INDIANA STATE REVIEW

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

April 2005

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INTRODUCTION

In 1990, the Interstate Oil Compact Commission (IOCC) and the U.S. Environmental Protection Agency (EPA) 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 published guidelines provided the basis for the State Review Program, a multi-stakeholder process by which state exploration and production (E&P) waste management programs are reviewed 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 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 November, 2004 a nine-person team appointed by STRONGER conducted a review to evaluate the adequacy of the Indiana program compared to the 2000 Guidelines. The nine-person team consisted of four team members and five observers. Bradley Field, New York Division of Mineral Resources; Stephen T. Link, attorney at law; Clarke Kahlo, Hoosier Environmental Council; and William Bryson, Ground Water Protection Council served as team members. Mark Carl, IOGCC; Don Neeper, STRONGER; Nancy Comstock, U.S. Department of Energy; Bonnie Robinson, U.S. Environmental Protection Agency; and Michael Cash, Coy Oil, Inc. participated as observers.

The process began with a streamlined questionnaire as part of the short-form review process that was sent to the Indiana Division of Oil and Gas (DOG). STRONGER tailors its state review process to the specific states being reviewed. A short-form review is a review process designed for states with small programs and limited oil or natural gas exploration and production activity. It covers the same information as a regular state review, but the questionnaire is shorter and more general than the questionnaire used for states with larger programs. STRONGER intended for the questionnaire to capture the status of the Indiana program relative to the 2000 Guidelines and the EPA's underground injection control requirements. The DOG prepared a response to the questionnaire which was then sent to the review team. Indiana's response to the questionnaire is provided in Appendix B.

The review team conducted its meeting, the in-state portion of the review, in Indianapolis, Indiana at the DOG offices on November 16–18, 2004. Mr. Mike Nickolaus and staff of the DOG provided a description of program activities and responded to questions from the team and observers. Following the interviews and review of the written materials and backup documentation provided by the state, the review team compiled this review report.

In addition, this report contains an initial review of the Indiana Underground Injection Control (UIC) program. The UIC program is designed to protect Underground Sources of Drinking Water (USDWs) through the regulation of Class II injection wells. The UIC portion of this review was conducted by the Ground Water Protection Council (GWPC) and the findings of the UIC review are included in Section 7 of this report.

This is the report of the review of the Indiana Division of Oil and Gas programs against the standards of the 2000 Guidelines. This report consists of six main sections according to the structure of the 2000 Guidelines: General Criteria, Administrative Criteria, Technical Criteria, Abandoned Sites, Naturally Occurring Radioactive Material (NORM), and Performance Measures, and a seventh section relating to the UIC program. Appendix A is a glossary of all acronyms used in the report. Appendix B contains Indiana DOG's written response to the questionnaire.

EXECUTIVE SUMMARY

A comprehensive review of the Indiana oil and gas environmental regulatory program has been completed by a multi-stakeholder group, which has concluded that the Indiana program is an effective program and also made recommendations for improvements in the program.

Program Strengths

The Review Team identified strengths of the Indiana program, which also are noted in several of the report's findings. The following offers an overview of the Indiana program's strengths.

Finding IV.4: The 2-year cycle for inspecting each commercial well is a good practice and the DOG is to be commended for these regular inspections. The use of unannounced inspections and the authority to enter any site without permission are desirable and commendable.

Finding IV.15: The DOG is to be commended for its DOG P.A.W.S system and its Virtual Procedures Manual, which provide ease of access and use for many of the DOG's functions.

Finding IV.18: The MOA with IDEM is a strong program element and appears to function effectively with close coordination and minimal duplication or overlap. The field workers in both IDEM and DOG work well together to implement the agreement in the field.

Finding VI.2: The Review Team commends the DOG for the overall effectiveness of its program, and especially for its innovative partnership with public interest and industry groups. In addition, the DOG has been innovative in its approach to orphan sites issues by facilitating the creation of an Environmental Advisory Board (EAB), an alliance of industry, public interest and government stakeholders.

Finding VI.9: The Review Team commends the DOG for encouraging and facilitating the adoption of orphan sites by responsible operators.

Finding UIC I-1: The Review Team compliments IDNR on the organization of Article 16, which contains all the oil, gas and UIC regulations. Each subject (i.e. application filing, plugging and well testing) has a section(s) that apply to UIC wells where specific requirements are needed. This may be a handier reference method for the operator than where the UIC regulations are contained in a separate section.

Finding UIC I: The Indiana MIT program far exceeds the minimum standards of the Federal Program primacy commitment which requires that at least 25% of wells tested in any given year be witnessed by an inspector.

Finding UIC X: The DOG recognition of the short time span that often occurs during times of economic depression in the industry between operation of a well and its temporary abandonment or abandonment without plugging is farsighted. Frequently, the last wells to be plugged on a lease in abandonment mode are Class II injection wells, consequently DOG's efforts help protect USDWs. This tracking program should also help decrease the number of orphan wells

Finding UIC XI: A strong aspect of the DOG plugging program is that DOG inspectors witness all pluggings.

Finding UIC XII: The EAB and the Brine Coalition provide DOG a good opportunity for stimulating public interest, at least for the Southern part of the state where oil is produced.

Program Recommendations

The following selected major findings and recommendations serve to complete the summary of the report.

Finding III.4: The DOG continues to develop and refine goals and detailed objectives relating to agency operations as part of the biannual Indiana budget process.

Recommendation III.4: The DOG should consider developing a long-range plan including vision, mission, and goals, in addition to the current 2-year planning/budgeting process. (2000 Guidelines 3.2)

Finding IV.7: The Virtual Procedures Manual is valuable in its present form as an internal guidance document. However, there is some information within the Virtual Procedures Manual which would also be valuable to the general public.

Recommendation IV.7: DOG should develop an online version of the Virtual Procedures Manual which is appropriate for public consumption. (2000 Guidelines 4.2.2.2)

Finding IV.11: The Indiana Access to Public Records Act provides that agencies respond to written public requests within 7 days of receipt. If a records request appears to raise an issue of non-disclosability, and if the DOG does not refer the question to the Chief Counsel for 5 days following receipt of the request, there is a potential that the requesting public will not receive an answer or acknowledgement within the statutory 7-day period.

Recommendation IV.11: The DOG should review their internal procedures to ensure that the statutory response requirements are met. (2000 Guidelines 4.2.2.1)

Finding IV.19: The IDEM produces an annual report on the State of the Environment. However, the DOG does not participate in, or contribute to, the preparation of the report.

Recommendation IV.19: The DOG should seek to prepare an element for the IDEM annual report which highlights the activities under the MOA. (2000 Guidelines 4.4)

Finding V.5: There are no required setbacks or minimum distances from buildings, homes or other structures for wells, drilling pits or any other pit in the current rules (312 IAC 16) or proposed rule.

Recommendation V.5: The Review Team encourages the DOG to develop minimum distances from buildings, structures, roads and places of public assembly for the location of wells and pits. (2000 Guidelines 5.5.3)

Finding VI.4: The vast majority of true orphan well sites will be identified under the current Indiana program.

Recommendation VI.4: While absence of operable production equipment may be sufficient, the State should consider implementing some additional mechanism, such as well by well (or lease) production reporting, to help identify wells which, though permitted, are truly orphaned. (2000 Guidelines 6.3)

Finding VI.12: Indiana has established a proven, effective orphan well program and has implemented a fair and effective enforcement and compliance program as discussed elsewhere herein. Due to the potential threat to public health and the environment, however, the program should be monitored and re-evaluated, long-term and continuously.

Recommendation VI.12a: It is recommended that the State's Strategic Plan assess future potential impact of wells in the Trenton Field. (2000 Guidelines 6.8)

Recommendation VI.12b: It is recommended that the Oil and Gas Environmental Fund sources, particularly the well fee program, be closely monitored and evaluated against the fund's ability to anticipate and protect against future liabilities of future orphan wells. (2000 Guidelines 6.8)

Finding VIII.1: The Review Team found that the DOG is developing good analytical methods for tracking office performance. The Review Team recognizes that spill incidents are not sufficiently tracked within the present database system.

Recommendation VIII.1: The Review Team suggests the DOG develop a methodology for tracking spill incidents and a strategy for long-term trend analysis for environmental preventative measure and remediation results. (2000 Guidelines 8.2)

Finding UIC II: The DOG Director indicated that the inability to fill vacant administrative positions has caused existing staff to assume the duties and activities normally performed by persons in those positions. This has limited staff time to address other technical projects and some critical tasks or possible increases in UIC activity caused by increased drilling in the state.

Recommendation UIC II: IDNR should allow DOG to continue supporting ongoing efforts by the Ground Water Protection Council (GWPC) to obtain additional funding for state UIC primacy programs.

Finding UIC VII: The 3% falloff pressure per 30-minute testing period used by IDNR is very strict and, in fact, is stricter than the 5-10% used by other Class II primacy states and the 5% commonly used by EPA for DI programs.

Recommendation UIC VII: Division staff indicated the 3% falloff pressure was negotiated with EPA Region V at the time Indiana received primacy in 1991. While any state program can invoke a stricter standard than required by EPA, 3% loss may actually be so low that some internal well conditions not associated with a loss of well integrity could indicate a failure when none exists. The Review Team believes IDNR should check other primacy and DI programs in Region V to provide standard consistency unless the 3% falloff standard was based on specific well completion programs or geologic conditions intrinsic to Indiana.

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PROGRAM OVERVIEW

The Indiana Division of Oil and Gas (DOG) implements rules governing the drilling, operating and closure of wells, the construction, operation and closure of pits, the management of spills of oil and gas exploration and production waste and the construction, operation and closure of tank batteries.

The DOG derives its authority from the Indiana Code section 14-37. This statute specifies that the Natural Resources Commission (NRC) is the ultimate authority for the regulation of oil and gas operations as follows "The commission shall regulate the drilling, casing, operating, plugging, and abandoning of wells and any related fluid storage to prevent the following:

(1) Waste.
(2) Fresh water pollution.
(3) Blowouts.
(4) Cavings.
(5) Seepages.
(6) Fires.
(7) Unreasonably detrimental effects upon fish, wildlife, and botanical resources.

The DOG regulates oil and gas exploration and production operations by delegation from the NRC through an established set of oil and gas rules promulgated in the Indiana Administrative Code. These rules, established under section 312 IAC 16 provide for permitting of wells, establishment of requirements for the disposal of produced fluids, construction and operation of pits and tanks, issuance of enforcement actions and civil penalties and management of oilfield spills.

All oil and gas drilling operations in Indiana must be permitted with DOG, and all permitted operations must conform to rules and policies established by the division and the NRC. Permits expire in one year unless drilling is commenced or the permit is renewed. DOG inspectors have statutory authority to enter any property for the purposes of inspecting operations and to examine any pertinent records in order to administer and enforce provisions of the statute. Inspections are unannounced and are conducted according to a prescribed system of priorities defined by policy. Complaints received from the public are investigated in accordance with division policy.

The DOG has the authority to issue enforcement actions, both informal and formal and to assess civil penalties up to $10,000 per day for each day of noncompliance in accordance with an established Penalty Matrix approved by the NRC. Additionally, the DOG has the authority to seek permit revocation for non compliance that is not corrected within established guidelines.

The rules do not require waste tracking or disposal except for oilfield brines which are regulated by the Underground Injection Control (UIC) program delegated to the division by the USEPA.

The DOG operating budget is funded by a combination of severance tax revenues, general fund allocations and permit fees. The DOG also manages an orphan sites program that is funded by the assessment of annual wells fees and civil penalties.

The DOG has 19 employees including a division director, 3 assistant directors, 2 petroleum geologists, a field geologist, 1 field inspection manager, 7 field inspectors, an information

technology administrator, administrative assistant, office manager and account clerk. Each inspector manages a geographical area and inspects operations, takes enforcement actions and conducts complaint and incident investigations in that area. The DOG maintains a field office in southwest Indiana to manage field services for the main oil and gas production area of the state. Technical support is available, if needed, from other employees within the DOG, from other divisions of the DNR and from other state agencies such as the Indiana Department of Environmental Management (IDEM). All inspectors are assigned 4 wheel drive vehicles and are equipped with laptop computers which contain the complete DOG database (permit information, drilling and completion data, enforcement data etc...) for quick reference and data entry in the field. Each inspector is also assigned a set of well gauges and a handheld GPS unit for well and facility geo-referencing. Employee training is conducted on an as needed, as available and as budgeted basis but typically includes equipment training, well plugging and cementing techniques, computer and database training and field operations training.

Oil and gas E&P wastes, other than produced water, are typically managed on-site and usually consist of cuttings, drilling mud, fresh water and other RCRA Subtitle C exempt wastes. Produced water is managed under the UIC program. Waste tracking, other than UIC waste, is not required but general provisions state that "To prevent surface or underground pollution, no person shall dispose of a fluid that results from the development or production of a well for oil and gas purposes except as approved by the division." The DOG is currently working on the development of surface facility rules with IDEM; which will include provisions for the handling and disposal of exempt wastes from oilfield operations, other than UIC waste.

Drilling pits are to be temporary structures associated with specific drilling, completion or plugging operations, and are to be properly drained and closed when those operations are complete. Drilling pits do not require liners. However, the rules specify that "Upon completion of a well, pits shall be filled and leveled. The surface shall be restored as nearly as practicable to conditions existing before drilling commenced." Permanent pits may also be authorized for the storage of oilfield brines prior to their injection in an authorized Class II injection well. Such pits must meet specific siting, liner and freeboard criteria.

The DOG does not currently authorize the use of landspreading for oilfield waste other than for spilled materials, which must be managed on-site. Spills are managed under the divisions' rules and include specifications for reporting, testing and remediation siting and standards. The rules do not address land application (landfarming) of cuttings but because drilling fluids in Indiana normally consist of fresh water and bentonite mud the spreading of drill cuttings upon conclusion of drilling operations is typical. The proposed surface facilities rule will specifically address the issue of landspreading of exempt waste. Burial of drill cuttings and other exempt wastes is not currently addressed in the rules. However, the proposed surface facilities rule will address this issue.

