upper right corner of pages 4 through 8 and select "Applicable" or "Not Applicable."
- ❑ **Maintaining Records.** There must be a record of checking for releases at least once a month. For methods that do not produce a written record, a log is an acceptable method of documenting that the method or equipment was checked as required. A simple log can be kept for an entire year's of release detection results. Relying on an alarm *not* going off is insufficient; power or equipment failure would render the release detection method inoperable.



This ATG is easily accessible. The operator has the last few months of test results printed and clipped to the business bulletin board to the right of the ATG console.

- ❑ **Release Detection Forms.** Refer to the end of this chapter for a number of common release detection forms that inspectors can provide to owners and operators. These forms are helpful in case owners and operators are not doing proper paperwork for release detection.

- ❑ **Electronic Release Detection Systems.** For UST systems that rely on electronic monitoring for release detection, it is important that an inspector reviews the system setup, and, if possible, print out the results. The system setup will provide valuable information as to the programming and proper functioning.
- ❑ **Maintenance and Calibration:** Leak detection devices must be “installed, calibrated, operated, and maintained according to the manufacturer's instructions, including routine maintenance and service checks for operability or running condition”. In an effort to standardize what inspectors should look for to meet this requirement, ADEC had provided a series of checklists developed by the National Work Group on Leak Detection Evaluation. ADEC suggests using these checklists when no maintenance and calibration schedule can be found during inspection.
- ❑ **Multiple Release Detection Methods for Tanks.** It is only necessary for an owner or operator to pass one type of release detection for tanks (except inventory control/TTT or manual tank gauging/TTT). However, all methods that are present or in use must be noted on the form. ADEC strongly recommends that the method of release detection the operator uses at the time of inspection is the method that is inspected for passing. This avoids the scenario where a tank passes inspection using a method that is technically present but is not being used consistently.
- ❑ **Multiple Sensors in One Compartmentalized Tank.** When testing compliance for release detection the inspector must check compliance for each compartment.
- ❑ **Manual Tank Gauging.** Manual tank gauging is uncommon in Alaska so ADEC has removed it from the UST Operation's Inspection Report Form. However, a detailed description of how to inspect a manual tank gauge system is included in this manual.
- ❑ **Pressurized Piping Requirements.** Pressurized piping systems require two methods of release detection. An owner or operator must have a method for detecting large catastrophic leaks and one for detecting small ones. Starting in 2001, all pressurized piping must have an automatic line leak detector (ALLD) present.

| |
|---|
| Possible Leak Detection Combinations |
| <ul style="list-style-type: none">❑ Automatic line leak detector (3 gph) and double-wall pipe with liquid sump sensor.❑ Automatic line leak detector (3 gph) and double-wall pipe with manual interstitial monitoring.❑ Electronic line leak detector that can perform 3 gph continuous plus 0.2 gph/month and/or 0.1 gph/annual.❑ Mechanical line leak detector (3 gph) and annual line tightness test.❑ Automatic line leak detector (3 gph) and SIR monthly. |

Note that when interstitial monitoring is used on a piping system, a line tightness test is not required. The interstitial monitoring, when properly done, is a valid monthly method and takes the place of the line tightness test.

Also note that a stand-alone sump sensor on a double-wall pipe with no automatic line leak detector is no longer a valid method of leak detection.

- ❑ **Twelve Months of Data.** Sometimes a review of release detection data shows that the owner or operator does not have records of the last 12 months as required. In 2000-2001, one-third of all UST systems failed to meet this requirement. Lacking some or all of the last 12 months of records does not mean the tank system fails inspection. The lack of records would fail the inspection only if the owner or operator could not prove that release detection was working at the time of inspection. In other words, passing the most recent 30 days worth of release detection requirements enables the inspection to pass with the note that the total record keeping requirement is incomplete.
- ❑ **Sending ADEC Release Detection Data.** An owner or operator that does not have 12 months of previous release detection data for tanks and piping must demonstrate to ADEC that they will do release detection correctly in the future. This is considered leak detection “probation.” *The owner or operator must provide ADEC with the next six month's of release detection data, starting 30 days after the inspection. Make sure the owner or operator understands this.*
- ❑ **Failed Results.** If an inspector notes a failed test result when reviewing the 12 months worth of release detection data, it should be noted in the deficiencies portion of the Inspection Report Form. If a release is suspected to be on-going, the inspector should notify the owner or operator of the requirement to notify ADEC.
- ❑ **Soil and Groundwater Monitoring.** ADEC regulations do not allow for soil or groundwater monitoring as a valid form of release detection unless the owner or operator gets prior approval from ADEC. If an inspector finds a UST that uses soil or groundwater monitoring, a copy of the ADEC approval that allows this method of release detection should be attached to the Inspection Report form. If the owner or operator has no such approval, the owner or operator must use and have inspected another valid form of release detection.

