2019 Oil and Natural Gas Stakeholder Roundtable
Summary of Event

Background

On November 4-5, 2019, State Review of Oil and Natural Gas Environmental Regulations (STRONGER) and the Environmental Council of the States (ECOS) convened a multi-stakeholder roundtable (Roundtable) with funding and input from the United States Environmental Protection Agency (US EPA) to discuss and share individual input on environmental issues in upstream oil and natural gas development. Topics included produced water, life-cycle water opportunities and optionality, air quality and methane, community risk communication, orphaned and abandoned wells, and waste management. Participants included stakeholders from state, tribal, and federal government, environmental non-governmental organizations (eNGOs), state and industry associations and trade groups, and industry.

Throughout the Roundtable, the Chatham House Rules were observed. Thus, this summary does not identify feedback or viewpoints from specific participants. Furthermore, this summary does not represent group advice or consensus and is not intended to be a complete recitation of the proceedings. This document compiles individual input from the participants and is intended to serve as a reference for possible future discussions and further collaboration among stakeholders. However, comments from US EPA on agency activity related to discussions during the 2018 Roundtable are attributed to US EPA.

The Roundtable continued discussions from the 2018 Roundtable convened by US EPA, ECOS, and the Interstate Oil and Gas Compact Commission (IOGCC). Overall goals for the Roundtable included:

- Continuing the dialog from the 2018 Roundtable to improve relationships and enhance communication among stakeholders;
- Discussing and providing individual input on cross-cutting issues and approaches to challenges at the intersection of technology, regulation, and the environment associated with oil and natural gas development; and
- Identifying and sharing individual perspectives on innovative and effective solutions for overcoming those challenges.

ECOS, STRONGER, and US EPA identified the following organization-specific goals for the Roundtable:

ECOS:

- Engage with oil and gas stakeholders and our federal regulatory partners on key issues that the Shale Gas Caucus (SGC) has been working to address;
- Spotlight state and other best practices; and
- Gather input to inform the SGC's 2020 agenda.

STRONGER:

- Inform direction of future updates and developments of STRONGER guidelines; and
- Identify opportunities for future state reviews.

US EPA:

- Maintain a space for stakeholders to see each other, listen and share individual input;
- Obtain individual feedback on EPA programs and policy;
- Obtain individual feedback on ways to create clarity and certainty in EPA programs;
- Explore opportunities for better communication and improved compliance; and
- Obtain individual feedback on opportunities to facilitate state/tribe regulation of oil and natural gas.

US EPA provided updates on agency activity since the 2018 Roundtable. US EPA identified the following focus areas and actions that demonstrate potential solutions to the challenges identified at the inaugural roundtable event. Here are the challenges and actions taken:

Challenge	Action
Enhance communication	• Co-regulator outreach; and • Memoranda of agreement and understanding with states and related organizations (STRONGER; IOGCC)
Compliance through collaboration	• OECA Policy: Enhancing Effective Partnerships Between EPA and States in Civil Enforcement, and • New Owner Oil and Gas Audit Program
Engage stakeholders and share information	• National Produced Water Study and related outreach, • Water Reuse Action Plan, and • Online Oil and Gas Compliance Assistance Center
Consistent program implementation	• EPA Lean Management; Regional realignment, and • Underground Injection Control (UIC) Comprehensive Program Evaluation; updated Primacy website
Clarity and certainty in regulation	• Recent regulatory efforts to streamline requirements and clarify expectations

2019 Roundtable Summary

The Roundtable agenda was divided into three sessions covering Optionality and Produced Water, Air Quality and Methane Excellence, and Cross-Media and Emerging Topics. Breakout groups were held after the final session to facilitate a more focused discussion on topics identified during the session discussions and voted on by participants at the conclusion of each session. The following summary is organized by topic according to the agenda. Appendix A contains the Roundtable slide deck.

Many of the issues highlighted overlap with other agenda topics (for example: potential air quality considerations of produced water treatment). The points listed represent concepts among the diverse viewpoints shared during the session and breakout group discussions. Achieving consensus was not a goal or expectation or result of the Roundtable. STRONGER encourages stakeholders to consider these concepts based on individual input and the related opportunities to advance the high-level discussion and aspirational goals discussed below.

Optionality and Produced Water

The discussion on Optionality and Produced Water centered on three main areas: research challenges, regulatory issues, and economic factors affecting treatment and reuse of produced water both in and out of the oilfield. The following is a brief summary of the topics/individual comments discussed.

