

Oil and Gas Study



October 10th, 2011

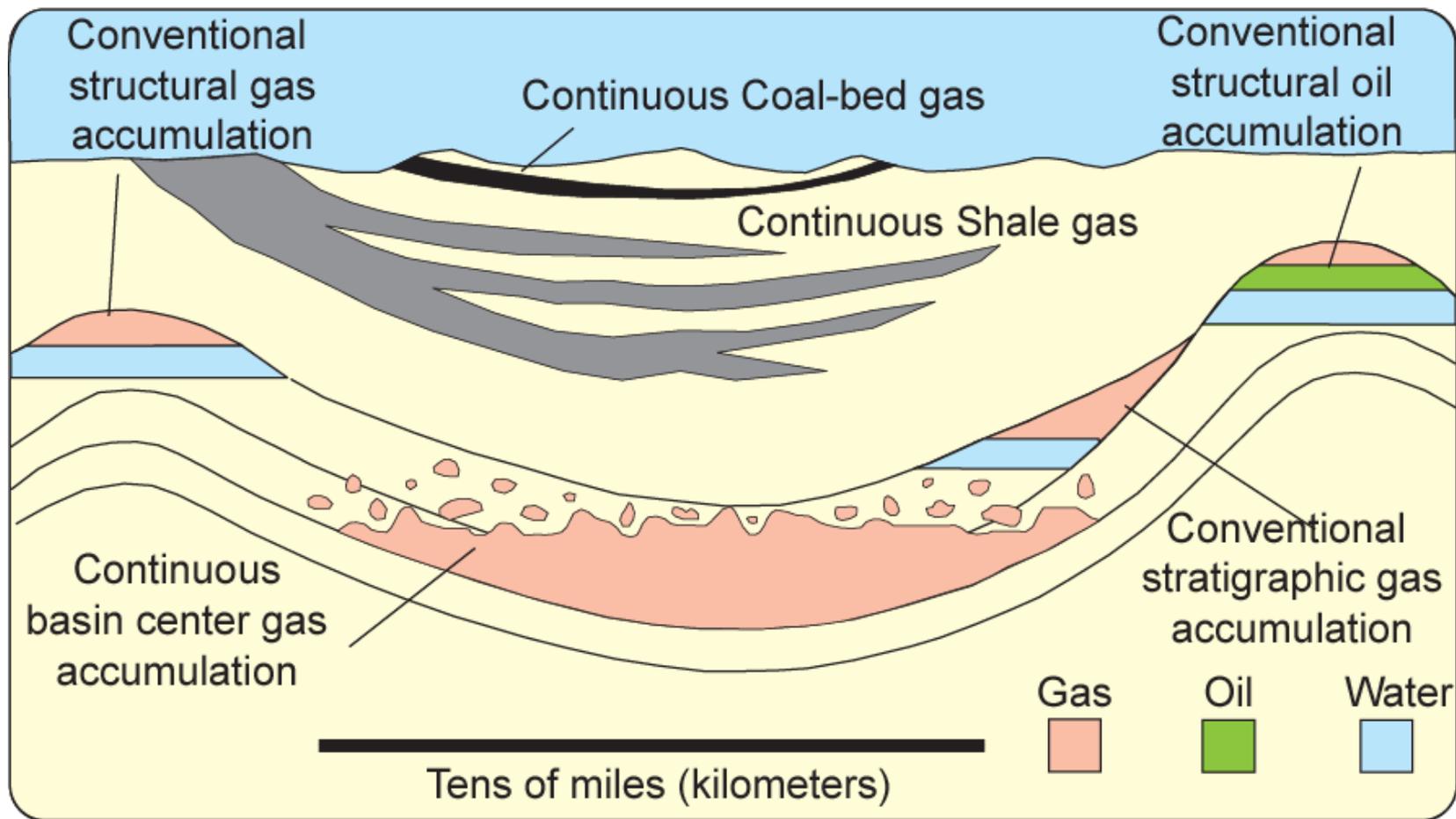


Agenda

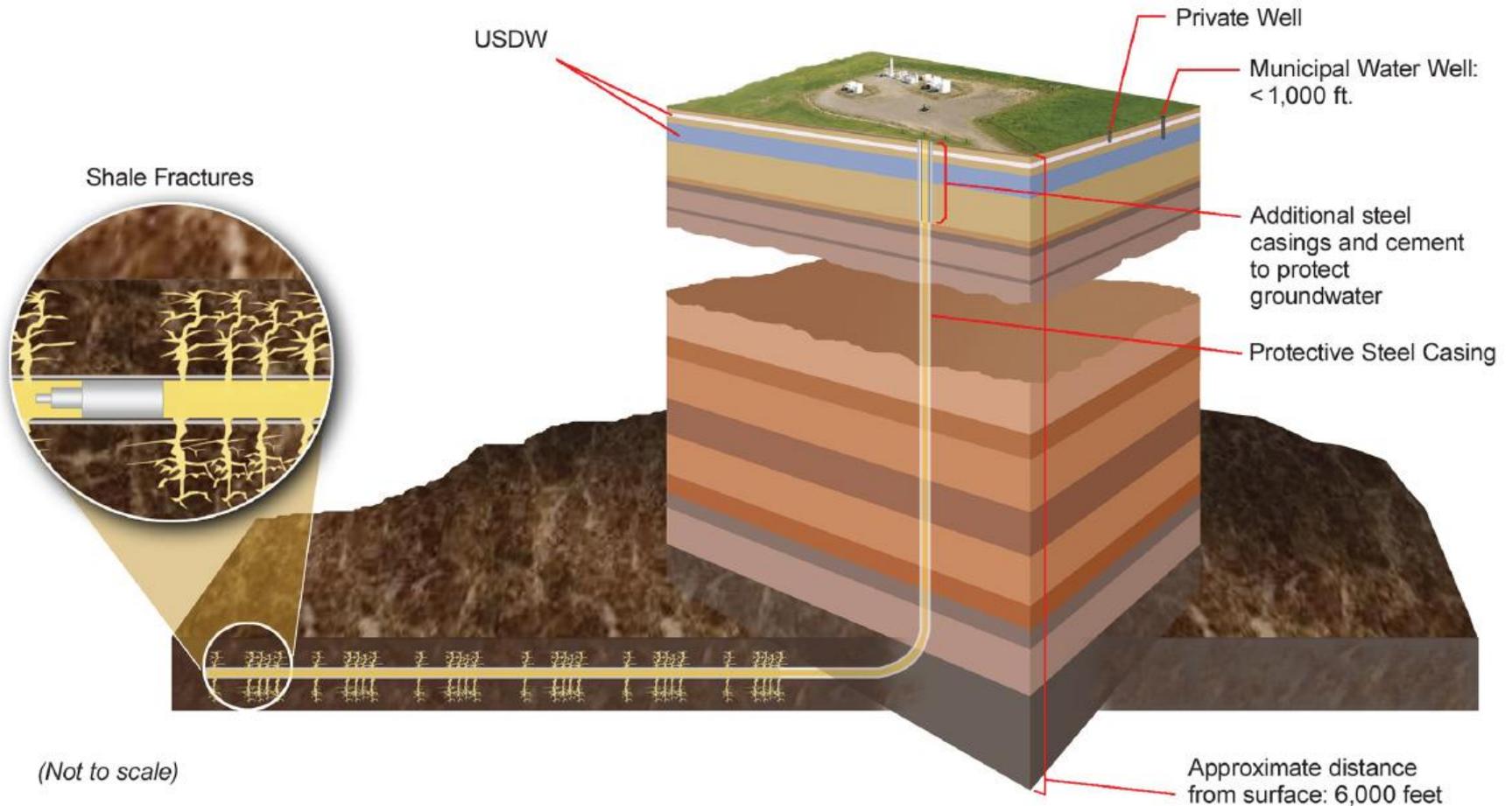


1. Introductions
2. Shale gas extraction and resources in NC
3. Process of the DENR oil and gas study
4. Public input opportunities
5. Proposed outline for the oil and gas study
6. Your comments

