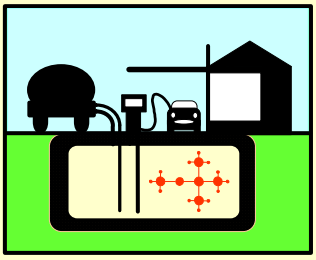
MTBE/USTs: A True Perspective

Mealey's MTBE & UST Litigation Conference

Ritz Carlton, Marina del Rey, CA

November 4-5, 2002



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In the Beginning …

- Unprotected USTs per Fire Codes & Space Restrictions
- Oil Company Realization of Release Liability in 1970's
- In 1980's Oil Industry Worked with Federal & State Rulemakers to Reduce/Minimize Future, Undetected Releases
- With Early Detection, Minimal Damage & Clean Up Costs

At the same time …

- Lead in Gasoline Phase Out … *Octane Need filled by MTBE*
- Oxygen Required to Be Added to Gasoline – Winter/Summer
  … In Winter Months a Choice = Ethanol (with subsidy) v. MTBE
  … In Summer Refiner Choice = MTBE … *Ethanol Volatility Problems*

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1988 Federal & State UST Programs

Pre-Upgrade Requirements:

- Installation Certification
- Inventory Reconciliation
- Spill/Overfill Prevention Procedures
- Existing Corrosion Protection Maintenance
- Industry Code/Standard Repairs
- Release Detection Requirements
- Pressurized Pipe Leak Detection
- Periodic UST System Testing

Many Operational/Maintenance Requirements …
ENFORCEMENT CRITICAL TO BE EFFECTIVE

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Federal & State Upgrade Requirements

… full upgrades required prior to December 22, 1998

- Spill Prevention Catch Basin at Fill Point
- Overfill Protection w/ Automatic Shutoff
- System Corrosion Protection – USTs & Piping

CA Upgrades …

- Striker Plates
- Automatic Pump Shutoff w/ Leak Detection

Many Waited Until the End of 1998

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MTBE Connection …

- With Effective Enforcement, No Lengthy Plumes (Hundreds of Feet Long)
- With More Rapid Detection; Cleaning Up Gasoline Containing MTBE – Not MTBE in Groundwater

The Problem with MTBE in Groundwater

was

Lacking UST Program Enforcement/Compliance

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Origin of CA MTBE Ban

University of California MTBE Study

- A $500K, 6 mo Study
- Predicted $340MM to $1.5B per year in CA groundwater remediation costs
- Predicted 60 to 340 additional CA public supply wells contaminated

…leading to …

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Executive Order D-5-99

March 25, 1999 …

WHEREAS, the findings and recommendations of the U.C. report, public testimony, and regulatory agencies are that, while MTBE has provided California with clean air benefits, because of leaking underground fuel storage tanks MTBE poses an environmental threat to groundwater and drinking water.

Removal of MTBE ordered by December 31, 2002.

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CA UST Studies & Reviews

- SWRCB Leak Detection Study - January 1998
- Bureau of State Audits GW Report - December 1998
- UC MTBE Study - November 1998
- CA UST Advisory Panel - January 1999
- Non-Upgraded UST Workgroup - January 2001
- CA UST Program Enforcement Panel - August 2001

All Pointing to UST Program Enforcement Problems!

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CA UST Advisory Panel

January 1999

Four Teams of Experts assigned to Investigate & Review LUST Sites to determine Leak History associated with UST Systems meeting 1998 Upgrade Standards.

Panel recommendations formed the basis of UST provisions in SB 989.

Four Teams of Experts Investigated …
Four Key Areas of Concern

1. Compatibility & Permeability
2. Upgraded Tank Release Site Evaluations
3. Leak Source & Detection Data Collection & Analysis
4. Marina Fuel Facility Equipment & Practices

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CA UST Advisory Team 1

"UST Compatibility/Permeability"

It's a Federal Law...

- Public Law 98-616, November 8, 1984
- H&SWA'84 / Subtitle I – Regulation of Underground Storage Tanks
- Section 9003(g)(1)(C) ... Interim Prohibition ... the material used in the construction or lining of the tank is compatible with the substance to be stored.

