

OHIO FOLLOW-UP AND SUPPLEMENTAL REVIEW



**State Review of Oil and Natural Gas
Environmental Regulations, Inc.**

June 2005

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
INTRODUCTION	5
PROGRAM OVERVIEW.....	7
PROGRAM HIGHLIGHTS.....	9
I. GENERAL CRITERIA	13
II. ADMINISTRATIVE CRITERIA	15
Permitting	15
Compliance	15
Contingency Planning.....	16
Public Participation.....	18
Program Planning	19
Financial Assurance.....	19
Waste Tracking.....	20
Data Management.....	20
Personnel.....	21
Interagency Coordination	23
III. TECHNICAL CRITERIA.....	25
General.....	25
Siting Criteria.....	26
Waste Characterization.....	27
Technical Criteria for Pits.....	28
Commercial and Centralized Disposal Facilities.....	30
IV. ABANDONED SITES.....	31
VI. NATURALLY OCCURRING RADIOACTIVE MATERIAL.....	35
VIII PERFORMANCE MEASURES	37
APPENDIX A – GLOSSARY OF ACRONYMS	39
APPENDIX B – COMPLETED OHIO QUESTIONNAIRE	41

EXECUTIVE SUMMARY

At the invitation of the Ohio Department of Natural Resources, Division of Mineral Resource Management (ODNR, DMRM), a comprehensive review of the Ohio oil and gas environmental regulatory program has been completed by a multi-stakeholder Review Team. The program was reviewed against the Guidelines for the Review of State Oil and Natural Gas Environmental Regulatory Programs, published by State Review of Oil and Natural Gas Environmental Regulations, Inc. (STRONGER) in August, 2000.

The oil and gas waste management program implemented by DMRM has been the subject of two independent, voluntary reviews. A majority of the findings from the initial Ohio State Review, published in May, 1995, indicated that DMRM met or exceeded the criteria of the 1990 Interstate Oil and Gas Compact Commission (IOGCC) Guidelines then in effect. The report also contained thirty-two recommendations that suggested program changes or modifications to the DMRM program.

This Follow-up and Supplemental Review focused on the recommendations of the initial 1995 review, the 2000 Guidelines criteria, changes made to the DMRM programs since 1995, and new regulatory and data management techniques employed by DMRM to implement their programs.

Program Strengths

Over a 3 day period, the review team met with DMRM staff to discuss aspects of Ohio's regulation of oil and gas exploration and production wastes. The review team and observers were granted full access to staff and all questions were answered in a responsive and open manner. During the review, the team identified several areas where DMRM has taken noteworthy steps to implement effective programs as follows:

Strategic Planning Process - The DMRM adopted a formal strategic planning process following its creation in 2000. It is designed to identify the goals and objectives to be pursued annually by the DMRM, and the strategies for obtaining them. Each year, a core team made up of 15 DMRM staff members participates with each program Administrator/Supervisor in a two-day planning session to draft a Strategic Plan for the upcoming 12 months.

Data Management and Oil & Gas Information Web Site - The DMRM has developed, partly in response to findings and recommendations contained in the 1995 review, and in partnership with the Ground Water Protection Council (GWPC), an oil and gas risk-based data management system (RBDMS) designed with risk functions imbedded in the line code of the system. RBDMS is populated, and is constantly being updated, with data on all known oil and gas records in Ohio, including data contained in the DMRM's previous database, supplemental electronic records provided by industry, well log cards from the Ohio Division of Geologic Survey, abandoned well site information, and digitized maps showing, among other things, known well locations.

Ohio Oil and Gas Emergency Website - The DMRM developed a Website for use by fire departments and emergency response agencies to quickly and efficiently distribute information on well sites and tank batteries in the event of an emergency. This project was funded by a grant from the U.S. Department of Energy, and was managed and developed by Argonne National Laboratories. The website is an interactive, GIS-based system linked to the RBDMS, and allows emergency responders to locate wells, access Material Safety Data Sheets (MSDS) for chemicals stored at those locations, and obtain related ownership and contact information. It also provides links to other local, state and federal agencies, and a decision tree for well owners and operators to identify applicable reporting requirements in the event of a leak or spill.

Clean-up Guidance Documents - The DMRM has developed, partly in response to findings and recommendations contained in the 1995 Ohio Review, several guidelines for use in remediating and restoring soils contaminated by saline solids, including drill cuttings, tank bottom sediments, impoundment sludges and brine contaminated soils; and by Resource Conservation and Recovery Act (RCRA) exempt petroleum hydrocarbon products. In 1997, for example, the DMRM initiated a study, funded by a grant from the U.S. Department of Energy, examining bioremediation of crude oil spills as part of a comprehensive waste management plan for the State. That study ultimately led to the preparation of a guidance document entitled *Bioremediation of Crude Oil Spills: A Non-Technical Field Guide*, for use by oil companies and the DMRM's enforcement staff. It outlines legal requirements in the event of a RCRA exempt spill; discusses site evaluation criteria to assist companies in selecting the appropriate remediation process; and addresses the details of the bioremediation process itself, including field and laboratory testing to determine if clean-up standards have been achieved. Similarly, the DMRM worked on and completed studies that have led to the preparation of guidance documents addressing, and entitled, *Land Treatment of Saline Soils and Solid Wastes* and *In-Situ Treatment of Saline Soils and Solid Wastes*. The Review Team viewed these guidelines as noteworthy examples of state-federal coordination on funding and as practical mechanisms for addressing pollution and waste in the field.

Program Recommendations

During the review, the team also developed recommendations to improve Ohio's regulatory program. The recommendations made by the Review Team are the following:

Follow-up Review Recommendation 1 - The Review Team recommends that the DMRM complete its state SPCC rulemaking.

Follow-up Review Recommendation 2 - DMRM should continue to seek ways to enhance public participation. As an example, they could ensure notice of TAC meetings through use of the DMRM web site.

Follow-up Review Recommendation 3 - The Review Team recommends that DMRM continue to evaluate means of financial assurance in addition to bonds, Letters of Credit, and other financial instruments including, perhaps, the creation of a dedicated fund similar to that used for emergency spill clean-up. Some states

have adopted mechanisms such as bond pools, dedicated funds, and production levies to reduce the public liability for defaulting operators.

Follow-up Review Recommendation 4 - The DMRM should continue to seek additional sources of funding, including potentially a review of current permit fees and a review of other sources for an increase in program funding.

Follow-up Review Recommendation 5 - At current staffing levels, DMRM does an excellent job of overseeing the orphan well program, but should pursue additional staffing to directly address location of abandoned wells, which would benefit both the state and its citizens.

Follow-up Review Recommendation 6 - DMRM should consider whether adopting a NORM regulatory program is warranted in Ohio.

Follow-up Review Recommendation 7 - The Review Team commends DMRM for its strategic planning program and for tracking key program activities. The Team recommends that DMRM continue to identify other additional environmental indicators and benchmarks that can be tracked over time to evaluate the environmental performance of its programs (e.g., for example, the number of areas with contaminated groundwater and the number cleaned up each year as a raw number and as a percentage of the known problem areas). Such indicators can assist DMRM in its tracking of environmental changes to track environmental change as a result of program activities, and to make program alternations to continue to improve environmental results.

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INTRODUCTION

This Ohio Follow-up and Supplemental Review is a report of the progress made by Ohio since the initial May 1995 Ohio State Review of the oil and gas regulatory program. The reviews evaluate the effectiveness of the State's regulatory management of wastes derived from the exploration and production (E&P) of crude oil and natural gas and other environmental regulatory aspects of the State's programs. The 1995 Ohio State Review compared the state's programs to standards contained in the IOGCC Environmental Guidelines for State Oil and Gas Regulatory Programs, dated May 1994. The 1994 Guidelines are referred to in this report as the "IOGCC Guidelines". The ultimate purpose of the review was to identify strengths and recommend improvements for Ohio's E&P waste management regulatory program. Since the review team's report was issued, Ohio has been working to address recommendations contained in the report.

