

# How to Comply with Florida DEP AST Rules and Avoid Petroleum Discharges to the Environment



**Mott-Smith Consulting Group, LLC**



**Marshall T. Mott-Smith, President  
Mott-Smith Consulting Group, LLC  
2268-2 Wednesday Street  
Tallahassee, FL 32308**

**[marshall@mott-smithconsulting.com](mailto:marshall@mott-smithconsulting.com)**

**[www.mott-smithconsulting.com](http://www.mott-smithconsulting.com)**

**850-391-9835    850-591-1434 cell**



**Division of Waste Management -  
Mary Jean Yon, Director  
Dotty Diltz, Assistant Director**

**Bureau of Petroleum Storage Systems - 850-245-8821  
Mike Ashe, Chief**

**Storage Tank Regulation Section - 850-245-8838  
Bill Burns, Administrator - 850-245-8842**





# **FDEP District Offices**

**Pensacola - 850-595-8360**

**Jacksonville - 904-448-4300**

**Tampa - 813-632-7600**

**Orlando - 407-894-7555**

**West Palm - 561-681-6600**

**Fort Myers - 941-332-6975**



# Facility Statistics



**Registered  $\geq$  54,000**  
**Active Regulated – 21,122**



# Tanks



**Registered  $\geq$  186,000**

**Closed/removed  $\geq$  120,000**

**Regulated USTs – 25,570**

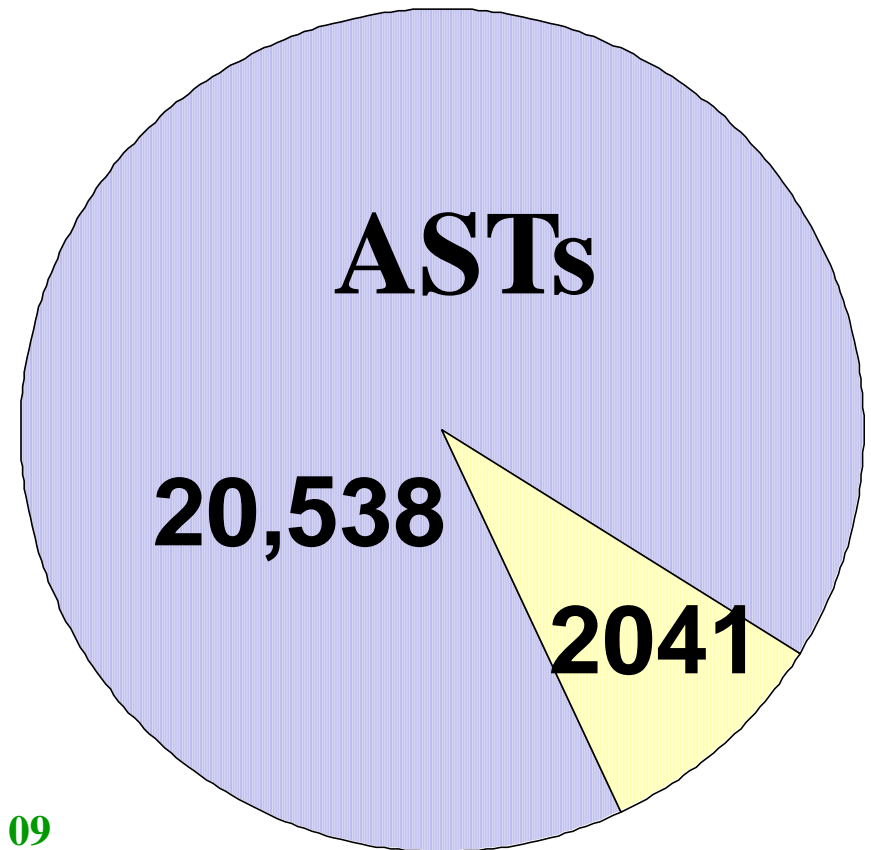
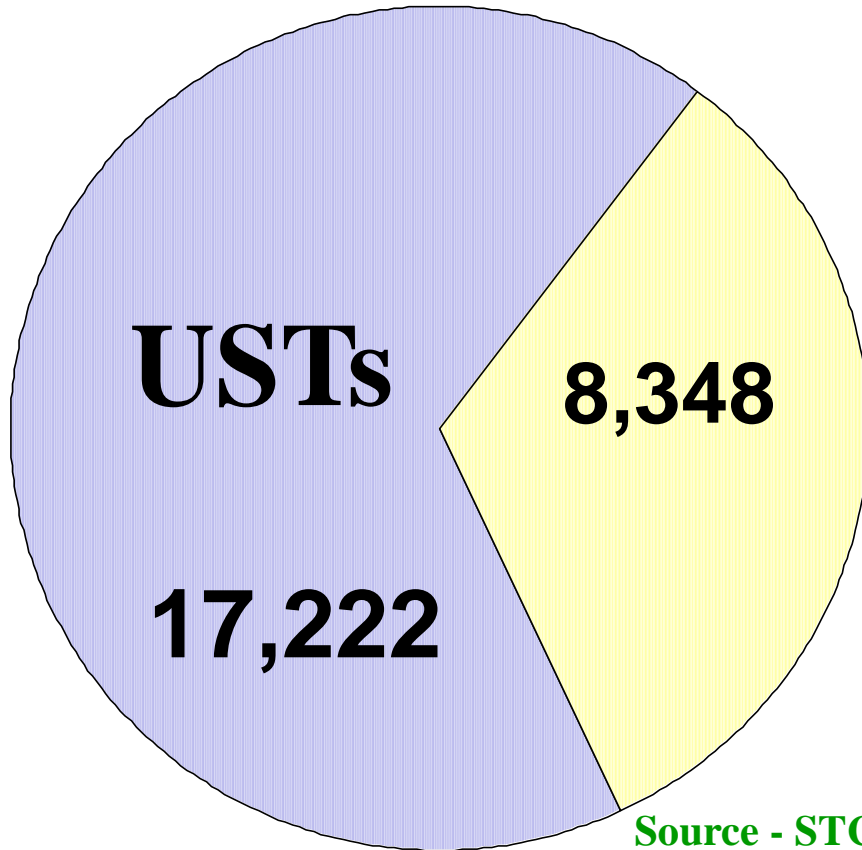
**Regulated ASTs – 22,579**

**\*As of Apr, 2009**

# April, 2009 Status

Double-wall USTs – 67.3%

ASTs with  
Secondary Containment  
91%

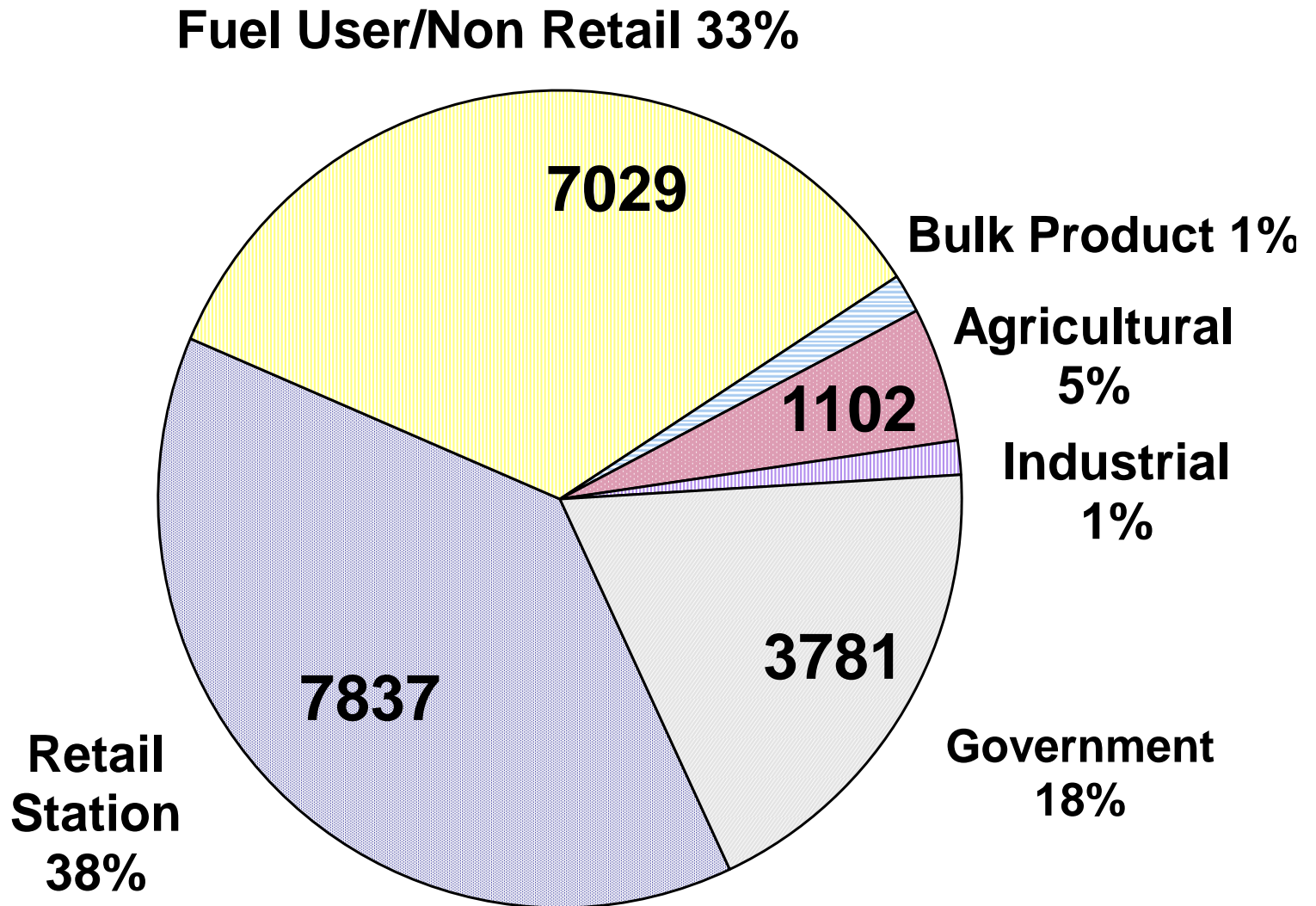


Source - STCM, Apr 09

Single-wall USTs 32.7%

Single-wall ASTs - 9%

# Storage Tank Ownership by Facility Type 2009 – ASTs & USTs



Source:  
STCM  
Apr 09



# >35,023 Incident and Discharge Reports Received

As of April 2009



# Protecting Florida's Water Quality





**Who or What gives DEP or any Agency the Authority to Regulate your Facility?**



# **Your Elected Representatives in the Florida Legislature!**



**Legislators pass laws giving authority for state agencies to adopt rules**

# Proposed AST Rule Changes



**Current Rule Revision Effort Ongoing Since 1999**

**Some believe there is no hope...**



**But...There is Hope...**





# **Applicability**

## **Chapter 62-762.301, F.A.C.**



# Are you Regulated?



# Applicability

## *Chapter 62-762.301, F.A.C.*

- All aboveground storage tanks over 550 gallons containing pollutants (pesticides, chlorine, ammonia, petroleum, or any derivatives of these substances).
- Tanks must contain products that are liquids at standard temperature and pressure.



# Types of Facilities Regulated



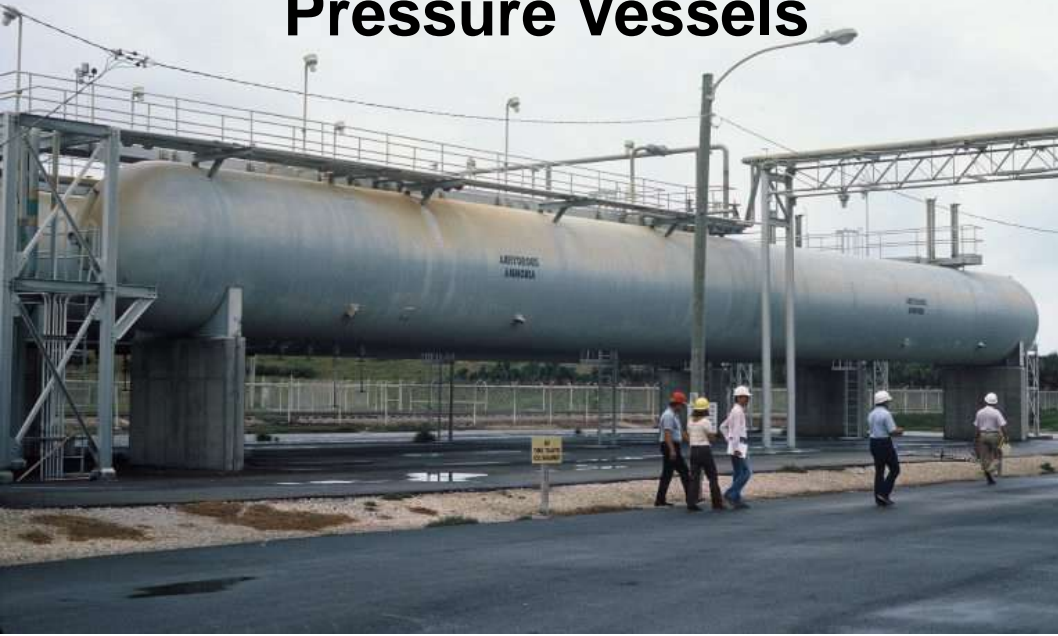


# MAJOR EXCLUSIONS:

- LP gas tanks.
- Hydraulic lift tanks.
- Stormwater or septic tanks
- Pipelines.
- Loading racks
- Flow through process tanks
- Residential tanks
- Heating oil tanks for on-site use (<30,000 gallons)



## Pressure Vessels



Agricultural tanks  
less than 550 gallons



Mobile Tanks

## Vapor Recovery Tanks





**Is this a  
Mobile  
Tank?**



**Is this an aboveground tank?**



# Tank, or domicile?



# Residential Tanks



# Reference Standards



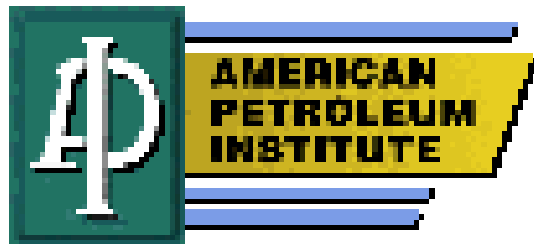
# Industry Reference Standards – The Technical Foundation of DEP's Regulations

- **ACI** - American Concrete Institute.
- **API** - American Petroleum Institute.
- **ASME** - American Society of Mechanical Engineers
- **ASTM** - American Society for Testing and Materials.
- **NACE** - National Association of Corrosion Engineers.
- **NFPA** - National Fire Protection Association.
- **PEI** - Petroleum Equipment Institute.
- **SSPC** - Society for Protective Coatings.
- **STI** - Steel Tank Institute.
- **UL** - Underwriters Laboratories.



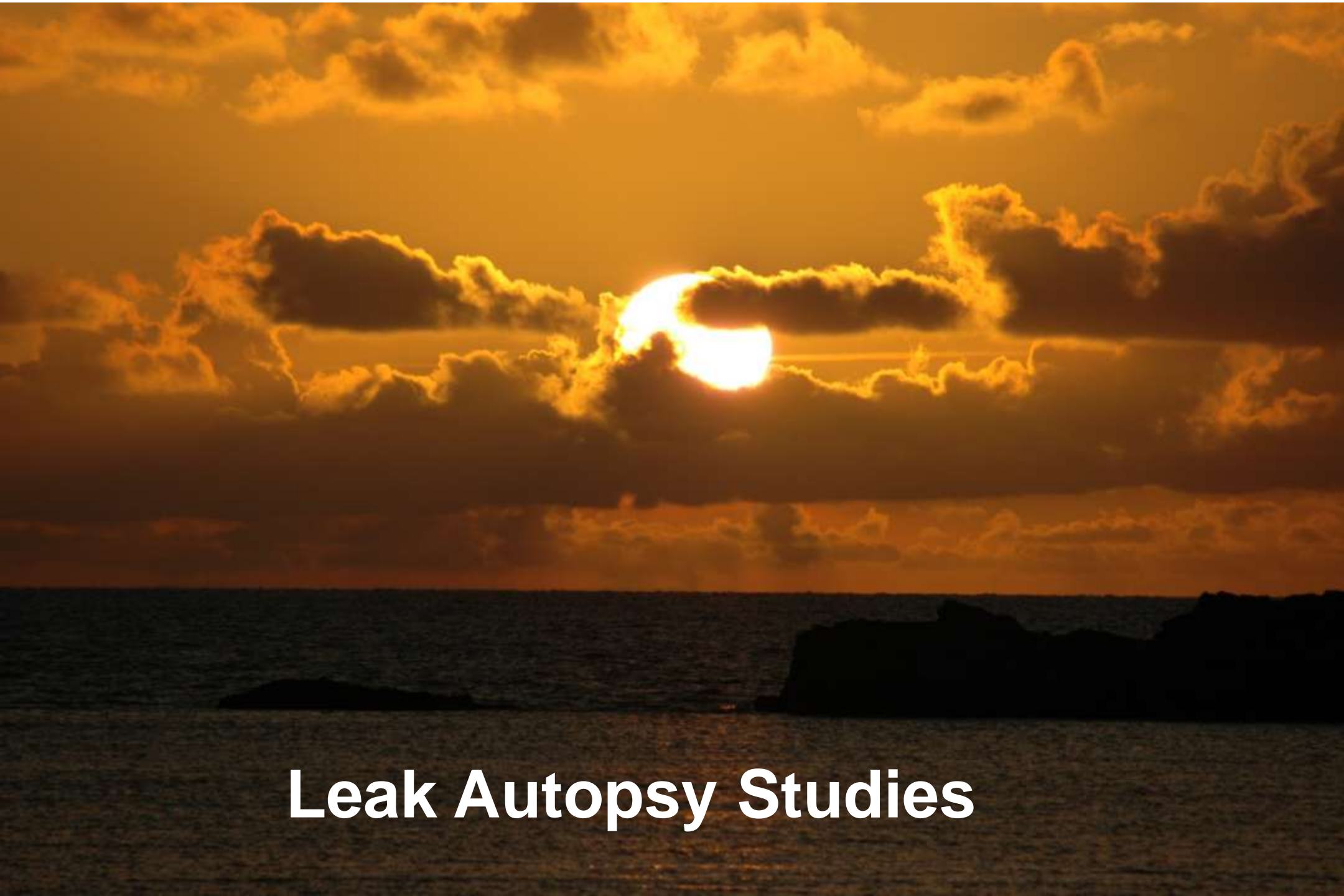
# Industry Reference Standards

- Available for review at DEP and County Offices
- Available for purchase by the Association
- Are considered rules when adopted by DEP
- Are constantly being updated and modified
- Are usually developed in Committee by industry experts, and may include regulators



# DEP's Florida Leak Autopsy Study – The Statistical Foundation of DEP's Regulations



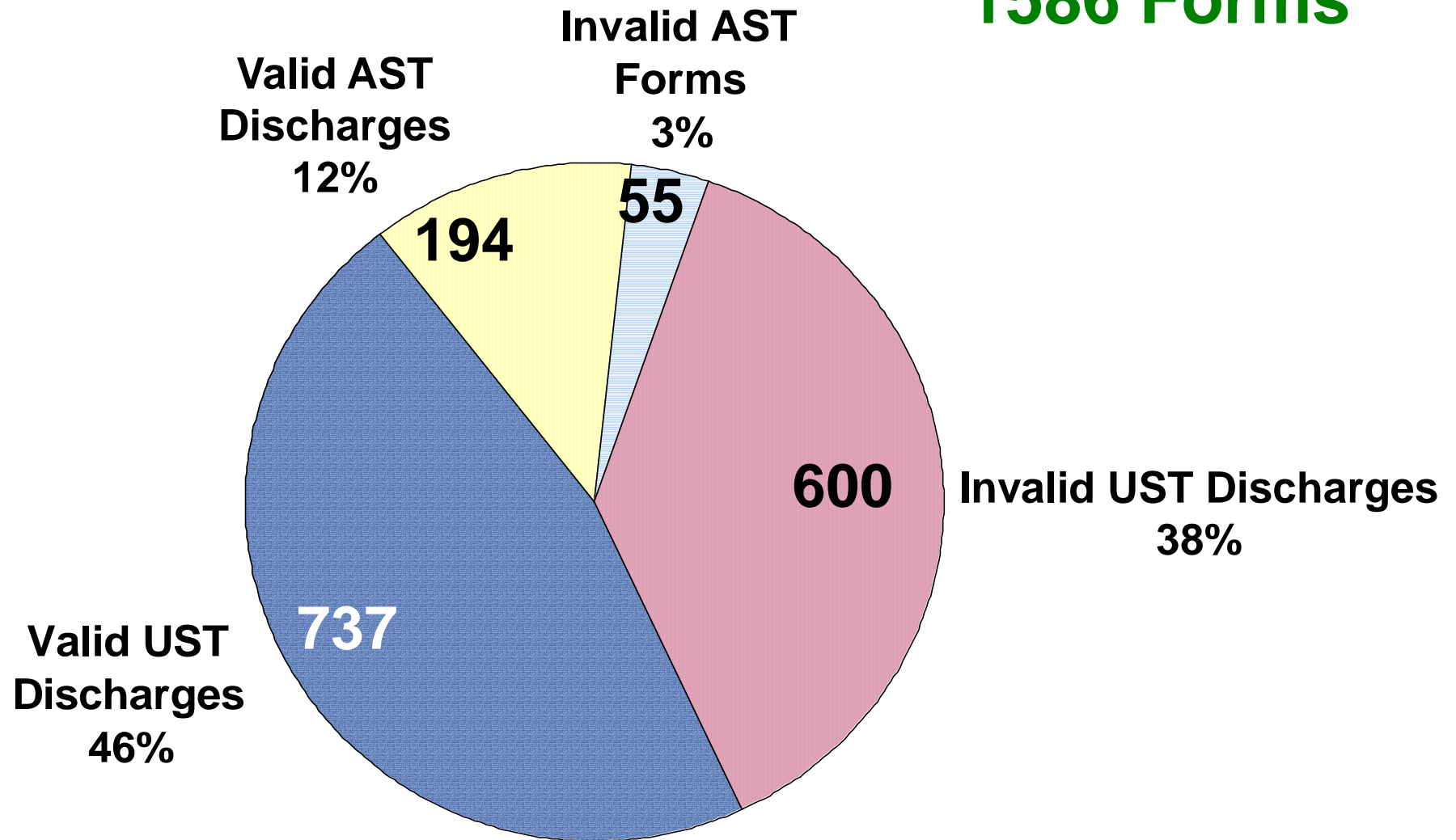


# Leak Autopsy Studies



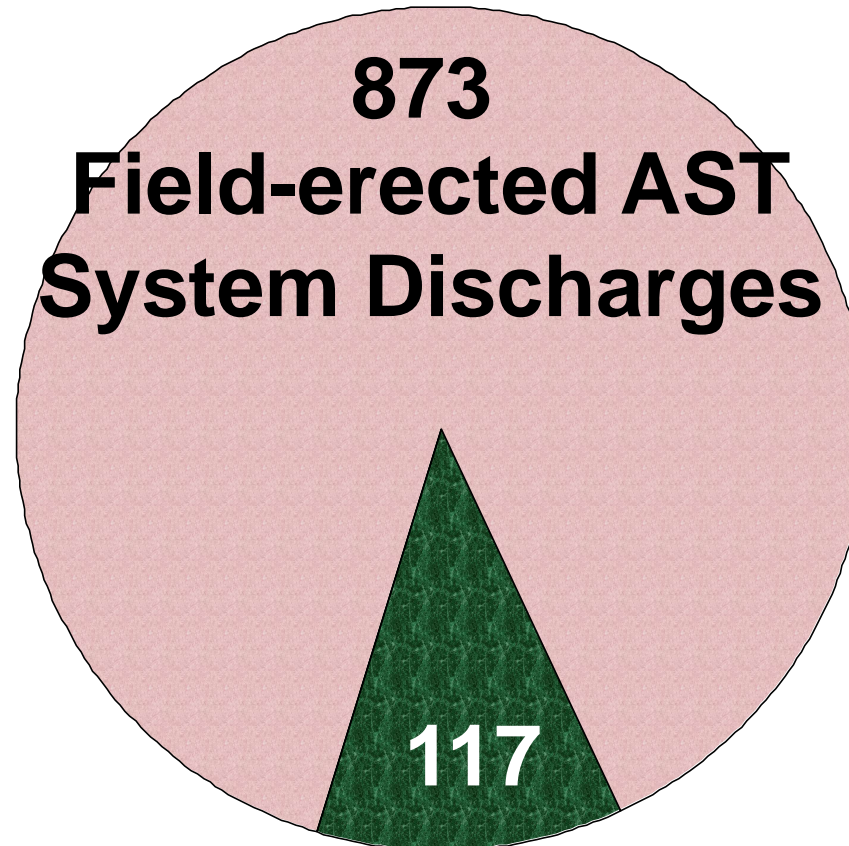
# Florida Leak Autopsy Forms 1 Jan 03 – 10 Mar 08

