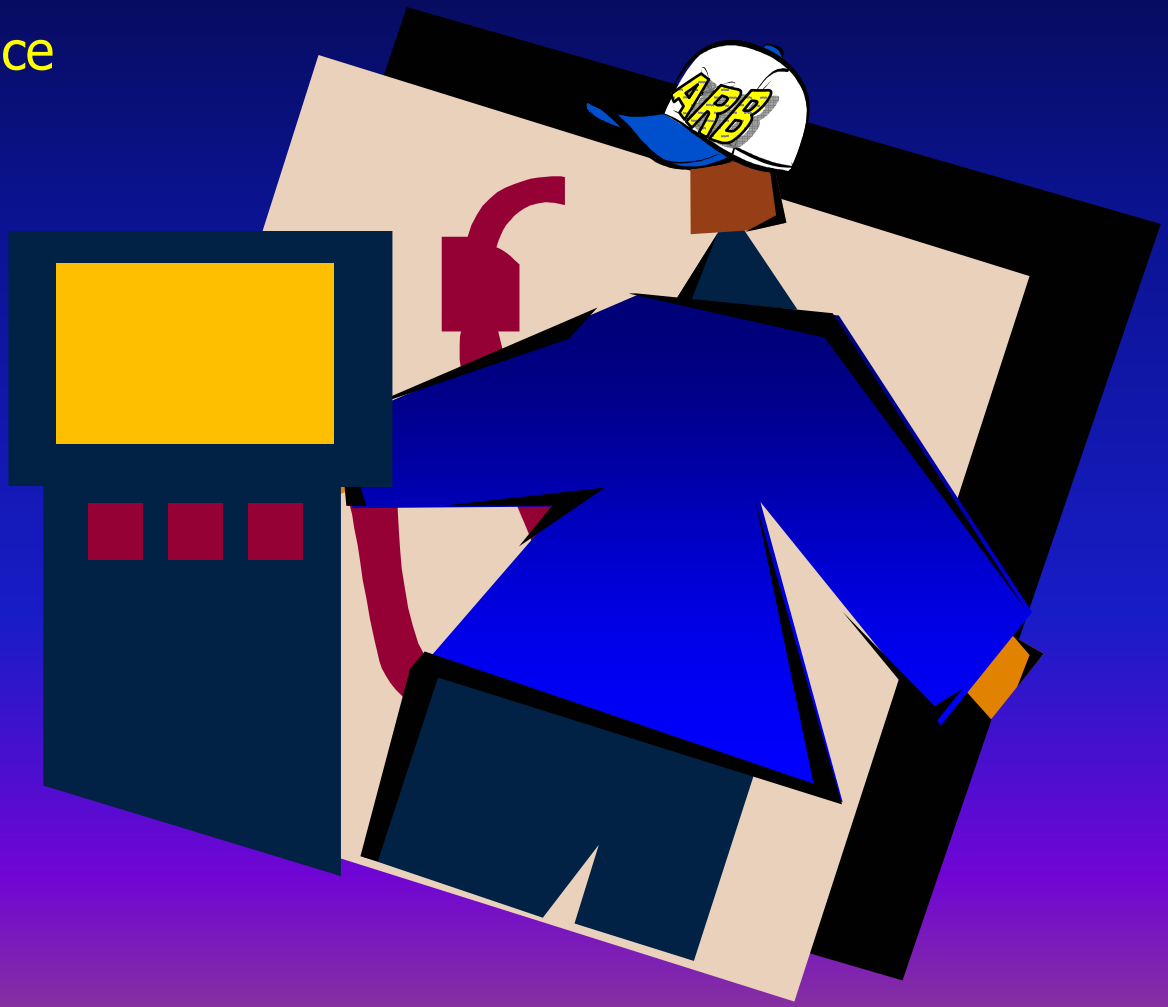
Enhanced Vapor Recovery

SCAQMD EVR Conference

City of Riverside

April 2, 2008



Cindy Castronovo
Air Resources Board
Cal-EPA

Outline

- Background & Benefits of Vapor Recovery
- 2009 EVR Phase II Deadline & Outreach
- Franklin/Healy EVR Phase II System
- VST EVR Phase II System
- In-Station Diagnostics
  - Veeder-Root and INCON

History Of Vapor Recovery

1972 & 73

BAAQMD and SDCAPCD adopt regulations requiring vapor recovery systems

1974

Health and Safety Code 41954 adopted to establish CA vapor recovery equipment certification program

1987

Benzene Air Toxic Control Measure is adopted which requires vapor recovery at any CA station that pumps greater than 480,000 gallons/year

1990

The FCAA requires the installation of gasoline vapor recovery systems at stations with a throughput greater than 100,000 gals/month in ozone non-attainment areas across the United States <u>AND</u> ORVR

1998

First ORVR cars sold

2000

CARB approves EVR

"Why Enhanced Vapor Recovery?"

- Equipment in field Not Working as certified
- SIP Settlement Agreement required More Emission Reductions
- Onboard Refueling Vapor Recovery (ORVR) Incompatibility

EVR addresses all of these areas!

