The Louisiana Mercury Reduction Act: Voluntary Assessment and Remediation from Natural Gas Production Sites from Land and Over Water*

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Search and Discovery Article #80022 (2008)
Posted August 10, 2008

*Adapted from oral presentation at AAPG Annual Convention, San Antonio, Texas, April 20-23, 2008

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Abstract

On June 2, 2006 the Louisiana Legislature created Act No. 126 - the Louisiana Mercury Risk Reduction Act. This law gave authority to the Louisiana Department of Environmental Quality (LDEQ) to regulate mercury-added products and provided the authority necessary to address unregulated mercury sources. An important aspect of this law incorporates voluntary participation by natural gas production/transportation companies in the assessment and remediation of metering sites where mercury has been released.

Beginning in the early 1990's, the voluntary program has been used by numerous companies to address the problem of mercury contaminated soil. Varied investigative approaches and remedial technologies have been implemented. A select group of site scenarios; e.g., pipe run, manifold, shed, tower, platform or environmental settings, such as urban areas, flooding lowlands, forested uplands/croplands, or marine/fresh waters, allow a streamlined and focused process for moving these sites through the regulatory process.

Over 30,000 potential sites exist in Louisiana. Approximately 5000 have been assessed and roughly 3000 have been remediated. About 900 additional sites are now participating in the process. This paper will discuss the procedures required to satisfy the Risk Evaluation and Corrective Action Program for those remaining sites on land as well as those in wetlands or over water.
The Louisiana Mercury Reduction Act: Voluntary Assessment and Remediation at Natural Gas Production Sites On Land and Over Water

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Louisiana Department of Environmental Quality
2008 AAPG Annual Convention
San Antonio, Texas
Acknowledgements

- Harold Leggett, Ph.D., Secretary, LDEQ
- Thomas F. Harris, Administrator – ETD
- Chris Piehler, Senior Environmental Scientist
- Ron Gouguet, NOAA
- All the Companies who voluntarily committed to the program
1992 First voluntary assessment and remediation of meter site.
1994 Formal funding by Legislature for programmatic study of mercury in the environment.
1998 RECAP established soil and groundwater standards.
2000 First use of Cooperative Agreements to define participating parties goals and responsibilities.
Highlights of the Mercury Program

- **2004** Governor Blanco selects the Mercury Initiative to showcase LDEQ activities.
- **2006** Senate Bill 615 signed into law as Act No. 126 – The Louisiana Mercury Risk Reduction Act.
- **2007** First NFA–ATT for Overwater Sites establishing approach for evaluation and remediation.
- **2008** LDEQ and participating companies join EPA National Partnership for Environmental Priorities (NPEP).
Goals of the Act: Reduce mercury releases to the environment

- Implement the Louisiana Mercury Risk Reduction Act of 2006 to regulate mercury in products and devices, and monitor development of required collection systems including convenience switches and anti-lock braking systems in end-of-life vehicles.

- Control emissions from coal-burning electrical generating units by implementing the federal Clean Air Mercury Rule, monitor for effectiveness, and implement further strategies if necessary.

- Study emissions from former mercury-cell chlorine manufacturers to ensure environmental protection is adequate during and after conversion to membrane-cell technology.

- Discourage waste incineration if mercury is a significant component of the waste and encourage waste minimization, pollution prevention, recycling, and beneficial re-use.
Goals of the Act: Reduce mercury releases to the environment

- Implement the Mercury Minimization Plan for the Louisiana Permit Discharge Elimination System to detect and address mercury releases through wastewater discharges.

- Scrutinize industrial landfills for controllable mercury releases. Establish requirements for best management practices to minimize off-site transport of mercury.

- Promote voluntary remediation of legacy mercury manometer sites and seek program continuation in the absence of volunteers.