**1586 Forms**



# Field-erected AST Facility Discharges without Leak Study or Leak Autopsy Forms - 88%

Source - STCM, Apr 07



Field-erected AST Facility Discharges with Leak Study or Leak Autopsy Forms - 13%

# Leak Autopsy Report Forms

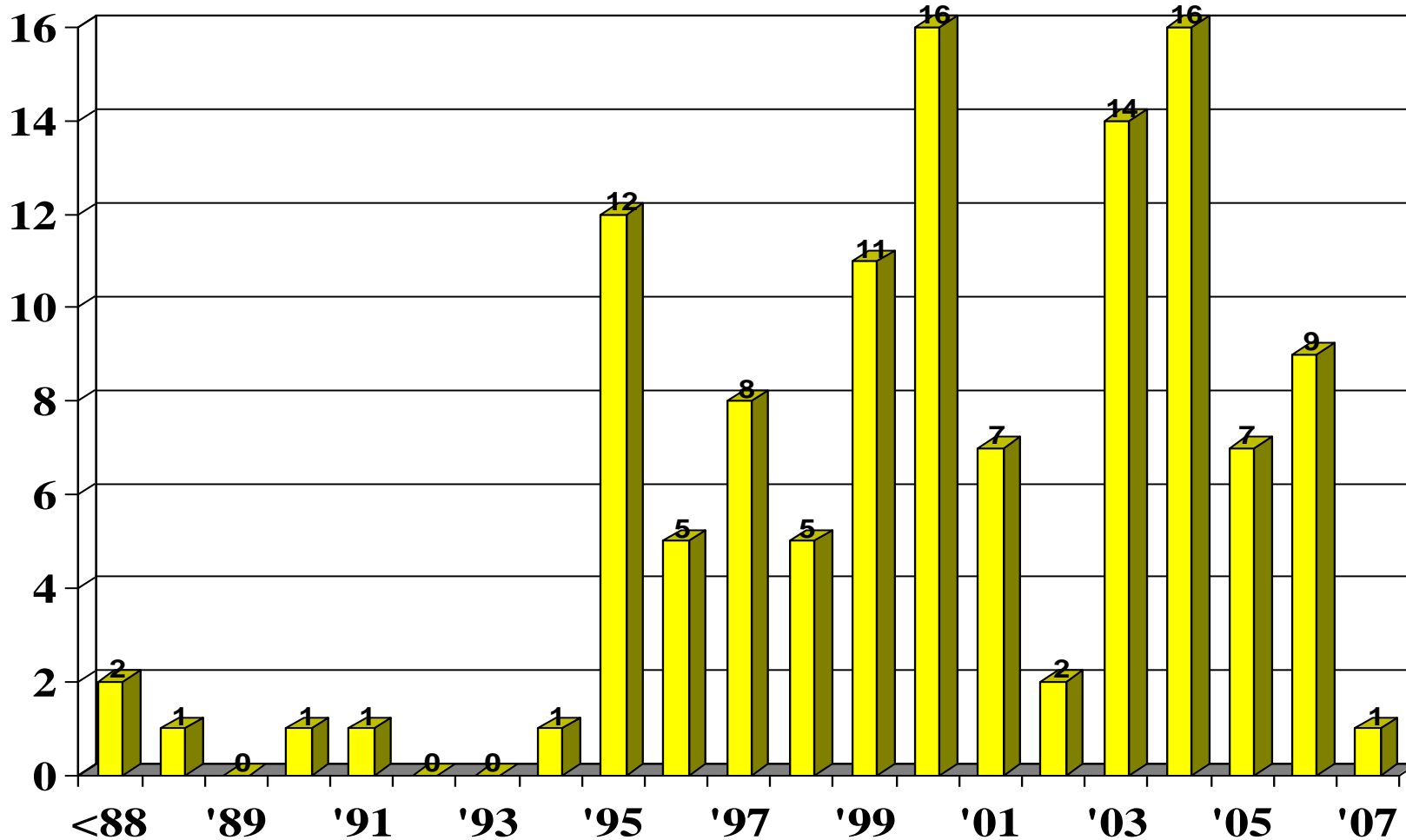
- Required for all new discharges after
  - January 1, 2003
- 47 Post-January 1, 2003 discharges  
(These have completed, field-verified Leak-Autopsy Report Forms)
- 70 Pre-January 1, 2003 discharges from the Florida Cause of Leak Study  
(Discharge information generated from inspection file reviews)

# Field-erected AST Discharges



# Discharges from Field-erected Aboveground Storage Tank Systems

Note: DEP  
AST Rules  
began in  
1991



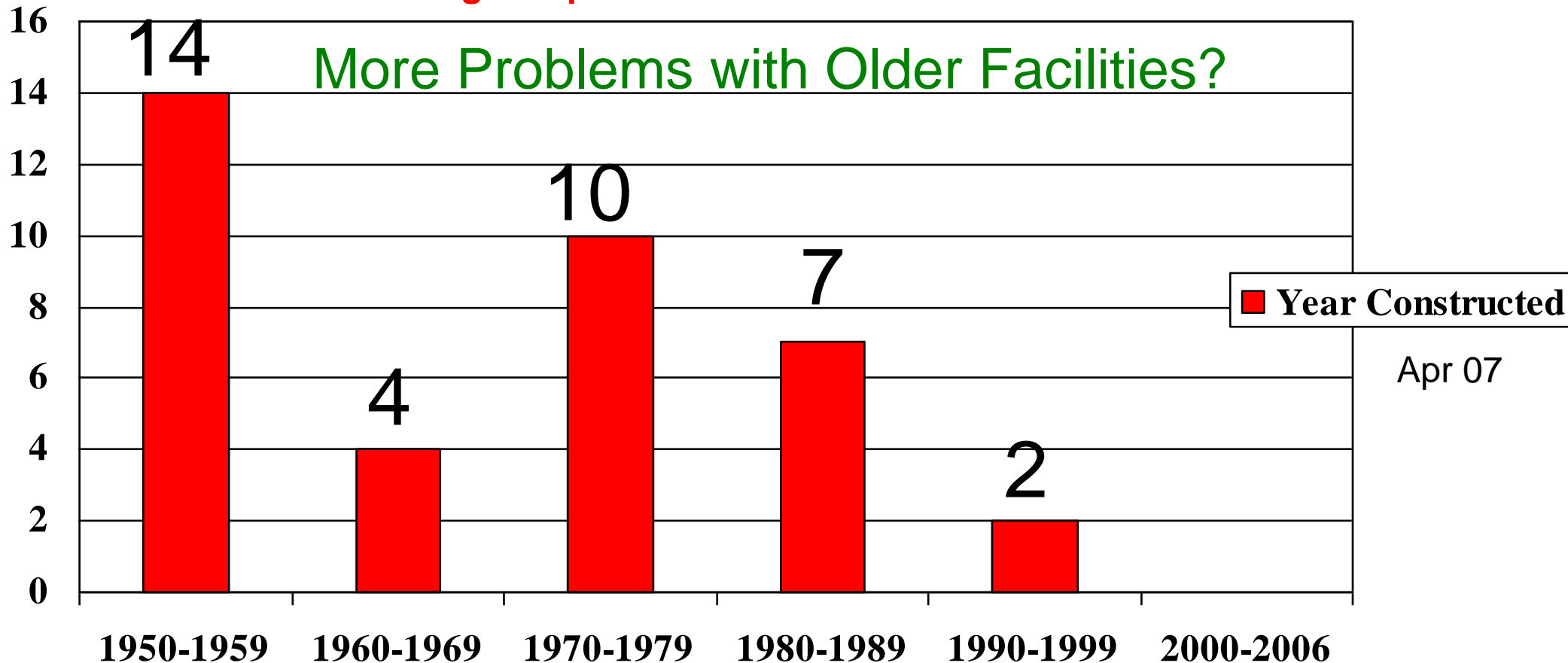
Discharges

**117**  
**Discharges**  
**Included in**  
**The Study**

Source: STCM, Apr 07

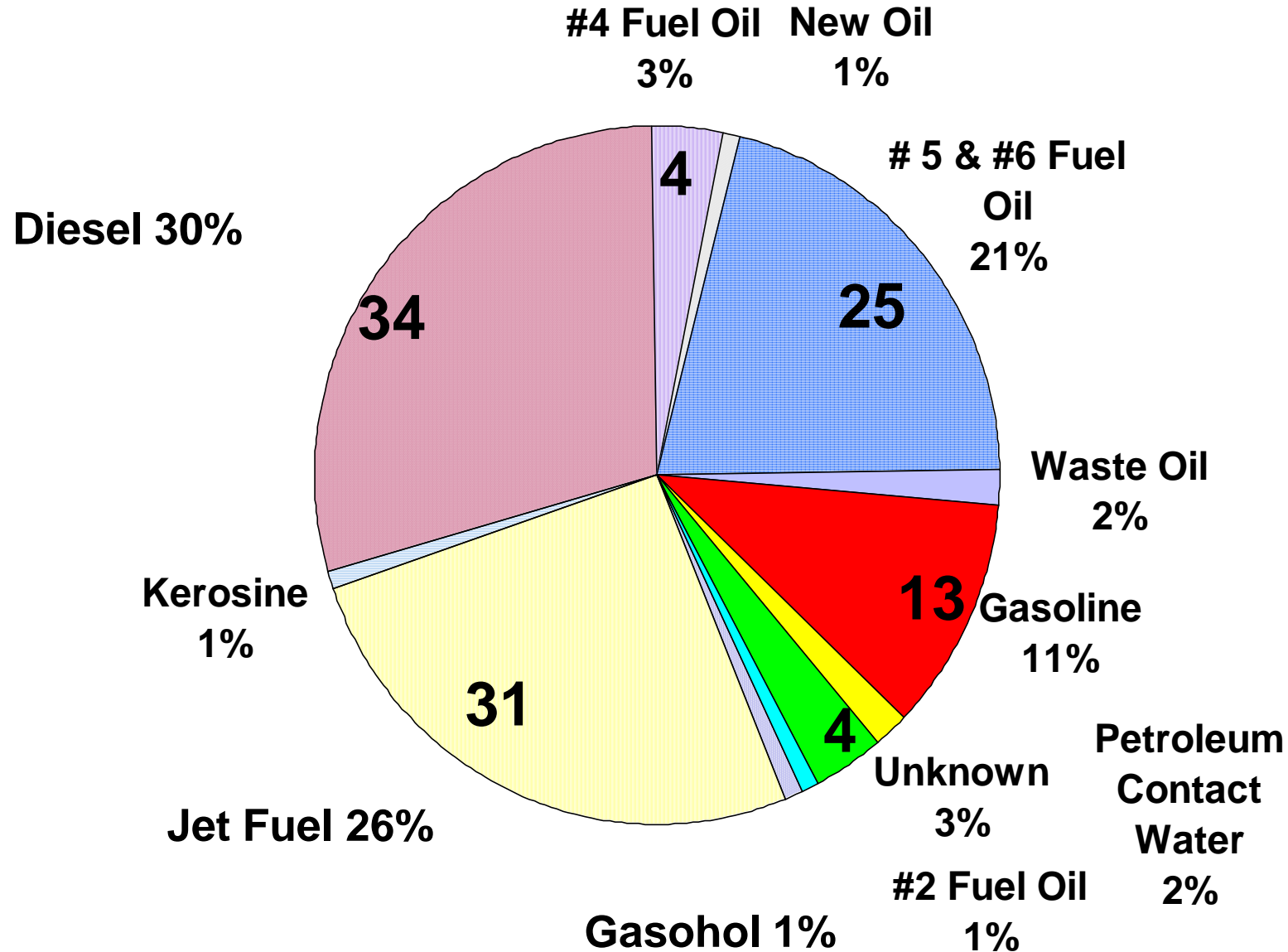
# Installation Date Ranges of Field-erected ASTs at Facilities with Discharges