EVR Improvements

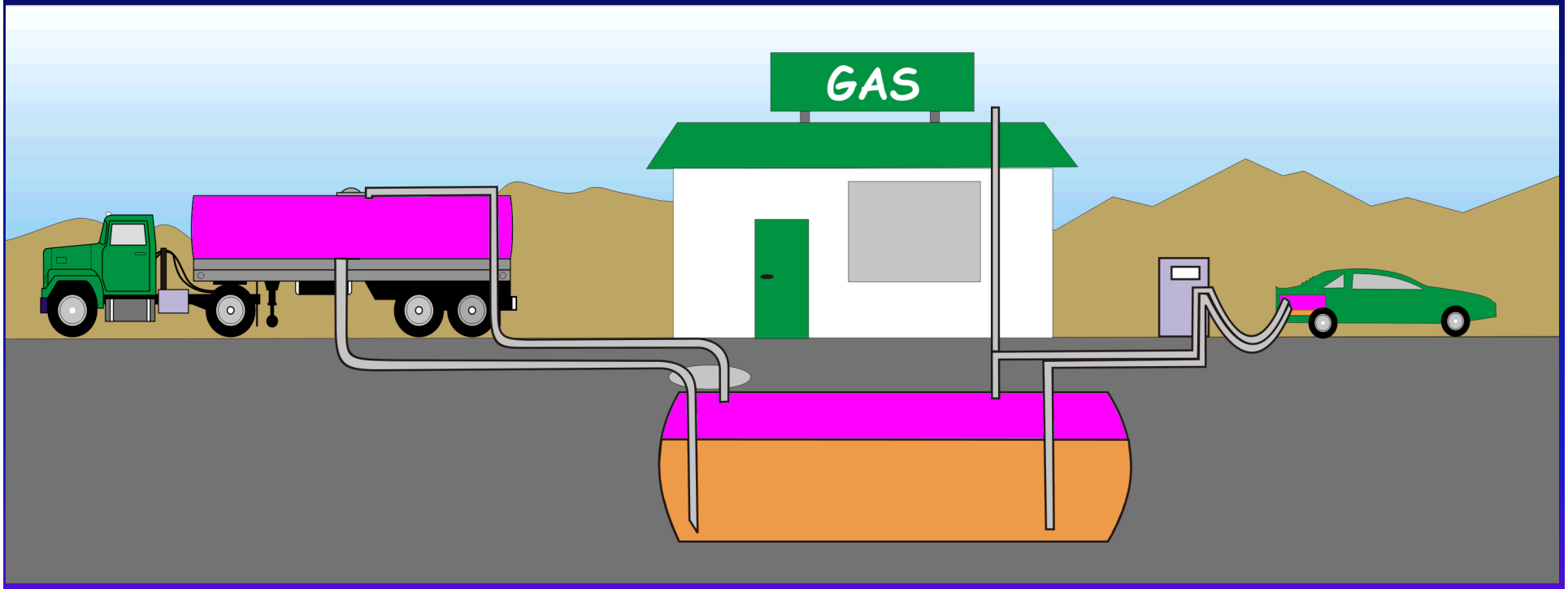
- More stringent certification requirements
- “Dripless” nozzles – less spillage
- Control of fugitive emissions
- Better components – less system leaks
- Compatible with vapor recovery systems on newer vehicles (ORVR)
- Vapor recovery system monitor (ISD)

GDF Vapor Recovery Benefits

- **16 billion gallons/year CA gasoline sales**
- **Uncontrolled emissions of 8.4 lbs of gasoline vapor for each 1000 gallons gasoline transferred**
- **347 tons/day** vapor recovery emission reductions from pre-EVR systems
- **25 tons/day** from Enhanced Vapor Recovery

Total Benefit: 372 tons/day or 120,000 gallons liquid gas/day or $420,000 savings/day ($3.50/gal)

