

Oklahoma Hydraulic Fracturing State Review

January, 2011



TABLE OF CONTENTS

INTRODUCTION.....	2
EXECUTIVE SUMMARY.....	4
HYDRAULIC FRACTURING	
Background.....	7
General.....	7
Standards.....	10
Reporting.....	13
Staffing and Training.....	15
Public Information.....	16
Water and Waste Management.....	16
APPENDIX A: GLOSSARY OF ACRONYMS.....	18
APPENDIX B: COMPLETED OKLAHOMA QUESTIONNAIRE.....	19

INTRODUCTION

In 1990, the Interstate Oil Compact Commission (IOCC) and the U.S. Environmental Protection Agency (USEPA) jointly published a Study of State Regulation of Oil and Gas Exploration and Production Waste, which contained guidelines for the regulation of oil and gas exploration and production wastes by the IOCC member states (the “1990 Guidelines”). The published guidelines, developed by state, environmental and industry stakeholders, provided the basis for the State Review Program, a multi-stakeholder review of state exploration and production (E&P) waste management programs against the guidelines. The purposes of the State Review Process are to document the successes of states in regulating E&P wastes and to offer recommendations for program improvement. In 1994, the guidelines were updated and revised (the “1994 Guidelines”) by the IOCC, now named the Interstate Oil and Gas Compact Commission (IOGCC).

In 1999, administration of the State Review Program devolved to a non-profit, multi-stakeholder organization named State Review of Oil and Natural Gas Environmental Regulations, Inc. (STRONGER). STRONGER again revised, expanded and updated the Guidelines, which were accepted by the IOGCC and published in June 2000 as Guidelines for the Review of State Oil and Natural Gas Environmental Regulatory Programs (the “2000 Guidelines”). In 2005, STRONGER again revised, expanded and updated the Guidelines (the “2005 Guidelines”).

In 2009, STRONGER formed a Hydraulic Fracturing Workgroup consisting of stakeholders to review issues associated with hydraulic fracturing and develop guidelines for state regulatory programs to address identified issues. After several meetings and a round of public comment, the workgroup submitted to STRONGER a set of guidelines that represented the consensus of the workgroup. In 2010, STRONGER distributed the workgroup’s guidelines (the “2010 Hydraulic Fracturing Guidelines”) for state regulation of hydraulic fracturing. Those guidelines were used as the basis of this review.

In August 2010, the Oklahoma Corporation Commission (OCC) volunteered to have its hydraulic fracturing program reviewed by STRONGER. The Oklahoma oil and gas regulatory program has undergone three prior reviews. The report of the initial review of the Oklahoma oil and gas regulatory program was published in 1992. A report of actions taken in response to recommendations from the 1992 review was published in 1995. The report of the next follow-up review, conducted after the guidelines were revised, was published in 2004.

The current review began with a questionnaire that was sent to the OCC Oil and Gas Conservation Division (OGCD). The questionnaire had been prepared by the STRONGER Board. STRONGER intended the questionnaire to capture the status of the Oklahoma program relative to the 2010 Hydraulic Fracturing Guidelines. The OGCD prepared a response to the questionnaire, which was then sent to the review team.

In October 2010 through January 2011 a seven-person team appointed by STRONGER conducted a review to evaluate the OCC program compared to the 2010 Hydraulic Fracturing Guidelines. The review team consisted of three team members and four official observers. The three team members were: Leslie Savage, Texas Railroad Commission; Wilma Subra, Subra Co.,

New Iberia, Louisiana; and Jim Collins, Independent Petroleum Association of America. The official observers were: Hal Fitch, Michigan Department of Natural Resources and Environment; Angie Burckhalter, Oklahoma Independent Petroleum Association; Bud Scott, Oklahoma Chapter of the Sierra Club; and Michael Overbay, USEPA Region VI.

The review team conducted a meeting, the in-state portion of the review, in the conference facilities of the OCC in Oklahoma City, Oklahoma on October 19, 2010. Ms. Lori Wrotenbery, Director of the Oil and Gas Conservation Division, presented an overview of hydraulic fracturing requirements in Oklahoma, and Ms. Julie Cunningham of the Oklahoma Water Resources Board (OWRB) presented an overview of the water resources management program. Ms. Wrotenbery, Mr. Tim Baker, Mr. Ron Dunkin, and Mr. Wayne Wright of the OGCD, and Ms. Cunningham of the OWRB responded to questions from the team members and official observers. In addition to the Oklahoma state representatives who participated in the review and the review team, there were sixteen industry and nine state government attendees who observed the proceedings. Following the meeting and after reviewing the written materials provided by the OGCD, the team members compiled this review report.

This is the report of the review of the Oklahoma program against the 2010 Hydraulic Fracturing Guidelines of STRONGER. Appendix A is a glossary of acronyms used in the report. Appendix B contains Oklahoma's written response to the STRONGER questionnaire.

EXECUTIVE SUMMARY

An in-depth review of the Oklahoma hydraulic fracturing regulatory program has been completed by a multi-stakeholder review team. The review team has concluded that the Oklahoma program is, over all, well-managed, professional and meeting its program objectives. The review team also made recommendations for improvements in the program.

Program Strengths

During the 2010 review of Oklahoma's regulation of hydraulic fracturing, the review team and observers were granted full access to OGCD staff, and all questions were answered in a responsive and open manner. During the review, the review team identified strengths of the Oklahoma program, which also are noted in several of the report's findings. The following offers an overview of some of the Oklahoma program's strengths.

1. Comprehensive Regulations

The OGCD recently conducted a statewide assessment of the issues and risks associated with hydraulic fracturing. The OCC incorporated regulatory measures necessary to address those risks into revisions of various rules referenced in OCC Rule 165:10-3-10. These measures address well completion operations, including hydraulic fracturing and the storage and recycling of flowback fluids. The OCC is commended for this comprehensive program update.

2. Comprehensive Standards

The OCC has developed comprehensive regulatory standards for hydraulic fracturing. These rules are listed in OCC Rule 165:10-3-10, which regulates well completion operations. OCC Rule 165:10-3-10 (a) provides a general prohibition against pollution of any surface or subsurface fresh water from well completion activities. OCC Rule 165:10-3-10 (b) provides a rule reference guide to the 35 other OCC rules regarding the management of hydraulic fracturing operations. These comprehensive standards provide a model for other states.

3. Five-Year Planning Process

The OGCD has prepared and is implementing a 5-year strategic plan that contains specific goals and includes hydraulic fracturing in the goals. The review team views the plan as a positive program management tool and commends the OGCD for this action.

