

STRATEGIC PLAN FOR
RESEARCH ON THE IMPACTS OF 21ST
CENTURY OIL AND GAS DEVELOPMENT IN
THE APPALACHIAN REGION AND BEYOND

HEI's Special Committee on Unconventional
Oil and Gas Development

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Origin of the Initiative

- Pennsylvania-based Shale Gas Roundtable formed in 2011 by leaders from government, industry, academia, environmental groups, and civil society.



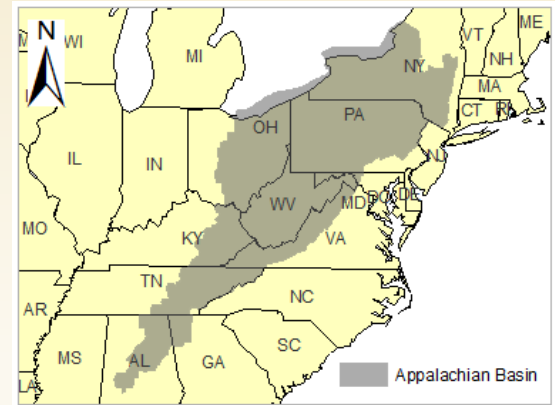
- The central question for the Roundtable:
“As a region, how can we most effectively and responsibly safeguard our communities and environment, grow our economy, and manage unconventional oil and gas development?”
- In 2013, the Roundtable called for “efforts to increase balanced research and rigorous monitoring of the possible impacts of unconventional oil and gas development.”
- HEI’s Special Scientific Committee was formed as a direct result of the Roundtable’s recommendation.



The Committee's Task

Develop a plan to help guide future research that will improve understanding of potential local and regional impacts of unconventional oil and gas development on

- human health and well-being,
 - ecologic systems, and
 - the environment
- of the Appalachian region and beyond.



Source of data:

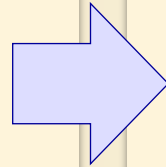
http://www.eia.gov/pub/oil_gas/natural_gas/analysis_publications/maps/maps.htm



Scope of Review

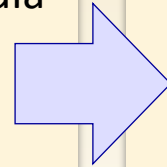
21st Century Oil and Gas Development

- Exploration
- Site preparation
- Drilling
- Well completion
- Production and processing
- Waste management
- Closure and post-production



Stressors

- Chemical and radiological releases to the environment
- Changes in quality of environmental media
- Water use
- Land development
- Induced seismic activity
- Community change
- Increased truck traffic
- Noise, light, and odor
- Accidents



Potential Impacts

- Reduced quality of environmental media
- Landscape disruption and habitat fragmentation
- Seismic damage
- Safety hazards
- Damage to community characteristics
- Reduced sense of well being and infrastructure capacity
- Public health concerns and stress



Identification of Research Questions

- Reviewed hundreds of reports and journal articles and participated in tours of oil and gas operations
- Consulted experts in local geology, hydraulic fracturing, and other aspects of oil and gas development
- Conducted workshops to seek guidance from a broad range of interested parties in the Appalachian region



The Committee's Draft Interim Report

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Available at HEI's website:

<http://www.healtheffects.org/UOGD/UOGD.htm>

**THE POTENTIAL IMPACTS OF 21ST
CENTURY OIL AND GAS DEVELOPMENT
IN THE APPALACHIAN BASIN:**

First Steps Toward a Strategic Research Plan

DRAFT

By the Special Scientific Committee on Unconventional
Oil and Gas Development in the Appalachian Basin
December 2014

- Scope of review and approach
- Summary of potential impacts at the local and regional levels
- Summary of research recommendations from the literature
- *It's not too late to review and comment!*

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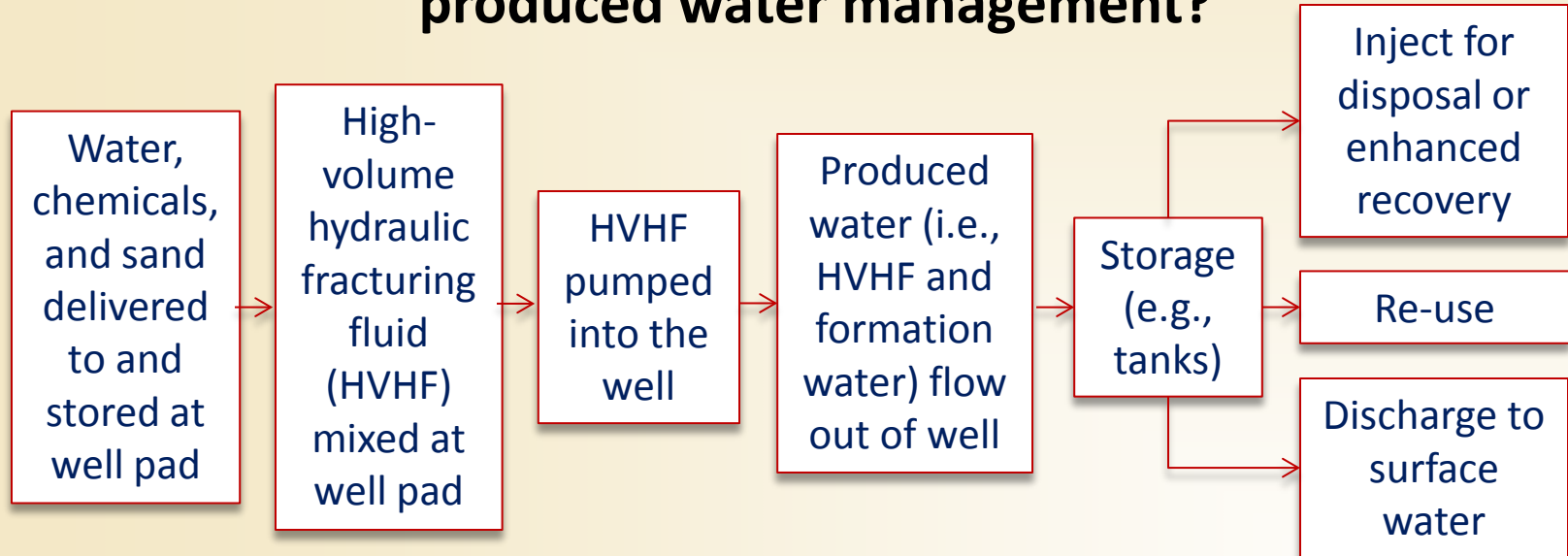
Some Notes on the Literature Regarding Potential Impacts