80 facilities with Discharges reported unknown dates of tank installations



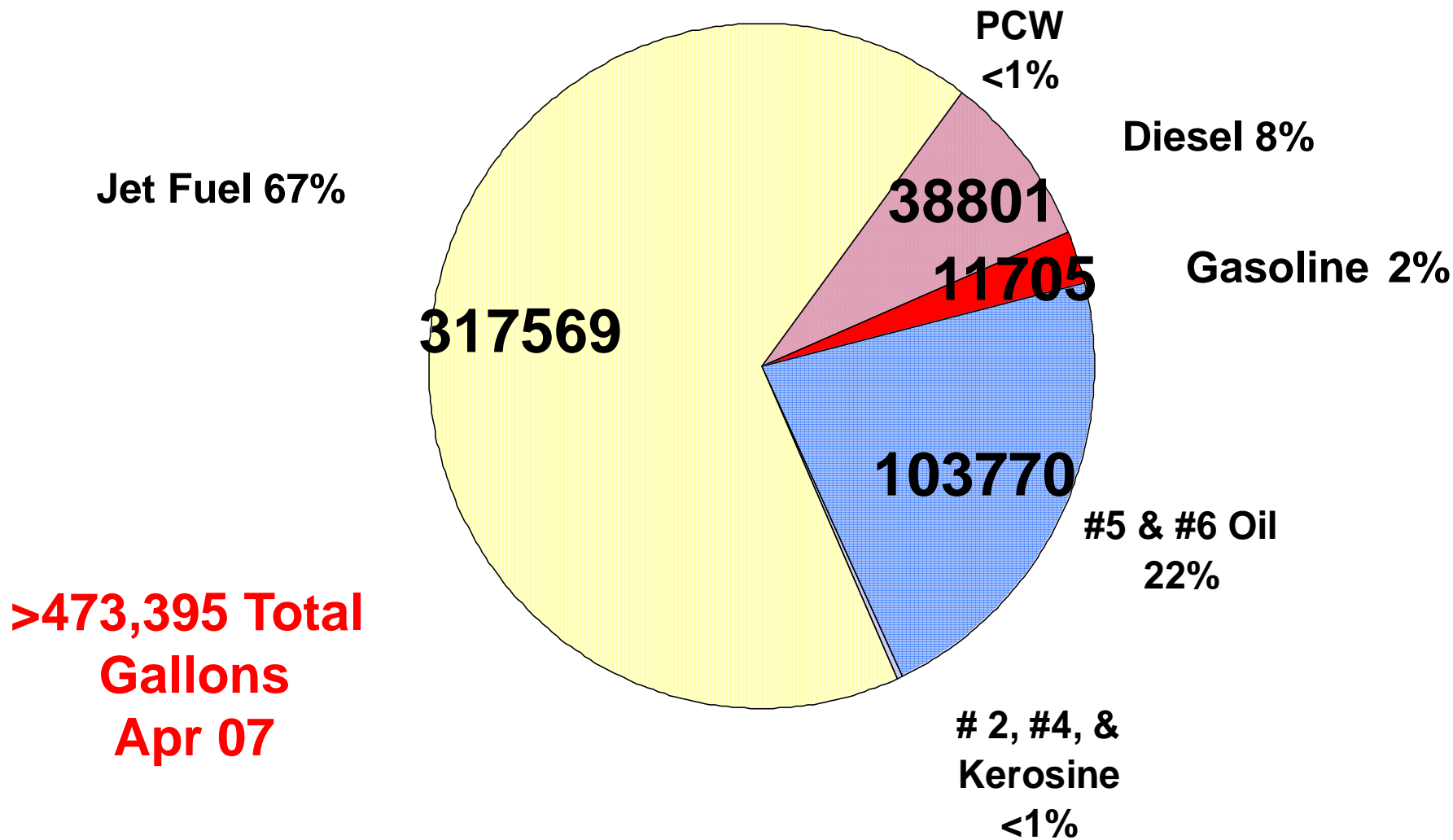
# Percent of Discharges by Product Type

Apr 07



Field-Erected AST Systems

# Percent of Estimated Gallons Discharged by Product Type



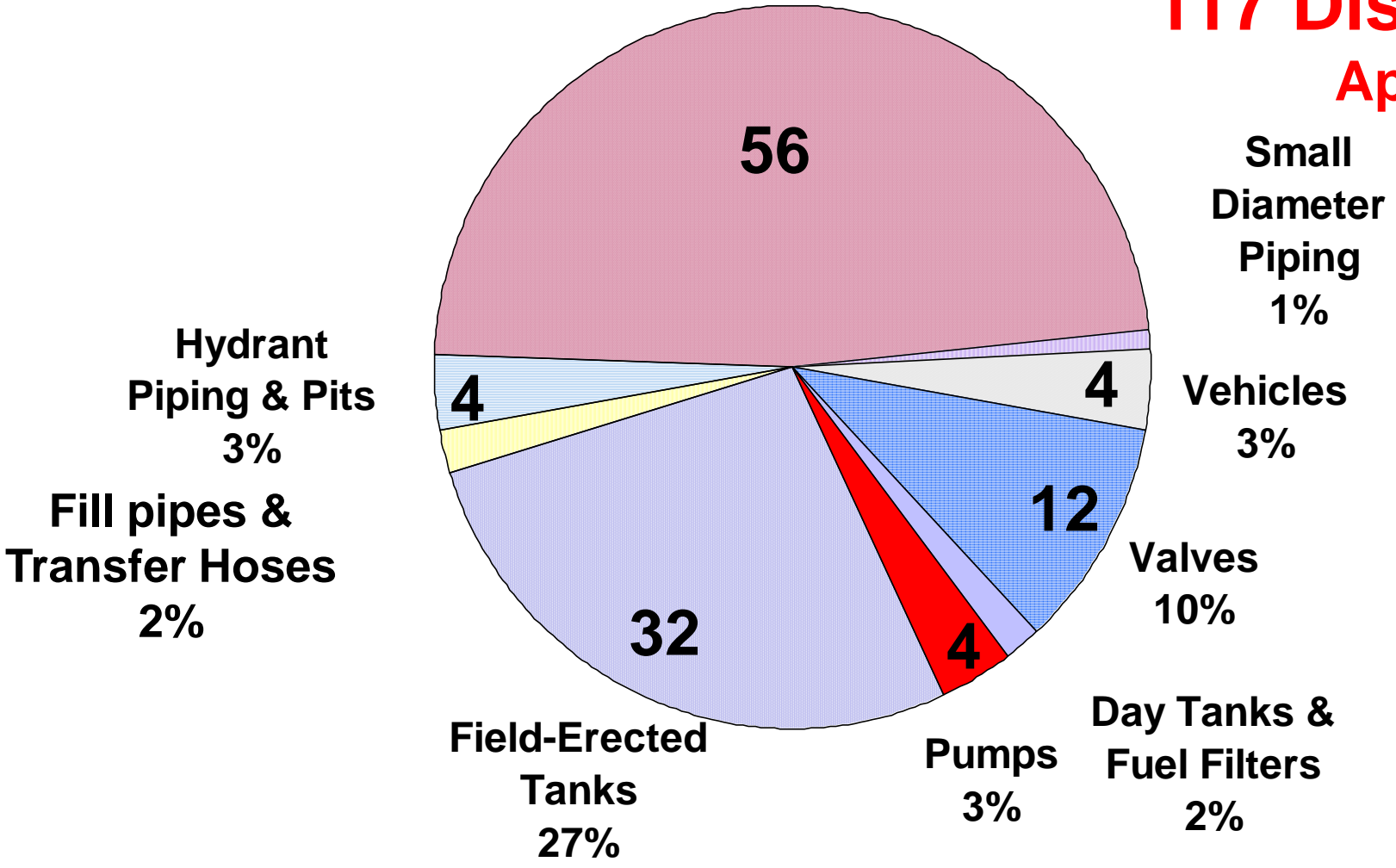
**Field-Erected AST Systems**



# Sources of Discharges - Field-Erected AST Systems

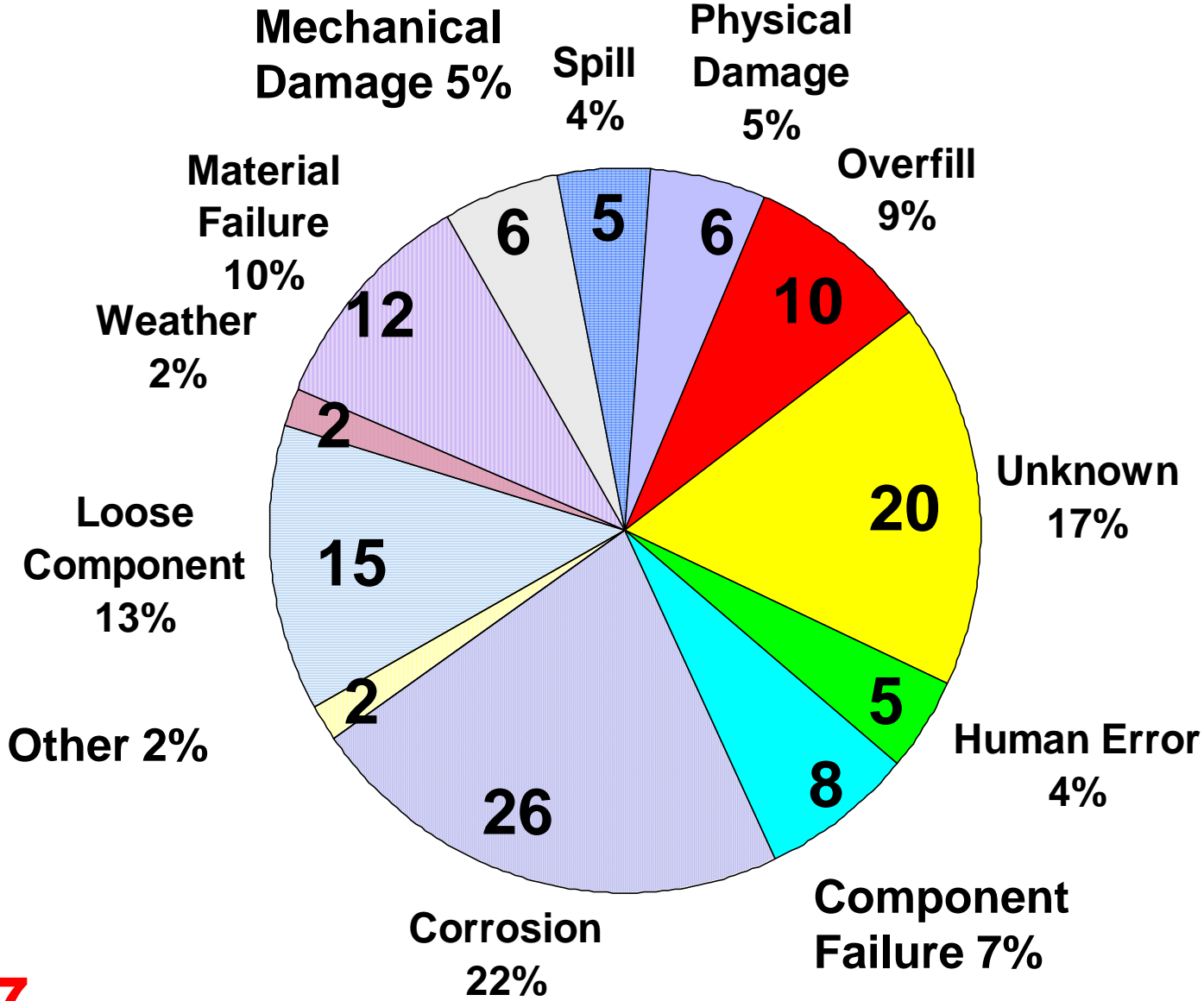
**117 Discharges**  
**Apr 07**

**Bulk Product Piping 48%**



**Tanks are only 17% if overfills and other external factors are excluded**

# Causes of Discharges from All Sources

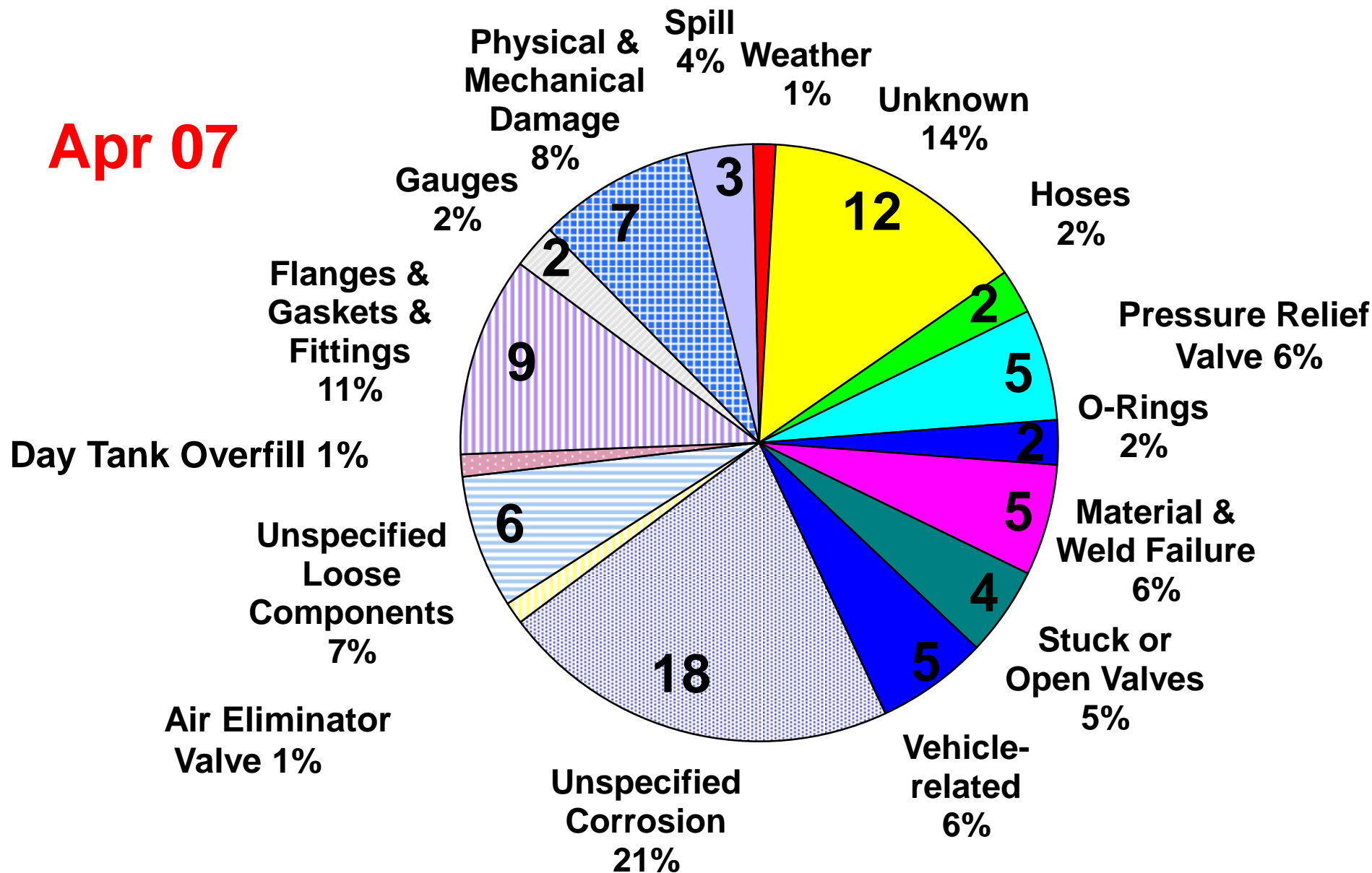


Apr 07

Field-Erected AST Systems

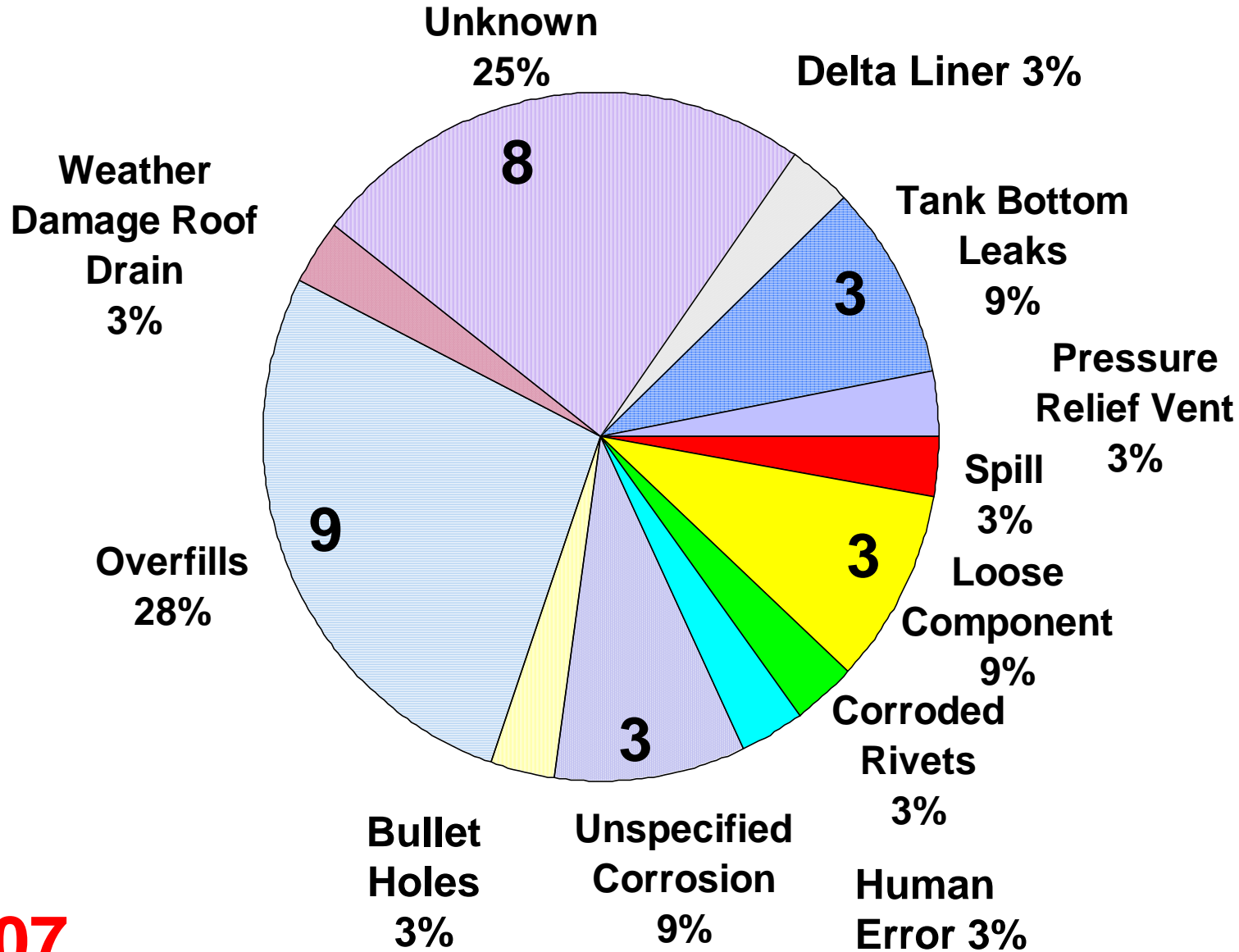
# Causes of Discharges from Piping, Valves, & Pumps

**Apr 07**



**Field-Erected AST Systems**

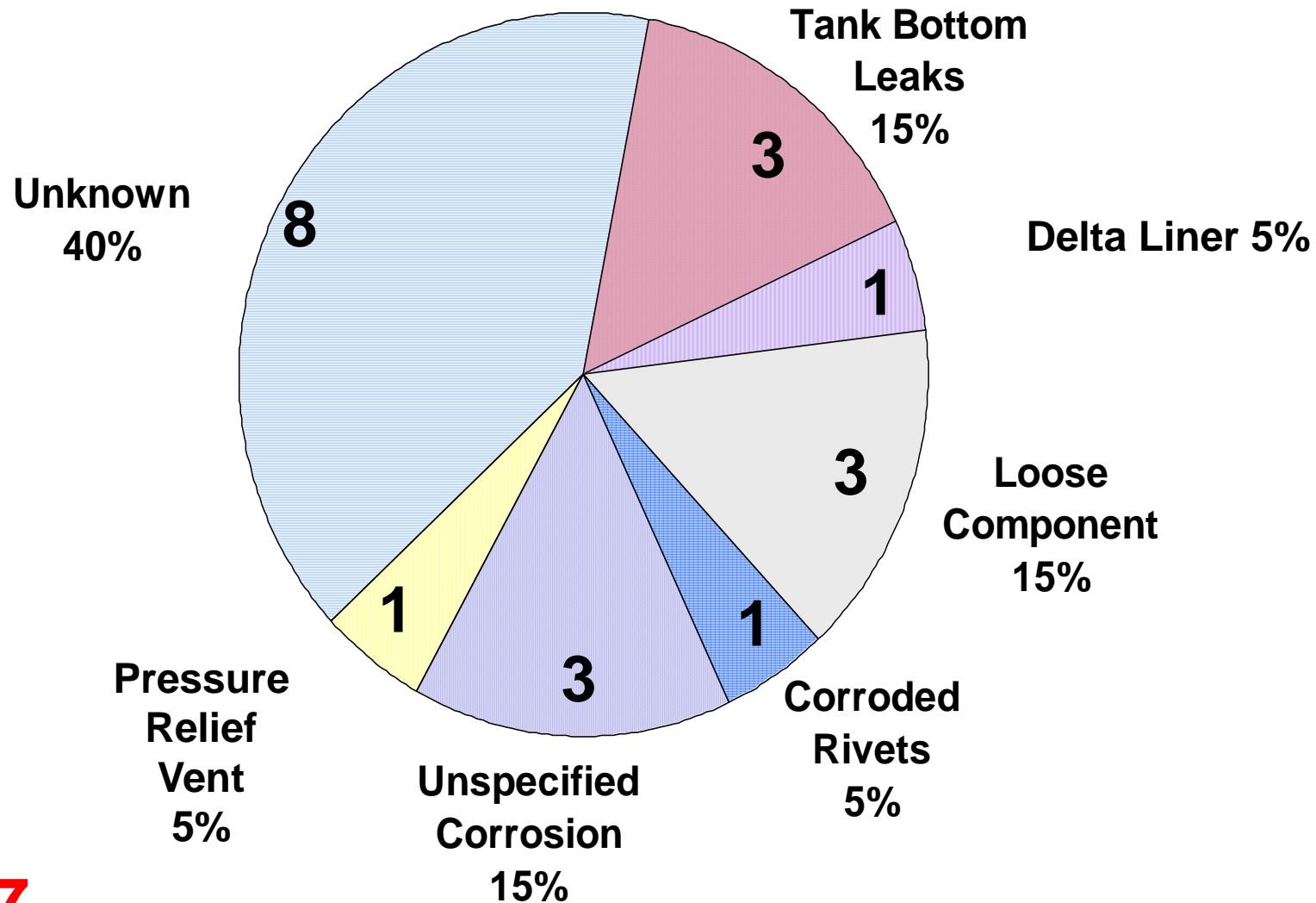
# Causes of Discharges from Tanks



**Apr 07**

**Field-Erected AST Systems**

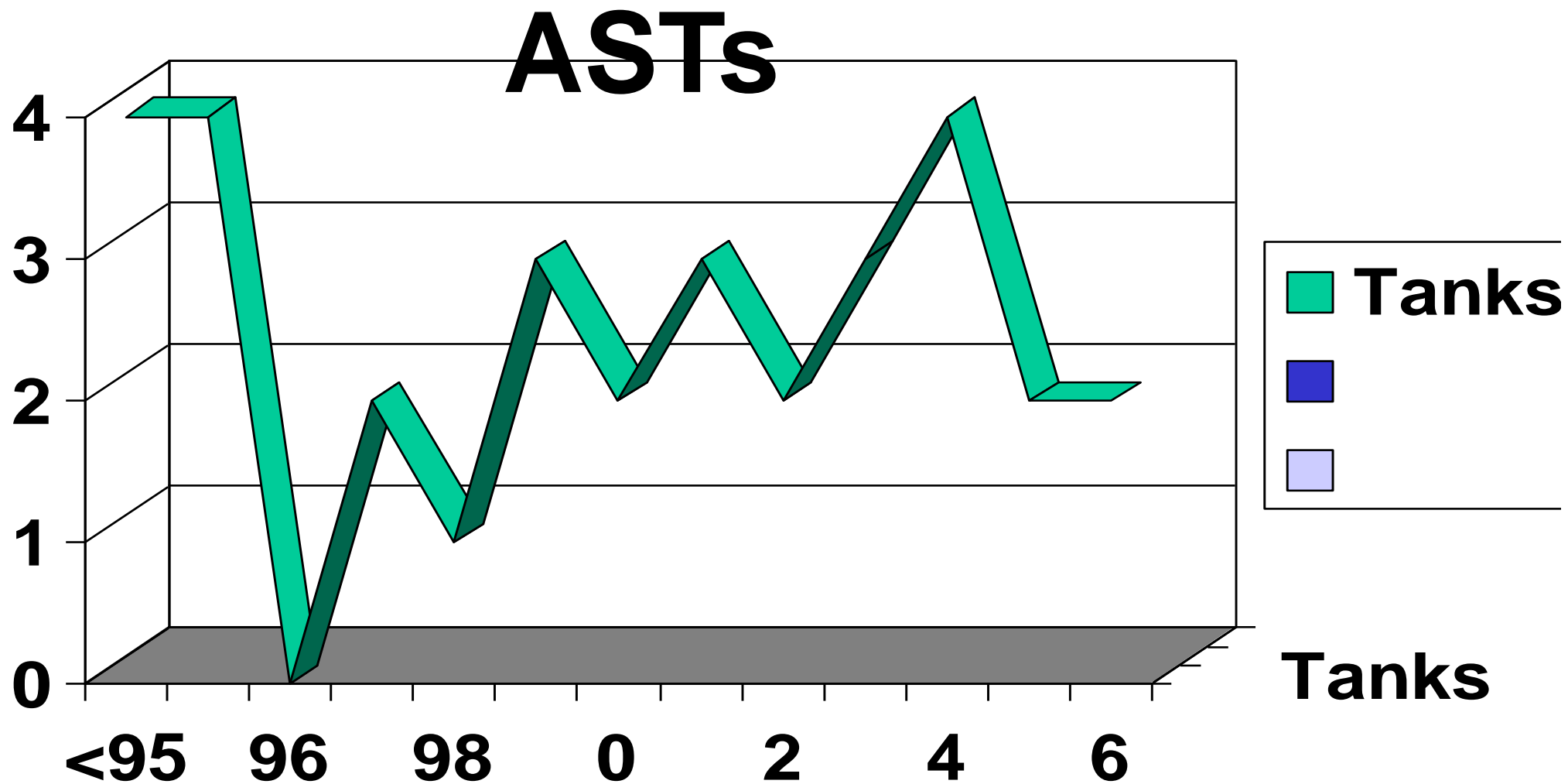
# Causes of Discharges from Field-erected Tanks, Excluding External Factors (e.g. Overfills & Weather)