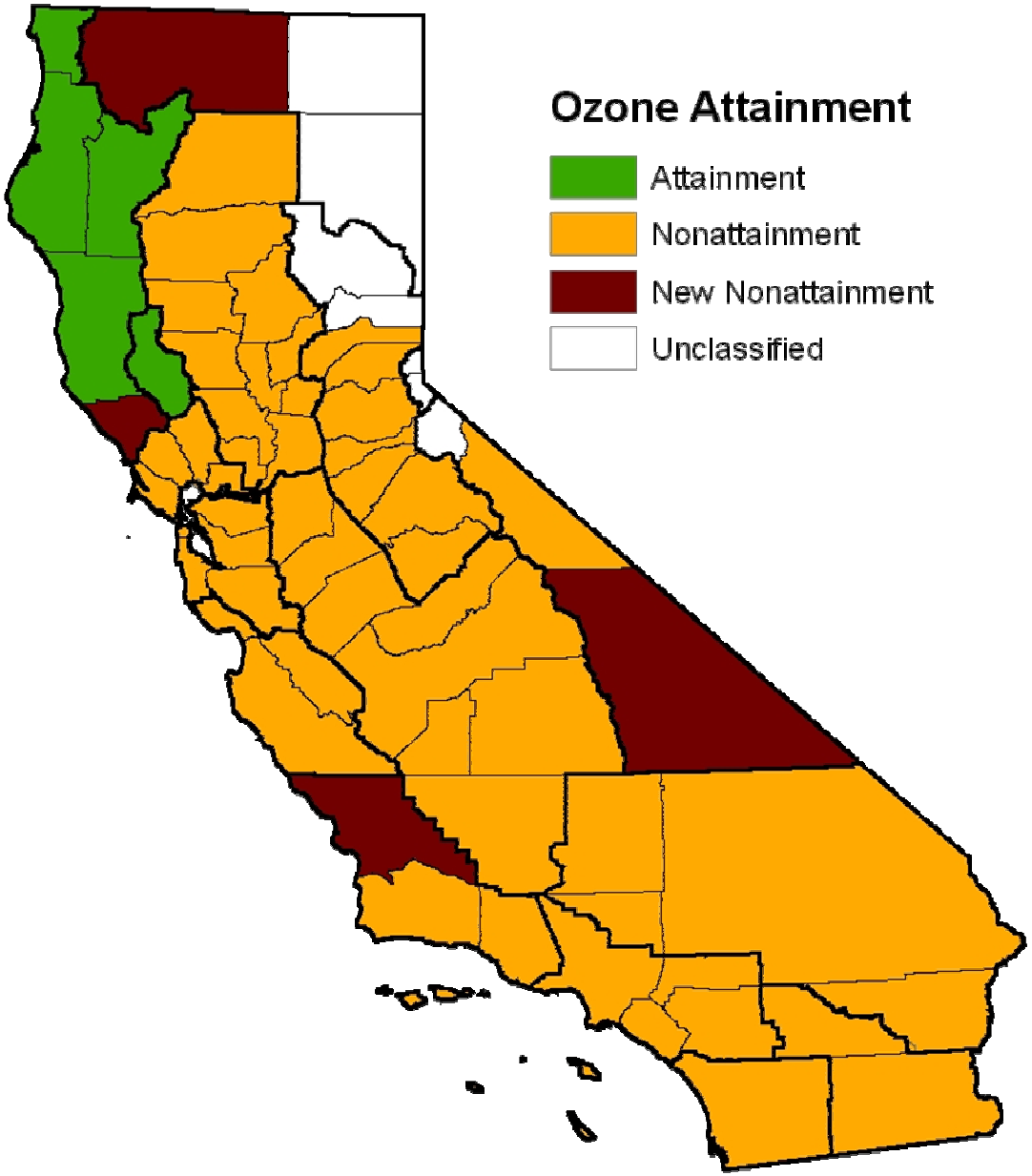
Vapor Recovery at Service Stations



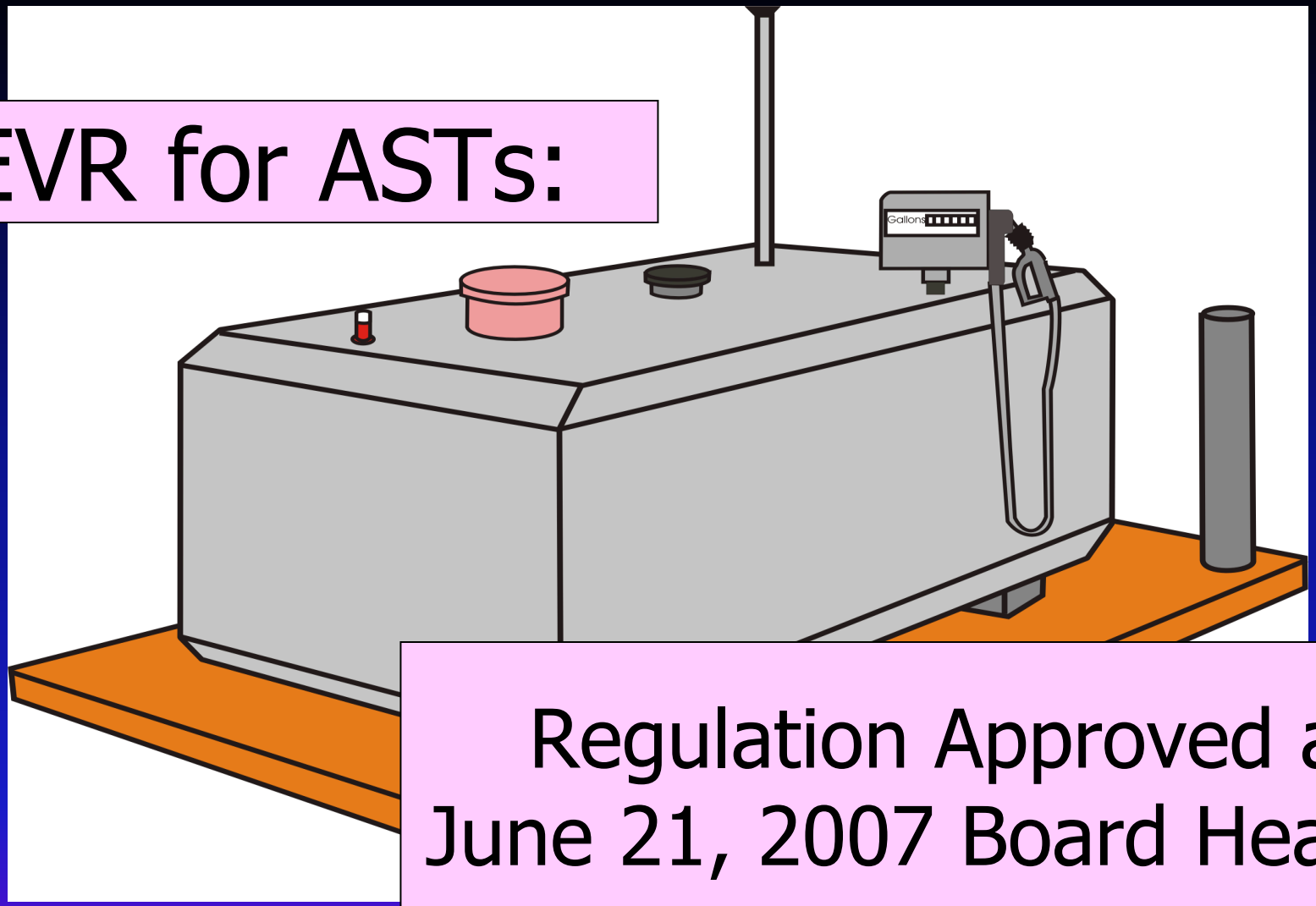
Phase I

Phase II

Changes to Ozone Attainment Designations



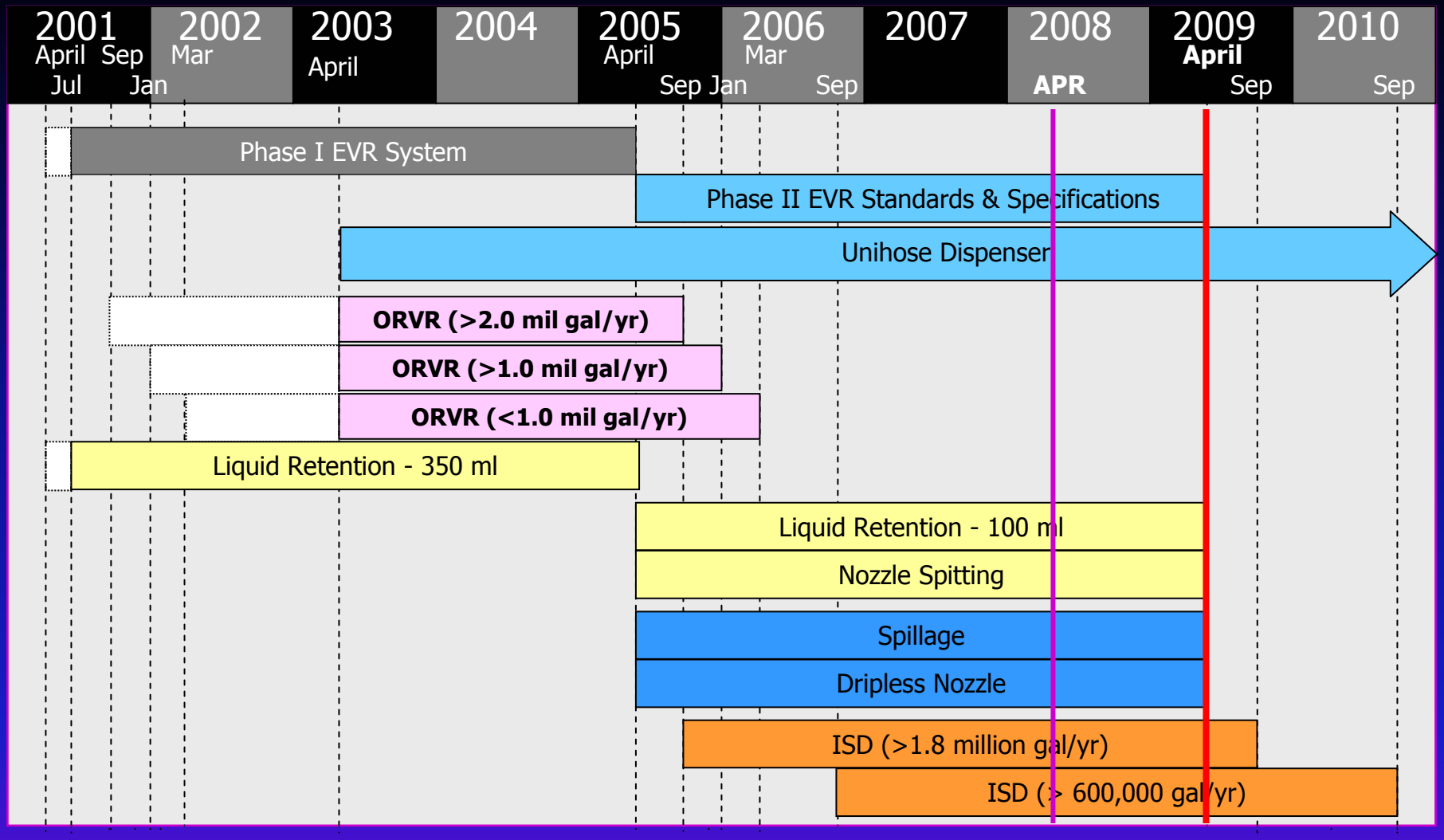
