

Assessing Safety and Health Hazards of Workers in Oil and Gas Extraction: A Survey

Supporting Statement Section A

New

Request for Office of Management and Budget (OMB) Review and Approval for a Federally Sponsored Data Collection

Project Officer:

Kyla Retzer, MPH

Centers for Disease Control and Prevention (CDC)

National Institute for Occupational Safety and Health (NIOSH)

Western States Division

P.O. Box 25226

Denver, CO 80225-0226

Phone: 303-236-5934

Cell: 907-229-2743

E-mail: kretzer@cdc.gov

July 20, 2017

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- **Goals of the study:** The first goal is to conduct preliminary research of on-duty and off-duty factors that may affect risk for motor vehicle crashes, injuries and illness among oil and gas extraction workers. Second, to identify the perceived safety and health needs and concerns (e.g. chemical exposures, respiratory symptoms) of oil and gas extraction workers, a largely non-unionized workforce. Third, to assist in generating hypotheses for future research on health and safety topics in this workforce.
- **Intended use of the resulting data:** To guide future research priorities and to raise awareness about the safety and health concerns of workers in the oil and gas extraction industry.
- **Methods to be used to collect:** In-person convenience sample of workers on a voluntary basis.
- **The subpopulation to be studied:** Land-based oil and gas extraction workers in the U.S.
- **How data will be analyzed:** Descriptive analyses (prevalence and trends); multivariate logistic regression and other statistical methods to analyze associations between work and non-work related risk factors and injuries/illness.

A. Justification

A.1. Circumstances Making the Collection of Information Necessary

This is a new information collection request (ICR) from the National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC). The request is for two years to complete data collection. This data collection is authorized by Section 20(a)(1) of the Occupational Safety and Health Act (29 U.S.C. 669) (Attachment A).

The mission of NIOSH is to promote safety and health at work for all people through research and prevention. The Occupational Safety and Health Act of 1970, Public Law 9-596 (Section 20) [a][1] authorizes NIOSH to conduct research to advance the health and safety of workers.

This research effort is to conduct a survey (Attachment C) of U.S. land-based oil and gas extraction workers to collect occupational safety and health information, which are not available elsewhere. The only known survey that has collected safety and health information on oil and gas workers is the National Health Interview Survey (NHIS), which contains an occupational safety and health (OSH) module. NIOSH analyzed this dataset by industry subsector. Unfortunately, for the majority of OSH module questions, estimates are not available for oil and gas workers because of the small sample of those workers surveyed in the NHIS. The results from the OSH module regarding oil and gas extraction workers are available at <http://www.cdc.gov/niosh/topics/nhis/mining.html>.

This will be the first time that an epidemiological survey on safety and health topics will be administered to this subgroup of workers. This information will: 1) provide a preliminary exploration of potential on-duty and off-duty factors that may affect risk for motor vehicle crashes, injuries and illness among oil and gas extraction workers, 2) provide a snapshot of perceived safety and health needs and concerns (e.g., chemical exposures, respiratory symptoms) of oil and gas extraction workers, a largely non-unionized workforce, 3) assist in generating hypotheses for future research on health and safety topics in this workforce, and 4) provide information to the oil and gas extraction industry and the research community about worker concerns and preliminary research priorities.

The oil and gas extraction industry includes operations involved in the drilling and extraction of crude oil and natural gas, comprising the largest part of the U.S. mining industry. During 2003–2013, 1,189 oil and gas extraction workers were killed on the job, resulting in an annual fatality rate seven times higher than for all U.S. workers (25.1 versus 3.7 deaths per 100,000 workers)¹. Long work hours, manual labor, heavy machinery, and the mobility of people and equipment may contribute to elevated occupational fatality rates for this industry².

Levels of oil and gas extraction activity is very cyclical, leading to frequent hiring surges when activity increases, in response to higher oil and gas prices. This cyclical trend results in an ongoing introduction of new and inexperienced workers into this high hazard industry and heightens the need for research that will improve the safety and health of its workers.

This study will provide important information on the health and safety of oil and gas extraction workers that is not available elsewhere. The proposed data collection will provide an initial step towards achieving several prioritized strategic goals identified by the National Occupational Research Agenda (NORA) Oil and Gas Sector Council. NORA is a partnership program to stimulate innovative research and improved workplace practices. Unveiled in 1996, NORA has become a research framework for NIOSH and the nation. Diverse parties (industry,

academia, government, insurance, etc.) collaborate to identify the most critical issues in workplace safety and health. NORA is divided into industry sector councils. The goals of the NORA Oil and Gas Sector Council addressed by this survey include:

Research Goal 1.2.1: Identify risk factors for occupational fatalities associated with fatigue among oil and gas extraction workers.