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CA UST Advisory Team 1

"UST Compatibility/Permeability"

Potential Compatibility Problems

- **Equipment Including …**

  …Tanks …Lines …Hoses
  … Nozzles …Gaskets …Seals
  …Turbine Pumps … Meters …Fittings

- **Materials Including …**

  … Elastomers … Metals
  … Plastics/Polymers … Coatings/Linings

- **Dynamic & Static Testing**

MTBE in gasoline (@ ≤15 vol%) has no documented material compatibility issues

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Ethanol Blend Compatibility & Permeability

Recommended	Not Recommended
METALS	
Aluminum	Zinc-Galvanized (EtOH only)
Carbon Steel	
Stainless Steel	
ELASTOMERS	
Buna-N® (hose & gaskets)	Buna-N® (seals only)
Fluorel®	Neoprene® (Chloroprene – seals only)
Fluorosilicone*	Urethane Rubber
Neoprene® (hoses & gaskets)	
Polysulfide Rubber	
Natural Rubber (EtOH only)	
Viton®	
POLYMERS	
Acetal	Polyurethane*
Nylon	Alcohol-based Pipe Dope
Polyethylene (recently applied)*	
Polypropylene	
Teflon®	
Fiberglass Reinforced Plastic*	

* The manufacturer of the specific material should be consulted.

Reference API Recommended Practice 1626

... no standard Protocol for measuring permeation but …

- Limited amount of data available shows …

… **Demonstrated permeability**

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CA UST Advisory Team 2 Findings

"Upgraded Tank Release Site Evaluations"

- **Poor contractor installation and unknown quality of agency inspection**
- **Poor operator/contractor choice of upgrade components**
- **Operator disabling/overriding of leak detection systems**
- **Failure to respond to and investigate monitoring system alarms**
- **Discrete release incidents; spills, overfills, drive-offs, etc.**

BUT …

There was <u>no evidence</u> that fully upgraded, compliant and well-maintained UST systems are subject to on-going continuous leaks.

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CA UST Advisory Team 3 Findings

"Leak Source & Detection Data Collection & Analysis"

- **Releases are primarily from older, non-compliant UST systems**
- **Piping near the dispensers are the most problematic release source**
- **Currently releases are most often discovered during UST closure/removal processes**
- **The LUST data provided little information on the size of the problem when discovered**

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Introduction to the California UST Program

CA Hybrid Tank Systems

Total Mix of USTs in CA …

- Single-Walled Tanks & Piping [pre-84]
- Double-Walled Tanks & SW Piping
- Double-Walled Tanks & DW Piping
- Double-Walled Tanks & DW Piping
  … <u>with</u> Under Dispenser Containment

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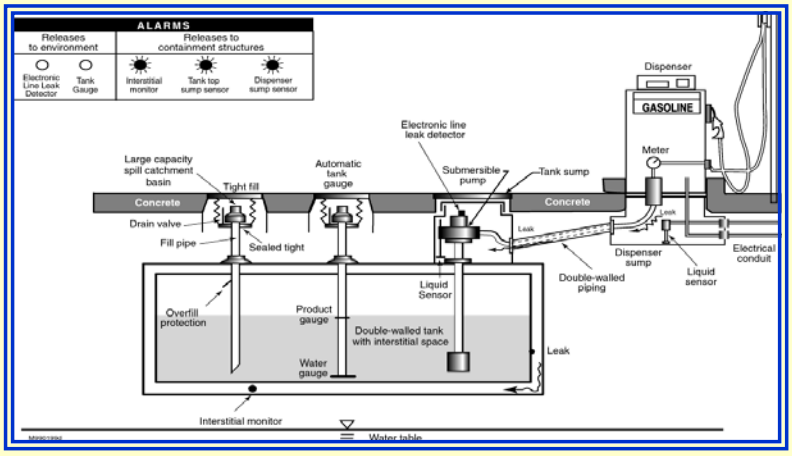
Double-Walled Tank System

… <u>with</u> Under Dispenser Containment



Graphic by ENSR

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California UST Enforcement

The SWRCB has no enforcement authority

+100 Local UST Enforcement Agencies in CA

Local Implementing Agencies (LIAs)

LIA Agencies Include …

- City & County Fire Departments
- City & County Boards of Health
- City & County Environmental Departments

LIAs Report to Local Governing Bodies …

- City Councils
- County Boards of Supervisors

SWRCB and its Regions only have enforcement authority over clean ups.

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Detections of MTBE ≥ 3 ppb

County	GWW
El Dorado	**4**
Kern	**6**
Los Angeles	**12**
Mendocino	1
Orange	3
Riverside	2
Sacramento	2
San Benito	1
San Bernardino	2
San Diego	2
San Francisco	2
San Mateo	2
Shasta	1
Solano	1
Sonoma	1
Tulare	1
Yuba	2
Total	**45/85**

Source: CA DHS – 03/04/02

Questionably Adequate UST Program Enforcement

The focus should be on **better enforcement** through improved training, greater authority and increased agency resources.

