

Public Health Aspects of
Ethanol use in Gasoline:
Report to CT Legislature

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Background

- Public Act 06-53
 - Evaluate health risks assoc w/ethanol-blended gasoline
 - Prior evaluation: NEIWPC/NEISCAUM, 2001
 - Focus of current report
 - Environmental impacts of ethanol-blended gasoline as described in NEIWPC and Cal (1999)
 - Cal EPA - Joint CARB and EOHHA report
 - Environmental impacts described by CT DEP

Framework for Assessment

- Gasoline emissions are toxic – must start with a baseline
- Comparison across gasoline blends:
 - 11% MTBE oxyfuel
 - Non-oxygenated fuel
 - 10% ethanol oxyfuel

Media & Chemicals of Interest

- Air
 - Fugitive emissions from gas tank and pump
 - Ethanol, BTEX, MTBE
 - Exhaust emissions from tailpipe
 - Acetaldehyde, formaldehyde, 1,3-butadiene
- Groundwater / Drinking Water
 - Contaminant plume from spilled gasoline
 - Ethanol, MTBE, BTEX

Fate and Transport Issues

- Does ethanol modify Reid VP?
 - Alter fugitive emissions?
- Does ethanol increase vapor permeation?
 - CARB/CRC study suggests E10% increases permeation and overall reactivity
- Does ethanol affect exhaust emissions?
- Does ethanol affect breakdown and migration of hydrocarbons in gw?

Toxic Endpoints

- Ethanol in water – risk to fetus
- BTEX/MTBE in water – cancer and non-cancer
- Acetaldehyde, PAN, formaldehyde in air -
 - acute respiratory effects
- Acetaldehyde, formaldehyde, benzene in air
 - cancer risk
- MTBE, ETX in air – non-cancer effects

Risk Approach

- Review issues and general trends in releases
 - Qualitative assessment
- Determine whether
 - ethanol subsurface releases likely to be a risk to pregnant women or others
 - increased ambient acetaldehyde/PAN likely to be acute or chronic health risk
 - Consider genetic polymorphism in ALDH-2
 - increased volatile permeation will increase health risks
 - decreases in MTBE/formaldehyde and changes in BTEX counterbalance any increases from ethanol/acet

Timeline

- Draft DPH Assessment –10/15/06
- Integration with DEP portion / edits
- Complete draft for DEP/DPH approval
- Submit to Legislature – 12-30-06