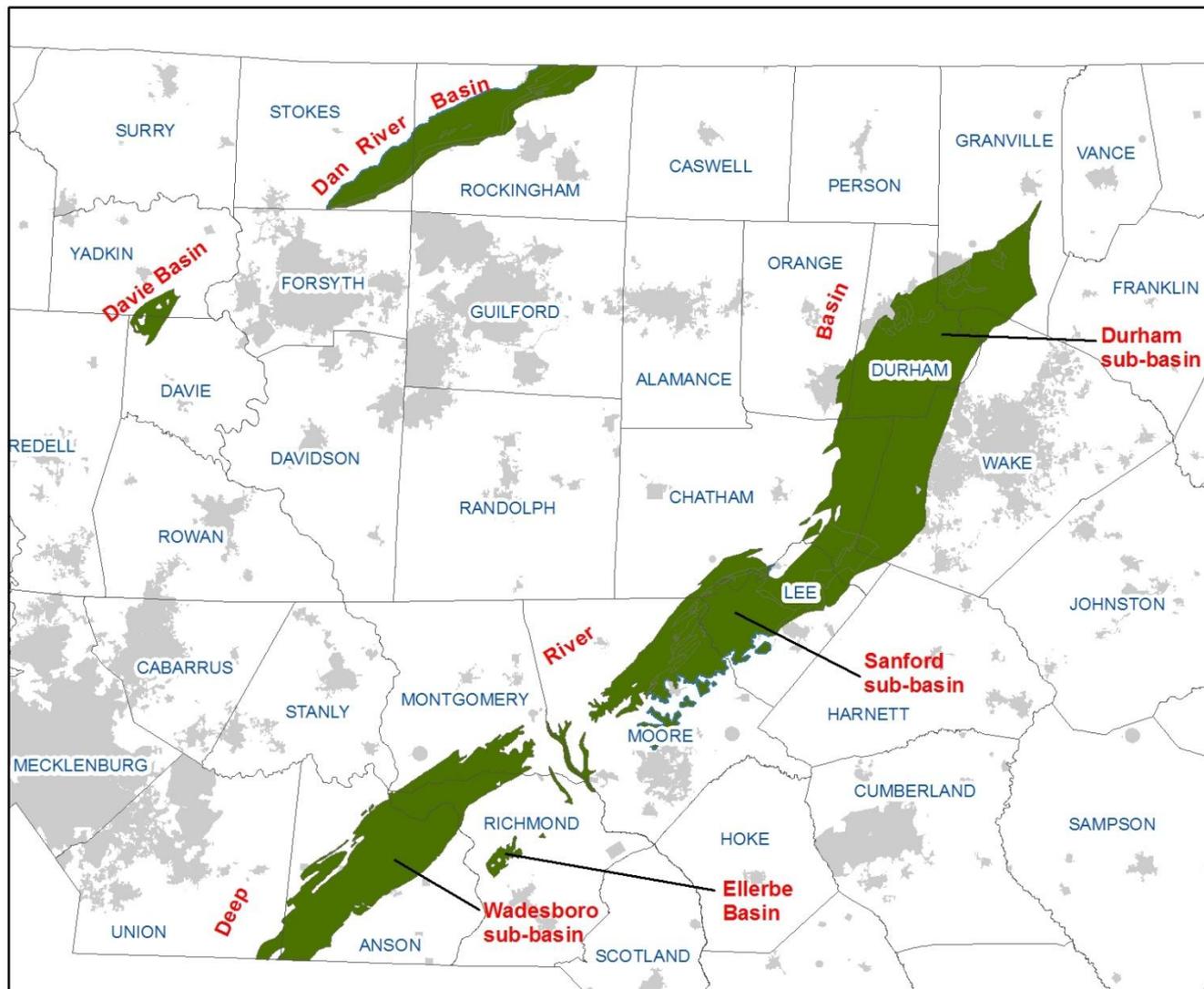
Categories of Hydrocarbon Occurrence (Schmoker, 1995)



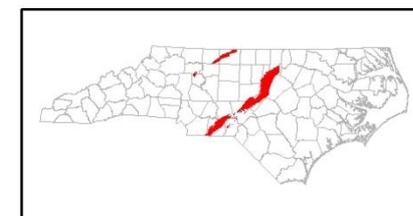
Hydraulic Fracturing and Horizontal Drilling



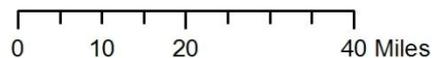
Exposed North Carolina Triassic Rift Basins



-  Municipalities (2006)
-  County Outlines
-  Triassic Basins



Location of North Carolina mapped Triassic basins.



NCDENR Study



- Internal DENR study team



- **STRONGER** review
 - Nonprofit group, compares our regulations to guidelines
 - Panel review is October 24-28th
 - Opportunity for STRONGER to ask questions of DENR staff members
 - Public may observe from 8 am – 2 pm
 - October 24th @ Parker Lincoln conference room, 2728 Capital Blvd., Raleigh
 - October 25-28th @ Dobbs Bldg Rm. 2115, 430 N. Salisbury St., Raleigh

Public Input



- Public Meetings (today and in early 2012)
- Written Comments
 - Email to: Shale_Gas_Comments@ncdenr.gov
 - Mail to:
NCDENR, attn: Trina Ozer
1601 MSC
Raleigh, NC 27699
- Get updates
 - Send an email to: DENR_Shale_Gas@ncdenr.gov
 - Visit our website: <http://portal.ncdenr.org/web/guest/shale-gas>
- Technical Advisory Group
 - Available to answer DENR's questions on science, law, engineering

Proposed Outline of the Study Under S.L. 2011-276



[1] Although the study language in Session Law 2011-276 speaks in terms of all of the state's oil and gas resources, the study will focus on the shale gas resource that has been identified in the Triassic Basin. The study will note where any findings and recommendations may have broader application to other potential oil and gas resources.