Strategic Goal 2: By 2020, reduce the occupational motor vehicle fatality rate in the oil and gas extraction industry by 50 percent.

Strategic Goal 4: By 2020, reduce the rate of non-fatal occupational injuries in the oil and gas extraction industry by 50 percent.

Strategic Goal 5: By 2020, identify hazards, characterize risk, and prevent chemical exposures, which could lead to occupational illness in workers in the oil and gas extraction industry.

A.2. Purpose and Use of Information Collection.

The purpose of this effort is to collect data that will guide health and safety research and outreach in this high-risk workforce. In particular, this information will: 1) provide a preliminary exploration of potential on-duty and off-duty factors that may affect risk for motor vehicle crashes, injuries and illness among oil and gas extraction workers, 2) provide a snapshot of perceived safety and health needs and concerns (e.g., chemical exposures, respiratory symptoms) of oil and gas extraction workers, a largely non-unionized workforce, 3) assist in generating hypotheses for future research on health and safety topics in this workforce, and 4) provide information to the oil and gas extraction industry and the research community about worker concerns and preliminary research priorities.

This survey will be administered in person using electronic tablets or paper copy to a convenience sample of 500 workers over approximately 1–1.5 years at various oil and gas worksites, contractor meeting sites, temporary lodging facilities, equipment and trucking yards, and training sites where agreement to participate by the company and worker has been obtained.

NIOSH is committed to the concept of Research to Practice (r2p), meaning that we strive to ensure that NIOSH-generated knowledge is used to create practical interventions to reduce illness and injury among workers. We engage stakeholders (e.g., other government agencies, industry partners, subject matter experts, the workers themselves) throughout the process. This ensures that we focus on issues that are of importance to the workers of the specific industry and can be translated into interventions and activities with practical utility within that industry.

The information resulting from this survey will be used as follows:

- Results of the survey will be published in peer-reviewed journals to contribute to the body of scientific knowledge surrounding oil and gas extraction workers.
- The survey results will aid in identification and prioritization of future research activities and resources.
- NIOSH will provide results of survey and relevant recommendations to the National Occupational Research Agenda (NORA) Oil and Gas Sector Council, a council tasked with stimulating innovative research and interventions to reduce the occurrence of injury and illness at work for the oil and gas

sector. Results and recommendations will also be provided to trade associations within the oil and gas industry (Association of Energy Service Companies [AESC], American Petroleum Institute [API], International Association of Drilling Contractors [IADC]), and regional safety and health networks called “STEPS” networks. The results and recommendations will highlight areas of concern regarding health and safety for workers.

- Evidence-based key safety and health messages will be developed and disseminated to oil and gas extraction workers, based on concerns identified in the survey and scientific evidence of intervention effectiveness or standard OSH practices.
- Once disseminated, oil and gas company Health, Safety, and Environmental teams can use the key health messages we provide to develop targeted trainings and information dissemination.

This study will also stimulate a heightened awareness of the safety and health issues encountered by this worker population and lead to improved decision making by all stakeholders involved in this industry.

If this survey were not administered, we would continue to rely on information from surveys of workers from other industries to extrapolate the health concerns for the large population of oil and gas workers. By assuming that oil and gas workers are like other worker populations, we risk not identifying important industry-specific health issues and injury hazards, which could lead to wasted resources on unnecessary research projects and lack of overall impact in the safety and health of workers. It is feasible that we will find some health concerns among this population which mirror those in other industries with established health and safety messaging; in this case, we can save resources by adapting those resources to oil and gas worker needs.

While this survey is planned as a one-time data collection, it is possible that there will be additional uses for the data that have not yet been determined by the investigators (for example, using this cohort as a comparison group for future surveys). However, any additional use of the data for such purposes would not change any burden estimates or create additional privacy issues for participants of this study.

NIOSH has fully funded this program and is a part of the NIOSH budget through Fiscal Year 2018.

A.3. Use of improved information technology and burden reduction.

