

OIL AND GAS DEVELOPMENT IN MICHIGAN THROUGH THE USE OF HYDRAULIC FRACTURING

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**60,000 Oil &
Gas Wells
Since 1925**

Active Wells:

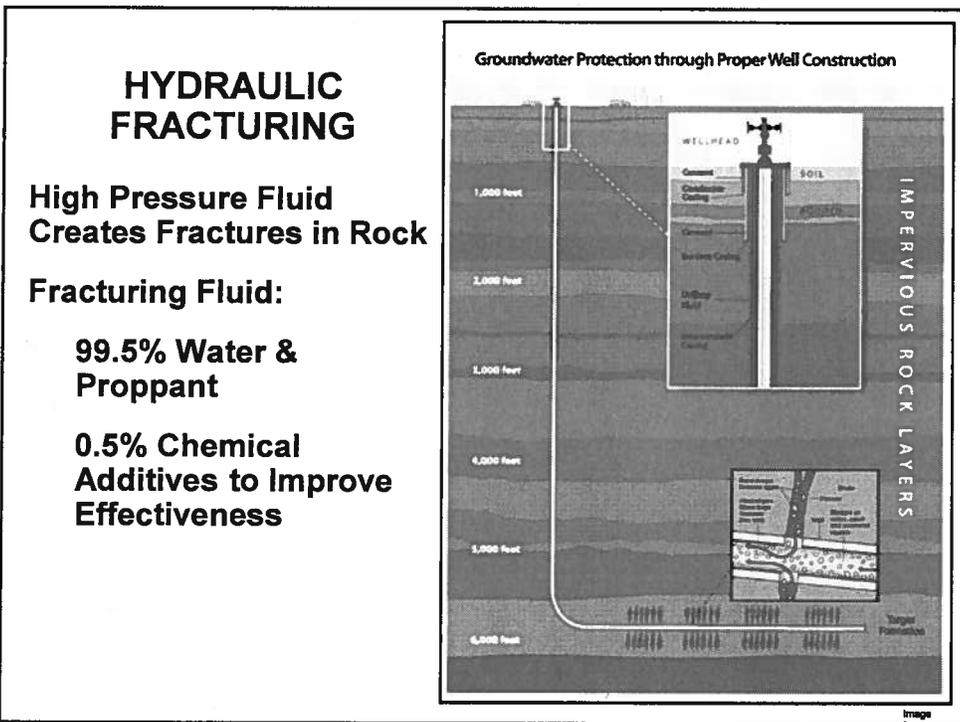
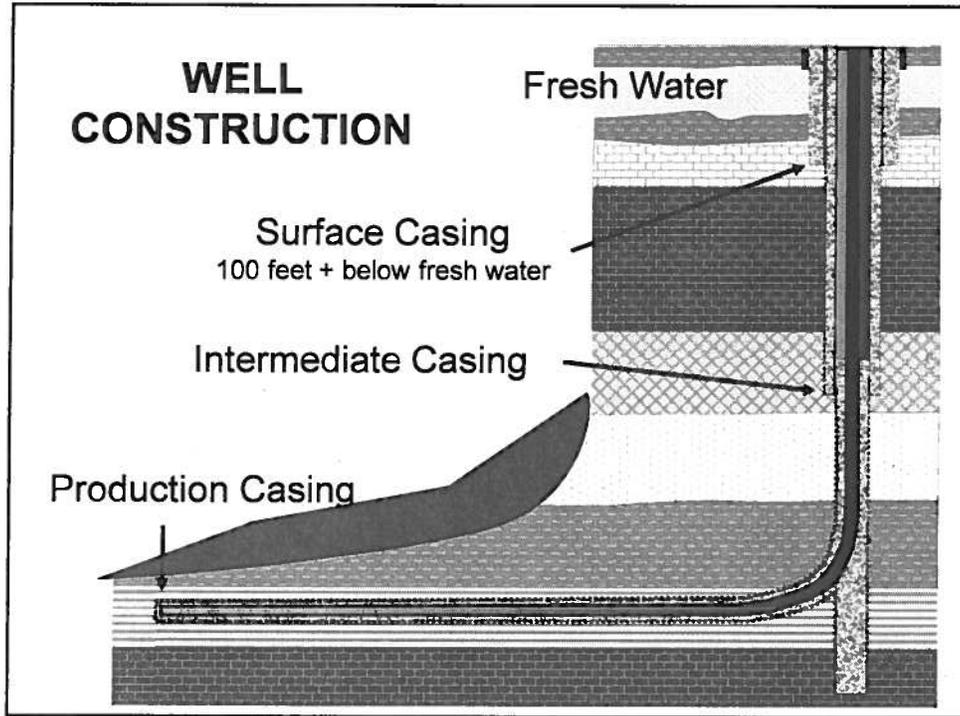
- 4500 oil
- 11,000 gas
- 1300 water injection & disposal
- 3000 gas storage



MICHIGAN OIL & GAS REGULATIONS

- **Well Location and Spacing**
- **Drilling and Construction**
- **Well Completion (includes Hydraulic Fracturing)**
- **Production Operations**
- **Spill and Emissions Management**
- **Plugging and Restoration**
- **Inspection and Enforcement**

WHAT IS HYDRAULIC FRACTURING?