4. Guardian Guidance

A guidance document, referred to as the “OCC Guardian Guidance” has been developed and distributed widely (printed form and the OCC website). The Guardian Guidance provides a step-by-step process an operator follows to assess, clean up if necessary, and close: 1) historically impacted sites and 2) complex and/or unusually extensive sites, and sites that have known or likely impacts to ground water or surface water. The Guardian Guidance is used by operators in developing remediation plans and by the OGCD in approving them. The review team commends the OGCD for the development and distribution of this document.

Program Recommendations

The following are the primary areas where recommendations are made by the review team for improvements of the Oklahoma hydraulic fracturing program. Discussion and findings for these recommendations can be found in the various sections of the report. Readers are encouraged to review the specific discussion and finding for each recommendation.

1. Notification of Hydraulic Fracturing

Prior notification of hydraulic fracturing operations, while not specifically required in regulation, is accomplished through regular visits to the well site during drilling and receipt from the operator of the hydraulic fracturing schedule.

Although the review team considered this to be sufficient for meeting the intent of the STRONGER guidelines for wells being drilled, notice should be given to the OGCD for wells to be fractured that have been in production.

2. Well Completion Reports

Well completion reports are required to be filed within 30 days of completion of the well. Form 1002A is used to file the report. Volumes of hydraulic fracturing fluid and proppant used are reported in the same text field.

The review team recommends that OGCD, as part of the conversion of its data management system to RBDMS, revise the well completion form to include

individual fields for reporting aggregate volumes of fracturing fluids and proppant used, the fracture pressures recorded, pressure behind the casing and hydraulic fracture materials used.

3. Program Funding

The OGCD is doing a good job with the resources they have, especially by taking advantage of technology and prioritizing the workload. However, rig activity has increased 40% over last year, so demand on staff resources is increasing.

The review team recommends that the State of Oklahoma develop a more stable source of funding for the OGCD and provide resources to allow the filling of positions and provision of equipment to a level that is sufficient to meet program responsibilities.

HYDRAULIC FRACTURING

I. BACKGROUND

Oil and gas have been produced in Oklahoma since the early 1900's. Oil and gas are produced throughout much of the state. Presently there are about 2,660 active operators, 137,800 active wells (43,600 gas, 83,700 oil and 10,500 injection/disposal), and thousands of miles of gathering and transmission pipelines. There are approximately 320,000 plugged and abandoned wells in Oklahoma.

Recently the Woodford Shale has become an important source of natural gas. Woodford Shale development has occurred primarily in the southeast, west-central and south-central portion of Oklahoma. The development of the Woodford Shale has been spurred by horizontal drilling and hydraulic fracturing technologies.

The Oklahoma Corporation Commission (OCC) is the regulatory agency in Oklahoma responsible for the regulation of oil and gas drilling and production. The OCC was established in 1907, and began to regulate oil drilling and production in 1914.

Hydraulic fracturing has been conducted in Oklahoma for over 60 years. More than 100,000 wells have been hydraulically fractured. The State of Oklahoma has not identified any instances where hydraulic fracturing has harmed groundwater.

II. GENERAL

The OCC is the agency in Oklahoma responsible for the regulation of oil and gas drilling and production, pipeline safety, petroleum storage tanks and filling stations, public utilities (natural gas, electric, telephone), trucking, and railroad crossings. Oil and gas E&P activities are regulated under the authority of the Oil and Gas Conservation Act which was passed by the Legislature in 1915. The OCC has primacy for the Class II Underground Injection Control program.

The OCC is comprised of three elected commissioners. The OCC has legislative, judicial and administrative authority. OCC orders are appealable to the Oklahoma Supreme Court.

The OCC has nine divisions: Administration, Administrative Proceedings, Consumer Services, General Counsel, Information Technology, Oil and Gas, Petroleum Storage Tank, Public Utility and Transportation.

The Oil and Gas Conservation Division (OGCD) regulates oil and gas well drilling and production activities in a manner that prevents waste, safeguards mineral property rights, protects the environment, and ensures public safety.

The OGCD is divided into three departments: Field Operations, Technical Services, and Pollution Abatement. The Division's main office is in Oklahoma City. The Field Operations Department has 48 inspectors located in four regions. Regional offices are located in Bristow, Kingfisher, Duncan and Ada.

The Oklahoma Water Resources Board (OWRB) regulates water use in Oklahoma. The mission of the OWRB is to manage, protect and improve the water resources of the state and plan for Oklahoma's long-range water needs in a responsive, innovative and professional manner. The Board is made up of nine members appointed by the Governor. The OWRB is divided into four Divisions: Planning and Management, Financial Assistance, Water Quality and Administrative Services.

Oklahoma law requires any person who uses groundwater or water from a stream to obtain a permit from the OWRB. The use of water for domestic purposes does not require a permit. Permits are either long-term (one year or more) or short-term. Short-term permits cannot be renewed.

Surface water in Oklahoma is considered public water. As such, it can be used by anyone who obtains a permit for non-domestic use. In general, the first person to apply for a stream water right establishes a right superior to later applicants (i.e., "first in time, first in right"). Stream water permits specify the amount of water and the length of time for use. Failure to use the permitted amount of water in the specified time will result in a cancellation or reduction of the stream water right.

Groundwater belongs to the land surface owner and may be used subject to the Oklahoma Groundwater Law. A permit is required for non-domestic use. In order to obtain a permit, an applicant must prove that they own or lease the land surface, that the land lies over a groundwater basin, that the proposed use will be beneficial, and that waste of groundwater will not occur.

The largest volume water uses are for agriculture and public supply. About 2% of water use is for oil and gas activities.

The OWRB has developed and is currently engaged in a multi-year process of updating the Oklahoma Comprehensive Water Plan. The Plan addresses water needs across the state, including water needs for development of oil and gas resources including the Woodford Shale.

The Oklahoma Department of Environmental Quality (ODEQ) is divided into five divisions: Air Quality, Water Quality, Land Protection, Customer Services, and Environmental Complaints & Local Services. The Water Quality Division regulates facilities that treat, transport, store, and discharge wastewater other than wastewater associated with oil and gas exploration and production. ODEQ regulates air quality and Naturally Occurring Radioactive Materials (NORM) related to oil and gas exploration and production.

The Oklahoma Energy Resources Board (OERB) provides for the cleanup of abandoned oil field sites and for public education. The OERB activities are funded by a voluntary one-tenth of one percent assessment on the sale of oil and gas, paid by producers and royalty owners. The assessment is sent to the Oklahoma Tax Commission in the same manner as the payment of gross production tax. Any producer or royalty owner who does not wish to participate can apply for a refund. Historically, 95 percent of all OERB contributions remain in the fund. The OERB has cleaned up over 10,600 sites since its inception.

The OCC has developed close working relationships with the OWRB and OERB. The OCC has utilized the OWRB as a resource to address issues related to water use for hydraulic fracturing. The OCC abandoned well plugging program and the OERB abandoned site program work cooperatively to address legacy oil and gas problems.