OPINION:

The SWRCB **must** have oversight authority to enforce where needed.

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USEPA State UST Approval Program

CA UST Program Never Approved …

- The USEPA has been specifically critical of the CA UST Program decentralized approach.
- The USEPA has never approved the CA UST Program.
- **The USEPA retains enforcement authority over the CA UST Program.**

- There are no known Federal enforcement activities in CA -

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Extension of MTBE Phase Out

CA Governor Executive Order D-52-02

March 14, 2002 …

WHEREAS, strengthened underground storage tank requirements and enforcement have significantly decreased the volume and rate of MTBE discharges since Executive Order D-5-99 was issued in March of 1999 …

…I FIND that it is not possible to eliminate use of MTBE on January 1, 2003, without significantly risking disruption of the availability of gasoline in California … would substantially increase prices, harm California's economy and impose an unjustified burden upon our motorists.

… take the necessary actions to postpone for one year the prohibitions of the use of MTBE and other specified oxygenates in California gasoline.

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California Energy Commission Study

re: California Strategic Fuel Reserve

California is Short on Gasoline

- MTBE phase out would create a 5% - 10% shortfall
- Blending EtOH will further reduce base gasoline
- CA gasoline imports to increase 56–100 TBD
- Few refiners outside CA able to produce CA RFG3
  - … especially for EtOH blending
  - … and only when short supply drives up the price
- CA needs to expand gasoline & EtOH import infrastructure

Source: Stillwater Associates

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Projected Cost to CA Consumers

- EtOH case = $300MM to $450MM/yr in additional gasoline costs
- Refinery upsets & gasoline shortages = Price spikes bringing prices up to $3/gal

What About the Environment?

- MTBE detections in public drinking water continue at <1.0% with reduced detection and at lower levels.
- The incidence of leaking tanks is also reduced and clean up technologies are more effective.

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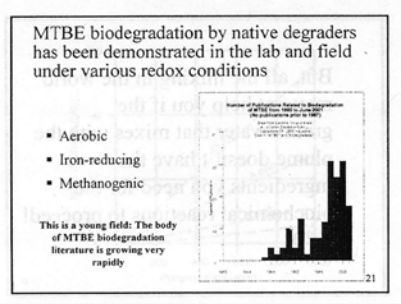
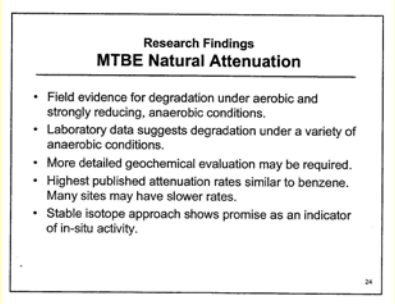
Improving & More Cost-Effective Clean Up Technologies

MTBE Natural Attenuation





Murray D. Einarson
Palo Alto, CA

Tim Buscheck, Chevron ER&T
Richmond, CA

Let's take a look at the real world statistics.

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CA Public Water Systems

MTBE Monitoring Data *[Cumulative]*

	05/12/97	06/18/98	05/25/99	07/03/00	07/20/01	07/03/02
4000 Systems Sampled/Total	8%	14%	23%	35%	48%	64%
System Detects	15	25	40	32	44	52
11000 GW Sources Sampled/Total	~17%	~27%	46%	61%	73%	88%
GW Source Detects	**13 Total**	**26 Total**	**43 Total**	**15** >13ppb	**17** >13ppb	**20** >13 ppb
% Sampled Detects	**~0.70%**	**~0.82%**	**0.85%**	**0.51%**	**0.58%**	**0.61%**

Source: CA DHS

- Many Sources are back to **Non-Detect**
- Detections have **Declined** as a percentage of total sampled and are at **Very Low Levels** of Detection
- New detections … **Old Releases** recently found?

