



***Petroleum Cleanup Program Updates***



Effective July 1, 2008, the Bureau of Petroleum Storage Systems (BPSS) of the Florida Department of Environmental Protection (FDEP) has increased the priority score funding threshold from 37 to 45 for sites eligible for the Petroleum Cleanup Preapproval Program. The impact of this score increase in Broward County is minimal, as only two sites will be affected.

In response to the priority score threshold change, the FDEP has issued a guidance document on the procedures for implementation of the funding score change, dated June 26, 2008. These procedures include the following:

- Prior to July 1, 2008, all work orders that are listed on the weekly approval list and in the backlog scored 37 to 44 will be paid for proposal preparation. The prepared work orders will be returned to the contractors once the proposal preparation payment is processed.
- Owners and/or Responsible Parties who paid deductibles for qualifying sites where the funding authorization was removed prior to commencement of cleanup work that do not have pending requests or payment plans may submit a written request to the Bureau Chief's Office for a refund of their paid deductible if desired.

Facilities which are scored between 37 and 44 can participate in the Limited Source Removal Initiative (LSRI) if they meet all the necessary requirements. The deadline for participation in the LSRI was extended from June 30, 2008 to June 30, 2009. The LSRI was developed by FDEP as a response to the Florida Legislature in order to provide state funding for the following tasks at eligible discharge facilities:

- Limited source removals of contaminated soil from eligible discharges that have not received a Site Rehabilitation Completion Order (SRCO).

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- Limited source removals of contaminated soil from eligible discharges that are not scored above the priority score funding threshold (45, as of July 1, 2008).
- Source removal performed in conjunction with an early upgrade of Underground Storage Tanks (USTs) in order to meet secondary containment requirements found in Chapter 62-761, Florida Administrative Code (F.A.C.), including associated soils that would be inaccessible for future remediation.

Work performed in the LSRI is under the Preapproval Program and must follow the current Preapproval Program Standard Operating Procedures Manual (SOP) and the procedures and technical criteria set forth in the FDEP document titled "Revised Procedural and Technical Guidance for the Limited Source Removal Initiative in Conjunction with an Early Underground Storage Tank Update" effective July 1, 2005 and revised July 1, 2007.

In addition, the following legislative changes were recently signed into law and became effective July 1, 2008:

**Funding Caps:** The FDEP and the Florida Petroleum Marketers Association (FPMA) crafted legislation that increased the funding caps for the two State-funded petroleum contamination cleanup programs with expenditure limitations. The two eligibility programs this cap increase applies to are the Petroleum Cleanup Participation Program (PCPP) and the Petroleum Liability Restoration Insurance Program (PLRIP). The PCPP program funding cap increase is \$100,000 and the PLRIP program funding cap increases are \$100,000, \$150,000 and \$200,000 per incident depending on the date of the eligible discharge. All previous eligibility requirements and deductibles remain unchanged. The funding cap increases are automatic for all incidences in which a Site Rehabilitation Completion Order (SRCO) had not yet been issued (prior to June 1, 2008), and there is nothing that an owner, Responsible Party, or Consultant need to do. Those sites which previously transitioned out of the Preapproval program upon reaching the original funding limit will be transitioned back into the Preapproval Program. All cleanup costs paid outside of preapproval however are not reimbursable.

**Invoice Deadlines:** Within the Preapproval Program, the Consultant must submit an invoice for work completed within 30 days after written acceptance of each interim deliverable or written approval of the final deliverable. Previously the only requirement for invoice submittal was Section 2p of the Work Order Terms & Conditions attached to each Preapproval Work Order which stated that a final invoice be submitted within 60 days after written approval of the final deliverable.

### **IMPORTANT LINKS:**

The July 1, 2007, Revised Procedural and Technical Guidance for the Limited Source Removal Initiative document can be found at the following FDEP website:

[http://www.dep.state.fl.us/waste/quick\\_topics/publications/pss/pcp/procedures/Revised\\_LSRI\\_Document\\_070107.pdf](http://www.dep.state.fl.us/waste/quick_topics/publications/pss/pcp/procedures/Revised_LSRI_Document_070107.pdf)

A copy of June 26, 2008, funding score change procedures can be found at:

[http://www.dep.state.fl.us/waste/quick\\_topics/publications/pss/pcp/procedures/ScoreIncreaseProcedures-062608.pdf](http://www.dep.state.fl.us/waste/quick_topics/publications/pss/pcp/procedures/ScoreIncreaseProcedures-062608.pdf)

Additional details regarding the scoring change and future announcements from BPSS-FDEP can be found at:

<http://www.dep.state.fl.us/waste/categories/pcp/pages/announcements.htm>

A summary of all Legislative Changes can be found at:

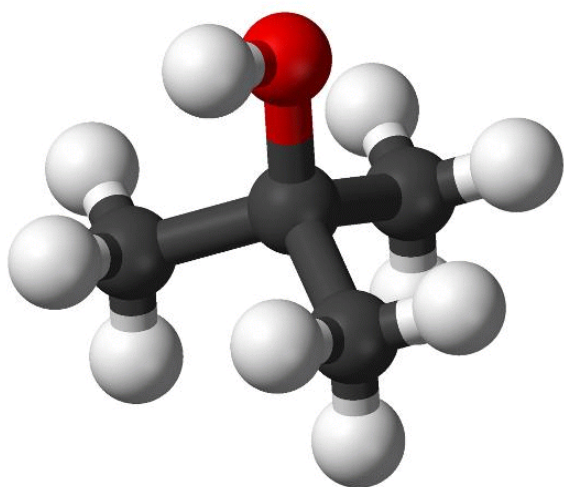
[http://www.dep.state.fl.us/waste/quick\\_topics/publications/pss/pcp/geninfo/CleanupProgramLegislation.pdf](http://www.dep.state.fl.us/waste/quick_topics/publications/pss/pcp/geninfo/CleanupProgramLegislation.pdf)

For additional information, you may contact Ray Ledbetter, Ph.D., at (954) 519-1445 or [rl Ledbetter@broward.org](mailto:rl Ledbetter@broward.org).

## *Tertiary-Butyl Alcohol at Petroleum Contaminated Sites*

Throughout most of the Twentieth Century, lead was a common anti-knocking agent added to gasoline. In 1973, citing health risks caused from lead emissions, the Environmental Protection Agency (EPA) issued standards that called for a gradual phase-out of lead in gasoline. This phase-out culminated in the Clean Air Act Amendments of 1990 and EPA regulations banning lead in motor vehicle gasoline after 1995. In most instances lead was replaced by Oxygenates (alcohols and ethers) which boosted the octane quality of gasoline, enhanced combustion, and reduced exhaust emissions.

Methyl tertiary-butyl ether (MTBE) became the most widely used oxygenate in motor vehicle fuels throughout the United States, whereas ethanol became dominant in other parts of the world. Other oxygenates that have been or may be added to gasoline include: ethyl tertiary-butyl ether (ETBE); tertiary-amyl methyl ether (TAME); diisopropyl ether (DIPE); tertiary-butyl alcohol (TBA); and methanol.



MTBE, as the predominant oxygenate used in the United States, is the only oxygenate listed as a Petroleum Product Chemical-of-Concern (COC) in the Gasoline and Kerosene Analytical Group (Table A of Chapter 62-770, Florida Administrative Code (FAC)). But is MTBE the only oxygenate we should be concerned with?

TBA (identified as "Butyl alcohol, tert-") is a listed contaminant in Chapter 62-777, FAC. The residential direct exposure based soil Cleanup Target Level (CTL) is 5.7 mg/kg (ppm). The groundwater CTL is 1,400 µg/L (ppb), and the Natural Attenuation Default Concentration (NADC) for TBA is 14,000 µg/L. If TBA or other oxygenates are detected at a site above the applicable Cleanup Target Levels (CTLs), they must be properly reported, assessed, and remediated if necessary.

Recent assessment work conducted in Broward County has identified a significant presence of TBA reported in groundwater samples collected from shallow, intermediate, and deep intervals of petroleum contaminated gasoline stations. Examples of TBA data from three different sites in Broward County are as follows:

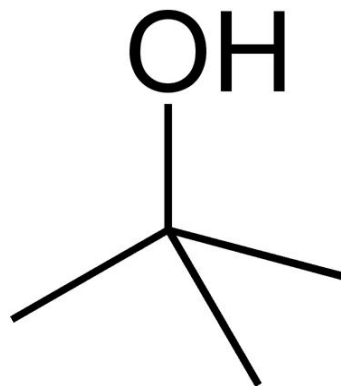
- 262,000 ppb at 50-feet below grade close to the source.
- 346,000 ppb in the shallow zone at the property boundary.
- 34,300 ppb at 40-feet below grade at the property boundary.

Ms. Patricia Ellis, with the Delaware Department of Natural Resources and Environmental Control, has reported a concentration of 1,650,000 ppb TBA at a site (November 2007, LUSTLine Bulletin 57). The data reported in Broward County is generally limited to the initial assessment phase. Any impact that TBA may have on the stability and/or migration of the traditional BTEX/PAH plume cannot yet be correlated.

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So, what is TBA? TBA (CAS Number 75-65-0) is a colorless solid or liquid whose chemical formula is  $(\text{CH}_3)_3\text{COH}$ .