The OGCD conducts its hydraulic fracturing regulatory activities under the authority of OCC rules. Recently the OGCD conducted an evaluation of hydraulic fracturing activities. During the evaluation the OGCD comprehensively reviewed hydraulic fracturing operations and past and current trends. Following the evaluation, the OCC completed rulemaking to update Oklahoma's hydraulic fracturing regulations. The STRONGER hydraulic fracturing guidelines were used in developing the rule changes. These rules are listed in OCC Rule 165:10-3-10, which regulates well completion operations. OCC Rule 165:10-3-10 (a) provides a general prohibition against pollution of any surface or subsurface fresh water from well completion activities. OCC Rule 165:10-3-10 (b) provides a rule reference guide to the 35 other OCC rules regarding the management of hydraulic fracturing operations.

The OCC has been delegated primacy from USEPA for the Class II Underground Injection Control (UIC) program.

The OGCD developed a strategic plan to guide their activities over the five-year period FY 2007 – FY 2011. The plan established five goals. The first goal is to inspect all well and to record the well location utilizing GPS, verify compliance, and update the well records. From July 1, 2006 to June 30, 2010, OGCD staff inspected 139,709 wells.

The second goal of the plan is to improve OGCD information systems by expanding e-filing, developing capabilities to file field reports electronically, replacing legacy computer systems with the Risk Based Data Management System (RBDMS) which is becoming commonly used by oil and gas states, completing data entry (e.g. plugging), and increasing the use of GIS capabilities.

The third goal is to increase well data compliance by using the compliance tracking system to assure the receipt of well completion reports, injection volume reports and mechanical integrity test reports.

The fourth goal is to reduce backlogs. To date OGCD has eliminated the backlog of completion reports, completed the inventory of orphan wells, and plugged high priority orphan wells. OGCD is plugging all high priority orphan wells promptly as they are discovered.

The fifth goal is to update the rules. In 2007, rulemaking adjusted fees, clarified notification requirements for setting conductor pipe and spudding a well, provided for administrative approval for applications for comingling and multiple completions, distinguished stratigraphic

test holes from seismic operations, addressed new well completions, recognized special aspects of coalbed methane wells, and established rules for the gas seep program. The 2008 rulemaking established rules for the Brownfields program, updated rules for Lake Atoka and McGee Creek Reservoirs, simplified reporting requirements for gas well tests, made technical amendments to soil farming requirements, and addressed STRONGER recommendations from the review conducted in 2004. In 2009, rulemaking provided for administrative approval of UIC applications; suspended well allowable calculations in certain special allocated gas pools; allowed most well test results to be reported on Form 1002A; clarified requirements for cementing horizontal wells, controlling wells during drilling, and controlling spills; and required prior notice to the district office of the setting of conductor pipe. The 2010 rulemaking created the rule referenced guide for hydraulic fracturing, established specific rules for flow-back water pits, updated spacing rules for horizontal wells, made technical amendments to well plugging requirements, made technical amendments to H₂S safety requirements for tanks, provided for administrative approval of production on a vacuum, and cleaned up and standardized rule language.

Finding 9.2.1.

Recently the OGCD conducted an evaluation of hydraulic fracturing activities. During the evaluation the OGCD comprehensively reviewed hydraulic fracturing operations and past and current trends. Following the evaluation, the OCC completed rulemaking to update Oklahoma's hydraulic fracturing regulations. The OCC is commended for this comprehensive program review and update.

Finding 9.2.2.

The OGCD has prepared and is implementing a 5-year strategic plan that contains specific goals and includes hydraulic fracturing in the goals. The review team views the plan as a positive program management tool and commends the OGCD for this action.

STANDARDS

As mentioned above, Oklahoma has developed comprehensive regulatory standards for hydraulic fracturing. These rules are listed in OCC Rule 165:10-3-10, which regulates well completion operations. OCC Rule 165:10-3-10 (a) provides a general prohibition against pollution of any surface or subsurface fresh water from well completion activities. OCC Rule 165:10-3-10 (b) provides a rule reference guide to the 35 other OCC rules regarding the management of hydraulic fracturing operations.

Proper casing and cementing represent the primary means of protecting groundwater during hydraulic fracturing operations. OCC Rule 165:10-3-4 contains minimum casing and cementing standards. Oilfield grade steel casing is required for all casing strings. The OCC has mapped the

base of treatable waters so adequate surface casing depths (a minimum of 50 feet below the base of treatable water) can be readily determined. Minimum cementing intervals are specified. Surface casing is to be cemented by circulating cement to the surface. Production casing is required to be cemented a minimum of 200 feet above producing zones. OGCD inspectors must be given notice 24 hours in advance of cementing so that they have an opportunity to witness the activity. If the inspector does not witness cementing, and in other instances based on site-specific circumstances, a cement bond log can be required. Each string of casing is to be pressure-tested to a minimum of 1,500 pounds or a pressure equal to 2% of depth, whichever is greater. Alternative casing and cementing procedures can be approved.

OCC rules address unanticipated operational or mechanical changes that may be encountered during hydraulic fracturing. Rule 165:10-3-4(c)(7)(l) requires the operator to contact the district office within 24 hours of discovery of a casing problem. OCC Rule 165:10-3-3(b) requires the operator to take immediate action to repair surface or production casing that fails and to notify the district office or the Manger of Pollution Abatement.

With development of the Woodford Shale, the use of larger pits (over 50,000 barrel capacity) to store flowback fluids and water for hydraulic fracturing became necessary. These larger pits have a longer design life. Earlier regulations addressed the temporary storage of flowback water in smaller pits used in the vicinity of drilling operations. The recent rulemaking included measures related to the larger flowback water recycling pits. OCC Rule 165:10-3-13 addresses the construction and maintenance of tanks. OCC Rule 165:10-3-29 covers the use of dikes and retaining walls. OCC Rule 165-10-7-16 specifies requirements for the construction, operation siting, and maintenance of noncommercial pits used for temporary storage of flowback water. OCC Rule 165-10-9-4 addresses commercial recycling pits.

In some cases additional requirements are imposed. Special construction and operating requirements apply in wellhead protection areas and hydrologically sensitive areas. OCC Rule 165-10-29-1 and various Commission orders contain special field rules that apply in the vicinity of municipal water supplies. Noncommercial flowback water recycling pits with over 50,000 barrels capacity and commercial facilities are required to install monitoring wells or leachate collection systems. If a leak occurs, a remediation plan is required.

