Pennsylvania Follow-up State Review

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

September 2013

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INTRODUCTION

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

In 1999, administration of the State Review Process devolved to a non-profit, multi-stakeholder organization named State Review of Oil and Natural Gas Environmental Regulations, Inc. (STRONGER). STRONGER again revised, expanded and updated the Guidelines, which were accepted by the IOGCC and published in June 2000 as Guidelines for the Review of State Oil and Natural Gas Environmental Regulatory Programs (the "2000 Guidelines"). In 2005, 2010 and 2013, STRONGER again revised, expanded and updated the Guidelines (the "2005 Guidelines", the "2010 Guidelines" and the "2013 Guidelines"). The 2013 Guidelines were used as the basis of this review.

USEPA and the U.S. Department of Energy have provided grant funding to STRONGER to support its activities. The American Petroleum Institute has also provided no-strings attached funding to support the state review process.

In March 2013, the Pennsylvania Department of Environmental Protection (DEP) volunteered to have its program reviewed by STRONGER. The Pennsylvania oil and gas regulatory program has undergone four prior reviews. The report of the initial review of the Pennsylvania oil and gas regulatory program was published in 1992. The reports of two follow-up reviews, conducted after both the Pennsylvania regulations and the guidelines were revised, were published in 1997 and 2004. In 2010 the report of the Pennsylvania hydraulic fracturing program was published.

The current review began with a questionnaire that was sent to the Office of Oil and Gas Management. The questionnaire had been prepared by the STRONGER Board. STRONGER intended the questionnaire to capture the status of the Pennsylvania program relative to the 2013 Guidelines. The Office of Oil and Gas Management prepared a response to the questionnaire, which was then sent to the review team.

In May 2013 a ten-person team appointed by STRONGER conducted a review to evaluate the DEP program compared to the 2013 Guidelines. The review team consisted of six team members

and four official observers. The six team members were: Leslie Savage, Chief Geologist for the Railroad Commission of Texas and a STRONGER Board member; David Claus, Deputy Chief of the Division of Oil and Gas Resources Management within the Ohio Department of Natural Resources; Bruce Baizel, Director of the Oil and Gas Accountability Project of Earthworks and a STRONGER Board member; Katy Dunlap, Eastern Water Project Director for Trout Unlimited; Steve Rhoads, State Government Relations for Shell Oil Company; and Mark Stebbins, District Engineering Manager for CNX Gas Company. The four Official Observers were Tracy Carluccio, Deputy Director of the Delaware Riverkeeper Network; Dan Soeder with the Department of Energy's National Energy Technology Laboratory, Office of Research and Development; Jim Collins, a STRONGER Board member representing the Independent Petroleum Association of America; and Bonnie Robinson, a Geologist with the Environmental Protection Agency, Office of Resources Conservation and Recovery.

The review team conducted a meeting, the in-state portion of the review, in the conference facilities of the DEP, in Harrisburg, Pennsylvania on May 28 - 30, 2013. Mr. Scott Perry, Deputy Secretary of the Office of Oil and Gas Management, presented an overview of the Pennsylvania oil and gas environmental regulatory program. Mr. Perry and Mr. Kurt Klapkowski, Director of the Bureau of Oil and Gas Planning and Program Management; Mr. Gene Pine, Mr. Joseph Lee, Ms. Susan Ghoweri, Mr. Seth Pelepko, Mr. Joseph Adams and Mr. Steve Brokenshire also of the Bureau of Oil and Gas Planning and Program Management; Ms. Elizabeth Nolan, Bureau of Regulatory Counsel; Mr. Steve Socash of the Bureau of Waste Management; Mr. Dan Husted from the Field Operations Deputate; and Mr. Kerry Leib, Emergency Response Coordinator, responded to questions from the team members and official observers. In addition to the twelve DEP representatives who participated in the review, there were two environmental, four industry and six state and federal attendees who observed the proceedings and offered questions for consideration by the review team. Following the meeting and after reviewing the written materials provided by the Office of Oil and Gas Management, the team members compiled this review report. The draft report was sent to the state and official obeervers for review and comment. All comments were addressed.

This is the report of the review of the Pennsylvania program against the 2013 Guidelines of STRONGER. Appendix A is a glossary of acronyms used in the report. Appendix B contains Pennsylvania's written response to the STRONGER questionnaire.

EXECUTIVE SUMMARY

In 2013 a multi-stakeholder review team has completed an in-depth review of the Pennsylvania oil and gas environmental regulatory program. The review team has concluded that the Pennsylvania program is, over all, well-managed, professional and meeting its program objectives. The review team also made recommendations for improvements in the program.

Program Strengths

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

1. Program Updates Reflecting Unconventional Development

The review team commends DEP for increasing its staff levels to address additional permitting, inspection and enforcement activities related to increased unconventional gas well development. Over the past four years, as unconventional gas well development has increased in Pennsylvania, the Office of Oil and Gas Management has increased its staff from 64 to 202 employees. Permit fee increases, promulgated in 2009, enabled the DEP to expand staffing to its current level of 202 employees. Approximately 80% of the staff are assigned to engineering, scientific or permit/inspection-related work, as Oil and Gas Inspectors or Oil and Gas Inspector Supervisors, and the remaining 20% are assigned to clerical, administrative, or legal work to support the DEP's Oil and Gas Program.

During this same period of time, DEP restructured the oil and gas program to improve management of the oil and gas program, and to provide for centralized and more consistent enforcement of violations.

In addition, the review team has noted that recently adopted legislation distinguishes between unconventional shale gas development and conventional gas development, providing for opportunities to address unique challenges associated with unconventional gas development.

2. Orphan and Abandoned Well Program

DEP is commended for their public participation activities associated with the abandoned sites program. Public participation activities with respect to abandoned wells have been occurring for many years by local individuals and environmental groups. These groups have been especially proactive in searching for abandoned oil and gas wells. Two such groups are the Senior Environmental Corp, who searched for abandoned wells in Oil Creek State Park in Venango County and "Save Our Streams PA", who is involved in finding abandoned wells in Potter and McKean Counties.

3. Naturally-Occurring Radioactive Material (NORM) and Technologically-Enhanced Naturally-Occurring Radioactive Material (TENORM)

DEP is commended for initiating a comprehensive evaluation of radiation levels specifically associated with unconventional gas development. This TENORM study is the first of its kind in the nation. This study is examining the levels of naturally occurring radiation in a variety of equipment, materials and media associated with oil and gas development. The study also examines potential environmental impacts and exposure to the public and workers. The design of the Department's study was subject to a peer review and interested members of the public are able to comment on the study documents.

The Department initiated the TENORM study in 2013 to respond to concerns associated with worker and public TENORM exposure associated with unconventional Marcellus shale gas exploration and development activities. The Office of Oil and Gas Management stated that drill cuttings and other materials associated with oil and gas have occasionally triggered radiation monitors at landfills. The Department's data indicates that less than half a percent (0.5%) of all drill cuttings generated by the unconventional Marcellus Shale industry in 2012 that were disposed in Pennsylvania landfills triggered radiation monitors. The cuttings did not contain levels of radioactivity that would be acutely harmful to the public, and were disposed in accordance with the protocols established by DEP. DEP also reported that unconventional drilling process water sample results indicate the presence of radium-226 (Ra-226), a common NORM radionuclide and the element associated with the natural decay series with the highest mobility.

4. Stormwater Management

DEP is commended for its program for stormwater management. Operators performing earth disturbance activities associated with oil and gas activities must develop and implement Erosion and Sedimentation Control Best Management Practices (BMPs) to

minimize the potential for accelerated erosion and sedimentation. This requirement applies to all earth disturbance activities regardless of size.

A person proposing earth disturbance activities must develop and implement a written Erosion and Sediment Control Plan (E&S Plan) when earth disturbance activities will result in total earth disturbance of 5,000 square feet or more, the earth disturbance activity has the potential to discharge to water classified as High Quality or Exceptional Value or if the person is required to develop an E&S Plan under 25 Pa. Code Chapter 102 or other Department regulations (e.g. 25 Pa. Code Chapter 105, relating to water obstructions and encroachments and dam safety). A person proposing oil and gas activities that involve five acres or more of earth disturbance over the life of the project must obtain an Erosion and Sediment Control Permit (E&S Permit) prior to commencing the earth disturbance activity.The ESCGP-2 permit was designed for areas of disturbances associated with oil and gas activities greater than 5 acres, and usually applies to unconventional drilling locations. Special consideration is given to and additional requirements apply to earth disturbances that have the potential to impact waters that are sediment impaired or classified as High Quality or Exceptional Value.

On December 29, 2012, the DEP published the *Policy for Erosion and Sediment Control and Stormwater Management for Earth Disturbance Associated with Oil and Gas Exploration, Production, Processing or Treatment Operations or Transmission Facilities.* This policy describes erosion and sediment control and stormwater management requirements for oil and gas activities in Pennsylvania.

DEP considers well sites to be under construction until post-drilling restoration takes place. Consequently, all erosion and sediment controls must be maintained until the site is restored and permanently stabilized. DEP conducts regular inspections to assure compliance with program requirements. Inspections of erosion and sedimentation controls at oil and gas well sites and associated roads and pipelines are conducted by Water Quality Specialists.

5. Hydraulic Fracturing

DEP is commended for its hydraulic fracturing program. Standards for well casing and cementing require that the operator conduct those activities to control the well at all times, prevent migration of gas or other fluids into sources of fresh groundwater; and prevent pollution of fresh groundwater. In February of 2011, DEP amended its regulations regarding well design and construction requirements to provide enhanced casing and cementing standards for new well construction. The requirements include standards for casing and cementing to meet anticipated pressures and protect resources and the

environment. These standards address internal pressure rating, pressure testing of casing, centralization, and certification of joint welders. The program requires that cement used in the surface casing meet certain compressive strength and free water specifications and isolate the wellbore from fresh groundwater; contain pressures from drilling, completion, and production; protect the casing from the geochemical effects of the subsurface; and prevent gas flow in the annulus.

The regulations require that operators provide notification prior to, and reporting after completion of, hydraulic fracturing operations. This notification can be by email. Operators are required to report instances of defective cementing or casing within 24 hours of the discovery and correct the defect. If the defect cannot be addressed immediately, a corrective action plan is due within 30 days.

The well completion report requirements and chemical disclosure requirements exceed public disclosure and reporting requirements of the Guidelines.

Program Recommendations

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

1. Need for Standardized Data

The review team recommends that DEP maintain consistent standardized data for tracking violations and enforcement actions to facilitate accurate internal DEP performance evaluation and to provide accurate information to the public. DEP has utilized different methods of evaluating program effectiveness and operator compliance since initiating its compliance baseline program in 2005. DEP should analyze past compliance data, using methods to periodically determine the effectiveness of the regulatory and enforcement program over time, and that the results of such evaluation made public.

2. TENORM Study

The review team recommends that the DEP complete its TENORM study for unconventional gas development to determine whether its program appropriately assesses E&P wastes for TENORM. If DEP determines it necessary to develop an oilfield TENORM program, particular attention should be paid to sampling and analysis procedures to characterize TENORM wastes coupled with appropriate action levels relative to background concentrations to ensure worker safety. In addition, opportunities for on-site disposal of TENORM wastes generated during production should be considered.

If the TENORM study indicates that specific E&P TENORM regulations are warranted, the review team also recommends that the regulations address permitting, construction, operational and closure standards for pits containing TENORM, technical criteria for burial and land spreading of TENORM wastes, and standards for centralized and commercial facilities. The Review Team also recommends that the Department review and consider the Conference of Radiation Control Program Directors Suggested State Regulations for Control of Radiation.

3. Surface Casing Depth

The review team recommends that DEP consider developing a process by which it determines surface casing setting depths to protect fresh groundwater. DEP does not have a consistent method to determine surface casing setting depths to ensure protection of fresh groundwater. DEP standards for all well casing and cementing practices require that the operator conduct casing and cementing activities to control the well at all times, prevent migration of gas or other fluids into sources of fresh groundwater; prevent pollution of fresh groundwater, meet anticipated pressures, and protect resources and the environment. Application of these performance standards and, most importantly the determination of the surface casing seat depth, is up to the operator.

DEP has not established numerical criteria for fresh groundwater, thus operator determination is subjective. Different companies use different rationale for determining surface casing seat depth. DEP should take a more active role in establishing criteria in this regard.

4. Pre-Drill Water Sampling

The review team recommends that the State consider developing guidance for pre-drill sampling. The 2012 Oil and Gas Act includes a presumption that an operator of a

conventional well is responsible for water pollution if such pollution occurs within six months of drilling or alteration and is within 1,000 feet of the well. An operator of an unconventional well is presumed responsible for water pollution if such pollution occurs within twelve months of the later of completion, drilling, stimulation or alteration of the well and is within 2,500 feet of the well. An operator may defend itself against such presumptive liability by collecting and analyzing pre-drill samples at water supplies to characterize baseline conditions prior to drilling, completion, and fracture stimulation. The protocols for such sampling address appropriate factors, including distance/radius from the well, timing/frequency of testing, reporting of the data, responsibility for sample collection, testing, cost, surface owner consent, laboratory accreditation, and remedial actions. However, the DEP has been reluctant to provide guidance on the pre-drill sampling and testing of water wells since it might impact operator liability.

While the review team commends the State for the pre-drill sampling and testing of water wells, it also is of the opinion that greater guidance on sampling procedures and testing of indicator parameters is appropriate.

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I. General Criteria

The Department of Environmental Protection (DEP) is the agency with responsibility for the regulation of oil and gas exploration and production in Pennsylvania. Within the Department, the Office of Oil and Gas Management has the lead responsibility for program development and implementation. The Office of Oil and Gas Management is divided into two Bureaus; the Bureau of Oil and Gas Planning and Program Management and the Bureau of District Operations. Other programs within the DEP, including the Bureaus of Waste Management, Water Quality, Radiation Protection and Air Quality, share portions of the responsibility for activities that fall within their jurisdiction.

Agencies outside of DEP who also have a regulatory responsibilities include the U.S. Environmental Protection Agency (Underground Injection Control program), U.S. Fish and Wildlife Service (threatened and endangered species), the Department of Conservation and Natural Resources (Topographic and Geological Survey and threatened and endangered species), Pennsylvania Fish and Boat Commission (threatened and endangered species), Pennsylvania Game Commission (threatened and endangered species), the Susquehanna River Basin Commission and Delaware River Basin Commission (water allocation), U.S. Army Corps of Engineers (activities impacting streams and wetlands), the Pennsylvania Departments of Economic and Community Development, Labor and Industry, and Transportation, and the Pennsylvania Public Utilities Commission and Pennsylvania Emergency Management Agency.

Statutory Authority

Oil and gas activities regulated by the DEP are conducted under the authority of the following statutes: Oil and Gas Act (2012), Oil and Gas Conservation Law (1961), Coal and Gas Resource Coordination Act (1984), Clean Streams Law (1937), Dam and Safety Encroachment Act (1978), Solid Waste Management Act (1980), Air Pollution Control Act (1960), Storage Tank and Spill Prevention Act (1989), Water Resources Planning Act (2002), Non-coal Surface Mining Reclamation and Control Act (1984), Section 1905 of the Administrative Code (1929), Environmental Laboratory Accreditation Act (2002), Delaware River Basin Compact (1961), Susquehanna River Basin Compact (1968), Great Lakes-St. Lawrence River Basin Water Resources Compact (2008), Hazardous Material Emergency Planning and Response Act (1990), Hazardous Sites Cleanup Act (1988), Pennsylvania Safe Drinking Water Act (1984), Land Recycling and Environmental Remediation Standards Act (1995) and the Radiation Protection Act (1984). All of these statutes provide authority for DEP to promulgate rules and regulations.

Finding I.1.

The review team has determined that Pennsylvania's statutes adequately describe the powers and duties of the regulatory bodies charged with managing oil and gas activities.

Finding I.2.

The review team has determined that statutory authority exists to promulgate appropriate rules and regulations for oil and gas related activities.

Rules and Regulations

In Pennsylvania, regulations related to oil and gas activities must follow a process that involves consideration by the Oil and Gas Technical Advisory Board, the Environmental Quality Board, the Citizen's Advisory Council, the Independent Regulatory Review Commission, and the public.

Pennsylvania's Oil and Gas Technical Advisory Board (TAB) is comprised of five members who are petroleum engineers, petroleum geologists, or experienced drillers, and one member who represents mining interests. Pennsylvania's Environmental Quality Board (EQB) consists of 20 members and includes representation by the Secretary of the DEP, as chair, and representatives from the Departments of Health, Community and Economic Development, Transportation, Agriculture, Labor & Industry, Fish and Boat Commission, Game Commission, Public Utility Commission, Historical and Museum Commission, State Planning Board, the Citizen's Advisory Council, and the House and Senate leadership of the General Assembly. The Citizen's Advisory Council (CAC) is comprised of the Secretary of the DEP and 18 citizen volunteers appointed by the Governor, President Pro Tempore of the Senate, and Speaker of the House of Representatives. The Independent Regulatory Review Commission (IRRC) consists of five Commissioners, four of whom are appointed by the General Assembly and the fifth member is appointed by the Governor—none of whom may be a Commonwealth employee or hold an elected or appointed position in Pennsylvania Government.

New regulations related to oil and gas activities must adhere to a comprehensive development and review process. After DEP drafts the appropriate regulatory language, the draft rulemaking is presented to the TAB for action. Through the TAB, technical and scientific information is evaluated and discussed, including additional alternative regulatory provisions. The public may attend TAB meetings and provide comments on proposed regulations.

As the draft regulatory provisions are developed and finalized, DEP prepares additional documents to supplement the regulations, including an Executive Summary, Preamble, and

Regulatory Analysis Form. The Executive Summary is a one to two page summary of the regulatory proposal prepared for the members of the EQB that identifies the summary of the proposal, its purpose, the groups affected by the proposal, and the DEP advisory committee(s) that were involved in the review of the proposal.

The Preamble, including an explanation of the regulation and rationale, is published in the *Pennsylvania Bulletin* (Commonwealth's official gazette for information and rulemaking) along with the proposed regulatory language. After the proposed rulemaking package has been developed, it is reviewed by the DEP Policy Office for completeness, format and substance; the DEP Office of Chief Counsel for legality; and the Secretary. Once the rulemaking is approved by the Secretary, it is reviewed by the Governor's Office of General Counsel, the Governor's Policy Office and the Governor's Budget Office.