**Apr 07**

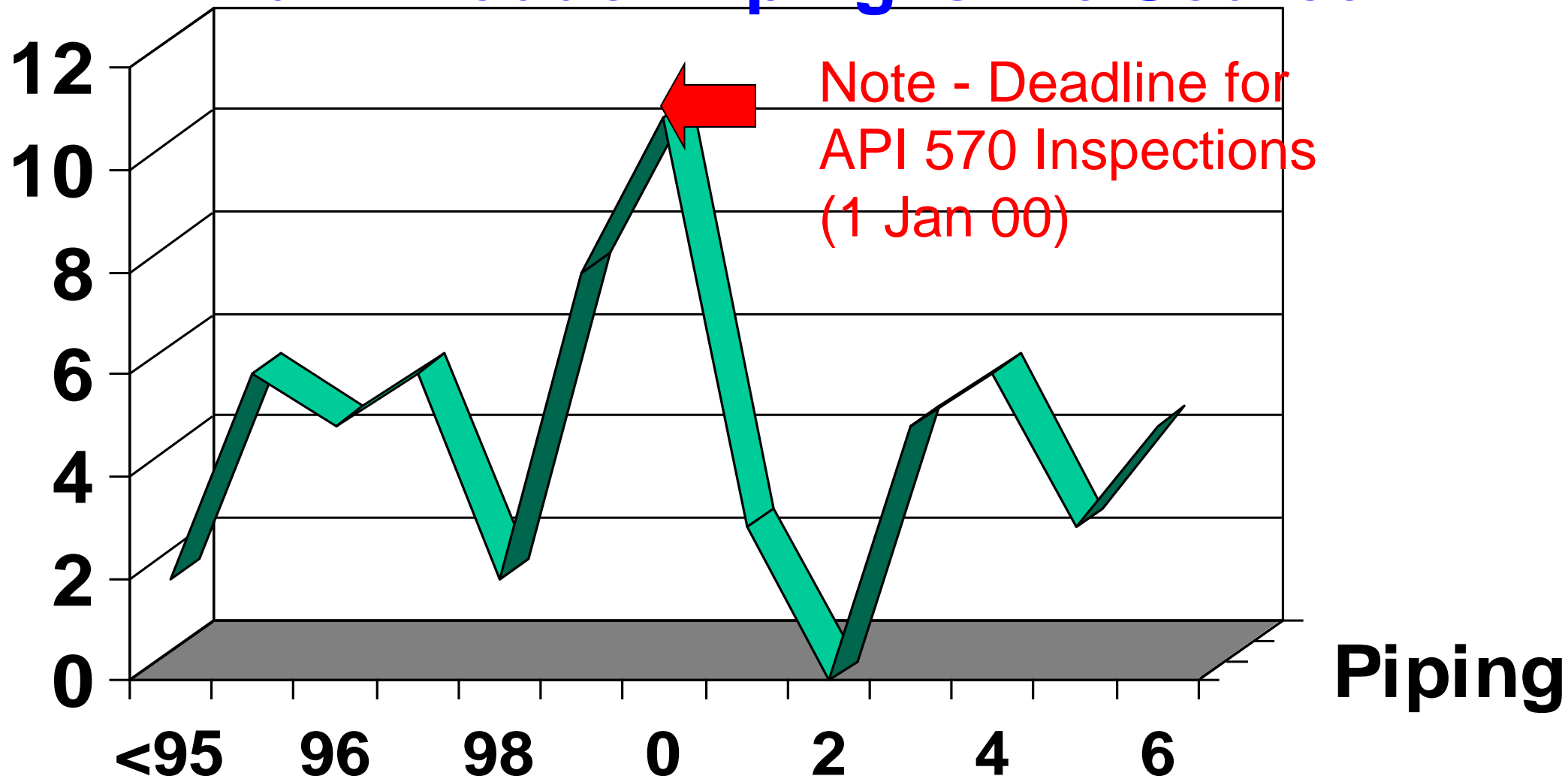
**Field-Erected AST Systems**

# Leak Autopsy Reports Received – Field-erected Tank is the Source



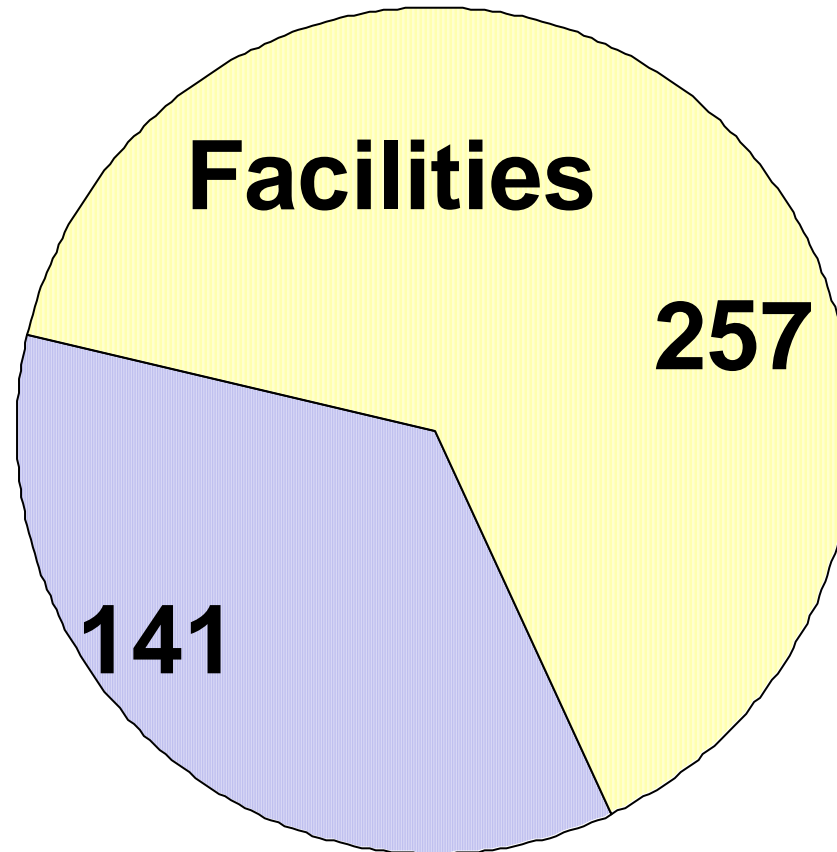
\*Note - DEP adopted API 653 in 1991

# Leak Autopsy Reports Received – Bulk Product Piping is the Source



# Registered Florida Facilities with Discharges at Sites with Field-erected ASTs - 65%

Source - STCM, Apr 07



**Registered Facilities without Discharges  
35%**



# Discharge Photos





**Tank Overflow**



**Tank Overfill**

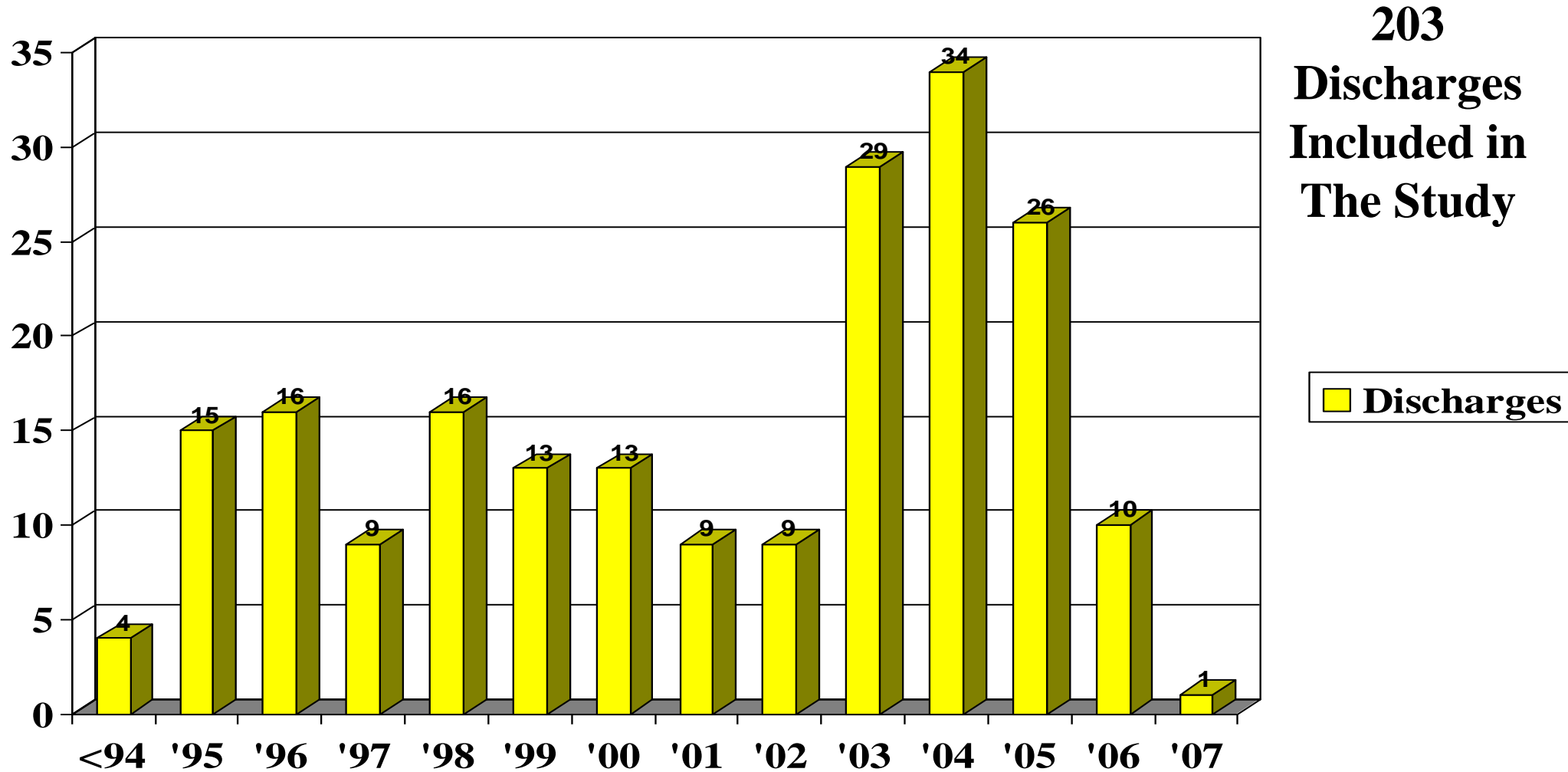


# Shop-fabricated Tank Discharges



06/22/2007

# Discharges from Shop-fabricated Aboveground Storage Tank Systems



**203**

**Discharges  
Included in  
The Study**

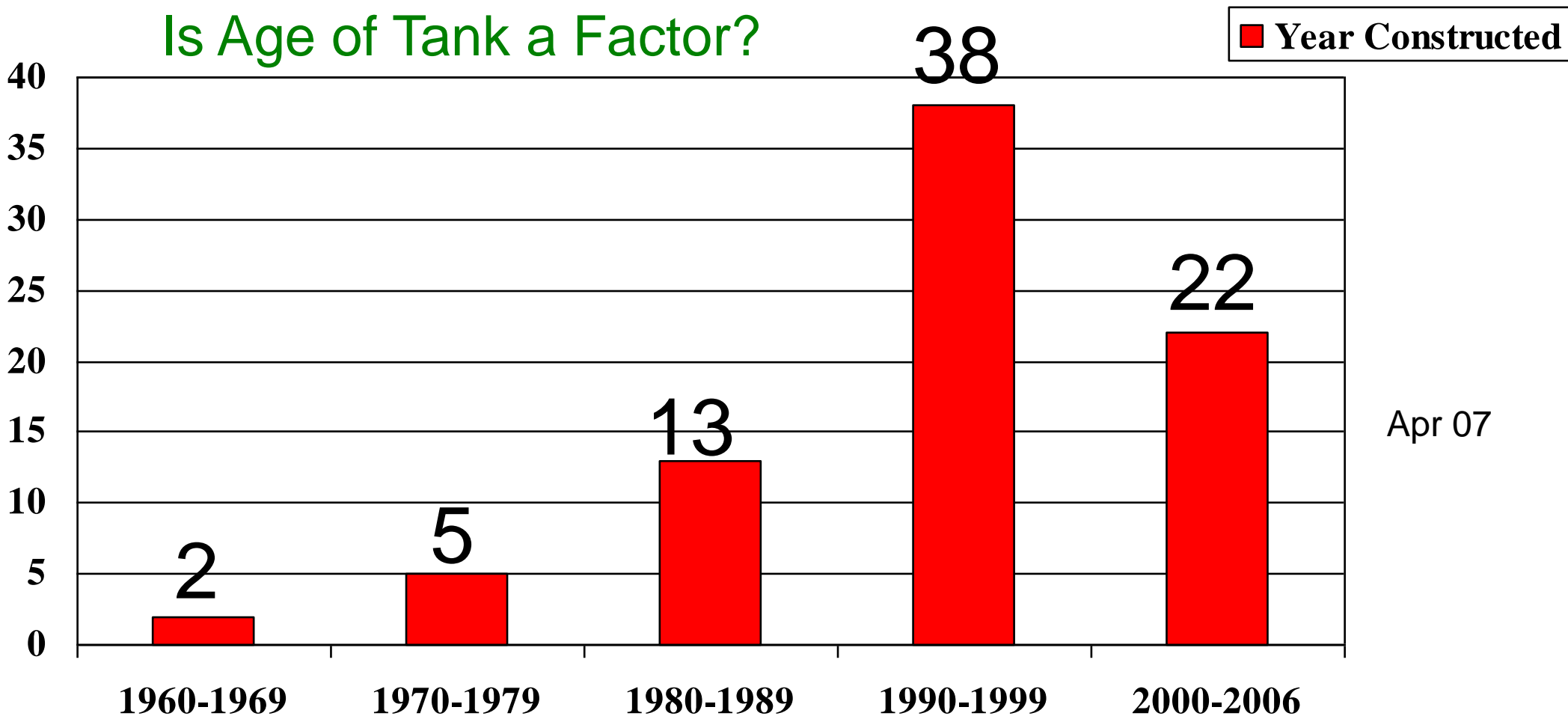
**Discharges**

Source: STCM, Apr 07

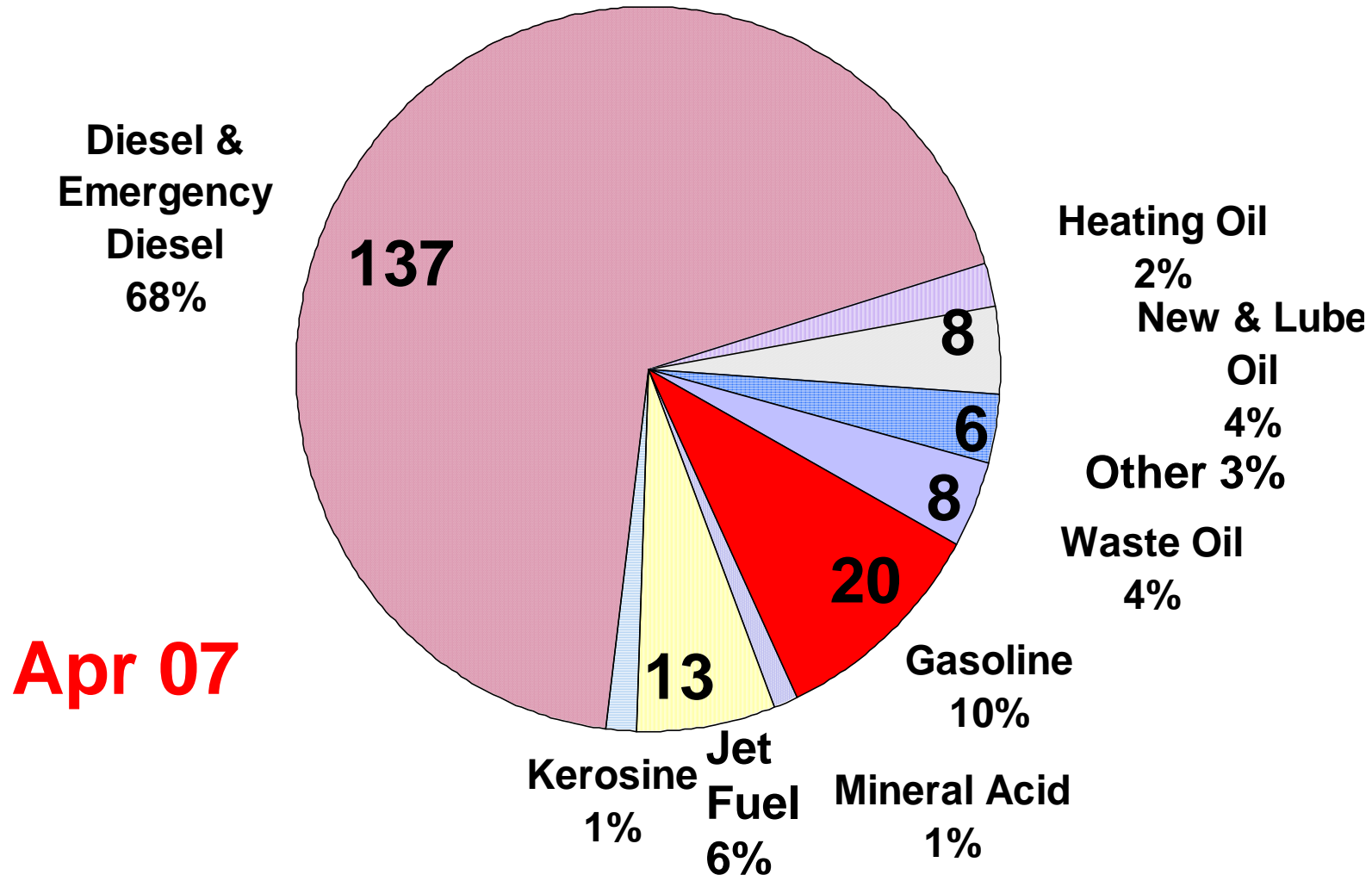
# Tank Installation Date Ranges for Shop-fabricated AST Facilities with Discharges

122 facilities with Discharges reported unknown dates of tank installations

More problems with Newer Facilities?  
Is Age of Tank a Factor?