It is estimated that 90% of participants will self-administer the survey electronically using tablets that have a touch screen. All multiple choice and short answer questions will be provided in this manner. The remainder of the questions, which are qualitative and may have long answers, will be administered by an interviewer who will enter the responses directly into an electronic tablet or laptop computer. The interviewer-administered format for the long answer questions increases the likelihood that the respondent will give a complete answer because they will not have to type it themselves (which can be cumbersome on a tablet). During recruitment, researchers will also offer the worker the option to have the entire survey administered by an interviewer. By doing so, this decreases the likelihood that low-literacy individuals will not participate in the survey. Workers will also be offered the option to complete the questionnaire in a hard copy format to accommodate workers who are not comfortable with the tablet technology.

The electronic format will allow for skip patterns so that respondents only read questions that are applicable to them. Automatic recording of responses will reduce the need for data entry and cleaning. The questionnaire has been pilot tested and will take approximately 30 minutes for the multiple choice/short answer questions and 10 additional minutes for the interviewer administered questions. The screening form, consent form, non-

respondent questionnaire and questionnaire will be available in English and Spanish. Every effort will be made to have a fluent Spanish speaker/translator on the research team for each trip to answer questions and conduct interviewer administered questions. In the event a Spanish speaker is unavailable for the research team, translators will be arranged to be available on-call over the phone when needed.

A.4. Effort to Identify Duplication and Use of Similar Information

The only known survey that has collected worker safety and health information is the National Health Interview Survey (NHIS), which contains an occupational safety and health (OSH) module. NIOSH analyzed this module's data by industry subsector. For the majority of OSH questions, estimates were not able to be given due to the small sample of oil and gas workers surveyed in the NHIS. The results for oil and gas extraction can be found at <http://www.cdc.gov/niosh/topics/nhis/mining.html>.

The NIOSH Oil and Gas Program has conducted several comprehensive searches to identify available literature regarding occupational safety and health research related to U.S. land-based oil and gas extraction workers. While limited, available research has been focused on fatalities¹⁻⁵ and specific chemical exposures, including respirable silica and volatile organic compounds⁶⁻⁸. After many discussions with industry partners and attendance at many industry safety and health conferences, we are unaware of any data collection being conducted that would allow for examination of the associations among health conditions, injuries, sleep quality and quantity, health behavior, and working conditions among U.S. land-based oil and gas extraction workers.

A recent study of long haul truck drivers was conducted by NIOSH that collected similar information on health conditions, health behavior, injuries and sleep as is proposed in this study⁹. While this is a different worker population, it might be a useful comparison group for estimates found in this study.

The Survey of Occupational Injuries and Illnesses (SOII)* generates national estimates of non-fatal occupational injuries and illness by industry and occupation, but it has a number of limitations. First, only diseases that are recognized as 'occupational diseases' — for instance, skin irritation or rashes — are included in SOII. Our proposed survey will collect data on a variety of health conditions without regard to the perceived origin of the condition. Second, the magnitude of nonfatal occupational injuries and illnesses among oil and gas extraction workers may be underestimated, since self-employed workers are excluded from SOII. Finally, the most detailed SOII data cover only injuries and illnesses that require days away from work, thus excluding injuries that might result in a change of duties or other limitations to working.

Studies of oil and gas workers in offshore settings internationally have been conducted, focusing primarily on stress, psychosocial factors, and safety culture¹⁰⁻¹². However, no similar questionnaires have been conducted with U.S. land-based oil and gas extraction workers. Many of these workers are now working in remote areas and often staying in temporary lodging facilities away from their homes. The psycho-social impacts for these workers may be similar to what is found for offshore oil and gas workers.

A.5. Impact on Small Businesses or Other Small Entities.

A proportion of this industry is comprised of workers employed by small businesses. However, participation in the survey is voluntary and will only be conducted when the worker and supervisor agrees that there is time for

* <http://www.bls.gov/respondents/iif/>

the worker to complete the survey without interfering with or delaying the work operation. The number of questions have been kept to a minimum and include only what are considered essential topics.

A.6. Consequences of Collecting Information Less Frequently.

This request is for a one-time data collection. If this data collection does not take place, industry leaders and federal programs will not be able to make evidence-based decisions regarding the safety and health concerns of oil and gas extraction workers. Additionally, this data collection will inform NIOSH's research agenda by aiding in prioritization of research activities and resources. There are no legal or technical obstacles to reduce the burden as this is a one-time data collection.