Contingency planning and spill risk management are addressed in the rules. OCC Rule 165-10-7-5(c)(1)(A) and 165:10-7-5(c)(1)(D) require notification of the district office or field inspector within 24 hours of discovery of a spill and follow-up reporting within 10 days describing the event. OCC Rule 165:10-7-7(c) authorizes the district manager or field inspector to require actions to stop or clean up pollution. This can include temporarily shutting down a lease or facility. If an operator cannot be contacted, the OCC is authorized to take necessary emergency action to stop pollution.

A guidance document, referred to as the “OCC Guardian Guidance” has been developed and distributed widely (printed form and the OCC website). The Guardian Guidance provides a step-by-step process an operator follows to assess, clean up if necessary, and close: 1) historically impacted sites and 2) complex and/or unusually extensive sites, and sites that have known or likely impacts to ground water or surface water. The Guardian Guidance is used by operators in developing remediation plans and by the OGCD in approving them.

The OGCD, when testing for contamination in responding to a spill or complaint, has an established protocol for sampling and analyzing for chemicals of concern based on the type of waste or incident being investigated. Salt is used as a key indicator and primary constituent of concern when characterizing flowback water and other hydraulic fracturing waste materials. If the basic chemical analysis indicates possible contamination, OGCD will analyze for additional constituents as necessary to identify the source and delineate the nature and extent of the contamination.

OCC Rule 165:10-7-24 incorporates the waste management hierarchy into a waste management practices reference chart. This rule lists typical waste streams and encourages beneficial use of the waste.

OCC Rule 165:10-5-7(c) requires commercial disposal well operators to maintain a log recording the amount, source, operator and/or owner of all wastes received for disposal. Logs must be kept for at least five years. Trucks that haul the waste must be licensed by the OCC Transportation Division. Waste haulers are required to maintain run tickets that contain the amount and origin of wastes they haul. OCC Rules 165:5-1-25 through 165:5-1-30 provide a formal structure for managing complaints. They address the response period, steps and timelines for action. Complaints are logged on an incident report. A field inspection is conducted, the person filling the complaint is contacted within 48 hours, and an update on Form 1085 is prepared. The district office sends a response within 5 days, and the complaint is either referred to pollution abatement or it is closed. The person filing the complaint receives notification of this action.

Finding 9.2.1.1.

The OCC has developed comprehensive regulatory standards for hydraulic fracturing. These rules are listed in OCC Rule 165:10-3-10, which regulates well completion operations. OCC Rule 165:10-3-10 (a) provides a general prohibition against pollution of any surface or subsurface fresh water from well completion activities. OCC Rule 165:10-3-10 (b) provides a rule reference guide to the 35 other OCC rules regarding the management of hydraulic fracturing operations. These comprehensive standards provide a model for other states.

Finding 9.2.1.2.

A guidance document, referred to as the “OCC Guardian Guidance” has been developed and distributed widely (printed form and the OCC website). The Guardian Guidance provides a step-by-step process an operator follows to assess, clean up if necessary, and close: 1) historically impacted sites and 2) complex and/or unusually extensive sites, and sites that have known or likely impacts to ground water or surface water. The Guardian Guidance is used by operators in developing remediation plans and by the OGCD in approving them. The review team commends the OGCD for the development and distribution of this document.

Finding 9.2.1.3.

The OGCD considers salt to be the primary constituent of concern when characterizing flowback water and other hydraulic fracturing waste materials. They use TDS as a key indicator when conducting initial field investigations. The OGCD has an established protocol for sampling and testing for chemicals of concern based on the type of waste or incident being investigated. If the basic chemical analysis indicates possible contamination, they will analyze for additional constituents as necessary to identify the source and delineate the nature and extent of the contamination.

Finding 9.2.1.4.

Noncommercial flowback water recycling pits with over 50,000 barrels capacity and commercial facilities are required to install monitoring wells or leachate collection systems. Hydrologically sensitive areas are not defined in the OCC rules pertaining to these facilities nor is there a direct reference to where such definition may be obtained.

Recommendation 9.2.1.4.

OCC rules should be amended to include a definition of hydrologically sensitive areas or to provide appropriate reference to such a definition. (STRONGER Guidelines, Section 9.2.1.)

REPORTING

OCC Rule 165:10-3-4(e) and (k) require the operator to give notice 24 hours before setting surface casing or cementing surface or other casing strings. No separate notification is required prior to hydraulic fracturing. Field staff makes regular visits to the well site while the well is being drilled, and receive the schedule for hydraulic fracturing from the operator. OCC Rules 165:10-7-16(e)(6), 165:10-7-16(f)(2)(K), 165:10-7-16(f)(3)(iii), 165:10-7-16(M)(6) and 165:10-7-(M)(9) provide the inspector with notice and inspection opportunity for pits used for flowback water.

OCC Rule 165:10-3-25 requires an operator to submit a well completion report within 30 days after completion activities. Completion reports are filed on OCC Form 1002A. The volumes of fluids and proppants are reported on the form.

OCC Rule 165:10-1-6(g) provides the OCC with the authority to obtain information on chemicals used in hydraulic fracturing or other E&P operations. The OGCD has used this authority during incident investigations.

As noted earlier, OCC Rule 165-10-7-5(c)(1)(A) and 165:10-7-5(c)(1)(D) require notification of the district office or field inspector within 24 hours of discovery of a spill and follow-up reporting within 10 days describing the event. This initial spill reporting can be verbal or written. If verbal, OGCD staff complete a written report from the verbal notification.

The Oklahoma Hazardous Materials Emergency Response Commission (OHMERC) implements the federal Emergency Planning and Community Right-to-Know Act (EPCRA). Under EPCRA, doctors and other emergency personnel can obtain information on chemical constituents in hydraulic fracturing fluids in the event of an emergency situation. In Oklahoma, they can obtain this information with the assistance of the OHMERC.

The Open Records Act (51 O.S. 24A.19) provides for the treatment of confidential information that may be submitted to the OGCD. The OGCD indicated that it has not received any requests to keep hydraulic fracturing information confidential.

Finding 9.2.2.1.

Prior notification of hydraulic fracturing operations, while not specifically required in regulation, is accomplished through regular visits to the well site during drilling and receipt from the operator of the hydraulic fracturing schedule.

Recommendation 9.2.2.1.

Although the review team considered this to be sufficient for meeting the intent of the STRONGER guidelines for wells being drilled, notice should be given to the OGCD for wells to be fractured that have been in production. (STRONGER Guidelines Section 9.2.2.)

Finding 9.2.2.2.

Well completion reports are required to be filed within 30 days of completion of the well. Form 1002A is used to file the report. Volumes of hydraulic fracturing fluid and proppant used are reported in the same text field.

Recommendation 9.2.2.2.

The review team recommends that OGCD, as part of the conversion of its data management system to RBDMS, revise the well completion form to include individual fields for reporting aggregate volumes of fracturing fluids and proppant used, the fracture pressures recorded, pressure behind the casing and hydraulic fracture materials used. (STRONGER Guidelines Section 9.2.2.)