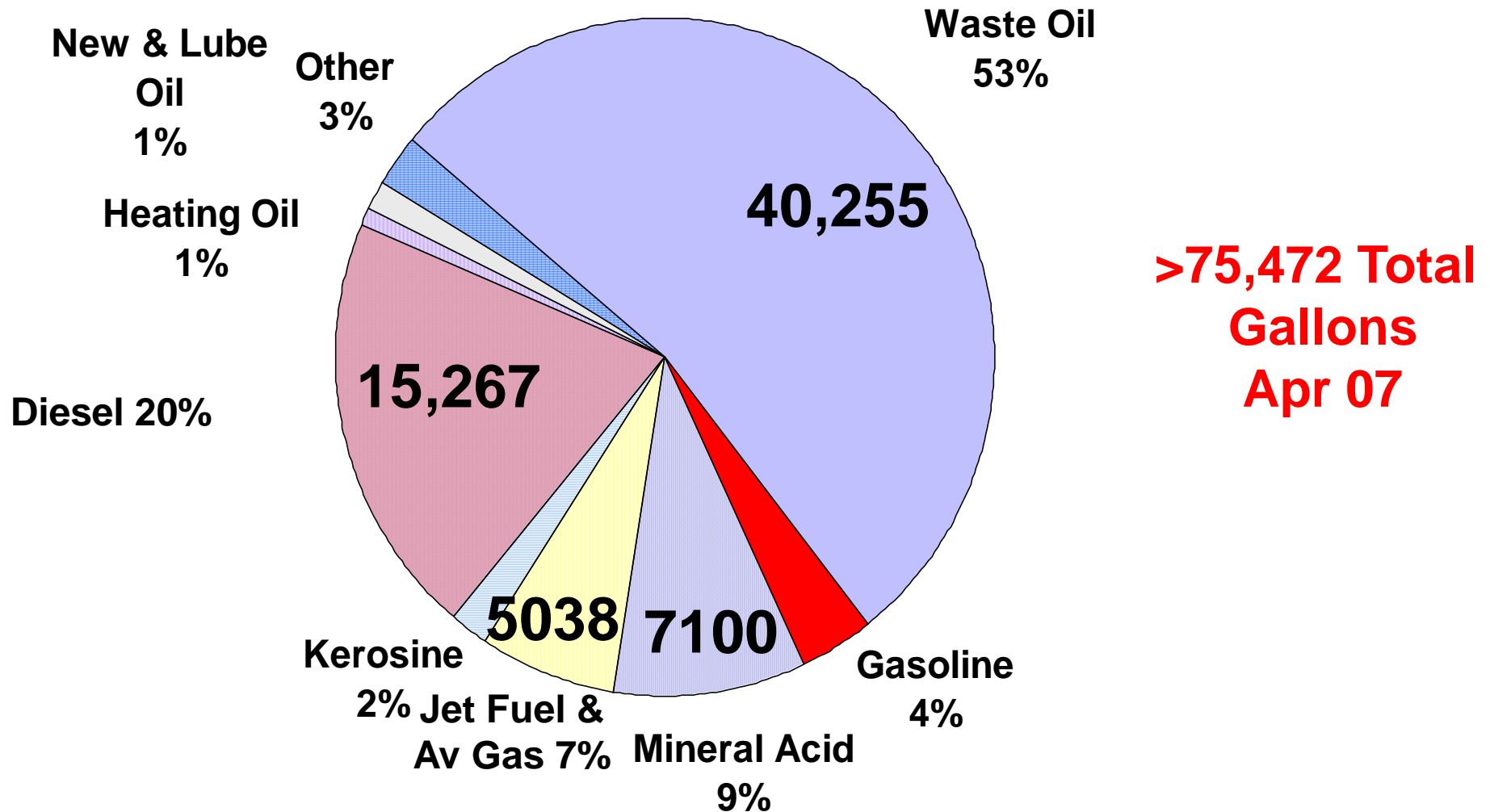


# Percent of Discharges by Product Type



**Shop-fabricated AST Systems**

# Percent of Estimated Gallons Discharged by Product Type

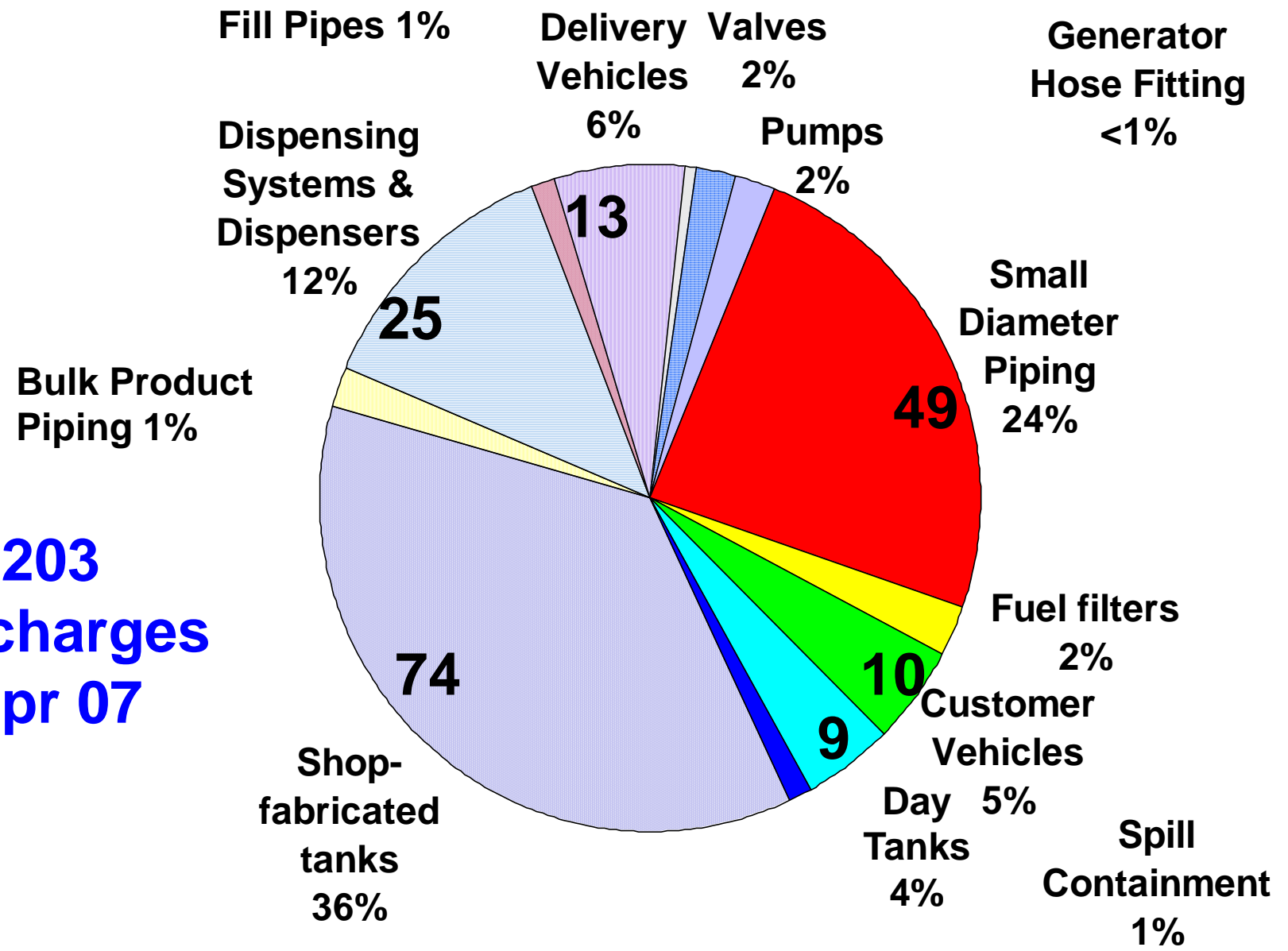


**Shop-fabricated AST Systems**



# Sources of Discharges - Shop-fabricated ASTs

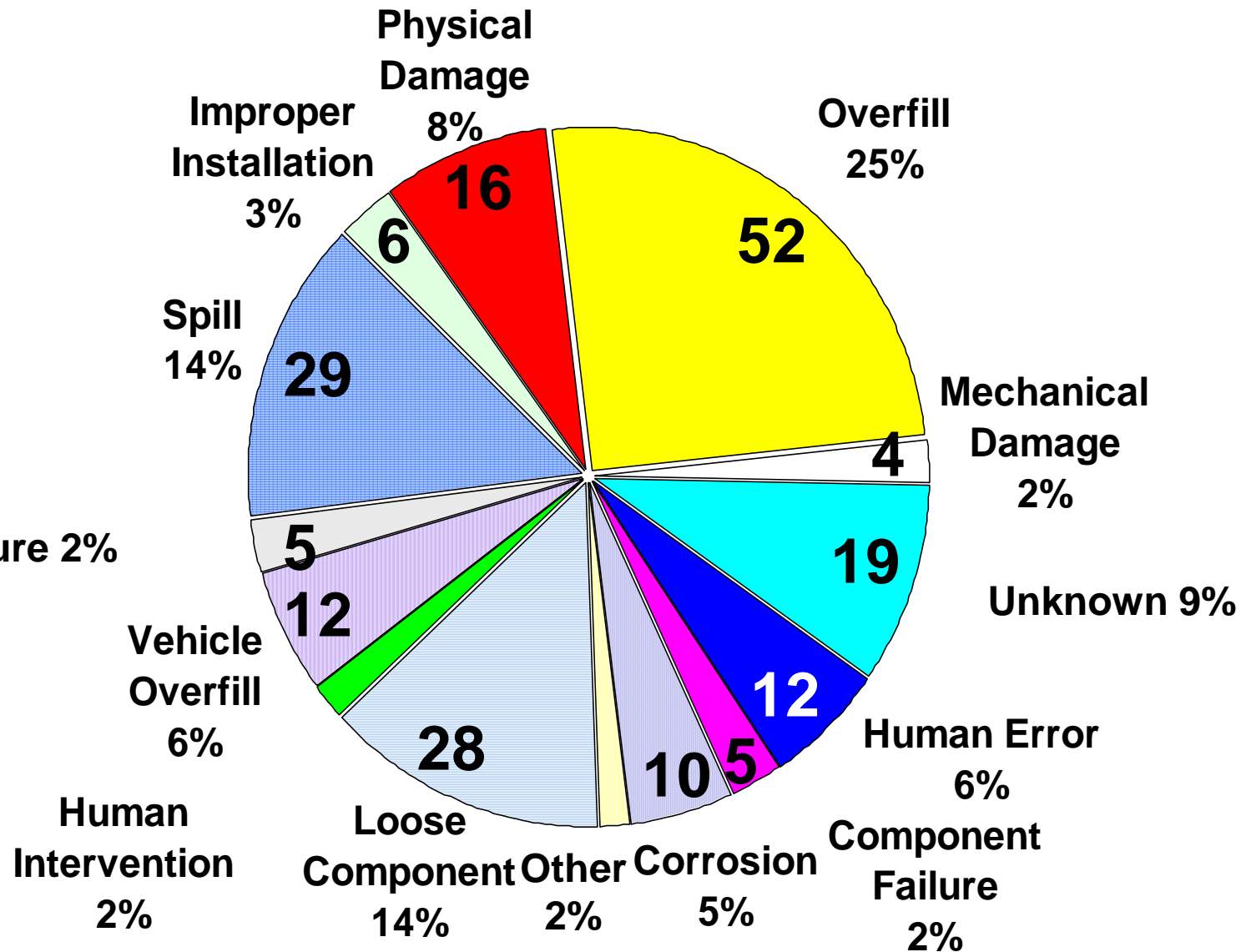
**203**  
**Discharges**  
**Apr 07**





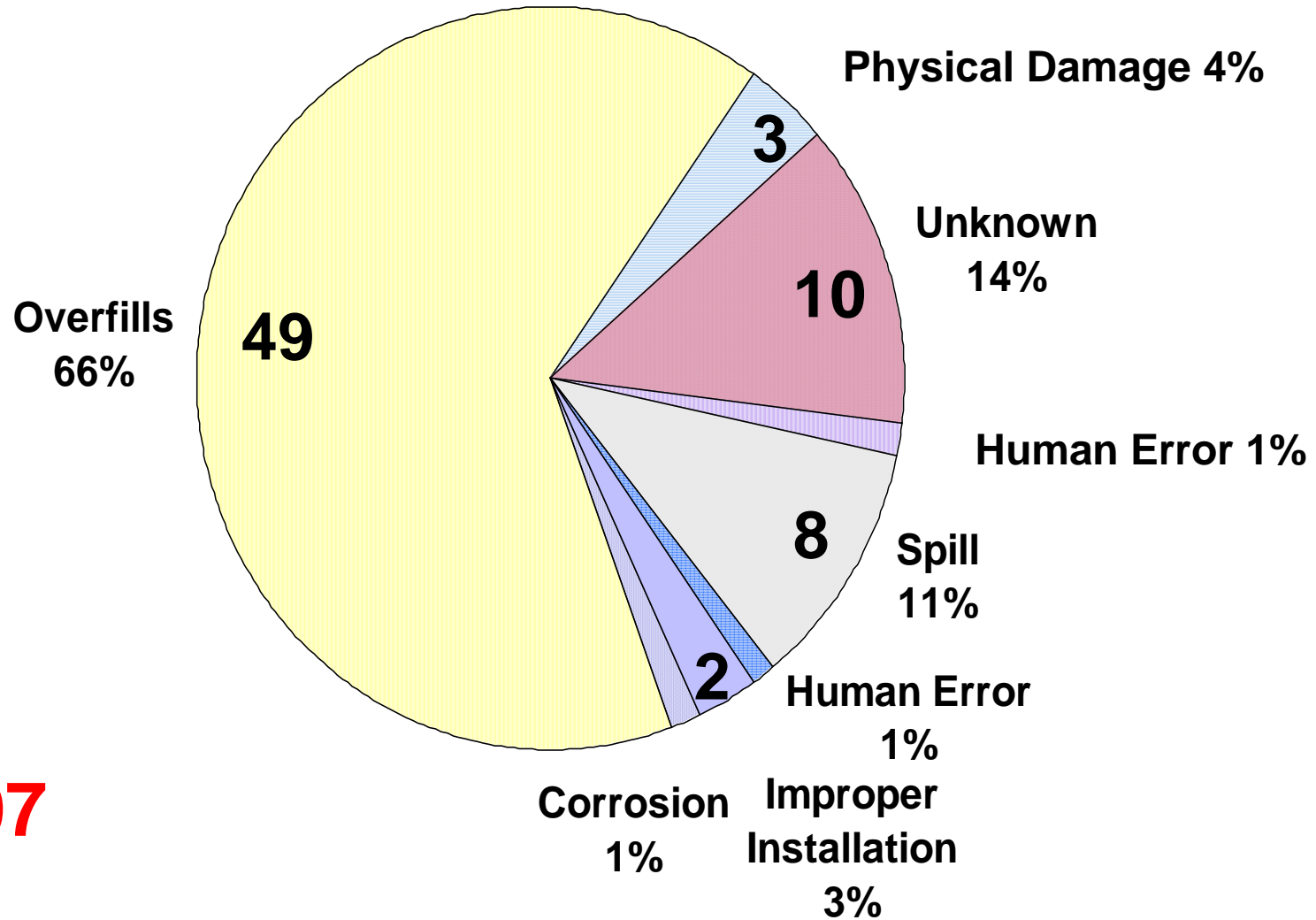
# Causes of Discharges from All Sources

Apr 07



Shop-fabricated AST Systems

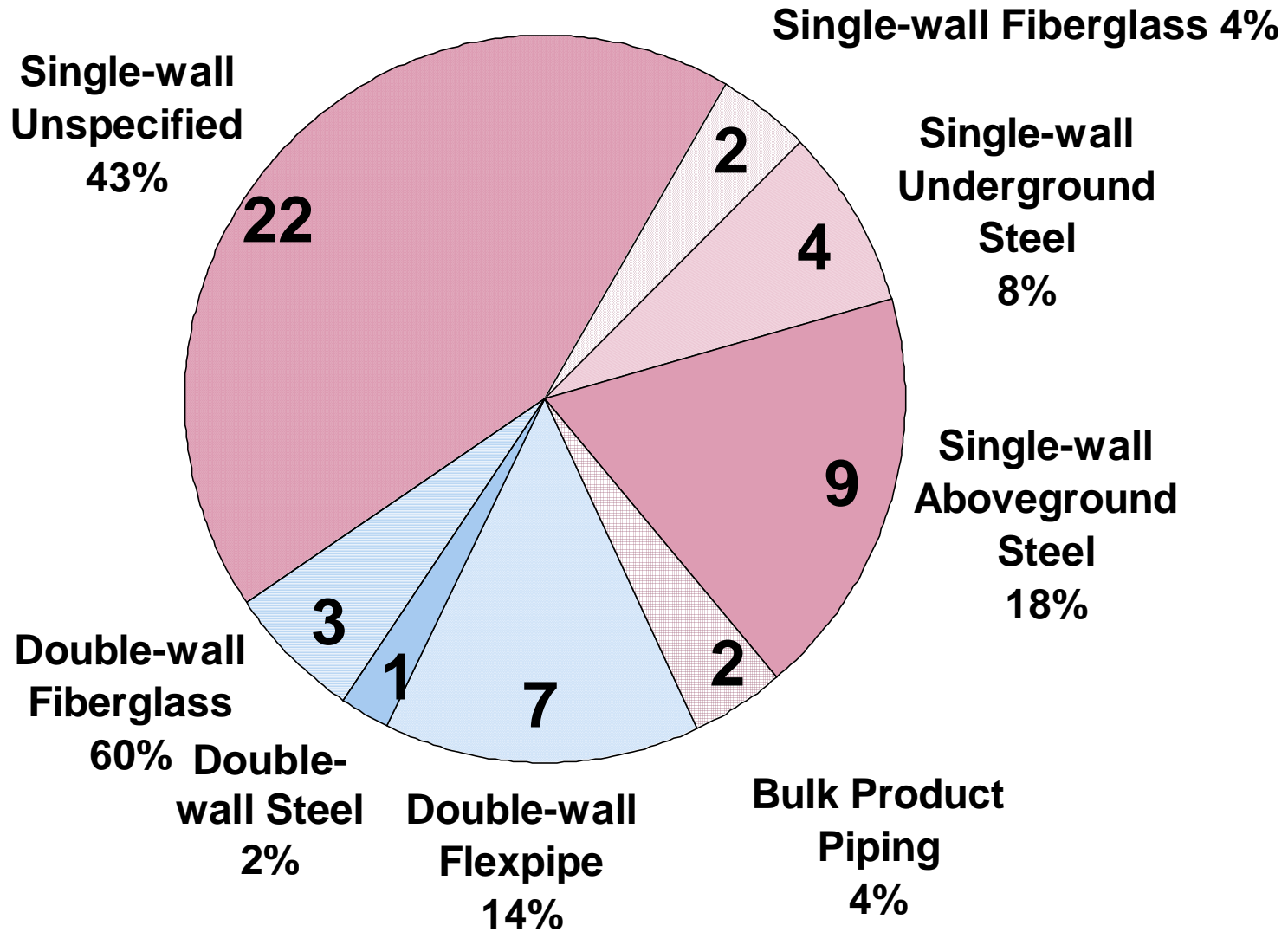
# Causes of Discharges from Tanks



**Apr 07**

**Shop-fabricated AST Systems**

# Causes of Discharges from Piping, Different Types of Piping

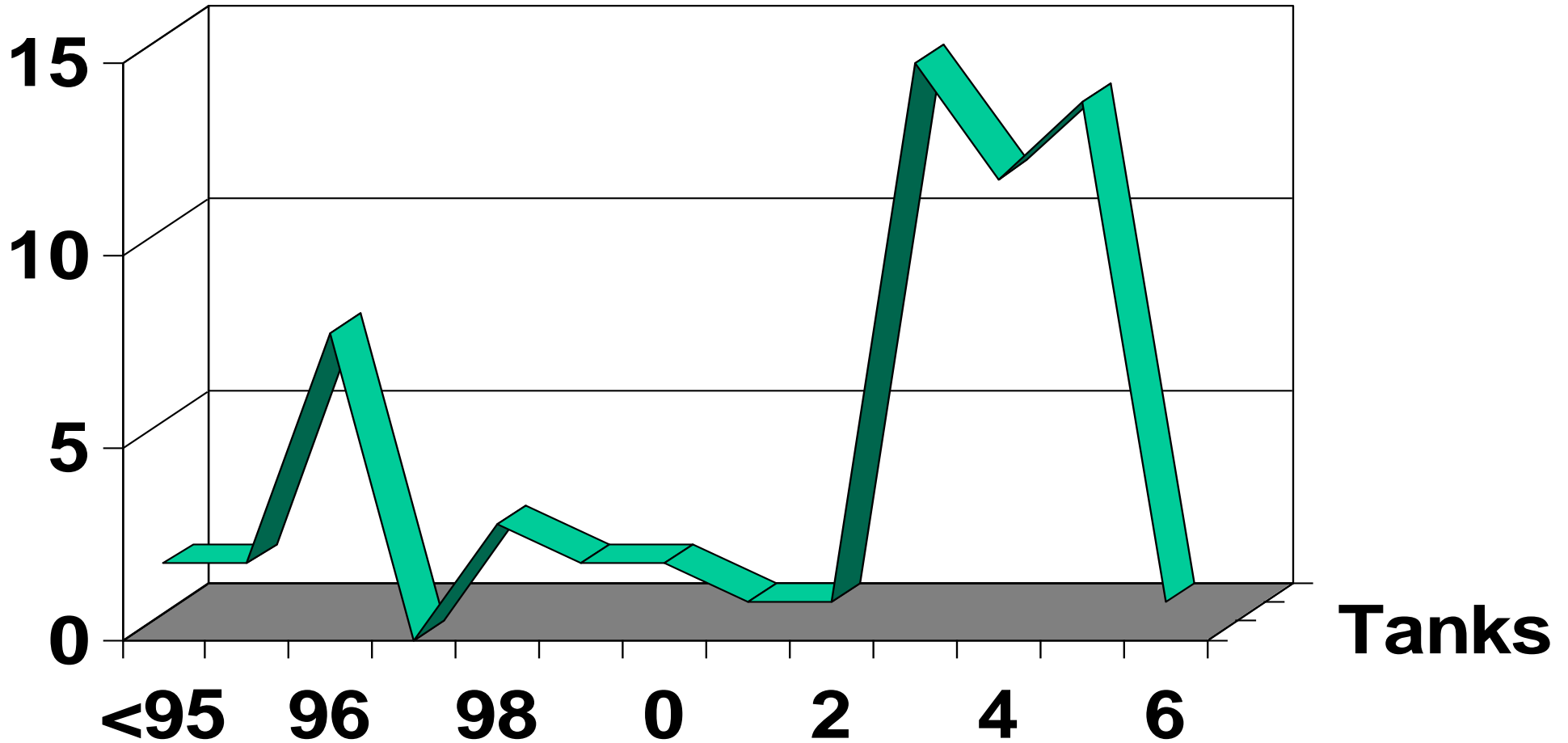


**Apr 07**

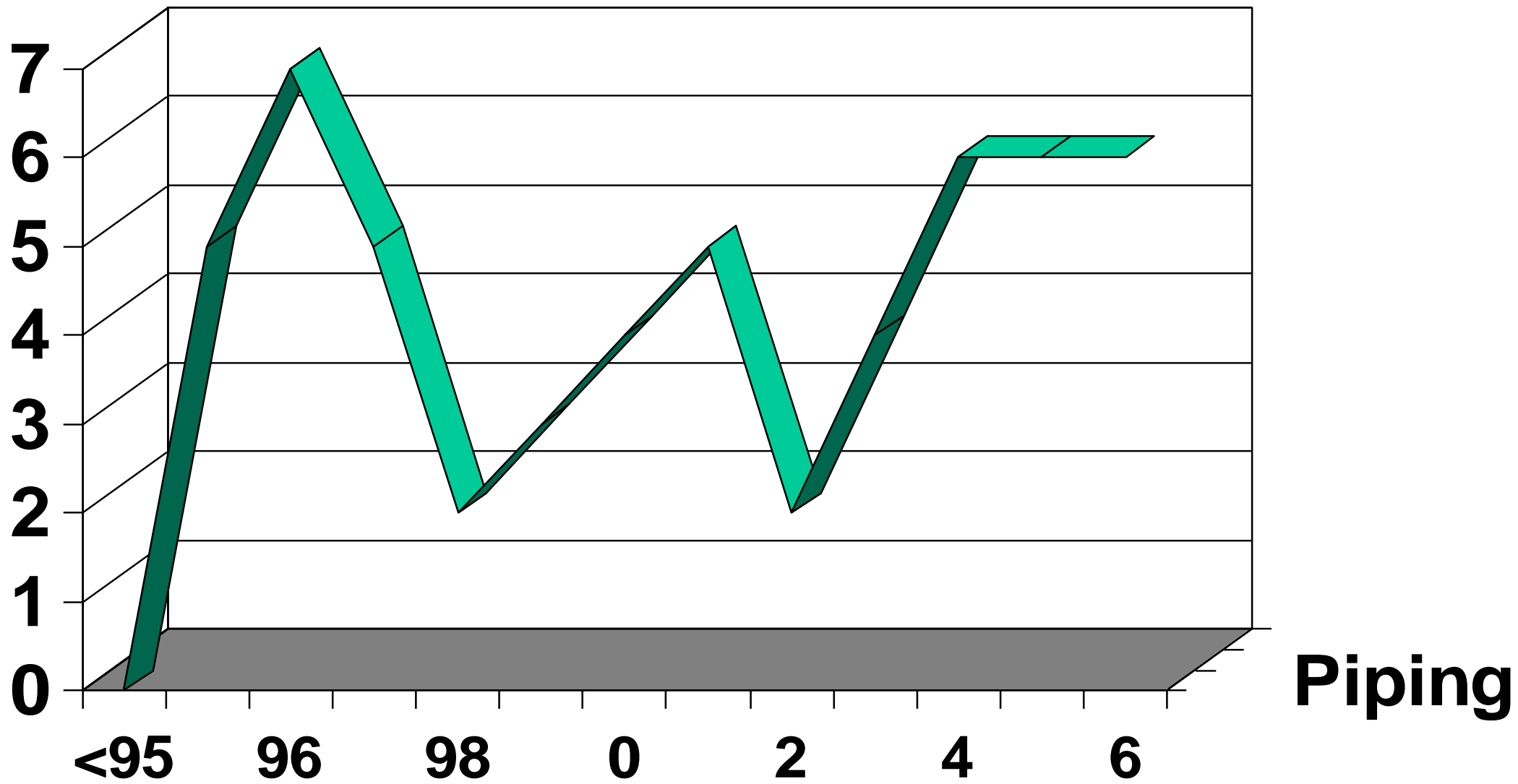
**Shop-fabricated AST Systems**

# Leak Autopsy Reports Received – Tank is the Source

## Shop-Fabricated Tanks



# Leak Autopsy Reports Received – Piping is the Source



# Compliance







**DEP Regulates Storage Tank Systems**

# USE APPROVED EQUIPMENT!



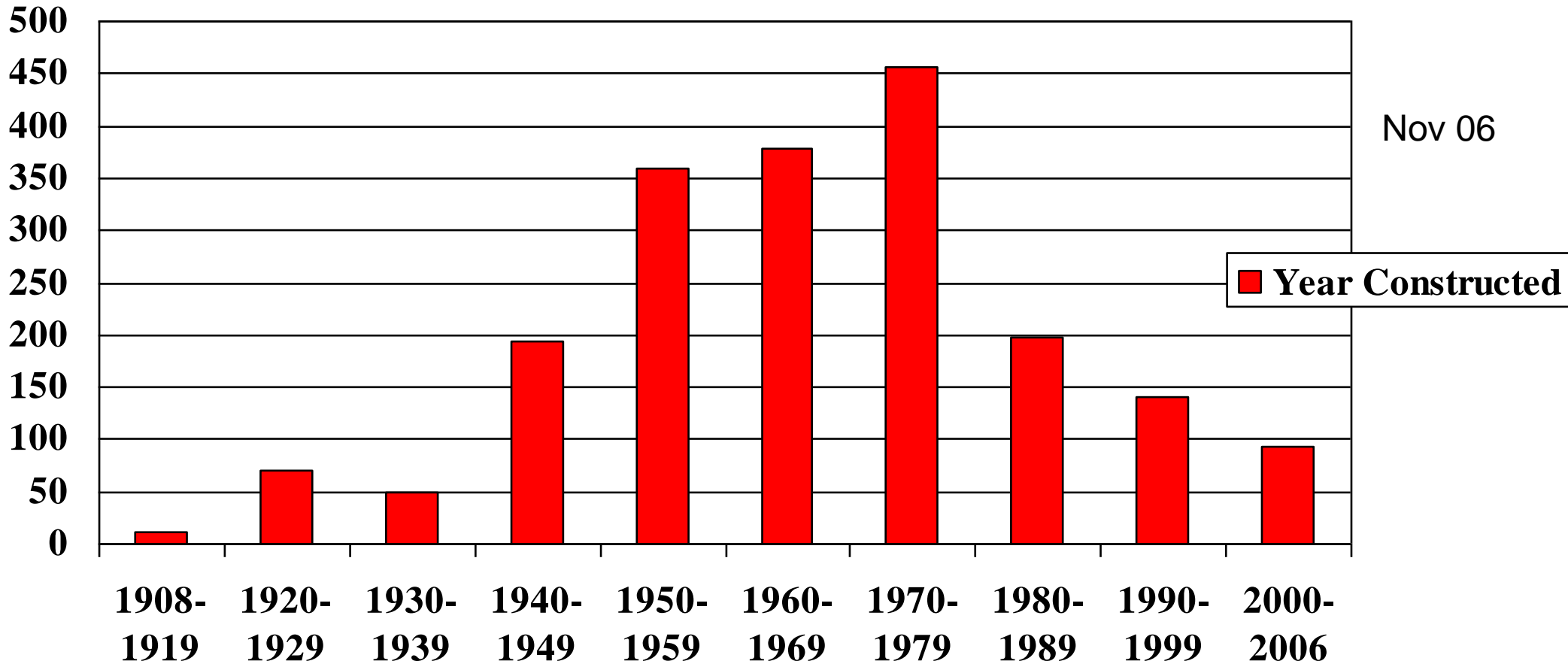
# Equipment Approvals



# Tanks

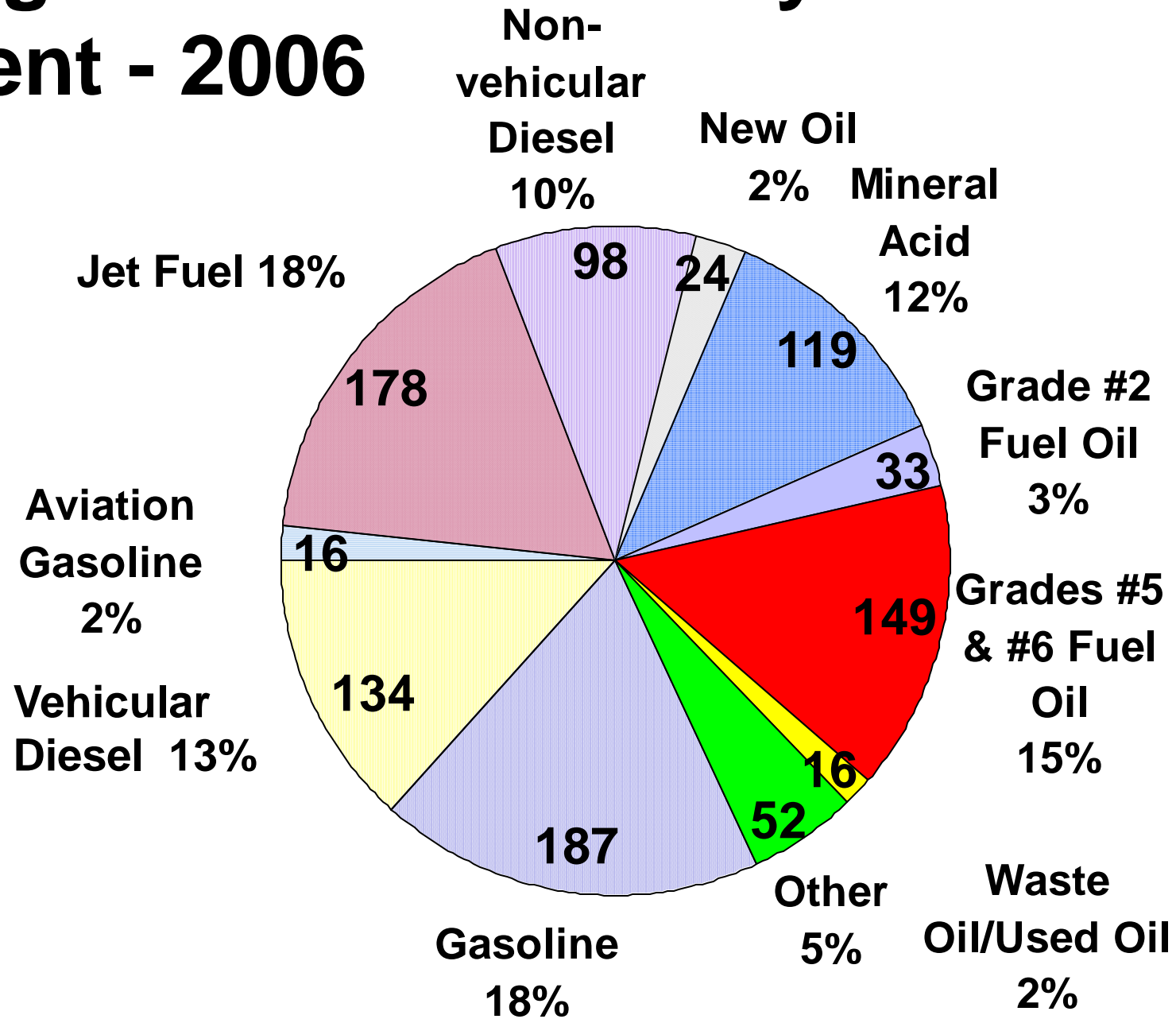


# Installation Date Ranges for all Registered Florida Facilities with Field-erected ASTs



**398 Facilities with 2144 Tanks >50,000 gallons (189 270.59 liters)**

# Storage Tank Facilities by Tank Content - 2006



Source:  
STCM  
Nov 06

# Field-Erected AST Installation





**Tank Shell**



**Welding**



**Bottom plates**



**Quality work is essential!**



# Piping Connections, Sumps, Manways, & Shell Penetrations



# Reference Standards- API-650

## Cathodic Protection







































**Roof vents**



**Cutting the shell**



**New bottom construction**



**Pre-painting**



# All new tanks must have secondary containment beneath the tank and in the dike-field around the tank\*



# **Petroleum Contact Water Tanks**

**Must meet  
construction  
standards  
except for  
secondary  
containment**



# Shop-fabricated tank installation





# Issues in selecting the type of shop-fabricated tank best-suited for your needs:

- Storage volume needed
- Site security
- Available space
- Piping needs
- Dispensing needs
- Portability
- Regulation
- Cost
- Operation and maintenance issues
- Risk assessment – fire safety, hurricanes, hunters





**Do the job right!**



**Do the job right with  
Qualified Personnel!**



# **AST Secondary Containment**

A scenic background image featuring a sunset or sunrise over a body of water. The sky is filled with soft, colorful clouds in shades of orange, yellow, and blue. In the foreground, the silhouettes of palm trees and other vegetation are visible against the bright horizon. The overall mood is serene and natural.



