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7/22/1997

A Comprehensive Proposal to Protect the Public from Dangerous Exposures to Hydrogen Sulfide (H2S)

Presentation before Department of Environmental Quality and Michigan Public Service Commission

By Keith Schneider and Arlin Wasserman
Great Lakes Bulletin News Service

Accidental and intentional releases of poisonous hydrogen sulfide (H2S) from oilfield installations in the 1990s have resulted in a reign of injuries, evacuations, and livestock deaths in Manistee and Mason counties. Chief among the causes is:

1.The lack of a defined health exposure limit to protect citizens.
2. The absence of scientifically sound air dispersion and risk assessment models to predict the outcomes of credible accidents.
3. Muddled jurisdictions and confusion about responsibilities among state agencies.
4. Antiquated laws that allow companies to keep secret vital information needed in emergencies.
5. The failure to establish enforceable penalties to improve industry performance.

The Michigan Land Use Institute, in partnership with Filer Township, the Human Health and Safety Committee, Citizens of Mason County, and Olson, Noonan, Ursu and Ringsmuth has prepared a comprehensive plan to remedy these flaws in state oversight. This plan, which seeks as its central goal the elimination of public health threats from H2S, makes the following recommendations:

*An interagency commission should immediately be formed to develop a coordinated oversight framework for ending the hazard from H2S releases from oil and gas installations. The public should be invited to participate on the commission.

*The evaluation of health hazards from H2S should become an integral part of the siting, permitting and regulating functions served by DEQ with respect to the oil and gas industry in Michigan. To do so in a credi

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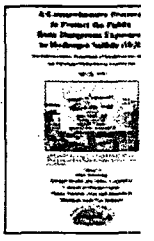

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MARCH 13, 2006
SMITH, SNYDER & AC
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responsible fashion, the assessment of health hazards should be based on the best of medical and engineering technology.

A new public health exposure limit of 0.1 ppm must be established for H2S. This limit is based on the Department of Community Health's general recommendation for hazardous emissions, which takes 1/100 of the occupational limit as acceptable for public safety. If wells, pipelines, or processing facilities can not meet this standard, they should not be allowed.

*The DEQ's Air Quality Division should select a suitable air dispersion model sanctioned by the U.S. Environmental Protection Agency (EPA).

*The Michigan Public Service Commission should develop a binding agreement with the DEQ that also includes a role for the Air Quality Division in evaluating the siting of pipelines that contain dangerous levels of H2S.

*The 90-day confidentiality clause that enables energy companies to protect sensitive data must be waived for any information related to public health concerns. New regulations are needed to require energy companies to disclose to local governments and citizens on a timely basis the ownership, H2S content, emergency response measures and other vital information to protect public safety.

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II. Critique of Existing Rules; Lapses in Oversight

By Hans Voss,
Associate Director, Michigan Land Use Institute

The DEQ's current regulatory framework for permitting and overseeing oil and gas development allows wells, pipelines and processing facilities containing dangerous levels of H_2S without any assessment of the health risk.

The DEQ has no exposure limits for citizens, and no defined procedure for assessing health and safety risk.

Emergency preparedness plans do not adequately protect the public.

Moreover, the piecemeal approach to overseeing oil and gas operations, with separate agencies overseeing different aspects of the development, makes for a disjointed, ineffective regulatory system that has the potential for even larger accidents. The many documented H_2S incidents in and around Manistee County, and the potential for larger accidents, have shown that this regulatory framework presents an unacceptable risk to citizens.

Permitting Wells, Pipelines, Facilities Handling H_2S

For wells containing H_2S concentrations of 300 ppm or more the Administrative Rules under part 615 of P.A. 451 require a blanket setback of 300 feet from public areas, highways, and structures used for public or private occupancy.The rules require a 600-foot buffer for H_2S processing facilities.

In 1976 a state task force, made up of regulators and industry representatives, recognized the serious health risks of H_2S and recommended that the setback distance increase to 1,400 feet from nearest residence or public area. The task force recommendations were not, however, incorporated into the rules.

This threshold of 300 ppm is not based on an evaluation of site specific risk assessment. The 300 and 600-foot setbacks are based on a generic mathematical formula that incorporates a radius of exposure of 100 ppm. These concentrations far exceed the recommended public exposure limits for H_2S.

The occupational HS exposure limit for a healthy 160 pound male is a concentration of 10 ppm over a
normal 8-hour work period. Considering that a diverse population can range from newborn infants to senior
citizens with serious ailments, the Michigan Department of Community Health recommends a public H_2S
exposure limit of 0.01 ppm.
Independent safety studies conducted on wells and pipelines in Manistee County show that well, pipeline
and facility leaks would result in an H_2S exposure much higher than the occupational limit of 10 ppm. That
level is a clear danger to a diverse population and greatly exceeds the Health Department's recommended
public exposure limit. Risk assessment experts have told us that other states, such as California and Texas,
have established recommended exposure limits below 0.1 ppm.

Recommendation:

To ensure the safety of residents a regulatory structure must be developed that is based on exposure limits.
Mere setbacks that do not incorporate a thorough safety analysis for the maximum credible gas leak scenarios
will not protect public health and safety in the event of a release.