A.7. Special Circumstances Relating to the Guidelines of 5 CFR 1320.5

This request fully complies with the regulation 5 CFR 1320.5

A.8. Comments in Response to the Federal Register Notice and Efforts to Consult Outside the Agency

A. A 60-day Federal Register Notice was published in the *Federal Register* on 08/10, vol. 81, No. 154, pp. 52870-52872 (see Attachment B). There were no comments posted.

B. The following individuals outside the agency were consulted on this ICR during 2015.

Kenny Jordan, Executive Director, AESC (Association of Energy Service Companies), kjordan@aesc.net, 713-781-0758

Meredith Towle, MPH, Occupational Epidemiologist, State of Wyoming, Meredith.towle@wyo.gov, (307) 777-7671

Rebecca L. Reindel, MS, MPH, AFL-CIO Safety and Health, rreindel@aflcio.org, (202) 637-5003

Jim Melius and Walter Jones, Laborers Health and Safety Fund, jonesw@lhsfna.org and melius@nysliuna.org, 202-628-5465

Tiffany Rice, MS CSP, Assistant Professor, Oil and Gas, West Virginia University, Safety and Health Extension, tiffany.rice@mail.wvu.edu, 304-293-2852

Warren Hubler, Vice President, Health and Safety, Helmerich & Payne, Inc., warren.hubler@hpidc.com, (918) 742-5531

Rick Ingram, Health and Safety Advisor, BP Lower 48 Onshore, (Member NACOSH), rickey.ingram@bp.com, (281)366-5854

Michael Kosnett, MD, MPH, Medical Toxicologist and Associate Clinical Professor, University of Colorado Denver, michael.kosnett@ucdenver.edu, (303)571-5778

A.9. Explanation of Any Payment or Gift to Respondents

It is important to maximize response rates during information collection. There have not been any other similar information collection efforts in the land-based oil and gas extraction workforce, so it is difficult to determine workers' willingness to participate. Additionally, the typical oil and gas extraction worker is on duty for long shifts (at least 12 hours) and may have long commutes to remote well sites; as such, requesting that workers complete the questionnaire while off-duty at temporary lodging sites will also be challenging, as free time can be very limited. Based on the experience of NIOSH survey teams with similar populations (such as the Coal Workers' Health Surveillance Program), we believe small tokens of appreciation are important for building awareness of a program and increasing participation in survey activities. Therefore, we feel that offering appreciative tokens to the oil and gas extraction workers will serve to increase response rates from individual workers. Additionally, these tokens will serve as advertising for participating in the survey, further increasing our overall response rate.

We plan to offer all oil and gas extraction workers that we contact about the survey (whether in person or via a letter on their door at the man camps) a NIOSH hard hat sticker. These stickers are very popular among oil and gas extraction workers and will likely attract additional participants. We will offer an additional token of appreciation to those workers who complete the survey. If the workers are on-duty (i.e., being paid by their employer) at the time of survey completion, they will be offered a \$10 gift card. If they are off-duty, they will be offered a \$30 gift card. Though we edited the survey to include only essential questions to meet our goal, it is relatively lengthy; thus, we feel that this additional token of appreciation will encourage participants to complete the survey in total (i.e., it will help ensure that data quality at the end of the survey is similar to that of the beginning of the survey).

For those workers who refuse the full survey, but are willing to complete the brief non-respondent questionnaire (Attachment D), we will offer additional hard hat stickers. This will maximize participation in the non-respondent survey, allowing us to compare those who did not respond to those who did (increasing our ability to generalize our findings).

Note that if we are on a work site and the company does not want us to distribute these tokens of appreciation to their workers while they are on-duty, we will respect the company's decision and not distribute tokens of appreciation.

A.10. Protection of the Privacy & Confidentiality of Information Provided by Respondents

This submission has been reviewed by the CDC Privacy Officer who determined that the Privacy Act does not apply. The privacy act does not apply because the survey responses (i.e. records) will not be retrieved using a personal identifier. Further noted is that no personal identifying information (PII) will be recorded (e.g. names, social security numbers, or any other unique identifier) as a part of the data collection.

If needed at recruiting sites, researchers may obtain a list of names, e-mail addresses, and/or phone numbers for workers at the worksite. This list will be used only for scheduling and to track the proportion of workers who complete the questionnaire and non-response questionnaires (Attachment H). This list of personal identifiers will not be a part of data collection and will be managed by the agency in a responsible and secure manner. Once the site visit is completed and response rates calculated, this list containing personal identifiers will be

deleted from the researcher computers or shredded, if maintained as a hard copy. Data will not be disclosed, unless otherwise compelled by law.