Roadspreading of waste fluids is not currently allowed except for the spreading of materials, other than brine contaminated soils, from spills. Roadspreading of spilled materials is confined to lease roads and must conform to application requirements that are designed to prevent the materials from leaving the road surface. Roadspreading of exempt oilfield waste other than spills will be addressed in the proposed surface facilities rule.

Permanent tanks must be surrounded by secondary containment having a capacity of at least 1 ½ times that of the largest tank or tanks connected in series within a battery. All dikes must be kept

free of vegetation, water or other fluids. Tanks, along with any other surface equipment not needed to monitor the site, must be removed when the site is abandoned and the site must be returned as nearly as practicable to its condition prior to operations. Indiana has no commercial or centralized disposal facilities and does not address such sites in the statutes or rules.

Orphaned sites are defined as those sites that have been improperly abandoned and for which no viable responsible party exists. At present the official orphan sites list includes, only those wells for which the permit has been revoked, including their associated facilities, and where a responsible party is not available. However, other improperly abandoned wells not on the official orphan sites list are managed through the orphan sites program. Plugging of these wells and reclamation of the sites are the responsibility of DOG, and wells are plugged as funding and contracting capability are available. Funding for the orphan sites program comes from an annual well fee, the assessment of civil penalties and the forfeiture of bonds. The wells are chosen for plugging according to their potential for environmental damage. The program is managed by a DOG assistant director who manages site review, contracting, technical criteria and follow-up of site closures.

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GENERAL CRITERIA
(2000 Guidelines Section 3)

FINDING III.1: *The Review Team finds that the Indiana program meets all the General Criteria of the 2000 Guidelines, Section 3, except where otherwise noted.*

3.1 General

The Division of Oil and Gas of the Indiana Department of Natural Resources (DNR) is charged with all permitting and regulatory responsibility for drilling, the operation and closure of wells, the construction, operation, and closure of pits, the management of spills from oil and gas exploration and production, and the construction, operation and closure of tank batteries. It implements the administrative rules as promulgated by the Natural Resources Commission and published in the Indiana Administrative Code.

Legislative authority is provided by Indiana Code 14-37 (originally enacted in 1947). The statute provides that the Natural Resources Commission (NRC) is the ultimate authority for the regulation of oil and gas exploration and production. It specifies that "the Commission shall regulate the drilling, casing, operating, plugging, and abandoning of wells and any related fluid storage to prevent the following: waste, fresh water pollution, blowouts, cavings, seepages, fires, and unreasonably detrimental effects upon fish, wildlife, and botanical resources."

The DOG administers the oil and gas regulatory program through formal delegation from the NRC through rules adopted by the NRC and promulgated under 312 IAC 16. The rules provide for permitting of wells, establishment of requirements for the disposal of produced fluids, the construction and operation of pits and tanks, the issuance of enforcement actions, and management of oilfield spills.

The DOG's budget is currently funded at a level of approximately $1.4 million per year. Its Oil and Gas Environmental Fund is currently funded at a level of approximately $250,000 per year.

FINDING III.2: *The DOG currently possesses adequate enabling authority and administrative rules to conduct its program of regulation of oil and gas exploration and production. Generally, its budget has been sufficient to fund its principal activities, although recent state fiscal pressures have constrained certain projects and functions.*

The DOG conducts periodic activities which coordinate its functions with other agencies, the regulated industry, and the public, and is cognizant of the need to maintain open communications with all stakeholders. It appears that its efforts to involve the public could benefit from additional attention. Also, the DOG performs its permitting and enforcement of exploration and production wastes according to a set of technical criteria. Some additional criteria are currently undergoing revision through a draft Surface Facilities Rule.

3.2 Goals

The DOG's Mission Statement provides its overarching goal as follows:

"The Division of Oil and Gas promotes the responsible development of oil and natural gas resources while protecting the environment. We serve the industry and the citizens of Indiana through professional leadership, management, and education." (source: current Strategic Plan). The DOG's 5-page Draft Strategic Plan for 2005-2007 repeats the above 1996 Mission Statement.

FINDING 111.3: *The mission statement as written, provides for the protection of the environment while maintaining an economically viable industry. The term "promote" could be misconstrued to emphasize one portion of this statement over the other.*

The DOG program activities, such as those relating to underground injection control and environmental protection, provide for the protection of human health. These activities are not recognized in the mission statement.

RECOMMENDATION III.3: *DOG should consider revising the mission statement to include that activities are conducted in a manner that is protective of human health and the environment. (e.g."The Division of Oil and Gas fosters the responsible development of oil and natural gas resources in a manner that is protective of human health and the environment.")*

The DOG's existing (1996) Strategic Plan contains an extensive 3-paragraph Vision Statement. The latter 2 paragraphs (relating to customer focus/customer culture and creating a positive working environment) of the plan have been eliminated in the draft 2005-2007 Strategic Plan.

The draft 2005 to 2007 Strategic Plan also includes sections on Values, Operational Objectives, Strategies, and Goals. Four Goals are specified for the period:

1) Implement a new database with e-service, GIS and benchmarking capabilities, and populate it with data;
2) Audit and update 25% of existing rules and associated procedures, policies and programs to streamline regulatory operations;
3) Prepare and submit updated Underground Injection Control (UIC) Program Description and Quality Management Plans to EPA; and
4) Obtain staff training related to programmatic and state administrative processes. Each Goal is followed by a list of Action Steps designed to attain the Goal.

In addition to the draft Strategic Plan, the DOG is currently developing an extensive list of topical Performance Standards Guidelines comprised primarily of objectives and functional tasks.

FINDING III.4: *The DOG continues to develop and refine goals and detailed objectives relating to agency operations as part of the biannual Indiana budget process.*

RECOMMENDATION III.4: ***The DOG should consider developing a long-range plan including vision, mission, and goals, in addition to the current 2-year planning/budgeting process. (2000 Guidelines 3.2)***

ADMINISTRATIVE CRITERIA
(2000 Guidelines Section 4)

FINDING IV.1: *The review team finds that the Indiana program meets the Administrative criteria of the 2000 Guidelines, Section 4, except where otherwise noted.*

4.1 Basic Requirements

The Guidelines require that state programs for the regulation of wastes resulting from the exploration and production of oil and gas (E&P wastes) should include provisions for permitting, compliance, and enforcement.

FINDING IV.2: *The review team finds that the state of Indiana, through its Division of Oil and Gas (DOG) of the Indiana Department of Natural Resources conducts an extensive program for the regulation of E &P wastes. The program possesses the three essential elements required by the Guidelines. The enabling statute, I.C. 14-37, grants broad authority to the Natural Resources Commission which has delegated certain of its powers to the DOG. The DOG employs a staff of 19 which is comprised of a Director, 3 Assistant Directors, 2 petroleum geologists, a field geologist, an information technologies (IT) manager, 1 field inspection manager, 7 inspectors, and support and administrative staff.*

Permitting

Under the enabling legislation (Indiana Code 14-37) and subsequent administrative rules (312 Indiana Administrative Code, Article 16), all drilling operation for oil and gas must be permitted by the DOG. All permitted drilling operations must comply with the rules adopted by the Natural Resources Commission.

Approximately 300 new permits are issued annually. Permitting activity has slightly increased due to recent higher petroleum demand and higher prices.

Currently, there are 6,896 oil producing wells and 2,362 gas producing wells. An additional 22,472 wells are dry holes.

The permitting process for drilling is comprehensive in that it includes all aspects of facilities siting and construction. Permitted sites are inspected by the DOG to ensure compliance with siting and construction requirements.

Permits do not become effective until 18 days after they are issued.

The DOG cannot deny a permit unless under specific situations, as defined by rule.

Permits are valid for one year only. The Division inspects each site to determine whether the well has become operational.

The DOG also permits injection wells and, since, 1991, has assumed the primary enforcement authority for the federal UIC program

FINDING IV.3: *The 18-day waiting period for each well is considered to be a problem for industry which believes that the waiting period is too long. The DOG believes that permits should become immediately effective.*

RECOMMENDATION IV.3: ***In concert with the industry and with public interest stakeholders, the DOG should examine the rationale and length of the term of the waiting period for new wells. (2000 Guidelines 4.1.1)***

Compliance Evaluation

DOG has divided the state into 8 inspection districts. Two are supervised from the Indianapolis office and 6 are supervised from the Evansville office. Inspectors conduct approximately 6,000 inspections per year. Inspectors receive notice of drilling 24 hours before drilling begins so that they can inspect the site during drilling. The DOG inspects each well and tank battery at least every two years. They also witness approximately 300 MIT tests a year, and witness approximately 250 plugging and abandonments of wells and restoration of sites per year. The DOG prepares detailed inspection reports. Citizens can request site inspections via the internet.

The DOG has a policy of easy and quick access to inspectors by operators. This includes immediate forwarding of calls reporting spills or other emergencies to the inspectors. In some cases, inspectors have given their phone numbers, including cellular or home number, to operators to report spills in emergency situations.

The DOG maintains a database (data DOG) which appears to be detailed and comprehensive to enable DOG to monitor compliance and initiate enforcement actions. Although the complete database for each well is not available to inspectors in the field, it is slated for use in the near future. This will aid inspection and enforcement and will improve overall efficiency of operations.

The DOG has developed an electronic "Virtual Procedures Manual" for agency personnel which compiles essential guidance for inspections, enforcement, spill response and administrative matters.

All of the Division's well routine inspections are unannounced. In addition, the Division has the legal authority to enter any site without permission and to inspect records.

The rules adopted by the NRC authorize the DOG to impose a permanent permitting ban upon operators which fail to correct violations. It prohibits operators from ever receiving another permit to operate in Indiana and from receiving transfer of a previously permitted well.

FINDING IV.4: *The 2-year cycle for inspecting each well is a good practice and the DOG is to be commended for these regular inspections. The use of unannounced inspections and the authority to enter any site without permission are desirable and commendable. The permanent permitting ban from operating in Indiana is a good enforcement tool. The DOG is to be commended for implementing the pending field data access system. (2000 Guidelines 4.1.2.1)*

Enforcement

The DOG has full authority to suspend or revoke permits. There is a process of administrative review pending suspension or revocation of a permit, and the operator has ample opportunity to comment on the proposed enforcement action or rectify the condition.

The DOG utilizes a progressive system of enforcement. It includes a warning ("courtesy letter") providing 30 days to bring the facility into compliance, a formal Notice of Violation (NOV) with possible accompanying penalties (as authorized by adopted rule of the Natural Resources Commission), an Administrator's Order, and finally a Director's Order.

The DOG may issue a letter of Permit Denial after a Notice of Violation has been issued and the violation not corrected. The letter must allow for the requisite 30-day period for the permittee to request a proceeding following the NOV notice pursuant to IC 4-21.5-3-6.

The DOG issues 300 to 400 warnings per year and approximately 150 NOVs. According to the DOG, most warnings and violations will come into compliance.

Currently, there are approximately 350 oil and gas operators in addition to about 1000 permits for landowner (personal) gas wells.

Approximately 150 violations per year receive a formal NOV. Of these, about 25% are appealed to the NRC for hearing by an administrative law judge operating from the NRC's Division of Hearings.

The DOG maintains an Enforcement History Report database for all permits which provides a summary of enforcement activity.

The Division cannot suspend the operation of an oil well, but can revoke the permit. However, it can suspend the operation of an injection well.

It requires an extended period of time to revoke a permit because the DOG's policies provide many opportunities to correct deficiencies.

Since 1997, the DOG has the authority to assess financial penalties (fines) and determines the amount of such fines via a nonrule policy document penalty matrix (last amended effective January 1, 2003).

Penalties are assessed by the main office of DOG upon recommendation from the field staff. Violators have 30 days to correct the deficiency and pay the penalty. Failure to pay the fine or correct the deficiency can result in permit revocation.

FINDING IV.5: *The DOG seems to apply enforcement consistently across the board with no apparent favoritism, for which it should be commended. The DOG uses its penalty and permit revocation powers as enforcement tools but does not have authority to order suspension of operation.*

RECOMMENDATION IV.5: ***Although beyond the present staffing capabilities, the DOG should seek legislative authority to include permit modification and suspension for good cause. (2000 Guidelines 4.1.3.1.f)***

4.2 Additional Program Requirements

State Contingency Plan

The DOG has developed a contingency plan for responding to spills and releases. It is conducted in cooperation with the Indiana Department of Environmental Management (IDEM) via a formal Memorandum of Agreement (MOA) between the DNR and IDEM dated June 13, 1997. Generally, if a spill or release threatens state waters, or otherwise poses a relatively greater risk under specified conditions, then IDEM's Office of Emergency Response has jurisdiction. The emergency procedures are documented in the DOG's Spill Response Plan dated May 18, 1998. Both the Spill Response Plan and the MOA are included in the DOG's electronic Virtual Procedures Manual.

FINDING IV.6: *The Memorandum of Agreement between IDEM and the DNR appears to adequately address the need for a coordinated emergency response plan.*

DOG regulations require the operator to immediately clean up any unauthorized spill or release. DOG has developed a spill management plan as guidance to operators.

Public Participation

The DOG recognizes the need and importance of public access to information and participation in the permitting and enforcement process. In fact, landowners are usually the party who alerts the DOG to potential violations.

The DOG indicates that it welcomes participation from the public on an informal basis throughout its permitting and enforcement processes. (2000 Guidelines 4.2.2.1)

The DOG utilizes its website as a primary method for communicating and coordinating with the public and the industry. In addition, the Division maintains close contact with the Indiana Oil and Gas Association. All DOG forms are available online. Citizens can request site inspections online.