All regulations developed by the DEP must be reviewed and approved by the EQB. The EQB takes formal action on each rulemaking, including approving the length of the public comment period and the provision for any public meetings and/or hearings on the regulatory proposal. After the EQB approves a proposed regulation, the rulemaking is submitted to the Office of General Counsel and upon approval, is forwarded to the Office of Attorney General for review of form and legality.

Following approval by the Office of Attorney General, DEP submits the proposed regulation to the Standing Environmental Resources and Energy Committees and the IRRC for review and comment. The rulemaking is also submitted to the Legislative Reference Bureau for publication in the *Pennsylvania Bulletin* to commence the official public comment period on the proposal. All proposed rulemakings are subject to a minimum comment period of at least 30 days. During the public comment period, public information meetings and hearings may be held on the proposed rulemaking. Once the public comment period closes, IRRC has an additional 30 days to review the rulemaking and the public comments received on the proposal and to submit its own comments on the proposed rulemaking to the EQB.

After the conclusion of the public comment period, including IRRC's comment period, the DEP will consider each of the comments received and prepare a Comment and Response Document which lists each paraphrased comment and commentator with an appropriate DEP response. Simultaneously, the TAB, working in collaboration with DEP, may choose to organize workgroups—comprised of technical experts convened by DEP and the CAC—to evaluate the comments received on more technical issues. The committee may then recommend changes or amendments to the regulatory proposal based upon its evaluation of the comments.

Once all comments have been considered, DEP develops the final regulatory package, which includes the final regulatory language, Executive Summary, Order, and Regulatory Analysis Form. The final regulatory language is presented to the TAB for consideration. After the final

rulemaking package has been developed, the DEP Policy Office for completeness, format and substance; DEP Office of Chief Counsel for legality; and the Secretary review it. Once is it approved by the Secretary, it is reviewed by the Governor's Office of General Counsel, Governor's Policy Office and Governor's Budget Office.

Similar to the proposed rulemaking, DEP presents the final rulemaking to the EQB and responds to any concerns the members may have. The EQB takes formal action on each rulemaking. After approval by the EQB, the rulemaking is submitted to the Standing Environmental Resources and Energy Committees and IRRC for formal action. IRRC has a minimum of 30 days to review the rulemaking and take formal action on it, which occurs at a public meeting of the commission. The Standing Committees have a minimum of 20 days to take action on the rulemaking and can take action up until 24 hours prior to IRRC's public meeting. After IRRC approves the final rulemaking, it is submitted to the Office of Attorney General for review of form and legality. Upon approval by the Office of Attorney General, the final rulemaking is submitted to the Legislative Reference Bureau for publication in the *Pennsylvania Bulletin.*

Finding I.3.

The review team has determined that Pennsylvania has a rigorous process for developing regulations, reviewing regulations and obtaining input from various stakeholders including the public.

Finding I.4.

The review team has determined that recently adopted regulations distinguish between unconventional shale gas development and conventional gas development, providing for opportunities to address unique challenges associated with unconventional gas development.

Staffing and Funding

Over the past three years, as unconventional gas well development has increased in Pennsylvania, the DEP has increased its staff from 64 to 202 employees. Permit fee increases, promulgated in 2009, enabled the DEP to expand staffing to its current level of 202 employees. Approximately 80% of the staff is assigned to engineering, scientific or permit/inspection-related work, as Oil

and Gas Inspectors, Oil and Gas Inspector Supervisors, Water Quality Specialists and Water Quality Specialist Supervisors; the remaining 20% are assigned to clerical, administrative, or legal work to support the DEP's Oil and Gas Program.

The DEP recognizes that additional staff resources will be needed to implement regulations under recently passed legislation (2012 Oil and Gas Act). To support new staffing levels, DEP has proposed a rulemaking to increase permit fees from an average of $3,200 (based upon a sliding scale based on well bore length) to a flat fee of $5,000. The proposed rule was presented to the TAB in April 2013 and was presented to the EQB in July 2013, which approved the proposed rulemaking. DEP is proceeding to move the rulemaking through the remainder of the regulatory development process.

Two additional funds are utilized by DEP to fund the plugging of orphaned and abandoned wells; however, these funds do not currently provide funding to support staff.

Finding I.6.

> DEP staff levels have increased to address additional permitting, inspection and enforcement activities related to increased unconventional gas well development.

Recommendation I.6.a.

> The review team recommends that DEP continue to evaluate whether it has sufficient staff and funding resources to manage current and projected oil and gas well development activities, including resources to address emergency issues if an operator is unwilling or unable to assume liability. (STRONGER 2013 Guidelines Section 3.1.d.)

Recommendation I.6.b.

> The review team recommends that DEP conduct a workload analysis, as part of its program evaluation, to determine which program areas and geographic areas that additional staff may be needed in the future. (STRONGER 2013 Guidelines Section 4.2.3.2.)

Goals

DEP's general mission is to protect Pennsylvania's air, land and water from pollution and to provide for the health and safety of its citizens through a cleaner environment. Among other laws

pertaining to oil and gas activities, DEP is charged with implementing the Oil and Gas Act, which declares it in the public interest to foster, encourage and promote the development, production and utilization of natural oil and gas resources of the Commonwealth.

Pennsylvania's Oil and Gas Act was recently amended by the 2012 Oil and Gas Act, to achieve the following purposes: permit optimal development of Pennsylvania's oil and gas resources consistent with protection of health, safety, environment and property of the state's citizens; protect the safety of personnel and facilities employed in coal mining or exploration, development, storage and production of natural gas or oil; protect the safety and property rights of persons residing in areas where mining, extraction, development, storage or production occurs; and protect the natural resources, environmental rights and values secured by the Pennsylvania Constitution.

Finding I.7.

Pennsylvania's Oil and Gas Program generally has clear goals and objectives

State/Regional Variations in Criteria

Pennsylvania is divided into different physiographic regions, each with unique climate, hydrology, and geology characteristics that may impact the manner in which oil and gas exploration, development and production are performed. To address fundamental differences between regions, the state program should have some flexibility, while maintaining a level of consistency to achieve the state's overall E&P program goals, as described above.

The 2012 Oil and Gas Act established several ways in which DEP can accommodate local and regional variability, including allowing for waivers from setback distances between unconventional wells and existing buildings or water wells, water supply extraction points, and from streams, springs or other bodies of water. According to the Act, DEP must grant waivers in these situations where consent is provided by the landowner or water purveyor, and where the operator submits a plan—subject to DEP approval—identifying additional measures, facilities or practices to be employed during well site construction, drilling and operations. DEP also has regulatory authority under 25 Pa.Code § 78.75a to designate alternative areas if DEP determines that well drilling requirements beyond those provided under Chapter 78 are necessary to drill, operate or plug a well in a safe and environmentally-protective manner.

Water allocation and water management for E&P activities is treated differently in Pennsylvania's three major river basins: Delaware River basin, Susquehanna River basin and the Ohio River basin. In both the Delaware River basin and the Susquehanna River basin, an inter-state basin

compact has established a basin-specific commission to regulate water allocation and permit water withdrawals, among other goals. Pennsylvania is a signatory party to both the Delaware River Basin Compact and the Susquehanna River Basin Compact, and as such, plays a role in overseeing water withdrawals for oil and gas activities in each respective basin. In the Ohio River basin, the DEP oversees and authorizes water withdrawals for oil and gas activities through company-wide Water Management Plans.

Finding I.8.

Water withdrawals for oil and gas activities are regulated differently in different parts of Pennsylvania.

Recommendation I.8.a.

The review team recommends that the DEP continue to work with the river basin commissions to insure consistent oversight of surface and ground water withdrawals for oil and gas activities, while recognizing regional variability. (STRONGER 2013 Guidelines Section 3.3.)

Recommendation I.8.b.

The review team recommends that the state clarify conditions under which variances will be considered. (STRONGER 2013 Guidelines Section 3.3.)

II. ADMINISTRATIVE CRITERIA

Basic Requirements

DEP has been delegated primary enforcement authority for various federal programs, including the Clean Water Act (National Pollution Discharge Elimination System Permits), the Clean Air Act, and the Resource Conservation and Recovery Act (Solid Waste). Pennsylvania has adopted and enforces federal regulations, in addition to some state-specific programs and requirements. These programs include permitting, compliance evaluation and enforcement provisions.

The U.S. Environmental Protection Agency retains federal primacy under the Safe Drinking Water Act for the Underground Injection Control program in Pennsylvania. The EPA Region III Groundwater and Enforcement Branch conduct permitting of UIC disposal and enhanced recovery wells. DEP reviews and issues any well permits and erosion and sediment control permits that are associated with the site where a UIC well is constructed.

Permitting

Pursuant to the 2012 Oil and Gas Act, an individual well permit must be obtained prior to drilling, altering or operating an oil or gas well and the permit must be posted on site prior to construction of the well site, including the access road. DEP reviews well permit applications for administrative completeness and to ensure that the proposed well location is sited properly, in accordance with setback requirements for streams, wetlands, water wells, buildings and floodplains. Additional information that is required in the application to drill, alter or operate an oil and gas well includes the impact on public resource, proposed well proximity to a gas storage reservoir, proposed well proximity to a landfill, whether the well is proposed to be located in a special protection watershed, whether the well is located within a H_2S area, and whether waste, including drilling cuttings from drilling of the well, will be disposed of onsite as well as proof of notification to the surface landowner, the host municipalities, adjacent municipalities, users of water supplies near the proposed well, coal owners and gas storage owners. A well permit is valid for one year provided drilling commences and continues with due diligence. Well permits can be renewed for an additional year, provided that the applicant renews 15 days prior to permit expiration, pays a renewal fee, and affirms under penalty of law that all of the information in the renewal application is the same as the initial application.

An application to drill, alter or operate an oil or gas well must be accompanied by a number of other permits and/or approvals. Other permits and/or approvals that may be required, depending upon the specific application, include: an erosion and sediment control permit (for surface disturbance of greater than 5 acres) from DEP; a centralized impoundment permit from DEP; a

water allocation permit from the Delaware River Basin Commission for withdrawals from the Delaware River watershed; a water allocation permit from the Susquehanna River Basin Commission for withdrawals from the Susquehanna River Basin; and/or a Water Management Plan approved by the DEP for withdrawals from any waters of the Commonwealth.

Many of the waste management practices used at well sites are authorized by the well permit so long as they comply with the Chapter 78 regulations. Alternative waste management practices from those outlined in regulation may be used upon DEP approval.

Gas wells that are proposed to be drilled through workable coal seams are subject to the Coal and Gas Resource Coordination Law. Wells that penetrate the Onondaga horizon or are at least 3,800 feet deep if that formation is not present are subject to the Oil and Gas Conservation Law.

Finding II.1.

> The review team has determined that Pennsylvania's Oil and Gas Act allows for a consolidated permit review process that could streamline the permit application and review procedures.

Recommendation II.1.

> The review team recommends that DEP consider developing a streamlined permitting process. (STRONGER 2013 Guidelines Section 4.1.1.)

Compliance Evaluation

The DEP has a compliance evaluation program that includes procedures for receipt, evaluation, and investigation, of information provided by the regulated community, for possible enforcement actions. DEP receives electronic notice of critical stages of E&P activities, including spud date, resumption of drilling, cementing of all casing strings, conducting pressure tests of the production casing, stimulation of a well, abandoning or plugging of a well and waste reporting. Well records, completion reports and site restoration reports are sent to the regional oil and gas district office and assigned to an inspector to review the information for completeness and to record the data in DEP's online database.

DEP has the capability to conduct regular inspections at critical stages of E&P activities. An operator may not commence drilling activities until DEP has conducted an inspection of the unconventional well site after installation of erosion and sediment control measures. Restoration reports submitted to the DEP through its electronic reporting system are field verified. Oil and gas inspectors are responsible for inspecting operating wells, underground gas storage reservoirs,

abandoned wells, and inspecting the methods used in plugging abandoned wells and reconditioning old wells. Water Quality Specialists are responsible for conducting inspections of a well site for compliance with erosion and sediment control measures detailed in the erosion and sediment control plan or permit, and other activities regulated by the Clean Streams Law. DEP has unrestricted access to enter a site and make inspections, conduct tests or sampling, examine records and make copies.

DEP has a toll free hot line number, available 24 hours/7 days a week, for oil and gas related complaints. Response times vary depending upon the severity of the complaint. Complaints are logged into DEP's Complaint Tracking System. DEP's environmental laboratory is accredited through the National Environmental Lab Accreditation Program and complies with chain of custody and documentation procedures associated with the accreditation.

Finding II.2.

DEP reported to the review team that field staff had been conducting an average of 30 oil and gas inspections per month, and that new statutory notification requirements for notification of critical stages of E&P activities allows inspectors to conduct additional inspections.

Recommendation II.2.

The review team recommends the state evaluate the inspection goals for oil and gas inspectors and develop ways to make inspections more efficient. (STRONGER 2013 Guidelines Section 4.1.2.1.b.)

Finding II.3.

The review team has determined that DEP is collecting data to evaluate program effectiveness and identify inspection priorities.

Recommendation II.3.

The review team encourages DEP to continue to periodically review data to determine if inspection priorities should be adjusted based upon potential risk and statutory obligations. (STRONGER 2013 Guidelines Section 4.1.2.1.)

Finding II.4.

The review team has determined that DEP has not historically used a consistent method for issuing violations, making it difficult to evaluate compliance with regulations and DEP performance over time. DEP has recently restructured the oil and gas program to improve management of the oil and gas program, and to provide for centralized and consistent enforcement of violations.

Recommendation II.4.

The review team recommends that DEP maintain consistent standardized data for tracking violations and enforcement actions, to facilitate accurate internal DEP performance evaluation and to provide accurate information to the public. (STRONGER 2013 Guidelines Section 4.1.2.1.

Enforcement

The DEP has the authority to issue a notice of violation with a compliance schedule, a restraining order, an injunction, an administrative order, and to revoke, modify or suspend a permit. DEP may also initiate court action, assess civil penalties, seek criminal sanctions, and require forfeiture of bonds. DEP has emergency response authority regarding both hazardous and nonhazardous substances, with the authority to order or undertake, if the responsible party fails to do so, the necessary and appropriate emergency interim response. DEP can also recover all of the agency's emergency response costs, including the cost of regaining control of the well, controlling the perimeter of the well site, preparing water sprays, establishing trenches or dikes to capture runoff fluids and providing the resources and equipment needs for the incident.

Civil penalties are assessed in accordance with DEP policy, and based upon harm to public safety and the environment, the willfulness of the violation and compliance history. For a general violation of Pennsylvania's Oil and Gas Act, a fine of $1,000/per day or imprisonment of 90 days, or both, may be assessed. Willful violations constitute a misdemeanor, and upon conviction, a fine of up to $5,000, or one year imprisonment, or both, may be assessed. In addition to other remedies, the DEP may, after a hearing, assess a civil penalty of up to $25,000 plus $1,000 for each day the violation continues. For violations related to the construction, alteration or operation of an unconventional well, the DEP may, after a hearing assess a civil penalty of up to $75,000 plus $5,000 per day for each the day the violation continues, regardless of whether the violation was willful. Factors considered in determining the penalty amount are identified by statute and include the willfulness of the violation, damage or injury to natural resources of this Commonwealth or their uses, endangerment of safety of others, the cost of remedying the harm, savings resulting to the violator as a result of the violation and any other relevant factor. Any person aggrieved by a DEP action may appeal to the Environmental Hearing Board.

Finding II.5.

The review team has determined that Pennsylvania has effective enforcement tools that clearly provide a right of appeal to aggrieved persons.

Contingency Planning and Spill Risk Management

Pennsylvania's state contingency program for E&P activities is codified in regulation under the state's Oil and Gas Act, Clean Streams Law and Solid Waste Management Act, and requires an operator to prepare several plans for preventing and responding to spills and releases at E&P facilities. Under the Hazardous Sites Cleanup Act, DEP has the authority to address all spills of hazardous substances and emergency authority regarding an actual or threatened release of a nonhazardous substance, if the responsible party failed to take appropriate action. Oil and gas operators are required to develop a Preparedness, Prevention and Contingency (PPC) plan. Unconventional well operators are also required to develop and submit to the Commonwealth and other county and local entities an Emergency Response Plan, which addresses the possibility of any emergency on a well site, beyond a spill or release, and covers all aspects of operations at a well site.

Pennsylvania's Hazardous Sites Cleanup Fund provides DEP with funding for spills and releases in the event that a responsible operator cannot be located or is unwilling or unable to respond. Additionally, where an operator can be located, DEP may recover the agency's emergency response costs, including the cost of regaining control of the well, controlling the perimeter of the well site, preparing water sprays, establishing trenches or dikes to capture runoff fluids and providing the resources and equipment needs for the incident.

In the event of a reportable spill or release, the responsible party must notify the DEP by telephone at the appropriate DEP regional office, or via a toll free number. Under certain circumstances, as specified under applicable law and in accordance with the control and disposal plan and/or PPC plan, the responsible party must immediately notify emergency responders such as state or local police, county emergency management officials, federal authorities, other state authorities and downstream users of impacted or threatened waters. DEP recognizes the jurisdictional authority of local responders in protecting the health and safety of their citizens and works alongside local responders to implement a unified command system that involves all agencies that have a jurisdictional responsibility for any aspect of the incident. In each of DEP's six regional offices a Regional Emergency Response Program Manager (ERPM) leads an emergency response program. The Regional ERPM has the full authority of the Regional Director in responding to emergency situations.

Pennsylvania's general state contingency plan includes the following elements: facilities, materials and equipment that may pose a significant threat to human health or the environment; the various environments at risk, including surface and groundwater and land (environmentally sensitive areas, special soil or geologic conditions, urban areas, cultural and special resource

areas); measures to address public and responder safety concerns, including training for response personnel; the operator's incident command structure, including emergency contact information for key personnel; equipment, manpower and contracted services to respond to spills and releases; opportunities for coordination of joint response actions; procedures for communication with impacted or threatened parties; methods of containment of spills and unauthorized releases; and methods of disposal of materials of concern. Emergency responders are trained in personal protection and safety, environmental sampling, containment and control, and have authority to issue field orders to enforce DEP regulations.