Section 1 – Potential Oil and Gas Resources



A. Overview of the Triassic basins

- Sanford sub-basin of the Deep River Basin
- Dan River Basin
- Durham and Wadesboro sub-basins of the Deep River Basin
- Buried Coastal Plain basins

B. Estimates of technically recoverable gas

- Sanford sub-basin
- Dan River Basin

C. Anticipated industry behavior

- Rates of well drilling
- Rates of gas extraction

Section 2 – Oil and Gas Exploration and Extraction



A. How hydrocarbons are generated and trapped in the Earth

B. Methods used to find hydrocarbons

- Geophysical methods
 - ✦ Seismic reflection
 - ✦ Gravity and magnetics
- Lithologic and geophysical logs
- Organic geochemistry indicators

C. Methods to extract hydrocarbons

- Conventional drilling and well treatment
- Horizontal drilling
- Hydraulic fracturing

Section 3 – Potential Infrastructure Impacts



A. Water supply

- Existing water sources
- Existing water use
- Projected water demand (based on local water supply plans)
- Expected additional water use for drilling and hydraulic fracturing

B. Road and bridge infrastructure

C. Pipeline availability

D. Wastewater treatment

- Existing wastewater treatment capacity
- Wastewater treatment needs associated with oil and gas activity (both industrial and domestic wastewater)

Section 4 – Potential Environmental Impacts



- A.** Constituents and contaminants associated with hydraulic fracturing
- B.** Groundwater impacts
 - Location of water supply wells (public and private)
 - Potential for contamination by constituents of fracturing fluids
 - Potential for methane release
- C.** Process wastewater
 - Disposal
 - Potential for recycling
- D.** Stormwater management
 - Environmentally sensitive site design
 - Erosion and sedimentation
 - Post-development runoff
 - Surface spills and releases from the well pad

Section 4 – Potential Environmental Impacts, cont'd



E. Air quality impacts

- Air emissions
- Current permitting requirements

F. Impacts on fish, wildlife and important natural areas

- Threatened and endangered species
- Location of parks, designated state nature preserves, other significant natural areas

G. Management and reclamation of drilling sites (including orphaned sites)

H. Management of naturally occurring radioactive materials (NORM)

I. Potential for seismic activity

J. Solid and hazardous waste generated in the extraction process

Section 5 – Potential Economic Impacts



- A.** Estimate of jobs created
 - Temporary vs. permanent jobs
 - Industry use of local labor vs. imported labor
- B.** Comparison of existing bonding requirements to those in other oil and gas states
- C.** Comparison of existing severance taxes to severance taxes or royalty payments in other oil and gas states
- D.** Fiscal impacts to local government (infrastructure and services)
- E.** Use of special assessments
- F.** Estimate of revenue generated by severance taxes or royalties at levels comparable to other oil and gas states

Section 5 – Potential Economic Impacts, cont'd



G. Fees for permitting of oil and gas exploration and extraction activities

- Current environmental permitting fees in North Carolina
- Fees in other oil and gas producing states
- Recommendations for new or modified permit fees

H. Additional state resources needed to provide regulatory oversight

I. Other recommended uses for oil and gas revenue

- Improvement of water and wastewater infrastructure
- Remediation of contaminated sites
- Land and water conservation

Section 6 – Potential Social Impacts



A. Impacts on nearby communities from drilling operations

- Housing availability
- Property values
- Demand for social services

B. Impacts on quality of life within nearby communities, including impacts on:

- Recreational activities
- Commercial and residential development
- Noise from construction and drilling operations
- Visual impacts from construction and drilling operations

Section 7 – Proposed Regulatory Framework



- A. Guidance for development of a regulatory framework**
 - STRONGER standards for state oil and gas programs
 - State-by-state review of oil and gas programs
 - Public comment
 - Existing state policy
- B. Recommended policies to guide regulation of oil and gas development**
- C. Recommended regulatory framework**
 - Public participation
 - Interagency coordination
 - Criteria for permit issuance or denial
 - Scope and frequency of inspection
 - Compliance and enforcement procedures
 - Data management

Section 8 – Consumer Protection and Legal Issues



- A. Mineral leases
- B. Surface landowner rights
- C. Disclosure to landowners (both surface and subsurface)
- D. Compensation for damages

Section 9 – Other Issues

Appendix

Session Law 2011-276

Summary of Public Comment

Your Comments