Verbal consent will be obtained from participating oil and gas extraction workers (Attachment F) in which NIOSH will explain risks of participation, describe intended uses of the information, explain that participation is voluntary, and that they may discontinue the questionnaire at any time. The questionnaire will collect potentially sensitive information about health status, injury, and safety and health concerns. Benefits to participants include increased knowledge of safety and health issues of workers in this industry and targeted prevention programs based on the information NIOSH gains from this survey. The questionnaire will be completed in an area where privacy to the worker is assured.

Only aggregated data from this survey will be published. Oil and gas operators and other participating oil and gas contractors will not receive data on individual workers and reports will not contain company identifiers. Any possibility of indirectly identifiable information will be considered carefully when stratifying results by age, gender, occupation, etc.

Information will be stored on the third party web application, Qualtrics, whose log-in information is accessible only to researchers on this project. Information will also be transferred to encrypted NIOSH-owned computer systems, which require a 2-step authentication for access. In the field, authorized NIOSH staff will be in continuous possession of any tablets when not being used by research participants. Computers containing survey response data related to this project will be kept secure by NIOSH staff at all times. Long-term data storage will be on secure NIOSH servers. Access to the data will be limited to authorized NIOSH project staff for the purpose of performing research on prevalence of injuries/illness and their associated risk factors, to use as a basis for designing or evaluating interventions and to identify subgroups of workers at increased risk for further study.

This dataset will not contain PII.

A.10.1. Privacy Impact Assessment Information

No privacy impact assessment was needed because data collection does not involve records containing information in identifiable form, in accordance with the E-Government Act of 2002, Section 208.

A.11. Institutional Review Board (IRB) and Justification for Sensitive Questions

IRB Approval

The proposed data collection was reviewed and approved by the NIOSH Human Subjects Research Board (15-WSD-01XP)(Attachment E).

Sensitive Questions

The proposed questionnaire contains questions that may be sensitive in nature, including questions regarding chronic diseases (heart disease, diabetes, cancer), health and personal habits, driving habits, awareness of

hazards, history of injuries on the job, health and safety concerns, and opinions regarding the emphasis that their employer places on the health and safety of workers.

Because some questions are sensitive in nature, data will be treated in a secure manner and will not be disclosed, unless otherwise compelled by law. Responses will be aggregated to a level that ensures responses will not be identifiable.

The potentially sensitive questions are needed to determine key safety and health hazards and concerns for these workers so that appropriate recommendations can be made regarding the best policies, interventions, or work practices to prevent or mitigate these hazards. To effectively improve the safety and health of oil and gas extraction workers, NIOSH also needs an understanding of the risk factors for injuries and illness for this workforce. Therefore, it is important to collect data regarding health and personal habits, driving and other on-the-job safety habits, and elements of the work environment (including safety climate and safety policies). An understanding of the prevalence of these risk/protective factors, and associations between these factors and a history of injury or illness, will also allow NIOSH to develop recommendations to improve the safety and health of oil and gas extraction workers. This knowledge will also be used to assist oil and gas operators in making changes to improve the safety and health of their workers and to guide future research on specific hazards among oil and gas extraction workers.

A.12. Provide estimates of the hour burden of the collection of information.

A. Annualized Burden to Respondents

No direct costs will accrue to respondents other than their time to complete the screening and questionnaire. We estimate a total annual estimated response burden of 154 hours for this information collection. This burden will be incurred for two years. This estimate is based upon an annual estimated 313 workers to be screened, with 250 eligible workers that agree to do the general portion of the questionnaire (80% response rate). We estimate that 90% of workers will complete the questionnaire using the electronic tablet (225 workers) and 10% of workers will opt to complete a hard copy version (25 workers). We estimate that approximately 75% of eligible workers drive as a part of their work duties and will complete the motor vehicle module; 90% of workers will use the tablet version and 10% of workers will complete a hardcopy (168 workers and 19 workers respectively). This estimate accounts for the time each respondent spends reading and signing the consent form and completing the questionnaire. The average burden per response is based on estimates from the pilot test. The following table provides an estimates of the annualized burden hours.