Research Challenges

- Quality, real-time data should be generated, and samples shared with the academic ecosystem so that approved analytical methods can be developed and built upon.
- Standardized toxicological screenings could be more easily developed if play-by-play characterization of produced water existed.
- Filling in knowledge gaps will enable right sized technology to the address specific risk and uses, allowing more appropriate treatment solutions to be used.
- As treatment of produced water for use outside of the oil field is not common, the database on treatability is not as robust as that of other industries which presents challenges in setting standards.

Regulatory Issues

- States should develop incentives that promote in-field reuse of produced water over freshwater sourcing.
- US EPA could help develop standardized protocols for produced water that are more useful than broad statements on constituents which are less helpful due to differences among plays. A regulator may be looking at other pollutants than the standard 126 priority pollutants.
- Ensure states have the framework they need to regulate produced water (e.g. enforcement authority).
- It was acknowledged that treatment for uses outside of the oil field must be protective of water quality. However, some states have not developed criteria and some states have little experience with permitting of discharges. Investments in people and programs will need to be made.
- The potential air quality concerns associated with treatment should be taken into consideration.
- Work is needed on the question of ownership of the water and potential liability for treated produced water.
- Increasing transportation of produced water using lay-flat pipe brings a higher risk of spills and there are opportunities for regulators to become more involved in this area.
- The American Petroleum Institute (API) has initiated a standards discussion group around transportation of produced water, including using lay-flat hoses.

Economic Factors

- Water shortages are expected to become more common in the future, disposing of water without giving thought to reuse potential should no longer be an option. If freshwater sourcing is low-cost, incentives could be considered to promote the use of non-fresh water.
- When developing water infrastructure, opportunities should be sought for future or shared non-oil and gas use, including future use of infrastructure by irrigation companies.
- Rather than thinking of UIC as the best option, companies should consider what is the most sustainable use of the water. The goal should be a business environment that is protective of health and the environment, and favors keeping water in the hydrological cycle.

Policy considerations

- Improved public education and community risk communication around produced water and the safety and risks associated with reuse is needed.

Air Quality and Methane Excellence

Discussions during the Air Quality and Methane Excellence session focused on challenges at the intersection of technology and regulation and effects of regulatory policy on operators of various sizes. The following is a brief summary of the topics/individual comments discussed.

Technology and Regulation

- Regulatory development moves slowly, yet industry is moving quickly with new technology. States and the federal government could create streamlined pathways that allow advanced technology to be considered, approved and used. State agencies could work together on those pathways, and a federal standard/baseline would make that easier to accomplish.
- A shift to performance-based regulation could promote flexibility in leak detection and repair (LDAR).
- Existing sources need a baseline that all operators can comply with. Incentives for the development and use of new technology can form the basis of future regulations. A key incentive is more efficient issuance of permits.
- Better and more data are needed to inform regulation and the role of technology in a conversation that has shifted from, “Should we regulate methane?” to “How do we regulate methane?”
- Nonattainment brings operators into permitting at even lower emission thresholds. It may result in disincentivizing operations such as tankless pads that are overall more efficient and require central processing facilities. This represents a sizeable burden to industry and to the regulator, as many state agencies do not have adequate staff to handle the increased permitting.

- US EPA has not received any applications for alternative means of emissions limitations (or emerging technology) since 2016. New technology needs consistent standards for function and implementation so that testing and enforcement measures can be harmonized.

Policy Effects

- Requiring the smaller and marginal well producers to comply with additional requirements may risk putting them out of business. There was a discussion about opportunities for larger companies to provide assistance and guidance to these smaller companies. There was also a discussion about other industries that have undergone significant changes due to regulatory requirements.
- The market is currently the greater driver for methane emission reductions than regulation.
- Flexibility in inspection requirements could allow larger operators to shoulder the inspection burden and allow smaller operators to focus on repairs. For example, self-certification programs could allow certain companies to take on a greater self-inspection requirement and disclose more information.

Orphan and Abandoned Wells

There was a discussion of orphan and abandoned wells and responses to a survey of 29 states. The participants engaged in a productive conversation and offered individual comments about how government and industry could work together to address this challenge. The following is a brief summary of the topics/individual comments discussed.

- States may have funds for plugging wells, but often cannot get contractors due to high demand within the industry. Even if states could get contractors, many lack adequate staff to manage them.
- One state estimated the cost to plug all of its abandoned wells to be in the billions of dollars. Currently there is inadequate funding and staffing at the agency, and a lack of motivation in the legislatures to make well plugging a priority.
- How can industry support states where they lack resources?
- Section 404 mitigation could be a pathway to secure additional water quality improvements through plugging orphan wells.
- Plugging costs may not include complete site reclamation costs.
- In addition to well sites, how are states addressing abandoned midstream infrastructure?

