**Appendix 1. Draft introductory text that will be sent to 64 respondents via email:**

NORA Oil and Gas Extraction Council Members and Partners,

Greetings. Included in this email is a link to a brief online questionnaire. This questionnaire seeks to understand which occupational safety and health issues are most critical in the oil and gas extraction industry based on your experiences. Your participation is voluntary, and I expect that it will take you no longer than 15 minutes to complete. The questionnaire does not collect personally identifiable information and the results will not be disseminated publically. Results from the questionnaire will be used to facilitate a discussion during our next NORA Oil and Gas Extraction Council meeting, and as the basis for developing a new NORA Oil and Gas Extraction Research Agenda.

Thank you very much for your time. If you have any questions about this questionnaire or the NORA Oil and Gas Extraction Council meeting, please call me.

Sincerely,

Ryan

Ryan Hill, MPH

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**Appendix 2. Draft questionnaire**

**NORA Oil and Gas Extraction Council Questionnaire (DRAFT)**

The purpose of this questionnaire is to collect information from partners to understand which occupational safety and health issues are most critical for future research and collaboration. This questionnaire asks you to identify the topics and issues that you believe are the highest priority in the U.S. oil and gas extraction (OGE) industry. The results from this survey will be used to facilitate discussions of these priorities, resulting in the NORA Oil and Gas Extraction Research Agenda. Your responses are confidential and will not be disseminated to the public.

1. Please review the **safety hazards** below and indicate which you consider to be Low, Medium, or High priority research areas for improving worker safety in the oil and gas extraction industry:

On the job roadway incidents

Well-site motor vehicle incidents

Commuting

Contact injuries (struck by/caught between/dropped objects)

Fires and explosions

Pressure-related events

Falls from height

Electrocutions

Heat/Cold Stress

Musculoskeletal disorders

Slips/trips

Pinch point injuries

Noise

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please review the list of **health hazards** below and indicate which you consider to be Low, Medium, or High priority for improving worker health in the oil and gas extraction industry:

Respirable Silica

Diesel Particulate Matter (DPM)

Hydrocarbon gases and vapors

Benzene

NORM

Hydrogen Sulfide

Dermal Exposures

Chronic Health hazards (i.e. cancer, respiratory disease)

Acute health hazards (i.e. hydrogen sulfide, hydrocarbon gases)

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please review the list of **cross-cutting issues** below and indicate which you consider to be Low, Medium, or High priority for improving worker safety and health in the oil and gas extraction industry:

Making the business case/conducting cost-benefit analyses for health and safety

Defining a set of leading indicators for the OGE industry

Ensuring effective contractor management

Establishing evidence-based lifesaving rules

Increased use of Process Safety Management

Increased use of Safety Management Systems

Improving Safety Climate in the OGE industry

Ensuring safety and health during the great crew change (retirement of older workforce and transition to younger workers)

Improving emergency response

Lock Out/Tag Out improvements

Engineering Controls

Improved use of multi-gas monitors

Increased use of PPE (flame retardant clothes, respirators, hearing protection, etc.)

Worksite wellness (i.e. smoking cessation, substance abuse prevention, nutrition)

Evaluation of existing federal and state regulations and their effect on health and safety

Assessing the existence and needs for recommended practices to address current safety and health hazards on the wellsite

Improving health and safety of small companies

Evaluation of industry-specific education and training programs

Identifying the safest shift length and shift rotation situations

Evaluation of geographic differences in safety and health hazards (e.g. weather, road infrastructure)

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please rank (1 being most important) the top 2 research activities for reducing **silica exposures** in the oil and gas extraction industry (considering the new OSHA silica standard):

Evaluation of existing engineering controls being used by industry

Development of new engineering controls

Surveillance for silicosis

Ongoing exposure assessment during hydraulic fracturing

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please rank (1 being most important) the 2 most critical **control technology** evaluation activities for improving worker safety and health in the oil and gas extraction industry:

Silica controls

Alternative produced fluid sampling strategies (without opening hatch)

Permeation of drilling fluids into skin

Drilling rig controls (i.e. pipe handling, automated tongs)

“Smart” Lock-out/Tag-out controls (e.g. remote alerts)

Remote monitoring of lone workers

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please rank (1 being most important) the 3 most critical **surveillance activities** for improving the type and quality of data collected in the oil and gas extraction industry:

Expand to include **long term health effects** (i.e. respiratory disease, cancer)

Identify and analyze work related **hospitalizations**

Track **Near Misses/High Potential incidents** voluntarily submitted by companies

Complete case reports with **in-depth investigations** of serious incidents

Collect **voluntarily submitted leading indicator** data

Collect **voluntarily submitted injury and illness** data

1. Please rank (1 being most important) the 3 **worker groups** that you consider the highest priority for improving worker safety and health in the oil and gas extraction industry:

Short service employees (new, inexperienced workers)

Hispanic workers

Non-English speaking workers

Temporary workers

Small contractor employees

Young workers

Aging workforce

Lone workers

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please rank (1 being most important) the 3 **motor vehicle safety issues** that you consider the highest priority for research and intervention.

Fatigue

Seatbelt use

Speeding

Journey management (minimizing road travel and associated risks, e.g. weather)

Load securement

Distracted driving

Contractor management

Musculoskeletal injuries

Commuting

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please rank (1 being most important) the 2 types of motor vehicle **technologies** most in need of evaluation.

Fatigue/distracted driver detection

In-vehicle monitoring

Journey management technologies

Predictive analytics

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please review the list **communication products** below and select those most effective for disseminating research-based recommendations to safety and health professionals in the oil and gas extraction industry? (Select all that apply)

Short videos

Hazard Alerts

Online training tools

Apps (on the phone)

Life-saving rules

Virtual reality tools

Scientific articles

Trade journal articles

Conference presentations

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please review the list **communication products** below and select those most effective for disseminating research-based recommendations to workers in the oil and gas extraction industry? (Select all that apply)

Short videos

Hazard Alerts

Online training tools

Apps (on the phone)

Life-saving rules

Virtual reality tools

Scientific articles

Trade journal articles

Conference presentations

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_