Section 3: Release Detection Summary

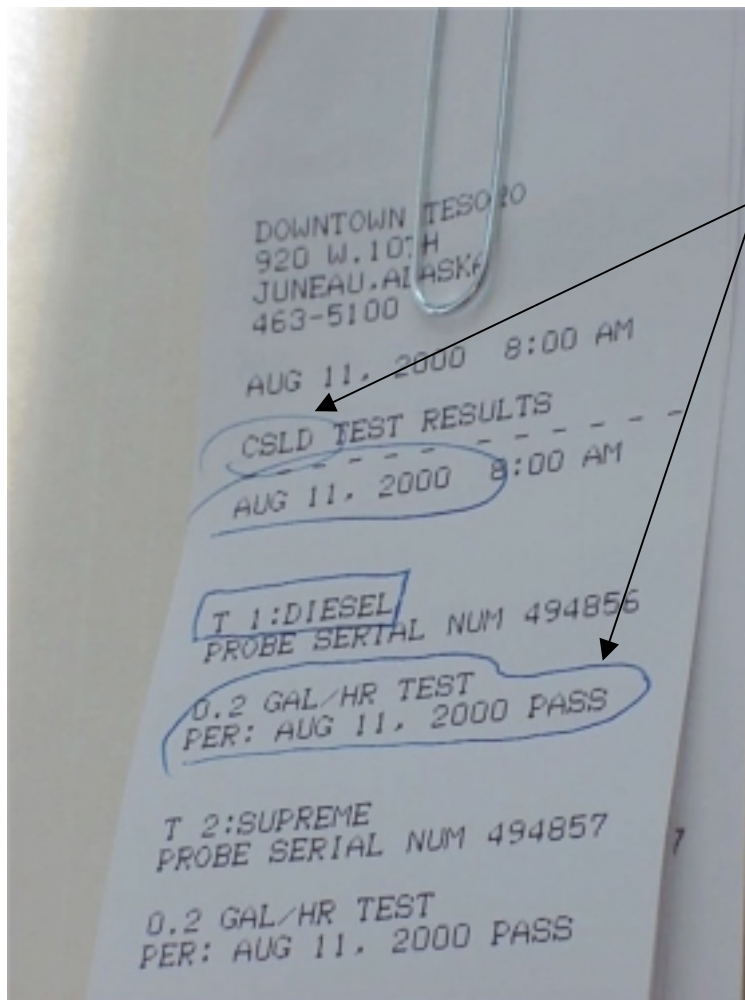
Fill out release detection information for each tank and pipe subject to inspection. Once complete, go to the page as directed and fill out all applicable questions. *Fill out the pages on release detection that apply.*

- ❑ **Tanks Method.** Check the box to describe any type of release detection method present or in use. Then select the primary release detection that is used for each tank. Then proceed to all pages listed in the last column for the primary methods only. If the inspector is not sure, **do not guess.** Contact ADEC for advice at 1-800-478-4974. Afterwards, proceed to the page or pages listed for each release detection type. Make sure the tank and piping ID numbers match up.
- ❑ **Piping Method.** Check the box to describe any type of release detection method present or in use. Then select the primary release detection that is used for each pipe. Then proceed to all pages listed in the last column for the primary methods only. If the inspector is not sure, **do not guess.** Contact ADEC for advice at 1-800-478-4974. Afterwards, proceed to the page or pages listed for each release detection type. Make sure the tank and piping ID numbers match up.

Section 3.a: Automatic Tank Gauging (ATG)

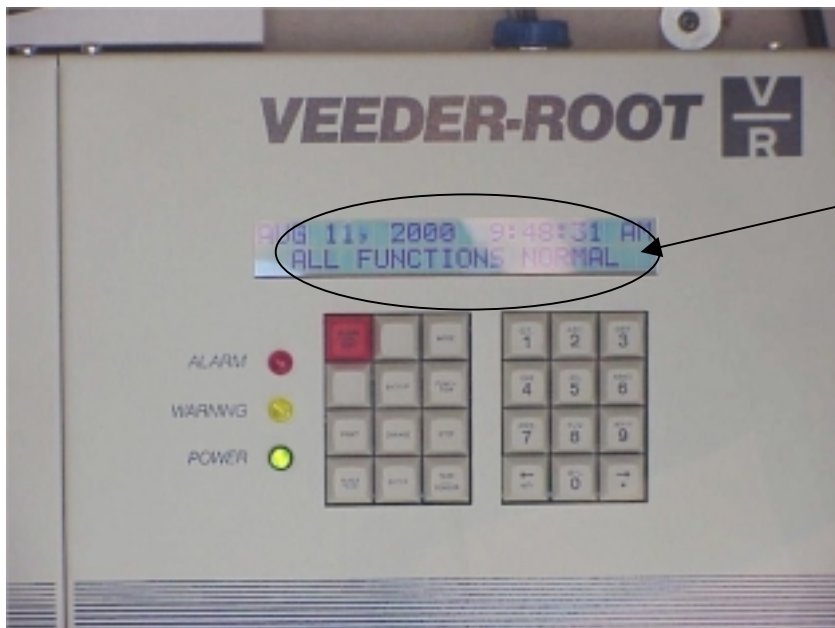
The inspector must fill out each question for a UST system that uses an ATG. *Note that a "No" answer does not necessarily mean the entire inspection fails.* See the key at the bottom of the table afterwards to determine if the release detection system passed inspection. Otherwise, see 18 AAC 78.065 (e).

- ❑ **Line 1: Console Make and Model.** List the make and model of the ATG that is in use. List for each tank if different.
- ❑ **Line 2: Probe Type.** Specify the make and model of each probe. Also specify the type, either magnetorestrictive (mag) or capacitance (cap).
- ❑ **Line 3: ATG performs test Continuously, Monthly, Weekly, Other.** List how often the ATG is programmed to run a test. *Do not guess.* Check the system setup to verify how the ATG was programmed. List either continuous (CSLD), monthly (M), weekly (W) or other (explain)



Determining continuous leak detection. Note this leak detection print-out sheet specifies it is running a CSLD (Continuous Statistical Leak Detection).

- ❑ **Line 4: Device is calibrated, operated, and maintained per manufacturer's instructions, including routine maintenance and service checks for operability or running condition.** The ATG should be receiving routine maintenance as required in the owner's manual. Many manufacturer's recommend annual maintenance. If maintenance has not been done in the last year, note it as a deficiency and then perform the tasks. If there are no maintenance requirements in the manual, ADEC suggest referring to the National Leak Detection Workgroup's List of Leak Detection Evaluations for UST Systems – 9th Edition, November 2001, Part V, for a general list of recommend maintenance practices.
- ❑ **Line 5: System Setup is Reviewed and Proper Setting Confirmed. Probes Present.** The inspector should review the setup of the ATG and confirm it was properly programmed. The inspector should make adjustments to the system setup if they are incorrect. The inspector should also insure through visual confirmation that the probes are present in the tank. If visual confirmation is not possible or potentially destructive, another method is to manually measure the fuel level (in inches) in each tank or compartment and compare the height of the fuel to the readout (in inches) on the ATG. If the comparison does not match, there may be a problem.
- ❑ **Line 6: Monitoring panel or control box is present and working.** The ATG should have a console box that is present and functioning. Some vendors only allow company-certified persons to inspect or test an ATG. Some inspectors have found a high number of ATGs with the "power" light bulb burned out. While not required, inspectors should as routine measure check the lights and make sure bad bulbs are replaced.