STAFFING AND TRAINING

Like many other states, Oklahoma has experienced revenue shortfalls over the past year. Consequently, the OGCD has had to reduce its staff complement. Since 2009, the OGCD staff level has dropped from 125 full time equivalent (FTE) positions to 110 FTE. These cuts have been spread across the OGCD, impacting the central and district offices.

The OGCD has continued to meet many of its operational responsibilities in spite of the cutbacks. This has been accomplished through the use of technology that automates business practices and due to the slowdown in drilling activity. The OGCD has prioritizes its workload, giving highest priority to environmental complaints.

The OGCD routinely invites industry representatives to provide training to OGCD staff on new technologies, including hydraulic fracturing. In addition to mandatory safety and hazardous materials training, other training is provided as resources allow.

Finding 9.2.3.1.

The OGCD is doing a good job with the resources they have, especially by taking advantage of technology and prioritizing the workload. However, rig activity has increased 40% over last year, so demand on staff resources is increasing.

Recommendation 9.2.3.1.

The review team recommends that the State of Oklahoma develop a more stable source of funding for the OGCD and provide resources to allow the filling of positions and provision of equipment to a level that is sufficient to meet program responsibilities. (STRONGER Guidelines, Section 9.2.3.)

Finding 9.2.3.2.

The OGCD utilizes industry professionals to provide specialized training on various subjects, including hydraulic fracturing.

Recommendation 9.2.3.2.

The review team recommends that the OCC provide resources to allow existing OGCD staff the opportunity to receive specialized training related to hydraulic fracturing and to properly train new staff to equip them to properly do their job. (STRONGER Guidelines, Section 9.2.3.)

PUBLIC INFORMATION

The OCC makes use of its website to make available to the public information on current events. They have also posted applicable OCC rules, forms, the Guardian Guidance document and OCGD databases for industry and public use.

The OGCD has been converting its data management system to RBDMS. In addition to improving the OGCD's abilities to track activities and respond to incidents, it will improve public access to information about the program.

OCC staff periodically provides information through town hall meetings, seminars, and other presentations. Recently the OCC has conducted several town hall meetings targeted on the topics of horizontal drilling and hydraulic fracturing.

Finding 9.2.4.1.

The OCC provides public information through its web site and through participation at public events. Public access will improve as RBDMS is implemented.

III. WATER AND WASTE MANAGEMENT

The OWRB regulates the use of both surface water and groundwater. One of the OWRB functions is the permitting of the beneficial uses of water. Water used for oil and gas E&P activities is considered a beneficial use, and as such, a temporary use permit is usually issued for oil and gas activities, including hydraulic fracturing. It should be noted that the largest volume of water uses are for agriculture and public water supply. About 2% is used for oil and gas activities.

The OCC has mapped the base of treatable groundwater in Oklahoma. These maps are used for determining the casing and cementing requirements for wells, and are useful in providing protection of the groundwater resources.

As mentioned above, OCC rules provide standards for pits and tanks used for the temporary storage of flowback and other wastes resulting from hydraulic fracturing operations. Flowback represents the largest volume waste from hydraulic fracturing operations. OCC Rule 165:10-7-24(b)(3) specifies the requirements for the management and disposal of flowback and other liquids from hydraulic fracturing operations.

Recycling of flowback water from hydraulic fracturing operations is encouraged by the OGCD. OCC Rule 165:10-7-24 incorporates the waste management hierarchy into a waste management practices reference chart. This rule lists typical waste streams and encourages beneficial use of the waste. Factors such as water availability and transportation costs for moving flowback water

to disposal facilities are also encouraging flowback recycling. Recently revised OCC rules for pits were developed to provide for recycling. These included OCC Rule 165:10-7-16(f), which specifies the requirements for the construction, operation and closure of large, noncommercial pits used for the storage of flowback water from hydraulic fracturing, and OCC Rule 165:10-9-4, which regulates the storage of flowback water at commercial facilities.

The OGCD also encourages the use of alternate, lower-quality waters for hydraulic fracturing operations. These include lower quality groundwater and treated wastewater.

In Oklahoma, flowback that is not recycled is sent to a disposal well. Discharge to surface waters is prohibited. There are currently over 4,100 disposal wells in the state.

OCC rules specify requirements for tracking and reporting on transportation of the wastes for disposal. OCC Rule 165:10-5-7(c) requires commercial disposal well operators to maintain a log recording the amount, source, operator and/or owner of all wastes received for disposal. Logs must be kept for at least five years. Trucks that haul the waste must be licensed by the OCC Transportation Division. Waste haulers are required to maintain run tickers that contain the amount and origin of wastes they haul.

Finding 9.3.1.

The OCC maps of the base of treatable groundwater have been digitized and are accessible to the public.

Finding 9.3.2.

The OGCD encourages recycling of flowback water and the use of alternate, lower quality waters for use in hydraulic fracturing operations. OCC rules incorporating the waste management hierarchy assist in this effort.

Appendix A

Acronyms

E&P	Exploration and Production
EPCRA	Emergency Planning and Community Right-to-Know Act
FTE	Full Time Equivalent
IOCC	Interstate Oil Compact Commission
IOGCC	Interstate Oil and Gas Compact Commission
NORM	Naturally Occurring Radioactive Material
NPDES	National Pollution Discharge Elimination System
OCC	Oklahoma Corporation Commission
ODEQ	Oklahoma Department of Environmental Quality
OERB	Oklahoma Energy Resources Board
OGCD	Oil and Gas Conservation Division
OHMERC	Oklahoma Hazardous Materials Emergency Response Commission
OWRB	Oklahoma Water Resources Board
RBDMS	Risk Based Data Management System
STRONGER	State Review of Oil and Natural Gas Environmental Regulations, Inc.
TDS	Total Dissolved Solids
UIC	Underground Injection Control
USEPA	U.S. Environmental Protection Agency

Appendix B

Hydraulic Fracturing Questionnaire

(Note: Written responses to questions should be brief (i.e., 1 paragraph in length). Additional information may be requested by the review team during the in-state portion of the review.)

General [9.2]

Has the state evaluated potential **risks associated with hydraulic fracturing**, taking into account factors such as depth of the reservoir to be fractured, proximity of the reservoir to fresh water resources, well completion practices, well design, and volume and nature of fluids?

The Oklahoma Corporation Commission (OCC) has evaluated potential risks associated with hydraulic fracturing. The main risk to freshwater resources associated with hydraulic fracturing relates to the handling of fluids at the surface. OCC rules governing the surface management of chemicals, flowback waters, and other hydraulic fracturing fluids are addressed later in this document.

