

Minimization Strategies for Noise, Dust & VOCs

Legislative Studies Update

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OOG Workshop

May 16, 2013

Minimization Strategies for Noise, Dust & VOCs

Why?

- Citizen complaints
- Other regulatory requirements
 - DOH road bonds, access road sediment and control, general duty to minimize air emissions
- Community safety and relations
 - Nuisance issues
 - Community Taskforce
 - Emergency services, Law enforcement, DOH companies, schools hospitals, citizens
 - Marshall Co., Wetzel Co.
- Protect the environment

Unique terrain in West Virginia

- Ridgetops – hillsides
- Remote - nearby residences
- Channeled air flow (hollow)
- Site-specific considerations

Activities Generating Noise, Dust and VOCs during well pad development

- Temporary (pad construction – flowback/completion)
- Vehicle Traffic
 - Congestion
- Vehicle Engine Idling
 - On-road and off-road
- Diesel-fueled Compressor Engines – Power & Hydraulic Fracturing

Remote site, no nearby residence





Remote site near a residence



Pre-§22-6A Pad



Pre-§22-6A Pad



Pre-§22-6A Pad

Site with nearby resident





Remote relatively nearby resident



Channeled Air Flow Site with nearby residents



Channeled Air Flow Site with nearby residents



Diesel-fueled compressors



Hydraulic Fracturing



Diesel engines

- Operate 20 - 30 years
- Emit
 - Particulate matter (dust, soot)
 - Nitrogen oxides (ozone pre-cursor & acid rain)
 - Volatile organic compounds, inc. air toxics
- Cancer and non-cancer effects associated with long-term exposure
 - Non-cancer respiratory and cardiovascular effects
 - Several human epi studies link increased lung cancer with diesel PM (EPA, NATA 2005)

Noise

- EPA guideline threshold of less than 70 decibels over 24-hour average, to prevent hearing loss over a lifetime
- Acceptable short-term noises may be above the average with no effects
- Sound may be perceived as a nuisance at levels below the EPA guideline
 - Transient nature & sound frequency
 - Nighttime noises during sleep cycles more disruptive

Equivalent Sound Levels in Decibels Normally Occurring Inside Various Places ⁽¹⁾

SPACE	L eq (+) - Decibels
Small Store (1-5 clerks)	60
Large Store (more than 5 clerks)	65
Small Office (1-2 desks)	58
Medium Office (3-10 desks)	63
Large Office (more than 10 desks)	67
Miscellaneous Business	63
Residences:	
Typical movement of people – no TV or radio	40-45
Speech at 10 feet, normal voice	55
TV listening at 10 feet, no other activity	55-60
Stereo music	50-70

(+) These measurement were taken over durations typical of the operation of these facilities.

⁽¹⁾ EPA, “Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety”, Table 2

Dust

- Particulate Matter
 - EPA National Ambient Air Quality Standards (NAAQS)
 - PM₁₀, 24-hr
 - PM_{2.5} – 24-hr and annual
 - Fine particles can get deep into the lungs
 - Adsorbed compounds

Volatile Organic Compounds (VOCs)

- Long term vs. short term exposures
- Some constituents may have health effects
- Contributes to ozone formation
- Benzene, Toluene, Xylenes, Ethylbenzene (BTEX)
- Diesel exhaust
 - Cancer and non-cancer effects associated with long-term exposure

Some Minimization Strategies for Noise, Dust and VOCs

- Many of these already used by WV companies
- Better use of roadway wetting agents would reduce peak dust exposures
- Lower travel speeds
- Noise reduction
 - Access road siting ~ traffic congestion
 - Mufflers
 - Sound barriers
 - Reduced nighttime operations

Some Minimization Strategies for Noise, Dust and VOCs *continued...*

- Orientation of engines, traffic with respect to residences
- Vehicle engine idling
- Maintenance & catalysts - hydraulic fracturing engines

Diesel-Powered Motor Vehicle Idling Act (West Virginia Code §17C-13A)

- Applies on both private and public property
- Limits regulated entities to no more than 15 min idling per one-hour period
 - number of exceptions including for public safety & manufacturing
- Enforceable by a law enforcement officer defined by code
 - such as local police, county sheriffs and state police; not DEP inspectors