- Much focus on potential impacts related to:
 - Human exposure to and risk from various potential health stressors
 - Air quality
 - Water quality
 - Induced seismicity
 - Habitat loss and fragmentation
 - Social changes in local communities
- More discussion about potential impacts during development than during production or post-production
- Limited peer-reviewed information and data, but literature is growing

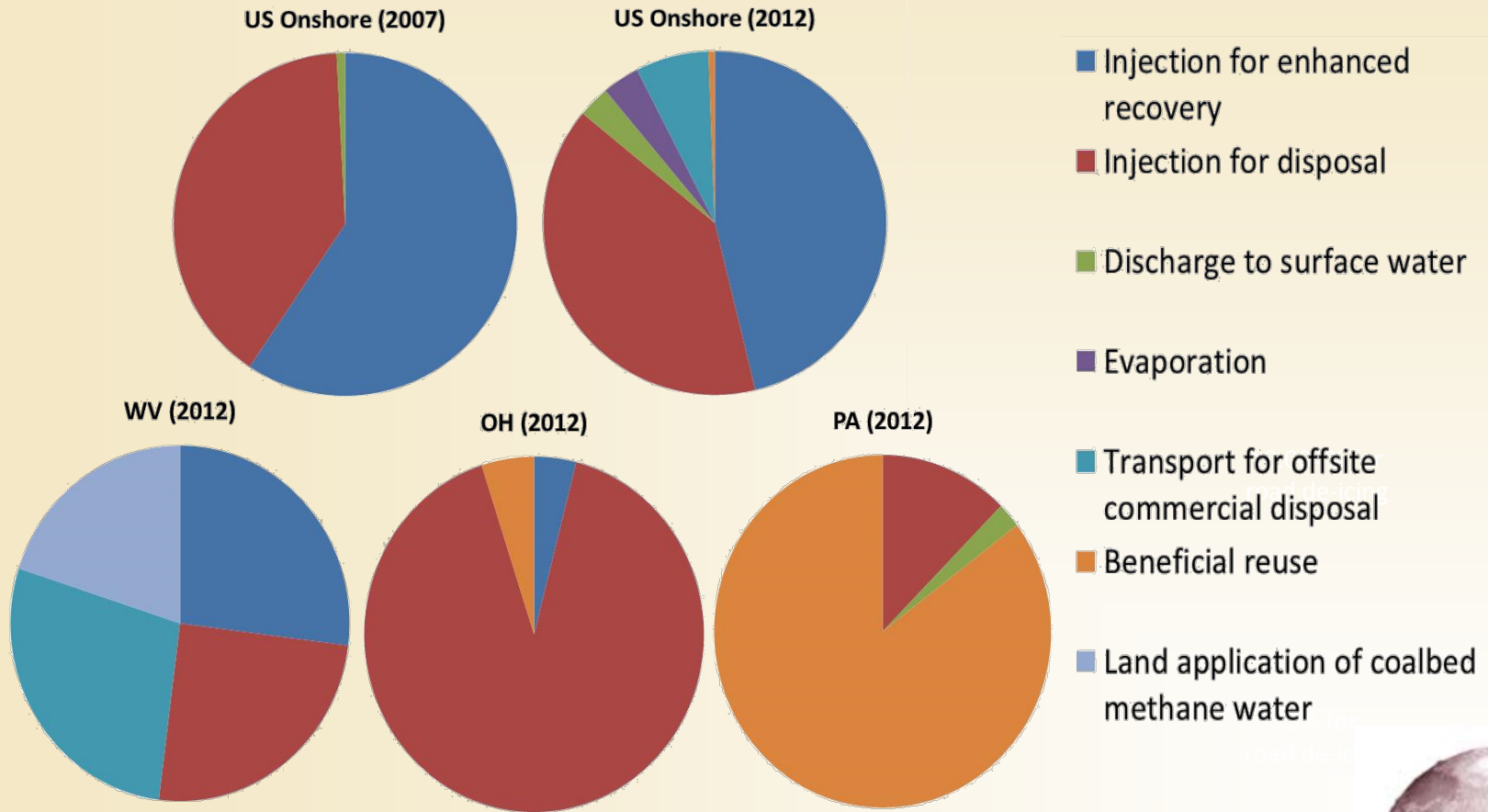


One Example of the Committee's Approach to Identifying Research Questions

Potential impacts related to produced water management?