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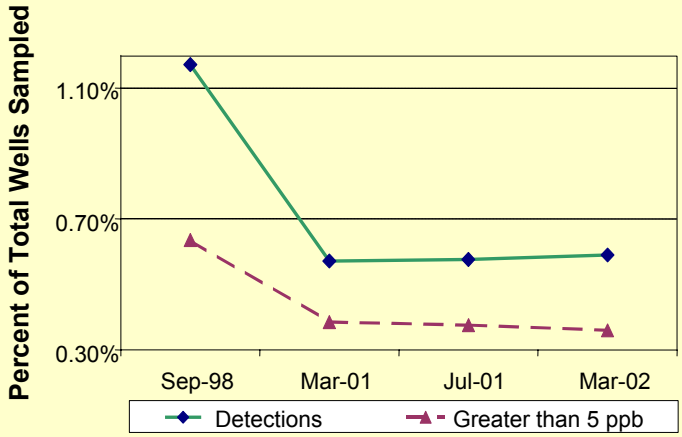
Presence of MTBE in Public Wells



Based on data from California Department of Health Services

Graph from Gordon Schremp, CEC, 03/02

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CA Leaking UST Statistics

CA LUSTs	1998	1999	2000	2001	2002 – 10/02
Open LUST Cases	16,127	15,783	15,167	14,739	14,406
Closed LUST Cases	18,033	20,113	21,660	23,147	23,736
New LUST Cases	-	**1,736**	**931**	**506**	**278**
Closed LUST Cases	-	-2,080	-1,547	-1,487	-589
Net LUST Cases	-	-344	-616	-981	-311

CA LUST Fund Statistics

Fiscal Year	97/98	98/99	99/00	00/01	01/02
Claims Received	743	1,229	1,193	945	655

Source: SWRCB

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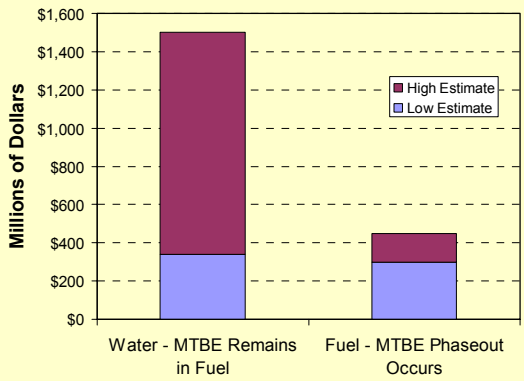
UC MTBE Study/CEC Cost Estimates

Then …



Sources: Water Cost 1998 UC Study; Fuel Cost 1998 CEC Study

Graph from Gordon Schremp, CEC, 03/02

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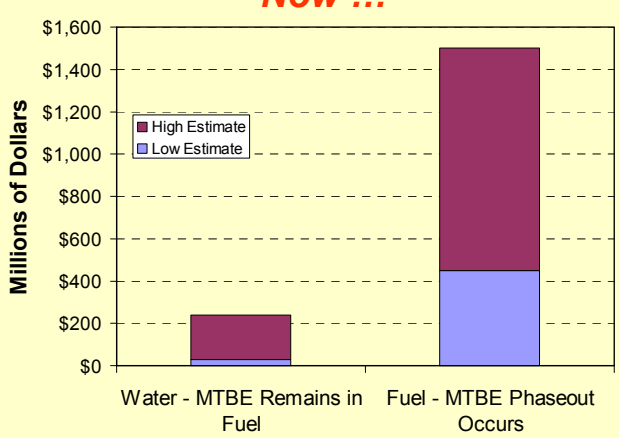
Updated Estimate – Future Scenario

Now …



Sources: Water Cost Data SWRCB; Fuel Cost CEC Estimate

Graph from Gordon Schremp, CEC, 03/02

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Executive Order Comparison

Executive Order D-5-99

March 25, 1999 …

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Similar National Trends

There are similar trends developing nationally with regard to:

… Low Detection of MTBE (USGS-NAWQA)

… UST & LUST Statistics (USEPA-OUST)

… Gasoline Supply Matters (DOE-EIA)

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Problems → Solutions

CA SB 989

Sher - Hayden

Chapter 812, 10/10/99

CA AB 2481

Frommer

Chapter 999, 09/27/02

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A Few CA SB 989 Provisions …

- Increased agency tank site inspections from once every 3 years to once a year.
- Enhanced protection of vulnerable drinking water sources from single-walled tank systems.
- Phased-in installation of under-dispenser containment at all sites.
- Increased training requirements to include tank owners & operators.
- Required periodic testing of secondary containment systems, leak detection & alarms.
- Increased civil penalties for tampering with or disabling leak detection systems.