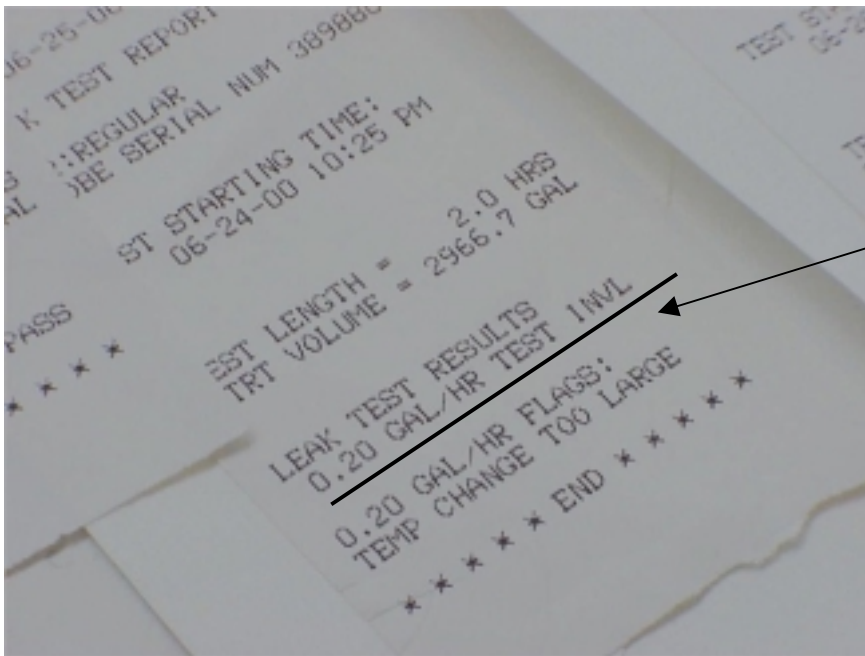


ATG in good working order: The LED reads "All functions normal" and the power light is on.

- ❑ **Line 7: Performance Criteria.** An inspector should check the performance standards and ensure they are met. The last 12 months of ATG test results should be reviewed and evaluated. The only way to effectively inspect the performance criteria is to print off a current system set-up report from the ATG and compare the setup parameters to the criteria in the Third Party Evaluation. If you cannot get a printout or satisfactory confirmation of the system set-up, do not pass the ATG.

Some common problems include:

- **24 Hour UST systems.** A number of ATGs are installed at UST systems that operate 24 hours a day but are not programmed to run a continuous test. A common problem is that the ATG needs a minimum amount of "quiet" time where no fuel is added or subtracted in order to run a valid test. It may not be possible to get a valid reading at a UST system open 24 hours a day. Make sure that if a UST is open and accessible 24 hours a day that there is sufficient "quiet" time to get a valid reading.



Example of ATG monthly test results where test is invalid. Southeast Alaska gas station, Aug. 2000.

- **Tank Size.** Many ATGs are not certified if the tank exceeds a certain size, generally 15,000 gallons or greater. Check the manufacturer's specifications and make sure the tank size is allowable.
- **Throughput.** Some ATGs use continuous statistical leak detection (CSLD). CSLD generally has a monthly throughput for performing a valid test. A UST with a very high volume throughput may exceed the tolerance of the method. High volume sites should be assessed for their monthly throughput and comparing to third party evaluation literature.

- **Minimum Product Level:** The product in the UST should be filled to the level required by the ATG manufacturer to produce valid monthly test results.
- **Line 8: Owner's Manual: Documentation.** The owner or operator should have a copy of the ATG manual either in hardcopy or CD-ROM format. If not, the owner or operator should be instructed to contact the manufacturer or vendor immediately and get a copy of the manual. Because of the variety of ATG systems available, it is very important that you get the documentation for exact make and model of the ATG, including all sensors. *Presence of the documentation is now mandatory in order to pass inspection.*



With today's technology, ATG manuals can be found in CD-ROMs on ATG vendor web pages



Example of
ATG sump
riser and
probe that is
easy to
access.

- ❑ **Line 9: Performance Standards Met.** An ATG may only be used if a third party evaluator tested the make and model and found it to meet minimum industry performance standards. *Both the console and the probes must be evaluated. If you do not know the make and model of the probes, do not guess.* There are two ways to determine third party evaluation. 1) Ask the owner or operator to provide you with a copy of the third party evaluation, found in the ATG literature. If the ATG is an older model (pre-1990), proof of certification may not be available. 2) Check the latest version of the EPA document "List of Leak Detection Evaluations for UST Systems." A copy of this document can be obtained by downloading it off the Internet web page <http://www.nwglde.org>
- ❑ , or see ADEC for a copy. *Every inspector should get a copy of this document and keep a current copy on hand during all inspections.*

The inspector must also list the percent probability of detection (PD) and probability of false alarm (PFA) for the ATG for each tank or compartment. Get this information from the system set-up, not the third party certification. Note that ATGs that are programmed to run leak tests continuously probably have a different performance standard than the usual 95% (PD) and 5% (PFA).

Exact Type of Probe or Sensor

There are a wide variety of probes and sensors that may be present at a UST system. Unless the inspector has documentation to show the exact make and model of each sensor, verification of third party approval may not be possible.