DEP requires, prior to generation of waste, each oil and gas well operator to prepare and implement a PPC plan for the control and disposal of fluids, including top-hole water, brines, drilling fluids, additives, drilling muds, stimulation fluids, well servicing fluids, oil, production fluids and drill cuttings from the drilling, alteration, production, plugging or other activity associated with oil and gas wells. Each PPC plan must identify the control and disposal methods and practices utilized by the well operator and include a pressure barrier policy that identifies barriers to be used during identified operations. Unconventional well operators are also required to prepare and submit to DEP a well site containment plan describing the containment practices to be utilized and the area of the well site where containment practices will be employed.

DEP has full enforcement authority under various environmental statutes where an operator fails to respond properly to a spill or release. All violations issued to a well operator are noted in DEP's oil and gas reporting database and cleanup activities under Pennsylvania's Land Recycling Program are tracked in DEP's eFACTS database.

Finding II.6.

> The review team determined that Pennsylvania has adapted its pollution prevention and emergency response requirements to address increased unconventional shale gas development.

Public Participation

DEP utilizes its eFACTS database to provide public notification of receipt of permit applications related to E&P activities and to describe the status of the application review and approval. The 2012 Oil and Gas Act requires an unconventional well operator to send, by certified mail a copy of the plat to the surface owner, the municipality where the tract is located, each municipality

within 3,000 feet of the proposed unconventional vertical well bore, the municipalities adjacent to the well, all surface landowners and water purveyors whose water supplies are within 1,000 feet of the proposed well location (or in the case of an unconventional well, within 3,000 feet of vertical well bore), storage operators within 3,000 feet of the unconventional vertical well bore, owner and lessees of any coal seams and each coal operator required to be identified in the well permit application. Municipalities and storage operators have an opportunity to submit written comments to DEP on the proposed well permit application. Well permits are public records maintained in the files located at the district offices.

Most permits associated with oil and gas activities are published in the *Pennsylvania Bulletin*. However, well permits, are not published in the *Pennsylvania Bulletin.* For modifications to a General Permit or policy related to E&P activities, DEP provides notification to the public through the *Pennsylvania Bulletin* and accepts public input on the documents in question. General information about Pennsylvania's E&P program is available online.

Finding II.7.

The review team has determined that the DEP publishes a large amount of information about its E&P regulatory program online, but the information is not presented in a user-friendly manner.

Recommendation II.7.

The review team recommends that DEP make the website more user friendly to allow the public easier access to the data it contains. (STRONGER 2013 Guidelines Section 4.2.2.2.)

Program Planning and Evaluation

The DEP conducts program evaluation and planning at regular short-term and long-term intervals. The Bureau of Oil and Gas Planning and Program Management develops a two-year strategic plan that is reviewed and updated as projects are completed. Short-term work plans are developed by Bureau Directors, and reviewed and updated on a bi-weekly basis with the Deputy Secretary. Compliance with environmental health and safety metrics such as spills and erosion and sediment control is routinely evaluated. A compliance baseline by which to compare current enforcement and compliance activities was established in 2005. All violation and enforcement actions are compared annually to the previous year and to the number of wells drilled in that year.

Finding II.8.

The review team has determined that DEP has utilized different methods of evaluating program effectiveness and operator compliance since initiating its compliance baseline program in 2005.

Recommendation II.8.

The review team recommends that DEP analyze past compliance data, using methods to periodically determine the effectiveness of the regulatory and enforcement program over time, and the results of such evaluation made public. (STRONGER 2013 Guidelines Section 4.2.3.1.)

Financial Assurance

The 2012 Oil and Gas Act established new collateral and surety bonds requirements. A bond must be filed with the application for the well permit and is conditioned upon the operator's faithful performance of all drilling, water supply replacement, restoration and plugging requirements. Liability under the bond continues until the well has been properly plugged and for a period of one year after filing of the certificate of plugging with the DEP. The DEP may declare bond forfeiture if a well owner or operator fails to comply with Chapter 32 of the Oil and Gas Act, regulations promulgated under Chapter 32 or conditions of a permit relating to Chapter 32. In accordance with the 2012 Oil and Gas Act, bond amounts for unconventional wells were increased, based on well bore length; however, bond amounts for conventional wells remain unchanged. The EQB may adjust the bond amounts every two years.

Finding II.9.

The review team has determined that the financial assurance requirements for E&P environmental and regulatory facilities meet the guidelines.

Waste Hauler Certification

The commercial transportation of E&P waste is regulated under Pennsylvania's Solid Waste Management Act. All vehicles transporting E&P wastes must have signs or placards that identify the name and business of the vehicle owner and the type of waste being transported. Vehicles transporting residual waste in Pennsylvania are required to have a fire extinguisher, safety equipment, protective clothing, first aid supplies, and absorbent mats. A daily operational record is required to be maintained and kept in the cab, and must include the type of waste being transported, the weight or volume of the waste, generator information and the processing or

disposal facility information. A waste hauler is also required to keep a residual waste contingency plan in the cab of the vehicle.

Finding II.10.

The review team has determined that Pennsylvania has a program for commercial hauling of E&P waste that meets the guidelines with the exception that a certification program is not in place.

Recommendation II.10.a.

The review team recommends that DEP consider whether a program for certification of commercial waste haulers is appropriate. (STRONGER 2013 Guidelines Section 4.2.5.)

Recommendation II.10.b.

The review team recommends that DEP develop a training program to ensure E&P waste hauler compliance with regulations under the Solid Waste Management Act. (STRONGER 2013 Guidelines Section 4.2.5.)

Location of Closed Disposal Sites

The DEP requires an operator to provide information about disposal site closure in its well site restoration report that is required to be submitted within 60 days of site restoration. Information required includes: the date of land application of the tophole water, the results of pH and specific conductance tests and an estimated volume of discharge; a description of the method used for disposal or reuse of the free liquid fraction of the waste, and the name of the hauler and disposal facility, if any; the location of the pit in relation to the well, the depth of the pit, the type and thickness of the material used for the pit sub-base, the type and thickness of the pit liner, the type and nature of the waste, a description of the pit closure procedures used and the pit dimensions; and the location of the area used for land application of the waste, and the results of a chemical analysis of the waste soil mixture if requested by the DEP; and the types and volumes of waste produced and the name and address of the waste disposal facility and waste hauler used to dispose of the waste.

Data Management

DEP utilizes the Environment Facility Application Compliance Tracking System (*e*FACTS) to

provide permitting, inspection and compliance information about authorizations, clients, sites and facilities to the public. Users can search the database to find inspection and pollution prevention visits as well as inspection results data, including enforcement information when violations are noted. DEP also hosts an interactive oil and gas reporting website which allows members of the general public to produce reports of permits issued, wells drilled, compliance and enforcement activities, as well as abandoned and orphan wells. A user can search this database by operator, by county, by type of well, and/or by time period.

The DEP is currently developing an electronic well permit application system to improve data quality, permit application review and efficient permit issuance. DEP currently requires electronic notification and electronic production/waste reporting. The enhancements will improve document management, data quality, permit application review and efficient permit issuance.

Finding II.11.

The review team commends DEP for its efforts to integrate databases containing information about E&P activities.

Finding II.12.

The review team finds that DEP's data collection meets the guidelines with the possible exception of how data collected is shared with the public.

Recommendation I.12.

The review team recommends that DEP evaluate and where appropriate modify the eFACTS system and its interactive data reporting websites to facilitate public access to the data. (STRONGER 2013 Guidelines Section 3.2.)

Finding II.13.

The review team commends DEP for initiating development of an electronic well permit application system to facilitate submission of comprehensive permit applications, review and approval of permit applications, and provide a central location for public information.

Personnel and Funding

The DEP's Oil and Gas Program is administered through a central office of Bureau of Planning and Program Management, which is divided into three divisions: Well Development and Surface Activities, Well Plugging and Subsurface Activities, and Compliance and Data Management. The Well Development and Surface Activities Division develops regulations and policies for activities related to stormwater management, control and disposal of E&P wastes, and site remediation and reclamation. The Well Plugging and Subsurface Activities Division administers the abandoned well plugging program and develops regulations and policies pertaining to well drilling, operation and plugging. The Compliance and Data Management Division develops guidance on enforcement procedures, well permitting and data management protocols. The Division is also responsible for administering and enforcing the production and waste reporting requirements. The Bureau of Regulatory Counsel provides legal support for the Oil and Gas Bureau of Planning and Program Management.

Each district office employs licensed professional geologists and engineers who review well permit applications, erosion and sediment control permit applications, stream and wetland crossing permit applications and centralized impoundment applications. There are currently 83 individuals within the oil and gas program that hold positions as Oil and Gas Inspectors, who are responsible for overseeing well drilling, completion, servicing, operation and plugging activities, and Water Quality Specialists, who are responsible for overseeing well site and pipeline construction activities as well as investigate spills and water supply complaints. Environmental Protection Specialists are also housed in district offices and are responsible for waste management activities at well sites and for tracking waste treatment and disposal at commercial facilities.

The Oil and Gas Program is completely funded through the well permit fee, erosion and sediment control permit fee, impact fees generated through unconventional well development and any fines collected.

Finding II.14.

The review team commends the DEP for increasing staffing levels over the past three years to accommodate additional oversight responsibilities associated with increased unconventional gas development and has determined that certain sections of DEP's Oil & Gas Bureau remain understaffed.

Recommendation II.14.

The review team recommends that DEP continue to evaluate whether it has sufficient staff and funding resources to manage current and projected oil and gas well development activities in light of new requirements under Act 13 of 2012, particularly newly mandated inspections. (STRONGER 2013 Guidelines Section 3.1.d.)

Coordination Among Agencies

In 2011, at the direction of Governor Corbett, Pennsylvania undertook a multi-agency review of Marcellus Shale development to examine and make recommendations: to mitigate environmental impacts associated with unconventional shale gas development and to recommend mitigation measures; foster efforts to promote market development; develop a trained workforce; enhance emergency response; and identify and mitigate uncompensated local and community impacts; provide for appropriate public health monitoring and analysis. The member agencies involved in the Governor's Marcellus Shale Advisory Commission ("Commission") included DEP, the Department of Conservation and Natural Resources, Pennsylvania Emergency Management Agency, Department of Agriculture, Department of Transportation, Pennsylvania Public Utility Commission, and the Department of Community and Economic development. The Commission issued a report in July 2012 with 96 recommendations. All of the recommendations that required legislative action were incorporated into the 2012 Oil and Gas Act.

DEP utilizes the Pennsylvania Natural Heritage Program's (PNHP) Pennsylvania Natural Diversity Inventory (PNDI) to identify and mitigate impacts to threatened and endangered species. The PNDI system is managed by the Department of Conservation and Natural Resources (DNCR) and includes plant and animal species classified by DNCR, the Pennsylvania Game Commission, Pennsylvania Fish and Boat Commission, and the U.S. Fish and Wildlife Service. Also, DEP informally consults with EPA Region 3 on underground injection well permits and air quality issues. DEP does not consult with the U.S. Forest Service on surface management issues associated with oil and gas development on the Allegheny National Forest.

Pennsylvania is a member of the Susquehanna and Delaware River Basin Commissions. The commissions exercise authority for Susquehanna River Basin Commission and Delaware River Basin Commission, for surface and groundwater withdrawal permit applications in the Susquehanna River Basin and Delaware River Basins, respectively. DEP administers the program outside of those basins.

Finding II.15.

The review team has determined that DEP is coordinating with the EPA to implement the

underground injection control well program.

III. TECHNICAL CRITERIA

General

The Commonwealth's oil and gas program includes technical criteria for E&P waste management practices, including criteria for waste characterization, waste management hierarchy, pits, land application, tanks and centralized and commercial facilities. The Commonwealth establishes performance standards and design specifications based on site-specific or regional differences in geology, hydrology, climate, and waste characteristics.

The DEP E&P waste management program requires that facilities and sites used for the storage or disposal of wastes derived from the exploration and production of oil and natural gas should be operated and managed at all times to prevent contamination of groundwater and surface water, soil and air, protect public health, safety and the environment, and prevent property damage.

The Bureau of Waste Management's Residual Waste Program's Form 26R, Chemical Analysis of Residual Waste, Annual Report by the Generator, includes a comprehensive list of required analytical parameters for wastewater produced from the drilling, completion and production of unconventional gas wells. The DEP's regulations allow for disposal of oil and gas wastes into landfills, provided the landfill is designed to contain such wastes, and the wastes contain no free liquids.

DEP's technical criteria for siting, construction, and operation of E&P waste disposal facilities address site-specific conditions. DEP's siting criteria is determined on a case-by-case basis for pits, landspreading, landfilling and burial, and reclamation facilities. Section §78.62 establishes the requirements for disposal of residual waste in a pit at the well site, including disposal at the well site on which the waste is generated; the disposal area is not within 200' measured horizontally from an existing building, unless the current owner thereof has provided a written waiver consenting to the disposal closer than 200'. The disposal area is not within 100' of a stream, body of water or wetland; the disposal area is not within 200' of a water supply; the bottom of the pit is a minimum of 20" above the seasonal high groundwater table; and the pit is designed, constructed and maintained to be structurally sound and impermeable.

Waste Characterization

The DEP waste characterization requirements are provided through the Residual Waste Program implemented by the Department's Bureau of Waste Management. Waste characteristics for waste hydraulic fracturing fluids and for wastewater produced from the drilling, completion and production of unconventional wells must be reported on Form 26R. For impoundments and tanks, the volume of wastewater stored must also be reported.

Finding III.1.

The review team finds that the state program generally meets criteria of the Guideline, Section 5.2, with the possible exception of NORM. (See Section V)

Recommendation III.1.

The review team recommends that the DEP complete its TENORM study for unconventional gas development to determine whether its program appropriately assesses E & P wastes for NORM. (STRONGER 2013 Guideline Section 5.2.2.b.)

Waste Management Hierarchy

The Pennsylvania 2012 Oil and Gas Act requires operators to develop water management plans that include a reuse plan for fluids that will be used to hydraulically fracture unconventional wells. Under 25 Pa.Code § 287.53, an operator that generates more than an average of 2200 pounds of residual waste per generating location per month shall prepare a source reduction strategy that includes, for each type of waste generated, the extent and nature of operator's source reduction program. Where no program has been established, the operator's strategy shall include a characterization of the waste stream, description of potential source reduction options, and evaluation of those options.

Finding III.2.

The review team finds that waste minimization and fluid recycling plans, as well as waste minimization strategies, are required, consistent with STRONGER 2013 Guideline Section 5.3.3.a.

Technical Criteria for Pits

According to the DEP, there are about 1600 drilling production pits in Pennsylvania. Under Pennsylvania law, 25 Pa.Code § 78.57 regulates pits for collection of brine and other fluids produced during operation, service and plugging of wells. Percolation and evaporation pits are prohibited. Pits for temporary containment during drilling, altering, completing, recompleting, servicing and plugging of a well and disposal pits are not individually permitted, but are

authorized by the well permit. Centralized impoundments for wastewater storage from multiple wells must obtain a Dam permit.

No notice is currently required prior to construction and operation of pits authorized under the well permit or by rule. Centralized impoundments, under 25 Pa.Code § 105.21a, require published notice in the Pennsylvania Bulletin.

Pits for temporary containment must meet the construction and performance standards in 25 Pa. Code § 78.56, including structural integrity, minimum freeboard, liner compatibility, and distance to seasonal high groundwater table, in order to prevent the threat of pollution to waters of the Commonwealth. Disposal pits must meet the construction and performance standards in 25 Pa.Code §§ 78.61 and 78.62, which also include concentration standards. Liners are required for all temporary containment and disposal pits.

Centralized impoundments require an individual permit under Chapter 105 but are not explicitly regulated as to types and characteristics of wastes that can be placed in the impoundment. Liner requirements are specified.

Finding III.3.

> The review team finds that the design and construction standards for centralized impoundments meet the guidelines.

Closure and reclamation of pits is governed by the requirements of 25 Pa.Code §§ 78.61 and 78.62, including time limits, removal of free liquids and restoration completion reports.

Finding III.4.

> The review team finds that the DEP's experience with pits has shown that, although their use is decreasing, many liner failures still occur with pits and other types of waste are being dumped into pits.

Recommendation III.4.

> The review team recommends that the DEP consider adopting regulations or incentives for alternatives to pits used for unconventional wells in order to prevent the threat of pollution to the waters of the Commonwealth. (STRONGER 2013 Guidelines Sections 5.3.3.d. and 5.5.3.e)

Finding III.5.

The review team finds that the current regulations include a performance standard for reasonable protection at well sites, including pits, from the unauthorized actions of third parties, but does not require fencing.

Recommendation III.5.

The review team recommends that the DEP consider regulations for well site security that meet the Guidelines. (STRONGER 2013 Guideline Sections 5.5.3.f. and 5.5.4.b.)

Landspreading (non-commercial)

The DEP has specific criteria for landspreading in sections 78.61 and 78.63 that regulate above the casing seat and below the seat land application of drill cuttings, including restrictions on pollutional materials and concentration limits. The agency has not found any significant difference between cuttings from vertical and horizontal wells, including NORM.

Finding III.6.

The review team finds that the DEP criteria for landspreading generally meet the guidelines for Landspreading, Section 5.6, except with regard to NORM. (See Section V)

Technical Criteria for Burial and Landfilling

The DEP's current E&P regulations address burial and landfilling of E&P wastes in Sections 78.61 and 78.62, where requirements related to restrictions on pollutional material, setbacks/siting, removal of free liquids, liners, backfilling, and revegetation are included.

Finding III.7.

The review team finds that the DEP's regulations generally meet the requirements of Section 5.7. of the Guidelines.

Technical Criteria for Roadspreading

There are currently over 200,000 barrels of brine from conventional wells that are spread annually from 84 facilities in Pennsylvania. The DEP's regulations do not contain specific roadspreading criteria, but the department has developed guidelines that address the spreading of brine on unpaved roads. The guidelines specify the need for a permit, the testing criteria for wastes proposed for roadspreading, the application rates and any buffer zones required. Flowback and fluids from unconventional wells are not allowed to be roadspread.

Finding III.8.

The review team finds that the DEP's roadspreading program generally meet the requirements of Section 5.8. of the Guidelines.

Recommendation III.8.

The review team recommends that the DEP consider codifying the current roadspreading guidelines in the department's E&P regulations. (Guideline Section 5.8.2.)

Technical Criteria for Tanks

The DEP's current regulations in 25 Pa.Code §§ 78.56 and 78.57 are limited with regard to requirements for location, use, capacity, age and construction of E&P waste tanks. The agency believes that about 200,000 tanks are currently being used in the state. The 2012 Oil and Gas Act requires all permanent aboveground and underground tanks to comply with corrosion control requirements, establishes containment requirements for unconventional well sites and requires removal of all equipment from the well site within nine months after completion of drilling.