The DOG requires direct notification of adjacent landowners and those within ¼ mile for injection wells in additional to publication in newspapers of local circulation.

The Indiana Access to Public Records Act (I.C. 5-14-3-1 et seq.) generally provides that state and local public agency records are disclosable public records and subject to public inspection and copying subject to certain statutory exceptions. The DOG is a public agency and its records are generally subject to public disclosure.

The DOG will hold an informal hearing if requested by any interested person prior to a formal hearing conducted by an administrative law judge via a formal appeal of an agency action to the Natural Resources Commission. These informal hearings are public-noticed in local newspapers. Any member of the public is invited to participate. Notes and comments are recorded (but not a verbatim transcript). Following the hearing, the DOG Administrator issues an order or decision which is available to anyone who requests it.

The DOG's Virtual Procedures Manual is not publicly available, and in fact is described in a text heading as confidential: "This manual is an 'Advisory Document' and is intended for DIVISION PESONNNEL ONLY".

FINDING IV.7: *The Virtual Procedures Manual is valuable in its present form as an internal guidance document. However, there is some information within the Virtual Procedures Manual which would also be valuable to the general public.*

RECOMMENDATION IV.7: ***DOG should develop an online version of the Virtual Procedures Manual which is appropriate for public consumption. (2000 Guidelines 4.2.2.2)***

The DOG performs valuable public services by ensuring that oil and gas extraction is conducted in a manner that will protect the environment. Yet it generates and receives relatively little publicity. It creates news releases relatively infrequently and some DOG news releases apparently fail to receive approval from the DNR's executive office.

The DOG creates and maintains individual files and reports of spill incidents and remediation programs. However, these reports are maintained at several locations (the Indianapolis headquarters office and the Evansville field office) thus complicating access by the public.

FINDING IV.8: *Public access to the agency's records for spills and remediation would be enhanced by an improved file system.*

RECOMMENDATION IV.8: ***The DOG should consider ways to enhance the retrievability of public files from its two offices so that the agency and the public can have easy and convenient access. (2000 Guidelines 4.2.2.1)***

The DOG has produced a few public information brochures describing the agency's functions and the public's role and rights in agency operations, decisions and proceedings.

FINDING IV.9: *There is a need for more published general information available to the public about the DOG and its responsibilities and procedures. It would be desirable to prepare a public brochure to explaining the DOG's responsibilities and operations and how the public can participate.*

RECOMMENDATION IV.9: ***The DOG should consider publishing and disseminating a brochure or similar public education materials about the agency and its procedures. This would help to communicate the process and ensure the consistency of information to the public over time and among numerous employees. This brochure should also be posted on the DOG's website. (2000 Guidelines 4.2.2.1)***

FINDING IV.10: *One reason for the low level of DOG public education materials is the perception that the Department of Natural Resources is considered to be primarily a recreation-oriented agency. As a result, its regulatory activities related to natural resource production and protection, and the protection of environmental quality, are not adequately reflected in the DNR's publicity materials.*

RECOMMENDATION IV.10: ***The DOG should increase its efforts to publicize its activities through the various Division and Departmental media including its website, media advisories, newsletters, and other publications such as the DNR's Outdoor Indiana magazine. (2000 Guidelines 4.2.2.2)***

The DOG receives periodic requests from the public for agency records. It seeks to respond to those requests within 5 days. For requests which may involve records which might be subject to statutory exception and thus non-disclosure by the agency, the DOG seeks to refer them to the Chief Counsel of the DNR within 5 days.

FINDING IV.11: *The Indiana Access to Public Records Act provides that agencies respond to written public requests within 7 days of receipt. If a records request appears to raise an issue of non-disclosabliity, and if the DOG does not refer the question to the Chief Counsel for 5 days following receipt of the request, there is a potential that the requesting public will not receive an answer or acknowledgement within the statutory 7-day period.*

RECOMMENDATION IV.11: ***The DOG should review their internal procedures to ensure that the statutory response requirements are met. (2000 Guidelines 4.2.2.1)***

FINDING IV.12: *The DOG works on a regular basis with selected community groups, such as the Southwest Indiana Brine Coalition, the Environmental Advisory Board of the Indiana Oil and Gas Association, and with Four Rivers Resource Conservation and Development Area, for which the Division should be commended.*

RECOMMENDATION IV.12: ***The DOG should attempt to include the participation of other community and/or industry groups when comprising workgroups regarding E&P waste management. (2000 Guidelines 4.2.2.3)***

The DOG posts and maintains website listings of applications filed, permits, and permits-issued on a weekly basis.

FINDING IV.13: *Website listings of applications and permits are an excellent tool for public information.*

RECOMMENDATION IV.13: ***The current practice of application and permit postings on the website should be continued. Also, detailed provisions and procedures for public participation should be posted. (2000 Guidelines 4.2.2.2)***

<u>Financial Assurance</u>

A bond is required for drilling, deepening, operating, or converting a well, or for test drilling (oil and gas) unless the applicant qualifies for the Well Fee Only program. The Well Fee Only program has several eligibility criteria pertaining generally to established operators who have no significant violation history or outstanding penalties. The annual well fee is required by 312 IAC 16-3.5-1.

The bond requirements are prescribed in 312 IAC 16-4-1 et seq. For operators who do not qualify for the Well Fee Only program the division requires the submission of an individual bond in the amount of $2,500 for a single well or a blanket bond in the amount of $45,000 for any number of

wells.

Waste Hauler Certification

The DOG operates no certification program for waster haulers because there are no centralized or commercial waste management facilities located in Indiana. All saltwater produced (approximately 40 million barrels per year) is injected back into the ground below groundwater zones per the requirements guidelines of the Underground Injection Control program.

Waste Tracking

The DOG does not formally track liquid or solid wastes because there are no centralized or commercial facilities.

The DOG allows the spreading of oil-impacted soils and tank bottoms on leased property roads. Road spreading of salt water is not allowed.

The DOG encourages the on-site bioremediation of waste spills.

Location of Closed Disposal Sites

The DOG does not maintain records of closed disposal sites because there are no such sites in Indiana.

Data Management

The DOG has created and maintains a comprehensive database system which is generally capable of storing and retrieving the information needed to operate its E&P waste management program. The data set appears to conform to the minimum guidelines set forth in the IOGCC publication Guidelines for States: Exploration and production Data Management**.**

FINDING IV.14: *The DOG is to be commended for its data management system which provides significant capability for entry, maintenance and retrieval/reporting of information.*

The DOG has created an electronic data management system called DOG P.A.W.S. It features menus which provide for searching, permitting, permit transfers, reports, querying, and others.

The DOG's draft Strategic Plan calls for increasing the capabilities of the electronic system, including providing for remote access and converting paper records to electronic form.

The DOG has created a Virtual Procedures Manual which contains descriptions of procedures for many of the Division's administrative and regulatory functions.

FINDING IV.15: *The DOG is to be commended for its DOG P.A.W.S system and its Virtual Procedures Manual which provide ease of access and use for many of the DOG's functions. The DOG maintains a data collection and recording system which appears to be adequate and is generally available to the public under Indiana's Access to Public Records Act.*

RECOMMENDATION IV.15: ***The DOG is urged to continue to improve its database management capabilities through use of RBDMS or another similar system, in order to optimize effectiveness. (2000 Guidelines 4.2.8.2)***

4.3 Personnel and Funding

Personnel

The DOG administers a comprehensive program of regulation of E&P wastes. It includes the traditional administrative functions of a regulatory agency including program planning and evaluation, budgeting, and personnel as well as the programmatic activities of permitting and enforcement. Management of the DOG appears to be well delegated to the operating sections, and staff retention and continuity is favorable.

The DOG obtains its legal services from among the small staff of in-house attorneys who represent the interests of all of the divisions of the Department of Natural Resources. These lawyers appear to be sufficiently available to properly represent the DOG's interests.

The technical staff appear to be well qualified and dedicated.

The DOG's field personnel appear to be well trained and communicate well with well operators

FINDING IV.16: *The DOG annually budgets for staff training programs. These programs are generally adequate, although much of the beneficial training is only available out of state which is limited by travel and training funds. Many of the geologic and managerial staff of the division are licensed by the state. The DOG has produced a draft employee training plan, and a Virtual Procedures Manual.*

RECOMMENDATION IV.16: ***The DOG should encourage the Department to provide more flexibility in travel for training opportunities. The DOG should proceed to finalize and adopt its employee training program.***

Funding

The DOG is funded by a combination of state budgetary appropriations and business license fees. Fines for violations go to an Oil and Gas Environmental Fund for clean-up and remediation. The DOG currently operates on revenue of nearly $1.4 million.

DOG indicated that it has to rely on IDEM for groundwater sampling and analysis to support its program activities.

FINDING IV.17: *The DOG could use more funding for ground water sampling analysis.*

RECOMMENDATION IV.17: ***The DOG should seek additional funding for groundwater sampling analysis. (2000 Guidelines 4.3.2)***

4.4 Coordination Among Agencies

The DOG's principal program requiring close coordination is its MOA with the IDEM for spill response and remediation. The MOA has been in effect since 1998.

FINDING IV.18: *The MOA with IDEM is a strong program element and appears to function effectively with close coordination and minimal duplication or overlap. The field workers in both IDEM and DOG work well together to implement the agreement in the field.*

RECOMMENDATION IV.18: ***The MOA with the IDEM should be re-evaluated periodically to ensure that it incorporates any new or changed circumstances. (2000 Guidelines 4.4)***

FINDING IV.19: *The IDEM produces an annual report on the State of the Environment. However, the DOG does not participate in, or contribute to, the preparation of the report*.

RECOMMENDATION IV.19: ***The DOG should seek to prepare an element for the IDEM annual report which highlights the activities under the MOA. (2000 Guidelines 4.4)***

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TECHNICAL CRITERIA
(2000 Guidelines Section 5)

5.1 General

All oil and gas drilling operations in Indiana must be permitted with the DOG. Indiana's permitting program addresses the collection, management and disposal of E&P wastes. Oil and gas E&P wastes, other than produced water, are typically managed on-site and consist of cuttings, drilling mud, fresh water and other RCRA Subtitle C exempt wastes. Indiana rules require that no person shall dispose of a fluid that results from the development or production of a well for oil and gas purposes except as approved by the division (312 IAC 16-5-13, Sec. (a)).

The Indiana program handles spills of petroleum and E&P wastes through a MOA with IDEM that establishes the policies, responsibilities and procedures regarding notification and cleanup. The DOG has developed a draft surface facility rule with IDEM that will include provisions for handling and disposal of exempt wastes, other than UIC wastes, from oilfield operations. The Review Team strongly encourages adoption of the surface facility rule in Indiana as reflected in the findings and recommendations contained herein.

Siting Criteria

While the need for a drilling pit is noted during application review, the DOG does not currently require specifications for the location, orientation and construction of drilling pits. There are no required setbacks or minimum distances from buildings, homes or other structures for drilling pits. The draft surface facility rule will require that the 100' setback from any stream, river, lake or drainage way (proposed 312 IAC 16-5-13, Sec. (c)(2)) apply to drilling pits and include any surface water (312 IAC 16-5-11, Sec.(d)(1)).

FINDING V.1: *The existing rule in Indiana does not meet the minimum criteria for setbacks for drilling pits.*

RECOMMENDATION V.1: ***The proposed surface facility rule should be passed. (2000 Guidelines 5.1.e.iv)***

The DOG implements a karst drilling policy to address site specific conditions where karst geology is known or expected (geologic hazard). The policy recommends that steel tanks be used during drilling instead of drilling or reserve pits.

5.2 Waste Characterization

The DOG rules do not require the characterization or tracking of most wastes. Drilling fluids in Indiana normally consist of fresh water and bentonite muds. Fluids taken off of the drilling pits are most likely fresh water and are disposed with the drill cuttings, most typically through landspreading. Drilling mud additives or chemicals are not prohibited, approved nor tracked by DOG. The draft surface facility rule does not require any testing of wastes in produced fluid or drilling and circulation pits, but may require a laboratory analysis to verify appropriate disposal from an emergency pit (312 IAC 16-5-11, Sec.(f)(5)). It is the policy of the DOG to require a water analysis for produced fluids that are injected into a Class II Underground Injection well.

Sampling and Analysis

The proposed draft facility rule would allow the DOG to require an owner or operator to obtain a laboratory analysis for the purpose of verifying appropriate disposal in the case of emergency pits (312 IAC 16-5-11, Sec.(f)(5)).

FINDING V.2: *The DOG should have the authority to test all fluids from all impoundments and the proposed facility rule should require some minimum testing for fluids in pits, including a standard list of test constituents and the use of qualified labs.*

RECOMMENDATION V.2: ***The proposed surface facility rule should be amended to include minimum pit fluid testing protocols and the rule should be passed. (2000 Guidelines 5.2)***

Quality Control

The DOG policy on water analysis for Class II UIC wells states that the analysis must be performed at a laboratory, not on site. The written permits for Class II wells specify that the sample must be analyzed for 5 parameters: Total Dissolved Solids (TDS), pH, Specific Gravity, Resistivity and Temperature.

5.3 Waste Management Hierarchy

There is no waste reduction or management hierarchy in the DOG rules. However, the oil pricing environment may lend itself to creative uses of oil wastes, such as tank bottoms. By use of a heater treater, tank bottoms can be rendered saleable.

FINDING V.3: *There is an opportunity to manage oil wastes in Indiana due to the positive pricing environment for oil.*

RECOMMENDATION V.3: ***The Review Team recommends that the Indiana DOG encourage waste minimization, e.g. using heater-treater for recovering tank bottoms. (2000 Guidelines 5.3.1)***

5.5 Technical Criteria for Pits

Permitting

The Indiana Code requires that an owner or operator construct and maintain necessary mud circulation and reserve pits (312 IAC 16-5-12(a)). Drilling pits are to be temporary structures associated with specific drilling, completion or plugging operations, and are to be properly drained and closed when those operations are complete. Approval to construct a drilling or reserve pit in Indiana is implied with the issuance of a permit to drill. The present Indiana code specifies that a pit may be authorized under a permit for oil and gas purposes for backwash water, for emergency use, or in connection with a Class II well (312 IAC 16-5-13(c)). Evaporation pits are prohibited in both the current and proposed rule.