- Support activities that reduce soil erosion and other nonpoint discharges to limit transport of background mercury in native soils washed to stream by rainfall. Support the Louisiana Nonpoint Source Management Plan as it applies to minimizing sediment in runoff.
Mercury Releases by Activity

- Chlor-Alkali Plants: 2500 lbs
- Coal Power Plants: 1644 lbs
- Crude Oil Refineries: 471 lbs
- Electric Arc Furnaces: 450 lbs
- Carbon Black Plants: 127 lbs
- Paper Mills: 46 lbs
- Crematoria: 21 lbs

2004 TRI DATA (in lbs)
Prior Meter Remediation Projects

- Fina – 8/8
- ARKLA – 62/62
- ANGI – 41/130
- Seagull – 45/60
- SONAT – 1/1
- USF&WS – 510
- NorAM – 2/2
- Columbia – 16/16
- Trunkline – 34/52
- Delhi – 7/7
- LIG – 285/429
- NorAm – 51/64
- ARCO – 9/9
- Gas Masters 150?
- SONAT – 6/6
- USF&WS – 485/530

TOTALS: 1052/1376 (76%)  660 USF&W
## Recent Meter Remediation Projects

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* These 17 site were evaluated for impacts in marine or estuarine waters.

Many Operators did not provide the number of non-remediated sites.
EnerVest – Monroe Gas Field – CA 01/08

- 400+ Active meter locations.
- Unknown number of prior sites or abandoned meters.
- 40 meters per year replacement.
- 40 additional sites evaluated/remediated per year.
- 10 year program – can expedite to shorten timeframe.
- Targeted meter replacement will remove 320+ lbs of mercury per year.
- Invited to join EPA-NPEP
What do these meters look like?
Where are these meters found?
What is the problem?
How are these sites remediated?
### Table 3.66

Transcontinental Gas Pipe Line Corporation

Loisiana Mercury Assessment and Remediation Program - AP 10426

2003-2004 Assessment and Remediation Verification Sample Results

Humble Thistle (Tailgate) M&G, Tubes 2157 and 2666, LaFourche Parish, LA

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**Notes:**

- Laboratory reports B, H shown above correspond to remediation verification samples collected after respective evaluation events. Except for samples collected in the tailgate area, which were completed in that area and new verification samples were collected.

- All results reported in mg/kg except for TCLP samples which were reported in ug/L.

- Analytical results shown in BOLD and SHARED GRAY indicate a result greater than 1 mg/kg.
More Challenges: Over Water
Assessment for Over Water Sites

- Two scenarios: Fresh or Estuarine Waters.
  - Atchafalaya Basin
  - Coastal Plaquemines Parish

- Ecological risk based on sediment and biota.
  - Risk Based Corrective Action Program (RECAP)
  - Biota–sediment accumulation factor (BSAF)
  - Food web model

- Parameters for evaluation.
  - Total Hg  TOC  Grain size
  - Total sulfides  DO  pH  Water Temp
  - Turbidity  Salinity  Conductivity
Based on lower trophic level organisms.
- Sediment–biota interface is most direct.
- Act as critical food sources for higher trophic levels.

Biota for Fresh Waters
- Crawfish – crustaceans
- Mosquito fish – forage fish

Biota for Estuarine Waters
- Blue Crab – crustaceans
- Small fish – forage fish
Risk Evaluation using BSAF

- Site specific sediment Hg values.
- Biota body Hg values.
- BSAF factor.
- Food web modeled to most sensitive receptor species (Great Blue Heron).
- Acceptable ecological risk is a Hazard quotient (HQ) of 1.0 or less.
- Human Health Assessment by comparison to FDA/EPA food advisory of 0.5 mg/kg in fish and shellfish (based on 12 ounces per week).
Over Water Conclusions

- The Pilot Study for over water sites was appropriate and representative of those sites evaluated. (NOAA and LDEQ)
- The Final Report and conclusions indicate acceptable risk levels for those 17 sites.
- This Ecological Risk Evaluation approach for sites over water in a variety of settings is a valuable tool for bringing sites to closure.
Benefits of Participation

- Reduces available mercury in the environment.
- Reduces mercury uptake in fish – humans.
- Reduces exposure risk to employees.
- Reduces cleanup/disposal costs vs. regulatory program mandated procedures.
- Reduces risk of penalties for non-compliance.
- Proactive project are GREAT Public Relations.
- EPA/DEQ Recognition through the National Partnership for Environmental Priorities (NPEP).
It Just Makes Sense

Up to 8 pound per meter

Not in our fish!