Finding III.9.

The review team has determined that a large number of tanks exist throughout Pennsylvania and that the state does not have standards for tank closure and removal.

Recommendation III.9.

The review team finds that the DEP consider adopting regulations that address tank inventory, structural integrity, siting, the use of open top tanks, secondary containment, tank security and removal. (Guideline Section 5.9.2.)

Technical Criteria for Commercial and Centralized Disposal Facilities

There is currently one commercial disposal facility available to unconventional well operators and 22 centralized storage facilities in the state. Permitting and oversight of the disposal facilities is conducted mainly by the Department's Bureau of Waste Management. When E&P waste leaves a well site it is regulated under 25 Pa.Code Chapters 287-299 – the state's standard residual waste regulations – by the Bureau of Waste Management, and not by the Office of Oil and Gas Management.

Finding III.10.

The review team finds that the program generally meets the requirements for Section 5.10 of the Guidelines.

IV. ABANDONED SITES

DEP has currently identified over 9,000 orphaned and abandoned wells in the State of Pennsylvania.

The Office of Oil and Gas Management manages and implements the Orphan and Abandoned Well Plugging Program, which inventories, prioritizes, and remediates abandoned and orphan wells discovered and reported to DEP. An inventory of these wells is maintained in two DEP databases; the Abandoned and Orphan Well database, and eFACTS. As new wells are added to the database, they are evaluated using a scoring matrix that assigns points relative to criteria based on their impacts to health, safety, and the environment. Remediation is accomplished through DEP managed well plugging contracts, in coordination with the Department's Construction Contracts Program.

Section 3271 of the 2012 Oil and Gas Act (Act 13) provides the statutory mechanism for the majority of the monies used to fund the Orphan and Abandoned Well Plugging Program. This legislation continues the surcharge fee structure originally established by the Oil and Gas Act of 1984. Specifically, a $50 surcharge is added to the permit application fee for any new oil or gas well, and allocated to the Abandoned Well Plugging Fund. An additional surcharge of either $100 for oil wells or $200 for gas wells is added to the permit application fee and allocated to the Orphan Well Plugging Fund. The Act 13 Marcellus Legacy Fund will also provide approximately $14 million per year in funding to support certain conservation projects and environmental protection measures, including plugging abandoned wells. This funding is available through a grant program administered by the Commonwealth Financing Authority (CFA) and the Department of Community and Economic Development (DCED). The Pennsylvania DEP is to be commended for having multiple sources of funding for the plugging of orphan and abandoned wells.

The Department has drafted new regulations under section 78.52a (relating to orphan and abandoned well identification) requiring operator identification of orphaned and abandoned wells, within a prescribed distance, prior to hydraulic fracturing of a well. For a gas well or horizontal oil well, the operator must identify the location of orphaned or abandoned wells within 1,000 feet measured horizontally from the vertical well bore and 1,000 feet measured from the surface above the entire length of a horizontal well bore. For a vertical oil well, the operator must identify the location of orphaned or abandoned wells within 500 feet of the well bore.

Public participation activities with respect to abandoned wells have been occurring for many years by local individuals and environmental groups. These groups have been especially

proactive in searching for abandoned oil and gas wells. Two such groups are the Senior Environmental Corp, who searched for abandoned wells in Oil Creek State Park in Venango County and "Save Our Streams PA", who is involved in finding abandoned wells in Potter and McKean Counties.

There are two full time plugging inspectors statewide that are dedicated to the orphan and abandoned well program. Other oil and gas inspectors assist the two dedicated plugging inspectors as needed. The DEP is planning on adding one additional plugging inspector.

Finding IV.1.

> The Pennsylvania DEP is to be commended for their public participation activities associated with the abandoned sites program.

Finding IV.2.

> The review team finds that the Pennsylvania Abandoned Site Program meets or exceeds the STRONGER Guidelines.

V. NATURALLY OCCURRING RADIOACTIVE MATERIALS (NORM)

Following its 1997 NORM study, DEP placed a low priority on the development of NORM regulations for oilfield waste streams because of the low radiation levels routinely detected at well sites, waste management operations, pipe yards, and other relevant facilities. Instead of regulations tailored to the oil and gas program, DEP relied on its general waste management program to regulate radiation contaminated wastes that may be present in all waste streams being disposed in the Commonwealth.

In the 2004 Review of the Pennsylvania Program, the Bureau of Oil and Gas Management reported that it had posted the results of its 1997 NORM study on its web site for general public access and that regulations had been promulgated to establish monitoring and management standards and practices for NORM disposed at commercial and municipal waste disposal facilities throughout the Commonwealth.

2004 Review Finding VII.1.

> The placement of the NORM Report on the Department's web site for public access satisfies the recommendation made in the 1997 report.

2004 Review Finding VII.2.

> The new regulations governing the management of radioactive materials at commercial and municipal waste disposal facilities throughout the Commonwealth satisfy the Guidelines for the proper handling of oil and gas field NORM that is disposed at DEP-permitted waste disposal facilities. (2000 Guidelines Sections 7.3.1, 7.3.2, 7.3.3, 7.3.4, 7.3.5, 7.3.7, 7.3.9 and 7.3.10)

In the current review, the Department clarified certain elements of its comprehensive waste management program for TENORM wastes. It indicated that:

1. The Department considers naturally occurring radioactive material that is generated during oil and gas exploration or production activities to be technologically enhanced (TENORM).

2. Waste facilities that manage TENORM must be permitted under Solid Waste Management Act regulations.

3. The waste program regulations include a definition of TENORM, monitoring requirements for incoming waste loads and action levels based on conservative public and occupational annual dose limits, and radiation Action Plan requirements for waste disposal facilities that are evaluated by the Department.

The Department also stated that it relies on OSHA oversight of TENORM worker safety in the state, and that any remediation activities associated with E&P TENORM contamination are evaluated on a case-by-case basis using the site-specific numeric cleanup standards in its Land Recycling Program.

Finding V.1.

> The Department's comprehensive management program for TENORM waste disposal satisfies the recommendations in 7.3.1, 7.3.2, 7.3.5, 7.3.6, 7.3.9 and 7.3.10.

In response to the Questionnaire prepared for this review, the Office of Oil and Gas Management reported that DEP had initiated a comprehensive study to examine the levels of naturally occurring radiation in a variety of equipment, materials and media associated with oil and gas development. The study would also examine potential environmental impacts and exposure to the public and workers. The design of the Department's study was subject to a peer review and interested members of the public are able to comment on the study documents.

The Department initiated the 2013 TENORM study in response to concerns associated with worker and public TENORM exposure associated with unconventional Marcellus shale gas exploration and development activities. The Office of Oil and Gas management stated that drill cuttings and other materials associated with oil and gas have occasionally triggered radiation monitors at landfills. The Department's data indicates that less than half a percent (0.5%) of all drill cuttings generated by the unconventional Marcellus Shale industry in 2012 that were disposed in Pennsylvania landfills triggered radiation monitors. The cuttings did not contain levels of radioactivity that would be acutely harmful to the public, and were disposed in accordance with the protocols established by DEP. DEP also reported that unconventional drilling process water sample results indicate significant concentrations of radium-226 (Ra-226), a common NORM radionuclide and the element associated with the natural decay series with the highest mobility.

The Department stated that any policies or regulations developed to regulate E&P TENORM as a result of the study would undergo a comprehensive public participation process that would include presentations and discussions at DEP advisory boards as well as a formal public comment period.

Finding V.2.

We commend the Department for initiating the TENORM study, which is the first of its kind in the nation to perform a comprehensive evaluation of radiation levels specifically associated with unconventional gas development.

Finding V.3.

The Study initiated to evaluate potential TENORM exposure from unconventional gas development satisfies Guidelines Section 7.2 that states periodically reevaluate the need for a regulatory program and the basis for determinations that levels of NORM present in oil and gas operations in the State do not present a risk to human health or the environment.

Finding V.4.

The Department's study is designed to determine whether a comprehensive management program is needed to regulate E&P TENORM wastes associated with unconventional shale development in Pennsylvania. Consequently, it generally satisfies Guidelines Section 7.3.3.

Recommendation V.4.a.

In order to determine whether specific E&P TENORM waste regulations are needed to supplement its general waste management program, the study should evaluate all the elements for an oilfield NORM program recommended in 7.3. If the department proceeds to develop an oilfield NORM program, the Review Team recommends particular attention be paid to:

1. Sampling and analysis procedures to characterize TENORM wastes coupled with appropriate action levels relative to background concentrations to ensure worker safety. (STRONGER 2013 Guidelines Section 7.3.2.)

2. Opportunities for on-site disposal of TENORM wastes generated during production. (STRONGER 2013 Guidelines Section 7.3.10.)

If the TENORM study indicates that specific E&P TENORM regulations are warranted, the Team also recommends that the regulations address:

1. Permitting, construction, operational and closure standards for pits containing TENORM. (STRONGER 2013 Guidelines Section 7.3.7.)

2. Technical criteria for burial and land spreading of TENORM wastes. (STRONGER 2013 Guidelines Section 7.10.)

3. Standards for centralized and commercial facilities. (STRONGER 2013 Guidelines Section 5.10.).

Recommendation V.3.b.

If the TENORM study indicates that specific E&P TENORM regulations are warranted, the Review Team recommends that the Department review and consider the Conference of Radiation Control Program Directors Suggested State Regulations for Control of Radiation. (STRONGER 2013 Guidelines Section 7.4)

VI. STORMWATER MANAGEMENT

General

The DEP regulates erosion and sediment control from stormwater runoff under the 2012 Oil and Gas Act (Act 13) and the Clean Streams Law as well as 25 Pa. Code Chapters 78, 93 and 102. The DEP has established standards for erosion and sediment control during construction activities and for post construction stormwater management after construction activities are complete.

State Regulatory Program Elements and Criteria

On December 29, 2012, the DEP published the *Policy for Erosion and Sediment Control and Stormwater Management for Earth Disturbance Associated with Oil and Gas Exploration, Production, Processing or Treatment Operations or Transmission Facilities.* This policy describes erosion and sediment control and stormwater management requirements for oil and gas activities in Pennsylvania.

Operators performing earth disturbance activities associated with oil and gas activities must use Erosion and Sediment Control Best Management Practices (BMPs) to minimize the potential for accelerated erosion and sedimentation. This requirement applies to all earth disturbance activities regardless of size. An Erosion and Sediment Control plan for disturbance of greater than 5000 sq. ft. but less than 5 acres is required under 25 Pa.Code §§ 78.53 and 102.4. The ESCGP-2 permit was designed for areas of disturbance greater than 5 acres, and usually applies to unconventional drilling locations. Inspections of erosion and sedimentation controls at oil and gas well sites and associated roads and pipelines are conducted by Water Quality Specialists.

The DEP considers well sites to be under construction until post-drilling restoration takes place. Consequently, all erosion and sediment controls must be maintained until the site is restored and permanently stabilized. The DEP conducts regular inspections to assure compliance with program requirements.

Finding VI.1.

> The review team found that the Pennsylvania stormwater program elements meet or exceed the STRONGER Guidelines.

Finding VI.2.

The review team finds that the criteria associated with the DEP erosion and sediment control program meet or exceed the STRONGER Guidelines.

Finding VI.3.

The review team commends the DEP for its program for stormwater management. Special consideration is given to streams that are sediment impaired or classified as High Quality or Exceptional Value. The program employs the appropriate practices for temporary and permanent soil stabilization, thus minimizing the impact of stormwater on streams and wetlands.

VII. HYDRAULIC FRACTURING

The Marcellus shale is an organic-rich black shale that was deposited in an oxygen-deficient marine environment during Middle Devonian (~390 million years ago). Long known to be a source rock for many conventional oil and gas reservoirs in the Appalachian basin, it is now being explored as an unconventional reservoir. The Marcellus shale is prevalent throughout most of Pennsylvania, although its depth and thickness are variable. The depth to the top of the Marcellus shale ranges from 0 feet where it crops out in central Pennsylvania to over 9,000 feet in parts of southwestern and northeastern Pennsylvania. The Utica shale lies beneath the Marcellus shale. With advancements in horizontal drilling and hydraulic fracturing technology, the Marcellus shale has become an important gas play. The use of "slick-water frac" enables operators to recover gas more efficiently and in larger quantities.

The drilling of oil and gas wells in Pennsylvania is regulated under several chapters of the Pennsylvania Code and various state acts. A complete list of laws and regulations, along with their respective web links, can be found on the DEP – Office of Oil and Gas Management's website.

The Office of Oil and Gas Management is responsible for permitting, inspecting, and ensuring regulatory compliance of wells drilled by oil and gas companies. Ultimately DEP regulates the processing and transportation of all wastewater generated from oil and gas sites under the 2012 Oil and Gas Act or the Solid Waste Management Act. Other site related wastes are regulated under the Solid Waste Management Act and Residual Waste Regulations, all of which seek to minimize waste and protect the environment and the public.

DEP is responsible for regulating the disposal of hydraulic fracturing flowback fluid. If the disposal method is to be an injection well, two permits are needed: one from the DEP and another from the U.S. Environmental Protection Agency.

General

Pennsylvania's program considers potential risks associated with hydraulic fracturing, and accounts for factors such as depth of the reservoir to be fractured, proximity of the reservoir to fresh water resources, well completion practices, well design, and volume and nature of fluids.

The 2012 Oil and Gas Act (the Act) differentiates between conventional and unconventional formations and wells. The Act defines an "unconventional formation" as "a geological shale formation existing below the base of the Elk Sandstone or its geologic equivalent stratigraphic interval where natural gas generally cannot be produced at economic flow rates or in economic

volumes except by vertical or horizontal well bores stimulated by hydraulic fracture treatments or by using multilateral well bores or other techniques to expose more of the formation to the well bore." 58 Pa.C.S. § 3203. All other formations are considered to be "conventional" formations. An "unconventional well" is defined as "a bore hole drilled or being drilled for the purpose of or to be used for the production of natural gas from an unconventional formation." Id.

The Act includes more stringent statutory requirements for unconventional wells to manage potential risks associated with such wells. The Act includes setback requirements, presumptive liability, bonding, impact fees, and certain reporting/recordkeeping requirements. In February of 2011, DEP amended its regulations regarding well design and construction requirements to provide enhanced casing and cementing standards for new well construction.

The Act addresses risks associated with hydraulic fracturing by defining and handling "unconventional" and "conventional" formations and wells differently. Generally speaking, "unconventional" wells are subject to more stringent requirements in terms of setbacks, presumptive liability, bonding, impact fees, and certain reporting/recordkeeping, intended to manage potential risks commensurate with high-volume hydraulic fracturing.

Finding VII.1.

The review team finds that the Pennsylvania program considers regional variations.

Finding VII.2.

The review team finds that the Pennsylvania program differentiates between conventional and unconventional wells.

Recommendation VII.2.

The review team recommends clarification of which regulations apply to all oil and gas activities and which apply to unconventional activities. (STRONGER 2013 Guidelines Section 9.2.)

Finding VII.3.

The review team commends DEP for evaluating and addressing documented issues associated with unconventional development.

Standards

DEP standards for all well casing and cementing practices require that the operator conduct casing and cementing activities to control the well at all times, prevent migration of gas or other fluids into sources of fresh groundwater; and prevent pollution of fresh groundwater. In February of 2011, the DEP amended its regulations regarding well design and construction requirements to provide enhanced casing and cementing standards for new well construction. The State program includes standards for casing and cementing to meet anticipated pressures and protect resources and the environment. Such standards address internal pressure rating, pressure testing of casing, centralization, and certification of joint welders. The State program requires that cement used in the surface casing meet certain compressive strength and free water specifications and isolate the wellbore from fresh groundwater; contain pressures from drilling, completion, and production; protect the casing from the geochemical effects of the subsurface; and prevent gas flow in the annulus. The regulations require that operators report instances of defective cementing or casing and notify the program within 24 hours of the discovery and correct the defect. If the defect cannot be addressed immediately, a corrective action plan is due within 30 days.

Finding VII.4.

The review team finds that the state does not have a consistent method to determine surface casing setting depths to ensure protection of fresh groundwater.

Recommendation VII.4.

The review team recommends that the state consider developing a process by which it determines surface casing setting depths to protect fresh groundwater. (STRONGER 2013 Guidelines, Section 9.2.)

Finding VII.5.

DEP has enhanced casing and cementing standards to address issues related to hydraulic fracturing.

Recommendation VII.5.

The review team encourages the State to consider regulations to require operators to evaluate and mitigate potential risk of hydraulic fracturing communication with active,

abandoned or orphan wells and other potential conduits that penetrate target formation or confining formations above (STRONGER Guidelines Section 9.2.1.)

Operators are required to notify DEP prior to commencement of fracture stimulation to allow inspection. Operators also are required to report instances of defective cementing or casing and notify DEP within 24 hours of the discovery and to correct the defect. If the defect cannot be addressed immediately, a corrective action plan is due within 30 days. This regulation also applies to failures during stimulation activities.

Finding VII.6.

Although the State requires prior notification of fracture stimulation and reporting of well failure, it does not require that operators monitor the annulus during fracture stimulation.

Recommendation VII.6.

The review team recommends that the State consider requiring operators to monitor for operational and mechanical changes, including annular pressures, during hydraulic fracturing to focus on specific factors that could be affected. (STRONGER 2013 Guidelines Section 9.2.1.)

The Act includes a presumption that an operator of a conventional well is responsible for water pollution if such pollution occurs within six months of drilling or alteration and is within 1000 feet of the well. An operator of an unconventional well is presumed responsible for water pollution if such pollution occurs within twelve months of the later of completion, drilling, stimulation or alteration of the well and is within 2,500 feet of the well. An operator may defend itself against such presumptive liability by collecting and analyzing pre-drill samples at water supplies to characterize baseline conditions prior to drilling, completion, and fracture stimulation. The protocols for such sampling address appropriate factors, including distance/radius from the well, timing/frequency of testing, reporting of the data, and responsibility for sample collection, testing, cost, surface owner consent, laboratory accreditation, and remedial actions.

Finding VII.7.

The review team commends the State for the pre-drill sampling and testing of water wells.

Recommendation VII.7.

The review team recommends that the State consider developing guidance for pre-drill sampling. (STRONGER 2013 Guidelines Section 9.2.1.)