EVR for ASTs:



Regulation Approved at June 21, 2007 Board Hearing

Effective January 2009

EVR Timeline (updated June 2006)



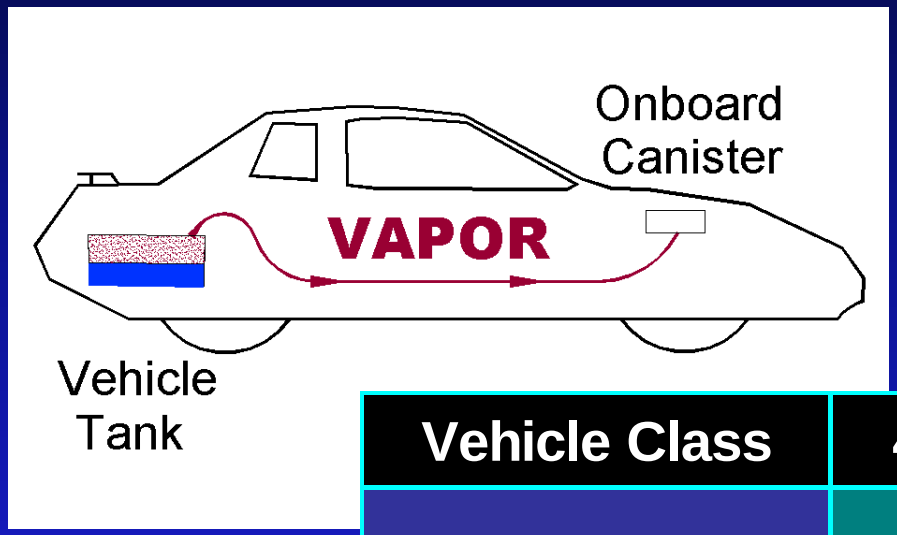
Dotted box: time between start of 4-year clock and operative date