The draft surface facility rule will require that the current 100’ setback from any stream, river, lake or drainage way be expanded to apply to any surface water and to all impoundments, defined

to include drilling pits (proposed 312 IAC 16-5-11, (d)). Impoundments in the proposed rule include circulation pits for well operations from drilling through plugging, produced fluid pits associated with Class II disposal wells, pits for emergency containment of overflows, gas flaring and for controlled burn of crude oil and spill contaminated straw and vegetation. The draft rule will also require that operators file an application for, and receive approval from the DOG, for the construction and operation of all pits classified as impoundments. The draft rule will also require that operators file an application for, and receive prior approval from the DOG, for the construction and operation of an impoundment, defined to include drilling pits.

FINDING V.4: *The existing rule in Indiana does not provide for a clear permit review process for drilling pits.*

RECOMMENDATION V.4: ***The proposed surface facility rule includes a requirement for review and prior DOG authorization for construction and operation of impoundments and should be passed. (2000 Guidelines 5.5.2.a)***

Construction

The DOG does not currently require specifications for the location, orientation and construction of drilling pits. A drilling pit liner is not required, nor is there a minimum freeboard requirement.

The current regulations in Indiana require that a pit for brackish water, emergency use or in connection with a Class II well be surrounded by walls that prevent entry of surface drainage from adjacent areas and be constructed to prevent flooding during a regulatory flood (312 IAC 16-5-13(c)(1)(3)). These pits are constructed as per plans approved by the DOG and the commission must confirm conformance with the plans. Pits must be lined with an impermeable liner. Drilling pits in Indiana are not included in the current 312 IAC 16 regulations, and therefore are not subject to the existing construction requirements, including the requirement for an impermeable liner.

FINDING V.5: *The existing rule in Indiana does not provide for minimum construction standards for drilling pits.*

RECOMMENDATION V.5: ***The proposed surface facility rule includes requirements for construction including the requirement for an impermeable liner. This proposed rule should be passed. (2000 Guidelines 5.5.2.a)***

The draft surface facility rule (proposed 312 IAC 16-5-11(d)(4)) requires that a synthetic liner that has a hydraulic conductivity of $1x10^{-6}$ centimeters per second and a minimum thickness of 12 millimeters underlie all defined impoundments, including drilling pits.

FINDING V.6: *Requiring minimum thickness and conductivity for impermeable liners in impoundments is positive and encouraged. However, the team believes that the proposed minimum liner thickness may be overprotective.*

RECOMMENDATION V.6: ***The Review Team recommends that the specific permeability standards, like those in the proposed rules, be adopted. The team recommends, however, that the minimum liner thickness requirement be evaluated in light of accepted engineering***

standards. (2000 Guidelines 5.5.3.e.vi)

Installation requirements are specified in the proposed rule. Identification signs will be required and the impoundment will have to be covered with netting or other approved material to keep birds and flying mammals from landing in the impoundment. Minimum distances that a well and/or pit may be located from dwellings, buildings, roads or other structures are commonly used to reduce/minimize potential impacts from E&P waste collection and storage.

FINDING V.7: *There are no required setbacks or minimum distances from buildings, homes or other structures for wells, drilling pits or any other pit in the current proposed 312 IAC 16 rules.*

RECOMMENDATION V.7: ***The Review Team encourages the DOG to develop minimum distances from buildings, structures, roads and places of public assembly for the location of wells and pits and to include them in the proposed surface facility rule. (2000 Guidelines 5.5.3)***

Operational Requirements

Current 312 IAC 16 rules require that fluid levels be kept at least (2) feet below the top of the pit wall at the point of lowest elevation. This requirement will apply to all defined impoundments, including drilling pits, in the proposed surface facilities rule. The proposed surface facility rule will require that the impoundment surface be kept free of oil and debris and that the impoundment shall not have any type of drainage system.

FINDING V.8: *The current regulatory scheme in Indiana does not contain acceptable fluid level management requirements for all types of pits.*

RECOMMENDATION V.8: ***The Review Team encourages the DOG to adopt standards such as those of the proposed surface facility rule. (2000 Guidelines 5.5.4.c,f)***

Operational requirements for emergency pits are enhanced in the proposed rule. An emergency pit will be sited down gradient from the fluid source. Rainwater collected in the impoundment can be disposed pursuant to a National Pollution Discharge Elimination System (NPDES) permit or placed into a tank within a secondary containment structure and injected into a Class II disposal well. The DOG will have the authority in the proposed rule to require that the owner or operator of an emergency pit obtain a laboratory analysis of fluids collected in the impoundment and submit the analysis to the DOG.

FINDING V.9: *The current rule in Indiana does not fully address the operation of emergency pits.*

RECOMMENDATION V.9: ***The Review Team encourages the DOG to adopt the proposed surface facility rule. (2000 Guidelines 5.5.4.k)***

Closure

The current 312 IAC 16 rules contain minimal pit closure and reclamation requirements. Mud pits are required to be filled and leveled upon completion of a well and the surface restored "as nearly as practicable" to pre-drilling condition (312 IAC 16-5-12).

The proposed surface facility rule will require that free fluids be removed from an impoundment and disposed of in accordance with applicable federal, state and local laws. Remaining residue in the impoundment less than (1) foot in depth can be solidified and buried in place at least (5) feet below the surface; removed from the impoundment and disposed in accordance with applicable federal, state and local laws; or remediated in accordance with Indiana's existing Spill Rule (312 IAC 16-5-24).

Under the proposed rule, synthetic pit liners can either be removed and disposed, or perforated or shredded and mixed with solidifying material and buried at least (5) feet below the ground surface when hardened. Final reclamation of the impoundment includes filling with uncontaminated earthen material, covering with soil to support vegetation, graded to original contours and stabilized to prevent erosion (proposed 312 IAC 16-5-11(h)(3)(4)).

There is currently no requirement that pits be closed within a certain time period, but the proposed surface facility rule will require that circulation impoundments shall be closed within (30) days after conclusion of their use unless converted for use as an emergency impoundment.

FINDING V.10: *The current 312 IAC 16 rules in Indiana contains minimum pit closure and reclamation requirements.*

RECOMMENDATION V.10: ***The proposed surface facility rule contains appropriate pit closure and reclamation requirements and should be adopted. (2000 Guidelines 5.5.5.c)***

5.6 Technical Criteria for Landspreading

Existing Indiana Code states that no person shall dispose of a fluid resulting from development or production of a well for oil and gas purposes except as approved by the DOG (312 IAC 16-5-13(a)). Landspreading of drilling pit fluids and landfarming of cuttings is common in Indiana and it occurs with minimal oversight by the DOG. Pit fluids are mostly fresh water and the Division does not receive complaints about the practice from landowners and lessors, who are consulted by the owner or operator prior to landspreading of pit fluids. The proposed surface facility rule requires that free fluids be removed from the impoundment and disposed according to federal, state and local laws.

FINDING V.11: *The proposed rule does not address landfarming of solids and drill cuttings. Neither the current 312 IAC 16 nor proposed rules contain requirements for disposed fluid pH or application standards such as loading rates, spreading and disking.*

RECOMMENDATION V.11: ***The Review Team recommends that these criteria be adopted in the new surface facility rule and that the rule be adopted. (2000 Guidelines 5.6.3)***

5.7 Technical Criteria for Burial and Landfilling

Regulatory Requirements

Current Indiana rules do not have requirements for burial and landfilling of E&P wastes. The proposed surface facility rule will allow impoundment residue no thicker than (1) foot in depth to

be solidified in place with slurry cement, kiln dust or another division approved fluid. The resulting mixture will then have to be buried at least (5) feet below the ground surface (proposed 312 IAC 16-5-11(h)(2)(a)).

FINDING V.12: *The Indiana regulatory program does not adequately address burial and landfilling of E&P wastes.*

RECOMMENDATION V.12: ***The Review Team recommends that the solidification and burial requirements be adopted in the new surface facility rule and that the rule be adopted. (2000 Guidelines 5.7.3.b)***

5.8 Technical Criteria for Roadspreading

Regulatory Requirements

Oil and oil contaminated fluid can be disposed in Indiana by application to lease roads for the purpose of dust suppression (312 IAC 16-5-27(a)(1)). Although no application standards or requirements exist, the fluid is required to be spread in a manner designed to ensure that the materials do not leave the roadbed. Furthermore, oil or oil contaminated fluid that is to be roadspread must be spread within (72) hours of removal from secondary containment.

There is no roadspreading of brine or produced water allowed in Indiana. Saltwater or fluid contaminated with saltwater must be either injected into a permitted Class II well or discharged under a NPDES permit issued by the IDEM (312 IAC 16-5-27(b)). Saltwater is defined in Indiana as water that is brought to the surface in connection with conventional oil and gas production or wastewater from gas plants that are an integral part of production operations.

5.9 Technical Criteria for Tanks

There are between 200-400 operating tank batteries in Indiana. Almost all of the waste handled by tanks is produced water that is collected in tanks prior to injection into Class II wells for disposal or enhanced recovery. The exact number of operating tank batteries will be confirmed with an inventory program including inspections slated as high priority by the DOG for the coming year.

FINDING V.13: *The Review Team agrees that a tank inventory program is a critical initial step to assessing the scope of any impacts associated with tanks.*

RECOMMENDATION V.13: ***The planned tank inventory program should be completed as soon as possible and the DOG should devote the resources necessary to complete the program in a timely fashion. (2000 Guidelines 5.9.2.a)***

The proposed surface facility rule provides for the construction and operation of tank batteries only for the storage of produced fluids prior to their injection into a Class II well or for disposal in accordance with other federal, state and local laws. Tank batteries may also be constructed to contain oil produced from a well. The (100) foot setback from surface water prescribed for surface impoundments will also be required for tank batteries. A tank battery constructed in a flood hazard area will have to be constructed in a manner that will prevent the tanks from being

reached by a flood.

Wooden tanks will not be allowed in Indiana upon adoption of the proposed surface facility rule. Netting will be required over open top tanks to keep them free of birds and flying mammals. Although specific construction requirements are not set forth, tanks will have to be constructed and repaired with materials designed to permanently prevent the leakage of fluids.

Secondary containment of 1 ½ times the volume of the largest tank or tanks connected in series will be required. The secondary containment must be kept clear of vegetation and must be able to hold fluids for a minimum of (72) hours. Secondary containment will not be allowed for the storage of produced fluids. Lining the secondary containment will not be required. Rainwater collected in the secondary containment will have to be disposed following the same requirements for produced fluids. A laboratory analysis of the disposed fluid can be required by the DOG under the proposed rule. The proposed surface facility rule contains requirements for tank battery closure and site reclamation.

FINDING V.14: *The present Indiana code does not contain specific regulatory requirements for tank batteries.*

RECOMMENDATION V.14: ***The proposed surface facility rule contains requirements for tank battery closure and site reclamation. The proposed rule should be adopted. (2000 Guidelines 5.9.3)***

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ABANDONED SITES
(2000 Guidelines Section 6)

6.1 Abandoned Oil and Gas Sites Introduction

Indiana has developed and implemented an extensive program to inventory, prioritize and remediate abandoned sites, headed by an Assistant Director for Orphan Sites and Administration.

Indiana currently has 405 identified abandoned sites. The overall number has been declining in recent years, the State program having remediated 109 sites since 1999 and the ancillary EAB program having remediated 59 sites since its creation in late 2000.

FINDING VI.1: *The Review Team finds that the Indiana program meets all of the abandoned sites criteria of the 2000 Guidelines, Section 6, except where otherwise noted.*

FINDING VI.2: *The Review Team commends the DOG for the overall effectiveness of its program, and especially for its innovative partnership with public interest and industry groups. In addition, the DOG has been innovative in its approach to orphan sites issues by facilitating the creation of an Environmental Advisory Board (EAB), an alliance of industry, public interest and government stakeholders.*

6.2 Definition of "Oil and Gas Site" and "Abandoned Site"

Indiana includes in its definition of "Abandoned Sites" both unplugged wells and improperly plugged wells, as well as associated facilities such as pits and tank battery sites. The DOG maintains an orphan well list consisting of those wells for which a permit has been revoked and for which a responsible party is unavailable. The statutory scheme is broad enough to include lien rights in the State as to casing and all other personal property and equipment associated with the well.

The inclusion of wells other than permit-forfeited wells in the statutory scheme is important due to an historic fact unique to Indiana. Most modern oil and gas activity is located in roughly the southwestern one-third of the State (the "Illinois Basin"). Numerous relatively shallow wells were drilled in the late 1800's and early 1900's, however, in a large north central part of the State known as the "Trenton Field", now largely abandoned. Those wells were drilled well prior to the establishment of any regulatory scheme and accompanying permit requirements. Such wells are covered by the program.

FINDING VI.3: *The Review Team finds that the DOG's definition of "Abandoned Sites" is sufficient under the Guidelines.*

6.3 Identification of Abandoned Sites

The State currently compiles its orphan well list primarily by reference to permit revocations. This approach has the added benefit of simultaneously determining the availability of a responsible party, since ordinarily revocation will occur pursuant to enforcement action with notice and hearing procedures. The identification process is augmented by citizen or landowner

inquiries or proceedings which would cover both unpermitted wells and previously permitted but improperly plugged wells. Emergency situations are covered by the statute.