The team performing the 1995 initial review included Michael Wallen, Kentucky Department of Mines and Minerals; Sandra Brennan, New York Department of Environmental Conservation; Craig Eggerman, Wyoming Oil and Gas Conservation Division; Leslie Savage, Railroad Commission of Texas; Kathy Beckett, Robinson & McElwee, Charleston, W.V; and Shirley Sinn, oil and gas environmental consultant. Official observers participating in the initial review were Graham Robb, The Oxford Oil Company; Gitta Racinskas, Ohioans for Safe Water; Bill Hochheiser, U.S. Department of Energy; and Steve Souders, U.S. Environmental Protection Agency.

In 2000, State Review of Oil and Natural Gas Environmental Regulations, Inc. (STRONGER) published revised and expanded Guidelines for the Review of State Oil and Natural Gas Environmental Regulatory Programs, referred to in this report as the "2000 Guidelines". This Ohio Follow-up and Supplemental review evaluates Ohio's responses to recommendations of the 1995 initial review, and compares the Ohio program to the 2000 Guidelines.

The Follow-up and Supplemental Review of the Ohio oil and gas regulatory program was conducted in Columbus, Ohio at the offices of the Division of Mineral Resources Management-(DMRM) from October 4th to 6th, 2004. A three-member team representing State regulatory agencies, the oil and gas industry, and the environmental community were appointed by the STRONGER Board. Official observers were also appointed. The 2004 review team included Mr. Bob Wilson, Virginia Department of Mines, Minerals and Energy, representing state environmental regulatory programs; Gregory Russell, Vorys, Sater, Seymour and Pease, LLP, representing the oil and gas industry; and Sandy Bihn, Western Erie Lake Water keeper, representing the environmental community. Official Observers included Jerry James, James Engineering, Inc.; Mark Carl, Interstate Oil and Gas Compact Commission; Dan Derkics, U.S. EPA Office of Solid Waste; and Donald S. Garvin, Jr., Trout Unlimited and member of the STRONGER Board.

The follow-up review included:

- An overview of the state's regulatory program;
- The state's responses to recommendations of the 1995 initial Review;
- Aspects of the state's program that are new since the 1995 review; and
- Inquiry into all aspects of the state's program addressed by the 2000 Guidelines to determine whether program, rule or legislative changes have occurred since the previous review.

Questions were phrased in terms of "What did you do with recommendations from the last review?", "What has changed since the last review?", and "How does your program stack up against the current Guidelines?"

DMRM provided written responses to a questionnaire prior to the in-state portion of the review. This report includes the 2004 Review Team findings and recommendations, along with a brief overview of several DMRM developments which go "above and beyond" the Guideline standards. Some of the developments are particularly noteworthy and merit further review for the benefit of other state oil and gas regulatory programs.

PROGRAM OVERVIEW

History of Oil and Gas Production in Ohio

Ohio has a long and colorful history of oil and gas exploration and development that predates the turn of the century. In 1814, for example, saltwater well drillers struck oil at 475 feet in Olive Township, Noble County, giving Ohio a claim for the first discovery of oil from a drilled well in the country. The first commercial production of oil was discovered in Macksburg, Ohio (Washington County) in 1860, only one year after Colonel Drake struck the first oil well in Titusville, Pennsylvania. Shallow Pennsylvanian sandstone reservoirs were developed at length from 1861 through the early 1900's in southeastern Ohio. In 1884, the Lima oil field was discovered in northwestern Ohio, making Ohio the world's largest oil producer at the time. Between 1888 and 1937, over 70,000 wells were drilled to the Ordovician Trenton Limestone in northwestern Ohio. In 1887, natural gas was discovered in the Silurian "Clinton sandstone" in Fairfield County, Ohio. Since that discovery, over 74,000 wells have been completed in the "Clinton sandstone" throughout eastern Ohio.

Ohio now has approximately 62,867 active wells, most of which are characterized as stripper wells, meaning that they produce 10 barrels of oil or 60 thousand cubic feet (Mcf) of natural gas per day or less. In 2003, Ohio produced 5.65 million barrels of oil and 93.6 million Mcf of natural gas. Cumulatively, the number of oil and gas wells drilled in Ohio since the earliest production has reached 269,790, yielding over one billion barrels of crude oil and almost eight trillion cubic feet of natural gas.

The Division of Mineral Resources Management (DMRM)

On July 16, 1965, the Division of Oil and Gas (the duties of which now lie with the Division of Mineral Resources Management) was created through Substitute House Bill 234, and was given a three-fold mission:

- Assure protection of public health, safety and the environment;
- Promote the orderly and efficient development of oil and gas reserves; and,
- Assure conservation of natural resources.

Soon thereafter, Ohio became one of the first states in the Appalachian Basin to initiate a program to fund the plugging of improperly abandoned oil and gas wells. Many of these wells were drilled and abandoned before 1900 without a record of their locations, and can often be found beneath buildings, houses, streets, and in residential and public recreation areas. Funded by the Oil and Gas Mineral Severance Tax, the program spends approximately \$800,000 annually, and to date has plugged approximately 1,500 idle and orphan wells. The Chief of the Division is authorized not only to spend monies from this fund on the plugging and abandonment of orphan wells, but also to correct conditions that he reasonably determines are causing imminent health or safety risks.

Ohio's Safe Drinking Water Act, Underground Injection (UIC) Program was approved by U.S. EPA in 1982, giving Ohio primacy for establishing requirements for the permit issuance, well construction, monitoring and reporting for conventional brine injection wells, enhanced recovery projects and the annular disposal of brine.

The Division's responsibilities for protecting public health, safety and the environment were greatly expanded in 1985 with the adoption of Amended Substitute House Bill 501 (a comprehensive brine transportation and disposal bill), which, among other things:

- Eliminated all earthen brine and storage pits in Ohio;
- Established as lawful brine disposal options (i) injection in a permitted Class II disposal well, including enhanced recovery and annular disposal wells; and (ii) surface application;
- Required administrative review and approval of local brine spreading resolutions;
- Established registration and annual reporting requirements for brine haulers and local private entities that adopt brine spreading resolutions;
- Authorized the Chief of the Division to order replacement of contaminated water supplies;
- Authorized the Chief to deny permits or require special permit conditions for operations that present an imminent danger to public health, safety, or damage to the environment; and,
- Created a research fund to assess environmental and public risks associated with annual disposal and surface spreading of brine.

In 1990, the Division amended its rules for annular disposal to require (a) cemented surface casing; (b) an initial mechanical integrity demonstration prior to receiving disposal authorization; and (c) ongoing mechanical integrity verification using a U.S. EPA-approved test. Since these amendments were enacted, the number of active annular disposal wells has been substantially reduced.

PROGRAM HIGHLIGHTS

Overall, Ohio has a well-managed and innovative oil and gas environmental regulatory program. During its review, the Review Team noted several aspects of the DMRM program and its operations that merit special recognition and which may offer ideas for other state regulatory programs.

Strategic Planning Process

The DMRM adopted a formal strategic planning process in 2000. It is designed to identify the goals and objectives to be pursued annually by the DMRM, and the strategies for obtaining them. Each year, a core team made up of 15 DMRM staff members participates with each program Administrator/ Supervisor in a two-day planning session to draft a Strategic Plan for the upcoming 12 months. Staff input is solicited both prior to and after the two-day planning session. Once the plan is finalized, the core team meets quarterly to assess the progress being made in meeting the Plan's goals and objectives.

The Strategic Plan is available electronically to all staff, as are quarterly reports (in PowerPoint) depicting the Plan's accomplishments to date. Additionally, the DMRM holds monthly meetings with its field personnel to discuss activities and priorities for the upcoming month, allowing for routine re-evaluations and refinements of the Plan and methods to achieve goals and objectives.

The Review Team was very impressed with the DMRM's strategic planning process and the commitment it shows to developing and operating a successful regulatory program.

Data Management and Oil & Gas Information Web Site

The DMRM has developed, partly in response to findings and recommendations contained in the 1995 Ohio Review, and in partnership with the Ground Water Protection Council (GWPC), an oil and gas Risk Based Data Management System (RBDMS) designed with risk functions imbedded in the line code of the system. RBDMS is populated, and is constantly being updated, with data on all known oil and gas records in Ohio, including data contained in the DMRM's previous database, supplemental electronic records provided by industry, well log cards from the Ohio Division of Geologic Survey, abandoned well site information, and digitized maps showing, among other things, known well locations. It is now used in virtually every aspect of the DMRM program, including permitting, inspection, plugging, enforcement and administrative functions, as well as the DMRM's strategic planning process for the identification and evaluation of enforcement issues and trends.