Start of solid bar: date required for new or modified facilities (operative date)

End of solid bar: date required for existing facilities (installed before start of bar)

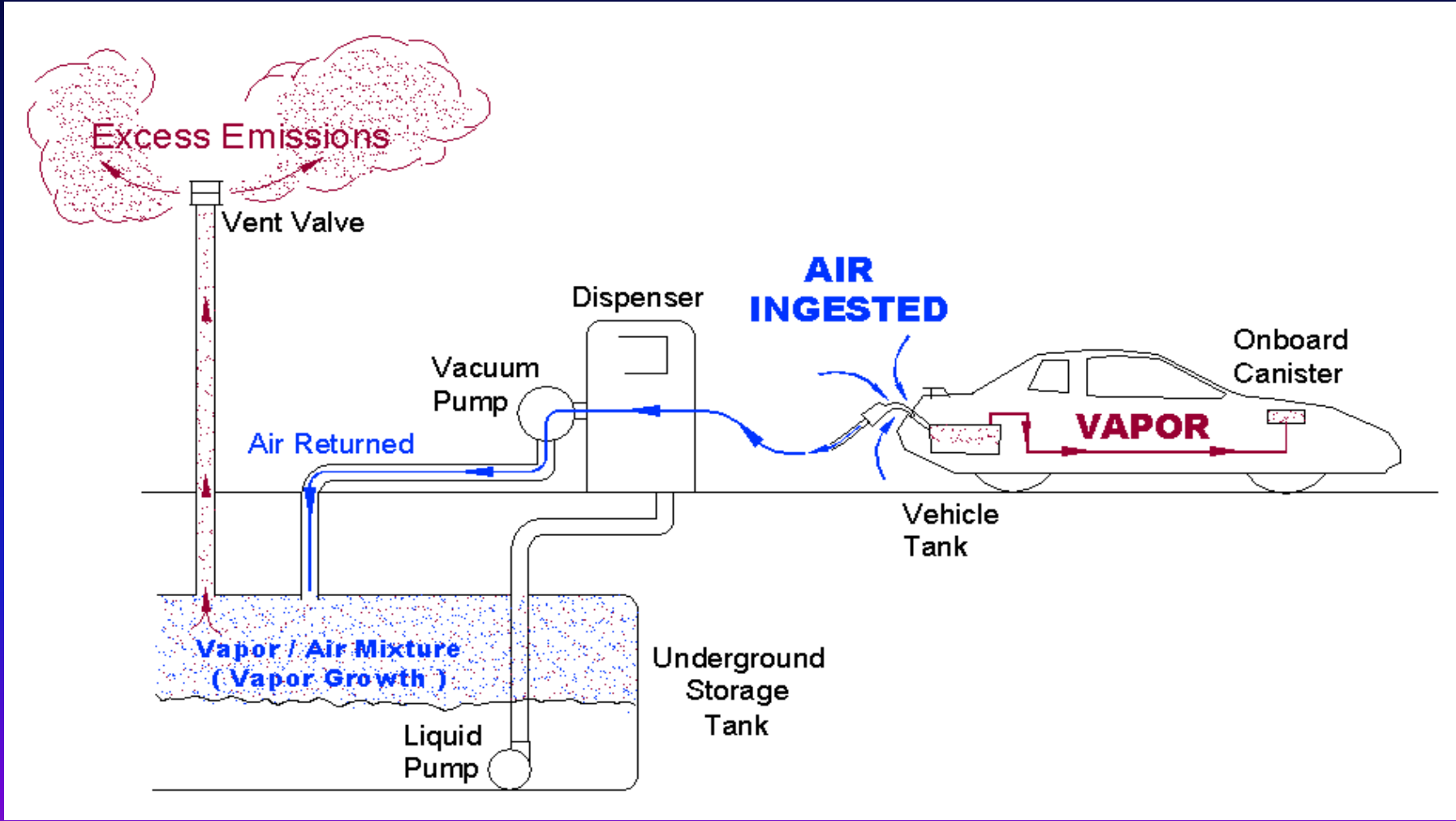
Not required for dispensers installed before April 2003

Onboard Refueling Vapor Recovery or "ORVR"



Vehicle Class	40%	80%	100%
Passenger	1998	1999	2000
LD Trucks & MDV (<6000 lbs)	2001	2002	2003
MD Vehicles (6001-8500 lbs)	2004	2005	2006