Community Risk Communication

After an overview of what risk communication to communities encompasses and recommendations for factors to consider, the participants engaged in an educational discussion. The following is a brief summary of the topics/individual comments discussed.

General Considerations

- Tell the truth, be clear about what you know, do not speculate or offer answers that you cannot provide or verify. Be clear on the potential issues, risks, and opportunities and avoiding speculation on any specific outcome.
- Effective risk communication must be conducted with empathy and understanding.
- Put the issue at the center of the discussion rather than an individual.
- The benefit of good science can be lost when communicated poorly.
- Understand the audience's level of knowledge and use a shared vocabulary.
- Remember that understanding, rather than acceptance, may be the goal. Transparency and honesty are critical to achieving either outcome.
- The importance of appropriate risk communication training for front-line communicators cannot be overstated.
- Cultural differences must be taken into account, especially when communicating with tribal or indigenous communities.

Resources

- State Oil & Gas Regulatory Exchange Induced Seismicity Report section on communicating risk to communities.
- California case study of community driven program and success on trust building for air quality control planning and community engagement.

Waste

There was a short discussion about trends and updates in oilfield waste management. The following is a brief summary of the topics/individual comments discussed.

- Some states are seeing PFAS firefighting foam used on oilfield fires. Small amounts can create substantial contamination. It was suggested that PFAS/PFOA are the key contaminants to address over the next ten years.
- State review process through STRONGER is available for states to use to document their programs and continuous improvement efforts in a transparent, multi-stakeholder framework. Dovetails with community risk discussion.
- US EPA's 2019 report on its review of RCRA Subtitle D recommended no changes were necessary at this time. The Agency is obligated to review its RCRA requirements every three years.
- It is becoming increasingly important to consider the "Resource" in RCRA and explore opportunities for waste minimization and reuse. Thinking in terms of a circular economy will be key to realizing those opportunities.

Appendix A

STRONGER
State Review of Oil & Natural Gas Environmental Regulations

ECOS

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engineers | scientists | innovators

Oil and Natural Gas Stakeholder Roundtable

November 4-5, 2019

Welcome and Opening Remarks

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Welcome and Opening Remarks

- Jim Kenney, Cabinet Secretary, New Mexico Environment Department
- Ryan Steadley, Executive Director, STRONGER
- Lia Parisien, Executive Project Manager, ECOS

Opening Remarks and US EPA Update

- Douglas Benevento, Associate Deputy Administrator, US EPA
- Megan Garvey, Senior Advisor, US EPA

US EPA Updates: from 2018 Roundtable

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Action	2018 R/T
Enhance communication • Co-regulator outreach • Memoranda of understanding	✓
Compliance through collaboration • OECA Policy: Enhancing Effective Partnerships • New Owner Oil and Gas Audit Program	✓
Engage stakeholders and share information • National Produced Water Study • Water Reuse Action Plan • Online Oil and Gas Compliance Assistance Center	✓
Consistent program implementation • EPA Lean Management; Regional realignment • UIC Comprehensive Program Evaluation; Primacy website	✓
Clarity and certainty in regulation • Regulatory efforts to streamline requirements and clarify expectations	✓

Individual Introductions and Ground Rules

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- Individual Introductions
- Ground Rules and Logistics
  - Chatham House Rules
  - Be professional
  - Limited length of comments: try not to repeat
  - Use name tent to identify interest in speaking
  - Silence cell phones: feel free to step out if needed
  - Summary of meeting will be released after Roundtable
- Interactive Polling for Breakout Sessions
- Safety Moment and Emergency Egress

Goals for Oil and Gas Roundtable

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US Environmental Protection Agency (EPA)

- Maintain a space for stakeholders to see each other, listen and share individual input
- Obtain individual feedback on EPA programs and policy
- Identify ways to create clarity and certainty in EPA programs
- Explore opportunities for better communication and improved compliance
- Obtain individual feedback on opportunities to facilitate state/tribe regulation of oil and natural gas

ECOS Shale Gas Caucus (SGC)

- Engage with oil and gas stakeholders and our federal regulatory partners on key issues that the SGC has been working to address
- Spotlight state and other best practices
- Gather input to inform the SGC's 2020 agenda

State Review of Oil and Natural Gas Environmental Regulations (STRONGER)