Nearly all of the oil and gas data in RBDMS is available to field personnel through regional and remote access connections. Field personnel may also enter data using laptop computers while out in the field. Access to much of the data contained in RBDMS is also available to the public, industry, and local, state and federal agencies, through the DMRM website, which has nearly 2,000,000 user visits annually. Additionally, emergency data is shared with state and local emergency response agencies and local fire departments through the DMRM website.

RBDMS serves as a risk based data management model for at least 17 other state oil and gas regulatory programs, and has received an Award of Excellence in Technical Development from the GWPC and was named as one of the U.S. Department of Energy's (U.S. DOE) top 100 technical developments.

The Review Team regarded RBDMS as an excellent data management tool, offering the DMRM, the regulated community, other regulators, and the public, in "user friendly" format, flexibility in data access, feedback, and analysis.

Ohio Oil and Gas Emergency Website

The DMRM developed a website for use by fire departments and emergency response agencies to quickly and efficiently distribute information on well sites and tank batteries in the event of an emergency. This project was funded by a grant from the U.S. Department of Energy, and was managed and developed by Argonne National Laboratories. The website is an interactive, GIS-based system linked to the RBDMS, and allows emergency responders to locate wells, access Material Safety Data Sheets (MSDS) for chemicals stored at those locations, and obtain related ownership and contact information. The Emergency Planning and Community Right-to-Know Act of 1986 (SARA Title III) information is also posted on this web site. Ohio may be one of the first States in the nation to have eliminated certain paper reporting requirements and replaced these requirements with an electronic reporting format. This makes data more readily available to emergency response teams and the public. It also provides links to other local, state and federal agencies, and a decision tree for well owners and operators to identify applicable reporting requirements in the event of a leak or spill.

Among other things, the website has been recognized at The Council of State Governments, Midwestern Legislative Conference in July, 2004. The Review Team also wishes to recognize this website as an innovative approach to providing access to emergency response information to responders and the public alike. (<http://odnrwell-locator.cyberpro.com/>)

Clean-up Guidance Documents

The DMRM has developed, partly in response to findings and recommendations contained in the 1995 Ohio Review, several guidelines for use in remediating and restoring soils contaminated by saline solids, including drill cuttings, tank bottom sediments, impoundment sludges and brine contaminated soil; and by Resource Conservation and Recovery Act (RCRA) exempt petroleum hydrocarbon products. In 1997, for example, the DMRM initiated a study, funded by a grant from the U.S. Department of Energy, examining bioremediation of crude oil spills as part of a comprehensive waste management plan for the State. That study ultimately led to the preparation of a guidance document entitled Bioremediation of Crude Oil Spills: A Non-Technical Field Guide, for use by oil companies and the DMRM's enforcement staff. It outlines legal requirements in the event of a RCRA exempt spill; discusses site evaluation criteria to assist companies in selecting the appropriate remediation process; and addresses the details of the bioremediation process itself, including field and laboratory testing to determine if clean-up standards have

been achieved. Similarly, the DMRM worked on and completed studies that have led to the preparation of guidance documents addressing, and entitled, Land Treatment of Saline Soils and Solid Wastes and the In-Situ Treatment of Saline Soils and Solid Wastes. The Review Team viewed these guidelines as noteworthy examples of state-federal coordination on funding and as practical mechanisms for addressing pollution and waste in the field.

PROGRAM ELEMENTS BEYOND THE GUIDELINES

State Spill Prevention, Control and Countermeasures Program

In response to the Clean Water Act of 1972, the U. S. Environmental Protection Agency (U.S. EPA) issued the Oil Pollution Prevention regulation that was to form the basis of their oil spill prevention, control and countermeasures (SPCC) program. As modified after passage of the Oil Pollution Act of 1990, the SPCC program requires owners of certain oil storage facilities to prepare and submit plans detailing design, operation and maintenance procedures established to prevent spills from occurring, as well as countermeasures to control, contain, clean up, and mitigate the effects of spills that could affect navigable waters. The SPCC plan, which must be submitted to U.S. EPA and maintained onsite (or in the nearest field office if a site is unmanned), is the cornerstone of the U.S. EPA program.

Ohio's Division of Mineral Resource Management has drafted and is in the process of finalizing state SPCC rules. A workgroup, composed of Division enforcement staff and industry representatives, was formed in 2003 for the purpose of creating the rules. Ohio's approach differs from that of the U.S. EPA in several significant aspects. First, while U.S. EPA emphasizes and bases its program on the plan, the DMRM program emphasizes prevention and training. The second major difference is that, while the U.S. EPA program addresses only oil spills, Ohio's program includes oils, oilfield brines, and other chemicals.

The Ohio program places its emphasis on the training of staff and industry in methods of spill prevention and response. An SPCC training manual for enforcement staff has been developed, and DMRM is working cooperatively with oil and gas trade associations to educate facility owners on the current federal SPCC requirements and the proposed Ohio requirements. Spill prevention training will focus on proper construction and use of pits and secondary containment structures such as dikes and retaining walls for secondary containment. Standardized means of calculating secondary containment volumes will be taught to inspectors and industry, and an interactive computer program has been developed to assist operators in compliance and inspectors in enforcement.

Because oilfield brine is the major component of Ohio's waste stream, DMRM has included standards of practice for brine handling in its SPCC program. The inclusion of brine is apparently unique to Ohio's SPCC and certainly exceeds federal mandates and STRONGER guidelines. U.S. EPA requirements are based only on the oil spill provisions of the Clean Water Act. Ohio has taken an additional step by recognizing brine as a potential source of pollution that deserves attention equal to that given oil.

Contingency training for spill response is included in DMRM's SPCC training program. As with other aspects of the program, response training focuses on practical methods that are aimed at containment and cleanup. Individual SPCC plans are not required under the theory that responders may not have access to or knowledge of a plan. It is thought that having trained responders will allow containment and cleanup to proceed more smoothly and quickly. The Division envisions having a list of approved contractors who are linked to permitted operators, and who the Division can call out for spill management if an operator cannot be reached.

Ohio's DMRM has designed and partially implemented an SPCC program that goes above and beyond requirements and guidelines. Their program is exemplary in many aspects such as their focus on training, planning and prevention instead of the development of a formal plan that may or may not be available to responders. The inclusion of oilfield brine in their spill planning is unique to their program and is commendable. DMRM realizes that EPA could still require operators of facilities with oil storage to provide a plan, but believe that their program meets and exceeds all requirements for a state plan. With its practicality, its focus on prevention, training and response and its inclusion of potential pollutants other than oil, the Ohio SPCC program is one that could, when fully developed, provide a model for other producing states.

I. GENERAL CRITERIA

In 2000, the Ohio Department of Natural Resources (ODNR) merged the Division of Oil and Gas (DOG) with the Division of Mines and Reclamation (DOM), creating the Division of Mineral Resources Management (DMRM). This followed a study undertaken by the Director of the Ohio Department of Natural Resources to evaluate and improve the Department's organizational structures and increase efficiencies. The DMRM has authority, as a result, over the development all of coal and mineral mining and oil and gas extraction industries in Ohio.

In June, 2001, House Bill 94 established the Ohio Oil and Gas Emergency Website as a replacement for paper reporting requirements under the Emergency Planning and Community Right-to-Know Act of 1986 (also known as SARA Title III). Emergency responders now have the ability to quickly determine, by computer, the chemicals and potential storage volumes at well site locations and tank batteries, and identify the owner and contact information for emergency response.

During late 2003 through early 2004, a joint DMRM, oil and gas, and coal industry team met to update and consolidate the Division's two sets of plugging rules (one for coal bearing townships and one for non-coal bearing townships). As a result, a single set of plugging rules has been developed for state-wide application.