ORVR - Phase II Incompatibility

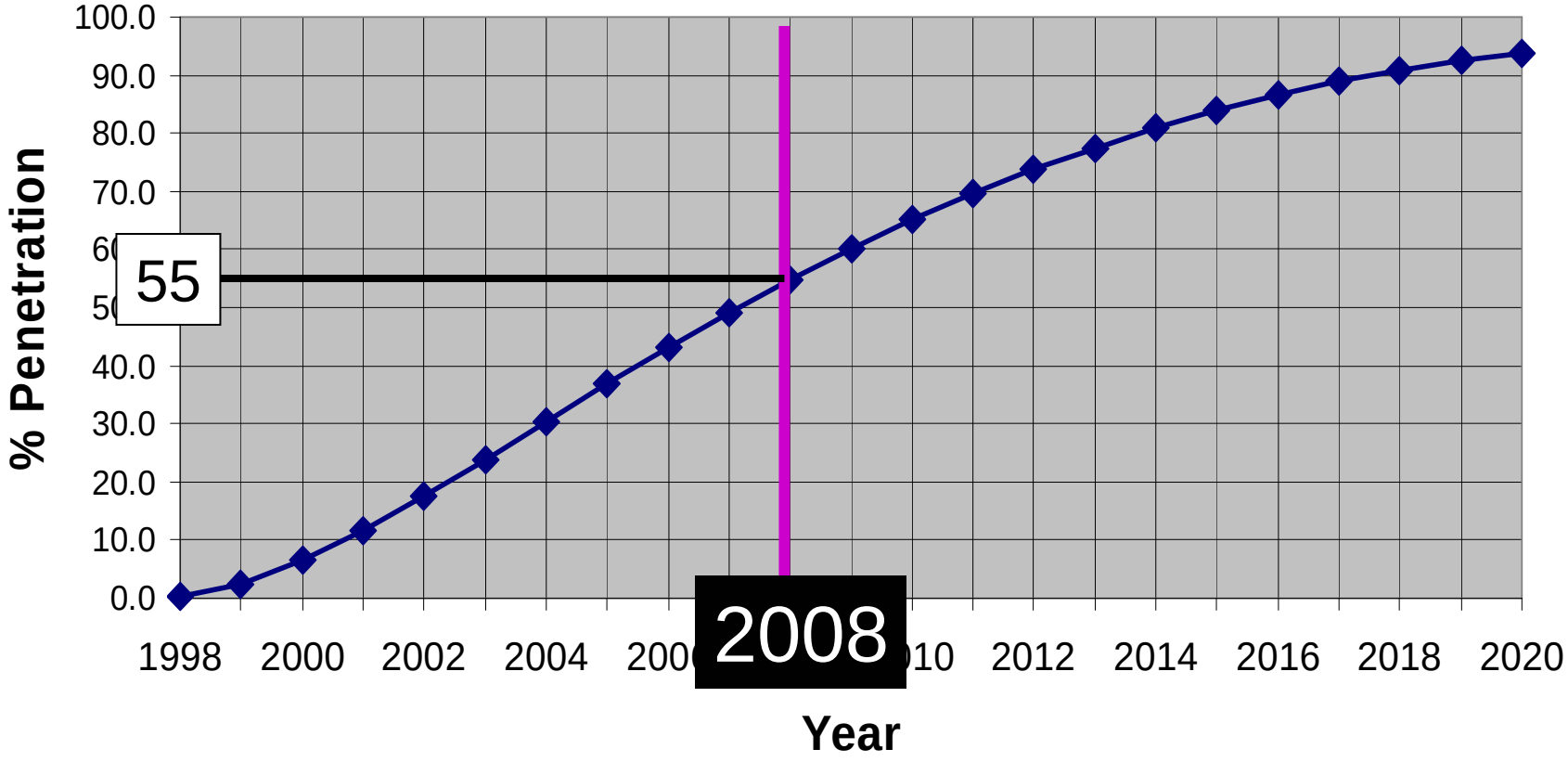


US EPA "widespread use" of ORVR Vehicles

- Phase II systems are required by federal, state and local agencies
- US EPA may allow removal of Phase II vapor recovery systems in next 10 years
- CA expects to keep Phase II systems until 2020 or longer to maintain emission reductions

ORVR Vehicle Penetration

(vehicle miles traveled - VMT)



Limited ORVR "Widespread Use" Designations

- US EPA 12/12/06 memo
  - Initial fueling of new vehicles at automobile assembly plants
  - Refueling of rental cars at rental car facilities
  - Refueling of flexible fuel vehicles at E85 dispensers
- US EPA 11/28/07 memo
  - Expand "widespread" use to ORVR fleets
- ARB 2/20/08 letter
  - Encourages districts to modify rules to exempt E85 and ORVR fleet dispensing from Phase II

Phase II EVR 2009 Deadline

- **12,000 GDFs have 12 months to upgrade to EVR Phase II systems!**
  - Obtain permits
  - Purchase equipment
  - Install using certified contractor
- Potential contractor shortage if wait until last minute
- See Advisories 359 & 372

EVR Phase II Certified Systems

- Two EVR Phase II systems certified

Healy EVR Phase II System (assist)

