



# TRAIN DERAILMENT EMERGENCY RESPONSE

IOWA INTERSTATE RAILROAD, LTD. (IAIS)

Rail Line

MP 122.4

Tiskwila, Bureau County, IL

Responding OSCs:

Leonard Zintak

Paul Ruesch

Paul Atkociunas



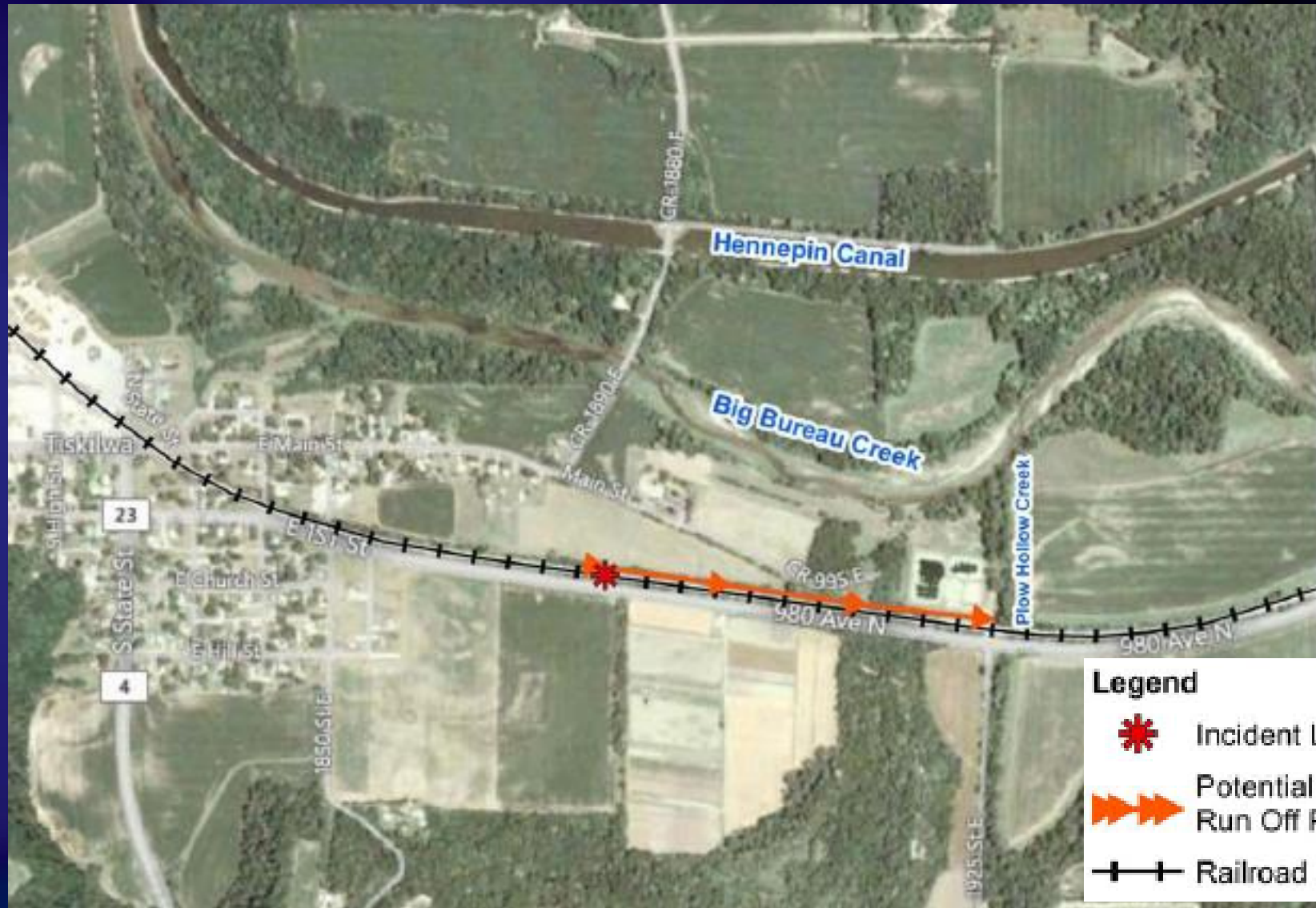
# SITE



Pop = 800



# FEATURES



**Legend**

-  Incident Location
-  Potential Run Off Path
-  Railroad



# DERAIL / SPILL / FIRE / BLEVES

















# UNIFIED COMMAND



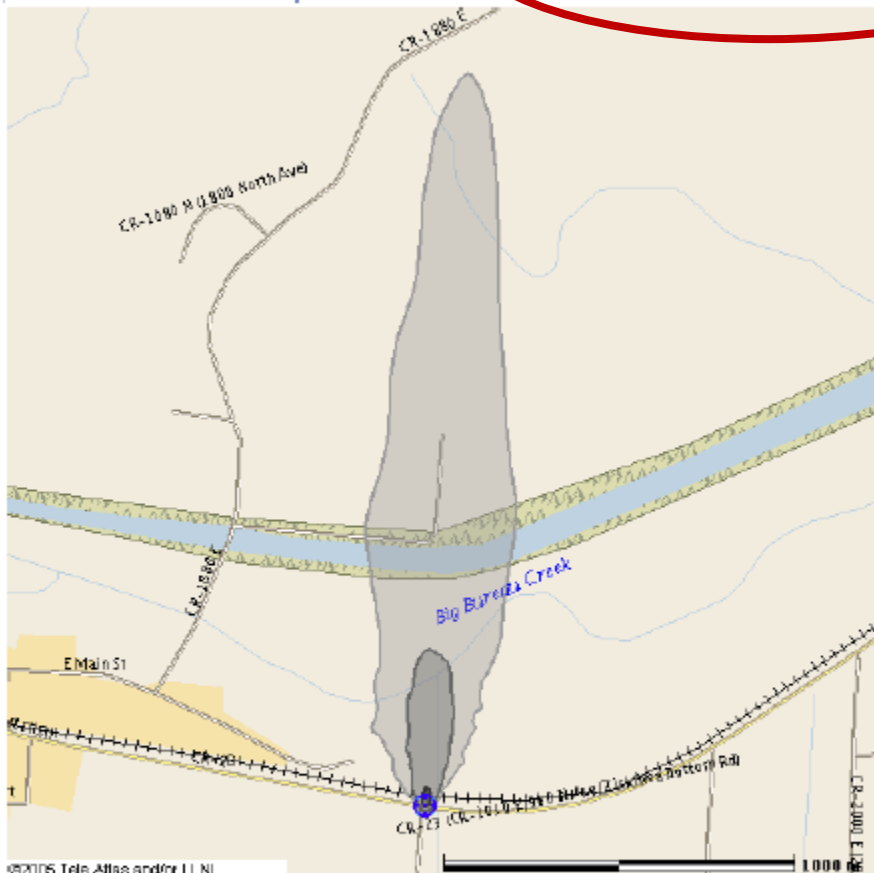


# NARAC MODEL

Not For Public Dissemination

1 Hr Avg Air Conc. at 10/07/2011 17:00:00 UTC

12-Hour Forecast  
Automated Report - Actual Release



Map Size: 2.5 km by 2.5 km Id: Production.rcE19111.rcC1

Effects and Actions			
	Description	(g/m3) Extent Area	Population
	No guidelines specified. Possibly contaminated area. Use to confirm with monitoring surveys.	>1.00E-6 54.3 m 1,200 m2	0
	No guidelines specified. Possibly contaminated area. Use to confirm with monitoring surveys.	>1.00E-6 448 m 45,957 m2	0
	No guidelines specified. Possibly contaminated area. Use to confirm with monitoring surveys.	>1.00E-7 2,099 m 585,411 m2	0

Note: Areas and counts in the table are cumulative. Population Source = LandScan USA V1.0.

Effects or contamination from October 07, 2011 16:00 UTC to October 07, 2011 17:00 UTC

Release Location: 41.289058 N, 89.485233 W

Material: particulate

Generated On: October 07, 2011 16:12 UTC

Model: ADAPT/LODI

Comments:

Hypothetical release

of 1 kg starting at

10/07/2011 16:00:00 UTC for 12 hr

gridded met

NARAC Operations: ( onDuty Assessor ); narac@llnl.gov; 925-424-6465

Requested by: (Connee Foster (mgr); NARAC -- Operation; 202-282-9369; foster5@llnl.gov)

Approved by: (IMAAC Operations Coordinator; IMAAC; 925-424-6465)