Regulations at 25 Pa.Code § 78.56 specify the requirements for temporary storage of polluting substances and wastes, including stimulation fluids and the associated flow back. These substances must be contained in pits or tanks that are structurally sound, protected from unauthorized acts and constructed and maintained with sufficient capacity to contain all polluting substances and wastes which are used or produced during drilling, altering, completing and plugging the well. The Clean Streams Law also provides overarching authority for DEP to regulate surface controls associated with fracturing activity.

These regulations address freeboard in pits and tanks; standards for pit sub-base and liners; standards for the pit liner design, construction and maintenance; and standards for pit closure, including removal of free liquid from the pit and the chemical constituencies of any cuttings or residual waste that will be encapsulated in the pit must not exceed regulatory standards. The regulations do not require liners or secondary containment around tanks or other facilities storing polluting substances, but such liners are recommended practices.

The 2012 Oil and Gas Act establishes surface containment requirements for unconventional well sites. Unconventional well sites are required to be designed and constructed to prevent spills to the ground surface or of the well site. The Act requires implementation of containment practices on the site during drilling and hydraulic fracturing and that are sufficiently impervious and compatible with the waste material to prevent or contain a spill until it can be removed or treated. Containment areas must be sufficient to contain the "volume of the largest container stored in the area plus 10% to allow for precipitation, unless the container is equipped with individual secondary containment." Storage tanks may also need to meet the corrosion control requirements in the PA Storage Tank Regulations (25 Pa.Code Chapter 245). The regulations also require that centralized wastewater impoundments include a double liner system as part of their permit requirements.

Finding VII.8.

The review team finds that the State program exceeds the standards for surface controls associated with hydraulic fracturing in Section 9.2.1

Recommendation VII.8.

The review team recommends that the State review its standards for facilities, including fresh water impoundments, for consistency across all programs. (STRONGER 2013 Guidelines Section 9.2.1.)

The State requires operators to develop and implement a preparedness, prevention and contingency plan for the control and disposal of waste fluids associated with oil and gas wells. (25 Pa.Code § 78.55) In addition, § 3218.2 of the 2012 Oil and Gas Act requires operators to prepare and submit to DEP a well site containment plan describing the containment practices to be used and the area of the well site where containment practices will be employed.

Finding VII.9.

The review team finds that the State's program meets the contingency planning and spill risk management procedures in Section 4.2.1 of the guidelines.

The DEP Bureau of Waste Management's Residual Waste Program requires characterization of hydraulic fracturing waste and reporting of such waste on Form 26R, Chemical Analysis of Residual Waste Annual Report by the Generator. DEP recently modified the form to incorporate a comprehensive list of required analytical parameters for wastewater produced from the drilling, completion and production of Marcellus or other gas wells.

Finding VII.10.

The review team finds that DEP's waste characterization requirements are consistent with Section 5.2. of the guidelines.

The State encourages drilling operators and the generators of hydraulic fracturing fluid wastes and other wastes associated with the drilling, completion and stimulation, to develop and expand source reduction and recycling opportunities. Operators are increasingly recycling hydraulic fracturing fluids for use at subsequent fracture stimulation operations at other wells, which reduces the need for fresh water.

Such recycling is, in part, due to the regulations promulgated by DEP in August 2010 (25 Pa.Code § 95.10(b)(2)), which require operators to develop, and submit to DEP upon request, a wastewater source reduction strategy by August 22, 2011. The strategy must include information regarding waste characterization and volume, potential wastewater source reduction options through recycling, reuse or other beneficial uses, the rationale for selecting the source reduction

methods to be employed by the operator; and a quantification of the flowback and production fluid that is recycled or reused either to fracture other natural gas wells or for other approved beneficial uses. The strategy must be updated annually.

In addition, DEP prohibits the disposal of fracturing related fluids from unconventional gas wells at facilities that do not treat fluids containing total dissolved solids such as chlorides to drinking water standards. This policy has been the primary driving force behind maximizing recycling and minimizing disposal of fracturing related wastewater.

Finding VII.11.

> The review team finds that DEP's program promotes a waste management hierarchy consistent with Section 5.3 of the guidelines.

As a residual waste, hydraulic fracturing waste generation, transportation and disposal tracking requirements are integrated into DEP's Residual Waste regulations. Such regulations (25 Pa.Code Chapters 287 – 299) specify the reporting, recordkeeping and waste stream analytical requirements for generators of hydraulic fracturing wastes. Form 26R provides the analytical and reporting requirements for generators of hydraulic fracturing wastes and requires information on the processing or disposal facilities that will accept the waste. Regulations at 25 Pa. Code Chapter 299 provide requirements for transportation to permitted facilities, accident prevention and contingency planning, emergencies, wastes from accidents and spills, recordkeeping and reporting, and appropriate signage on transportation vehicles. Certain waste haulers must be certified and are subject to the requirements of the DEP's Waste Transportation and Safety Program.

In addition, operators are required to submit annually to Office of Oil and Gas Management records pertaining to waste volumes and the location of disposal or recycling facilities as part of an operator's annual waste and production reporting responsibilities. The 2012 Oil and Gas Act establishes the specific requirements for transportation records for wastewater fluids from unconventional wells, which include maintenance for five years of records of the amount and destination of the fluids transported; the number of gallons of wastewater fluids produced in the drilling, stimulation or alteration of a well; name of the person of or company that transported the wastewater fluids to a disposal site or to a location other than the well site; each location where wastewater fluids were disposed of or transported and the volumes that were disposed of at the location other than the well site; and the method of disposal.

Finding VII.12.

The review team finds that the tracking of waste disposed at commercial or centralized facilities meets the requirements of Section 5.10.2.3 of the guidelines.

The DEP home page prominently features a link to "Report an Incident," which provides phone numbers for the public to call if they observe a pollution event. These phone lines are staffed 24 hours per day and designated DEP staff are on call to respond to emergencies at all times. Complaint reports are generated and transmitted to the appropriate DEP office for follow up investigations. If an emergency related to an oil or gas well is reported, oil and gas inspectors are dispatched immediately to the site.

Finding VII.13.

The review team finds that the state's procedures for receipt of complaints related to hydraulic fracturing are consistent with Section 4.1.2.1.

Reporting

The 2012 Oil and Gas Act requires operators to notify DEP 24 hours prior to commencement of well drilling and, if there is a break in drilling of 30 days or more, 24 hours prior to the resumption of drilling. The Act also requires operators to notify DEP at least 24 hours prior to the cementing of all casing strings, prior to the conduct of pressure tests of the production casing, prior to stimulation, and abandoning or plugging an unconventional well. Field inspectors are notified via electronic mail, which provides sufficient notice to allow for monitoring of these activities.

Operators are required to file a well completion report within 30 days of completion of a well. Information required on this report includes a perforation record, a stimulation record including fluid type and amount, propping agent information, average injection rate, open flow before and after treatment, rock pressure and well service company name. All chemicals used in hydraulic fracturing must be reported on well completion reports and entered into a national registry.

Finding VII.14.

The review team finds that the State requires notification prior to, and reporting after completion of, hydraulic fracturing operations consistent with Section 9.2.2.

Finding VII.15.

The state's well completion report requirements and chemical disclosure requirements exceed public disclosure and reporting requirements of Section 9.2.2

Finding VII.16.

The review team commends DEP for notification of inspectors by email of fracture stimulation jobs.

DEP regulations (25 Pa.Code §§ 78.55 and 91.34) require operators to develop and implement a preparedness, prevention and contingency plan, which necessitates identification of all polluting substance and wastes that will be used or generated, and identify the methods for control and disposal of those substances or wastes. As part of the preparedness, prevention and contingency plan operators must list the chemicals or additives used and the different wastes generated during hydraulic fracturing. The preparedness, prevention and contingency plan includes Material Safety Data Sheets, cleanup procedures, toxicological data and waste chemical characteristics. The approximate quantities of each material and the method of storage must be specified. Preparedness, prevention and contingency plans must be available the well site and must be submitted to DEP upon request.

In addition, the Pennsylvania Worker and Community Right to Know Act, 35 P.S. §§ 7301-7320, requires that every employer make readily available the Material Safety Data Sheet for every hazardous substance or hazardous mixture to which the employees may be exposed.

All chemicals used in hydraulic fracturing must be reported on well completion reports and entered into a national registry.

In the event that confidential business proprietary information (CPI) is submitted, the 2012 Oil and Gas Act contains provisions to protect this information (See 58 Pa.C.S. § 3222.) The Right-to-Know Law, 65 P.S. §§ 67.101-67.3104 ("RTKL"), outlines when a Commonwealth agency must provide a "public record" to a person requesting a record. A "public record" is defined very broadly, with two relevant exceptions: (1) records that constitute or reveal a trade secret or confidential proprietary information (65 P.S. §§ 67.102, 67.708(11)); and (2) records exempt from being disclosed under any other Federal or State law or regulation (65 P.S. § 67.102). A party that submits a record to a Commonwealth agency may include a written statement indicating that the record contains confidential business proprietary information or a trade secret. If the party has submitted such a written statement with the record, when a requester seeks that record, the agency must notify the party of the request and give that party an opportunity to provide input on the release of the record. The agency must either deny the request or release the

record and must notify the party claiming CPI or a trade secret of its decision. If the agency denies the request for a record containing CPI or a trade secret, it bears the burden of demonstrating that the record is exempt from public access by the preponderance of the evidence.

Staffing and Training

In 2009, DEP increased its well permit fees for the first time since the Oil and Gas Act was enacted in 1984. As a result, the state's oil and gas program is now completely funded by well permit fees, and DEP has been able to increase the size of its permitting, compliance and enforcement staff. DEP added 37 positions in 2009 and opened a new Oil and Gas Office in Williamsport to address increased Marcellus Shale activity. In 2010, the Governor directed DEP to hire an additional 68 staff in response to the continued dramatic growth of the Marcellus Shale. The office is several years old. The total complement of staff regulating oil and gas well development in Pennsylvania is 202 people. This number includes administrative and legal staff in addition to inspectors, permitting and management staff.

DEP routinely provides annual training opportunities to oil and gas field inspectors and permitting staff. Areas of training include monitoring and compliance, technical services, well operations for subsurface activities, environmental protection for surface activities, inspection report revision and field inspection' erosion and sediment control, HazWoper Safety Training, and well control.

Finding VII.17.

> The Review team commends the State's efforts to keep up with changes in environmental and safety programs associated with unconventional well development.

Recommendation VII.17.

> The Review team recommends that the State ensure that staff continues to receive adequate training to stay current with new and developing unconventional technology. (STRONGER 2013 Guidelines Section 9.2.3.)

Public Information

Efforts to disseminate educational information regarding well construction and hydraulic fracturing include testimony before the Pennsylvania Legislature and public speaking events and

conferences. In addition, the oil and gas staff responds to inquiries received by letter, electronic mail, and telephone.

The Commonwealth's rulemaking process also provides excellent opportunities to disseminate educational information. Unlike other state agencies, DEP does not have independent rulemaking authority; therefore, all regulations developed by DEP must be reviewed and approved by the Environmental Quality Board, which is made up of 20 members and includes representation by the DEP Secretary (chair), and representatives from the Departments of Health, Community and Economic Development, Transportation, Agriculture, Labor & Industry, Fish and Boat Commission, Game Commission, PUC, Historical and Museum Commission, State Planning Board, the Citizen's Advisory Council, and the House and Senate leadership of the General Assembly. The Commonwealth's rulemaking process also includes review the Oil and Gas Technical Advisory Board (TAB), Governor's Office of General Counsel, the Governor's Policy Office and the Governor's Budget Office, Office of the Attorney General, Environmental Quality Board, the Standing Environmental Resources and Energy Committees and the Independent Regulatory Review Commission (IRRC). During the extensive rulemaking process, DEP holds meetings and conducts workshops with industry representatives, local government leaders, environmental groups, and other interested stakeholders.

In addition, DEP maintains a website that provides information regarding the chemicals used at Marcellus wells. Staff recently updated this list and added a description of hydraulic fracturing.

Finding VII.18.

> The review team finds that the state provides for dissemination of educational information regarding well construction and hydraulic fracturing to bridge the knowledge gap between experts and the public, particularly in areas where development has not occurred historically and in areas where high volume water use for hydraulic fracturing is occurring.

Water and Waste Management

Withdrawals of water required for hydraulic fracture activities from surface and groundwater sources have the potential to reduce stream flow to the point that thermal or other sources of pollution can occur. Under the 2012 Oil and Gas Act, water withdrawals for the purposes of supplying base fluids to conduct stimulation activities in association with unconventional resources may not adversely affect the quality or quantity of water in the watershed or that being relied upon by other users of the same water source. In addition, the Water Resources Planning Act requires entities withdrawing more than 300,000 gallons over a 30-day period to register their

water withdrawal. Through this registration, DEP tracks water withdrawal outside the Susquehanna and Delaware River basins.

In addition, as a result of the development of the Marcellus Shale, in 2008 DEP began requiring water management plans to identify where and how much water would be withdrawn. The 2012 Oil and Gas Act codified this requirement, stating that no person may use water from water sources in Pennsylvania for the drilling or hydraulic fracture stimulation of any unconventional natural gas well except in accordance with a Water Management Plan (WMP). The purpose of WMPs is to ensure that water quality standards are maintained and protected. Because large volume withdraws on surface water can, individually or cumulatively, impact water quality DEP must assure that excessive withdraws do not occur. DEP follows water withdrawal guidance promulgated by the Susquehanna River Basin Commission to ensure uniform statewide evaluation of water withdrawals. The Delaware River Basin Commission also has a role in evaluating impacts within that river basin and is in the process of promulgating regulations to address Marcellus Shale well drilling within its jurisdiction.

Finding VII.19.

> The review team finds that the state evaluates water withdrawal consistent with Section 9.3 of the Guidelines.

Recommendation VII.19.

> The review team recommends that the State clearly indicate what is required in a water management plan and make those plans available to the public. (STRONGER 2013 Guidelines Section 9.3.)

DEP encourages the use of water that is influenced by acid mine drainage (mine influenced water) for hydraulic fracturing purposes. The State provides funding to watershed groups that treat mine influenced water and promotes the sale of this water for hydraulic fracturing. In 2012, DEP developed a white paper that outlines the process by which an oil and gas operator or third party water supplier can obtain the necessary authorizations to use mine influenced water in well development operations.

Finding VII.20.

> The Review team commends the State for encouraging the use of alternative water sources, including recycled water, acid mine drainage and treated wastewater.

Wastewater generated by hydraulic fracturing operations in Pennsylvania is managed by treatment and discharge to surface water, underground injection wells, reuse in hydraulic fracturing of additional wells, and transportation to out-of-state facilities. The State indicates that the vast majority of the wastewater generated by traditional well drillers is treated at centralized waste treatment facilities and subsequently discharged to surface water. Because Pennsylvania has a small number of commercial injection wells, the majority of wastewater disposed of in injection wells is disposed of in wells outside of Pennsylvania. The wastewater that must be disposed can only be taken to facilities that are approved to receive it. These facilities include centralized treatment facilities. Most centralized treatment facilities have no discharge and instead sell the treated water back to operators.

DEP promulgated regulations in 2010 (25 Pa.Code § 95.10) that limit total dissolved solids concentrations in discharges from facilities that treat wastewater resulting from fracturing, production, field exploration, drilling or well completion of natural gas wells. The regulation limits these discharges to 500 mg/liter (mg/L) total dissolved solids, including no more than 250 mg/L chlorides, 10 mg/L total barium and 10 mg/L total strontium. The regulation includes grandfathering provisions to allow previously authorized facilities to continue to discharge at the previously authorized concentrations, and prior to May 2011, wastewater from the Marcellus Shale could be taken these facilities. On April 19, 2011, DEP issued a request that Marcellus Shale operators cease delivering wastewater to 15 discharge facilities that were still able to accept it under the grandfathering provision. The Marcellus Shale operators agreed to comply with the request, and, as a result, Marcellus wastewater is increasingly being reused to stimulate additional wells.

The DEP's Waste Management Program regulates the processing of oil and gas wastewater at centralized treatment facilities under a general permit (WMGR123) issued under the authority of the Solid Waste Management Act (SMWA), 35 P.S. §§ 6018.101 – 1003. Wastewater that is processed at the well site where it was generated or that is processed at the well site where it will be beneficially used to complete a well is regulated under the authority of the 2012 Oil and Gas Act, 58 Pa.C.S. §§ 3201 – 3274, through a request for Approval of Alternate Waste Management Practices (OG-71). WMGR123 contemplates long-term operation of the facility serving many well sites and contains specific provisions for bonding; public notices and participation; siting; self-inspection; record keeping and reporting. OG-71 is limited to only the waste generated or used at an individual well site and OGA specifies that waste processing activity ceases within nine months of completion of well drilling activity. The OG-71 authorization allows operators to provide wastewater treatment on the well site without overly time consuming administrative and technical reviews.

DEP seeks to encourage the processing and beneficial use of wastewater generated from oil and gas wells. At the same time, long term facility present potential for environmental impacts that warrants closer regulation, such as bonding, siting and oversight.

Finding VII.21.

The review team finds that the State program meets the guidelines for inspection of hydraulic fracturing activities.

Finding VII.22.

Waste associated with hydraulic fracturing is managed consistent with Section 9.3. of the guidelines.

Recommendation VII.22.

The review team recommends that the State distinguish between the requirements for handling ground water, surface water and treated water. (STRONGER 2013 Guidelines Section 9.3.)

DEP has developed a permitting process to allow the construction and operation of centralized wastewater storage impoundments to service multiple well sites over a period of up to several years without the need for restoration until after the final well site has been serviced.

DEP supports and has been encouraging reuse of flowback and produced water to fracture stimulate additional wells and the use of mine influenced water as a source of hydraulic fracturing water.

Finding VII.23.

The review team finds that the Commonwealth has addressed availability of water through water management plans.

Recommendation VII.23.

The review team recommends that DEP require monitoring at all water withdrawal sites to assure availability of water. (STRONGER 2013 Guidelines Section 9.3.)