- ❑ **Line 10: 12 Months Prior Data.** Make sure the owner or operator has a copy of the previous 12 months of release detection data for the ATG. Generally, this means looking at the print-out for each month. If the ATG is functioning properly, but the owner or operator cannot show proof of some or all of the previous 12 months, the inspection may still pass. The owner or operator must immediately begin tracking ATG readings. As well, the owner or operator must submit copies of ATG results to ADEC for review as proof that they are doing monthly release detection. The inspector should also confirm that the performance standards listed in Line 7 were met for the last 12 months. If they were not, please explain.
- ❑ **Line 11: No Leak.** Based on the results of the Automatic Tank Gauging, indicate whether or not there is any evidence of a release or suspected release from each tank. On the form, the inspector must specify whether the ATG results are from the most current month, or the last month's of complete data.
- ❑ **ATG Passes Inspection.** Based on an answer of Yes to questions 1 through 9 and 11, the ATG system passes inspection. If any one of these questions is "No," the ATG does not pass inspection. Therefore the UST system does not pass inspection. If the answer to 10 is "No," please explain in the Deficiencies Section.
- ❑ **Deficiencies, Corrections and Further Recommendations.** This section should be used if any of the questions are "No." This section should also be used to note any problems during the inspection, even those that were corrected. Portions of the UST systems that were adjusted or fixed should be noted. As well, any recommendation provided by the inspector to the owner or operator should be listed.

National Work Group on Leak Detection Evaluation

List of Leak Detection Evaluations for UST Systems, 9th Edition

ATG MAINTENANCE CHECKLIST

Magnetostrictive and Ultrasonic Probes

Minimum procedures to be conducted by a *qualified service technician*.

| | | |
|---|-----|----|
| Has all input wiring been inspected for proper entry and termination, including testing for ground faults? | Yes | No |
| Have the probe and sensors been checked for visible damage such as residue buildup, cracks, or breaks? ^{1,2} | Yes | No |
| Has the accuracy of the level sensor been tested? ³ | Yes | No |
| Has the accuracy of the water sensor been tested? ⁴ | Yes | No |
| Has the appropriateness of the high water level alarm setting been verified? ⁵ | Yes | No |
| Are all alarms activated and functioning properly? | Yes | No |

Comments:

1. Damaged probes must be cleaned or replaced as appropriate. Probes used in heavier products such as waste oil should be checked more frequently. Heavier products can leave deposits on the probe shaft and float assemblies that may restrict the measurement capacity of the probe.
2. Because the magnetostrictive probe consists of moving parts, its sensors can be damaged by excessive frictional wear as well as residue build-up. Residue build-up can affect the weight of the sensor as well as inhibit its ability to slide freely along the guide tube. Inaccuracies in the product level measurements could indicate a problem with the probe sensors. For additional testing of the probe sensors, perform the following test:
 - a. Remove the probe from the tank and place it carefully on the ground.
 - b. Place the water sensor flush with the bottom of the probe shaft and place the product float near the middle of the probe shaft.
 - c. Check the height reading on the tank gauge monitor (after allowing sufficient time for the monitor to respond).
 - d. Measure the distance from the bottom of the probe to the bottom of the product float and compare it with the reading on the monitor.
3. To test the accuracy of the product sensor:
 - a. Using the tank console monitor, take an initial fuel level reading.
 - b. Dispense one gallon of product into a calibrated container.
 - c. Using the tank console monitor, take a second fuel level reading.
 - d. Verify that the change in tank volume is one gallon.
4. To test the accuracy of the water sensor:
 - a. Remove probe from the tank.
 - b. By hand, move the water float up the probe to a point higher than the high-water alarm set point.
 - c. The monitor should respond with a high water alarm report. (The water height may also appear on the tank monitor display console.
 - d. Check this height against its actual location.
5. The high water level alarm should not be set so high that water ingress into the tank goes undetected for long periods of time.

Disclaimer: This checklist is not intended to tell the technician how to perform the maintenance and system check. Technicians should follow manufacturers' detailed instructions while making sure that all of the items on this checklist have been covered.

ATG MAINTENANCE CHECKLIST

Mass Buoyancy Probes

Minimum procedures to be conducted by a *qualified service technician*.

| | | |
|--|-----|----|
| Has all input wiring been inspected for proper entry and termination, including testing for ground faults? | Yes | No |
| Has the probe been checked for visible damage (such as residue buildup or cracks)? ¹ | Yes | No |
| Has the battery been tested within the last 3 months? | Yes | No |
| Has the accuracy of the product sensor been tested? ² | Yes | No |
| Has the accuracy of the water sensor been tested? ³ | Yes | No |
| Has the appropriateness of high-water level alarm setting been verified? ⁴ | Yes | No |
| Are all alarms activated and functioning properly? | Yes | No |
| Comments: | | |

1. Damaged probes must be cleaned or replaced, as appropriate. The mass displacement probe is very susceptible to dirt and residue build-up and should be checked semi-annually and cleaned, if necessary. Mass displacement probes used in viscous products such as waste oil should be checked more frequently. Products of this type can leave heavy deposits on the probe which may inhibit the accuracy of the probe. Checking a reconciliation report and/or manual sticking could verify the system's accuracy.
2. To test the accuracy of the product sensor:
 - a. Using the tank console monitor, take an initial fuel level reading.
 - b. Dispense one gallon of product into a calibrated container.
 - c. Using the tank console monitor, take a second fuel level reading.
 - d. Verify that the change in tank volume is one gallon.
3. To test the accuracy of the water sensor: (Note: water sensor is separator from the mass buoyancy probe.)
 - a. Remove the probe from the tank.
 - b. By hand, move the water float up the probe to a point higher than the high water limit.
 - c. The monitor should respond with a high water alarm. (The water height may also appear on the tank monitor display console.)
 - d. Check this height against its actual location.
4. The high water level alarm should not be set so high that water ingress into the tank goes undetected for long periods of time.

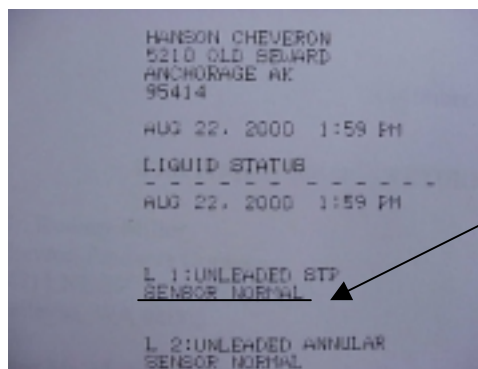
Disclaimer: This checklist is not intended to tell the technician how to perform the maintenance and system check. Technicians should follow manufacturer's detailed instructions while making sure that all of the items on this checklist have been covered.