Ethanol

# MSDS SPILLED PRODUCT

## MATERIAL SAFETY DATA SHEET (Complies with 29 CFR 1910.1200)

**PRODUCT NAME:** FUEL ETHANOL  
**ADM PRODUCT CODE:** 017609  
**SYNONYMS:** Denatured Ethanol, Ethyl Alcohol – Denatured  
**CHEMICAL FORMULA:** C<sub>2</sub>H<sub>5</sub>OH

### SECTION I

**MANUFACTURER:** Archer Daniels Midland  
4666 Faries Parkway  
Decatur, IL 62526  
**EMERGENCY NUMBER:** (800) 424-9300 Chemtrec (USA)  
(217) 424-5200 ADM Corporate  
**INFORMATION:** (888) 371-4408 or (563) 244-5208  
**DATE:** July 27, 2009

### SECTION II Hazardous Ingredients/Identity Information

COMPONENTS:	CAS Number	OSHA PEL	ACGIH TLV	Volume
Ethanol (Ethyl Alcohol) 200 proof	0064-17-5			95-98%
Natural Gasoline	8006-61-9			2-5%
*Benzene	0071-43-2	1 ppm	10 ppm	<0.1%

\*A chemical known to the State of California to cause cancer

Denatured with 2-5%  
'Natural Gasoline'

= OIL (OPA funding)

### SECTION III – Physical/Chemical Characteristics

Boiling Point, °F 165-175  
 Reid Vapor Pressure, psi, 100°F 3.5  
 Vapor Density (Air = 1) at 172°F 1.6  
 Specific Gravity (H<sub>2</sub>O=1) at 60°F 0.79  
 Evaporation Rate (Butyl Acetate=1) 3.2  
 Solubility in Water Completely miscible  
 Appearance and Odor Clear, colorless liquid; characteristic odor

### SECTION IV – Fire and Explosion Hazard Data

Flash Point (Method Used): Minus 5°F, Tag Open Cup  
 Auto ignition temperature: >689°F  
 Flammable Limits (LEL): 3.3  
 Flammable Limits (UEL): 19.0  
 Extinguishing Media: CO<sub>2</sub>, dry chemical or water for small fires; polar solvent foam for large fires.  
 Special Fire Fighting Procedures: Water is not effective until the alcohol contains approx. 80% water.  
 Unusual Fire and Explosion Hazards: Flammable liquid.



# AIR / WATER MONITORING

**Legend**

- ✳ Incident Location
- AreaRAE Location
- ▲ Water Sample
- YSI Location
- ➡ Potential Run Off Path
- +— Railroad

0 900 Feet





# AIR MONITORING

## AreaRAEs

\*Need to apply correction factors for UltraRAE, MultiRAE & AreaRAE instruments





# AIR MONITORING

Track  
Excavation

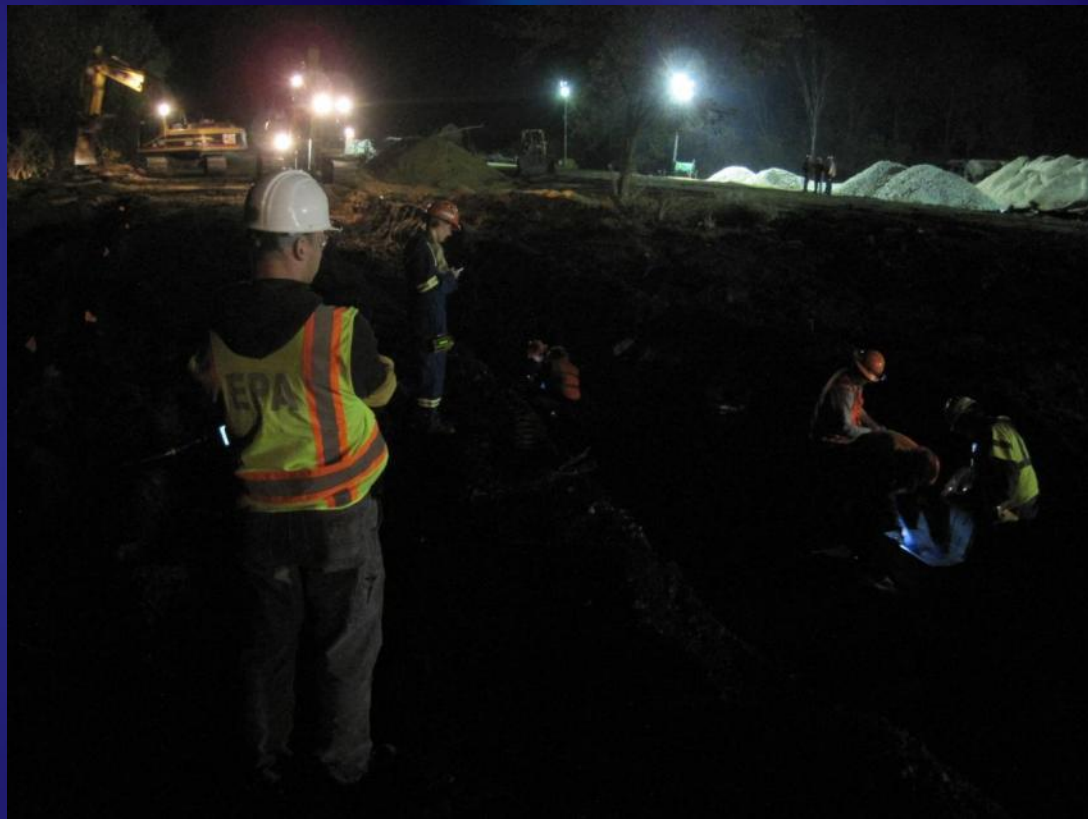
\*Need to  
apply  
correction  
factors for  
UltraRAE,  
MultiRAE &  
AreaRAE  
instruments