The DMRM is also the agency having authority to enact and enforce SPCC regulations in Ohio. In 1994, Senate Bill 182 transferred authority from Ohio EPA to the Division to promulgate SPCC rules for E&P waste operations. It is now in the process of drafting rules focusing on training and spill prevention. A draft training manual for both industry and the DMRM's regulatory staff has been completed.

Recently, on June 17, 2004, House Bill 278 was signed by the Governor, amending Ohio law to give the DMRM sole and exclusive authority to regulate the permitting, location and spacing of oil and gas wells in Ohio. The Ohio legislature reasoned, "The regulation of oil and gas activities is a matter of general statewide interest that requires uniform statewide regulation, and this chapter and rules adopted under it constitute a comprehensive plan with respect to all aspects of the locating, drilling, and operating of oil and gas wells within this state, including site restoration and disposal of wastes from those wells."

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II. ADMINISTRATIVE CRITERIA

Permitting

The DMRM issues to permit applicants a Notice to Permit Holders that states the following: “The Division of Mineral Resources Management has regulatory authority under Chapters 1509 of the Ohio Revised Code (ORC) and 1501 of the Ohio Administrative Code (OAC). Other political subdivisions (Federal, State and Local) have regulatory authority in relation to the drilling production, and/or plugging of oil/gas wells in Ohio.” In addition, House Bill 278 has given the DMRM sole and exclusive authority to regulate the permitting, location and spacing of oil and gas wells in Ohio. As a consequence, the DMRM has amended its Notice to Permit Holders to reflect the change in authority under Ohio law.

Initial Review Finding II.1

DMRM (DOG) notifies permit applicants that Federal, State, and local regulations apply.

Initial Review Recommendation II.1

DMRM (DOG) should notify the permit applicant that federal and other state permits or regulatory requirements may apply. (IOGCC Guidelines, section 4.1.1.)

Follow-Up Review Finding II.1

The Review Team finds that this recommendation has been met.

Compliance

The Ohio Revised Code authorizes the DMRM to assess penalties for various violations of the Ohio program. Nonetheless, the DMRM seeks to resolve most issues without the use of penalties, finding that it improves compliance.

When penalties are assessed, it is done on a case-by-case basis that takes into account the following factors (set forth in a 1998 guideline entitled, Negotiations of Consent Agreements): actual or potential harm or risk of harm to public health and safety and the environment; removal of any economic benefit from non-compliance; present and past history of similar violations; length of time violation stands uncorrected; recalcitrance, defiance or indifference to laws; recovery of extraordinary enforcement costs; ability to pay; quality and sufficiency of proof of violation; and time and expense of litigation versus amount and ability to collect anticipated civil penalty judgment. In addition, the DMRM has developed a guideline on specific penalty ranges to be considered for specific types of violations.

Initial Review Finding II.2

Penalties fluctuate with each consent agreement and are determined on an individual basis. The penalty factors considered by DMRM (DOG) meet the requirements of the IOGCC guidelines.

Initial Review Recommendation II.2

DMRM (DOG) should continue to monitor the assessment of penalties to ensure that the agency is consistently applying the factors used in calculating penalties. (IOGCC Guidelines, section 4.1.3.2.)

Follow-Up Review Finding II.2

The Review Team finds that this recommendation has been met and that the goal of the IOGCC Guideline, i.e., seeking consistency in penalty application, has been satisfied.

Contingency Planning

The DMRM only allows pits to be used during drilling operations and in the event of an emergency. With few exceptions, these pits are located within 10 to 20 feet of the well itself, which is located on a map required to be submitted with the drilling permit application. DMRM field personnel inspect pit construction. Pits used during drilling operations are required to be closed within 5 months of completion of drilling, which in practice tends to be less than 40 days. Emergency pits are required to be closed immediately after the emergency is resolved.

Initial Review Finding III.1

DMRM (DOG) has the authority to require a contingency plan for waste release control. Operators currently are required to comply with federal SPCC regulations.

Initial Review Recommendation III.1

DMRM (DOG) is encouraged to begin drafting and to adopt state SPCC regulations. (IOGCC Guidelines 4.2.1)

Follow-up Review Finding III.1

The DMRM is in the process of drafting rules focusing on SPCC Training and Spill Prevention. The delay has been the result of delays at the Federal level. The Review Team finds that this recommendation has been partially met.

Initial Review Finding III.3

Operators are subject to limited notification of spills. Except for oil spills and other spills regulated under emergency planning regulations, E & P waste spills are not required to be reported to DMRM (DOG).

Initial Review Recommendation III.3

The Review Team recommends that DMRM (DOG) amend its rules to require appropriate reporting of spills such as spills of produced water, drilling fluids, and associated waste (IOGCC Guidelines, section 4.2.1.1.)

Follow-up Review Finding III.3

The DMRM is in the process of drafting rules focusing on SPCC Training and Spill Prevention. Consideration is being given by the DMRM to adopting rules that require appropriate reporting of spills of brine and other fluids.

Follow-up Review Recommendation 1

The Review Team recommends that the DMRM complete its state SPCC rulemaking.

The DMRM has developed several guidelines for use in remediating and restoring soils contaminated by saline solids, including drill cuttings, tank bottom sediments, impoundment sludges and brine-contaminated soils; and by RCRA exempt petroleum hydrocarbon products. For example, the DMRM has prepared a guidance document entitled Bioremediation of Crude Oil Spills: A Non-Technical Field Guide, for use by oil companies and the DMRM's enforcement staff. It outlines legal requirements in the event of a RCRA exempt spill; discusses site evaluation criteria to assist companies in selecting the appropriate remediation process; and addresses the details of the bioremediation process itself, including field and laboratory testing to determine if clean-up standards have been achieved. The DMRM similarly prepared guidance documents addressing, and entitled, Land Treatment of Saline Soils and Solid Wastes and the In-Situ Treatment of Saline Soils and Solid Wastes.

Initial Review Finding III.5

DMRM (DOG) and Ohio Environmental Protection Agency (OEPA) do not provide specific cleanup standards or criteria for the development of remediation plans for crude oil and brine contaminated soil and groundwater.

Initial Review Recommendation III.5

DMRM (DOG) is encouraged to develop rules and/or guidelines outlining the time in which notification and subsequent cleanup should occur, and criteria relating to final remedial verification provisions to ensure that appropriate remediation has been accomplished. (IOGCC Guidelines, section 4.2.1.2.)

Follow-up Review Finding III.5

The Review Team finds this recommendation has been met.

Initial Review Finding III.6.

Although operators must prepare contingency plans and training in accordance with Federal regulations, they are not required to file contingency plans nor required to provide operator training under DMRM's (DOG) program.

Initial Review Recommendation III.6

The Review Team recommends that DMRM (DOG) consider a requirement that operators develop and implement contingency plans to be provided to DMRM (DOG) upon request, and that operators obtain emergency response training. (IOGCC Guidelines, section 4.2.1.2.)

Follow up Review Finding III.6

The Review Team finds that this recommendation has been met.

Public Participation**Initial Review Finding III.9**

Public Notice is provided for E & P waste management facilities.

Initial Review Recommendation III.9

The Review Team recommends that DMRM (DOG) evaluate whether public notice of drilling permit applications involving E&P waste management is adequate. (IOGCC Guidelines, section 4.2.2.1.)

Follow-up Review Finding III.9

Though its rule review process, the DMRM has considered whether an operator's drilling permit application and the general lease negotiation process provides sufficient notice of an operator's E&P Waste Management practices and has decided not to require greater public notice, generally, at this time. The DMRM has also considered that recent legislation may also require greater public notice in urbanized settings. The Review Team finds that this recommendation has been met.

The DMRM has developed an Oil and Gas Risk Based Data Management System (RBDMS) populated with data on all known oil and gas records in Ohio, including data contained in the DMRM's previous database, supplemental electronic records provided by industry, well log cards from the Ohio Division of Geologic Survey, abandoned well site information, and digitized maps showing, among other things, known well locations.

Nearly all of the oil and gas data on RBDMS is available not only to agency personnel, but also to the public, to industry, and to Local, State and Federal agencies, through the DMRM website. This website has approximately 200,000 user visits annually, and is also used to share information with state and local emergency response agencies and local fire departments.