- Inform direction of future updates and developments of STRONGER guidelines
- Identify opportunities for future state reviews

Updates and Trends in Oil and Gas

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Group	Updates and Trends
Federal	CAA: equivalency, new technologies, ozone standard CWA: WOTUS, publicly owned treatment systems RCRA: exploration and production waste decision OECA: Self-Audit Program MOU
Tribal and State	Develop more comprehensive regulations, while maintaining flexibility for innovation and technology Identify strategies to protect water quality and increase availability Consider how to regulate methane, require continual emission monitoring, and address legacy wells Clarify authorities and jurisdictions
Community and NGOs	Prevent and accurately report on air and methane emissions (use technology) Study potential impacts based on risk to community Benefits of the industry and social license to operate Universities leveraging with research

Updates and Trends in Oil and Gas

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Group	Updates and Trends
Customers (utilities)	Focus on supply chain impacts and responding to customer questions Identifying “Responsibly Produced Natural Gas” Setting “net zero” and other climate-related goals
Investors	Cash-flow, returns, profit focus to drive greater efficiency Transparency and data accuracy Climate risk management and disclosure focused on Paris Accord (2-degree scenarios) and Task Force on Financial Disclosure (TCFD) Water quantity and quality
Industry	Continual technology enhancement and improvement (i.e., LDAR and continuous monitoring) Reaching near zero air emissions Striving to even more efficient water use Environmental Partnership, ONE Future, IPIECA: striving for best practices

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Life-Cycle Water Opportunities and Optionality

Water: Optionality on Life-Cycle Basis

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Water Management

- Trend towards lower quality water
- Midstream industry entering business
- Economies of scale
- States removing barriers for recycling

Water Disposal

- Downhole injection
- Reuse and recycle
- Beneficial use
- Potential for groundwater recharge
- Water sharing between operators
- Climate strategy

Water: US EPA Subject Matter Expert

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- Study of O&G Wastewater Management under the CWA
- Draft National Water Reuse Action Plan
- Federal Interagency Collaboration
  - Drought resiliency – NDRP
  - DOE Grand Security Water Challenge
  - Reduce Federal Overlap
- Next Steps
  - Implementation of the Water Reuse Action Plan
  - Promote Technology Advancements
  - Regulatory Reform for Oil and Gas PW
  - Increase coordination among energy producing states, associations, and private sector to advance recycling opportunities and address regulatory burdens
- Provide more opportunities for discharge of treated PW
  - Is it needed, since discharge is currently allowable for beneficial use west of 98th?
  - Defining the technology basis (BAT) for treatment
  - Determining constituents requiring regulation
  - Management of treatment residuals
  - Water quality-based permitting
  - Reducing costs of desalination

Water: Industry Subject Matter Expert

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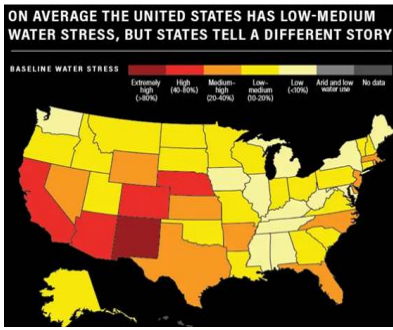
- Consider PW as a resource to mitigate water stress
  - New Mexico and other states facing extreme water scarcity
  - Volumes in aquifers are going down
- Operator is committed to:
  - Collaborative research to identify relevant constituents of concern
  - Developing risk-based water quality standards, ultimately facilitating measured relief to water stress in New Mexico
- Consider comprehensive water re-use metrics to inform business and policy decision associated with produced water management.
- Consider water reuse objectives as a matter of public policy



Water: State Subject Matter Expert

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- GWPC PW report
  - Benefits of beneficial reuse:
    - Reduce freshwater use
    - Minimize PW disposal
    - Reduce induced seismicity
    - Reduce transportation costs
  - Research opportunities:
    - Leak detection
    - Water treatment and automation
    - Separation of saleable products
    - Regulatory changes
- Innovative solutions
  - Wetlands mitigation
  - Water recharge
  - Brackish water research and storage
  - Fit for purpose water treatment
  - Centralized water storage (co-mingling)

Water: NGO Subject Matter Expert

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- Recycling PW for subsequent well completion
  - Viable use
  - Manage leaks and spills
- Reusing PW outside the oilfield
  - Significant knowledge gaps to fill regarding PW characterization (chemical and toxicological)
  - Robust treatment required: more than treating total dissolved solids
- Research to reduce gaps and inform regulatory programs
  - GWPC Report – Module 3: “Produced Water Reuse and Research Needs Outside Oil and Gas Operations”
  - Analytical method development: research and approved analytical methods