# SOIL SAMPLING





# SAMPLING PLAN



Center for Toxicology and Environmental Health, L.L.C.

5120 North Shore Drive North Little Rock, AR 72118 Phone: 501.801.8500 Fax: 501.801.8501 www.cteh.com

Working Draft

## SAMPLING AND ANALYSIS PLAN

### ETHANOL RELEASE

### TISKILWA, ILLINOIS

Prepared On Behalf Of:  
Iowa Interstate Railroad

**PREPARED BY:**

CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, L.L.C.  
5120 NORTH SHORE DRIVE  
NORTH LITTLE ROCK, AR 72118  
501-801-8500  
[WWW.CTEH.COM](http://WWW.CTEH.COM)

**October 9, 2011**

Revised October 10, 2011  
Revised October 13, 2011

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# RESPONSE



Alcohol-resistant foams  
(Oregon State U study)



# REMOVAL







29789

CAT

0111





















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United States Environmental Protection Agency 

## Tiskilwa Train Derailment

Tiskilwa, IL - EPA Region V  
NRC#: 991849

Site Contact:  
**Leonard Zintak**  
On-Scene Coordinator  
[zintak.leonard@epa.gov](mailto:zintak.leonard@epa.gov)

Mile Post 122.4  
Tiskilwa, IL 61368  
[epaosc.org/TiskilwaTrainDerailment](http://epaosc.org/TiskilwaTrainDerailment)  
Latitude: 41.2899170  
Longitude: -89.4909970

[KML](#) | [RSS](#) | [site map](#) | [area map](#) | [bookmark](#)

The Tiskilwa Train Derailment Site is located at Railroad MP 122.4 in Tiskilwa, Bureau County, Illinois. The incident occurred at 0255 hrs on October 7, 2011 and was reported to the NRC (Report #991849) by the Iowa Interstate Railroad (the PRP) at 0441 hrs. U.S. EPA OSC Len Zintak mobilized START contractors to begin emergency response activities on October 7, 2011.

Nine of the derailed train cars contained denatured ethanol. Several ethanol cars caught fire or exploded, and ethanol was spilled. It is unknown how much ethanol spilled. Approximately 27 cars of 126 total on the train derailed and roughly 500ft of track was impacted. 17 of the cars were "hopper" cars containing dry corn mash and the other 10 were full tanker loads of ethanol. The fire was extinguished, damaged cars and track removed, and soil excavated by October 10, 2011. Ethanol product that was not spilled or burned off was recovered. It is anticipated that the majority of the ethanol product release was burned off in the subsequent fire and explosions. The intensity of the fire prompted a voluntary evacuation of the town of Tiskilwa, Illinois, which was lifted on October 8, 2011 once the fire was under control. The National Transportation Safety Board (NTSB) assumed control of the incident in order to conduct a full investigation.

START contractors and railroad contractors established continuous perimeter air monitoring with AreaRAEs in 3 locations and MultiRAEs at various locations around the perimeter of the wreck site. In addition, START collected physical water samples from both the Plow Hollow Creek (to the east) and Big Bureau Creek (to the north) for laboratory analysis. Plow Hollow Creek flows north to Big Bureau Creek which flows east to the Illinois River approximately 8 miles downstream. Surface water sampling was conducted every 4-5 hours with a YSI meter following the incident. Finally, START contractors conducted oversight of PRP sampling (air, surface water and soils) activities as well as excavation and removal of underlying soils which may have been contaminated.