Initial Review Finding III.12

DMRM (DOG) uses advisory groups and boards of industry, government, and public representatives to obtain input and feedback on the effectiveness of state programs for the management of E&P waste. DMRM's (DOG) use of Technical Advisory Council (TAC) as a technical resource demonstrates innovative use of an advisory group.

Initial Review Recommendation III.12

The Review Team recommends that DMRM consider ways to encourage enhanced public participation. (IOGCC Guidelines, section 4.2.2.3.)

Follow-up Review Finding III.12

The DMRM has enhanced public participation with the development of both the RBDMS and the DMRM website. It also engages in public outreach through presentations and discussion opportunities at schools, fire departments, and local public meetings. In addition, the DMRM is responsive to public inquiries and engages in efforts to make Ohio's oil and gas program understandable to the public.

Follow-up Review Recommendation 2

DMRM should continue to seek ways to enhance public participation. As an example, they could ensure notice of TAC meetings through use of the DMRM web site.

Program Planning**Initial Review Finding III.13**

DMRM (DOG) has an effective planning and goal setting process and a good tracking system for measuring program activities. DMRM (DOG) sets goals annually and uses them to set priorities.

Initial Review Recommendation III.13

The Review Team recommends that DMRM (DOG) continue to use its planning and goal-setting process. During this process, DMRM (DOG) should evaluate the effectiveness of its E&P waste management program by establishing additional measurable goals and objectives. (IOGCC Guidelines, section 4.2.3.)

Follow-up Review Finding III.13

The Review Team finds that this recommendation has been met.

Financial Assurance**Initial Review Finding III.15**

DMRM (DOG) accepts various forms of financial assurance including financial statements.

Initial Review Recommendation III.15

The Review Team recommends that DMRM (DOG) periodically review financial statements for exempt domestic wells and consider requiring other types and amounts of financial assurance that will provide reliable monetary resources. (IOGCC Guidelines, section 4.2.4.)

Follow-up Review Finding III.15

While DMRM does periodically review the adequacy of financial assurance, the Review Team remains concerned that the resources that would be available in the event an operator defaults on his plugging and remediation obligations could be inadequate if there were a downturn in the industry. Bonds are difficult to track

over time because they may expire and there are various stipulations for use that may be inconsistent with other bonds. The same problems, plus the lack of uniform standards or ratios, exist with using financial statements (analogous to those dedicated to the Underground Storage Tanks financial assurance program) instead of or in addition to instruments such as bonds for financial assurance.

Follow-up Review Recommendation 3

The Review Team recommends that DMRM continue to evaluate means of financial assurance in addition to bonds, Letters of Credit, and other financial instruments including, perhaps, the creation of a dedicated fund similar to that used for emergency spill clean-up. Some states have adopted mechanisms such as bond pools, dedicated funds, and production levies to reduce the public liability for defaulting operators.

Waste Tracking

Initial Review Finding III.16

Ohio's brine haulers' program generally meets the IOGCC Guidelines for waste haulers.

Initial Review Recommendation III.16

The Review Team recommends that Ohio evaluate whether training of waste haulers is adequate to ensure proper management of E&P waste (IOGCC Guidelines, sections 4.2.5. and 4.4.)

Follow-up Review Finding III.16

The Review Team finds that this recommendation has been met.

Initial Review Finding III.19

Operators are not required to file pit locations as part of drilling applications. Generally, pit locations are within 200 feet of the well. Although inspectors record the locations of drilling pits, records are inconsistent.

Initial Review Recommendation III.19

The Review Team recommends that DMRM (DOG) ensure that there are adequate records on file to record the location of pits. (IOGCC Guidelines, section 5.5.5.f.)

Follow-up Review Finding III.19

The Review Team finds that this recommendation has been met.

Data Management

The DMRM has developed an oil and gas RBDMS populated with data on all known oil and gas records in Ohio, including data contained in the DMRM's previous database, supplemental electronic records provided by industry, well log cards from the Ohio Division of Geologic Survey, abandoned well site information, and digitized maps

showing, among other things, known well locations. It is now used in virtually every aspect of the DMRM program, including permitting, inspection, plugging, enforcement and administrative functions, as well as the DMRM's strategic planning process for the identification and evaluation of enforcement issues and trends.

Nearly all of the oil and gas data on RBDMS is available to field personnel through regional and remote access connections, who also may enter data using laptop computers while out in the field. Access to much of the data contained in RBDMS is also available to the public, industry, and local, state and federal agencies, through the DMRM website, which has approximately 200,000 user visits annually. Additionally, emergency data is shared with state and local emergency response agencies and local fire departments through the DMRM website.

Initial Review Finding III.20

DMRM (DOG) has limited computer data management capabilities for tracking E&P waste management and program compliance and is expanding the use of that capability. DMRM has been creative in its data management with very limited resources.

Initial Review Recommendation III.20

The Review Team encourages DMRM (DOG) to continue its efforts to find additional funding to enhance its data management by coordinating and consolidating data management computer systems and purchasing additional equipment to increase staff access to the data, especially staff in the regional offices. DMRM (DOG) is encouraged to develop a computerized compliance evaluation data management system. DMRM is also encouraged to continue sharing data with other divisions and agencies to increase effective use of limited funds and to gather data from other sources that will enhance DMRM's (DOG) ability to perform risk-based decision-making. (IOGCC Guidelines, section 4.2.8.)

Follow-up Review Finding III.20

The Review Team finds that this recommendation has been met.

Personnel

Initial Review Finding IV.2

DMRM (DOG) has developed a priority system to meet the changing needs of regulating the oil and gas industry. This system focuses on the protection of three important areas: a) public health and safety; b) the environment; and c) the resources of the State. The recognition that not all activities can be closely monitored, and the development of a system to ensure that more sensitive environmental or health and safety issues are higher priority, follows the intent of IOGCC Guidelines, section 4.3.1 Personnel.

Initial Review Recommendation IV.2

It is crucial that DMRM (DOG) continually monitor the priority system and the assignment of field staff to adequately provide for field inspection and verification of activities. (IOGCC Guidelines, section 4.3.1.4.)

Follow-up Review Finding IV.2

The Review Team finds that this recommendation has been met.

Initial Review Finding IV.4

DMRM (DOG) field staff receive training on technical and safety-related issues. DMRM inspectors have not received extensive training on exempt and non-exempt waste.

Initial Review Recommendation IV.4

The Review Team recommends that DMRM continue to expand their training program to address exempt and non-exempt waste issues and site assessments. (IOGCC Guidelines, section 4.3.1.5.)

Follow-up Review Finding IV.4

The Review Team finds that this recommendation has been met.

Initial Review Finding IV.5

DOM and DMRM has responsibility for witnessing and approving well plugging in coal mining townships.

Initial Review Recommendation IV.5

DMRM (DOG) and Division of Mines (DOM) must address the need for ensuring adequate inspections of wells plugged in coal mining townships. (IOGCC Guidelines, sections 4.3.1.4. and 4.3.1.5.)

Follow-up Review Finding IV.5

Because of the agency mergers, the Review Team finds that this recommendation is no longer an issue.

The DMRM continues to receive funding primarily from three sources: the Oil and Gas Severance Tax, Permit Fees and the General Fund. The severance tax rate and most permit fees were set in the mid – 1980’s and have not been increased. Total annual revenues over the past 5-year period have been relatively flat, ranging from approximately \$3.2 million in 2000 to \$2.9 million in 2004. While expenses during the same period have fluctuated due to personnel attrition (primarily), the most recent fiscal year (2004) had expenses of approximately \$2.9 million. Personnel costs make up most of the DMRM’s annual expenses.

In response to the resulting fiscal constraints, the DMRM, among other things, has been forced to eliminate items from its priority matrix due to lack of personnel. At the same time, recent legislative changes and increased demands have increased the DMRM’s staff requirements.

Initial Review Finding IV.6

DMRM (DOG) rates their funding as adequate for existing staff levels and program implementation.

Initial Review Recommendation IV.6

DMRM (DOG) should continue to seek additional funding, such as a general appropriation, to balance the fluctuating severance tax revenues. (IOGCC Guidelines, sections 4.3.1. and 4.3.2.)