The Well Plugging Statute, I.C. 14-37-8-1 et seq., requires an operator to plug and abandon a well that is completed as a dry hole, that ceases to produce or that is no longer operated for the purpose for which it was permitted, subject to criminal penalties. Regulations require any well not operating in excess of 60 days to be formally temporarily abandoned. Any citizen may request a hearing to determine whether a well is leaking or may leak. Permits may be revoked pursuant to I.C. 14-37-13-1. The Oil and Gas Environmental Fund Act, I.C. 14-37-10-1 et seq., expressly provides for appropriation of funds ". . . to supplement the cost required to abandon a well that has had a permit revoked…to cover the costs of remedial plugging and repairing of wells under (the Well Plugging Statute)…and to cover the cost to mitigate environmental damage or protect public safety against harm caused by a well regulated…"

FINDING VI.4: *The vast majority of true orphan well sites will be identified under the current Indiana program.*

RECOMMENDATION VI.4: ***While absence of operable production equipment may be sufficient, the State should consider implementing some additional mechanism, such as well by well (or lease) production reporting, to help identify wells which, though permitted, are truly orphaned. (2000 Guidelines 6.3)***

6.4 Funding for Abandoned Site Remediation

Indiana's Orphan Sites Program is funded by a combination of annual well fees, civil penalty assessment and bond forfeitures. The most predictable element, well fees, generates about $218,000 annually. Civil penalties generate about $38,000 annually. Bond forfeitures are more sporadic, as Indiana has moved generally from a bond system to a well fee system, except for new, unproven or violation prone operators. The fund, while capped at $1,000,000, is a dedicated fund which is not forfeited at year's end if unused. Funds collected in excess of the cap do not, however, return to the general fund, but rather go to the oil and gas fund (consisting primarily of severance tax revenues) used to administer the DOG.

Sites are remediated by the State at an average cost of around $6,500, while sites are remediated by the industry partnership at an average cost of around $2,400. Permit revocations are decreasing, following the switch to the annual well fee system which flushed many wells from permitted status to orphan status. Overall, more wells are being removed from the list than are being added, so that current funding appears adequate.

The State uses a combination of annual well fees and bonds as its primary assurance program. While contributing to the special purpose orphan well fund, these requirements have the added benefit of encouraging operator compliance and preventing wells from becoming orphaned. Notice to the State of all well transfers is required. Bonding mechanisms remain in place for the transferor until replaced by the transferee. Transfers are prohibited to an operator who previously had a permit revoked. Organizational reports are required to verify that managers of ineligible operators are not obtaining permits or transfers under a phantom entity.

FINDING VI.5: *The Review Team finds that current funding of the abandoned sites program is adequate, while recognizing that additional funding would hasten the elimination of this historical problem.*

FINDING VI.6: *The Review Team finds that the program is unduly hampered by the cumbersome and restrictive state bidding process associated with the letting of orphan site remediation contracts. The Review Team further finds that this process ultimately increases the remediation costs and reduces the number of qualified contractors available or willing to perform the work.*

RECOMMENDATION VI.6: ***The State should investigate the feasibility of modifying existing contract-letting procedures involving abandoned sites remediation. (2000 Guidelines 6.4)***

6.5 Criteria for Prioritizing Remediation

All identified abandoned sites are inspected and evaluated by an oil and gas field inspector. The evaluation is based on a 100 point scoring system, with relevant parameters being surface contamination, ground water contamination, condition of casing and fittings, affected population and affected area. Most of the parameters can be evaluated by visual examination, but ground water issues include a survey of area water users. The state can adjust its priorities to enable remediation of two or more neighboring sites as part of a single effort, thereby reducing costs.

FINDING VI.7: *The Review team commends the DOG on its development and use of an appropriate prioritization plan.*

Goal for Remediation

The State presented evidence that reasonable and measurable progress has been made in the relatively short history of the program.

Liability for Remediation

The Oil and Gas Environmental Fund Act provides that "…an expenditure from the fund… does not release a responsible person from liability…." It further provides that the State "…may seek reimbursement for expenses incurred under this chapter from a responsible person." That "responsible person" is typically the permit holder (or the former permit holder in the case of an improperly plugged well) or the person who drilled the well if unpermitted. The State does not consider the landowner to be a "responsible person"; nor does it consider a new operator on the same land to be a "responsible person" unless he or she "adopts" the well by repermitting.

The program does encourage responsible operators to acquire orphan wells by repermitting, subject to landowner agreement. The plugging statute contains a "Good Samaritan" provision at I.C. 14-37-8-14.

FINDING VI.8: *The Review Team finds that the abandoned sites program clearly defines primary responsibility for remediation to be with the owner or operator causing the contamination at the site.*

FINDING VI.9: *The Review Team commends the DOG for encouraging and facilitating the adoption of orphan sites by responsible operators.*

6.6 Standards for Remediation

The State does not differentiate between orphan wells and other wells with respect to its plugging statutes or regulations. All wells are plugged according to the same standards regardless of status. Available well records are reviewed and plugging orders are developed for submission to plugging contractors.

The DOG Director does have some flexibility in approving alternative plugging methods when circumstances exist or develop in the field. Such authority, however, is not unique to orphan wells and can be exercised with respect to any well. Since by definition there is no "responsible person" with personal knowledge and available with respect to an orphan well, however, it would seem more likely to be exercised in that situation.

The DOG has a policy of 100% witnessing of plugging operations. It also has policies and guidelines regarding variances, such as what constitutes reasonable effort to remove junk in the hole.

Similarly, there is no differentiation of site remediation requirements as to orphan wells versus any other well. Landowners are consulted, however, regarding the entire process, including plan site remediation. In this connection, written authorization is obtained from the landowner granting access for the contractor and relinquishing any claim to salvageable equipment.

A plugging and abandonment report is executed by the witnessing oil and gas inspector and service provider and maintained by the State for all orphan wells plugged under the program.

FINDING VI.10: *The Review Team finds that the standards for well remediation, both well bore and site, are adequate and commends the DOG for its 100% witnessing policy, its record keeping process regarding the program and its involvement of landowners in the process.*

6.7 Public Participation

The DOG maintains a website which contains an explanation of the orphan well program and a site specific listing of current wells on the list, updated quarterly. A brochure has been developed in conjunction with the EAB explaining the program, including a map depicting orphan wells and mail, phone and e-mail contacts for the Assistant Director in charge of the program. Public participation is further encouraged by the supporting groups, Southwest Indiana Brine Coalition, Indiana Oil & Gas Association and Four Rivers RC&D. The extent of contamination and planned methods of remediation are contained within the agency files and are available for public inspection.

As with all agency rule making, the public has an opportunity, pursuant to the Administrative Acts and Procedures Statute (I.C. 4-21.5-1-1 et seq.), for input in program rule making.

As previously mentioned, the Plugging Statute provides a mechanism for any person to request a hearing on leaking or potentially leaking wells. The website includes, in its FAQ section, specific guidance in reporting violations, spills and water well problems.

FINDING VI.11: *The Review Team finds that the orphan site's program meets the minimum standards regarding public participation.*

RECOMMENDATION VI.11: ***It is recommended that the DOG attempt to increase public awareness of the program. (2000 Guidelines 6.7)***

6.8 Avoid Future Abandoned Sites Problems

FINDING VI.12: *Indiana has established a proven, effective orphan well program and has implemented a fair and effective enforcement and compliance program as discussed elsewhere herein.*

RECOMMENDATION VI.12a: ***Due to the potential threat the environment, however, the program should be monitored and re-evaluated, long-term and continuously.***

RECOMMENDATION VI.12a: ***It is recommended that the State's Strategic Plan assess future potential impact of wells in the Trenton Field. (2000 Guidelines 6.8)***

RECOMMENDATION VI.12b: ***It is recommended that the Oil and Gas Environmental Fund sources, particularly the well fee program, be closely monitored and evaluated against the fund's ability to anticipate and protect against future liabilities of future orphan wells. (2000 Guidelines 6.8)***

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NATURALLY OCCURRING RADIOACTIVE MATERIAL
(2000 Guidelines Section 7)

Indiana has no documented cases of NORM occurrences above background levels at E&P facilities regulated by the DOG and, therefore, no regulatory program has been established relating to NORM management. Indiana has no commercial or centralized E&P waste disposal facilities, whether related to NORM or otherwise.

In general, matters relating to radiation are regulated by the Indiana Department of Health. Were it to be determined that NORM was present in oil and gas operations in Indiana at levels posing risks to human health or the environment such that a regulatory program were warranted, a legislative change would be required to confer authority to the DOG to implement such a program.

The DOG, in connection with anticipated rule changes regarding surface facilities, is currently conducting an inventory of all existing E&P facilities in the State. A NORM survey is being conducted in conjunction with this inventory. Such survey is being conducted by the Assistant Director of Field Services, with the express aim of determining the presence and frequency of occurrence of NORM at Indiana's E&P facilities.

FINDING VII.1: *The Review Team finds that the Indiana program meets all of the NORM criteria of the 2000 Guidelines.*

FINDING VII.2: *The Review Team commends the DOG for taking the initiative to assess NORM related risks and finds that the current, ongoing survey is adequate in scope and quality to make a meaningful determination in that regard.*

RECOMMENDATION VII.2: ***DOG should complete a NORM survey and make public its findings any and associated risks. (2000 Guidelines 7.3.3)***

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PERFORMANCE MEASURES
(2000 Guidelines Section 8)

8.1 General

The Guidelines state, "Beyond the general, technical and administrative criteria set forth elsewhere in this guidance document, an effective program for the regulation of E&P waste should periodically evaluate whether the program is meeting the goal of protecting human health and the environment in accordance with section 3.2" (2000 Guidelines, *Section 8*).

8.2 Performance Parameters

The Indiana DOG employs a performance assessment system utilizing strategic planning, performance standards and guidelines, duty descriptions and output tracking. The DOG's Strategic Plan is in draft form and will cover the period 2005-2007, corresponding to the biannual cycle of the Indiana legislature. The funding of the Division's activities also follows this two-year cycle. In addition to a mission and vision statement, the DOG will adopt Division Values in its Strategic Plan. The DOG plans to follow several strategies to accomplish its operational objectives over the two-year time period. The focus appears to be on measuring, evaluating and improving the internal processes and workings of the Division.

FINDING VIII.1: *The Review Team found that the DOG is developing good analytical methods for tracking office performance. The Review Team recognizes that spill incidents are not sufficiently tracked within the present database system.*

RECOMMENDATION VIII.1: ***The Review Team suggests the DOG develop a methodology for tracking spill incidents and a strategy for long-term trend analysis for environmental preventative measure and remediation results. (2000 Guidelines 8.2)***

The DOG is developing its Strategic Plan as part of the larger effort in the DNR. Input is gathered from within the agency to identify and resolve issues and program deficiencies. The DOG is involved with several external groups and has cultivated partnerships with stakeholders, industry and the public that provides the DOG with outside feedback and suggestions for improving performance is several key areas such as spill remediation and orphan well plugging.

The DOG is developing draft Performance Standards Guidelines which will cover over 100 performance standards and tasks from printer maintenance to legislative initiatives. The Division's database system contains sufficient input fields that Division performance can be tracked and evaluated in many key areas such as permit issuance time and enforcement case resolution. This allows the DOG to benchmark its performance by running queries against the information in the database.

FINDING VIII.2: *The Review Team commends the DOG for its benchmarking capability in the database, allowing them to evaluate performance against goals and objectives.*

RECOMMENDATION VIII.2a: ***While the DOG is developing measurement standards and methods for evaluating internal processes, the Review Team recommends that goals and***

standards be developed such that baseline work and processes can be separated from broader reaching goals or targets for achievement. Further definition of a goal versus a standard is necessary and recommended. (2000 Guidelines 8.3)

RECOMMENDATION VIII.2b: ***The Review Team suggests that the DOG develop environmental measures and outcome indicators within the purview of their jurisdiction that can be used as performance indicators. (2000 Guidelines 8.3)***

UNDERGROUND INJECTION CONTROL
(GWPC Review)

General

The Division of Oil and Gas of the Indiana Department of Natural Resources (IDNR) has had primacy for the Indiana Class II program since 1991. EPA administered the UIC program under Direct Implementation (DI) from 1980-1991. This report constitutes the initial review of Indiana's UIC program and was conducted in conjunction with the STRONGER Review of Indiana's E&P waste management program. As is the case with other waste management program elements, IDNR derives its legislative authority from Indiana Code 14-37 and implements the administrative rules as promulgated by the Natural Resources Commission as published in the Indiana Administrative Code. The administration of the oil, gas and UIC regulatory programs is assigned to the Division of Oil and Gas.

FINDING UIC I: *The Review Team compliments IDNR on the organization of Article 16, which contains all the oil, gas and UIC regulations. Each subject (i.e. application filing, plugging and well testing) has a section(s) that apply to UIC wells where specific requirements are needed. This may be a handier reference method for the operator than where the UIC regulations are contained in a separate section.*

IDNR receives about $116,000 from EPA to administer the UIC program. This constitutes about 35% of the actual amount to run the program. The two geologists in the Indianapolis office who administer the UIC application technical review are 100% UIC in terms of allocated time and funding. The Director for DOG indicated they have been unable to fill positions that have become vacant. Indiana has 1288 injection wells of which 200 are salt water disposal wells and the remaining 1,088 are for Enhanced Oil Recovery (EOR). Salt water is the principal E&P waste in Indiana, consequently, the UIC program is an important component of the DOG's E&P waste management regulatory activities.