U.S. EPA, START, NTSB and Illinois EPA reviewed a draft environmental monitoring plan covering groundwater, residential well, surface water, surface and sub-surface soils, wastes and air monitoring. This plan was submitted by the PRP on October 9, 2011 for review.

U.S. EPA demobilized from the site on October 10, 2011. Ongoing surface water monitoring and subsequent remediation activities which may be necessary will be overseen by Illinois EPA and local health officials. U.S. EPA OSCs will continue to provide data, information and technical support to Illinois EPA regarding the incident as requested.

For additional information, visit the [Pollution/Situation Report \(Pol/Sitreps\)](#) section.

[Bulletins](#)

None for this site.

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[POLREP - 2](#)  
[POLREP - 1](#)

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None for this site.

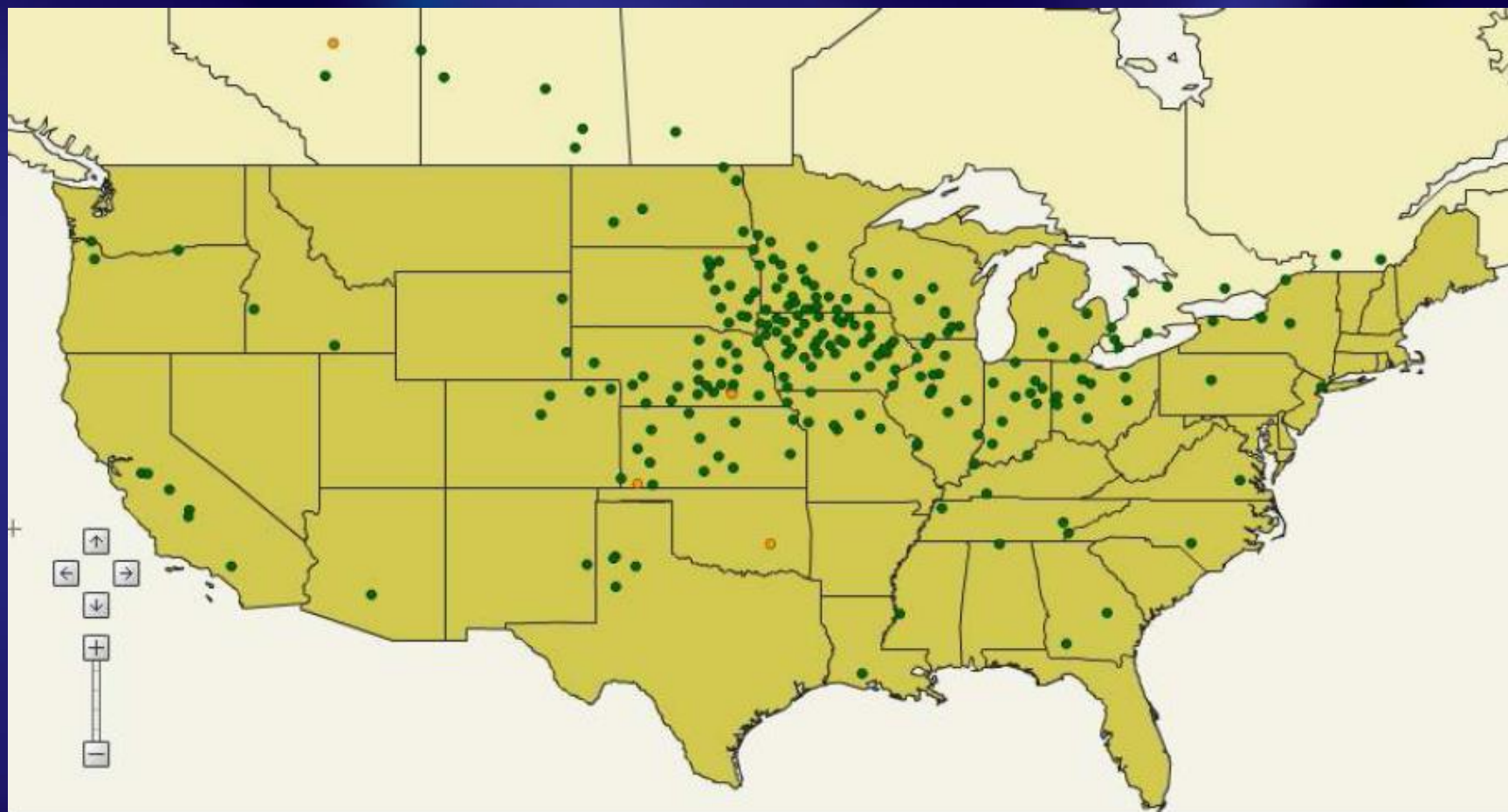
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# ETHANOL PLANTS