Not including ISD: VR-201

Including ISD: VR-202

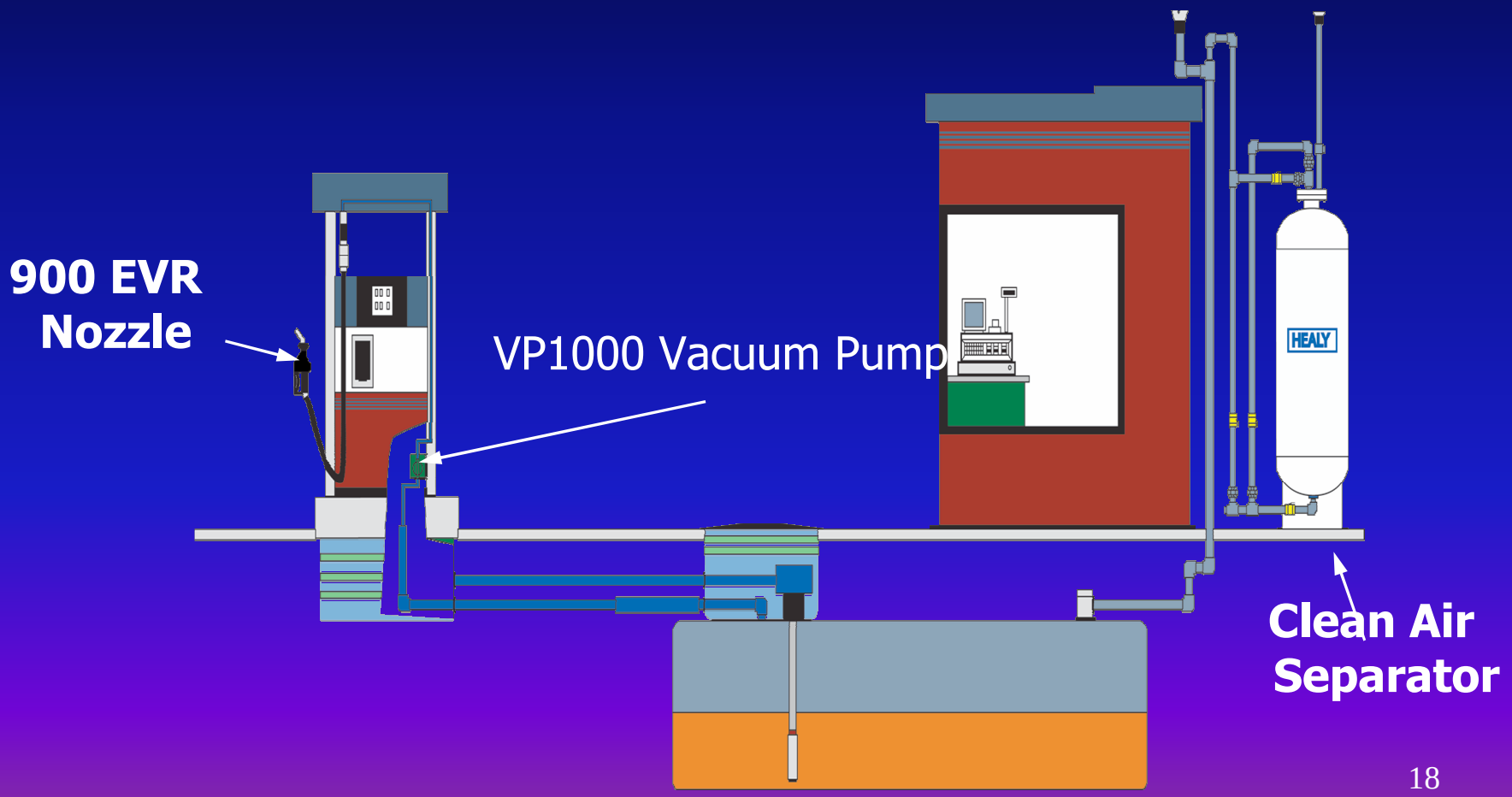
VST EVR Phase II System (balance)

Not including ISD: VR-203

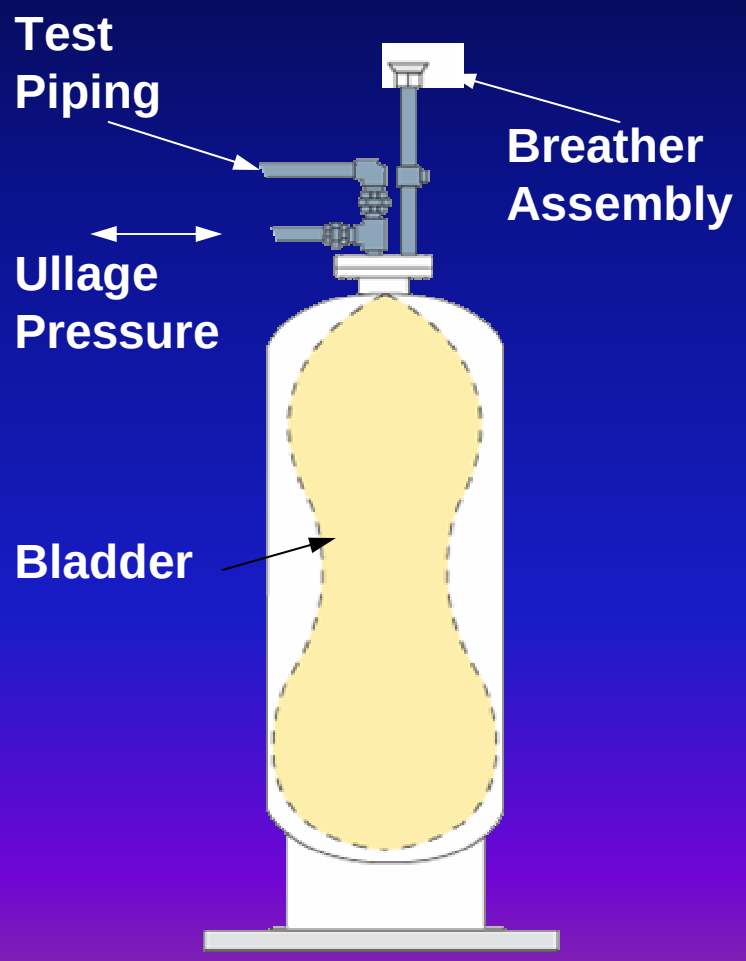
Including ISD: VR-204 !