EXISTING REGULATORY SAFEGUARDS FOR HYDRAULIC FRACTURING

- **Water use restrictions**
- **Groundwater protection**
 - **Wellbore casing & sealing**
 - **Management of “flowback” water**
 - **Spill prevention & containment**
 - **Disclosure of chemical additives**
- **Air quality protection**

WATER USE

- **Deep horizontal well:**
 - **Average: 5 million gallons**
 - **Largest: 21 million gallons**
- **DEQ requires Water Withdrawal Assessment**
- **DEQ does not approve withdrawal if adverse resource impact**
- **DEQ requires groundwater-level monitoring if there is a water well within 1/4 mile**

HOW MUCH IS 5 MILLION GALLONS?

Equivalent to:

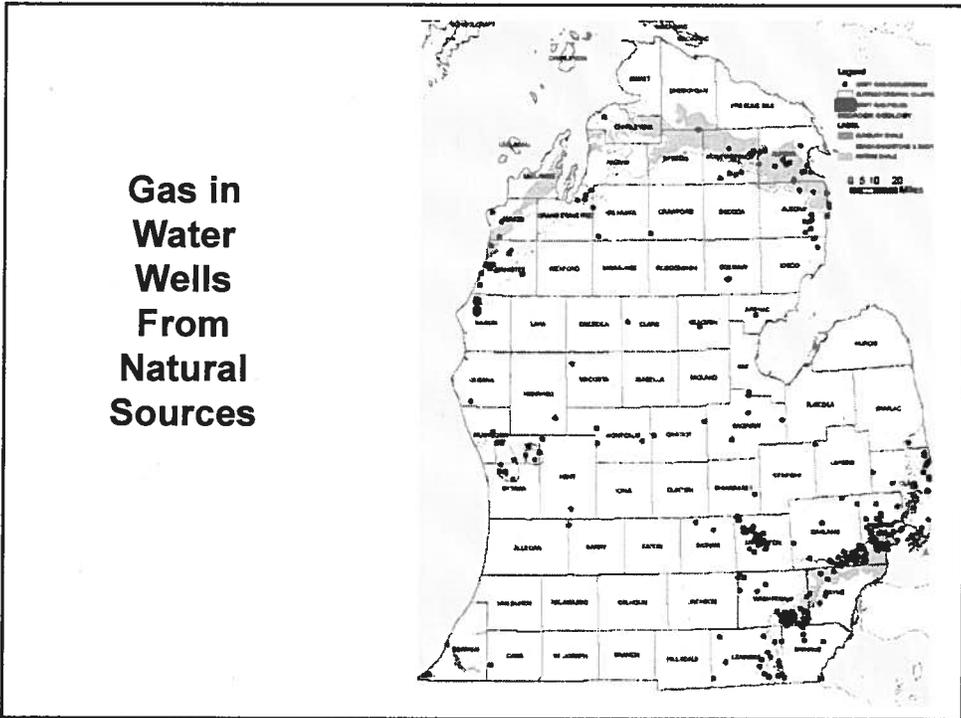
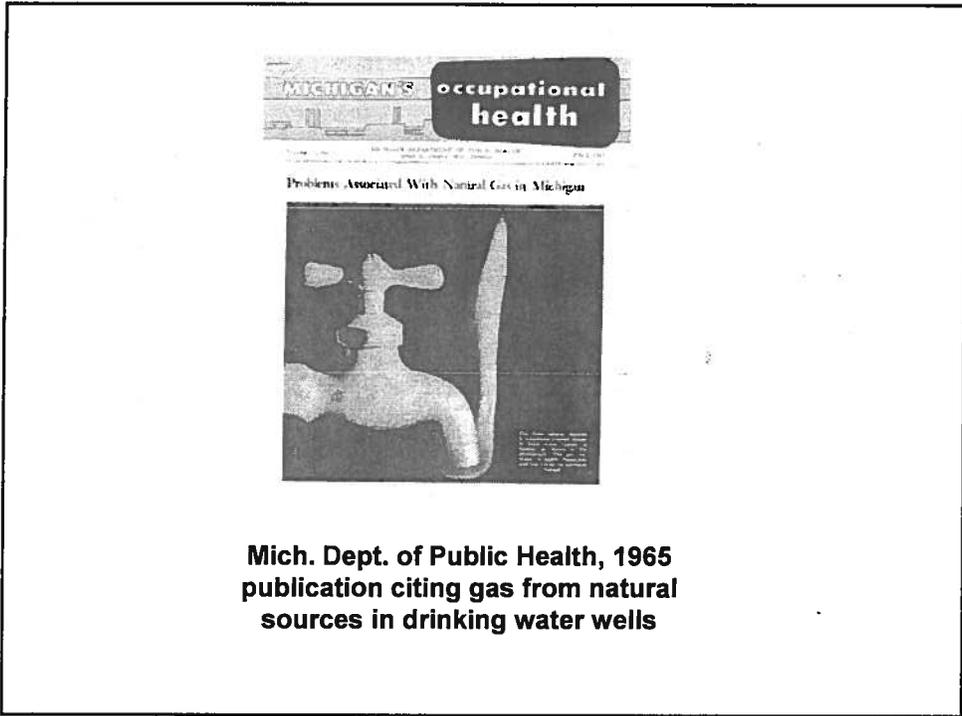
- **1,000 MW coal-fired power plant in 12 hours**
- **Irrigating 8 acres of corn in a growing season**
- **0.3 inches of rainfall over one square mile**