FINDING UIC II: *The DOG Director indicated that the inability to fill vacant administrative positions has caused existing staff to assume the duties and activities normally performed by persons in those positions. This has limited staff time to address other technical projects and some critical tasks or possible increases in UIC activity caused by increased drilling in the state.*

RECOMMENDATION UIC II: ***IDNR should allow DOG to continue supporting ongoing efforts by the Ground Water Protection Council (GWPC) to obtain additional support for state UIC primacy programs.***

Permitting

Permits are required before any well can be drilled, deepened, operated or converted to a Class II well by the authority of IC 14-37 and Regulation 312 IAC 16-3-1(b). An operator filing an application for a Class II well must first satisfy a set of general requirements applicable to all drilling and well completion activities accompanied by a $100 fee. In addition to the normal requirements for construction of Class II wells that will be protective of USDWs, the operators must show a plat of all oil and gas wells intersecting the proposed injection zone within ¼ mile of the proposed location as well as each water well within ¼ mile that is recorded with the

department. Most of the required information is outlined in Section 2 (e) through (o). DOG assigns a number to the application at the time of filing, which is not reused if the application is denied or withdrawn.

The permitting process appears to be well conceived and the actual technical review is conducted by two persons who have a BA in geology and three or more years experience working in the UIC program.

FINDING UIC III: *The permitting/ file review portion of the Indiana UIC program meets all federal UIC primacy requirements. The IDNR technical review is carried out by petroleum geologists, one of whom is licensed by the State of Indiana.*

The DOG has developed a very dedicated file/compliance review of existing UIC permits. On the average, file reviews take 1.5 to 2 days to complete. Part of this focus was to fill in the missing pieces of information from existing permits (pre-IDNR primacy) and another motive was to obtain compliance from operators to modify permits having violations (exceeding pressure and volumes, etc.). DOG geologists estimated that 35-50 % of all file reviews show some sort of adverse deviation from permit conditions. Generally, operators are given thirty (30) days to correct paper violations. Injection is not halted in 90% of the cases as no threat to USDWs exists.

FINDING UIC IV: *The DOG UIC staff is complemented on the diligence in using the file review as a tool to effectively achieve UIC well operator compliance.*

Inspections

The DOG has divided the state into eight (8) inspection districts: two are supervised out of the Indianapolis office and six are supervised out of Evansville. In the Evansville office, a field inspection manager, a field geologist and five field inspectors are available to address UIC activities. For UIC inspections and testing activities, the latter office carries the majority of the load. The UIC workload for field inspectors is about 20-25% of their total inspection, compliance evaluation and enforcement effort. Most of the UIC effort is involved with scheduling and witnessing the states 1288 injection wells for mechanical integrity over the 5-year rotation. In addition, field inspectors make routine visits to all wells over a two- year period.

FINDING UIC V: *The DOG inspection program appears to be well organized and Class II UIC wells are visit on a sufficient basis to detect any trends toward deteriorating well conditions, poor lease management or threat of well abandonment.*

Mechanical Integrity Testing (MIT)

The only test allowed by the IDNR for establishing Part I MI is the Standard Annulus Pressure Test (SAPT). Regulation 312 IAC 16-5-15 requires that all Class II wells be pressure tested with liquid at least once every five years at a pressure of 300 psi. The well must not lose more than 3% of its pressure over a 30-minute test period. Part II MI is determined by the evaluation of existing cement records or cement bond logs. All logs are interpreted by DOG geologists. Section (d) of Section 15 of the above stated regulation does allow the use of temperature logs, radioactive tracer surveys (RATS) or sonic logs for Part II, however, staff indicated these were rarely used by

Indiana operators. All MITs are scheduled through the field inspectors in the Evansville office and both original, and if necessary, follow-up tests are witnessed by IDNR inspectors. Work done to bring a well with a failed MIT up to standard for passage by retest is not always witnessed. The operator must provide documentary demonstration of the packer setting depth through use of a Wireline measurement or tubing tally and measure the amount of fluid return in order to pass the MIT. DOG staff indicated the annual failure rate to be about 11%.

FINDING UIC VI: *The Indiana MIT program far exceeds the minimum standards of the Federal Program primacy commitment which requires that at least 25% of wells tested in any given year be witnessed by an inspector.*

FINDING UIC VII: *The 3% falloff pressure per 30-minute testing period used by IDNR is very strict and, in fact, is stricter than the 5-10% used by other Class II primacy states and the 5% commonly used by EPA for DI programs.*

RECOMMENDATION UIC VII: ***Division staff indicated the 3% falloff pressure was negotiated with EPA Region V at the time Indiana received primacy in 1991. While any state program can invoke a stricter standard than required by EPA, 3% loss may actually be so low that some internal well conditions not associated with a loss of well integrity could indicate a failure when none exists. The Review Team believes IDNR should check other primacy and DI programs in Region V to provide standard consistency unless the 3% falloff standard was based on specific well completion programs or geologic conditions intrinsic to Indiana.***

Compliance and Enforcement

The DOG has several enforcement tools available to address non-compliance with regulations. Notices of Violation (NOVs) may be issued for any violation of IC 14-37 or Article 16. The procedures for issuing NOVs are contained in 312 IAC 16-5-21 as are the procedures for filing an appeal by an aggrieved party. This regulation applies to all oil and gas regulatory non-compliance including UIC. Most of the enforcement tools, such as the permanent permitting ban are discussed in other sections of this report and need not be reiterated in this section. They all apply to UIC program enforcement.

FINDING UIC VIII: *312 IAC 16-5-21 is positive because it allows flexibility wherein NOVs can be issued by the inspector most familiar with the non-compliance event or by the Director or Deputy Director of DOG.*

FINDING UIC IX: *The DOG staff has the authority to direct operators to shut down injection wells if their operation is as threat to USDWs.*

Plugging and Abandonment

The DOG administers an extensive plugging and abandonment program under Regulation 312 IAC 16-5-19 and provisions for temporary abandonment of wells under Regulation 312 IAC 16-5-20. These regulations apply to plugging and abandonment and temporary abandonment of all wells, including Class II injection wells. The rules governing the plugging and abandonment of wells, the temporary abandonment of wells and associated permitting and bonding requirements for wells in some abandonment mode were amended in 1998 and greatly strengthened. An owner

or operator may defer plugging and abandonment for one year if he or she applies to DOG within 60 days of the intention to temporarily abandon the well. The operator must demonstrate that all USDWs will be protected during the temporary abandonment period by determining the fluid level in the well by wireline or acoustical measurement. Regulations detail procedures to be used in case the fluid level is 100 feet or less below the base of the USDW. Temporary abandonment may be permitted for up to five years, based on an annual renewal of the permit.

FINDING UIC X: *The DOG recognition of the short time span that often occurs during times of economic depression in the industry between operation of a well and its temporary abandonment or abandonment without plugging is farsighted. Frequently, the last wells to be plugged on a lease in abandonment mode are Class II injection wells, consequently DOG's efforts help protect USDWs. This tracking program should also help decrease the number of orphan wells.*

FINDING UIC XI: *A second strong aspect of the DOG plugging program is that DOG inspectors witness all pluggings.*

Public Outreach

With regard to permitting activities, the Indiana UIC program has an adequate program in place to be aware when UIC applications are filed and the opportunity to comment is possible. EPA is provided an opportunity to review and comment on proposed UIC regulations before they are promulgated. The DOG also uses the Environmental Advisory Board (EAB) of the Indiana Oil and Gas Association (INOGA) to discuss needed changes in UIC regulations. This Board, while primarily formed to assist the DOG in addressing orphan wells and remediating old oil and gas sites, has been used as a forum for regulatory development. The EAB represents the seven county area that is home to most of Indiana's oil production. IDNR nor DOG have an stakeholder advisory board established to allow for discussion of oil, gas and UIC issues. Citizens can request site inspections online.

FINDING UIC XII: *The EAB and the Brine Coalition provide DOG a good opportunity for stimulating public interest, at least for the Southern part of the state where oil is produced.*

FINDING UIC XIII: *The informal hearing process is open to anyone who requests it on a particular issue. Most requests for hearing are from landowners who are generally satisfied once the matter is explained. It is DOG's experience that such hearings fail to draw much interest from parties other than landowners.*

APPENDIX A: GLOSSARY OF ACRONYMS

BCF	Billion cubic feet
DI	Direct Implementation
DOG	Indiana Division of Oil and Gas
E&P	Exploration and production
EAB	Environmental Advisory Board
EPA	United States Environmental Protection Agency
GIS	Geographic Information System
GPS	Global Positioning System
H_2S	Hydrogen sulfide
I.C.	Indiana Code
IAC	Indiana Administrative Code
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
IOCC	Interstate Oil Compact Commission
IOGCC	Interstate Oil and Gas Compact Commission
IT	Information Technologies
MIT	Mechanical Integrity Testing
MOA	Memorandum of Agreement
NORM	Naturally Occurring Radioactive Material
NOV	Notice of Violation
NPDES	National Pollutant Discharge and Elimination System
NRC	Natural Resources Commission
OERB	Office of Emergency Response Board
PDA	Personal Digital Assistant
RBDMS	Risk Based Data Management System
RCRA	Resource Conservation and Recovery Act
STRONGER	State Review of Oil and Natural Gas Environmental Regulations
TDS	Total Dissolved Solids
UIC	Underground Injection Control

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APPENDIX B: COMPLETED INDIANA QUESTIONNAIRE

INFORMATION FOR THE REVIEW OF STATE OIL AND GAS ENVIRONMENTAL REGULATORY PROGRAMS
IN STATES WITH A SMALL NUMBER OF WELLS

State: Indiana

Completed by: Michael Nickolaus

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Questionnaire Coordinator/Contact: Michael Nickolaus

INSTRUCTIONS: The primary basis for this review is the document, Guidelines for State Review of Oil and Natural Gas Environmental Regulatory Programs (June 2000). Please provide the information requested herein and be prepared to describe and discuss the additional information as requested. However, avoid providing background information, data, regulations or statutes that do not address issues in the Guidelines or are not related to the state's oil and gas environmental programs. (For example, regulation of underground fuel storage tanks is not addressed in this review.) Terms used in this questionnaire have meanings consistent with those contained in the Guidelines. Citations appearing in brackets (e.g., [5.3.]) refer to the applicable section or sections of the Guidelines.

At your request, a computer disk containing the questionnaire in Word 97 or Wordperfect 8.0 will be provided to facilitate your preparation of the document.

REQUESTED BACKGROUND INFORMATION

1. If readily available, please provide a brief history or other description of the oil and gas industry in your state, its regulation by state agencies, and recent E&P trends.

2. Please also include a copy of the following:

   A. Organization chart(s) showing the structure of all agencies responsible for the management and disposal of exploration and production (E&P) wastes, abandoned oil and gas sites, and oil-field NORM (naturally occurring radioactive materials).

   B. Statutes, rules, regulations and orders applicable to the management and disposal of oil and gas E&P waste, abandoned oil and gas sites, and NORM from oil and gas production.

   C. Any memoranda of understanding or similar agreements between state agencies or between the state and any other governmental entities (BLM, EPA, Indian Tribes, local jurisdictions) pertaining to the management and disposal of E&P wastes, abandoned sites, and NORM from oil and gas production.

   D. Any written mission statement(s), goals, objectives and policies applicable to oil and gas E&P waste management and disposal activities, abandoned sites, and NORM from oil and gas production.

3. Also, please include on a separate page any other relevant practices, program measures, guidelines or controls applicable to your state.

4. The next pages contain a matrix to be used to summarize E&P waste management practices. It is recognized that further explanation will likely be necessary. Don't try to capture everything or give precise numbers if not readily available - give only the big picture in the matrix.

E&P Waste Management Matrix

Waste Management Practices	Number of Facilities	Volume Managed Annually	Basis for Volume Determination
Pits:			
Drilling	300	Unknown	N/A
Production	100	Unknown	N/A
Special Use	N/A	N/A	N/A
Landspreading	None	N/A	N/A
Roadspreading	Unknown	Unknown	N/A
Tanks	200-400	1,900,000 barrels of oil and 40,379,889 barrels of saltwater	Annual production figures and quarterly monitoring reports
Commercial Facilities:			
Multipractice	N/A	N/A	N/A
Landfarms	N/A	N/A	N/A
Tank Bottom Reclaimers	N/A	N/A	N/A
UIC Surface Facilities	N/A	N/A	N/A
Oil-Field NORM	N/A	N/A	N/A
Centralized Facilities (non-NORM)	N/A	N/A	N/A
Oil-Field NORM	N/A	N/A	N/A
Municipal Landfills Accepting E&P Waste	None	None	None
Underground Injection Surface Facilities	1288	40,379,889 barrels	Quarterly Monitoring Reports
Abandoned Sites	450	N/A	Orphan sites list
Other	N/A	N/A	N/A

E&P Waste Management Matrix (cont.)

Waste Management Practice	Principal Agency	Primary Statute	Primary Rules, Regulations, or Orders	Applicable Guidelines
Pits:				
Drilling	Indiana Department of Natural Resources (IDNR) – Division of Oil and Gas	IC 14-37	312 IAC 16	N/A
Production	INDR – Oil and Gas	IC 14-37	312 IAC 16	N/A
Special Use	N/A	N/A	N/A	N/A
Landspreading	IDNR – Oil and Gas for on-site remediation Indiana Department of Environmental Management (IDEM)-Office of Solid Waste (With respect to landspreading)	IC 14-37	312 IAC 16	Spill Management Guide and MOA w/IDEM
Roadspreading	IDNR – Oil and Gas	IC 14-37	312 IAC 16	Spill Management Guide and MOA w/IDEM
Tanks	IDNR – Oil and Gas	IC 14-37	312 IAC 16	N/A
Commercial Facilities:				
Multipractice	N/A	N/A	N/A	N/A
Landfarms	N/A	N/A	N/A	N/A
Tank Bottom Reclaimers	N/A	N/A	N/A	N/A
UIC Surface Facilities	N/A	N/A	N/A	N/A
Oil-Field NORM	N/A	N/A	N/A	N/A
Centralized Facilities (non-NORM)	N/A	N/A	N/A	N/A
Oil-Field NORM	N/A Note: Indian Department of Health (IDOH) regulates matters relating to radiation but does not specifically regulate Oilfield NORM	IC 16-41-35	410 IAC 5	N/A
Municipal Landfills Accepting E&P Waste	IDEM – Office of Solid Waste	IC 13-20	329 IAC	N/A
Underground Injection Surface Facilities	IDNR – Oil and Gas	IC 14-37	312 IAC 16	Primacy agreement w/ USEPA
Abandoned Sites	IDNR – Oil and Gas	IC 14-37	312 IAC 16	N/A

Other	_____	_____	_____	_____

During the in-state review, please be prepared to describe and discuss the following if they are applicable in your state: Please reference the Guidelines in preparing for the discussion.