Migration of fluids between producing zones and fresh water aquifers is another possible risk. The probability of such migration is greatly reduced in the State of Oklahoma because the producing zones lie far below the freshwater aquifers. The OCC has mapped the base of treatable water in Oklahoma and found in nearly all instances there is a large margin of separation between the base of treatable water and producing zones. The few exceptions either: (1) do not involve underground sources of drinking water as defined by EPA due to the natural occurrence of oil in the fresh water; or (2) involve shallow producing zones that are not hydraulically fractured.

OCC Rule 165:10-3-1 requires a permit to drill a well. OCC Rule 165:10-3-4 provides minimum well construction standards and casing and cementing procedures to protect fresh water resources. The surface casing requirements of these rules ensure the proper setting and cementing of surface casing from the base of treatable water to the surface. These requirements further mitigate the risk of fluid migration into fresh water aquifers during hydraulic fracturing.

Hydraulic fracturing has been conducted in the State of Oklahoma in a safe manner for over 60 years. Throughout this history, over 100,000 wells have been hydraulically fractured. The State of Oklahoma has identified no cases of harm to groundwater related to hydraulic fracturing.

Has the state developed **standards to prevent the contamination** of groundwater and surface water from hydraulic fracturing?

In addition to the general prohibition on pollution in OCC Rule 165:10-7-5(a), OCC Rules 165:10-3-10 and 165:10-3-11 prohibit the pollution of surface or subsurface water during hydraulic fracturing or subsequent flowback operations. OCC Rule 165:10-3-4 provides well

construction standards and casing and cementing procedures to protect groundwater. Other rules also provide for protection of groundwater and surface water during hydraulic fracturing. These rules are referenced in OCC Rule 165:10-3-10, which provides a reference guide to the OCC rules related to hydraulic fracturing (copy attached).

Hydraulic Fracturing Standards [9.2.1]

Describe how state standards for **casing and cementing** meet anticipated pressures associated with hydraulic fracturing to protect other resources and the environment.

OCC Rule 165:10-3-4 provides minimum well construction standards and casing and cementing procedures to accommodate anticipated pressures in all drilling, completion, and production operations including hydraulic fracturing. Oil field grade steel casing is a requirement for surface casing and for additional casing strings. Minimum footages for cementing casing are specified.

Well construction and integrity is verified by witnessing and testing. Notification is required prior to cementing the surface casing or other casing strings. Pressure testing of all casing strings is required. A cement bond log is required in certain circumstances. Verification of proper well construction and integrity ensures adequate accommodation of expected pressures associated with hydraulic fracturing.

Discuss how the program identifies and, where deemed appropriate, manages risks associated with **potential conduits for fluid migration** in the area of hydraulic fracturing.

OCC has not identified any areas of the State where offsetting wells serve as conduits for fluid migration as a result of hydraulic fracturing. The pressure applied over a short period of time (several hours at best) to hydraulically fracture a producing formation creates fractures that typically extend short distances away from the well bore. Even if these fractures were to encounter a mud plugged well, the pressure would not be sufficient to break through the mud plug to the surface.

Instances have been documented of offsetting wells in the same zone being affected by fracturing operations, sometimes resulting in a decrease in production or complete loss of production. Therefore, operators do identify offset wells when planning and conducting hydraulic fracturing operations.

Describe program requirements that address actions to be taken in **response to unanticipated operational or mechanical changes** encountered during hydraulic fracturing that may cause concern.

The OCC has several rules in place to address unanticipated changes that may be encountered during casing and cementing or hydraulic fracturing operations. Rule 165:10-3-4(c) (7) (I) gives instructions to the operator to contact the District Office within 24 hours of the discovery of a

problem with surface casing. OCC Rule 165:10-3-3(b) requires immediate action to repair any rupture, break, or opening in the surface or production casing with notice to the appropriate District Office or the Manager of Pollution Abatement.

Briefly describe how **surface controls** associated with hydraulic fracturing, such as dikes, pits or tanks, meet Sections 5.5 and 5.9 of the guidelines.

OCC Rule 165:10-3-13 requires tanks to be constructed and maintained so as to prevent pollution of surface and subsurface fresh water. OCC Rule 165:10-3-29 states that, where necessary, dikes or retaining walls shall be constructed to prevent pollution of surface or subsurface water. Requirements for the construction, operation, siting, and maintenance of noncommercial pits are specified in OCC Rule 165:10-7-16. Noncommercial disposal well pits or enhanced recovery well pits can be used in the temporary storage of saltwater as provided in OCC Rule 165:10-7-20. Commercial recycling pits are addressed in OCC Rule 165:10-9-4. The special field rules that apply in areas of an environmentally sensitive nature can be found in Chapter 10, Subchapter 29 (*e.g.*, OCC Rule 165:10-29-1) or in Commission orders.

Briefly describe how **contingency planning and spill risk management** procedures related to hydraulic fracturing meet Section 4.2.1 of the guidelines.

OCC Rules 165:10-7-5(c)(1)(A) and 165:10-7-5(c)(1)(D) require notification to the District Office or Field Inspector within 24 hours of discovery of a non-permitted discharge of: a deleterious substance of ten barrels or more to the surface in a single event; a discharge of a deleterious substance of any quantity to the waters of the State; or a discharge of a reportable quantity of a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Following the notification, a written or oral report must be filed with the District Office within ten days describing the event. Hydraulic fracturing chemicals, flowback waters, and other hydraulic fracturing wastes are considered deleterious substances and/or hazardous substances under these rules.

OCC Rule 165:10-7-7(c) enables the response action. Where surface or subsurface pollution is apparent, a District Manager or Field Inspector may direct an alleged violator to take steps necessary to stop and/or clean up pollution. This may include a temporary shut down of the lease or facility. If an alleged violator cannot be located, the District Manager or Field Inspector may take emergency action necessary to abate pollution.

The OCC has developed guidance on responding to and remediating spills. The guidance is referred to as the OCC Guardian Guidance. This guidance is made available to the public in hard copy form as well as posted on the OCC website.

Briefly discuss how hydraulic fracturing **waste characterization requirements**, including, as appropriate, testing of fracturing fluids, are consistent with Section 5.2 of the guidelines.

The primary chemical of concern in flowback waters and other hydraulic fracturing wastes is salt. The OCC conducts or requires tests for total soluble salts or chlorides at appropriate stages of the waste management process. Our emphasis on the use of salt content as a key parameter for characterizing flowback waters and other hydraulic fracturing waste materials has been supported by numerous studies performed in recent years by oil and gas operators and companies developing water treatment systems. These studies have shown that salt content is the primary constituent of concern.