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Air Quality and Methane Opportunities and Optionality

Air Quality Excellence

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Air Emissions

- Ozone non-attainment
  - Attainment issues drive need for reductions
  - Some companies starting to work together
- Regulatory
  - States asking for flexibility in LDAR programs
  - Equivalency for states
- Voluntary actions
  - Some producers are aiming for almost zero emissions

Methane Emissions

- Regulatory
  - Regulators taking action
  - Sometimes can consider VOCs as indicator for methane
  - Equivalency for states
- Social license to operate
  - Investor and customer focus
  - Climate strategies
  - Leverage with voluntary carbon trading

Air Emissions:
US EPA Subject Matter Expert

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- OAR
  - Successes
    - Operational changes
    - Incorporation of best practices from new sources at existing source
  - Pathways for Emerging Technologies
  - State-Federal Regulatory Overlap
- OECA
  - Nonattainment and vulnerable communities
    - 2020-2023 National Compliance Initiative: Creating Cleaner Air for Communities
  - Audit programs for oil and gas
  - Compliance assistance and enforcement tools
- Region 6 flyovers

Air and Methane: NGO Subject Matter Expert

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- Methane science reveals large and growing problem
  - 13 MMT/year: 60% higher than EPA estimates
  - Preliminary data: Permian boom making problem worse
- Regulations needed to reduce pollution and waste
  - States are stepping up
  - Federal requirements needed as well
- Federal rollbacks are not helping
  - EPA rollback: 370,000 tons methane; 10K tons VOCs, 300 tons HAPs (2019-2025)
  - BLM rollback: >$1 billion in lost natural gas and pollution cost
- Need strong requirements and innovative approach pathways
  - Rules drive reduction, levels playing field, offers assurances around role of natural gas
  - Adaptable approaches lead to continuous improvement (EDF/SGC report)

Air Emissions:
State and Industry Subject Matter Experts

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State of Colorado

- Current successes
  - Detection and reduction of methane emissions
  - Ambient monitoring data from O&G producing regions shows significant decline in emissions
  - Occurred while production more than tripled in Colorado
- SB19-181
  - Requires minimizing of methane, VOC and NOx emissions from O&G
  - Authority over drilling and completions operations
  - Continuous monitoring: what is appropriate and cost effective

Industry

- Industry is moving forward
  - Working with state agencies
  - API Environmental Partnership
  - Testing continual monitoring technology
- Emissions are reducing based on intensity
- Industry voluntary activities
  - Research and piloting of emission detection technologies
  - Reduced emission technologies
  - API Voluntary Partnership

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Cross Media and Emerging Issues

Emerging and Cross Media Topics

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- Orphan and abandoned wells: Lori Wrotenbery, IOGCC
- Community risk communication: Christy Woodward, COGA
- Solid waste and TENORM: Ross Elliott, US EPA

Community Risk Communication

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- Listen to determine what questions and concerns you are trying to address
- Make science manageable
- Meet people where they are
- Establish small wins to build trust
- Find common ground

Solid Waste and TENORM

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- Classification of Exploration and Production (E&P) wastes
  - In April of 2019, US EPA pursuant to RCRA 2002(b), issued a determination that no revisions are necessary at this time for federal solid waste regulations
  - State regulatory requirements specific to oil and gas E&P waste management units were a key part of that evaluation
- Regulatory evaluation
  - Regulations and guidance for managing wastes from oil and gas E&P activities should effectively address the basic principles common to all waste management: *contain*, *clean up*, and *close*
  - Evaluate the effectiveness of oil and gas E&P waste management programs by understanding the as-written regulations and guidance
  - Consider how existing programs are implemented: what caused releases from waste management units and what can be done to prevent them in the future
- Materials management opportunities
  - Explore appropriate beneficial use of oil and gas E&P residuals
  - Leverage available tools, data, and knowledge from states and federal partners
  - Identify approaches to advance the goals of sustainable materials management

Breakout Sessions: Summaries

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- Optionality and Produced Water
  - Challenges in academic research – samples, testing, & analytical methods.
- Air Quality and Methane Excellence
  - Needs and drivers vary across operators – where is there alignment among operators of all sizes?
- Selected Cross-Media and Emerging Topics
  - States may have funds for plugging orphan/abandoned wells, but lack staff to manage contractors and often cannot get contractors. How can industry support states to address abandoned wells where they lack resources?