Section 3.b: Interstitial Monitoring

Fill out this section if the tank or piping or both use interstitial monitoring as a primary form of release detection. If used for both, make sure you complete the columns for tank and piping. See 18 AAC 78.065 (h).

The inspector must answer all the questions for a UST system that uses Interstitial Monitoring. *Note that a "No" answer does not necessarily mean the entire inspection fails.* See the key at the bottom of the table afterwards to determine if the release detection system passed inspection.

- ❑ **Line 1: Manual Equipment Accessible and Functional.** An inspector must be able to access and read the equipment that measures the space in between tank or pipe, called the interstice. The inspector could look for:
 - a) A stick or measuring device,
 - b) Water/fuel indicator paste, and
 - c) A log of monthly readings maintained by the owner or operator. The log would show the presence or absence of liquid. The inspector should perform a manual test of the interstice to ensure he/she agrees with the log readings. See the end of this chapter for a sample log.



Monthly Interstitial Monitoring report shows conditions are normal.

Update: Note that a stand-alone sump sensor for double wall pressurized piping is no longer allowed as a substitute for an automatic line leak detector. Double wall pipe systems must have interstitial monitor plus an automatic line leak detector.

- ❑ **Line 2: Interstitial Monitoring at the Lowest Point in the System.** Adequate interstitial monitoring is only achieved if it takes place at the lowest point in the system. Evaluate the system to ensure interstitial monitoring is positioned at the lowest point.



Checking a brine sensor on a double-wall compartment tank in South Central Alaska, 2001.

Lines 3 through 7 are only for systems that have sensors and electronic readouts.

An electronic interstitial monitoring system usually has a sensor that measures the presence or absence of liquid. Some double-wall fiberglass tanks have a brine solution in the interstice of the tanks, so interstitial monitoring involves measuring the level of brine. The inspector should run a test to ensure the sensor is functioning properly and test the console that provides the results of the readings. The console can be tied into an ATG system or be a stand-alone unit.

- ❑ **Line 3: Type of Sensor.** Describe whether the sensor is Liquid or Discriminating. List tank and piping separately.
- ❑ **Line 4: Monitoring Console Operational.** Test the monitoring box to ensure it is operational. Use the “test” or “diagnostic” mode to make sure the monitor is functioning properly.
- ❑ **Line 5. Interstitial Sensors.** Verify the presence of the sump sensor for each pipe run and a sensor in each interstitial portion of the tank. Locate available literature and test each sensor using the manufacturer’s specifications. For pipe sumps, the test usually involves turning the sensor upside down or immersing it in liquid. Test the sensor functionality using available manufacturer’s literature. Check to make sure the sump sensor is located at a recommended height off the floor of the sump or interstice. Make adjustments as necessary and note deficiencies. Interstitial sensors for tanks do not have to be removed from the interstice for testing unless required by the manufacturer.

- ❑ **Line 6: Interstitial Monitoring at the Lowest Point in the System.** Adequate interstitial monitoring is only achieved if it takes place at the lowest point in the system. Evaluate the system to ensure interstitial monitoring is positioned at the lowest point.
- ❑ **Line 7: Manufacturers' Specifications.** Many systems require routine maintenance. Inspector should locate and read through equipment manual or literature and make sure maintenance is being done routinely, including calibration. If owner or operator does not have a manual or the inspector cannot figure out routine maintenance, owner or operator should immediately contact equipment vendor and get a copy of manual.
- ❑ **Line 8: 12 Months Prior Data.** The owner or operator should have readings for the last 12 months of release detection for Interstitial Monitoring. Because owners and operators can often think that having a double wall tank guarantees a no-leak tank, there is a tendency to ignore monthly testing. If the system is functioning properly, but the owner or operator cannot show proof of the previous 12 months, the inspection may still pass. The owner or operator shall immediately begin tracking interstitial test results. As well, the owner or operator must file proof that they are doing monthly monitoring.
- ❑ **Line 9. No Product Evident.** Based on a visual inspection of the interstitial space, or information from electronic sensors and readings, verify whether or not there is product evident in any interstitial space.
- ❑ **Line 10: No Leak.** Based on the results of Interstitial Monitoring, indicate whether or not there is evidence of a release or suspected release from each tank or pipe.
- ❑ **Interstitial Monitoring Passes Inspection.** Based on an answer of "Yes" to questions 1, 2, 9 and 10 (for manual) or 2, 3, 4, 5, 6, 7, 9 and 10 (for electronic), the Interstitial Monitoring system passes inspection. If any one of these questions is "No," the Interstitial Monitoring system does not pass inspection. Therefore the UST system does not pass inspection. If the answer to 8 is "No," please explain in the Deficiencies Section.

Notes

Interstitial Monitoring and Pressure Piping. Interstitial monitoring, when properly configured and installed, may replace the annual line test for pressurized piping (and the three-year line tightness test for suction systems).

Sensor Placement in Pipe Sumps. There is no regulation that specifies the exact height of a sump sensor off the floor of a sump. A sensor placed too low will trigger an alarm each time liquid gets into the sump. A sensor placed too high will not register a potentially leaking pipe until it is too late. Common sense dictates that the height of the sump sensor is at a reasonable height to effectively detect a release. Float type sensors need to be positioned vertically in order to be effective.

Deficiencies, Corrections and Further Recommendations. These sections should be used if any of the questions are answered with "No." They should also be used to note problems during the inspection, even those that were corrected. Portions of the UST systems that were adjusted or fixed should be noted. As well, recommendations provided by the inspector to the owner or operator should be listed.



Before. Piping sump filled with water and product. The alarm sensor (follow arrow) is submerged in liquid. ATG was in alarm mode.

After. Liquid is removed from sump so leak detection equipment can function properly. However, sump sensor (while PVC tube on right side) is askew and may not work properly.