Follow-up Review Finding IV.6

The Review Team finds that the DMRM has assessed a reasonable need for additional staff resources to meet increasing program demands going forward.

Follow-up Review Recommendation 4

The DMRM should continue to seek additional sources of funding, including potentially a review of current permit fees and a review of other sources for an increase in program funding to address critical staff needs.

Interagency Coordination

Although some overlapping responsibilities with other state agencies exist, Ohio Department of Natural Resources (ODNR) is the sole regulatory agency with direct responsibility for E & P waste management in Ohio. There is continuous interaction among agencies on an as-needed basis as well as formal programs, such as the State Emergency Response Commission, to coordinate interaction and response. ODNR has developed the Ohio Oil and Gas Emergency Response Web Site that allows companies, the general public and other agencies such as local fire departments, emergency planning commissions and the OEPA to access real-time oil and gas information.

Initial Review Finding V.1

DMRM (DOG) strives to not duplicate other Ohio agency programs in matters of waste regulation and spill control and response. DMRM (DOG) has demonstrated a willingness to share information with other agencies and ODNR Divisions. DMRM (DOG) has no formal Memorandum of Understanding (MOU) with the State Fire Marshall, Department of Health (DOH), OEPA, or Bureau of Land Management (BLM).

Initial Review Recommendation V.1

DMRM (DOG) should develop, where appropriate, MOUs with the State Fire Marshall, DOH, OEPA, and BLM in areas concerning management of E&P waste and spill control and response activities. The MOUs should be consistent with the IOGCC Guidelines, section 4.4.

ODNR has representatives on the State Emergency Response Commission that was established for the specific purpose of coordinating emergency response activities among

agencies. In addition to ODNR, membership includes OEPA, the State Fire Marshall, and all other major response agencies. Additionally, ODNR has made information readily available to all agencies on its emergency response web site. While no formal MOU's have been developed, a highly effective system of coordination that negates the need for MOU's is in place, where appropriate. The one problem with the system is that, although the Division is the lead regulatory agency for E & P waste management, ODNR is not always the first called to handle problems.

Follow-up Review Finding V.1

The recommendation is effectively met. The Review Team agrees that systems currently in place eliminate the need for formal MOU's with other response agencies. It is recommended that ODNR pursue communication with other agencies to establish their authority and need to be called as first responders to E & P waste spills.

Since the initial Ohio review, the Divisions of Oil and Gas, Mines and Reclamation, and Mines Safety that were formerly separate agencies have merged into a single agency. A major impetus for the merger was the elimination of duplication and overlapping duties. As a result of the merger, plugging requirements were consolidated into one rule that is now used statewide.

Initial Review Finding V.2

DMRM (DOG) and DOM have overlapping duties and responsibilities for wells located in coal bearing townships, creating conflicting standards for plugging operations.

Initial Review Recommendation V.2

Ohio should address these overlapping responsibilities (IOGCC Guidelines, section 4.4.)

Follow-up Review Finding V.2

The recommendation has been met.

III. TECHNICAL CRITERIA

Ohio's E & P wastes are extensively characterized, segregated and tracked to ensure compliance with the state prohibition of contamination. The state has funded independent research projects to characterize brine, which is the major component of E & P wastes. ODNR considers site conditions when making permit decisions, and has the ability to place waste handling conditions on any permit so as to meet different necessities in different settings.

General

Initial Review Finding VI.1

Performance standards and design specifications for waste management practices generally meet the criteria of the IOGCC Guidelines, Sections 5.1.a and 5.1.c. However, Ohio Revised Code (ORC) allows discharge of brine to the land surface from exempt Mississippian wells.

Initial Review Recommendation VI.1

DMRM (DOG) should establish an ongoing inspection program in the area of exempt Mississippian wells to determine if any deleterious effects of brine release are occurring. If so, Ohio should initiate a change to address these discharges. If no deleterious effects are observed, inspectors should continue to monitor the area. (IOGCC Guidelines, sections 5.1.a and 5.1.c.)

Direct disposal of brine from statutorily "exempt" wells is monitored by DMRM through inspections and, as necessary, soil testing. Adverse environmental effects of disposal, when they occur at all are minimal and are restricted to the immediate area of discharge. Only about 200 wells are covered by the exemption. The exempt wells are classified as stripper wells. The exemption does not allow direct discharge of brine into streams, and producers of exempt wells are not relieved from Ohio's anti-contamination rules. Inspection focus on the "exempt" area has been significantly strengthened following the departmental merger.

Follow-up Review Finding VI.1

This recommendation has been met. The DMRM should continue its current program of inspections and testing.

Initial Review Finding VI.2

ODNR is working with OEPA to prepare an MOU to coordinate enforcement efforts involving the improper management of hazardous waste as defined by Subtitle C of the Resource Conservation and Recovery Act at Class II disposal facilities.

Initial Review Recommendation VI.2

ODNR and OEPA should development and implement an MOU to address improper management of hazardous waste at Class II disposal facilities. (IOGCC Guidelines, sections 2.9.d. and 5.1.b.)

Improper management of hazardous wastes at Class II disposal facilities in Ohio is rare, with only two known cases recorded in DMRM files. DMRM and OEPA have a strong working relationship and regularly interact with regard to the Class I program. OEPA assistance is always available when needed. Because of the existing degree of cooperation and interaction and the rarity of Class II concerns, DMRM has not found a need to develop an MOU.

Follow-up Review Finding VI.2

The Review Team agrees with DMRM'S assessment that an MOU is not necessary.

Initial Review Finding VI.3

DMRM (DOG) has extensively characterized brine.

Initial Review Recommendation VI.3

DMRM (DOG) should work with other involved agencies, such as OEPA, to further characterize associated waste and to establish a policy that encourages segregation of waste and procedures for handling them. (IOGCC Guidelines, sections 2.9. and 5.1.b.)

As noted in the original finding, DMRM and its predecessor agency have done extensive characterization of produced brines in the state, and continues to do so through the use of routine analyses and the funding of research projects. Additionally, differentiation of RCRA exempt and non-exempt wastes is required and DMRM takes action if this requirement is not followed. Other segregated wastes such as drilling muds and cuttings are properly handled either under operator best management practice or permit condition. DMRM has developed several guidance documents that address the proper handling of wastes.

Follow-up Review Finding VI.3

The recommendation has been met.

Siting Criteria

Initial Review Finding VI.4

OEPA generally meets the guidelines related to disposal of E&P waste in municipal solid waste landfills.

Initial Review Recommendation VI.4

Testing to determine contents of waste delivered to landfills should be encouraged to ensure that landfills are the best option for E & P waste management. (IOGCC Guidelines, sections 5.1.d. and 5.2.2.)

Ohio operators do not dispose of significant volumes of E & P wastes in landfills. Any waste taken to landfills is subject to testing requirements imposed by the landfill operator. The landfill operator determines testing parameters and methods, and will not accept waste until test results are in and the waste approved for disposal. Testing, acceptance and

disposal of wastes are the responsibility of the landfill, and are outside the jurisdiction of DMRM.

Follow-up Review Finding VI.4

The recommendation has been met, in that E & P wastes are subject to testing prior to landfill disposal. The Review Team agrees that ODNR does not bear responsibility for this testing.

Initial Review Finding VI.5

Ohio does not have a clear statement in statute, regulation or policy for specific siting criteria relative to E & P waste management practices at sites and facilities.

Initial Review Recommendation VI.5

Involved agencies, at a minimum, should develop siting criteria for all E & P waste management practices at sites and facilities and should develop a coordinated policy stating the criteria for each type of practice. (IOGCC Guidelines, section 5.1.e.)

The DMRM has developed guidelines for the use and siting of oilfield brines for dust or ice control. Guidelines defining siting criteria have also been developed for bioremediation of crude oil contaminated soils and the remediation of brine contaminated soils. The permit review process uses certain siting criteria for the use of drilling pits and the ultimate disposal of wastes.

In addition to programs and policies currently in place, recently-passed legislation (HB 278) includes requirements for siting criteria and reviews that the DMRM is in the process of implementing. Criteria for the placement and ultimate disposal of E & P waste in urbanized areas will be defined.

Follow-up Review Finding VI.5

The recommendation has been met.