Consumptive use of water in Michigan:

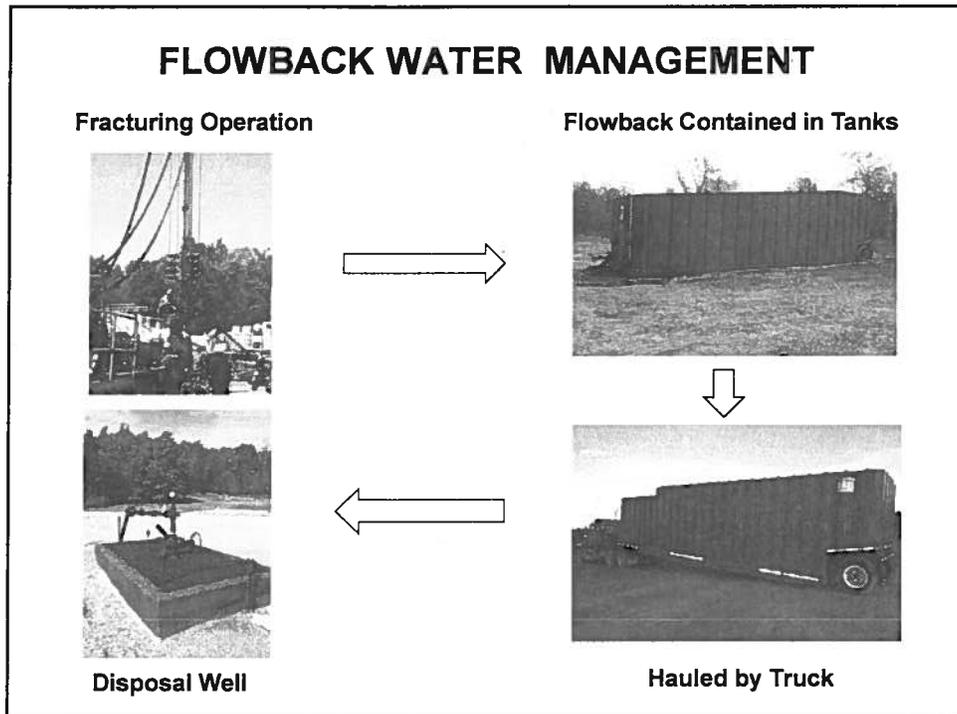
600 million gallons per day

GROUNDWATER CONTAMINATION

- **Michigan well construction and casing regulations protect groundwater against contamination**
- **No instances of groundwater contamination from hydraulic fracturing in Michigan**



**Gas in
Water
Wells
From
Natural
Sources**



SPILL CONTAINMENT

- **Secondary containment requirements**
- **Reporting and cleanup requirements**
- **Open pits allowed only for fresh water**

CURRENT REGULATIONS ON CHEMICAL DISCLOSURE

- **Material Safety Data Sheets posted at site**
- **Some chemicals subject to federal trade secret protections**
- **DEQ posts MSDSs on website**
- **Company must disclose details to medical professionals**

AIR QUALITY PROTECTION

- **DEQ requires capture of methane gas and flaring**
- **EPA recently imposed conditions similar to Michigan's**

DRAFT PROPOSAL FOR RULES REVISION

Four Main Issues:

- **Water withdrawals**
- **Baseline water sampling**
- **Monitoring and reporting**
- **Chemical additive disclosure**

Water Withdrawal

- **Codifies requirement for Water Withdrawal Assessment Tool**
- **Withdrawal not approved if adverse impact**

Baseline Sampling

- **Baseline water well samples within 1/4 mile**

Monitoring and Reporting

- **Install monitor well to check water levels**
- **Plan for preventing loss of water in supply wells**
- **Receive advance approval before each HVHF**
- **Notify DEQ 48 hours in advance**
- **Measure and report pressures and volumes**

Chemical Disclosure

- **Disclose chemical information online at FracFocus.org**
 - **Chemical name and concentration**
 - **Chemical family and trade name for trade secret chemicals**

Other Rule Issues

- **Well location rules more flexible**
- **Terms clarified on forming of drilling tracts and designating well locations**

IMPROVED ACCESS TO INFORMATION

DEQ is Enhancing the Permit Application List

- **Information more clear and accessible**
- **Will show roads, residences, land features**
- **Email address for comments or questions**

Website: www.michigan.gov/degoilgasminerals

NEXT STEPS

- **DEQ continually updates regulations for oil and gas production**
- **Copy of the proposed rule changes are available on the DEQ website**
- **Continue to meet with stakeholders to perfect the draft proposal**
- **New rules should be in place by fall of 2014**