Before – Access Road Oct 2009



After – Access Road
Gravel over broken
pavement



Road dust





west virginia department of environmental protection

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Randy C. Huffman, Cabinet Secretary
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To: Joe Hickman, Assistant Chief Inspector, W&W

aw/jfj

From: William F. Timmermeyer, Program Manager, Stormwater and Groundwater/UIC Team

Date: September 5, 2012

Ref: Approved Dust Suppressant List

Listed below are the dust suppressants approved by the Stormwater and Groundwater/UIC Team:

1. Calcium Chloride
2. COHEREX*
3. DUST BOND*
4. Lignin
5. Magnesium Chloride
6. Permizine* (Molasses and Water)
7. Pine Tar Dust Binder*
8. ULTRA BOND 2000*
9. RDC-100*
10. RDC-600*
11. Track Master Prep*
12. Water

*- Registered Trademark

Temporary Sound Barriers



Temporary Sound Barriers



Best Observed Practices?

- Noise
 - Dust
 - VOCs
 - Road Traffic
 - Access Roads
-
- Potential co-benefits across minimization strategies
 - Ex. Diesel fuel cost savings & reduced noise as well as dust, and VOC air emissions with drill rigs converted to LPG

Legislative Studies Update

Legislative Studies

§22-6A-23 Impoundment and Pit Safety Study

§22-6A-12(e) Noise, Light, Dust, VOCs Related to
Well Location Restrictions Study

§22-6A-23 Air Quality Study

§22-6A-23 Impoundment and Pit Safety Study

- Submitted to Legislative March 7, 2013
- OOG report, WVU structural and water sampling reports, OOG follow-up pit/impoundment inspections, OOG standard pit/impoundment inspection checklist available on internet

§22-6A-12 (e)) Noise, Light, Dust, VOCs Related to Well Location Restrictions Study

The secretary shall, by **December 31, 2012**, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

- Almost complete. Field component completed in fall 2012.

§22-6A-23 Air Quality Study

The secretary shall, by **July 1, 2013**, report to the Legislature on the need, if any, for further regulation of air pollution occurring from well sites, including the possible health impacts, the need for air quality inspections during drilling, the need for inspections of compressors, pits and impoundments, and any other potential air quality impacts that could be generated from this type of drilling activity that could harm human health or the environment. If he or she finds that specialized permit conditions are necessary, the secretary shall promulgate legislative rules establishing these new requirements.

- Still underway



[Home](#) > [Office of Oil and Gas](#) > [Horizontal Drilling](#) > [Legislative Studies](#)

Legislative Studies

The Natural Gas Horizontal Well Control Act of December 14, 2011 (W. Va. Code §22-6A), directs the West Virginia Department of Environmental Protection's Office of Oil and Gas to conduct studies of horizontal well drilling activities related to air quality as well as the safety of pits and impoundments.

[§22-6A-23 Impoundment and Pit Safety Study](#)

[§22-6A-12\(e\) Noise, Light, Dust, Volatile Organic Compounds Related to Well Location Restrictions Study](#)

[§22-6A-22 Air Quality Study](#)

[Natural Gas Horizontal Well Control Act](#)

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[§22-6A-23 Impoundment and Pit Safety Study](#)

[§22-6A-12\(e\) Noise, Light, Dust, Volatile Organic Compounds Related to Well Location Restrictions Study](#)

[§22-6A-22 Air Quality Study](#)

Noise, Light, Dust, VOCs Scope

- 7 pads – Brooke, Marion & Wetzel Counties
- 3 companies
- Monitors off-pad/ambient air
 - 6-12 days per site
 - ~250 – 1,250 feet from pad center
 - July – October 2012
- Pad construction, vertical drilling, horizontal drilling; hydraulic fracturing; flowback/completion

Monitoring

- West Virginia University (WVU) – Wireless Air Monitor System (WAMS)

PM2.5 (Dust), HCs, Light, Ionizing Radiation and Noise at multiple locations at each site; battery/solar powered

Summa canisters – 72-hour, volatiles

- Department of Energy (DOE) – National Energy Technology Laboratory

PM10, PM2.5, HCs, Light, O₃, SO₂, NO_x, OC/EC, NH₃, CO₂(and isotopes), CH₄(and isotopes) at a single location at each site; run via electric power or diesel generator

DOE trailer





WAMS



WAMS and Summa Canister



Questions?

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