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APPENDIX A

Acronyms

BMP	Best Management Practice
CAC	Citizens Advisory Council
CFA	Commonwealth Financing Authority
CPI	Confidential Proprietary Information
DCED	Department of Community and Economic Development
DCNR	Department of Natural Resources
DEP	Department of Environmental Protection
E&P	Exploration and Production
eFACTS	Environmental Facility Application Compliance Tracking System
EPA	U.S. Environmental Protection Agency
EQB	Environmental Quality Board
ERPM	Emergency Response Program Manager
ESCGP-2	Erosion and Sediment Control General Permit 2
IOGCC	Interstate Oil and Gas Compact Commission
IRRC	Independent Regulatory Review Commission
mg/l	milligrams per liter
NORM	Naturally Occurring Radioactive Material
OG-71	Oil and Gas Form No. 71
OSHA	Occupational Safety and Health Administration
PA	Pennsylvania
PNDI	Pennsylvania Natural Diversity Index
PNHP	Pennsylvania Natural Heritage Program
PPC	Preparedness Prevention and Contingency
RTKL	Right-to-Know Law
STRONGER	State Review of Oil and Natural Gas Environmental Regulation, Inc.
TENORM	Technologically-Enhanced Naturally-Occurring Radioactive Material
TAB	Oil and Gas Technical Advisory Board
WMGP123	Waste Management General Permit 123
WMP	Water Management Plan

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APPENDIX B

Completed Pennsylvania Questionnaire

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QUESTIONNAIRE FOR REVIEW OF STATE OIL AND GAS
ENVIRONMENTAL REGULATORY PROGRAMS

State PENNSYLVANIA

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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 answer the questions herein as completely as possible. However, avoid supplying 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.) The purpose of this questionnaire is to elicit information that will provide a fair and balanced characterization of the state's regulatory program, rather than an exhaustive inventory of waste management facilities. Terms used in this questionnaire have meanings consistent with those contained in the Guidelines. Citations which appear in brackets (e.g., [5.3.]) following each question refer to the applicable section or sections of the Guidelines.

REQUESTED BACKGROUND INFORMATION

I. 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.

OIL

The Seneca Indians used oil from springs near Oil City, Venango County for ceremonial purposes and early settlers used "Seneca Oil" as a medicine to cure all ailments. On August 27, 1859, "Colonel" Edwin Drake and a salt well driller, "Uncle Billy" Smith, drilled the first oil well in North America for commercial production. Oil was struck at 69 ½ feet and resulted in the world's first commercial interest in oil production. By the end of 1861, 2.5 million barrels of oil was produced. Development was so active that most of the oilfields in Venango County were discovered by 1870.

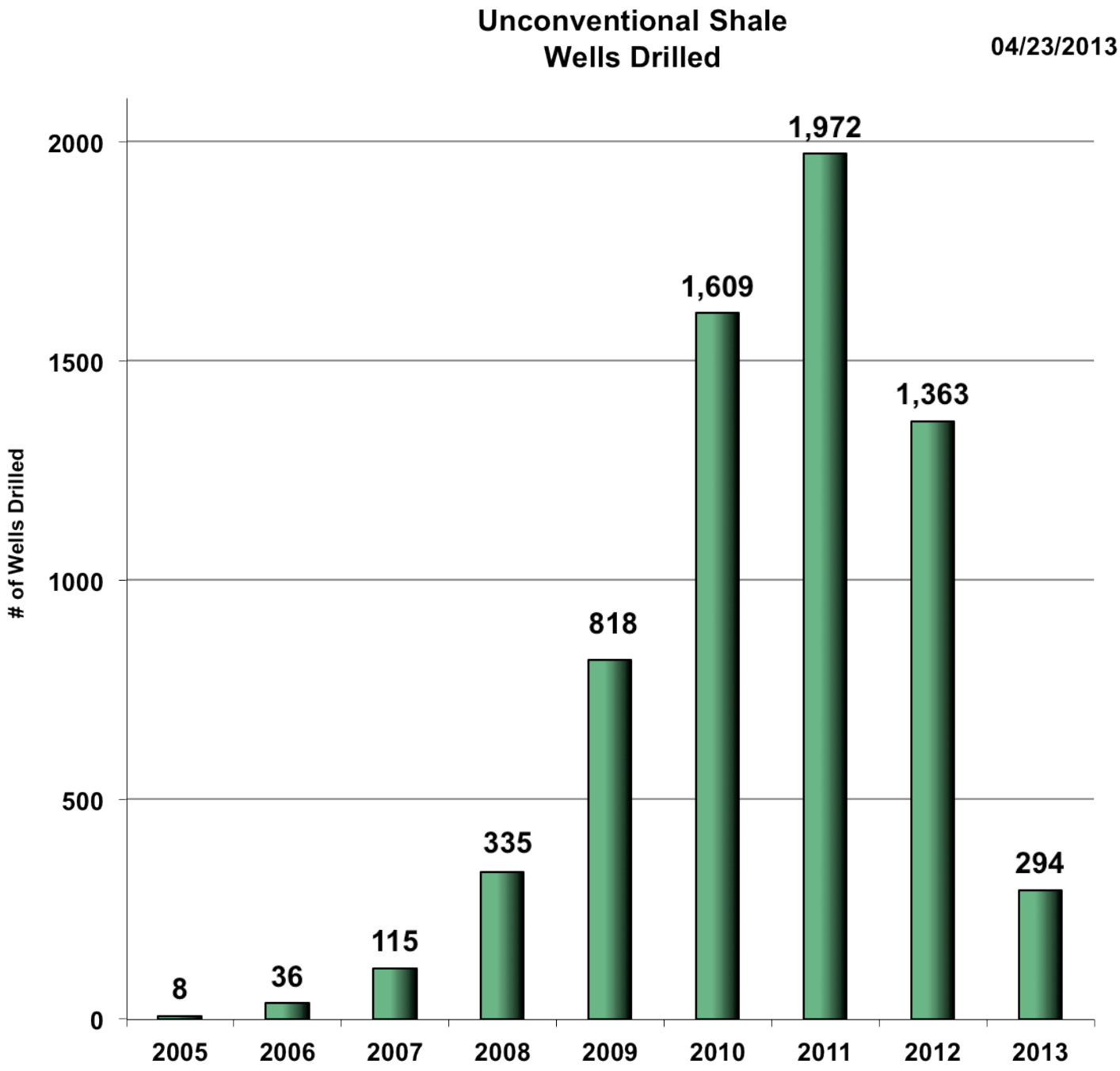
The Bradford field in McKean County, the largest field in the Commonwealth, was discovered in 1871 with a peak annual production of almost 23 million barrels in 1881.

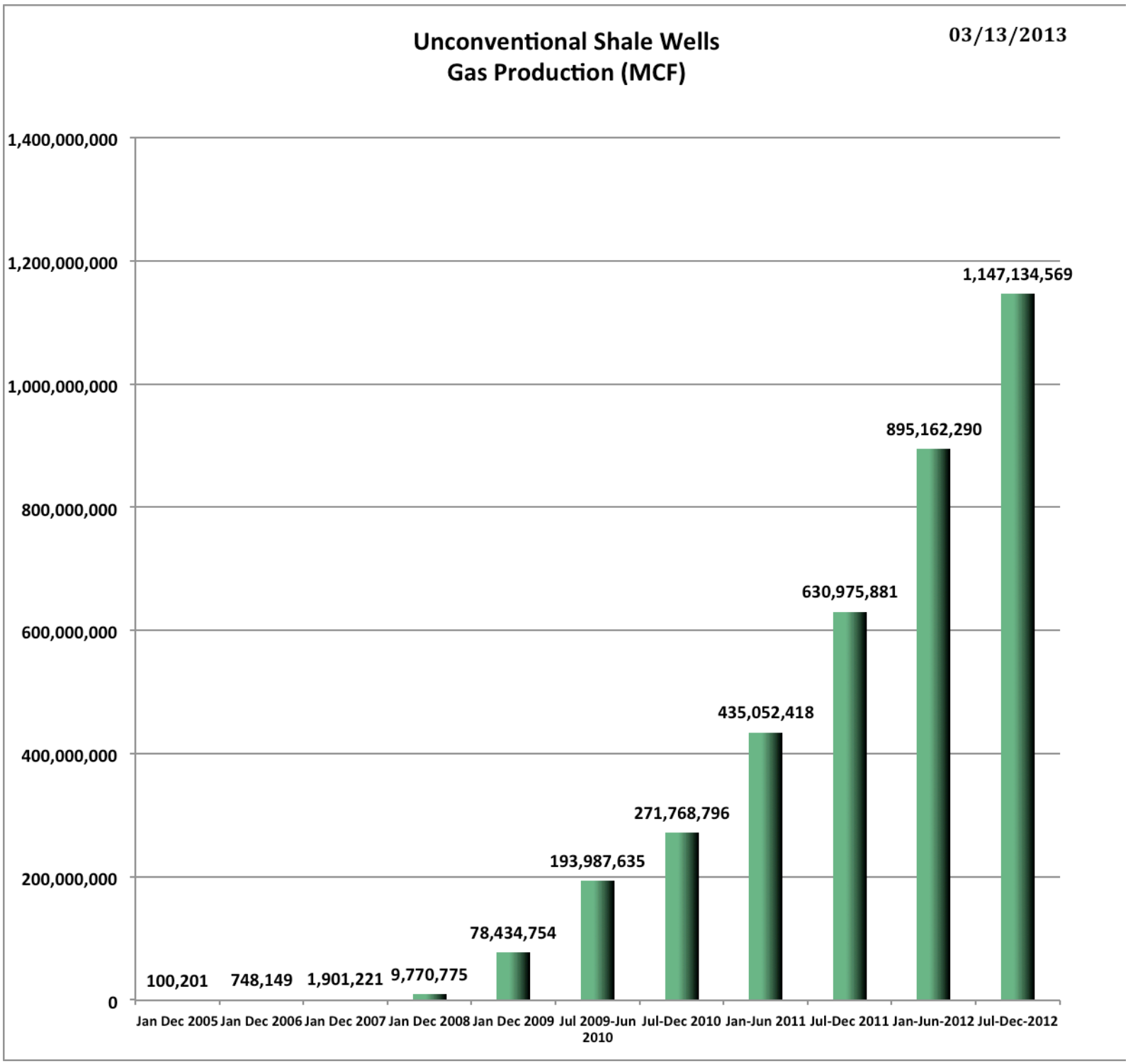
Pennsylvania was the leading oil producer until 1895. From the 1890's to the late 1920's, oil production declined until secondary recovery water flooding in the 1930's resulted in a marked production increase. Since the middle 1950's, oil production in Pennsylvania has been on the decline.

NATURAL GAS

During the early days of the oil boom (1860's – 1880's) gas was used as a fuel to drive engines at oil wells and for heating. Rapid expansion of the gas industry began in 1884 when gas began to be used in the Pittsburgh steel industry. Until 1930, all gas was produced from the shallow Mississippian and Upper Devonian formations. In 1930 gas was discovered in the Lower Devonian Oriskany Sandstone in Tioga County and in the Upper Silurian Medina Sandstone in Erie County in 1947.

In late 2004, the first Pennsylvania Marcellus shale was drilled and hydraulically fractured by Range Resources. Since that time, unconventional shale gas development has increased dramatically and Pennsylvania is now a net exporter of natural gas with over 2.1 trillion cubic feet of gas produced in 2012. Charts depicting annual well drilling and gas production are below.


Unconventional Shale
Wells Drilled
04/23/2013
# of Wells Drilled
2000
1500
1000
500
0
8
36
115
335
818
1,609
1,972
1,363
294
2005
2006
2007
2008
2009
2010
2011
2012
2013


Unconventional Shale Wells
Gas Production (MCF)
03/13/2013
1,400,000,000
1,200,000,000
1,000,000,000
800,000,000
600,000,000
400,000,000
200,000,000
0
100,201
748,149
1,901,221
9,770,775
78,434,754
193,987,635
271,768,796
435,052,418
630,975,881
895,162,290
1,147,134,569
Jan Dec 2005
Jan Dec 2006
Jan Dec 2007
Jan Dec 2008
Jan Dec 2009
Jul 2009-Jun 2010
Jul-Dec 2010
Jan-Jun 2011
Jul-Dec 2011
Jan-Jun-2012
Jul-Dec-2012

II. 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, oil-field NORM (naturally occurring radioactive materials), storm water management and hydraulic fracturing.

Organization Charts attached for review and use.

B. All statutes, rules, regulations and orders applicable to the management and disposal of oil and gas E&P waste, abandoned oil and gas sites, NORM from oil and gas production), storm water management and hydraulic fracturing.

See Appendix A

Additionally, the Department has recently drafted two proposed rulemakings.

One rulemaking amends 25 Pa.Code Chapter 78 (relating to Oil and Gas Wells) to update the requirements related to surface activities associated with the development of oil and gas wells. Additionally, these proposed amendments address recent statutory changes in Act 13 of 2012 (58 Pa.C.S. §§ 2301 – 3504). These proposed amendments update 25 Pa. Code Chapter 78 with revised planning, performance, notice, construction, operation, reporting, and monitoring standards to strengthen environmental protections associated with the development of oil and gas wells. The proposed amendments include new requirements for considering impacts to public resources, water supply restoration or replacement, predrill surveys, identification of orphaned and abandoned wells, temporary storage, freshwater impoundments, centralized impoundments, waste management, containment systems and practices for unconventional wells, site restoration, borrow pits, gathering lines, horizontal directional drilling, temporary pipelines, water management plans, and road-spreading activities.

The other proposed rulemaking increases the well permit fee to provide adequate revenue to support the ongoing operations of the program as well as to support the addition new positions within the Office of Oil and Gas Management as resources allow.

The Department presented draft language for these proposed rulemakings at the April 23, 2013 meeting of the Oil and Gas Technical Advisory Board (TAB) and both rulemakings will be presented to the Environmental Quality Board (EQB) later this year. If approved by the EQB, the proposed rulemakings will be published in the Pennsylvania Bulletin as proposed for public comment. The proposed language in both rulemakings is discussed when applicable throughout

this questionnaire. Please find the draft language for the fee package at http://files.dep.state.pa.us/OilGas/BOGM/BOGMPortalFiles/OilGasReports/2012/TAB%20MEETINGS/APR232013/2013-04-23_Draft_Annex_A_-_Proposed_Fee_Reg_(2013-04-02).pdf and the draft language for the surface activities package at http://files.dep.state.pa.us/OilGas/BOGM/BOGMPortalFiles/OilGasReports/2012/TAB%20MEETINGS/APR232013/2013-04-23_Ch_78_Subch_C_ANNEX_A_(2013-04-02).pdf.

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, NORM from oil and gas production), storm water management and hydraulic fracturing.

None

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

The Department of Environmental Protection's mission is to protect Pennsylvania's air, land and water from pollution and to provide for the health and safety of its citizens through a cleaner environment. We will work as partners with individuals, organizations, governments and businesses to prevent pollution and restore our natural resources.

On January 24, 2013, the Department announced that it would undertake a study to look at naturally occurring legal of radioactivity in by-products associated with oil and natural gas development. For more information, see http://www.portal.state.pa.us/portal/server.pt/community/oil___gas_related_topics/20349/radiation_protection/986697.

Oil and Gas Technical Guidance Documents can be found at http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-8294.

FAQs regarding well construction standards can be found at http://www.portal.state.pa.us/portal/server.pt/community/faq/20480.

FAQs regarding Act 13 of 2012 can be found at http://www.portal.state.pa.us/portal/server.pt/community/act_13/20789/act_13_faq/1127392.

FAQs regarding Act 9 of 2012 Emergency Response Regulations can be found at http://files.dep.state.pa.us/OilGas/BOGM/BOGMPortalFiles/IndustryResources/InformationalResources/Act_9_Emergency_FAQ.pdf

TGD include:

- Policy for Erosion and Sediment Control and Stormwater Management for Earth Disturbance Associated with Oil and Gas Exploration, Production, Processing, or Treatment Operations or Transmission Facilities
- Oil and Gas Operator's Manual

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

N/A

IV. The next pages contain a matrix which should 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 - give only the big picture in the matrix. Please provide explanation, as appropriate, when answering questions 1.5 and 1.6.

E&P Waste Management Matrix

Waste Management Practices	Number of Facilities	Volume Managed Annually	Basis for Volume Determination
Pits:			
Drilling	1600		
Production	Proposed to be eliminated		
Special Use			
Landspreading			
Roadspreading	84	212,981 bbl	All data from self-reporting by operator
Tanks			
Commercial Facilities:	6	242,129.48 bbl	
Multipractice			
Landfarms			
Tank Bottom			
Reclaimers	21	5,614,033.63 bbl – 58,242.06 ton	
UIC Surface Facilities	7 disposal, 1500+		
Oil-Field NORM	None		
Centralized Facilities (non-NORM)	4	3,313.99 bbl – 7,462.92 ton	
Oil-Field NORM			
Municipal Landfills	39	138,824 bbl, 1,246,324 ton	
Accepting E&P Waste			
Underground Injection	76	4,191,248.68 bbl	
Surface Facilities			
Abandoned Sites	250,000+		
Other			

E&P Waste Management Matrix (cont.)

Waste Management Practice	Principal Agency	Primary Statute	Primary Rules, Regulations, or	Applicable Guidelines
Pits:	PA DEP – OOGM is the principal	See App A Oil and Gas Act	See App A	
Drilling	agency for all practices except UIC. EPA has primacy of			See Appendix F Guidance Documents
Production				
Special Use				
Landspreading		Oil and Gas Act		
Roadspreading		Solid Waste Mgmt Act		
Tanks		Oil and Gas Act		
Commercial Facilities:				
Multipractice		Solid Waste Mgmt Act		
Landfarms				
Tank Bottom				
Reclaimers				
UIC Surface Facilities				
Oil-Field NORM Centralized Facilities (non-NORM)		Solid Waste Mgmt Act		
Municipal Landfills Accepting E&P Waste		Solid Waste Mgmt Act		
Underground Injection Surface Facilities		SDWA - Federal		
Abandoned Sites		Oil and Gas Act		
Other				

I. GENERAL CRITERIA

1. What is the **statutory authority** upon which your E&P environmental regulatory program is based? What powers and duties are provided in the statute(s)? [3.1.a]

   See Appendix A

2. Does this statutory authority include authority for the **promulgation of rules and regulations?** Please provide reference to the appropriate section(s). [3.1.b]

   See Appendix A

3. Do the statutes and regulations contain **definitions** of terms as necessary for program implementation? Please provide reference to the appropriate sections. [3.1.c]

   See Appendix A

4. Are the **levels of funding and staff** provided adequate for full E&P environmental regulatory program implementation? Please provide funding levels and total staff complement for E&P environmental regulatory activities for the past 3 years. Please differentiate between UIC and non-UIC program funding and staffing levels if such differentiation is applicable to your program. [3.1.d, 4.3.2]

	Funding level	Staff level
FY2009-10	$14,914,779	64
FY2010-11	$22,057,886	196
FY2011-12	$19,307,625	202
FY2012-13	$19,694,849	202
FY2013-14 (*)	$23,476,651	238 (**)
FY2014-15 (*)	$24,507,896	238 (**)

(*) – Projected funding level that includes anticipated fee increase.
(**) – Projected staff level based on passage of proposed fee rulemaking.