Secondary Barriers. Secondary barriers as the primary method of release detection for tanks in Alaska are rare. If the owner or operator used a secondary barrier (i.e.: tank pit liner) as the primary or sole source of release detection for tanks, documents on the following items must be submitted to ADEC along with the Inspection Report Form. *This does not apply to tanks with factory constructed*

interstitial spaces.

- a. **Thickness:** Barrier must have a permeability of at least 10^{-6} cm/sec.
- b. **Compatibility:** Barrier must be compatible with petroleum products stored and the petroleum products may not cause deterioration.
- c. **Corrosion Protection:** Barrier must not interfere with cathodic protection system.
- d. **Testing:** Groundwater, soil moisture, or rainfall cannot render testing or sampling inoperative so a release could go undetected for more than 30 days.
- e. **Groundwater:** Unless designed for such use, a barrier must always be above ground water and above the 25-year flood plain.
- f. **Monitoring Wells.** Barrier wells must be clearly marked.

Internally Fitted Liners or Bladders. If a tank has been fitted with an internal liner or bladder to act as a secondary containment device, it must meet the requirements listed above (a-f) for inspection.



Example of interstitial monitoring probe inside piping sump. The bottom of sensor should be slightly off the floor of the sump but not too high, so it can effectively detect a release into the sump.

ADEC's Monthly Release Detection Monitoring Form for Underground Storage Tank or Piping System Without Monthly Print-Out

[illegible]

*** Types of Monitoring (choose one)**

- A. Automatic tank gauge with no printer
- B. Manual sticking of dry interstitial space
- C. Electronic sensor attached to warning light or alarm

**KEEP THIS PAPER AND ANY ASSOCIATED PRINTOUTS
FOR AT LEAST ONE YEAR FROM THE LAST ENTRY.**

Section 3.c: Inventory Control and Statistical Inventory Reconciliation (SIR)

Fill out this section if the tank uses inventory control method, or inventory control and statistical inventory reconciliation. See 18 AAC 78.065 (b) and (d).

The inspector must fill out each question on the form for a UST system that uses an Inventory Control and SIR. *Note that a "No" answer does not necessarily mean the entire inspection fails.* See the key at the bottom of the table after question 17 to determine if the release detection system passed inspection.

Inventory Control

- ❑ **Line 1: Readings Recorded Daily.** Successful release detection using inventory control usually boils down to whether an owner or operator is doing good daily readings, including liquid levels, sales and delivery. Review all the release detection data and make sure it is being done and properly logged. If the owner or operator is not keeping a formal log, the owner or operator should obtain an ADEC Inventory Control Form.
- ❑ **Line 2: Monthly Reconciliation.** A number of owners and operators of USTs typically have inventory control data that is not routinely reconciled to determine if a leak may have occurred. *The inspection can pass if the last complete month of data is properly reconciled. The inspector should review the last 12 months worth of records to ensure the owner or operator is properly reconciling each month.*

| Date | Initial Reading | Final Reading | Difference | Notes |
|----------|-----------------|---------------|------------|-------|
| 12/24/00 | 2,487 | 2,498 | -2 | |
| 12/25/00 | 2,444 | 2,451 | +7 | |
| 12/26/00 | 2,473 | 2,481 | +8 | |
| 12/27/00 | 2,523 | 2,529 | +6 | |
| 12/28/00 | 2,548 | 2,549 | +1 | |
| 12/29/00 | 2,939 | 2,938 | -1 | |
| 12/30/00 | 2,977 | 2,977 | 0 | |
| 12/31/00 | 2,564 | 2,570 | +6 | |
| 1/1/01 | 2,305 | 2,305 | 0 | |
| 1/2/01 | 2,173 | 2,166 | -7 | |

GALLONS PUMPED = 6,500 TOTAL GALLONS OVER OR SHORT = +215

EST 3 DIGITS FROM THE TOTAL GALLONS over and under on line 1 and below

CHECK: 85 + 130 = 215 gallons

CONCURRENCE

LONG OVER OR SHORT LARGER than "LEAK CHECK" result YES NO (circle one)

File "YES" for 2 MONTHS IN A ROW, notify regulatory agency as soon as possible

THIS PIECE OF PAPER ON FILE FOR AT LEAST 1 YEAR

EXPIRE AUG 01 2000

Dept. of Environmental Compliance
Underground Storage Tanks

Sample of monthly inventory reconciliation where actual overage is higher than allowed. This may be a suspected release.

- ❑ **Line 3: Calibration Chart.** A calibration chart must be present and used to convert stick readings into gallons. If the calibration chart is not present or not being used, the owner or operator should immediately contact the tank manufacturer for a copy. If the owner or operator is not using a calibration chart by the time the inspection is complete, the tank will not pass inspection. The inspector should verify that the tank chart used is the correct one for each tank. (Suggestion: calibration chart software is also available from industry associations or the tank manufacturer.)
- ❑ **Line 4: Stick Readings for Deliveries.** In order for inventory control to work properly, the owner or operator must take a reading and record each delivery on an Inventory Control Form.
- ❑ **Line 5: Accurate Measurements.** The tank must be measured using a fuel gauge stick that is calibrated to the nearest 1/8" increment for accurate measurements. If not, the owner or operator should immediately obtain a gauging stick that has these capabilities.
- ❑ **Line 6: Stick Capability.** The tank must be measured using a fuel gauge stick that is tall enough to measure the full height of the tank. If not, the owner or operator should immediately obtain a gauging stick that has this capability.
- ❑ **Line 7: Measuring for Water.** The tank must be checked for the presence of water once a month. If water is present, the amount of water in the tank must be measured to the nearest 1/8." That information must be used in calculating inventory balances. If not, the owner or operator must begin doing so do immediately.
- ❑ **Line 8: Drop Tubes.** Drop tubes are required for release detection when using inventory to help stabilize fuel for an accurate product level measurement. Without a proper drop tube, inventory control fails inspection.
- ❑ **Line 9: Totalizer.** Each UST system using inventory control must have a totalizer that is accurately calibrated in order for release detection to work. *A tank without a totalizer cannot use inventory control.* If the totalizer is missing or not added prior to the end of inspection, then the owner or operator must begin using another type of release detection or fail inspection. The totalizer must have current approval from the Alaska Department of Transportation & Public Facilities (DOT/PF), Division of Measurement Standards & Commercial Vehicle Enforcement. Inspectors who wish to be certified in calibrating totalizers should contact DOT/PF at 907-345-7750.
- ❑ **Line 10: Overages/Shortages.** Inventory Control regulations allow for slight overages or shortages each month, not to exceed 130 gallons plus 1% of the tanks monthly through put. The inspector should double check the math on the Inventory Control form for the last complete month of results and confirm that this amount has not been exceeded.