Briefly describe how the **waste management hierarchy** contained in Section 5.3 of the guidelines (source reduction, recycling, treatment and disposal), including the provisions relating to toxicity reduction, are promoted for hydraulic fracturing.

OCC Rule 165:10-7-24 incorporates the waste management hierarchy into a waste management practices reference chart. Following these guidelines, an operator can identify options for reducing source materials, recycling fluids, and treating and disposing of wastes properly. Options for disposing of hydraulic fracturing wastes are listed in OCC Rule 165:10-7-24(b) (3).

Briefly describe how the **tracking of hydraulic fracturing waste** disposed at commercial or centralized facilities meets the requirements of Section 5.10.2.3 of the guidelines.

Under OCC Rule 165:10-5-7(c), a commercial disposal well operator must maintain a log of all wastes received. The log must record the amount, the source, and the operator and/or owner of the source of the waste. Logs must be kept on file a minimum of 5 years. In addition, the transport trucks are required to be licensed to haul deleterious substances with the Transportation Division of the OCC. The haulers are required to maintain run tickets stating the amount and origin of the substance hauled. These waste tracking requirements apply to flowback waters and other hydraulic fracturing wastes.

Briefly describe how procedures in place for receipt of **complaints** related to hydraulic fracturing are consistent with Section 4.1.2.1.

Complaints related to hydraulic fracturing are handled in the same manner as other environmental complaints are handled by the OCC. A process and timeline for the receipt, investigation, resolution, closure, and reporting of complaints is provided in OCC Rules 165:5-1-25 through 165:5-1-30 (Response to Citizen Environmental Complaints).

Reporting Associated with Hydraulic Fracturing [9.2.2]

Describe any required **notification** prior to, and reporting after completion of, hydraulic fracturing operations.

OCC Rule 165:10-3-4(c) (E) and (K) require 24-hour notification prior to setting surface casing or cementing surface casing or other casing strings. This notification provides the opportunity to

witness the cementing and testing of casing prior to hydraulic fracturing operations. Reporting of hydraulic fracturing operations, including the materials used, is required on the well completion report (OCC Form 1002A).

Is notification sufficient to allow for the **presence of field staff** to monitor hydraulic fracturing activities?

The Field Inspector makes regular visits to the well site during drilling operations. In the course of visits by the Field Inspector, the operator supplies the schedule for hydraulic fracturing procedures as requested by the Field Inspector. The Field Inspector is also given notice of and inspects hydraulic fracturing flowback pits during and after construction as required by OCC Rules 165:10-7-16(c)(6) and 165:10-7-16(f)(3)(iii).

Describe **reporting requirements** for hydraulic fracturing activities and whether they include the identification of materials used, aggregate volumes of fracturing fluids and proppant used, and fracture pressures recorded.

OCC Rule 165:10-3-25 requires a well completion report to be submitted within 30 days after completion of operations. The required completion report (OCC Form 1002A) contains fields for identifying details of the fracture treatment. Volumes of fluids and proppants are recorded on this form.

Describe any mechanisms for **disclosure of information on chemical constituents** used in hydraulic fracturing fluids to the state in the event of an investigation or to medical personnel in the event of a medical emergency.

The OCC has the authority under OCC Rule 165:10-1-6(g) to obtain information on chemical constituents used in hydraulic fracturing fluids from operators, service companies, or other persons. The OCC has exercised the authority of this rule in the past to obtain information on the constituents of drilling fluids in the course of an investigation of a blowout or other release. The OCC could use this authority to investigate a hydraulic fracturing incident if necessary.

Under 42 U.S.C.A Section 11043 of the Federal Emergency Planning and Community Right-to-Know Act (EPCRA), health professionals may obtain information on chemical constituents of hydraulic fracturing fluids from the well owner or operator. In the State of Oklahoma, the Oklahoma Hazardous Materials Emergency Response Commission (OHMERC) implements the requirements of EPCRA. In the event of a medical emergency, a doctor or other health professional may contact OHMERC for assistance in obtaining chemical information.

Briefly describe how hydraulic fracturing information submitted that is of a **confidential business nature**, is treated consistent with Section 4.2.2 of the guidelines?

Although the OCC has not received any requests to keep hydraulic fracturing information confidential, such a request would be honored consistent with the trade secrets provisions of the Open Records Act 51 O.S. 24A.19. EPCRA also contains protections for trade secrets.

Staffing and Training [9.2.3]

Briefly discuss if, in addition to the personnel and funding recommendations found in Section 4.3 of the guidelines, **state staffing levels** sufficient to receive, record and respond to complaints of human health impacts and environmental damage resulting from hydraulic fracturing.

The Oil and Gas Conservation Division, like other parts of the OCC, has experienced a significant cut in budget and staffing over the last year as a result of state revenue shortfalls. Since the beginning of 2009, the division's workforce has dropped from 125 FTE to 110 FTE. The cuts have affected both the Oklahoma City office and the four district offices. In the short term, the division has successfully managed its operations despite the reductions, assisted in part by the recent slowdown in drilling activity and an increasing use of automated business systems. In the long term, however, the OCC anticipates the need to restore a number of critical field and technical positions. The OCC is currently working with industry representatives and the Legislature to devise a funding mechanism that will provide a stable and sufficient source of revenue to support the OCC's oil and gas regulatory program into the future.

The Oil and Gas Conservation Division continues to place highest priority on response to environmental complaints and observes the timeframes set by rule for complaint response, investigation, and reporting. As a result, the staffing cuts have not significantly altered the division's performance in responding to complaints.

Describe staff **training** to stay current with new and developing hydraulic fracturing technology.

The Oklahoma City Office and the District Offices routinely invite industry professionals to give informational presentations on new technologies and other topics of interest. Many of these presentations are related to hydraulic fracturing. As funding allows, employees take advantage of a variety of available training courses, including training related to hydraulic fracturing.

Public Information [9.2.4]

Briefly describe how the state agency provides for **dissemination of educational information** regarding well construction and hydraulic fracturing to bridge the knowledge gap between experts and the public as provided in Section 4.2.2.2 of the guidelines. This is especially important in areas where development has not occurred historically and in areas where high volume water use for hydraulic fracturing is occurring.

Information is made widely available through the newly redesigned OCC website (occeweb.com). On the website, visitors have access to information on current events of public interest, OCC rules and forms, oil and gas databases, and many other sources of information in a

quick and easy manner. In addition to the updates made on the website, the OCC has been converting its older databases to a new Risk Based Data Management System (RBDMS), which will improve our abilities to track oil and gas operations and our own office and field activities, respond to incidents, and publish information in a safe and reliable way.

The OCC staff also provides information to the public on a regular basis through seminars and presentations. In the last year, the OCC conducted several town hall meetings around the state where horizontal drilling and hydraulic fracturing were discussed directly with the public.