**El Segundo bottoms**

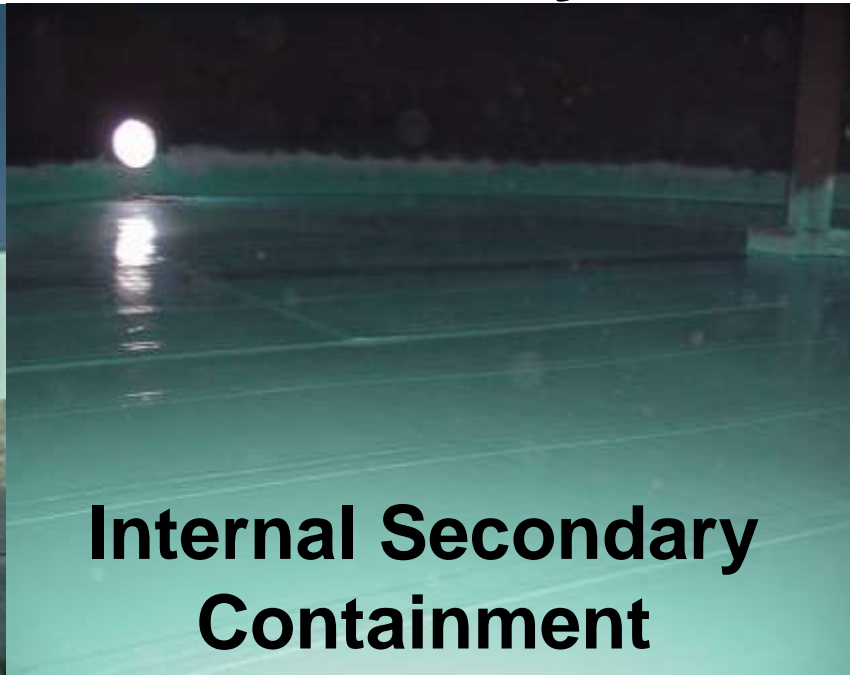


**Tank Lifting**

## **Field-erected AST Secondary Containment Options**



**Liners beneath  
the tank**



**Internal Secondary  
Containment**



**Double-Bottoms**


# Field-erected AST Lifting for secondary containment installation beneath the tank



2005 11 27







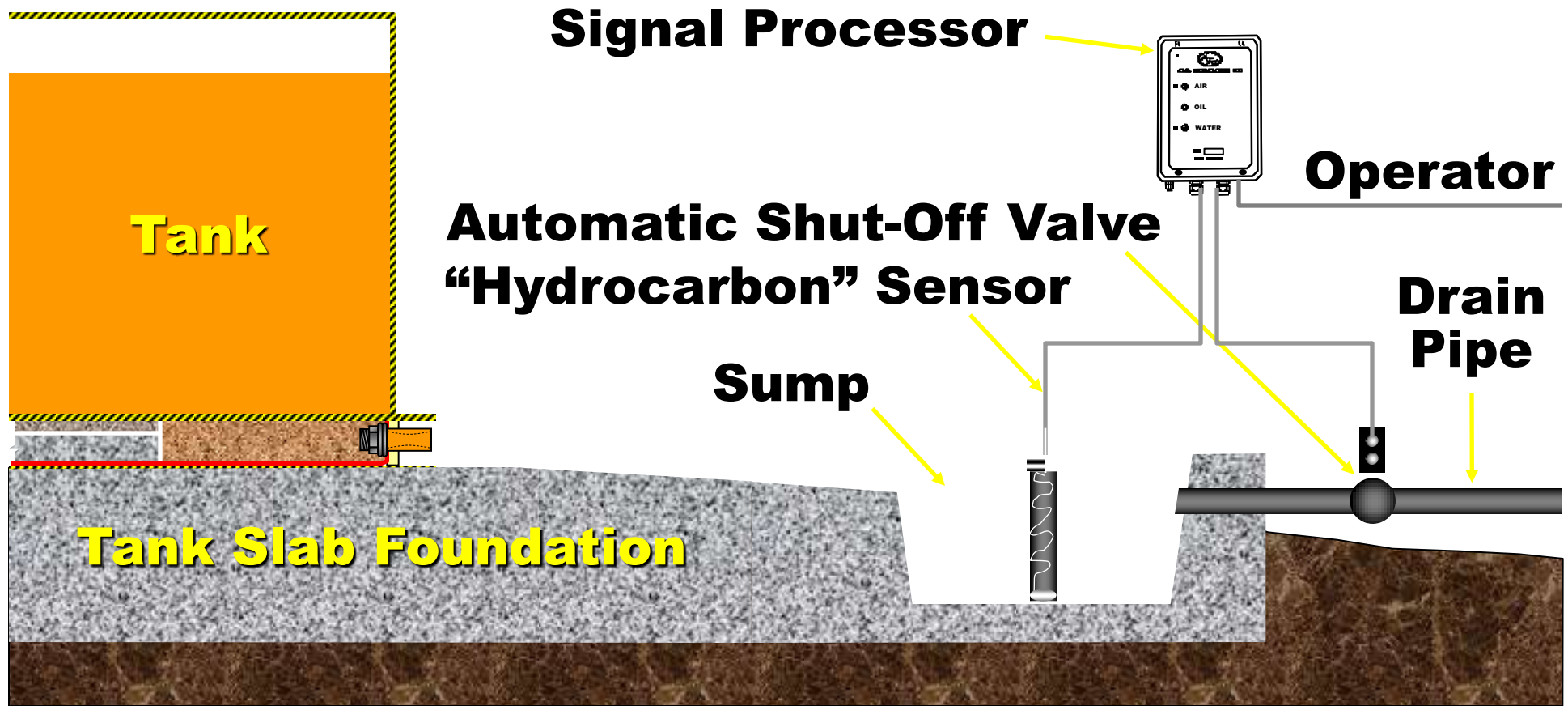
**Field-erected AST  
Dike-field  
Secondary  
Containment**

**Synthetic liner in dike field area**





# Alternative Dike Field Secondary Containment



Eco-Tank  
TABs-02  
System



T.R.A.P.S. System



Alternative  
Dike Field  
Secondary  
Containment

**Shop-fabricated ASTs needed to have secondary containment by January 1, 1990...New tanks need secondary containment at the time of installation**





## AST Secondary Containment - Shop-fabricated Tanks



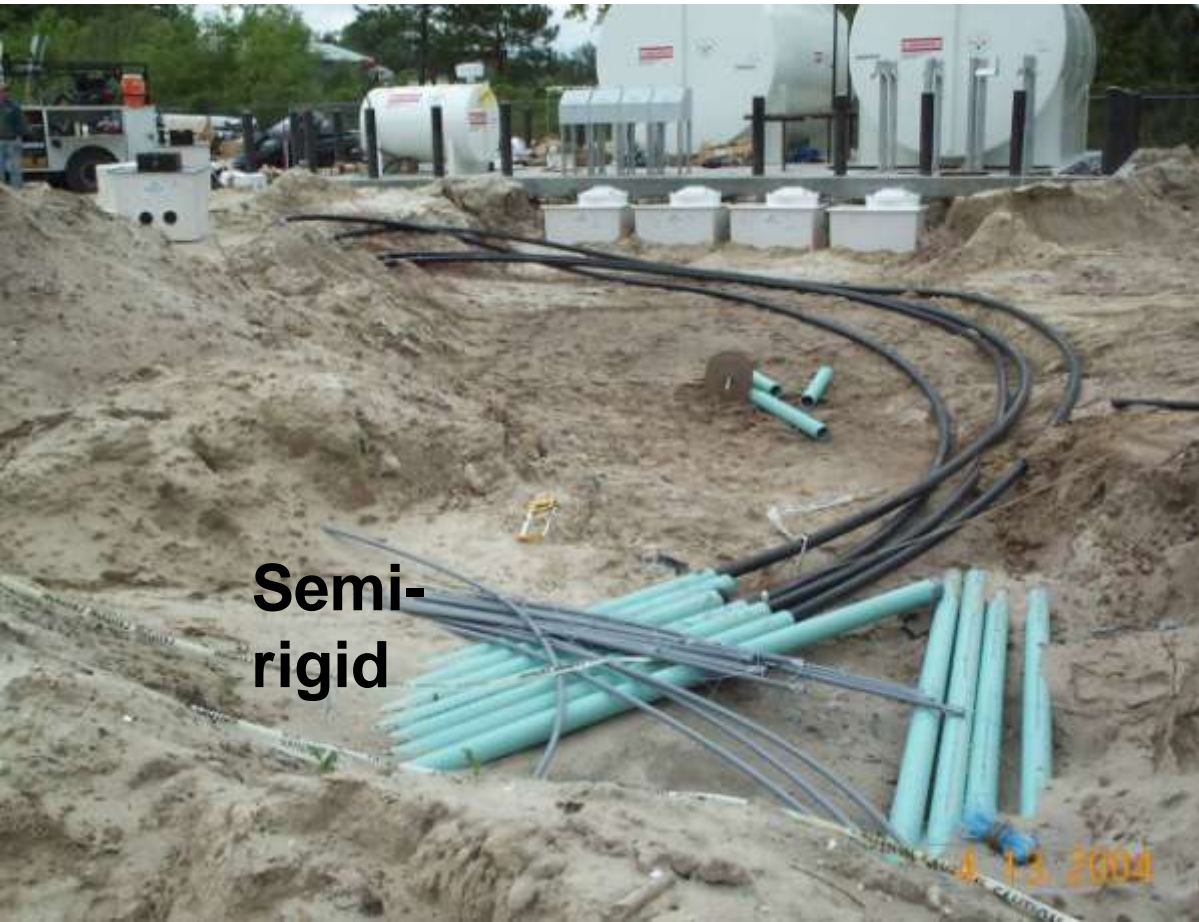


**Piping**

**Piping -  
The major source of  
Field-erected AST  
leaks...**



# Small Diameter Piping with Secondary Containment







**Be sure to install  
the proper valves  
for shop-fab  
ASTs with STPs  
serving  
dispensers**

**Piping above grade**



**Liner Penetrations**



**Fiberglass**



**Steel  
Bulk Product  
Piping with  
Secondary  
Containment**



# **Steel Bulk Product Piping with Secondary Containment - Installation concerns**



**Airport Hydrant Piping**



**Isolation  
valve  
pits**

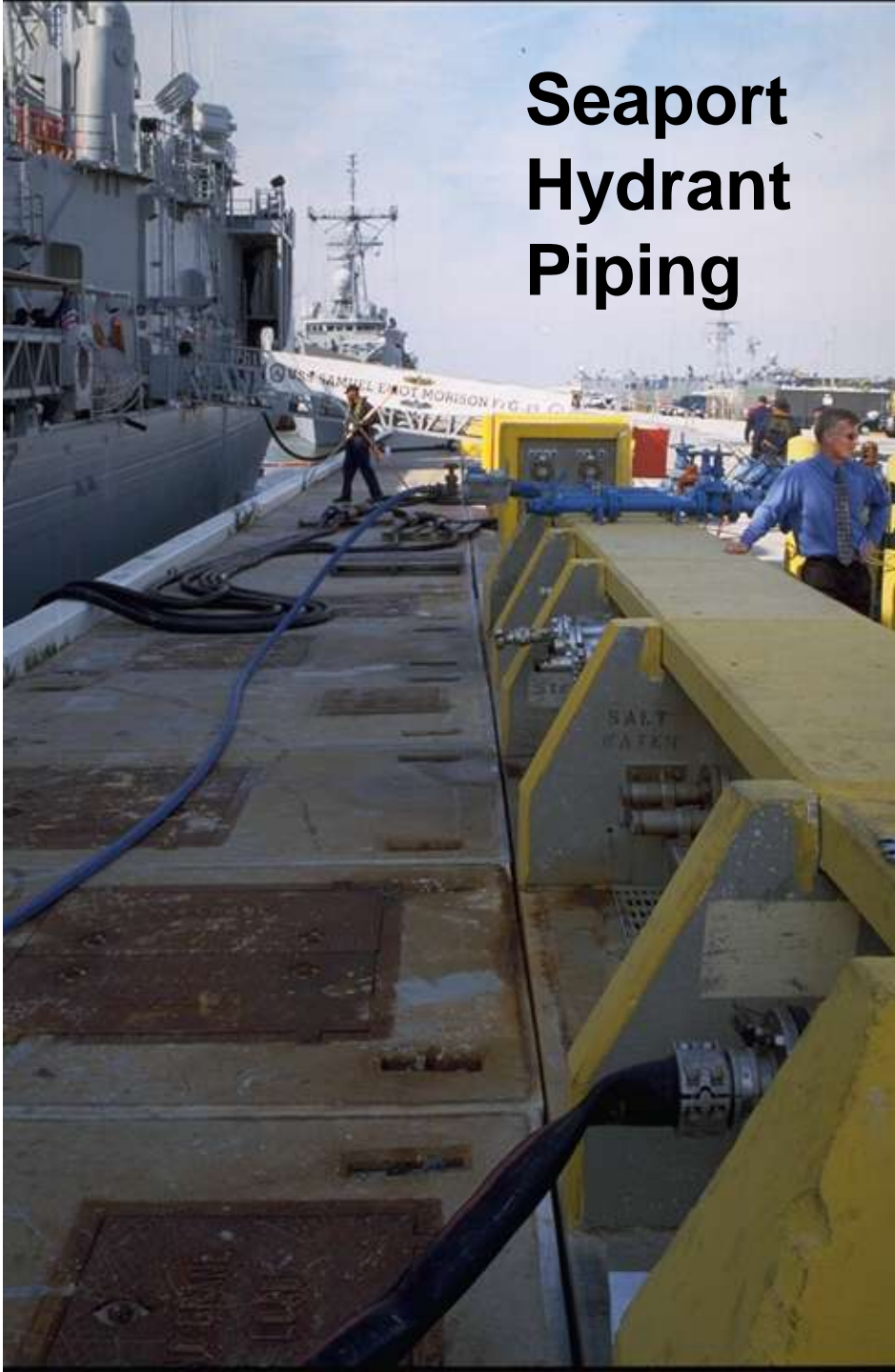


**Hydrant Pits**



**Hydrant Piping**

# Seaport Hydrant Piping







**AST Spill Protection**

1:52pm

# AST Overfill Protection



GAUGE HT  
MAX. FILL  
MIN. FILL  
LINE DISP.

12:43pm



12:34pm



LOW  
LEVEL



HIGH  
LEVEL



RUPTURE  
BASIN



ON

OFF



# The January 1, 2010 Deadline for Secondary Containment



# Table AST

## Chapter 62-762.511, F.A.C.

• Year Installed     1994            2000            2005            2010

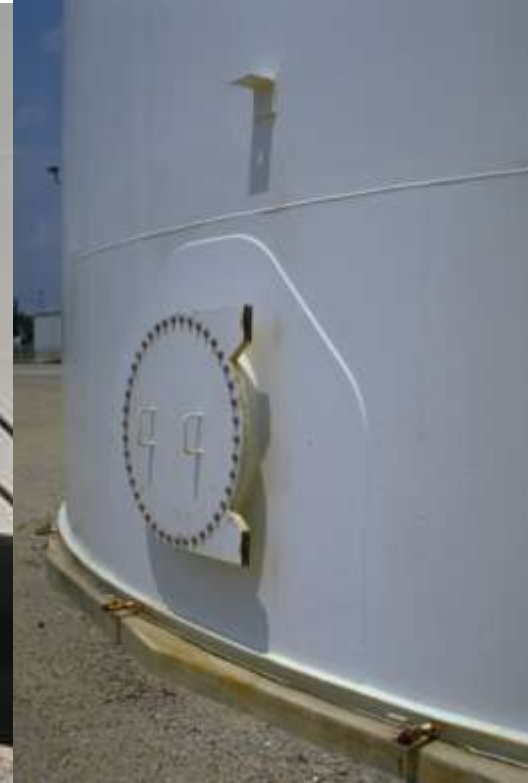
+ **Before the  
effective date  
of the rule**

**P**

**TVX**

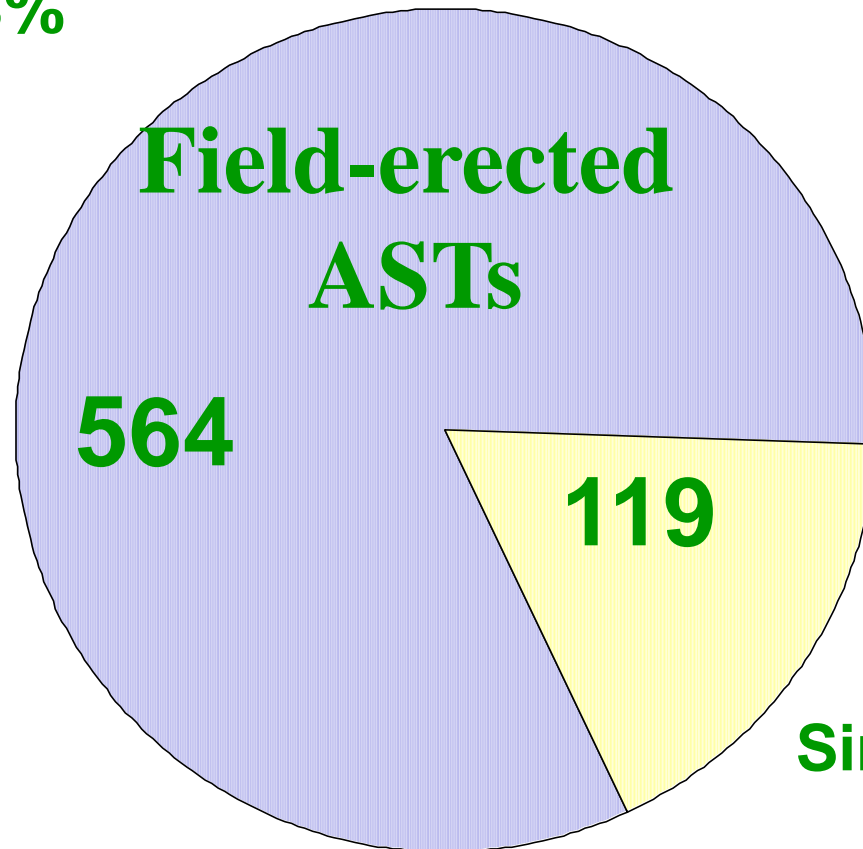
**W**

**U**



# Upgrade status

Field-erected ASTs with  
Secondary Containment  
83%



Single-wall Field-erected  
ASTs - 17%

March, 2008

# Internal Corrosion



**Liner installation**

# AST Upgrade Problems



**Human Error**



**External Corrosion**

**By January 1, 2010**

**Bulk  
Product &  
Hydrant  
Piping,  
unless  
deferred by  
API 570**



**Secondary  
Containment**



**Internally-  
lined  
tanks**



- DEP has never extended a deadline...
- Over 80% have upgraded, DEP would be sued if they extended the deadline
- Supply and demand...The longer you wait, the more demand for and the less available the supply of qualified installers of AST secondary containment
- Supply and Demand...The longer you wait, the more demand for and the more expensive the tank and piping system

**The Rumors are Wrong...**



**Don't**  
**Wait to**  
**Upgrade!**

# Release Detection Standards



- You have a choice of methods for single or double-wall systems
- Release detection must be performed monthly
- Anything that can be visual inspected must be visually inspected
- Secondary containment systems must have interstitial monitoring
- You must have an RDRL – a Release Detection Response Level established for major components
- You must keep records of your findings

## Release Detection General Requirements



# Performance Standards for Release Detection Methods

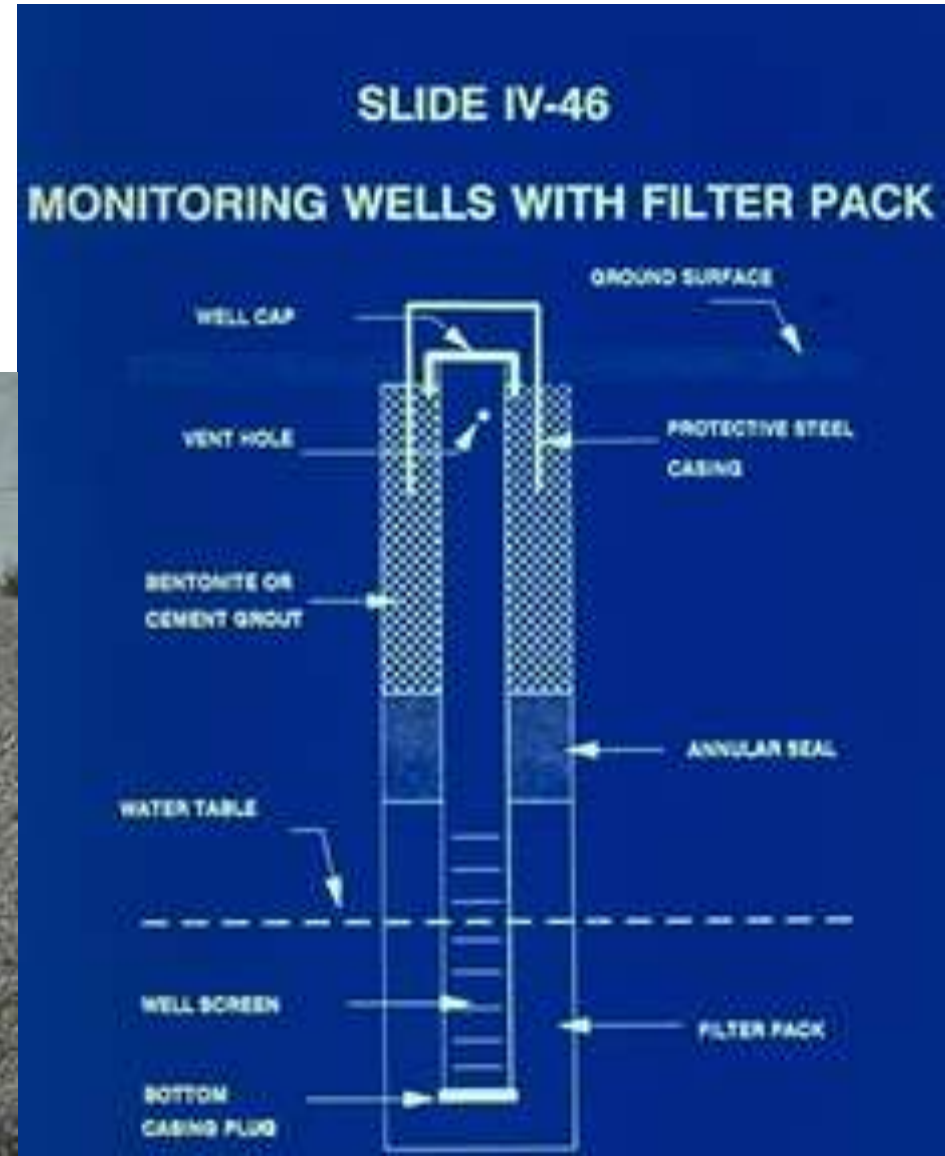
- General. Methods of release detection shall:
  - Be capable of detecting a leak of 0.2 gallons per hour or 150 gallons within 30 days with a probability of detection of 0.95, and a probability of false alarm of 0.05, with the exception of tightness testing, visual inspections, groundwater or vapor monitoring; and manual tank gauging.
  - Be approved in accordance with Rule 62-762.851(2), F.A.C.
  - Have a release detection response level described in writing.