Trends in Produced Water Management (from conventional and unconventional wells)



Data from: *U.S. Produced Water Volumes and Management Practices in 2012*. Prepared for the Ground Water Protection Council by Veil Environmental, LLC. April 2015.

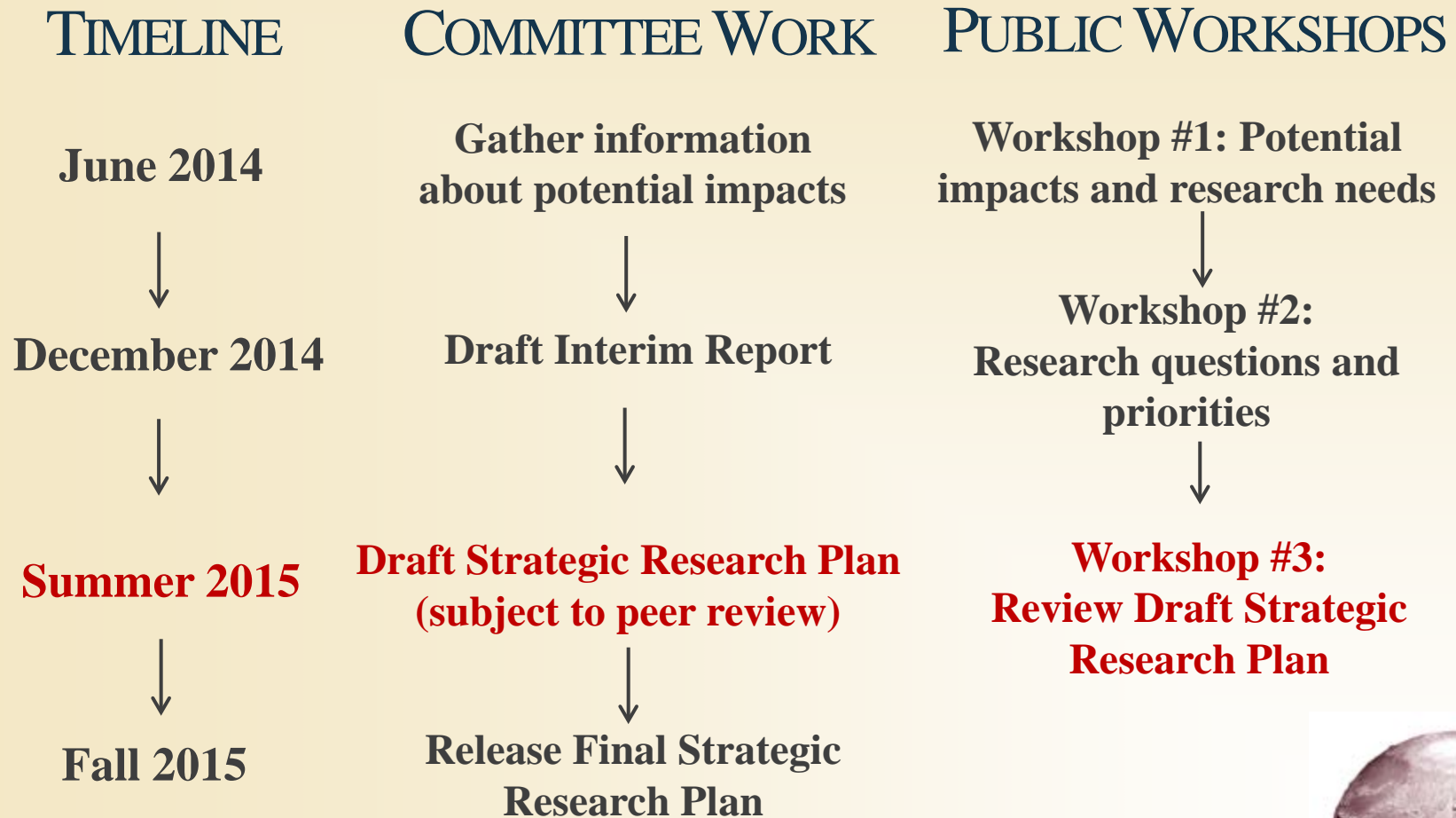


Prioritizing Research Questions

- The prioritization process will center on explicit criteria (e.g., significance of potential impacts, feasibility) for weighing the merits of each research question
- The information used to identify and prioritize research will be publicly available
- Stakeholder involvement has been and will continue to be encouraged



What is Next?



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