I. GENERAL CRITERIA - A general description of your E&P regulatory program, including funding and staffing, coordination with other agencies, and goals and program objectives. [3]

II. ADMINISTRATIVE CRITERIA - Administrative activities, including permitting, compliance evaluation, enforcement, contingency planning, public participation, regulatory development, financial assurance, data management, legal support, training, and program planning and performance review. [4]

III. TECHNICAL CRITERIA

A – GENERAL - Any general design or performance standards and variances or waivers, general siting criteria and waste characterization requirements. [5.1 - 5.2]

B – PITS - Technical criteria for permitting, constructing, protecting, monitoring, and closing and reclaiming pits. [5.5]

C - LANDSPREADING (Non-Commercial) - Technical criteria for landspreading of E&P wastes. [5.6]

D - BURIAL AND LANDFILLING (Non-Commercial) - Any requirements for burial or landfilling of E&P wastes. [5.7]

E – ROADSPREADING - Any requirements for roadspreading of E&P wastes. [5.8]

F – TANKS - Any requirements pertaining to the location, use, capacity, construction, operation, closure and removal of E&P waste tanks. [5.9]

G - COMMERCIAL AND CENTRALIZED DISPOSAL FACILITIES - A description of any program regulating commercial and centralized E&P waste disposal facilities, including permitting, siting, construction, operating and closure requirements and waste hauling and waste tracking program elements. [5.10]

IV. ABANDONED SITES - *Any state program to inventory, prioritize and remediate abandoned oil and gas sites, and a description of prioritization, funding and surface remediation activities supporting the program. [6]*

V. NATURALLY OCCURRING RADIOACTIVE MATERIAL - Any activities the state has undertaken to determine the occurrence and need for regulation of NORM, and any program elements applicable to the NORM regulatory program. [7]

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SUPPLEMENTAL QUESTIONNAIRE FOR UIC

A – GENERAL

1. Do the statutes mandate or allow the establishment of advisory boards, regulation review boards, or other vehicles designed to bring UIC program stakeholders together? *State statute neither mandates nor prohibits the establishment of advisory boards.* If not mandated by statute, are there other policies or orders issued by the agency that bring such groups together. *Informal advisory groups are often formed to deal with issues related to rule development.*

2. Excluding the changes in data management that are to be described in Section II, what significant statutory, regulatory, policy or budgetary changes have occurred during the past ten years (or since the state has received primacy if that is more recent) within or outside the agency that have affected the administration of the UIC program? *There have been significant changes to the rules governing the plugging and abandonment of wells, the temporary abandonment of wells and the permitting and bonding requirements. From a budgetary standpoint, the division has been unable to fill positions that become vacant.* Please explain the impacts of these changes. *The rules governing the plugging and abandonment of wells have been upgraded to provide for more competent and permanent plugs, alternate plugging methods, greater verification of plug setting and more stringent materials and methods specifications. The temporary abandonment rules were updated to provide for a longer shut in period but require more frequent monitoring of wells if a fluid level was used to demonstrate that a well on TA would not threaten a USDW. In 2002 the bonding rules were changed to provide for an Annual Well Fee in lieu of bonding for operators with a 2 year history of operation in good standing in the state. This fee program is the funding mechanism for the divisions' orphan sites program. The inability to fill vacant positions has left the division short handed which has led to the need to use professional staff to perform non professional tasks. Consequently, the amount of time available for more technical tasks has declined. This has led to the need for changes in the methodology we use to conduct Class II file reviews so that more reviews can be conducted in less time. However, this was done in a way that did not result in a less intensive file review but rather, in a more risk based approach to such reviews.*

3. Have the Safe Drinking Water Act Reauthorization (1996) and other federal mandates caused changes in the way the UIC program is administered (*i.e.*, Wellhead Protection, Source Water Protection, Watershed Management)? *The division has seen no effects from reauthorization or other federal mandates although recent moves to change reporting methods are a concern.*

4. Have the SARA Title III Program or the Community Right to Know Program (EPCRA) had an impact on your UIC program or on the ability of the regulated community to meet deadlines established in the State UIC regulations? *Not to my knowledge.* If so, describe the impacts.

5. Identify the more prevalent UIC related problems faced by the agency in providing adequate enforcement (*i.e.,* technical, field staff, legal support). *There are two principal areas where staffing shortages have created problems in enforcing the UIC rules. The first is in the area of administrative staff. As administrative positions became vacant and the division was unable to fill them, the tasks performed by those positions had to be distributed to other staff. This included the professional geologic staff. Consequently, certain tasks such as data entry, telephone coverage, records research and copying must sometimes be performed by professional staff. This leaves less time for more technical/ critical tasks. The second area that creates issues is the lack of dedicated legal assistance. The department has a limited number of attorneys and their workload is spread out amongst multiple divisions. Consequently, the amount of time available for managing oil and gas related issues is less than is needed to manage cases without occasional delays.*

6. Who performs the remedial action and /or plugging of a well if the operator of the well proves to be

insolvent? *The plugging of orphaned wells is the responsibility of the division under the Orphan Sites program. However, the state does not have a legal responsibility to plug such wells.* How are injection wells prioritized as compared to other wells for use of well plugging funds? *All oil and gas related wells, including Class II injection wells are prioritized based on risk of environmental impact.*

B – COMPLIANCE REVIEW PROCESS

1. What is the compliance review strategy? *Compliance (file) reviews are conducted on a rolling schedule.* How are wells selected for compliance review? *Wells are generally selected for review on the basis of the date of their last review with the oldest wells going first.* Is the compliance history a factor of selection? *In situations where a significant enforcement history suggests that an operator may not be in compliance with the requirements of the UIC program, a file review can be conducted more frequently than normal.* How often does the compliance review of a well coincide with mechanical integrity testing of that well? *With respect to Part II mechanical integrity the coincidence of file reviews with MI is 100%. However, with respect to Part I mechanical integrity the average coincidence rate is about 20%.*

2. Who performs the compliance review and what are the qualifications of the reviewers? *File reviews are conducted by a staff of two Petroleum Geologists. Each has a Bachelors degree in geology and at least eight years of UIC experience. Additionally, one is a Licensed Professional Geologist and the other is expected to apply for her license within the next year.*

3. Over a year period, what percentage of total UIC permits receives a compliance review? *Approximately 15% of all Class II injection wells are reviewed annually.*

4. How is the quality of compliance reviews assured and subsequently documented? *The division has established a set of very specific guidelines and procedures that are followed for every compliance (file) review performed. These procedures minimize the reviewer's subjectivity when conducting a compliance review. This in turn assures an effective, consistent, and accurate compliance review no matter who the reviewer might be. Periodic discussions regarding methods used to conduct compliance reviews occur between the geologists and their supervisor and are generally documented on performance reviews.*

5. Where deficiencies are discovered during the review, what actions are taken to correct the deficiencies*?. A letter detailing the deficiencies is sent to the operator with a corrective action request to be submitted to the division within a thirty day time period. The type of corrective action taken by the operator ranges from submission of additional data or remediation of construction deficiencies to accepting reduced operating parameters (injection rate restriction).* How frequently do they occur? *It depends on the geographic area under review and the age of the existing pool. Approximately 35% of file reviews will require corrective action at this time. The percentage is decreasing as older wells are reviewed and permanent correction of deficiencies is performed.*

6. How long does it take to do an average compliance review of a well without complications? *The number of wells within the area of review determines the amount of time an individual review will consume. On average, a full review will take 1.5-2 days.* What are complications? *Missing completion data, conflicting data on past completion reports, inadequately plugged wells in the area of review, inadequate primary cementation, misidentified injection zones, unpermitted perforated zones, identification of the lowest USDW, low injection volume on the original permit application , lack of well details in the database.* How frequently do they occur? *Approximately 35% of file reviews identify one or more of the listed complications. However, about 50% of all file reviews will result in an operator's request to modify the permit due to a low original injection volume assignment. This number is decreasing with time.*

7. Assuming that compliance reviews are currently conducted on wells under permit, what action is taken that may affect the continued use of the well for injection while technical, administrative or paper deficiencies are being corrected by the operator? *No immediate action is taken during the 30 day corrective action response period unless injection is occurring into an unpermitted zone or injection authorization has not been issued or has been rescinded. In that situation, the well is immediately shut in until the well is properly permitted.* How often does this occur? *In approximately 99% of situations needing corrective action, no immediate action to halt injection is needed as continued operation of the well does not pose a threat to USDW's.*

C - TECHNICAL CRITERIA

1. What are the state criteria for defining a USDW? *A USDW in Indiana is defined in statute and rule.* Does the state definition of "waters of the state" include ground water? *Depending upon the agency involved, groundwater may or may not be included in the definition of "waters of the state". For purposes of the UIC program groundwater is not included.* What agency is responsible for interpreting and enforcing the definitions? *With respect to the UIC program the Department of Natural Resources, Division of Oil and Gas interprets and enforces the definition.*

2. What are considered to be adequate casing and cementing (surface and production, etc.) requirements for a newly drilled injection well (depth, thickness, material, etc.)? *Indiana requires surface casing to be set and cemented below the lowest USDW. However, an operator has the option of setting long string and/or intermediate casing and cementing them to surface provided a continuous cement column on the long string or overlapping multiple casing strings is present. By rule, long string (production or injection) casing must be set to the top of or through the last stratum drilled* Is casing set and cemented through all USDWs? *Yes, for new wells.* If not, how are USDWs otherwise protected? *Refer to C3 below.*

3. What are considered to be adequate casing and cementing requirements for converted wells? *A minimum of 250 feet of primary cement immediately above the injection zone is required on the long string for converted wells.* Is casing required to be set and cemented through all USDWs? *No.* If not, how are the USDWs protected? *For the actual injection well, after the well passes an initial mechanical integrity test (MIT), annual field inspection is used to monitor the competence of the construction. Routine MIT's are required every five years. If wells in the area of review (AOR) are inadequately constructed or plugged, a maximum injection rate for the Class II well is calculated using formation specific data for the injection zone to prevent the fluid head from rising any higher than 100 feet below the lowest USDW at the distance of the closest problem well.*

4. Are packers routinely required for all newly completed and converted wells? *Yes.* If there are exceptions, what are the criteria used? *Exceptions are not allowed.* Does an exception impose alternative requirements (*i.e*., more frequent MITs, annulus and pressure monitoring, limitation on injection volume)? Do permits specify the type of packer to be used? *No.*

5. Do permits specify the use of tubing? *Yes.* Is lined tubing acceptable and under what conditions? *Yes.* Does the agency prescribe or impose restrictions on weight, grade, material, internal coating or other tubing qualities? *Yes. Indiana rules require that all tubing must meet API standards 5A, 5AC and 5AX (May 31, 1985 editions).*

6. Is annular injection of drilling fluids allowed? *No.* Under what conditions? How are the USDWs protected?

7. Are dual completions accepted? *Yes.* What types? *Oil or gas production and Class II injection.* Describe. *The injection zone should be located above the production zone to allow for completion of a standard annulus pressure test (SAPT). Although dual completion wells are permitted and do exist in Indiana, we discourage operators from this type of well construction. Rare situations have existed in grandfathered wells in which the injection zone is below the oil production zone. Because a standard MIT could not be performed on these wells, operators have typically opted to either convert them to a single purpose well or plug the well.*

8. How are the locations of USDWs determined? *Four methods of USDW determination are used. The primary method is interpretation of site specific geophysical log data. The others are lithologic boundary according to the formation description of the completion report or a published geologic report for the area, sea level if no logs are available for the area and a series of USDW maps developed for the Division of Oil and Gas by the Indiana Geological Survey for selected counties in southwestern Indiana.* How often are the maps, charts or other information used for determination updated and by whom? *The maps and reports have not been updated on a scheduled basis. Geophysical log data is continually being added to our files as wells are drilled.*

9. How is the adequacy of the confining system determined? *No qualitative data exists in our files for aquacludes. A minimum of twenty feet of shale or limestone above the injection zone is generally considered adequate to prevent upward migration of injected fluids.* In those areas where confining geological deposits may consist of prominently incised channel sand fills or karst surface faults or other unique geological conditions that may affect the containment of injected fluids, what buffer or insurance is provided to compensate for irregularities? *The injection rate is calculated to ensure that the requested rate will not endanger USDW's.* How are such conditions evaluated? *The injection rate is evaluated using a computer called Newcone that was provided to the division by the USEPA.*

10. What types of monitoring systems are required or have been approved (flow rate and cumulative volumes, tubing pressure, annuli pressures, etc.)? *With the exception of standard MIT pressure testing, at this time, no types of monitoring systems have been implemented in Indiana.*

11. Has the compatibility of injected fluid/cement and injected fluid/formation fluid been a problem? *No. However, fluid compatibility studies have not been conducted.*

12. How are the maximum injection pressures and rates established*? Maximum injection pressure is initially calculated using the formula located at 312 IAC 16-3-2(f)(3)(E) based on pressure gradient. A higher maximum injection pressure may be assigned based on instant shut in data from a well treatment report less than ten years old or from a step rate test run in the injection zone. Maximum injection pressures are assigned based on an allowance of 90% of the ISIP from a well treatment or the lesser of 90% of the maximum pressure reached or 90% of the breakover pressure from a step rate test. Maximum injection rate is assigned as requested by the operator if no problems exist in the AOR. However, if deficiencies are identified, a rate restriction may be calculated using the Newcone model provided by the USEPA.*