# Internal Release Detection for Single-wall Systems

**NONE**

# External Release Detection for Single-wall Systems

- Well construction
- Site Suitability
- Groundwater monitoring wells
- Vapor monitoring wells



# External Monitoring

- **Directionally-drilled fiber-optic or cable systems that can detect new discharges above background levels of contamination**





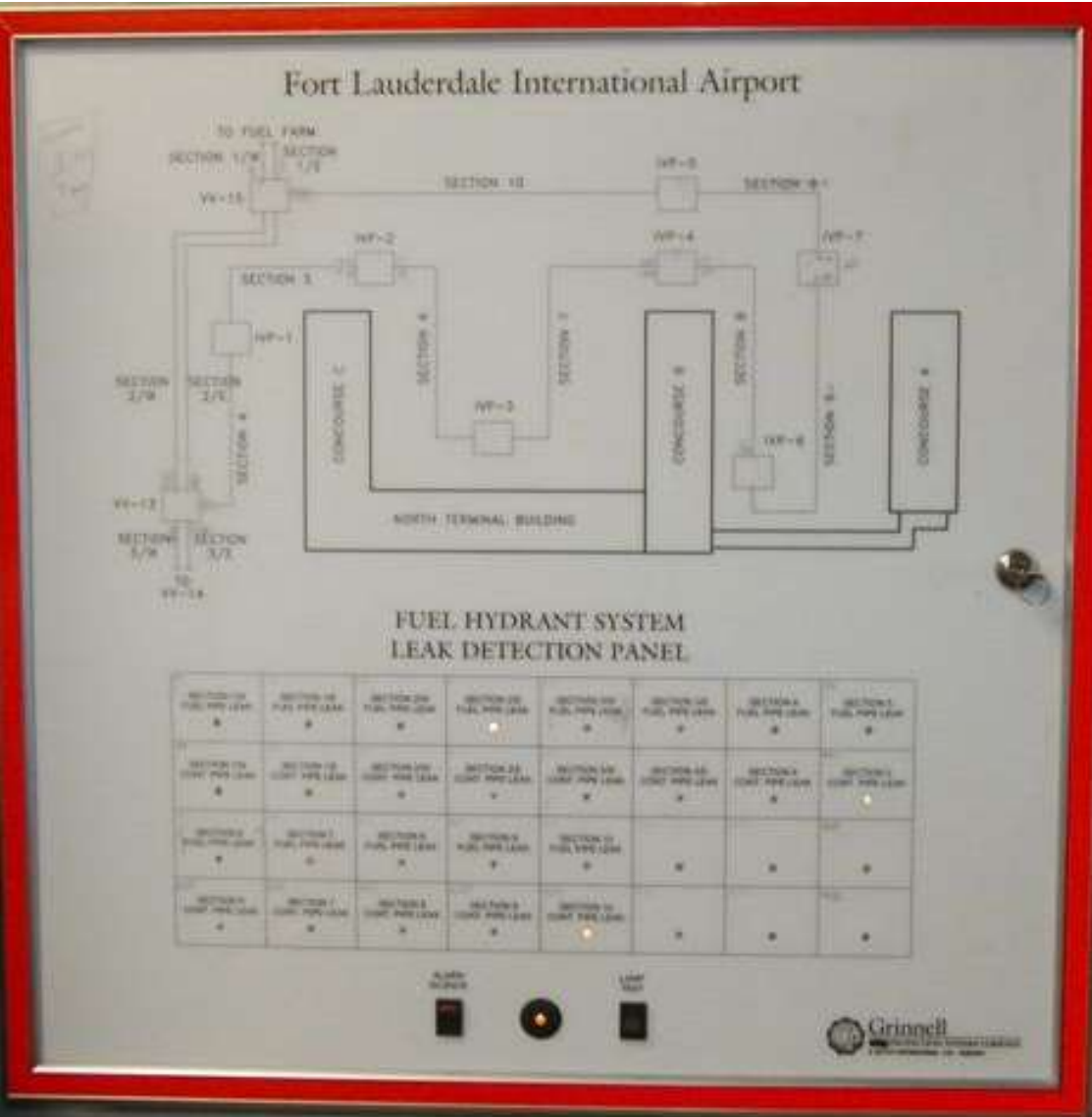
# Release Detection for Double-wall Systems

Internal  
Interstitial  
Monitoring



- Visual
- Vacuum
- Pressure
- Hydrostatic
- Sensors & Probes

# Interstitial Monitoring for tanks and piping



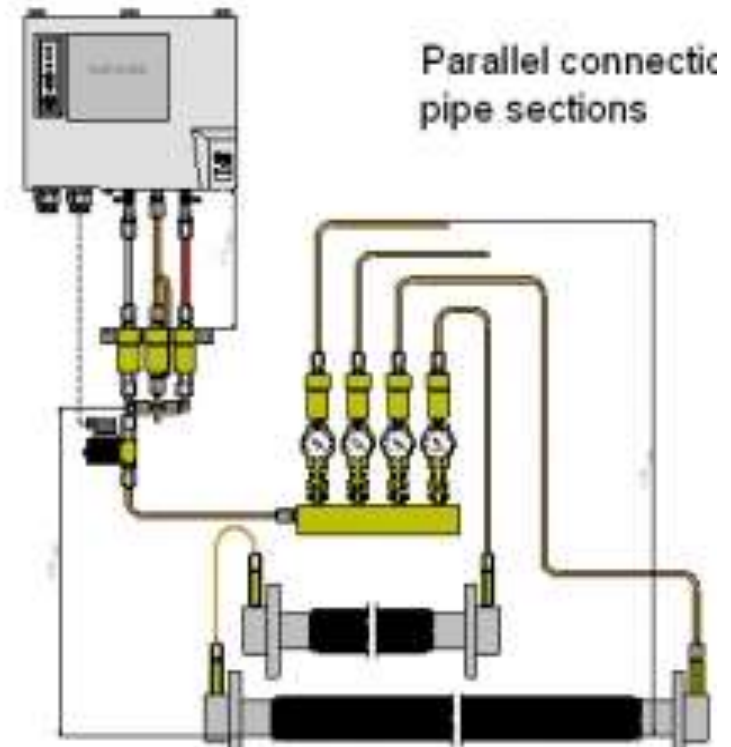
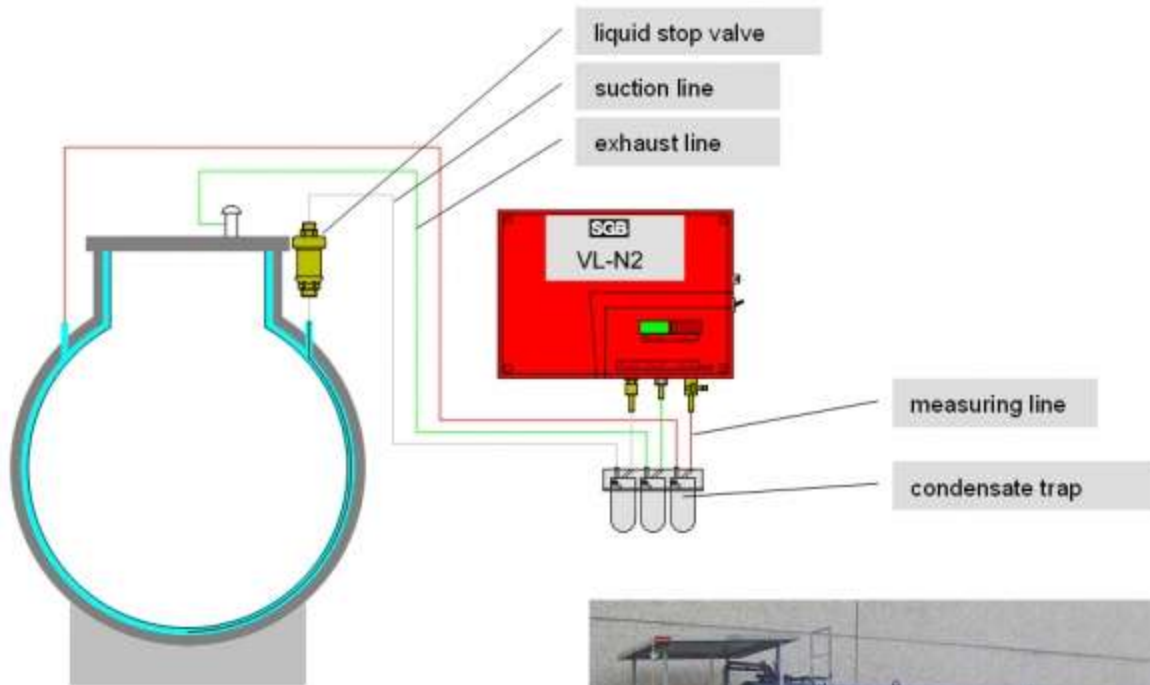
# Vacuum Gauges



# Recommendation for Release Detection...

**“First Class”  
Version**

## Vacuum or Pressure Continuous Monitoring



# Recommendation for Release Detection...

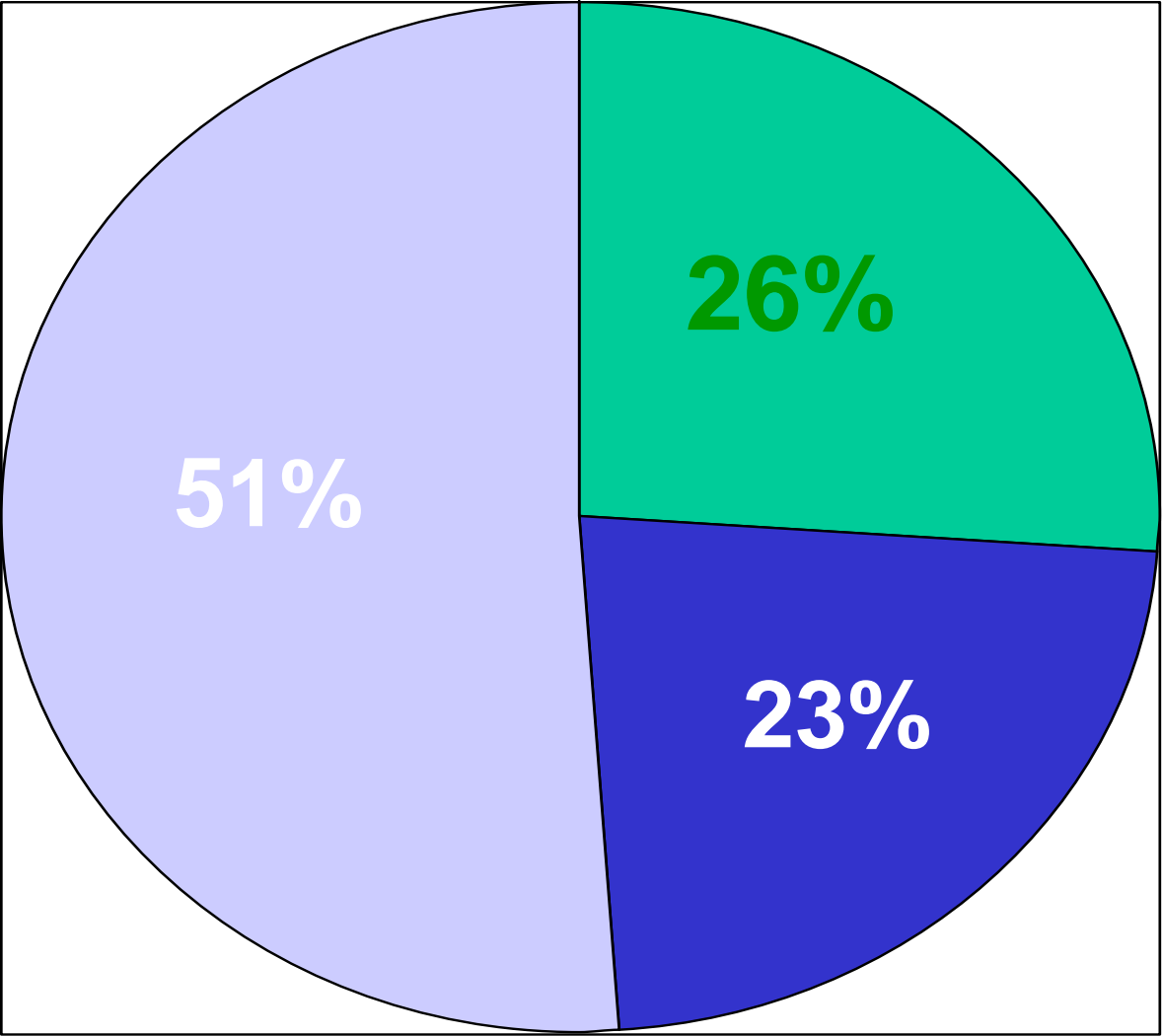
## The “Economy” Version



# Visual Inspections!

# Success of Leak Detection – Florida Cause of Leak Study

2002



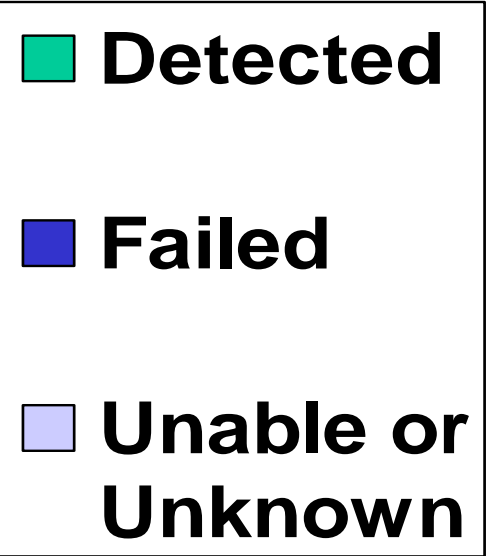
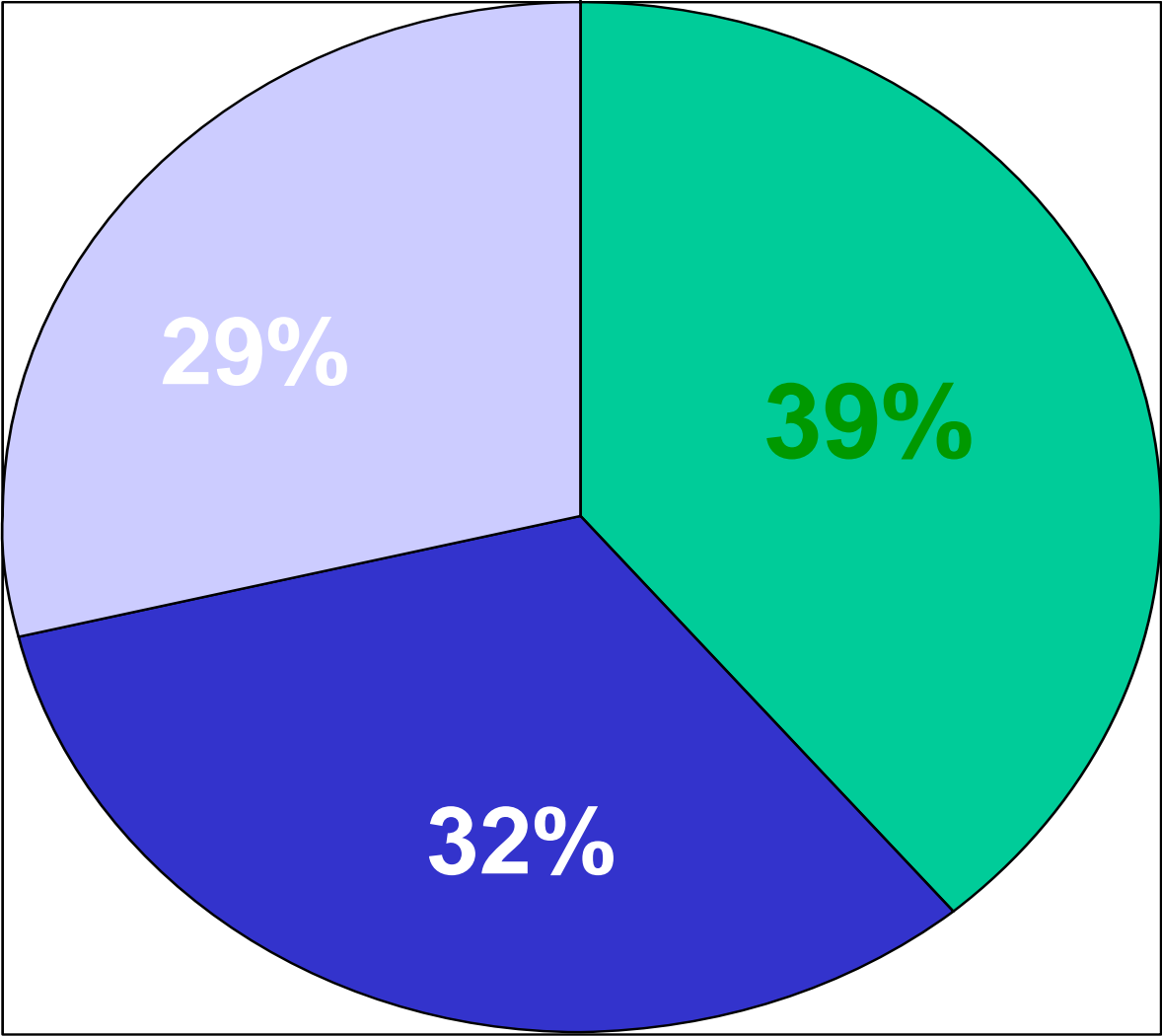
■ Detected

■ Failed

■ Unable or  
Unknown

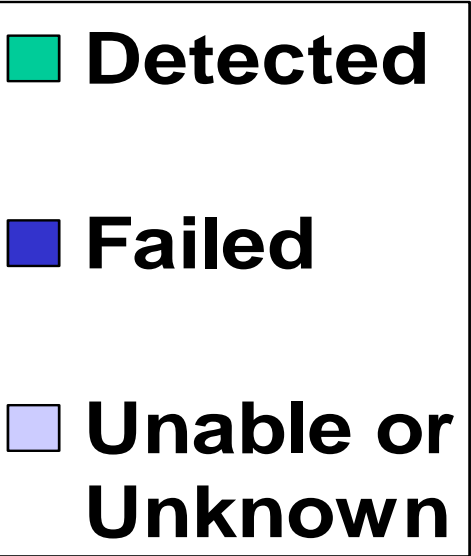
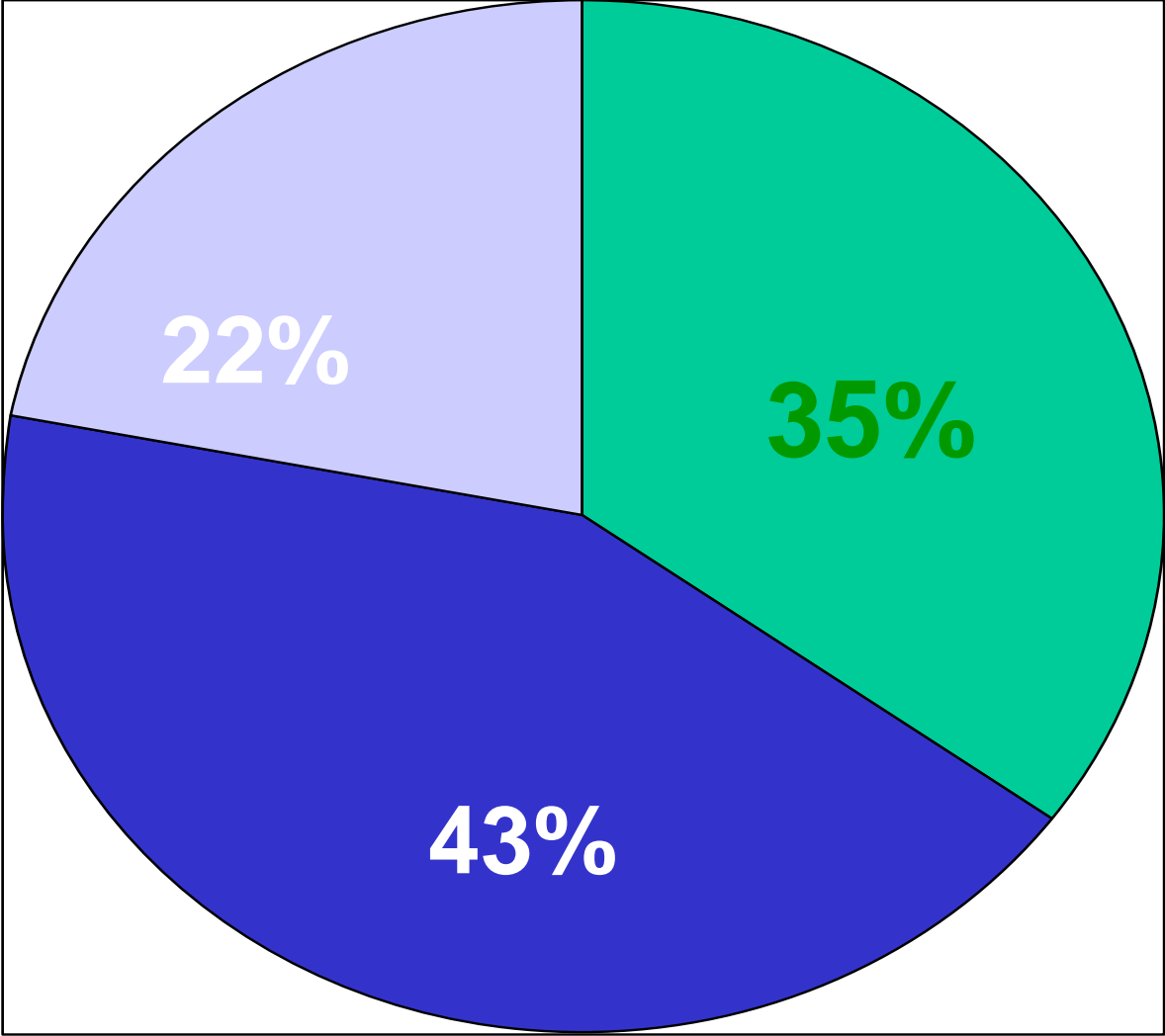
# Success of Leak Detection

