



MDE Maryland Department of the Environment

Maryland's Draft Marcellus Shale Risk Assessment Findings and Status

Presentation to the Marcellus Shale Advisory Commission

11/5/14





Standardized Assumptions Used

- Individual Site Impacts, 150 well, and 450 wells.
- 15-acres Site disturbance per pad.
- 5-million gallons water/well.
- 30% flowback volume.
- Generally consistent assumptions for activity duration.
- Truck traffic.
- Generally conservative approach.

Items Outside of RA Scope

- Health/Safety risks to workers on site (regulated by OSHA).
- Climate change risks.
- Risks from Downstream Infrastructure (natural gas liquefaction plants, gas main and transmission lines).
- A conclusion whether UGWD can be done safely.

Factors Used to Rank Risks

Probability	Definition
Low	Rarely happens under ordinary conditions; not forecast to be encountered under foreseeable future circumstances in view of current knowledge and existing controls on gas extraction
Medium	Occurs occasionally or could potentially occur under foreseeable circumstances if management or regulatory controls fall below best practice standards
High	Occurs frequently under ordinary conditions
Insufficient Data to Determine	Lack of available data to confidently assign probability



Factors Used to Rank Risks, Cont.

Consequence	Definition
Minor	Slight adverse impact on people or the environment; causes no injury or illness
Moderate	Considerable adverse impact on people or the environment; could affect the health of persons in the immediate vicinity; localized or temporary environmental damage
Serious	Major adverse impact on people or the environment; could affect the health of persons in a large area; extensive or permanent environmental damage
Insufficient Data to Determine	Lack of available data to confidently assign consequence

Risk Ranking Methodology

Probability →

Consequence ↓

Risk Rank	Low	Medium	High
Minor	Low	Low	Moderate
Moderate	Low	Moderate	High
Serious	Moderate	High	High

Example: Noise/Vibration Impacts from Vehicular Traffic

- **Standard Used:** Relied on noise standards exceedance at one's property line and truck decibel data to determine risk ranking.
- **Scope:** Considered noise from truck traffic for a single 6-well pad as noise not additive and anticipated distance between pads will attenuate noise.

Example RA for Noise/Vibration Impacts from Traffic

Aspect	Agent/ chemical	Impact on	UGWD Phase				
			Site identification/ preparation	Drilling, casing and cementing	HVHF / Well completion	Production	Well abandonment / reclamation
Noise / vibration	Vehicle traffic	Human / Community	Low (Mod/Minor)	Moderate (Mod/Mod)	High (High/Mod)	Low (Mod/Min)	Low (Mod/Min)

Key Factors Influencing RA findings:

1. Differences in truck traffic volume between phases and associated truck decibel levels at distance; and,
2. Pad BMPs (e.g., setbacks) do not attenuate noise from road traffic.



Key RA Receptors Considered

Human/Community (included quality of life considerations)

Ecological (included forest/farm fragmentation, organism and sensitive area impacts)

Key Overall RA Findings

Primary Human/Community Risks

1. Traffic
2. Air Emissions
3. Noise
4. Setback dependent methane migration risks

Primary Ecological Risks

1. Forest/Farm Fragmentation
2. Subsurface migration during fracking, flowback or from produced water
3. Water appropriations during critical periods

Comments Solicited

- Public Comment Period Closes November 17th
- Seven external reviewers have agreed to review all or part of the draft risk assessment

Name	Affiliation
Mark Boling	Southwestern Energy
Robert Jackson	Stanford University
Kate Konschnik	Harvard Law School
Michael McCawley	WV University School of Public Health
Kate Sinding	Natural Resources Defense Council
Bryan Swistock	Pennsylvania State Extension
Hannah Wiseman	Florida State University School of Law



Guiding Questions for Reviewers

1. Is the methodology appropriate for the analysis?
2. Are important assumptions identified and uncertainties stated?
3. Are the conclusions and inferences logically supported by the evidence presented?
4. Are there data, other evidence or additional risks not included that should be considered?

Questions and Discussion

1. Is the methodology appropriate for the analysis?
2. Are important assumptions identified and uncertainties stated?
3. Are the conclusions and inferences logically supported by the evidence presented?
4. Are there data, other evidence or additional risks not included that should be considered?

- Public Comment Period Closes November 17th
- Peer Review Process underway (7 external reviewers) with guiding questions:
 - Is the methodology appropriate for the analysis?
 - Are important assumptions identified and uncertainties stated?
 - Are the conclusions and inferences logically supported by the evidence presented?
 - Are there data, other evidence or additional risks not included that should be considered?



Next Steps, Cont.

- Public and Peer-Review Comments incorporated into a revised RA – timeline TBD based upon comment volume.

Q&A



Matthew C. Rowe

Deputy Director

Science Services Administration

Maryland Department of the Environment

matthew.rowe@maryland.gov

410-537-3578

