

Preparing Communities for Shale Development through Sustainable Planning

Environmental Impacts – Teaching Outline

Introduction:

The growth in Shale oil and gas development throughout the United States has the potential to bring positive impacts to the economies of communities and regions in which this development is occurring. However, as with any industry based on the extraction of natural resources, there will also be associated environmental impacts. The development of the shale energy industry involves land use changes for drilling, pipelines, and processing facilities; water use for hydraulic fracturing and processing facilities; air emissions from heavy vehicles, diesel power plants, flares, and leaking transmission lines; and waste management issues, including the disposal of drilling mud, naturally occurring radioactive materials, and flowback water from hydraulic fracturing. These activities have the potential to negatively impact water quality, air quality, and habitat. While it is difficult if not impossible to accurately assess the full range of environmental impacts directly attributable to oil and gas extraction, transport, and processing activities in a region, this curriculum will identify those impacts most likely to occur.

This curriculum is intended for use by Extension Educators with leaders and residents in shale impacted communities to help them prepare for the environmental impacts of shale development. Using a “train-the-trainer” approach, the initial target audience is Extension Educators and the intended external audience is community leaders and residents. This curriculum, resources and instructions are presented in a format that will enable Extension Educators to use this curriculum on their own and modify it to meet the specific needs of their communities and regions.

Learning Objectives:

Community leaders and planning officials are seeking to identify and understand strategies that will help to sustain the environmental qualities of their communities. With the growth in shale oil and gas extraction, and related transport, processing and waste management activities, many communities are attempting to understand and address the impacts to their environment. The overall purpose of this curriculum module is twofold: 1. To inform and educate community leaders, stakeholders and residents about the most commonly anticipated environmental impacts of unconventional shale oil and gas development, and 2. To provide this information in a useful format that will provide guidance in the development of sustainable community plans to address shale environmental impacts.

Workshop Authors: Joseph Bonnell, Program Director, School of Environment and Natural Resources, Ohio State University and Myra Moss, Ohio State University Extension

Process Used: Overview presentation and panel presentations with discussion. Power point

slides for the overview presentation and (audio? Written?) narrations for each slide are provided. Guidelines and suggestions for organizing the panel presentations are also included.

Length: The module (presentations and panel with discussion) can be accomplished in 90 minutes. However, two hours will allow more time for discussion and identification of potential planning strategies).

I. Presentation – Overview of Environmental Impacts of Shale Development (30 minutes – Extension Educators)

Use power point slides and (audio or written) narration. The narrative is designed to provide information and a possible “script” for each individual slide that the instructor can use to prepare and customize their own presentation.

Purpose:

Provide an overview of environmental impacts of shale development, including pipelines, processing and waste disposal. Included are the following environmental topics:

- a) Water quality and quantity
- b) Noise and light pollution
- c) Waste disposal (production fluids, flowback, cuttings)
- d) Transportation (truck traffic to/from site)
- e) Seismic activity
- f) Air pollution
- g) Spills, fires, explosions and fumes
- h) Erosion and sedimentation
- i) Habitat loss

II. Panel Presentations

After the overview of environmental impacts of shale development, a panel of targeted experts will cover additional topics that pertain more to the local, state and regional situation regarding the environment and shale development.

a. Suggested Panelists:

Identify panelists that can address the impacts of shale development in your geographic area as well as regulatory and policy structures in place or being considered. A mix of private (industry) and public (governmental) sector representatives is desirable. Diversity among your panelists will result in a more informative presentation and meaningful discussion. Suggested panelists include:

1. Representatives from the shale drilling industry such as environmental or sustainability coordinators, construction managers, environmental engineers, etc. Choosing representatives from companies that are operating in your geographic area provide the added opportunity for direct communication and the potential to build relationships.



2. Representatives from your state and/or local environmental policy and regulatory agencies – for instance, those agencies that are involved in the development of rules, permitting and oversight as it relates to the shale industry including drilling and the disposal of production water and other wastes (cuttings, for example).
3. Representatives from professional environmental organizations that monitor and comment on the environmental impacts of the shale industry.

b. Panel Format – Presentation and Discussion:
(45 minutes, presentations followed by discussion facilitated by Extension Educators)

Each panel can be asked to make short presentations about the environmental impacts of shale development from their experience and perspective. They might also offer suggestions for local officials and planners to help address these considerations. Presentations will be followed by question and answer when all the panelists have concluded their remarks.

If you expect there might be conflict or monopolization of the discussion by those with strongly held positions, consider handing out 3x5 index cards on which participants can record their questions. These cards will then be submitted to the Extension facilitators, who will directly ask these questions of the panel. This will give the Extension facilitators a better chance to insure that a broad range of relevant topics are covered, and insure more civility in the dialogue.

Remind participants, if needed, that the purpose of this session is to present data and information that can be used by the local community in the preparation of a sustainable plan to help prepare for and address the long and short-term impacts of shale development.

If you do not expect conflict or monopolization to occur, Extension can facilitate an open discussion between the presenters and the audience.

IV. Debrief

(10 minutes; group discussion facilitated by Extension Educators)

- a) Participants share what they learned and how they might apply this knowledge in their community
- b) Discuss how this knowledge can be incorporated in the development of a sustainable plan, including strategies to address specific impacts of concern. Capture ideas on flip chart and provide a summary to participants after the meeting)

V. Materials

The educational materials in this module provided to participants will include:

- a) Power point presentation



- b) Handout – *Shale Environmental Indicators* (A sample indicator fact sheet has been developed for the Marcellus/Utica Shale play in the Eastern Region of Ohio. This indicator sheet can be modified for your own community and region.)
- c) Program evaluation template
- d) Flip chart and markers to capture participant's suggestions
- e) Attendance record with participant's name and contact information

VI. Supplies Needed by Instructors/Facilitators

- a) LCD Projector and laptop to project power point slides
- b) 3x5 index cards for participant's question to panel
- c) Copy of handout materials for each participant
- d) Flip chart and markers

VII. Additional Resources for Educators

- a) Ohio State University Extension Shale Education Program:
<http://serc.osu.edu/extension>
- b) Ohio State University Subsurface Energy Resource Center:
<http://serc.osu.edu>
Environmental Impacts:
<http://serc.osu.edu/osu-extension/shale-library/environmental-impacts>
- c) Penn State Marcellus Center for Outreach and Research:
<http://www.marcellus.psu.edu>

For additional information, please contact the authors:

Joseph Bonnell, Program Director, School of Environment and Natural Resources, Ohio State University
bonnell.8@osu.edu
614.292.9383

Myra Moss, Extension Educator, Ohio State University Extension
moss.63@osu.edu
740.607.5177