Emergency Procedures

Current rules require a contingency plan for all wells and facilities containing H_2S concentrations of 300
ppm or more. The contingency plan must contain general procedures to be followed in the event of a release, a
map of the areas, and a list of contacts in the event of an emergency.
The rules do not require a oil and gas operator to provide surrounding residents and workers with procedures
for emergency evacuation. There is no community notification procedure. There is no consideration of
evacuation routes for residents, and there is no required training process for local emergency preparedness
personnel and local hospitals.
If a release occurred in a populated area this type of plan would be almost useless. Residents would not be
notified in a timely manner, they would not know what to do, and local emergency personnel would not be
able to respond appropriately.

Recommendation:

The requirements for these plans must be completely overhauled and a new set of risk-based criteria
established.

Disjointed Jurisdictions

Michigan's oversight of H_2S oil and gas operations is a confusion of separate agencies regulating differing
aspects of oilfield operations:
*The DEQ's Geological Survey Division regulates wells, some pipelines, and

processing facilities.
*The Michigan Public Service Commission holds the regulatory responsibility for gathering and
transmission lines.
*The DEQ'sAir Quality Division maintains oversight of air emissions from processing facilities.
*The Michigan Department of Community Health establishes and oversees the health exposure criteria.
*Local governments create and enforce local land use ordinances and have the obligation to protect the
health and safety of residents.
*This multi-jurisdictional regulatory structure creates conflicts because no single agency is responsible
for ensuring that the development of wells and facilities containing dangerous levels of H_2S occurs in a safe
and orderly manner:
*The Geological Survey Division does not follow the exposure limits set by the Health Department.
*Neither agency coordinates their permitting process with the MPSC.
*Even within the Geological Survey Division, permits are granted for wells without consideration of the
pipeline routes and locations of processing facilities.

Recommendation:

In order to establish an effective system for managing oil and gas operations, and to protect the health and
safety of citizens, there has to be consistency and uniformity among the agencies. An interagency commission
should immediately be formed to develop a coordinated oversight framework for oil and gas development.
Health and safety standards must assume that public exposures to H_2S do not exceed credible limits set by
public health professionals. The public should be invited to participate on the commission.

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A Brief Sour Gas Chronicle

1922 World's first sour well drilled at Hell's Half Acre in Turner Valley, Alberta. Fumes from flaring and venting peel house paint and dissolve lead fillings.

1924 US Public Health Service identifies H2S as "one of the most toxic of gases."

1929 Sour gas wells kill 30 oil and gas workers in Texas over a two year period.

1950 Sour gas leak in Mexico kills 22 and leaves another 47 brain damaged.

1960 Ranchers along the foothills from Pincher Creek to Olds complain of rusting fences, ailing cattle, sick trees, asthmatic children and foul odours down wind of sour gas plants. Industry calls it a "psychological" problem.

1971 At the insistence of the Queen of the Netherlands Shell Canada settles a million dollar lawsuit by 15 Pincher Creek families out of court. The suit documented 50 serious incidents of ill health and cattle death. The relocated ranchers call themselves DP's--displaced persons.

1982 Amoco well "blows" and spurts sour gas into the air for 67 days near Lodgepole just north of Edmonton. The blow out kills two workers and hundreds of cattle. Thousand of people down wind complain of headaches, eye irritation, nosebleeds, miscarriages and flu symptoms.

Industry calls it a "social contagion."

1985 University of Alberta toxicologist Dr. Tee Guidoitti recommends a H2S registry to keep track of injured workers and ranchers: government refuses to do so.

1986 A $3-million epidemiological study on Pincher Creek ranchers gives them a clean bill of health. Toxicologists call the study a fraud and a disaster. Funding for sour gas research dries up in Canada.

1990 A book about Hungarian workers in the sour gas fields of Kazakhstan reports widespread lung, nasal and neurological complaints due to low concentrations of H2S.

1992 After a six year delay the Alberta government publishes the proceedings of an International Workshop on "Effects of Acid Forming Emissions in Livestock." It called for more studies on sour gas and concluded that "the onus is almost exclusively on the livestock producer to prove that sour gas has an effect on the health of animals and human beings."

1994 An Alberta Research Council study on a sour gas pipeline break concludes that H2S and hydrocarbons likely killed and damaged the brains and immune systems of cattle on two ranches in central Alberta. A freedom of information request forces the study's release four years later.

1996 A lengthy report for Alberta Cattle Commission documents that H2S and other hydrocarbons can adversly

affect cattle health. A freedom of information request prompts release of heavily edited version two years later.

1997 US report documents widespread human illness, hospitalizations and livestock deaths in northern Michigan's new sour gas fields.

1998 Wiebo Ludwig begins bombing campaign against sour gas facilities in northern Alberta after industrial flares and emissions sicken his family. Vandalism totals $10-million and brings national attention to sour gas issues.

1999 Violet Holmes sues two Alberta companies for neurological damage (tremors and facial distortions) after sour gas flaring incident in Rimbey, Alberta. Companies settle out of court.

2000 Alberta public safety report criticizes industry regulator for inadequate sour gas monitoring (1 mobile unit) and enforcement. It recommends a proper human health study.

2001 Alberta government promises and then cancels a human health study It also reduces funding for an animal health study.

2002 Industry faces more than 30 toxic torts from Alberta landowners: most involve sour gas. -30-