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SB 989 Investigative Studies

1. How to best find & close the more than 2,000 holdouts of the 1998 upgrade requirements … COMPLETE – January 2001
2. Enforcement authorities & procedures under the CA UST program … COMPLETE – August 2001
3. Field Study, the causes and sources of UST releases … June 2002

These three investigative groups were directed to develop recommendations based on their findings – many recommendations found their way into AB2481.

A common recommendation from #1 & #2 …

provide SWRCB with enforcement authority

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MORE UST Protections

2002 AB 2481, Frommer

As a corollary to the one year MTBE phase out extension …

- New USTs installed after 07/01/03 must be Vapor Tight
- All Piping must be Double-Walled & maintained under Vacuum/Pressure
- All existing USTs within 1K ft of DWW must have ELD by 01/01/04
- Prohibition of Fuel Delivery to “Red Tagged” GDFs
- CUPAs authorized Administrative Penalties
- Continued DHS MTBE Treatment Research & Water Replacement at MTBE sites

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Congress - S.1850

Underground Storage Tank Compliance Act of 2001

- Funds for Enforcement
- 2-Year Inspection Frequency
- UST Operator Training
- MTBE Remediation
- Release Prevention & Compliance

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Still Room For UST Program Improvements?

Today, LUST Information is Primarily Anecdotal

- Improper Installation?
- Equipment Faults?
- Lacking Maintenance?
- Equipment Tampering?
- Inappropriate/Illegal UST System Operation?

Recommend: Random LUST Forensic Autopsies Recorded to Central Database.

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2/3rd CA UST Systems Leaking?

- Field test ordered by SB989
- SWRCB selected ultra-sensitive "Tracer Tight" test
- **One** suspected tank system liquid leak
- Two-thirds of sites detected vapor leaks
- Vapor leaks in lines and fittings

Impacts/Threats to Groundwater?

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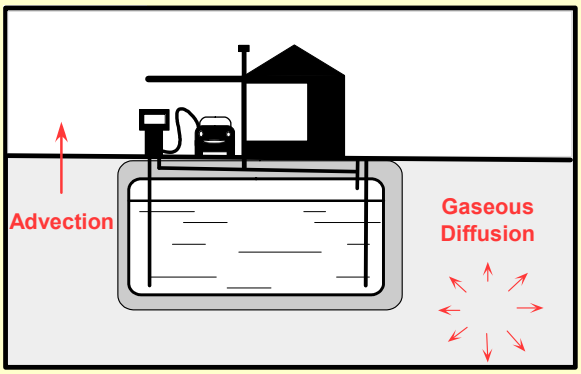
UST Vapor Leaks

… a matter of potential air quality concern, not groundwater concern.

MTBE is highly volatile and the vapors are low in mass.

Advection = Near Surface



Gaseous Diffusion = Deep

AB 2481 = liquid tight to vapor tight

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CA Groundwater Quality

Out of 16,000 PSW, 4,227 are ADI

Abandoned, Destroyed or Inactive

- Benzene MCL Exceedance (+) = 14 wells
- Natural Constituents MCL + = 1,162 wells
- Pesticide MCL + = 196 wells
- Solvent MCL + = 329 wells
- Nitrates MCL + = 313 wells

MTBE MCL + = 14 wells

Source: SWRCB & DHS

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BOTTOMLINE Problem …

Lacking Effective UST Enforcement

- Unreported UST System Alarms & Failed Tests
- Leak Detection Ignorance & Tampering
- Delayed Clean Up Response

With Compliant UST Systems …

Fewer LUST Incidents

Early Discovery & Response

… Less Costly and More Rapid Clean Up

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Continued Threat to Groundwater?

Any continued threat to groundwater from MTBE in gasoline is only as great as are the deficiencies of the resident petroleum storage integrity assurance programs.

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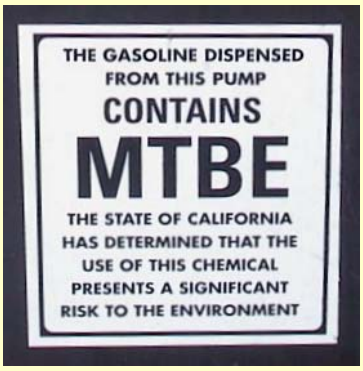

MTBE in Gasoline has *NOT* been a Significant Risk to the Environment

… it was the Lack of Enforcement/Compliance with Pre-Upgrade UST Regulations

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… for more information regarding MTBE …

http://www.CalGasoline.com

MTBE/USTs:
A True Perspective

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