March 06



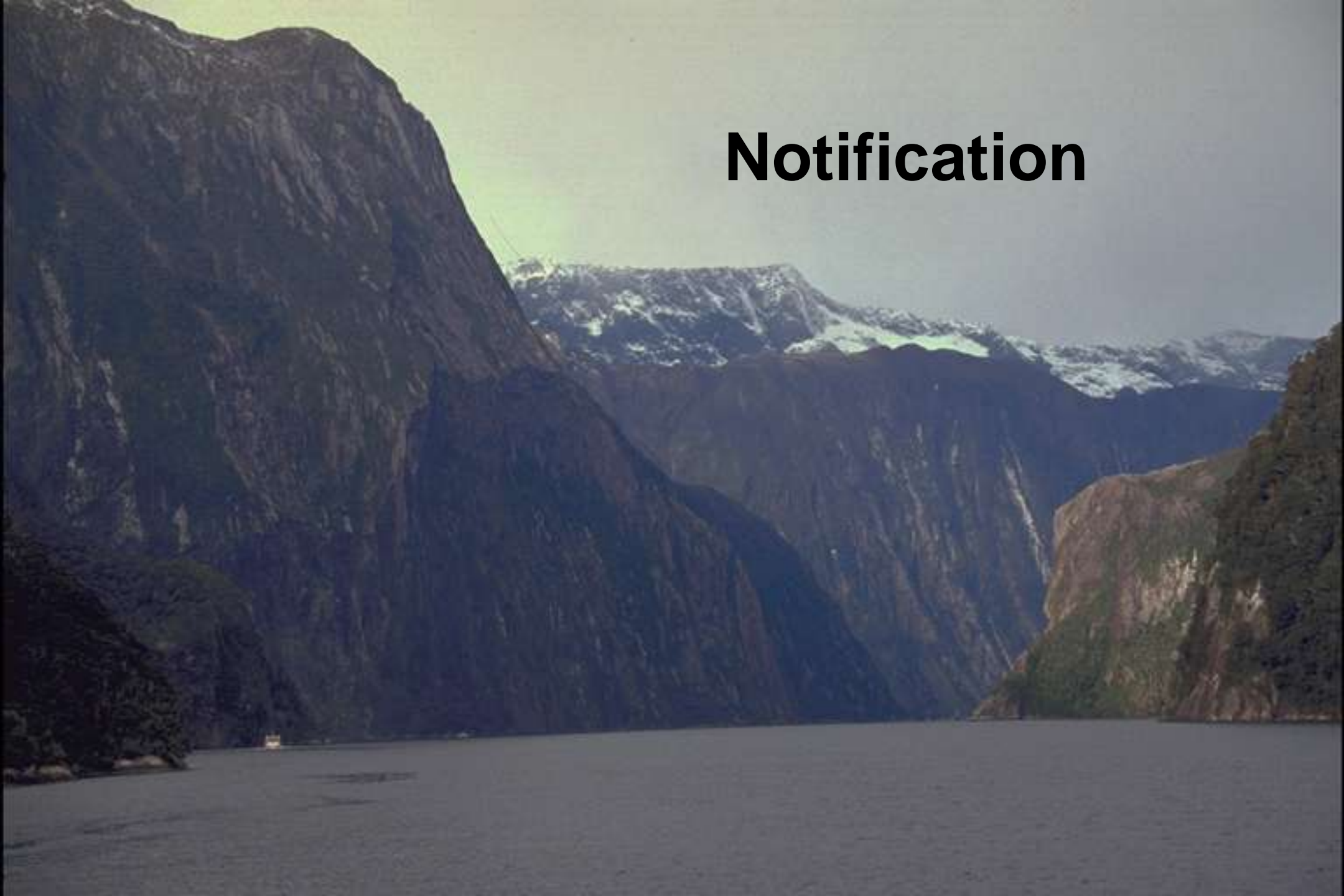
# Success of Leak Detection

Mar 08





# Notification



**Notification – The County (DEP’s Contractor) must be given a verbal or written notice within:**

- 30 days of installation or upgrading**
- 10 days before internal inspections or closure**
- And an additional notice within 48 hours of the above**
- 30 days after installation, complete DEP Registration Form for change of ownership, closure, upgrading, facility info, including financial responsibility**



# Registration



# Registration

- Owners must register with FDEP 30 days after regulated substances are put into the system.
- Fees - \$25/year/tank < 250,000 gallons
  - \$1 per 10,000 gallons > 250,000 gallons
- Questions? Call: 850-245-8839



## FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION STORAGE TANK REGISTRATION PLACARD

2004-2005

FACILITY ID: 9805385

PLACARD NO: 218443

PLACARD ISSUED: 06/17/2004  
PLACARD EXPIRES: 06/30/2005

FACILITY: US SUGAR CORP AVIATION  
AIRGLADES AIRPORT  
CLEWISTON FL 33440 -  
HENDRY COUNTY

FACILITY TYPE: Fuel user/Non-retail

STCM ACCOUNT: 22934

TANK SYSTEMS REGISTERED 

Michael W. Sole, Director  
Division of Waste Management  
Department of Environmental Protection

# Hazardous Substance ASTs



**Registered,  
but not  
Regulated**

**Must pay  
Registration  
Fees**



**Pressure Vessels**

# Financial Responsibility

A scenic view of a mountain valley. The foreground and middle ground are dominated by dense, vibrant green coniferous forests covering rolling hills. In the lower center, a small village with several buildings is visible. The background shows more forested mountains under a bright blue sky with large, fluffy white clouds. The text "Financial Responsibility" is overlaid in the center in a bold, black, sans-serif font.

# Financial Responsibility



- References EPA Requirements.
- One million dollars coverage required for petroleum marketers (cleanup and third party liability).
- \$500,000 coverage required for non-marketers.
- Use FR Allowable Mechanisms - Letter of Credit, Surety Bond, Insurance, etc.
- Only for petroleum storage systems. State & Federal facilities are exempt

- **\$1,000,000 dollars/incident, \$3,000,000 annual aggregate**
- **Large tanks, three million/six million**



# **Financial Responsibility**



# Repairs, Operation, and Maintenance of Storage Tank Systems



# Repairs

Short-cuts don't always work, and you get what you pay for...



# Repairs...

- Hire qualified people with good references





# Cathodic Protection



# Operation & Maintenance



# Dike-field Maintenance



**Internal lining**



**General O & M**

**Piping connection  
drip-protection**

**Fuel filters**



# Stormwater management

**Stormwater retention and removal , and dike field liners**







REPAIRED / ALTERED TO API 653 EDITION FIRST

Reconstructed by:  
**TAMPA TANK, INC.**  
**TAMPA, FLORIDA**

Original Standard API-12C

Tank No. 32-1

Date Completed SEPT., 1995

Tank Dia. 70'-0" Height 48'-3"

Serial No. 95058/303

Specific Gravity 0.74 (GASOLINE)

Design Pressure ATMOSPHERIC

Shell Course	Allow. Stress	Mat'l.
<u>BOT. 0.46"</u>	<u>23,430</u>	<u>A283 GR-C</u>
<u>2 nd. 0.40"</u>	<u>23,430</u>	<u>A283 GR-C</u>
<u>3 rd. 0.31"</u>	<u>25,960</u>	<u>A283 GR-C</u>
<u>4 th. 0.25"</u>	<u>25,960</u>	<u>A283 GR-C</u>
<u>5 th. 0.23"</u>	<u>25,960</u>	<u>A283 GR-C</u>
<u>6 th. 0.25"</u>	<u>25,960</u>	<u>A283 GR-C</u>

Orig. Const. Date 1957

Year Reconstructed NA

Liquid Level Max. 42'-2"

Capacity 28,900 Bbl

Max. Operating Temp. AMBIENT

12:28pm

# API 570 tests for Bulk Product Piping



# Unusual Situations



# Recordkeeping



# RecordKeeping

**Most records kept for two years, others for the life of the system**



# Recordkeeping

- Keep a spiral notebook of visual inspections
- Keep a tabbed notebook of all other records required by the Department
- Photo-document if possible
- Keep DEP Registration Information up-to-date



# Out-of-Service and Closure Requirements



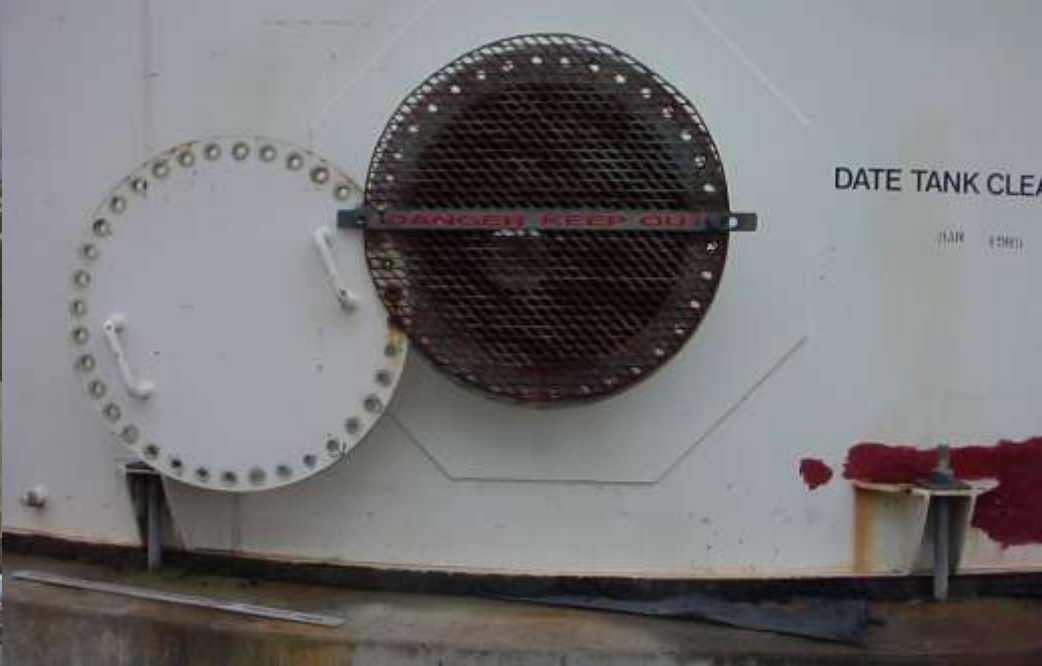


**Out-of-Service**  
**Single-wall – 2 years**  
**Double-wall – 10 years**

**Tanks must be empty!**



# AST Out-of-Service



# **AST Closure**

## **Two Choices – Removal, or abandon- in-place**







**A Petroleum Storage System Contractor (PSSC)  
certified by the Department of Business and  
Professional Regulation IS NOT REQUIRED**



## Closure Assessments

**Recommendation: Hire a qualified, experienced professional environmental consulting firm**

# Incident and Discharges



# Incident and Discharge Reporting

## Discharges



## Incidents





# Incidents

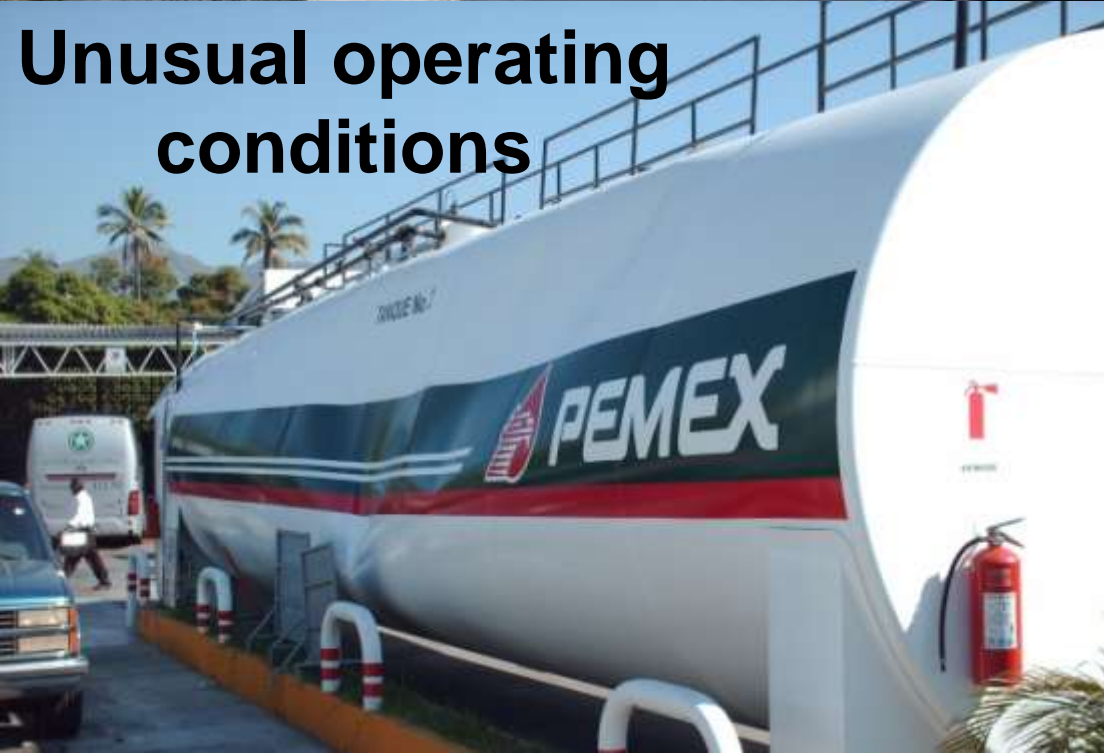


# Discharges



# Stained soils

# Unusual operating conditions



# Confirmed Release

# Incident & Discharge Response

**Tank bottom leak that remains in the dike-field - incident**



**Overfill outside of the dike-field - discharge**



**Incident Response –  
Complete Form #6 within 24 hours or the close of  
the next business day – perform an investigation  
and notify the County of the results within two  
weeks**



**Discharge Response – Complete Form #1 within 24 hours or the close of the next business day – control and abate the discharge**



**Need a time extension for  
closure? Have a better way of  
meeting a DEP rule?**

**Alternate Requirements**

A wide-angle photograph of a mountain valley. The foreground is a snow-covered slope. In the middle ground, a valley floor is covered with patches of snow and rocky terrain. The background features several prominent, rugged mountain peaks with steep, rocky slopes. The sky is blue with scattered white clouds.

# Ammonia Storage Tanks



# Mineral Acid Storage Tank Requirements



# Mineral Acid Storage Tanks

**Phosphoric Acid  
Tank**



**Sulfuric Acid  
Tank**

**800,000 Gallon  
Discharge**







# Storage Tank Forms



# Storage Tank Forms

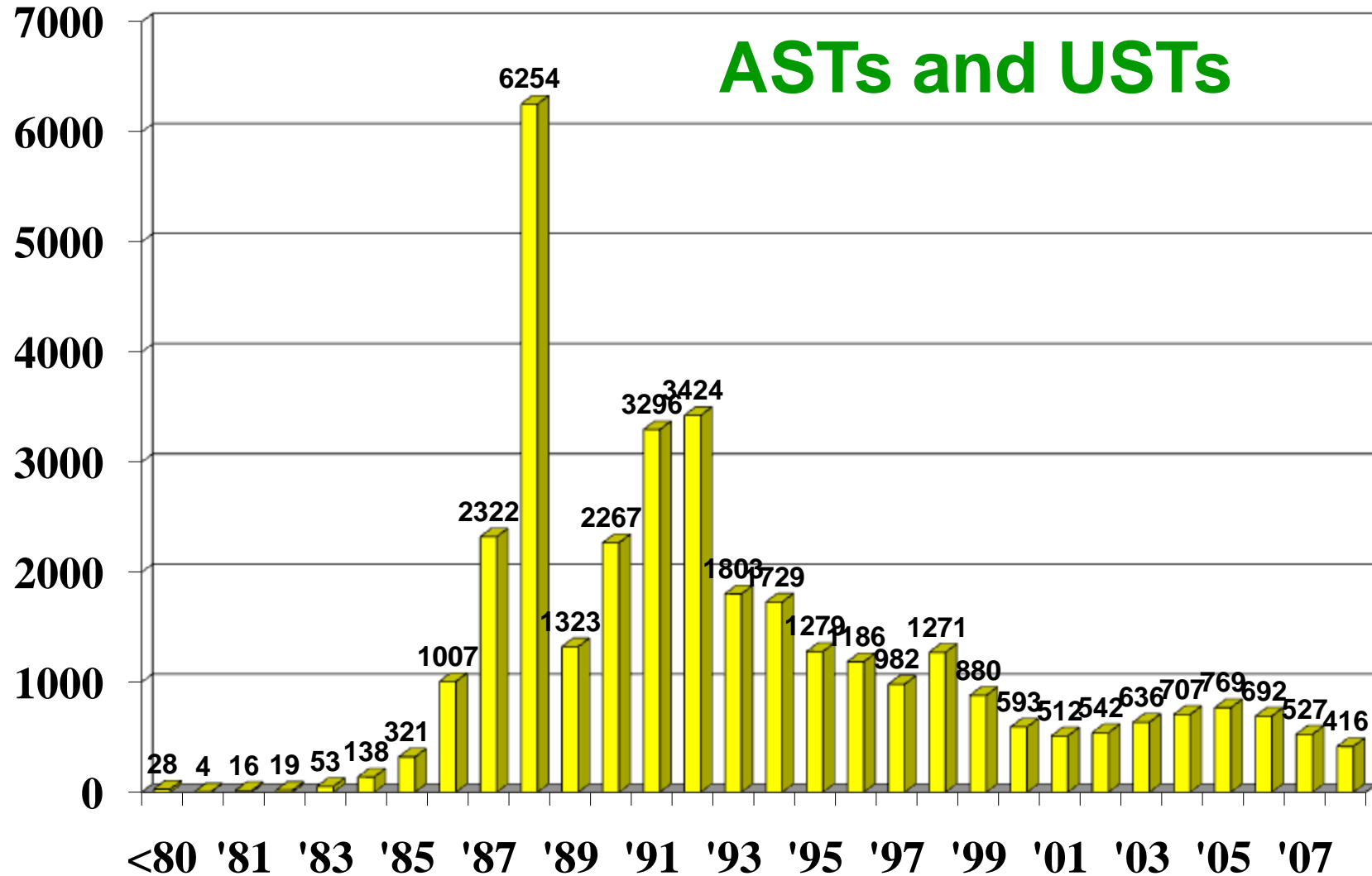
- 1. Discharge Report.
- 2. Storage Tank Facility Registration.
- 3. Certification of Financial Responsibility.
- 4. Alternate Procedures.
- 6. Incident Notification.
- 8. Limited Closure Summary Report



# Petroleum Discharge Report Forms Received

Discharges

Source: STCM, Apr 09

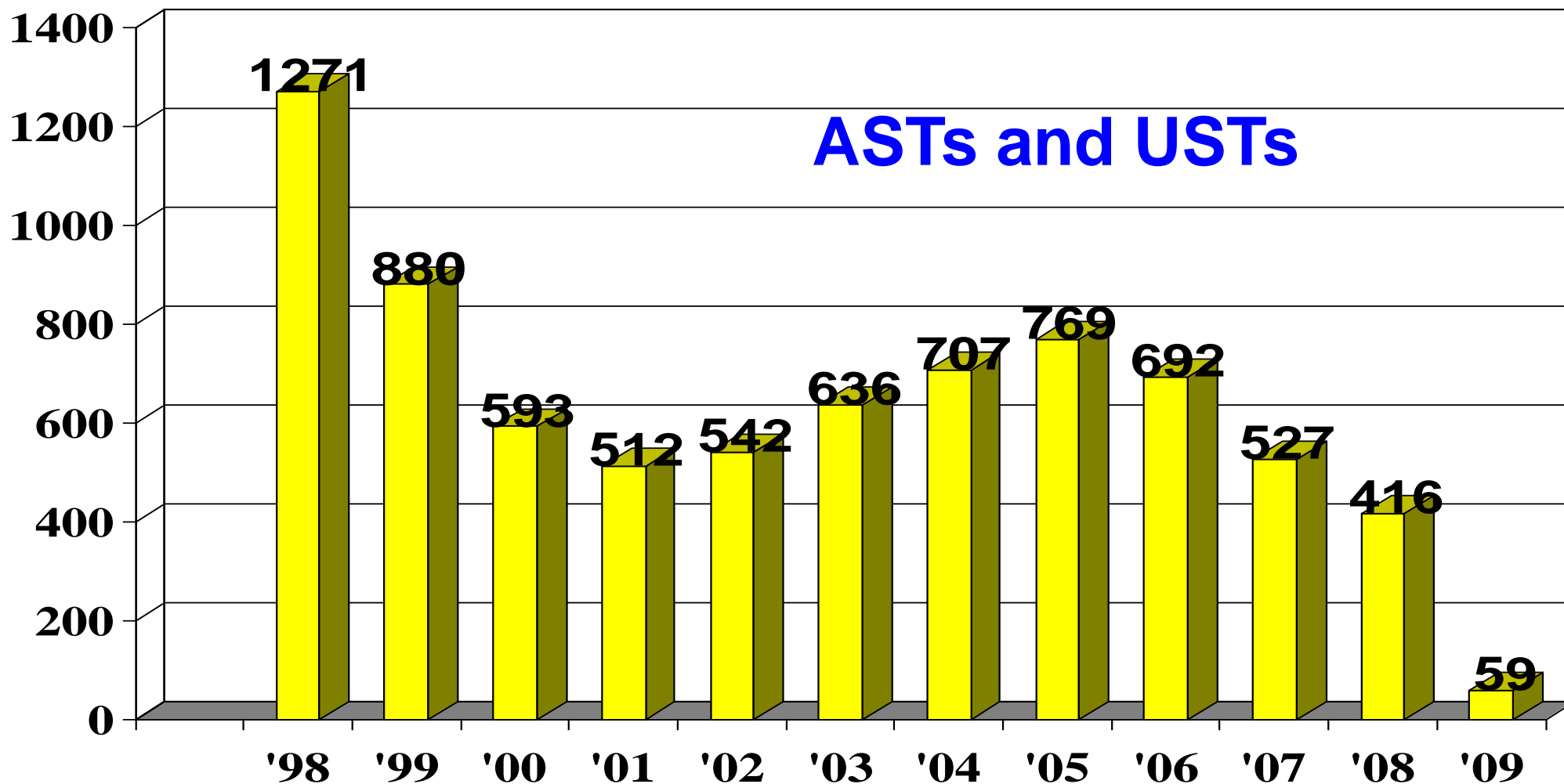


35,023 Discharge Report Forms Received

# Post-1998 Petroleum Discharge Report Forms Received

Discharges

Source: STCM, Apr 09



7604 Post-1998 Discharge Report Forms Received

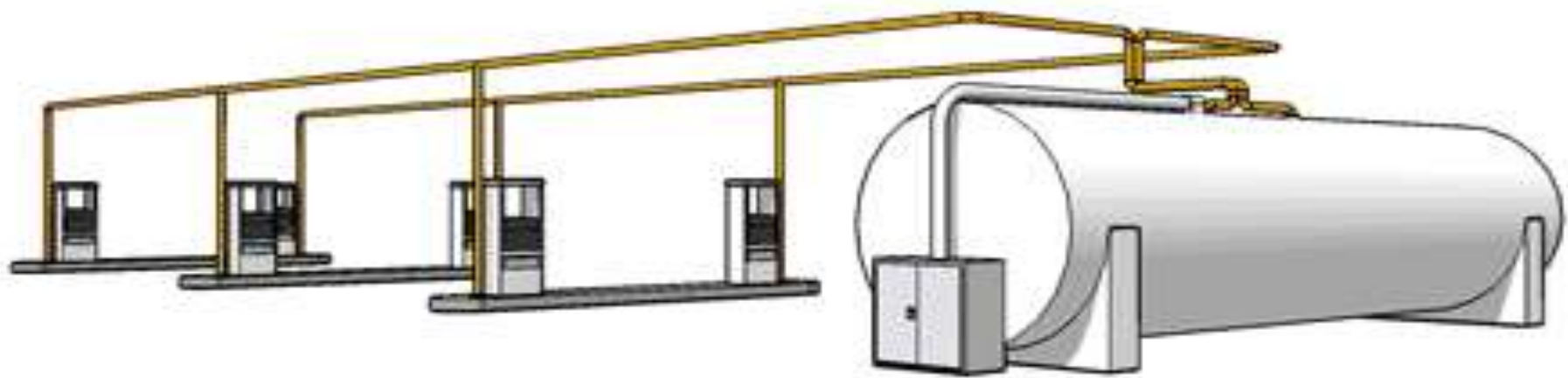
**The End**





# Atlas Fueling Systems Eco-Station













EnviroStation is a Registered Trade Mark, used under Licence.  
TM Registered Trade Marks of UPI Inc., used under Licence.



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