A: The above table indicates the funding levels available in the Well Plugging Fund from FY2009-10 through FY2012-13. The table also includes projected funding estimates for FY2013 – 15 that includes anticipated revenue that is contingent on the passage of a fee increase rulemaking package that is proceeding through the formal rulemaking process. The Well Plugging Fund supports Oil and Gas complement

(salary and benefit costs). Two additional funds are utilized by the Office of Oil and Gas Management to fund the plugging of orphaned and abandoned wells (i.e., "Orphaned Well Plugging Fund" and "Abandoned Well Plugging Fund"); however, those two funds do not currently provide funding to support staff/complement salary and benefit costs.

In 2004, the program employed 64 employees. With the permit fee increases that were promulgated in 2009, the Department received revenue to expand staffing in the program to the current complement of 202 employees. Approximately 80% of the staff is assigned to engineering, scientific or permit/inspection-related work, as Oil and Gas Inspectors or Oil and Gas Inspector Supervisors, and the remaining 20% are assigned to clerical, administrative, or legal work to support the Oil and Gas Program.

In 2013, DEP prepared a proposed rulemaking to increase the drilling permit fee revenue to support the ongoing operations of the program as well as to support the addition of new positions within the Office of Oil and Gas Management as resources allow. The unconventional well permit fees will be increased from an average of $3,200 (it is a sliding scale based on well bore length) to a flat fee of $5,000. The additional staff to be hired will enable DEP's Oil and Gas program to implement the inspection responsibilities required by Act 13 of 2012, to review well pad and pipeline development permit applications in an efficient and timely manner, and to support the Bureau of Planning and Program Management. The proposed rule was presented to the Oil and Gas Technical Advisory Board on April 23, 2013 and is scheduled to be presented to the EQB in July 2013. If approved, the Department will proceed by moving the draft final rulemaking through the remainder of the regulatory development process.

The U.S. EPA retains federal primacy for the Underground Injection Control (UIC) Program in Pennsylvania; therefore, this is not a program that the PA DEP is authorized to administer. Permitting of UIC disposal and enhanced recovery wells is conducted by the EPA Region III Groundwater and Enforcement Branch. Although this is a federal program, the DEP does review and issue any well permits and erosion and sediment control permits that are associated with the site where a UIC well is constructed. 25 Pa.Code § 78.18 (relating to disposal and enhanced recovery permits).

5. Discuss mechanisms in place in your state for the **coordination** of E&P environmental regulatory program activities among the public, government agencies and the regulated industry. [3.1.e, 4.4]

   Please see responses to question 10, 20 and 32.

6. What are the **goals or objectives** of the E&P environmental regulatory program? How do the goals and objectives of your E&P environmental regulatory program relate to protection of human health and the environment? Please provide reference to the

appropriate document(s). [3.2]

As an initial matter, the Pennsylvania Constitution contains a provision directly related to this question. Article I, Section states:

Natural Resources and the Public Estate Section 27.

> The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.

The Commonwealth's primary statute governing E&P activities was overhauled by Act 13 of 2012 (58 Pa.C.S. §§ 2301 – 3504) ("2012 Oil and Gas Act"). Chapter 32, relating to development, is the main portion of the 2012 Oil and Gas Act administered by the Department. Section 3202 relates to declaration of purpose of chapter, and states that the purposes of Chapter 32 are to:

> (1) Permit optimal development of oil and gas resources of this Commonwealth consistent with protection of the health, safety, environment and property of Pennsylvania citizens.
>
> (2) Protect the safety of personnel and facilities employed in coal mining or exploration, development, storage and production of natural gas or oil.
>
> (3) Protect the safety and property rights of persons residing in areas where mining, exploration, development, storage or production occurs.
>
> (4) Protect the natural resources, environmental rights and values secured by the Constitution of Pennsylvania.

58 Pa.C.S. § 3202.

In addition, the Department administers the Clean Streams Law (35 P.S. §§ 691.1 – 691.1001). Section 691.4 declares the policy of that statute:

> (1) Clean, unpolluted streams are absolutely essential if Pennsylvania is to attract new manufacturing industries and to develop Pennsylvania's full share of the tourist industry;
>
> (2) Clean, unpolluted water is absolutely essential if Pennsylvanians are to have adequate out of door recreational facilities in the decades ahead;
>
> (3) It is the objective of the Clean Streams Law not only to prevent further pollution of the waters of the Commonwealth, but also to reclaim and restore to a clean, unpolluted condition every stream in Pennsylvania that is presently

polluted;

(4) The prevention and elimination of water pollution is recognized as being directly related to the economic future of the Commonwealth; and

(5) The achievement of the objective herein set forth requires a comprehensive program of watershed management and control.

35 P.S. § 691.4.

The Department also administers the Oil and Gas Conservation Law, 58 P.S. § 401-419. That statute contains a policy statement:

DECLARATION OF POLICY

It is hereby declared as an expression of policy to be in the public interest to foster, encourage, and promote the development, production, and utilization of the natural oil and gas resources in this Commonwealth, and especially those which may exist in the Lower Devonian Series and the Silurian and Cambro-Ordovician Geological Systems or from any formation below the Onondaga horizon, in such manner as will encourage discovery, exploration, and development without waste; and to provide for the drilling, equipping, locating, spacing and operating of oil and gas wells so as to protect correlative rights and prevent waste of oil or gas or loss in the ultimate recovery thereof, and to regulate such operations so as to protect fully the rights of royalty owners and producers of oil and gas to the end that the people of the Commonwealth shall realize and enjoy the maximum benefit of these natural resources, it being recognized, however, that the uninterrupted exploration and development of Pennsylvania and Mississippian Systems and the Upper and Middle Devonian Geological Series, being sands and strata above the Onondaga Horizon, both of a primary and subsequent methods have been carried on exhaustively since the discovery of oil in the Drake Well in 1850 without regulatory restriction or control to such an extent that at the present stage of development it would be impractical and detrimental to the operation of such shallow horizons to impose regulations under this act, particularly in view of the facts that the production therefrom, whether of primary or secondary nature is carried on without appreciable waste and that the methods of exploration, discovery, development and production above the Onondaga Horizon and in shallow horizons at a depth of less than three thousand eight hundred feet differ from methods of exploration, discovery, development and production below the Onondaga Horizon or below three thousand eight hundred feet in cost, methods, operating problems, and other important characteristics.

Finally, as noted above, the Department has adopted a mission statement to govern all operations of the Department, regardless of the program involved:

The Department of Environmental Protection's mission is to protect Pennsylvania's air, land and water from pollution and to provide for the health and safety of its

citizens through a cleaner environment. We will work as partners with individuals, organizations, governments and businesses to prevent pollution and restore our natural resources.

7. Does your program provide for **flexibility** in determining the criteria applicable to E&P environmental regulation (e.g., variation in criteria dependent on region of the state or other factors; authorization of site-specific waivers for good cause shown and consistent with program goals and objectives)? If so, please provide reference to the appropriate document(s). [3.3]

   The 2012 Oil and Gas Act extended the setback distance for unconventional wells from 200 feet to 500 feet from existing buildings or water wells, unless consent is provided by the owner of the building or water well. 58 Pa.C.S. § 3215(a).

   The Act established a 1,000-foot setback for an unconventional well from a water supply extraction point used by a water purveyor, unless written consent is provided by the water purveyor. 58 Pa.C.S. § 3215(a).

   In accordance with the Act, the Department shall grant a variance from these distance restrictions if the operator submits a plan identifying additional measures, facilities or practices to be employed during well site construction, drilling and operations that is approved by the department. The variance, if granted, shall include any necessary additional terms and conditions of the permit ensure the safety and protection of affected persons and property. 58 Pa.C.S. § 3215(a). See http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-9805

   In addition, all well sites must maintain a setback of 100 feet between the edge of disturbance and any stream, spring, body of water identified on the most recent 7 ½ minute topographic quadrangle map of the United States Geological Survey or wetland greater than one acre in size. 58 Pa.C.S. § 3215(b).

   In accordance with the Act the Department shall grant a waiver for these setback requirements if the operator submits a plan identifying additional measures, facilities or practices to be employed during well site construction, drilling and operations that is approved by the department. Any waiver shall contain additional terms and conditions as necessary to protect the waters of the Commonwealth. 58 Pa.C.S. § 3215(b)(4).[1] See http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-9808

   Section 78.56 establishes standards for pits and tanks used for temporary containment. Subsection (b) allows the operator to request to use practices other than those specified in section 78.56 which provide equivalent or superior protection by submitting a

[1] On July 26, 2012, the Pennsylvania Commonwealth Court found 58 Pa.C.S. § 3215(b)(4) unconstitutional. On July 27, 2012, the Commonwealth filed an appeal of the Commonwealth Court's ruling to the Supreme Court. As of May 21, 2013, this appeal is still pending. Pending the Supreme Court's decision, there is currently a stay of the Commonwealth Court's opinion as to DEP's authority to issue waivers pursuant to section 3215(b)(4).

request to the Department for approval. The request must be made on forms provided by the Department.

The Department implements the OG-71 authorization which allows operators to provide wastewater treatment on the well site without overly time consuming administrative and technical reviews. The Department believes that the combination of the temporary nature of the on-site treatment facilities and the ease of use built into the OG-71 process is a good fit to provide adequate environmental protection while promoting recycling of wastewater.

The proposed rulemaking at § 78.59c also allows for alternative designs for centralized impoundments provided that the alternative design provides equivalent or superior protection to the requirements in the section.

A well operator may request approval from the Department to use an alternative method or material for the casing, plugging or equipping of a well under section 3221 of the act (58 Pa.C.S. § 3221). This is codified in section 78.75 (relating to alternative methods). A well operator may request permission to use a method or material other than those required by Chapter 78 for casing, plugging or equipping a well in an application to the department which describes the proposed alternative in reasonable detail and indicates the manner in which it will accomplish the goals of this chapter.

Notice of filing of the application shall be given by the well operator by certified mail to any affected coal operators, who may, within 15 days after the notice, file objections to the proposed alternative method or material. If no timely objections are filed or raised by the department, the department shall determine whether to allow use of the proposed alternative method or material. See http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-9807

Finally, the oil and gas regulations at section 78.75a allow DEP to establish areas of alternative methods in a manner similar to the development of a guidance document to establish more stringent requirements than those established by the regulations.

II. ADMINISTRATIVE CRITERIA

1. Briefly describe the **permitting** requirements for E&P facilities. Give reference to any statutory or regulatory requirements, including the permit terms and renewal procedures and the authority to refuse to issue or reissue permits or authorizations. Indicate whether the waste management practices listed in the matrix at the beginning of this questionnaire are authorized by individual permit, by rule, by general permit, through registrations or notices, verbally, or not at all. [4.1.1]

   All oil and gas wells drilled in the state since 1984 have been required under the Oil & Gas Act to be issued an oil and gas, Drill and Operate a Well (DOW) permit prior to drilling the well. Most other needed authorizations are based on department approvals unless certain criteria of the specific structure or process to be used on the well site require a permit to assure environmental protection. The erosion and sedimentation control for disturbed areas over 5 acres requires an Erosion and Sedimentation Control General Permit. See 25 Pa.Code Chapter 102. The general permit used in the state has just been revised and went into effect 2013. Please see appendix A for statutory authority and regulations for specific permitting.

   See 58 Pa.C.S. §§ 3211, 3215 of the 2012 Oil and Gas Act for permitting and setback requirements. See also Section 7 of the Coal and Gas Resource Coordination Law, and Section 3 of the Oil and Gas Conservation Law. These statutes can be viewed here:
   http://www.portal.state.pa.us/portal/server.pt/community/laws%2C_regulations__guidelines/20306

   Pursuant to the 2012 Oil and Gas Act, an individual well permit must be obtained prior to drilling, altering or operating an oil or gas well. Waste management practices at well sites are not authorized by a permit but are instead governed by the regulations themselves. The exception is when an operator proposes to use an alternative waste management practice. This would require submittal and approval of an alternative waste management practices form.

   Reviewing a well permit is primarily a function of ensuring that the well and well site is located correctly. That is, it meets the appropriate setbacks from streams, wetlands, water wells, buildings and floodplains. Unconventional gas wells are subject to greater setback requirements as well as subject to distance restrictions to public water supplies.

   Gas wells not subject to the Oil and Gas Conservation Law that are proposed to be drilled through workable coal seams are subject to the Coal and Gas Resource Coordination Law and must be spaced at least 1,000 feet from all other wells unless an exemption is agreed to by the coal owner. Horizontal gas wells may be "clustered" together to promote multi-well development on a single pad - provided the cluster is at least 2,000 feet from any other cluster.

Finally, wells that penetrate the Onondaga horizon or are at least 3,800 feet deep if that formation is not present are subject to the Oil and Gas Conservation Law. The Onondaga is directly below the Marcellus Shale formation and is subject to Pennsylvania's unitization law. Wells subject to this law, like Utica Shale wells, are not subject to the Coal and Gas Resource Coordination Law but must be located 330 feet from lease boundaries. This includes the entire length of the lateral of a horizontal well.

The next most critical aspect of well permitting is ensuring that all appropriate notices are provided to surface landowners, water supply owners, coal owners and municipalities. If all appropriate notices are provided, all appropriate resources are noted on the plat that accompanies the well permit and all setbacks and met, the application will be approved unless the applicant or its parent or subsidiary is in continuing violation of an order of DEP.

A well permit is valid for one year provided drilling commences and continues with due diligence. Well permits can be renewed for an additional year provided the applicant renews 15 days prior to permit expiration, pays the renewal fee (which is equal to the application fee) and affirms under penalty of law that all information in the renewal is the same as the initial application. 25 Pa.Code § 78.17.

Other permits that may be required include the DEP Earth Disturbance and Erosion and Sediment Control General Permit – 2 (ESCGP2 – a general permit) for E&P activities that disturb more than 5 acres of earth. And various general and individual permits for gathering line development activity involving stream and wetland impacts that are beyond the scope of this review.

2. Do E&P—related permits provide **notice of the permittee's obligation** to comply with other federal, state or local requirements? If so, please provide a copy of the form(s). [4.1.1]

   Yes. The instructions to the well permit application make this clear. This document is available at http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-87960/8000-PM-OOGM0001%20Instructions.pdf

3. Briefly describe your **compliance evaluation program** with regard to the following activities (give reference to any statutory or regulatory requirements for each):

   a. Procedures for receipt, evaluation, retention, and investigation of required notices and reports. [4.1.2.1]

      Reports such as the well record, completion reports and site restoration reports are sent to the appropriate oil and gas district office and assigned to the inspector responsible for well or site. The record is reviewed by the inspector for completeness and accuracy and the information is recorded in DEP's eFACTS database. Restoration reports will also be field verified.

Notices are received electronically by DEP through its website and automatically transmitted to the inspector responsible for inspecting the facility. Only inspection of unconventional well sites prior to well drilling is mandated by law. See 58 Pa.C.S. § 3211(f).

b. Inspection, sampling and surveillance procedures for facility monitoring, periodic inspections, comprehensive surveys, and violation investigation. [4.1.2.1.b]

25 Pa.Code Chapter 78, Subchapter X describes DEP's inspection policies. See: http://www.pacode.com/secure/data/025/chapter78/subchapXtoc.html

Each inspector has a goal of conducting 20 inspections per month. The inspection form will document any violation noted during an inspection and serves as a notice of violation to the well operator.

Violations and enforcement actions are taken in conformance with DEP Enforcement Actions policy which is available here:

http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48291/01%20550-4000-001.pdf

c. Public complaint and follow-up, including response times. [4.1.2.1.c]

DEP responds to all complaints reported by first hand witnesses. Response times may vary depending upon the significance of the issue being reported. Emergency complaints are responded to immediately 24 hours a day. Complaints are logged into DEP Complaint Tracking System as is any follow up information recorded by the inspector. Water supply complaints are handled in accordance with the requirements in 58 Pa.C.S. § 3218 and 25 Pa.Code §§ 78.51-78.52.

d. Authority to conduct unannounced inspections and investigations. [4.1.2.1.d]

Pursuant to 58 Pa.C.S. § 3258(a) DEP can conduct unannounced inspections.

e. Right of entry for inspection and copying of records. [4.1.2.1.e]

Pursuant to 58 Pa.C.S. § 3258(a) and (b) DEP has the right to enter sites regulated under the 2012 Oil and Gas Act and to examine any relevant records.

f. Chain of custody/evidence gathering. [4.1.2.1.f]

DEP's environmental laboratory is accredited by The NELAC Institute. This accreditation includes proper chain of custody procedures. Appendix C is the sample submission form utilized by DEP that includes documentation of the chain of custody.

4. Indicate which **enforcement actions** can be taken for violations of E&P environmental requirements. Give the reference for statutory authority for each

option. Also, provide the number of times these enforcement actions have been taken by the state over the past two years (number or frequency). If numbers or frequencies are not available, indicate which of these actions the state uses more often. [4.1.3.1]

	Action		Reference	Frequency
Yes	notice of violation		58 Pa. C.S. § 3253	5410
Yes	compliance schedule		58 Pa. C.S. § 3253	50+
Yes	restraining orders		58 Pa. C.S. § 3254	0
Yes	emergency response		58 Pa. C.S. § 3254.1	0
Yes	injunctive action		58 Pa. C.S. § 3254	0
Yes	administrative orders		58 Pa. C.S. § 3253	370
Yes	court action		58 Pa. C.S. § 3254	3
Yes	permit revocation		58 Pa. C.S. § 3253	0
Yes	permit suspension		58 Pa. C.S. § 3253	10
Yes	permit modification		58 Pa. C.S. § 3211	
Yes	civil penalties		58 Pa. C.S. § 3256	849
Yes	bond forfeiture		58 Pa. C.S. § 3225	1
Yes	criminal sanction		58 Pa. C.S. § 3254	2
Yes	Field Order		58 Pa. C.S. § 3251	47
	Conferences between operators, DEP and individuals	Consent Order & Agreement		Not tracked electronically 75

5. Do you have a formula for calculation of penalties? If so, what are the factors on which it is based? Give reference to any statutory or regulatory basis for such formula or provide a copy of any policy on which it is based. Indicate the penalties assessed and collected over the past two years. [4.1.3.2]

Civil penalties are calculated in accordance with DEP policy at the following link: http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48287/550-4180-001.pdf
Penalties are based on harm to public safety and the environment, the willfulness of the violation and compliance history.