- Other systems currently in cert process
- Takes about 1 year to complete certification

Healy EVR Phase II System



Healy Clean Air Separator (CAS)



Healy Clean Air Separator

Healy Clean Air Separator

Another Option: Horizontal CAS

VST EVR Phase II System

VST EVR Phase II System

Balance vs. Assist EVR Systems

- Most GDF operators believe EVR balance system will be cheaper than EVR assist as they already have the balance system
- Total cost depends more on which EVR processor fits with GDF site layout
- Healy: large and may need enclosure, but no electrical or sensors
- VST: small, but requires 2 vent lines, electrical & sensor conduit (even the non-ISD version)

ICC Vapor Recovery System Installer Exam

- ICC = International Code Council
- Maintain exams for UST program
- Exam panel includes ARB, SWRCB, contractors and gasoline marketers
- Exam available as of March 2007
- May be required by district rule or permit condition

In-Station Diagnostics (ISD)

- Identifies failures automatically
- Notifies station operator
- Reduces emissions by early detection and prompt repair
- Supplements district inspections
- Concept similar to OBD for vehicles
- Tie-in to existing UST leak monitors

ISD Implementation Deadlines

> 1.8 million gallons/yr	600,000 – 1.8 million gallons/yr	≤ 600,000 gallons/yr
New and Major Mod Sites: **Sept. 2005** Existing Sites: **Sept. 2009**	New and Major Mod Sites: **Sept. 2006** Existing Sites: **Sept. 2010**	**Exempt From ISD**

How ISD Works

Monitors Two Primary VRS Functions:

1. Collection of Vapors during Fueling
   - ISD flow monitor
2. Containment of Vapors in UST system
   - ISD pressure monitor
   - ISD leak test

ISD Sensors

←Pressure Sensor

Flow Meter

Veeder-Root TLS-350

ISD Option for Healy

INCON/FRANKLIN FUELING SYSTEMS

ISD & FUEL MANAGEMENT SYSTEMS

ISD Failure Modes & Assessment Frequency

	Degradation Failure	Gross Failure
A/L Ratio	Weekly	Daily
Balance vapor collection	---	Daily
UST Pressure	Monthly	Weekly
Pressure Integrity (leaks)	---	Weekly
Vapor Processor	---	Daily

Total Estimated Cost for EVR Phase II and ISD

	Number of Dispensers			
	2	4	6	12
EVR Phase II	$17,240	$24,925	$32,765	$56,285
ISD	$13,600	$16,500	$19,700	$28,900
TOTAL (rounded to nearest $100)	**$30,800**	**$41,400**	**$52,500**	**$85,200**

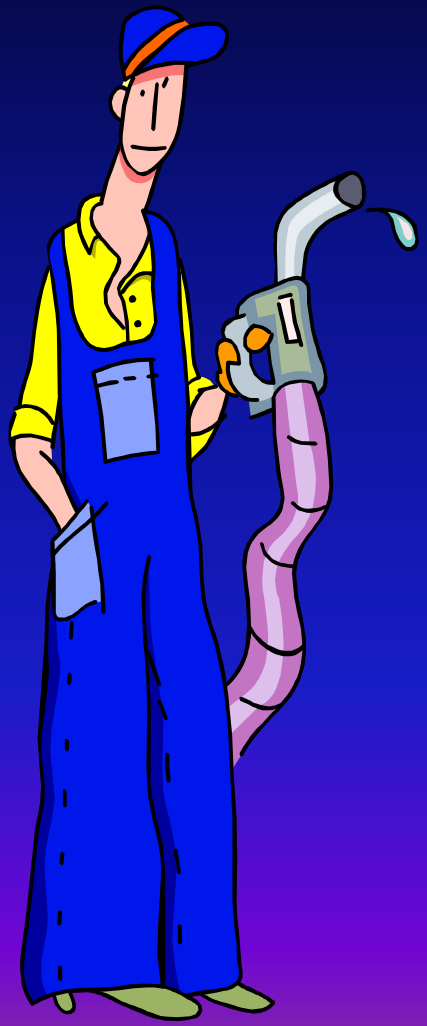
Does not include cost to replace dispensers, obtain permits, install electrical lines or conduct start-up tests

RUST program

- Small business assistance to comply with SB 989
- Also covers Enhanced Vapor Recovery and electronic monitoring system (ISD)
- Grants: $3,000 to $50,000
- Loans: $10,000 to $750,000
- www.waterboards.ca.gov/cwphome/ustcf/rust.html

EVR Contacts

- **EVR Regulations** - Cindy Castronovo
  - ccastron@arb.ca.gov (916) 322-8957
- **EVR Certification** - Pat Bennett
  - pbennett@arb.ca.gov (916) 322-8959
- **ISD and AST certification** – George Lew
  - glew@arb.ca.gov (916) 327-0900
- **In-Use Vapor Recovery** - Ranjit Bhullar
  - rbhullar@arb.ca.gov (916) 322-0223

www.arb.ca.gov/vapor/vapor.htm
www.evrhome.org

Questions?