Waste Characterization

DMRM requires recording and reporting of all sites used for ultimate disposal of E & P wastes. Liquid wastes are dominantly (97%) disposed of in DMRM administered Class II UIC injection or EOR wells. Other legal methods of disposal are land spreading (<3%) and annular disposal (<1%). Land spreading usually occurs on roads where brine, as defined in statute, is used for dust or ice control. The DMRM reviews and approves road-spreading plans, and the plans also require approval from the local jurisdictional agency. DMRM has prepared and distributed a guidance document to assist local agencies with the process. Solid wastes, mostly rock cuttings, drilling muds, and cement, are usually disposed of on drilling sites but, in sensitive areas, operators may be required to take special measures such as cement stabilization or transport to an OEPA-approved landfill.

Initial Review Finding VI.7

DMRM (DOG) has not formally adopted a waste management hierarchy.

Initial Review Recommendation VI.7

DMRM (DOG) is encouraged to elevate to high priority the development and implementation of a waste hierarchy.

While DMRM has not developed a formal waste management hierarchy, their operational procedures effectively follow such a plan. Fluid wastes, which are predominately fresh water, brine and spent treatment liquids, are disposed of in accordance with Ohio's no-contamination regulations by injection into class II wells, annular disposal or surface application including ice and dust control. Class II disposal accounts for 97% of all fluid disposal in the state. Surface application is subject to strict guidelines, and assistance manuals have been developed and made publicly available. The DMRM has funded two university research projects to assess the environmental acceptability of using brines for ice and dust control. Annular disposal is allowed only in permitted wells that are subject to certain testing requirements. Ultimate disposal destination of all fluid wastes must be reported to the Division.

Solid wastes consist of rock cuttings, drilling muds and oilfield cements. These wastes may be disposed of on site, at an approved site other than the permitted site, or at an OEPA approved and controlled landfill. Permit review includes suitability of site for disposal. Some solid wastes may be required to be encapsulated in cement.

Follow-up Review Finding VI.7

The recommendation has been met. The Review Team finds that, although a formal hierarchy has not been developed, the spirit of the recommendation is met through operational practice and direct facilitation of proper disposal by DMRM.

Technical Criteria for Pits**Initial Review Finding VII.3**

The Ohio regulations do not specifically require the use of pit liners. DMRM (DOG) has developed extensive technical criteria for pit liners.

Initial Review Recommendation VII.3

Although beyond the scope of the IOGCC criteria, the Review Team recommends incorporation of such criteria into regulation or guidelines.

While there are no direct requirements for pit liners, all pits are subject to the "no contamination" rule, and are required to be liquid-tight which, in practice, means that a liner must be used. Liners may be required in special condition areas, and extensive guidelines for liner use have been developed. In reality, all pits are lined with materials that would meet guidelines for special use areas.

Follow-up Review Finding VII.3

The recommendation has been met. Although no formal requirements have been placed in regulation, existing requirements and practices meet the intent of the recommendation.

Initial Review Finding VII.4

Although Ohio has the authority to require pits to be secured as addressed in the IOGCC guidelines, section 5.5.3.f., Ohio has not developed specific criteria.

Initial Review Recommendation VII.4

The Review Team recommends that Ohio consider developing fencing, netting, caging, or other criteria to secure pits. (IOGCC Guidelines, section 5.5.3.f.)

Pits are secured during use while they are a part of the drilling operation. Because permanent pits are not allowed and drilling pits are generally closed within 35 – 40 days of completion of drilling (with a requirement for closure within five months), they are in existence for only a short period of time. DMRM has the authority to require pit security as a permit condition or as a result of site evaluation by inspectors. HB 278 will require further evaluation of fencing and screening of surface facilities including pits.

Follow-up Review Finding VII.4

The recommendation has been met. The Review Team finds that DMRM has and exercises adequate authority to secure pits, and recognizes that security measures are probably unnecessary, except in urban areas.

Initial Review Finding VII.7

DMRM (DOG) has pit construction, operation and closure standards that generally meet IOGCC Guidelines, section 5.

Initial Review Recommendation VII.7

Although beyond the scope of the IOGCC Guidelines, the Review Team recommends that DMRM (DOG) consolidate these standards into guidelines.

The DMRM believes that permit requirements and special conditions, as applied to pits, serve as site-specific guidelines and negate the need for further documentation. Because permanent, long term pits are no longer allowed, and because, in practice, pits are associated directly with drilling operations, pit closure is closely associated with other well completion operations, and is not a problem.

Follow-up Review Finding VII.7

The recommendation has been effectively met.

Commercial and Centralized Disposal Facilities

Initial Review Finding VII.10

Ohio's regulatory program does not distinguish between commercial or centralized facilities.

Initial Review Recommendation VII.10

Although Ohio currently has no specific commercial or centralized facility regulations, the Review Team recommends that DMRM (DOG) establish, as necessary, a specific regulatory program by expanding the existing program to include technical and public participation requirements that would be applicable to such facilities. (IOGCC Guidelines, section 5.10.)

Ohio makes no distinction between commercial and centralized facilities. These facilities are usually associated with the UIC program for injection wells or enhanced recovery projects, and all are treated as commercial disposal facilities. Technical requirements for such facilities are well developed and subject to EPA oversight. All such wells and facilities are subject to stringent standards. Rules requiring extensive public notice are in place. Notice by mail and publication in an outlet specified by DMRM are required.

Follow-up Review Finding VII.10

The recommendation has been met and exceeded.

IV. ABANDONED SITES

Of the nearly 270,000 wells known to have been drilled in the state since the late 1880's, DMRM has identified and prioritized over 400 sites that are ready for plugging under the orphan well program. In recent years, the department has plugged 60 – 70 orphan wells per year from that identified pool. Orphan well plugging is funded by an annual appropriation of \$800,000 from severance tax revenues. Additional funds are available for the plugging of wells that are deemed to be in emergency situations.

Citizen reports are the usual source of well locations to be added to the orphan well inventory. DMRM inspectors visit newly reported sites and evaluate them based on a standard set of criteria that, among other considerations, assess environmental hazards and proximity to habitation. The wells are added to the list to be plugged according to the priority established by the evaluation. It is generally conceded that, considering the number of wells drilled in the state and the lack of reporting and plugging requirements for early wells, there are probably many additional wells that would qualify for the orphan program. The DMRM does not currently have sufficient staff to proactively search for abandoned sites.

In 1995, the Ohio legislature established the highly successful Landowner Grant program for plugging of orphan wells. This program allows landowners who have orphan wells on their property to procure plugging services directly from the provider and subsequently petition the state for reimbursement of all costs. While the DMRM is not involved with the plugging contract and operations, it must approve plugging procedures and its inspectors witness virtually 100% of plugging jobs to ensure compliance. The Landowner Grant program is very cost-effective, and is targeted to absorb approximately 75% of orphan well expenditures in the current fiscal year.

In addition to the Landowner Grant program, the DMRM annually requests competitive bids for plugging of selected, high-priority orphan wells, and has targeted approximately 12% of orphan well expenditures for contracts in the current fiscal year. Emergency contracts account for the remainder of orphan well expenditures. These contracts usually involve urban or other high-density population areas, and are usually the most expensive of plugging jobs accomplished.

The orphan and abandoned well inventory is constantly being updated and revised to ensure that top priority wells receive first attention. All wells are re-evaluated just prior to being placed on contract for plugging. Any newly discovered or reported well is evaluated and appropriately placed, according to priority, on the inventory of wells to be plugged. While there is no formal means of citizen input regarding the prioritization of wells to be plugged, the act of locating and notifying the department of newly found wells has the effect of public input, since it causes the evaluation process to commence, and can result in a rearrangement of the existing inventory.

DMRM has an aggressive policy aimed at preventing operators from improperly abandoning wells so as to increase the state's liability. Wells are evaluated on a case-by-

case basis. The first priority is to place capable wells back into production. If this is not feasible, the operator can be served with an enforcement notice that requires establishment of a realistic plugging schedule. The schedule is monitored, and any lack of compliance may result in a Chief's order to plug.