- ❑ **Line 11: 12 Months Prior Data.** Make sure the owner or operator has a copy of the previous 12 months of Inventory Control data. Generally, this means looking at the inventory sheets for each month. If the owner or operator is doing inventory control incorrectly, he or she can start doing it right and still pass inspection, but it will take 30 days of inventory control before passing inspection. Also, if the owner or operator cannot show proof of the previous 12 months, the inspection may still pass. However, the owner or operator must file proof with ADEC that they are doing monthly inventory control.
- ❑ **Line 12: No Leak.** Based on the results of inventory control, indicate whether or not there is evidence of a release or suspected release from each tank.
- ❑ **Inventory Control Passes Inspection.** Based on an answer of "Yes" to questions 1 through 10 and 12, the inventory control system passed inspection. If any one of these questions is "No," the inventory control system does not pass inspection and the UST system does not pass inspection. If the answer to 11 is "No," explain in the Deficiencies Section.

MONTHLY INVENTORY RECORD

MONTH/YEAR : ____/____ TANK ID# _____ FACILITY NAME: _____
 DATE OF WATER CHECK: _____ LEVEL OF WATER (INCHES): _____

| DATE | START STICK INVENTORY (GALLONS) | GALLONS DELIVERED | GALLONS PUMPED | BOOK INVENTORY (GALLONS) | END STICK INVENTORY | | DAILY OVER (+) OR SHORT (-) ["End" - "Book"] | INITIALS |
|------|---------------------------------------|----------------------|-------------------|--------------------------------|---------------------|-----------|--|----------|
| | | | | | (INCHES) | (GALLONS) | | |
| 1 | (+) | (-) | (=) | | | | | |
| 2 | (+) | (-) | (=) | | | | | |
| 3 | (+) | (-) | (=) | | | | | |
| 4 | (+) | (-) | (=) | | | | | |
| 5 | (+) | (-) | (=) | | | | | |
| 6 | (+) | (-) | (=) | | | | | |
| 7 | (+) | (-) | (=) | | | | | |
| 8 | (+) | (-) | (=) | | | | | |
| 9 | (+) | (-) | (=) | | | | | |
| 10 | (+) | (-) | (=) | | | | | |
| 11 | (+) | (-) | (=) | | | | | |
| 12 | (+) | (-) | (=) | | | | | |
| 13 | (+) | (-) | (=) | | | | | |
| 14 | (+) | (-) | (=) | | | | | |
| 15 | (+) | (-) | (=) | | | | | |
| 16 | (+) | (-) | (=) | | | | | |
| 17 | (+) | (-) | (=) | | | | | |
| 18 | (+) | (-) | (=) | | | | | |
| 19 | (+) | (-) | (=) | | | | | |
| 20 | (+) | (-) | (=) | | | | | |
| 21 | (+) | (-) | (=) | | | | | |
| 22 | (+) | (-) | (=) | | | | | |
| 23 | (+) | (-) | (=) | | | | | |
| 24 | (+) | (-) | (=) | | | | | |
| 25 | (+) | (-) | (=) | | | | | |
| 26 | (+) | (-) | (=) | | | | | |
| 27 | (+) | (-) | (=) | | | | | |
| 28 | (+) | (-) | (=) | | | | | |
| 29 | (+) | (-) | (=) | | | | | |
| 30 | (+) | (-) | (=) | | | | | |
| 31 | (+) | (-) | (=) | | | | | |

TOTAL GALLONS PUMPED >

TOTAL GALLONS OVER OR SHORT >

DROP THE LAST 2 DIGITS from the **TOTAL GALLONS PUMPED** number and enter on the line below

LEAK CHECK: _____ + 130 = _____ gallons

Is the "TOTAL GALLONS OVER OR SHORT" **LARGER** than "LEAK CHECK" result? **YES NO**
 (circle one)

If your answer is "YES" you may have an on-going release. Notify **ADEC** as soon as possible.

Statistical Inventory Reconciliation (SIR)

- ❑ **Line 13: Third Party Approval.** SIR may only be used if a third party evaluator tests the SIR method and is found to meet minimum EPA performance standards. There are two ways to determine third party evaluation. First, ask the owner or operator to provide you with a copy, usually found in the SIR literature. Second, check the latest version of the EPA document "List of Leak Detection Evaluations for UST Systems." A copy can be obtained by downloading it off the Internet web page at <http://www.nwglde.org> or contact ADEC for a copy. Every inspector should obtain a copy of this document and keep a current copy on hand during all inspections.
- ❑ **Line 14: SIR for Piping.** If the owner or operator uses SIR for piping, check the literature to make sure that the applicable SIR protocol allows piping. Not all makes and models do. If the SIR method does not cover piping then the piping fails for release detection and another method must be used. The SIR vendor should provide a statement that their method is good for both tanks and piping, or tanks only.
- ❑ **Line 15: Inconclusive Results.** Two consecutive months of SIR data with inconclusive results is a suspected release. If two consecutive inconclusives occur during or immediate prior to the inspection, then the owner or operator has failed to meet leak detection requirements (i.e.: has **no** leak detection) and is out of compliance for tank and/or piping leak detection. Also, this is a reportable suspected release. If there are two inconclusives that occurred over the last 12 months but not during the inspection time period, it should be noted in the deficiencies section on page 5 of the Inspection Report Form.
- ❑ **Line 16: No Leak.** Based on the results of the current SIR readings, indicate whether or not there is evidence of a release or suspected release from each tank or pipe.
- ❑ **SIR Passes Inspection.** Based on an answer of "Yes" to questions 13, 14 and 16, SIR passed inspection. As well, questions 1 through 10 and 12 on the previous page must all be "Yes." If any one of these questions is "No," the SIR system does not pass inspection. Therefore the UST system does not pass inspection. If the answer to 15 is "No," please explain in the Deficiencies section.