13. How is corrective action handled in those cases where the approval of the application is contingent upon resolution of an adverse situation? *The operator is notified of any deficiencies and the application is held for resolution of the problems.* If a plan for corrective action is contingent upon the transfer of a UIC permit, which party is held responsible? *The current permittee is responsible for any corrective action for a well.*

D - AREA OF REVIEW

1. How is the Area of Review determined for enhanced recovery wells or projects? *Indiana uses a static ¼ mile AOR except in cases where factors indicate a need for an expanded AOR. In such cases a ½ mile AOR is used.* For salt-water disposal wells? *The AOR determination for disposal wells is the same as for enhanced recovery wells.* For commercial wells? *Indiana does not have any commercial wells but if we did the AOR determination would be made the same way as is done for non-commercial wells.*

2. If area permits are issued, how is their Area of Review determined? *Indiana does not issue area permits. All permits are issued on a well by well basis.*

3. How is corrective action handled in those cases where the approval of the application is contingent upon resolution of an adverse situation? *See response to item C13.*

4. In a case where the operator elects to withdraw the application rather than take corrective action measures, what is the subsequent course of action taken by the agency? *No further action is taken.*

5. What authorities are open to the agency where the Area of Review reveals a problem (unplugged wells or other USDW-threatening situation) that is on acreage outside the operator's control. *The operator has the option of accepting a restriction in the operating parameters of a Class II well if he is unable to remediate the problem.* Is the operator's application denied if the operator has no legal status to effect corrective action*? Not automatically. The operator may have the option of accepting a rate restriction for the Class II well.*

E – AQUIFER EXEMPTIONS

1. How many exemptions have been requested since the inception of the program (or since receiving primacy) and what criteria were used for the requests? *Although an exact number of exemptions are not known, there*

have been no more than ten requests since Indiana received primacy in 1991. An operator would be required to submit a request for an exemption following the criteria outlined in 312 IAC 16-5-8 which states the aquifer:

1. does not currently serve as a source of drinking water; and

2. cannot now and will not in the future serve as a source of drinking water because it is:

A. mineral, hydrocarbon, or geothermal energy producing, or can be demonstrated by a permit applicant to contain minerals or hydrocarbons, that, considering their quantity and location, are expected to be commercially producible;

B. situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impracticable; or

C. so contaminated that to render that water fit for human consumption would be economically or technologically impracticable; or

3. contains fresh water with more than three thousand milligrams per liter of total dissolved solids and is not reasonably expected to supply a future user of fresh water.

2. How many requests have been granted and denied and, if denied, what basis or reason was given? *This is not a number which the division can readily determine but the number is not likely to be significant since we have had very few requests and almost no responses from USEPA.* Who issued the denial? *With respect to denials, the USEPA Regional Administrator has the authority to disapprove a request for an aquifer exemption.*

3. Are minor aquifer exemptions granted? *The division does not differentiate between minor and major exemptions.* How many have been granted and denied? *As with E2 above, this number is not readily available to the division but is likely to be minimal.* What was the basis for denial? What criteria are used to determine the limits of a minor exemption? *Minor aquifer exemptions are subject to the same criteria as full aquifer exemptions.*

4. Are certain aquifers granted exemptions in some parts of the state while the same aquifers are considered non-exempt in other parts of the state? *This information is not available.* If so, what criteria are used for evaluation of requests? *Requests would be reviewed case by case based on the geographic and geologic setting of each situation.*

F - MECHANICAL INTEGRITY TESTING

1. What types of mechanical integrity tests (MITs) are acceptable to the agency for satisfying the leak test (Part 1 of MI)? Are some tests acceptable only for a specific set of well completion conditions? Please list the tests and their limitations as to applicability. *The only test accepted by Indiana is the Standard Annulus Pressure Test (SAPT).*

2. What criteria are used for determining whether a well has passed/failed a pressure test? *The criteria for passage or failure of the SAPT include the following:*

A. Change in pressure over a 30 minute test period at a minimum pressure of 300 PSI using a fluid medium. If greater than 3% = Fail

B. Documentary demonstration of the packer setting depth such as a Wireline measurement or tubing tally. If not present = Fail

C. Sufficient fluid return to demonstrate that the packer is set near the specified depth. If insufficient = Fail

Why were these criteria selected? *The amount of pressure used and the amount of pressure change accepted were negotiated with USEPA during the primacy process. The use of fluid only is dictated by the fact that you cannot get a fluid return if gas is used as the media to impart pressure. Documentary evidence of packer location is a quality control measure as is the amount of fluid return.* Are the criteria more strict in sensitive ground water areas, wellhead protection areas, or areas of known corrosive ground waters? *No.*

3. Is the volume of fluid loss a factor in the determination of a failure? *The amount of fluid loss translates into loss of pressure. Measurement of actual fluid loss cannot be ascertained from a SAPT. However, if volume of fluid return is what is meant by this question, the answer is Yes.*

4. Is annulus pressure monitoring (APM) used to determine MI? How is an MI failure determined utilizing APM? *Indiana does not utilize APM as a means of demonstrating MI.*

5. How often is APM recorded? What is reviewed and who reviews it? Are there stricter standards imposed on wells located in special geological areas (faults, salt deposits, etc.) or in ground water situations described under question F-2, above? *N/A*

6. Are wells using APM required to have an initial pressure test? *N/A*

7. If other monitoring records are reviewed to establish MI, how are failures determined? If the determination of failure is different for each type of monitoring record, explain the process for each. *N/A*

8. What type of technical judgment or MIT is used to satisfy the fluid migration test (Part 2 of MI)? *Primary cement data is evaluated for an existing Class II well using cement records or cement bond logs.* If cement records are reviewed, what criteria are used to determine whether the well passes/fails? *A minimum of 250 feet of cement must be present outside the long string casing above the top of the injection zone for a grandfathered existing Class II well. New Class II wells must have the cement circulated to surface either as a continuous column on the long string or overlapping multiple casing strings.*

9. Identify any logs used for the determination of MI and the limitations imposed on their use. *Cement bond/variable density logs are the most common type of log used to verify MI for existing Class II wells. Other types of logs which may be run include radioactive tracer, temperature and sonic logs. However the latter are rarely used in Indiana.* Are logs more frequently used in areas where potential adverse geological situations have been encountered in the past or where groundwater may be from vulnerable or artesian sources? *There does not appear to be a correlation between the frequency of log use and the presence of adverse conditions.* Who interprets the logs or makes the decision to have the operator runs special log suites? *The most frequent type of log requested of the operator is a CBL/VDL. Logs are interpreted by the division geologists. Consultation with professional colleagues or logging company personnel is sought when necessary* How are failures of MI determined? *During a compliance review, a Class II well fails MI if there is less than 250 feet of primary cement present outside the long string casing immediately above the injection zone. For failure of a field MI failure, see response to item F2.*

10 What are the most common remedial actions required to correct MIT failures? *Failure of part 2 of the MIT requires an operator to remediate the cementation by either perforating and squeezing an adequate amount of cement to meet the minimum requirement or by setting and cementing a liner into the well. Failure of part 1 of the MIT may have several causes. Tubing failure may be remediated by pulling and replacing a joint. A packer failure may be overcome by reseating or replacing the packer. Failure due to a hole in the long string casing may be corrected by either perforating the casing and squeezing cement or by setting and cementing a liner in the well.*

G – IMPLEMENTATION OF THE MIT PROGRAM

1. What is the process for notifying an operator that demonstration of MI is due? *The division sends out written letters notifying operators which wells are coming due for MI demonstration.* How much prior notice is given? *Notices are sent out at least 30 days prior to the due date.* Are tests scheduled at the operator's or agency's convenience? *Tests are scheduled at mutually acceptable times.*

2. Is consideration given to having an operator run MITs on large numbers of wells in the same area or are other steps taken to schedule tests efficiently? *The decision to run tests on other wells in the area that may not be due for tests rests with the operator. However, if more than one well is due for a test it is common procedure to attempt to schedule them in groups to increase efficiency. Conversely, operators do not typically schedule tests for other wells in an area that are not currently or shortly due for MIT's.*

3. If the general cycle for testing is five years are there wells tested on a more frequent schedule and, if so, what are the criteria? *Yes. Wells that have had downhole repairs are reconstructed or have otherwise had the packer unseated are required to undergo a test before resuming operation. Similarly, if groundwater contamination has been reported in an area, all Class II wells within ½ mile must undergo a MIT regardless*

of the interval since the last test.

4. How are the pressure test and fluid migration test (Part I and II of MIT) coordinated? *These tests are not purposely coordinated but such coincidence occurs about 20% of the time as a consequence of MIT and file review schedule alignment.*

5. How are the MIT results filed and managed? *The results of MIT's are kept in the division database regardless of whether or not the well passed or failed a test.* In those cases where the well passed the test? In those cases where test failure occurred and follow-up for compliance purposes is necessary? *Database benchmarking reports are used to ensure follow-up occurs on failed MIT's.*

6. What are the personnel (inspector) resources required to implement the MIT program? *The division implements the MIT program within the normal scope of work of eight oil and gas inspectors.* Does this vary significantly from one year to the next? During periods within the industry where economic growth or depression occurs? *The resources needed to implement the MIT program do not vary significantly from year to year or due to industry economic factors since the cost of running the SAPT is nominal.*

H – WITNESSING A MECHANICAL INTEGRITY TEST.

1. Who witnesses MI demonstrations and what percentage of MI tests are witnessed by state inspectors? *100% of MIT's are witnessed by oil and gas inspectors.* Does witnessing vary from one producing region of the state to another? *No*

2. What do inspectors look for during an MI demonstration? *Inspectors look for changes in test pressure, proper sealing of the well during the test to prevent the introduction of additional pressure and fluid return following the test sufficient to demonstrate the approximate setting depth of the packer.* Are routine inspections of the other lease facilities conducted at the same time as a visit for MIT? *Typically the inspector will review other facilities such as tank batteries, pits and well and lease identification if these are close to the well being tested. However, due to the scheduled nature of MIT's well operation functions such as injection pressure are not reviewed.*

3. How much time is spent witnessing an average MI test? This estimate should also include travel time. *Between 1-2 hours are spent including travel to witness a MIT.* Are there occasions when the operator is not prepared to do the test at the appointed time? *Yes* What flexibility is allowed when this occurs? *Tests are typically rescheduled. However, if an operator has failed to conduct a scheduled test on the same well more than once the division will typically issue a Notice of Violation with Civil Penalty Assessment unless the operator demonstrates that the continued failure to run the test was beyond their control. In such cases the operator must still make every reasonable effort to conduct the test.*

4. How is the witnessing of MIT documented? *Information on the test is logged in the division database on each inspector's laptop computer for transfer to the main database in Indianapolis.* What documentation is required of the operator in those cases where the test was not witnessed? *This does not apply since all tests are witnessed.*

5. What action does the inspector take in those cases where it is discovered that the operator conducted a MIT prior to the scheduled time and subsequently made repairs? *Pre-testing by operators is allowed and does not result in any agency action as such pre-tests are usually advantageous to prevent failures due to minor issues such as wellhead and tubing thread leaks which are easily corrected and do not create a substantial risk to USDW's.* Does the agency require documentation of the work even though the action was taken voluntarily by the operator? *No*

I – FOLLOW-UP ON FAILED MI TESTS

1. In the event of MIT failure, how is the operator notified to shut the well in? *An operator would be notified immediately by phone or in person that a failure has occurred and that the well must be shut in. A formal Notice of Violation would be generated and mailed to the operator with instructions concerning what must*

be done to correct the violation and the date by which the violation must be corrected. If all wells failing MI are not shut in, please elaborate. *N/A*

2. Is the operator required to institute corrective measures for each failed MI? *As specified in the Notice of Violation, an operator has sixty days to perform and pass a MIT or plug and abandon the well. The operator must choose one of these options and perform the work prior to the date set for compliance.* If an alternative to effecting corrective measures is the plugging and abandonment of the well, how does the state require the operator to prepare the well so it can be plugged? *Prior to plugging a Class II well, the tubing must be removed unless the operator intends to use the tubing to spot the cement plugs. Regardless, the tubing must be removed at the time the well is plugged. The packer is allowed to remain and may be used as the base for a cement plug.*

3. How long is the operator given to complete repairs? *Sixty days. However, extensions can be approved if justified.*

4. Are repairs witnessed (what percentage)? *No but a follow-up MIT is required.* What percentage of retests are witnessed? *100%*

5. If workover of the well is required as a part of repair, does the agency require copies of reports documenting the work? *Workovers require a permit and submission of a Well Completion/ Recompletion Report.* Does this include such activities as well fracturing or removal of scale to enhance intake capacity? *No.*

6 What are the current MI failure rates for enhanced recovery and disposal wells? How has the failure rate changed through successive five-year cycles of testing? *Current failure rates are averaging approximately 11%. During the previous two, five year cycles, the failure rate increased from approximately 2% to approximately 7%. Although no substantial study of the reason for the increasing rate of failures has been conducted, it is our considered opinion that they result from a failure on the part of operators to conduct routine maintenance and repairs on wells that are increasing in age.*

J – CONTAMINATION/ALLEGED CONTAMINATION RESULTING FROM INJECTION WELL PRACTICES OR ASSOCIATED ACTIVITIES

1. Estimate the number of alleged USDW-contamination incidents reported to the agency in the past ten years. *Over the past 10 years the division has received about 8 complaints of groundwater contamination.* Were any of these associated with such activities as hydraulic fracturing, zone acidizing or other well stimulation activity? *No known contamination from well stimulation or treatment has been asserted or determined.* How many of the alleged incidents proved to be related to UIC activities? *To date only 2 incidents are considered likely to be related to Class II injection and in both cases possible criminal conduct related to either the plugging of wells or illegal/ unauthorized injection of saltwater are considered the most likely causes of the contamination.*