Table A12.1 Estimated Annualized Time Burden to Respondents

Type of Respondent	Form Name	Number of Respondents	Number of responses per respondent	Average burden per response (in minutes per hour)	Total burden (in hours)
Screening of workers	Module 1: Screening	313	1	5/60	26
Oil and Gas Extraction Workers	Non Respondent Questionnaire	63	1	5/60	5
Oil and Gas Extraction Workers	Tablet Version Module 2: General	225	1	25/60	94

	Module 3: Well Site Work, and Module 5: Closing Questions (survey and qualitative interview)				
Oil and Gas Extraction Workers	Hardcopy Module 2: General Module 3: Well Site Work, and Module 5: Closing Questions (survey and qualitative interview)	25	1	25/60	10
Oil and Gas Extraction Workers who drive at work	Tablet Version Module 4: Motor Vehicle (tablet)	168	1	5/60	14
Oil and Gas Extraction Workers who drive at work	Hardcopy Module 4: Motor Vehicle	19	1	5/60	2
Total					151

B. Annualized Cost to Respondents

The estimated annualized cost to the respondent population for the questionnaire is \$4,524 based on the average costs per burden hour and the burden hours as shown below. This burden will occur for two years of information collection.

Table A12.2 Estimated Annualized Cost Burden to Respondents

Type of Respondent	Form Name	Total Burden Hours	Hourly Wage Rate*	Total Respondent Costs
Screening of workers	Module 1: Screening	26	\$29.36	\$763
Oil and Gas Extraction Workers	Non-respondent questionnaire	5	\$29.36	\$147
Oil and Gas Extraction Workers	Tablet Version Modules 2: General Module 3: Well Site Work, and Module 5: Closing Questions	94	\$29.36	\$2760
Oil and Gas Extraction Workers	Hard Copy Version Modules 2: General Module 3: Well Site Work, and	10	\$29.36	\$294

	Module 5: Closing Questions			
Oil and Gas Extraction Workers who drive at work	Tablet Version Module 4: Motor Vehicle	14	\$29.36	\$412
Oil and Gas Extraction Workers who drive at work	Hard Copy Version Module 4: Motor Vehicle	2	\$29.36	\$59
Total		154		\$4435

The wage estimate was obtained from the Department of Labor, Bureau of Labor Statistics, National Occupational Employment and Wage Estimates- Current Employment and Wages from Occupational Employment Statistics (OES) Survey (<http://www.bls.gov/oes>) using the May 2014 estimates. The highest mean hourly wage for the category 'Extraction workers', 47-5000, was used, which was for Rotary Drill Operators, Oil and Gas.

A.13. Estimates of Other Total Annual Cost Burden to Respondents or Record Keepers

There are no additional cost burdens to respondents or record keepers.

A.14. Annualized Cost to the Government

The annualized cost to the government is approximately \$174,584 for each of the four years of the study, of which two years involve data collection. The total cost for the entire four year period is \$698,336. Costs include personnel charges for NIOSH personnel, including contractors, equipment, supplies and printing costs, and travel-related costs.

Table A14.1. Estimated Annualized Cost to the Federal Government

	Annualized Cost
NIOSH Personnel	\$127,425
Contracts/Services	\$20,767
Supplies	\$1,000
Travel	\$14,058
Equipment	\$2,334
Other (Tokens of Appreciation, Printing, Shipping)	\$7,500
Total	\$173,084

A.15. Explanation for Program Changes or Adjustments

This is a new data collection.

A.16. Plans for Tabulation and Publication and Project Time Schedule

Descriptive and statistical methods will be used to analyze the data. Responses for each question will be aggregated and reported with simple proportions. Results may be stratified by occupation, company type, or another logical stratification. However, results will not be stratified where the numbers are too small and could result in unintentional identification of respondents. Multivariate logistic regression will be used to evaluate associations between injury/illness and health and personal habits, driving and other on-the-job safety habits, and elements of the work environment (including safety climate and safety policies).

Table A.16.1. Project Time Schedule

Activity	Time Schedule
Develop database to collect questionnaire responses	During OMB Review
Outreach to oil and gas companies to identify potential participants	During OMB Review
Data Collection	1-24 months after OMB Approval
Data Cleaning	12-25 months after OMB Approval
Data Analysis	25-27 months after OMB Approval
Publication	28-36 months after OMB Approval

A.17. Reason(s) Display of OMB Expiration Date is Inappropriate

The display of the OMB expiration date is not inappropriate.

A.18. Exceptions to Certification for Paperwork Reduction Act Submissions

There are no exceptions to the certification.

References

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