Notes

SIR General. SIR used for leak detection must have a valid manufacturer's certification of performance. The owner and operator should have instructions on how to collect data by the SIR provider. Inventory data must be collected according to SIR provider. SIR is **not** a valid method of leak detection unless it is done according to the SIR provider's instructions and the results are "pass" (or the test's equivalent of "pass"). A brief explanation of how SIR works is available in the EPA booklet, "Introduction to Statistical Inventory Reconciliation for Underground Storage Tanks."

SIR Results. The vendor's SIR report should clearly state that the tank "Passed," "Failed," or received an "Inconclusive" result.

Scenario of Inspection that occurred in August, using July's SIR release detection data.

| May SIR results | June SIR results | July SIR results | Conclusion | Recommendation |
|------------------------|-------------------------|-------------------------|------------------------------|---|
| Pass | Inconclusive | Pass | SIR passed inspection | Check operator's method of sticking tank. |
| Inconclusive | Inconclusive | Pass | SIR passed inspection | Alert owner of historic suspected release. Trouble shoot system. Look for trends over last 12 months. |
| Pass | Pass | Inconclusive | SIR does not pass inspection | Need completed August data and results before confirmed that tank is not leaking. |
| Pass | Inconclusive | Inconclusive | SIR fails inspection | Reportable, suspected release. Owner must contact ADEC trouble shoot system and confirm or refute findings. |

Section 3.d: Tightness Testing

The inspector must fill out each question for a UST system that uses tightness testing for tanks or piping or both. *Note that a "No" answer does not necessarily mean the entire inspection fails.* See the key at the bottom of the table afterwards to determine if the release detection system passed inspection.

- ❑ **Line 1: Third Party Approval.** A tightness testing method may only be used if it is tested by a third party evaluator and is found to meet minimum industry performance standards. There are two ways to determine third party evaluation. First, ask the owner or operator to provide you with a copy, usually found in the TTT literature. Second, check the latest version of the EPA document "List of Leak Detection Evaluations for UST Systems." A copy can be obtained by downloading it off the Internet web page, <http://www.nwglde.org> or see ADEC for a copy. Every Inspector should get a copy of this document and keep a current copy on hand during all inspections.
- ❑ **Line 2: Certified Tester.** Only a person certified by the State of Alaska UST tightness testing may perform a tightness test. Confirm that a person certified in tightness testing performed the test. Check the DEC Internet web page for a current list of testers at, <http://www.state.ak.us/dec/dspar/stp/tank3.htm>. Please note the State of Alaska certification number.
- ❑ **Line 3: Last Tightness Test Data.** Use the following table to determine the tightness test requirements.

| Tank or Pipe | Tightness Test Frequency |
|-----------------------|---|
| Tank | Every five years from date of installation or upgrade |
| Pressurized Pipe | Every year |
| "Unsafe" Suction Pipe | Every three years |

Determine whether a tightness test is due prior to the passing of inspection. If a tightness test is due, the Inspector should inform the owner or operator that a tightness test must be done before inspection is complete. *Make sure that the date of the last tightness test is noted.*

- ❑ **Line 4: TTT and Inventory Control allowed?** For many underground storage tanks (USTs), December 22, 1998, marked the end of the use of inventory control and tank tightness testing to meet release detection requirements. Use the following table to determine if the tank or piping can still use inventory control and tank tightness testing and for how long.
- ❑ **Line 5: No Leak.** Based on the results of inventory control (and tightness testing if applicable), indicate whether or not there is evidence of a release or suspected release from each tank or pipe.

- ❑ **TTT Passes Inspection.** Based on an answer of "Yes" to questions 1 through 5, the tightness test passed inspection. If any one of these questions is "No," the release detection system does not pass inspection. Therefore the UST system does not pass inspection.

Notes

Five-Year Tightness Test. To qualify for limiting tightness testing to every five years, the tank system must be upgraded. That means that both the tank and piping must be protected from corrosion. Also, there must be a spill and overfill prevention device on the tank (if required). A tank system meeting all of these requirements may use inventory control or manual tank gauging with a tightness test every five years until 12/22/98, or until 10 years after corrosion protection is added to the tank, whichever is later.

Make sure you calculate the last date allowed to use inventory control and tank tightness testing and note answer on the form.

| Questions | | Answers | |
|--|---|---|---|
| Does tank have corrosion protection (and, if so, when installed)? | Does piping have corrosion protection and does UST have spill and overfill protection? | You can use inventory control plus: | |
| | | Tank tightness testing annually | Tank tightness testing every five years |
| No | No | Through 12/22/98 | No |
| No | Yes | Through 12/22/98 | No |
| Yes (anytime) | No | Through 12/22/98 | No |
| Yes (on or before 12/22/88) | Yes | Through 12/22/98 | Through 12/22/98 |
| Yes (after 12/22/88) | Yes | Until 10 years after Tank has corrosion protection | Until 10 years after Tank has corrosion protection |

Example: A 10,000-gallon unprotected steel tank with fiberglass piping was upgraded on 9/30/98. Upgrading included the addition of cathodic protection for the tank. The owner or operator may use inventory control until 9/30/2008. At that time, the owner or operator must use another form of release detection for the tank. Under this example, a tank tightness test will be due on 9/30/2003 and 9/30/2008.

Deficiencies, Corrections and Further Recommendations. This section should be used if any of the questions are "No." This section should also be used to note any problems noted during the inspection, even those that were corrected. Portions of the UST systems that was adjusted or fixed should be noted. As well, any recommendations provided by the inspector to the owner or operator should be listed.