Initial Review Finding VIII.1

DMRM (DOG) has an effective, well-managed orphan well site program. DMRM (DOG) does not regularly search for abandoned sites. DMRM (DOG) does not have a computer system that allows the agency to effectively list, track and identify well sites and owners.

Initial Review Recommendation VIII.1

DMRM (DOG) should develop appropriate mapping and computer systems to allow the agency to aggressively identify abandoned sites and determine if there are current owner/operators. (IOGCC Guidelines, section 6.3.)

DMRM has developed and is using a state-of-the-art database which contains all known oil and gas records in the state, including those associated with abandoned sites. The database is linked to maps, and can be queried to check for information regarding newly-reported or located wells and to search for owners. The state has identified over 400 wells that qualify for plugging under their program but, considering the fact that over 250,000 wells were drilled in the state, there are probably many more to be found. Most orphaned and abandoned wells are located through citizen reports and complaints. Each abandoned well site is evaluated and scored according to a standard matrix at the time of initial contact. The matrix considers various aspects of the location such as land use, well condition, environmental concerns, human health and safety and groundwater protection. The on-site inspector consults with the landowner as part of the initial evaluation. Landowners are instructed to contact the division for re-evaluation of the site if land use or well condition change. Each site is re-evaluated prior to being designated for plugging, and the landowner is, again, consulted. The DMRM has obtained detection and location equipment to assist with location of buried wells, but staffing levels do not allow dedication of personnel to search for abandoned wells. Field staff will diligently search for any well that is causing or has the potential to cause environmental harm. Wells to be plugged are prioritized according to actual or potential threats to human health and safety or the environment.

Follow-up Review Finding VIII.1

The recommendation has been met and exceeded.

Follow-up Review Recommendation 5

At current staffing levels, DMRM does an excellent job of overseeing the orphan well program, but should pursue additional staffing to directly address location of abandoned wells, which would benefit both the state and its citizens.

Initial Review Finding VIII.2

DMRM's (DOG) regulations do not formally provide for a mechanism to petition the agency concerning citizen input in the preparation of an abandoned site status.

Initial Review Recommendation VIII.2

DMRM (DOG) should provide for a formal mechanism to petition the agency to change a site's status on the inventory or the level of remediation required on the site. (IOGCC Guidelines, section 6.7.)

Each abandoned well site is evaluated and scored according to a standard matrix at the time of initial contact. The matrix considers various aspects of the location such as land use, well condition, environmental concerns, human health and safety and groundwater protection. The on-site inspector consults with the landowner as part of the initial evaluation. Landowners are instructed to contact the division for re-evaluation of the site if land use or well condition change. Each site is re-evaluated prior to being designated for plugging, and the landowner is, again, consulted. The DMRM also has a provision for landowners to cause wells on their property to be plugged, after which they receive reimbursement from the state. All plugging designs must be approved by DMRM staff, and all orphan plugging jobs are witnessed by staff.

Follow-up Review Finding VIII.2

The recommendation has been met. The Review Team believes that best practices are being employed, that adequate public involvement is facilitated, and that no formal process is needed.

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VI. NATURALLY OCCURRING RADIOACTIVE MATERIAL

The Ohio Department of Health (DOH) has statewide responsibility for regulation of radioactive materials. DOH has drafted NORM regulations, but has not yet made draft rules available for agency or public comment. It is not known how or if these regulations will impact DMRM. Although DMRM has not conducted formal investigations, available information and cursory observations have not indicated the need for NORM regulation in the Ohio oilfields.

Initial Review Finding IX. 1

No testing for NORM at oil and gas E & P sites and facilities has been done either by DMRM (DOG) or DOH.

Initial Review Recommendation IX.1.

Ohio should test for NORM at E & P sites and facilities to determine if NORM is present. DOH should determine the appropriate action levels for NORM. If NORM is found at action levels, Ohio should establish a regulatory program for all aspects of NORM. (IOGCC Guidelines, section 7.)

DMRM has not undertaken formal investigation of NORM in Ohio oil and gas operations. Regulatory responsibilities lie with the Department of Health, and their draft regulation is not yet available.

Follow-up Review Finding IX.1

The recommendation has not been met. Ohio has not yet tested to determine if NORM is present at E&P Facilities because the agency responsible for regulating NORM generally in Ohio, i.e., DOH has not yet completed the necessary rulemaking. Available information indicates, however, that NORM is not a problem in the oil field in Ohio.

Follow-up Review Recommendation 6

DMRM should consider whether adopting a NORM regulatory program is warranted in Ohio.

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VIII PERFORMANCE MEASURES

As discussed under the Program Highlights section of this report, the DMRM has adopted a formal strategic planning process that it has been implementing since 2000. It is designed to identify the goals and objectives to be pursued annually by the DMRM, and the strategies for obtaining them. Each year, a core team made up of 15 DMRM staff members participates with each program Administrator/ Supervisor in a two-day planning session to draft a Strategic Plan for the upcoming 12 months. Staff input is solicited both prior to and after the two-day planning session. Once the plan is finalized, the core team meets quarterly to assess the progress being made in meeting the Plan's goals and objectives.

The Strategic Plan is available electronically to all staff, as are quarterly reports (in PowerPoint) depicting the Plan's accomplishments to date. Additionally, the DMRM holds monthly meetings with its field personnel to discuss activities and priorities for the upcoming month, allowing for routine re-evaluations and refinements of the Plan and how to achieve its goals and objectives.

As part of the strategic planning process, DMRM tracks a number of indicators of program activity such as the number of orphan wells that are plugged, the number of mechanical integrity tests that are witnessed, and inspections performed. DMRM also tracks permit turn-around times and response times for public inquiries and complaints. Data for these parameters has been tracked for complaints for 15 years (in an electronic log for the past 2 years), for orphan well plugging for 10 years and for mechanical integrity tests for 20 years (since 1985).

In addition to activity indicators, the DMRM Strategic Plan identifies a number of objective-specific performance measures that are used to evaluate progress toward stated goals. These measures include such items as fatality and lost-time accident rates to evaluate their mine safety objectives, sites reclaimed and wells plugged per dollar spent to evaluate their reclamation objectives, and customer satisfaction rates to evaluate their customer service objectives.

The main environmental indicator of overall program success that DMRM tracks is the number and kind of off-site impacts that result from oil and gas exploration and production activities. Off-site impacts have been tracked for the past year.

Follow-up Review Recommendation 7

The Review Team commends DMRM for its strategic planning program and for tracking key program activities. The Team recommends that DMRM continue to identify other additional environmental indicators and benchmarks that can be tracked over time to evaluate the environmental performance of its programs (e.g., for example, the number of areas with contaminated groundwater and the number cleaned up each year as a raw number and as a percentage of the known problem areas). Such indicators can assist DMRM in its tracking of environmental changes to track environmental change as a result of program

activities, and to make program alternations to continue to improve environmental results.

APPENDIX A – GLOSSARY OF ACRONYMS

BCF	Billion cubic feet
BLM	Bureau of Land Management
DI	Direct Implementation
DMRM	Division of Mineral Resources Management
DOM	Division of Mines and Reclamation
DOG	Division of Oil and Gas
DOH	Department of Health
E&P	Exploration and production
EPA	United States Environmental Protection Agency
GIS	Geographic Information System
GPS	Global Positioning System
GWPC	Ground Water Protection Council
H ₂ S	Hydrogen sulfide
IOCC	Interstate Oil Compact Commission
IOGCC	Interstate Oil and Gas Compact Commission
MCF	Thousand Cubic Feet
MSDS	Material Safety Data Sheets
MIT	Mechanical Integrity Testing
MOU	Memorandum of Understanding
NORM	Naturally Occurring Radioactive Material
NOV	Notice of Violation
NPDES	National Pollutant Discharge and Elimination System
ODNR	Ohio Department of Natural Resources
OEPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
RBDMS	Risk Based Data Management System

RCRA	Resource Conservation and Recovery Act
SPCC	Spill Prevention, Control and Countermeasures program
STRONGER	State Review of Oil and Natural Gas Environmental Regulations
TDS	Total Dissolved Solids
UIC	Underground Injection Control
U.S. EPA	United States Environmental Protection Agency

APPENDIX B – COMPLETED OHIO QUESTIONNAIRE