Water and Waste Management Associated with Hydraulic Fracturing [9.3]

Fundamental differences exist from state to state, and between regions within a state, in terms of geology and hydrology. Describe how the state evaluated and addressed, where necessary, the **availability of water for hydraulic fracturing** in the context of all competing uses and potential environmental impacts resulting from the volume of water used for hydraulic fracturing.

The Oklahoma Water Resources Board (OWRB) oversees the permitting and use of both surface water and groundwater for beneficial purposes, including oil and gas uses. The OWRB typically issues a temporary provisional permit for water use in oil and gas operations including hydraulic fracturing. Impacts on competing uses are considered in the permitting process. The state is currently engaged in a multi-year process of revising Oklahoma's current Water Plan to provide for future state water needs. OCC staff has served on several of the Water Plan working groups. Future water needs of the oil and gas industry, including needs for drilling and hydraulic fracturing, have been considered as part of this process.

Another future water use under consideration is instream flow to protect aquatic and other wildlife uses and ecosystems. The new Water Plan, including final recommendations, will be submitted to the Legislature in early 2012.

Describe how the availability and use of **alternative water sources** for hydraulic fracturing, including recycled water, is encouraged.

The OCC recently revised its rules related to recycling of flowback water. OCC Rule 165:10-7-16(f) was created to specify construction, operation, and closure requirements for large noncommercial pits used to store flowback water for reuse on hydraulic fracturing operations. OCC Rule 165:10-9-4 was created for the long-term storage of flowback water at commercial recycling facilities. Both rules are designed to facilitate the recycling of flowback water.

The Oklahoma Marginal Quality Water Working Group considered the possible uses of a number of non-traditional water supplies from treated wastewater and storm water to water co-produced with oil and gas. Among the possible uses of marginal quality waters is hydraulic fracturing. The workgroup made recommendations as to which marginal waters were most likely to be available, and which sources and uses of these waters should be encouraged. A table listing potentially available marginal waters and their potential uses will be included in the Water

Plan. In addition, the U.S. Geological Survey is conducting a study of availability of brackish waters that may be used for hydraulic fracturing.

Briefly describe how **waste** associated with hydraulic fracturing is managed consistent with Section 4.1.1. and Section 7 of the guidelines.

The largest source of waste relating to hydraulic fracturing is flowback. The majority of flowback water used in hydraulic fracturing is disposed of by injection into a disposal well, often after a period of recycling the fluid back into fracturing operations. OCC Rule 165:10-7-24(b) (3) specifies the management options for flowback water and other hydraulic fracturing fluids. No produced waters or hydraulic fracturing fluids are discharged to surface waters in the State of Oklahoma.

NORM in Oklahoma is subject to the jurisdiction of the Department of Environmental Quality (DEQ). DEQ has not found it necessary to develop special regulations for NORM in the State of Oklahoma. In an application for an exception to OCC rules to allow for land application of flowback waters, the OCC required the applicant to test for NORM. NORM was not found above background levels.

Discuss how the state encourages the efficient development of adequate **capacity and infrastructure** for the management of hydraulic fracturing fluids, including the transportation, recycling, treatment and disposal of source water and hydraulic fracturing wastes.

Generally, the state has adequate capacity for disposal with over 6,300 active enhanced oil recovery injection wells and 4,100 active salt water disposal injection wells. With the recent increase in horizontal drilling in the state, some areas have experienced a temporary shortage of capacity while commercial disposal wells were being permitted or drilled; however, this problem has not been widespread or long-lived.

165:10-3-10. Well completion operations

(a) Hydraulic fracturing and acidizing. In the completion of an oil, gas, injection, disposal, or service well, where acidizing or fracture processes are used, no oil, gas, or deleterious substances shall be permitted to pollute any surface and subsurface fresh water.

(b) Rule reference guide. References to Commission rules regarding management of hydraulic fracturing operations are as follows:

- (1) Duties and authority of the Conservation Division (OAC 165:10-1-6).
- (2) Required approval of notice of intent to drill, deepen, re-enter or recomplete; Permit to Drill (OAC 165:10-3-1).
- (3) Surface and production casing (OAC 165:10-3-3).
- (4) Casing, cementing, wellhead equipment and cementing reports (OAC 165:10-3-4).
- (5) Swabbing and bailing (OAC 165:10-3-11).
- (6) Leakage prevention in tanks; protection of migratory birds (OAC 165:10-3-13).
- (7) Well site and surface facilities (OAC 165:10-3-17).
- (8) Completion reports (OAC 165:10-3-25).
- (9) Administration and enforcement of rules (OAC 165:10-7-2).
- (10) Cooperation with other agencies (OAC 165:10-7-3).
- (11) Water quality standards (OAC 165:10-7-4).
- (12) Prohibition of pollution (OAC 165:10-7-5).
- (13) Protection of municipal water supplies (OAC 165:10-7-6).
- (14) Informal complaints, citations, red tags and shut down of operations (OAC 165:10-7-7).
- (15) Scheduled monetary fines (OAC 165:10-7-9).
- (16) Use of noncommercial pits (OAC 165:10-7-16).
- (17) Surface discharge of fluids (OAC 165:10-7-17).
- (18) Discharge to surface waters (OAC 165:10-7-18).

- (19) One-time land application of water-based fluids from earthen pits and tanks (OAC 165:10-7-19).
- (20) Noncommercial disposal or enhanced recovery well pits used for temporary storage of saltwater (OAC 165:10-7-20).
- (21) Waste management practices reference chart (OAC 165:10-7-24).
- (22) One-time land application of contaminated soils and petroleum hydrocarbon based drill cuttings (OAC 165:10-7-26).
- (23) Application of fresh water drill cuttings by County Commissioners (OAC 165:10-7-28).
- (24) Application of freshwater drill cuttings by oil and gas operators (OAC 165:10-7-29).
- (25) Application to reclaim and/or recycle produced water for surface activities related to drilling, completion, workover, and production operations from oil and gas wells (OAC 165:10-7-32).
- (26) Use of commercial pits (OAC 165:10-9-1).
- (27) Commercial soil farming (OAC 165:10-9-2).
- (28) Commercial recycling facilities (OAC 165:10-9-4).
- (29) Duty to plug and abandon (OAC 165:10-11-3).
- (30) Notification and witnessing of plugging (OAC 165:10-11-4).
- (31) Plugging and plugging back procedures (OAC 165:10-11-6).
- (32) Plugging record (OAC 165:10-11-7).
- (33) Review of environmental permit applications (OAC 165:5-1-15 through OAC 165:5-1-19)
- (34) Response to citizen environmental complaints (OAC 165:5-1-25 through OAC 165: 5-1-30).
- (35) Contempt (OAC 165:5-19-1 through OAC 165:5-19-2).

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