TBA is also referred to as 1,1-Dimethylethanol; 2-Methyl-2-propanol; 2-Methylpropan-2-ol; Dimethylethanol; Methyl-2-propanol; tert-Butanol; t-Butyl Alcohol; t-butyl hydroxide; Trimethylcarbinol; trimethyl methanol. TBA is miscible in water; has a very low Henry's law constant of 0.00121 ( $\text{atm}\cdot\text{m}^3$ )/(g-mole); has an organic carbon partitioning coefficient (log Koc) of 1.57; and has a fuel-water partitioning coefficient (log Kow) of 0.35. TBA dissolves more readily into water than MTBE, and migrates much more quickly both horizontally and vertically. At a gas station under assessment in Broward County the following groundwater contaminant concentrations were present in a monitoring well located 50 feet from the underground storage tanks: benzene, <0.305  $\mu\text{g/L}$ ; MTBE, 127  $\mu\text{g/L}$ ; TBA, 62,600  $\mu\text{g/L}$ .



Research shows EPA granted approval to add gasoline grade TBA to unleaded gasoline to two different companies in the past. TBA is a trace component found in fuel grade MTBE (as a contaminant), and is a metabolite of MTBE biodegradation. Thus, as MTBE concentrations attenuate at a site, TBA concentrations can increase. Extensive discussion of the MTBE to TBA transformation is discussed in "Technical Protocol for Evaluating the Natural Attenuation of MtBE" (API Publication 4761, dated May 2007) and can be accessed via the internet at:

<http://api.org/ehs/groundwater/oxygenates/upload/4761new.pdf>.

Is TBA overlooked as a petroleum contaminant that will pose a tremendous challenge to assess and remediate, based on its Henry's law constant, Koc, and Kow? It is too early to tell the magnitude of TBA contamination issues throughout the State of Florida. The intent of this article is simply to provide an introduction to oxygenates other than MTBE, and to report the tremendous effort and expense observed in Broward County during the initial assessment phase to define the horizontal and vertical extent of TBA.

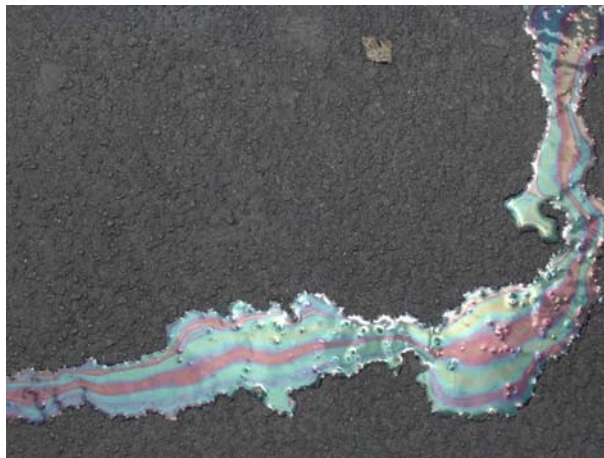
#### References:

[LUSTLine \(Bulletin 57; Bulletin 34\) http://www.neiwpc.org/lustline/](http://www.neiwpc.org/lustline/)

<http://api.org/ehs/groundwater/oxygenates/index.cfm>

<http://www.epa.gov/OUST/oxygenat/>

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## *Employment Opportunity with Broward County PPRAQ*

The Broward County Pollution Prevention, Remediation, and Air Quality Division (PPRAQ) is accepting applications for an open Hydrogeologist I Position. A brief summary of the position duties and experience and educational requirements is provided below:

**DESCRIPTION OF DUTIES:** This is advanced professional work performing hydrogeologic analyses of contaminated sites in the County.

Work involves conducting field investigations and review of contamination reports, and assessing actual or proposed remedial actions. Employees in this class exercise judgment and initiative within federal, state and county rules and regulations. Supervision is provided by a technical superior through conferences and review of reports.

**ILLUSTRATIVE TASKS:** Reviews hydrogeologic reports pertaining to the assessment and clean up of contaminated sites.

Manages field investigations and inspections at contaminated sites; monitors well drilling and installations, analytical testing and remediation activities.

Reviews and evaluates site test data used for estimation of aquifer characteristics and plume management.

**REQUIRED EXPERIENCE AND TRAINING:** Graduation from an accredited four-year college or university with major course work in geology, hydrogeology, or chemical, civil or environmental engineering; two (2) years experience in groundwater hydrogeology and the remediation of contaminated sites; or any equivalent combination of training and experience.

**SALARY RANGE:** \$38,772.03 - \$61,912.86 per year (dependent upon qualifications)

The position has been posted on Broward County's Human Resources website at: <http://www.broward.org/careers/>.

For a full description of the position responsibilities and requirements, please refer to the website. Applications will be accepted through 5:00 p.m., August 29, 2008. Broward County is an equal opportunity employer and provider of services.