<http://www.ethanolproducer.com/plantmap/>





# EXPECTED FATE

- **Release in Soil**
  - Rapidly biodegraded in soil
- **Release in Water**
  - Mixes with water
  - At high concentrations of water, ethanol separates from gasoline
  - Rapidly biodegraded in groundwater and surface water
  - Studies focusing on possibility of ethanol inducing transport of other chemicals such as benzene
  - YSI meter is ideal instrument as it gives Dissolved Oxygen, Conductivity, Temperature and pH in a single throw in a couple of minutes
- **Release in Air from spill/fire**
  - Ethanol vapor, like gasoline vapor, is denser than air and tends to settle in low areas
  - Vapor disperses rapidly
- **Release to storm/sanitary sewers**
  - Ethanol released to water will volatilize and rapidly biodegrade
  - Potential decrease in DO as a result of ethanol degradation can upset microbial functions at WWTPs
  - Potential flammability hazard must be addressed when ethanol is released to a sanitary or storm system





# OVERALL RISKS

## ▪ Human Health Effects

- Exposure to fuel ethanol can occur by breathing vapors (inhalation), skin or eye contact (absorption), or accidentally swallowing it (ingestion)
- Symptoms of exposure appear immediately - Dullness of memory and concentration; impaired motor coordination; drowsiness; stupor; and eventually coma. May cause skin irritation as a result of defatting
- Carcinogenic compounds not present in pure ethanol; however, because gasoline is used in the blend, E85 is considered to be potentially carcinogenic

## ▪ Ecological Effects

- Pure ethanol demonstrated lethal concentrations for fish (rainbow trout) at 11,200 - 15,300mg/l
- Pure ethanol biodegrades rapidly - bioaccumulation or concentration in food chain is not expected. However, the biodegradation may decrease the DO in surface water resulting in fish kills. Concern raised when  $< 5\text{mg/l}$



# Applicable Federal Regulations\* (Manufacturing)

- Emergency Planning and Community Right to Know Act (EPCRA)
- U.S. EPA Oil Pollution Control/Federal Water Pollution Control Act
- Clean Water Act
- Oil Pollution Act of 1990 (OPA 90)
- Resource Conservation and Recovery Act (RCRA)
- Clean Air Act (CAA)
- DOT Hazardous Materials Regulations (HMR); as amended by Homeland Security Act of 2002

\* *If thresholds are met for requirements of the regulation*

\* *State-specific regulations may also apply*

<http://www.epaosc.org/ResponseOverviews>



## Ethanol Manufacturing Facility Response Overview



Date: October 2008

Revision #:2

Prepared for: United States Environmental Protection Agency, Region 5

Prepared by: Weston Solutions, Inc.

Reviewed By: OSC - Jeffrey Kimble, OSC - William Simes, ERT - Harry Allen



**WESTON**  
SOLUTIONS  
Restoring Resource Efficiency



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# State, local officials prep for ethanol trains

Global's trains will bring in 3.6m gallons a week

BY: MARIAH SONDERGARD

August 30, 2011

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**MOST OF THE** ethanol that is mixed with gasoline in Massachusetts enters the state by ship or fuel truck, but that will change next year when Global Petroleum Corp. begins shipping ethanol to its blending terminal in Revere by 60-car trains. With each car carrying 29,000 gallons of nearly pure ethanol, the two trains a week will bring in nearly 3.6 million gallons.

The staggering volume of ethanol coming in by rail has inspired a flurry of state, local, and company safety preparations. Transport by train is more cost-effective and statistically safer than by truck, but the sheer scale of an ethanol train disaster is so much greater than an accident with a fuel truck that it has rattled Revere, where companies have handled millions of gallons of explosive fuels since the 1930s.



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Faryan, Gulch, Mitchell