	Average Penalty(*)	Total Collected(**)	Bonds Forfeited (**)
FY2010-11	$20,516	$3,787,701	$0
FY2011-12	$14,644	$2,287,519	$50,000
FY2012-13(+)	$17,181	$2,042,249	$0

(*) – Source: eFACTS database
(**) – Source: DEP fiscal database
(+) – Partial fiscal year-to-date (7/1/12 through 5/13/13)

6. Does your program include a **right of appeal** for review of actions? If so, please describe the appeals process and give reference to statutory or regulatory provisions governing appeals. [4.1.3.3]

   Any person aggrieved by a departmental action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. § 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717-787-3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800-654-5984.

   Pursuant to 25 Pa.Code § 1021.52 (relating to timeliness of appeal):

   . . . jurisdiction of the Board will not attach to an appeal from an action of the Department unless the appeal is in writing and is filed with the Board in a timely manner, as follows, unless a different time is provided by statute:

   > (1) The person to whom the action of the Department is directed or issued shall file its appeal with the Board within 30 days after it has received written notice of the action.
   >
   > (2) Any other person aggrieved by an action of the Department shall file its appeal with the Board within one of the following:
   >
   > > (i) Thirty days after the notice of the action has been published in the Pennsylvania Bulletin.

(ii) Thirty days after actual notice of the action if a notice of the action is not published in the *Pennsylvania Bulletin*.

7. Has the state adopted a **state contingency plan** for response to spills and releases? If so, briefly describe, including volumes that trigger a response, time in which notification and clean-up is to occur, and criteria (i.e., cleanup standards) used to assure that remediation was accomplished. Please provide reference to applicable portions of the state plan. [4.2.1.1.a]

   Under sections 501 and 505 of the Hazardous Sites Cleanup Act (HSCA), 35 P.S. §§ 6020.501, 6020.505, the Department has authority to address all spills and releases of "hazardous substances," as defined in HSCA section 103, 35 P.S. § 6020.103. In addition, in 35 P.S. § 6020.501(g), the Department has emergency response authority regarding nonhazardous substances. Under that provision, if there were an actual or threatened release of a nonhazardous substance and the responsible party failed to take appropriate action, the Department may "order or undertake the necessary and appropriate emergency interim response." In keeping with 35 P.S. § 6020.501(f), DEP already has hired contractors that DEP can instruct to address emergencies and other cleanups (and environmental investigations).

8. Describe any **funding** provisions to enable the state to respond to spills and releases in the event a responsible operator cannot be located or is unwilling or unable to respond, and any provisions for reimbursement of the state for monies so expended. [4.2.1.1.b]

   The Hazardous Sites Cleanup Fund, established under 35 P.S. § 6020.901, provides DEP with funding for such cleanups.

9. Describe any mechanisms provided by the state for the operators or public to **report spills and releases.** Please indicate if these mechanisms include telephone access 24 hours a day, 7 days a week, a 1-800 telephone number and telephone answering capabilities. [4.2.1.2]

   In the event of a reportable spill or release, the responsible party must notify the Department by telephone. The Department does not consider voicemail messages (unless left at a contact number identified in Appendix B or the 1-800 number below), e-mails or text messages to fulfill this notification requirement. Mailed letters or communications from a third party also are not acceptable forms of initial notification.

   Spills and releases should be reported to the appropriate DEP Regional Office listed in Appendix B. The Department also maintains a statewide toll free number: 1-800-541-2050. This number serves as a backup to the regional numbers and also supports a reporting mechanism for people who do not know which regional office is responsible for a particular area.

The notification procedures outlined above are in addition to those requirements outlined in the 2012 Oil and Gas Act, Solid Waste Management Act, Waste Transportation Safety Act, Clean Streams Law, or other applicable laws and any related regulations. Under certain circumstances, as specified under applicable law and in accordance with the control and disposal plan and/or PPC plan, the responsible party must immediately notify emergency responders (including, but not limited to state or local police and the County emergency management official), federal authorities, other state authorities and downstream users of impacted or threatened waters.

10. Describe any interagency **coordination of actions** between agencies having jurisdiction for response to spills and releases, including clear designation of on-site spill responsibilities. [4.2.1.3]

Legislative Authority

The Department is responsible for implementing a number of Pennsylvania laws which have components relating to emergency response, including the 2012 Oil and Gas Act, the Air Pollution Control Act, the Dam Safety and Encroachments Act, the Explosives Act, the Radiation Protection Act, various mining laws, the Clean Streams Law, the Solid Waste Management Act, HSCA, the Pennsylvania Safe Drinking Water Act, and the Storage Tank Management and Spill Prevention Act. DEP's authorities relative to emergency response to hazardous materials are most clearly delineated in HSCA.

Among other responsibilities relating to response actions, HSCA requires DEP to "provide for emergency response capability for spills, accidents and other releases of hazardous substances and contaminants." 35 P.S. § 6020.301(15). The law gives DEP the authority to take any action that it deems necessary or appropriate to protect the public health, safety or welfare or the environment from releases or threats of releases of hazardous materials.

The Department also responds and provides technical advice during hazardous material emergencies by the Hazardous Material Emergency Response and Protection Act. 35 P.S. §§ 6022.101 – 6022.307.

Organization

DEP's emergency response program is under the supervision of the Director of Environmental Emergency Response. The person in this position has the full authority of the Secretary of DEP in responding to emergency situations.

In each of DEP's six regional offices a Regional Emergency Response Program Manager (ERPM) leads an emergency response program. The Regional ERPM has the full authority of the Regional Director in responding to emergency situations.

The regional program is staffed, in addition to the ERPM, by a fulltime Assistant ERPM, and a part-time staff of DEP specialists who normally work in other DEP program areas. The teams consist of 10 to 17 members, depending on the region. The teams are trained in personal protection and safety, environmental sampling, containment and control, and have authority to issue field orders to enforce DEP regulations.

DEP's Emergency Response Commitment

The emergency response program is committed to having management personnel on around-the-clock standby in DEP's regional offices and in the central office to receive notifications of pollution incidents and environmental emergencies. The program has emergency response team members available to respond on-site whenever there is an immediate threat to the public health, safety, or the environment.

Types Of Responses

While the major focus of the program is response to spills to land or water, DEP also has significant involvement with air pollution incidents (either from a fire or industrial-transportation-related release) and leaking underground storage tanks. The program also gets involved in a limited number of incidents involving public water supply shortages or contamination, mining related discharges, oil and gas production related discharges, abandoned explosives, and food or waterborne illness outbreaks. Additionally, the program gets involved in radioactive materials incidents and also participates in nuclear facility drills and incidents. While not a direct responsibility of the emergency response program, the program does receive notifications for and coordinates with other DEP emergency response functions such as the Deep Mine Safety Rescue Teams (these teams also have expertise which may be valuable in a collapsed building incident), and the Dam Safety Program.

DEP Capabilities At A Response

The teams' primary duties at an incident are to provide assistance to the first responders and to make sure DEP regulations are being followed. DEP's emergency response mission is to protect and restore the natural environment and protect public health and safety. DEP's teams maintain Level B personal protection – self-contained breathing apparatus, spill response suits, gloves, boots and also are equipped with portable monitoring equipment for monitoring exposure of team members and other first responders and assessing the potential exposure of the public. The teams are equipped with sampling equipment to collect samples to assess the environmental consequences of the incident. Team members also carry limited supplies of absorbent material for situations in which

they are first on the scene. Team members can enforce DEP regulations on scene, and the Regional ERPM is authorized to enter into emergency contracts for whatever action is needed to protect the public health, safety, or the environment.

Interactions Between DEP And Other First Responders

DEP's emergency response program is committed to providing whatever assistance it can to first responders at emergency situations. While one of the mandated tasks is to protect the environment, this always will be a secondary consideration to the health and safety of the public or the incident responders.

DEP recognizes the jurisdictional authority of local responders in protecting the health and safety of their citizens and does not want to undermine that authority. It is hoped that other responding groups recognize DEP's jurisdiction in situations that involve hazardous wastes, contamination of the environment, or a member of the regulated community. DEP supports the concept of a unified command system that involves all agencies that have a jurisdictional responsibility for any aspect of the incident.

By working together, a dangerous situation can be handled quickly and responsibly to minimize the threats to the public or to the environment.

11. Describe any **requirements for operators** to take measures prevent and respond to spills and releases at E&P facilities. Indicate if these requirements are spelled out in regulations or guidance or if they are included in operator-specific or site-specific plans. [4.2.1.4]

    The requirements below are currently outlined in a draft policy. The proposed rulemaking seeks to codify these provisions in regulation.

    Operators are required to develop several plans for preventing and responding to spills and releases at E&P facilities. First, oil and gas operators are required by 25 Pa.Code §§ 78.55 and 91.34 to develop a Preparedness, Prevention, and Contingency (PPC) plan. The Department has a guidance document available with oil and gas specific information titled *Guidelines for the Development and Implementation of Environmental Emergency Response Plans.* This document is available at http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48522/400-2200-001.pdf. Further information is available in the Oil and Gas Operator's Manual, Chapter 4, http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48243/chap4.pdf

    Unconventional well operators are also required to develop and submit to the Commonwealth and other entities an Emergency Response Plan (ERP). 25 Pa.Code § 78.55(f)(3). The ERP is somewhat broader in scope than the PPC plans because it addresses the possibility of any emergency occurring on the well site, not just spills

and releases. The ERP also covers all aspects of operations at a well site, from site preparation to final plugging and restoration.

Section 78.66 of the proposed regulations outlines how operators are required to respond to spills or releases. The proposed rulemaking can be summarized as follows:

Remediation of a Spill or Release at an Oil & Gas Well Site

In General

Remediation of an area affected by a spill or release at an oil and gas well site is required. Upon confirming that a spill or release has occurred, the responsible party shall immediately initiate interim remedial actions necessary to prevent or address an immediate threat to human health or the environment, including prevention of further migration of pollutional substances.

Interim remedial actions are those actions necessary to prevent or address an immediate threat to human health or the environment and may include identifying and mitigating fire, explosion and safety hazards posed by vapors and free product, preventing further migration of the spilled or released material and free product recovery.

The responsible party must remediate the affected area by demonstrating attainment of the remediation standards available under the Land Recycling and Environmental Remediation Standards Act, 35 P.S. §§ 6026.101 – 6026.908, ("Act 2") and the Land Recycling Program regulations in Chapter 250 of Title 25 of the Pennsylvania Code; or under the alternative remediation option, meeting all the applicable requirements to demonstrate attainment of one or more of the remediation standards, except the notice, review and fee provisions under sections 302(e) and/or 303(h)(35 P.S. §§ 6026.302(e), 6026.303(h)), and section 703. 35 P.S. § 6026.703. For remediation purposes, not all regulated substances have a published Statewide health standard. In situations where there is no published Statewide health standard for a regulated substance, one of the other standards must be selected for that substance. For example, chlorides have a Statewide health standard for releases to groundwater, but do not have a Statewide health standard for releases in soil. For those chloride releases to soil, either the background or site-specific standard must be achieved in order to demonstrate attainment under Act 2.

The responsible party must appropriately remove and dispose of waste from the spill or release.

Small Spills

For spills of less than 42 gallons at a well site that do not pollute waters of the Commonwealth or threaten pollution of these waters, the responsible party should

remove the soil visibly impacted by the spill upon discovery of the spill and should dispose of the impacted soil by a method permitted by law. The responsible party should notify the Department of its intent to remediate a spill in this manner at the time notification of the spill is made.

Act 2

If the responsible party is utilizing Act 2, the responsible party should notify the Department of this decision in writing within 15 days of the spill or release. The notification should also include a brief summary of the actions the responsible party has taken and intends to take at the site to address the spill or release (e.g., a schedule for site characterization, to the extent known).

The responsible party will then be required to follow each applicable provision in Act 2, including publication of submission to DEP of a Notice of Intent to Remediate (NIR) and municipal notification of submission to DEP of a Final Report demonstrating attainment of the selected standard. However, the submission and publication of an NIR and public notification regarding the Final Report are not necessary for cleanups conducted under the Act 2 background or Statewide health standard if the Final Report is submitted to the Department within 90 days of the spill or release. 35 P.S. §§ 6026.302(e) and 6026.303(h). If the Department approves the Final Report, Act 2 provides the responsible party relief from cleanup liability for the contamination identified in the site reports submitted to and approved by the Department.

The forms for completing the NIR, Final Report Summary, and examples of the public notice language are available on the Department's website: http://www.portal.state.pa.us/portal/server.pt/community/land_recycling_program/20541/forms__lists/1034859

Alternative Remediation

Where a responsible party will not be utilizing Act 2, the responsible party may remediate a spill or release under the background or Statewide health standard in the following manner. A responsible party utilizing this alternative remediation option may not use the site-specific standard.

Within 15 days of the spill or release, the responsible party should provide a brief written report that includes, to the extent that is available, the following information:

1) The pollutional substance involved,

2) Where the spill or release occurred,

3) The environmental media affected,

4) Any impacts to water supplies, buildings or utilities, and

5) Interim remedial actions planned, initiated or completed.

The initial report should also include a summary of the actions the responsible party intends to take at the site to address the spill or release (e.g., a schedule for site characterization, to the extent known) and the anticipated timeframes within which it expects to take those actions. After the initial report, any new impacts identified or discovered during interim remedial actions or site characterization should also be reported in writing to the Department within 15 days of their discovery.

Within 180 days of the spill or release, the responsible party must perform a site characterization to determine the extent and magnitude of the contamination and submit a site characterization report to the appropriate DEP Regional Office outlining the findings. The report should also include discussion on any interim remedial actions taken. This report may be the last report submitted to the Department where interim remedial actions meet all of the requirements of a background and/or Statewide health standard, except the notice and review provisions.

If the site characterization indicates that the interim remedial actions taken did not adequately address the spill or release to meet all of the requirements of the background and/or Statewide health standard, except the notice and review provisions the responsible party must develop and submit a remedial action plan to the appropriate DEP Regional Office. The plan is due within 45 days of the site characterization.

Once the remedial action plan is implemented, the responsible party must submit a remedial action completion report to the appropriate DEP Regional Office. The Department will review the completion report to ensure that the remediation has met all the requirements of the background and/or Statewide health standard, except the notice and review provisions. Unless Act 2 is complied with in all aspects, relief from liability will not be available to the responsible party, property owner or person participating in the cleanup. However, the option of completing all remaining Act 2 requirements remains available.

12. Describe any **general state contingency program elements,** including those that address:

    a. Facilities, materials and equipment that may pose a significant threat to human health or the environment. [4.2.1.4.1.a]
    b. The various environments at risk, including surface and groundwater and land (environmentally sensitive areas, special soil or geologic conditions, urban areas, cultural and special resource areas). [4.2.1.4.1.a]

c. Measures to address public and responder safety concerns, including training for response personnel. [4.2.1.4.1.a]
d. The operator's incident command structure, including emergency contact information for key personnel. [4.2.1.4.1.b]
e. Equipment, manpower and contracted services to respond to spills and releases.[4.2.1.4.1.b]
f. Opportunities for coordination of joint response actions. [4.2.1.4.1.b]
g. Procedures for communication with impacted or threatened parties. [4.2.1.4.1.b]
h. Methods of containment of spills and unauthorized releases. [4.2.1.4.1.b]
i. Methods of disposal of materials of concern. [4.2.1.4.1.b]
j. Responder training. [4.2.1.4.1.c]

Please see response to Question 10, above.

13. Describe any **spill prevention measures,** including those that may include:

a. Secondary containment measures such as dikes, berms, firewalls or equivalent measures. [4.2.1.4.2.a]
b. Tertiary containment or monitoring systems in high risk areas. [4.2.1.4.2.b]
c. Inspection, testing and maintenance schedules and procedures for facilities and equipment. [4.2.1.4.2.c]
d. Site security measures as necessary. [4.2.1.4.2.d]
e. Periodic review of opportunities to reduce future spills and releases. [4.2.1.4.2.e]

Please see responses to Section III, Questions 1 – 54, below.

14. Describe any **spill response measures,** including those that may include:

a. Agencies and parties to be notified in the event of a spill or unauthorized release. [4.2.1.4.3.a]
b. Type of reporting (verbal, written) required. [4.2.1.4.3.a]
c. Reporting time requirements. [4.2.1.4.3.a]
d. Reporting thresholds. [4.2.1.4.3.a]
e. Type of information to be reported, such as operator name, a description of the incident including date and time of discovery, the type and volume of material released, the location of the incident, the apparent extent of the release, damage or threat to groundwater, surface water and land, and weather conditions.. [4.2.1.4.3.a]

Please see response to Question 11, above.

15. Describe any **state guidance for containment, abatement and remediation** of spills and releases including:

a. Clean-up standards. [4.2.1.4.3.b]
b. Required sampling and analyses. [4.2.1.4.3.b]
c. Any approved non-mechanical response actions. [4.2.1.4.3.b]

Please see response to Question 11, above. The Department maintains detailed regulations and guidance for the containment, abatement and remediation of spills and releases under Act 2. The regulations are codified in 25 Pa.Code Chapter 250, available at http://www.pacode.com/secure/data/025/chapter250/chap250toc.html. The Land Recycling Program's Technical Guidance Document is available at http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-8455.

16. Describe any requirements for **final reporting, site monitoring requirements and necessary agency approvals** following the response to spills and releases. [4.2.1.4.3.c]

Please see response to Question 11, above.

17. Describe any **follow-up actions by the state** for the failure of an operator to report or respond to spills and unauthorized releases, including enforcement, assessment of damages, and reimbursement of costs for responding to spills and releases. [4.2.1.5]

The Department retains full enforcement authority under the various environmental statutes where an operator fails to respond properly to a spill or release. 35 P.S. § 6026.905. Enforcement responses would follow the Department's guidance titled *Enforcement Actions by DEP's Oil and Gas Management Program* # 550-4000-001 (available at http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-8297).

In terms of assessment of damages and reimbursement for costs, the Department is authorized to assess civil penalties under the 2012 Oil and Gas Act taking into account "willfulness of the violation, damage or injury to natural resources of this Commonwealth or their uses, endangerment of safety of others, the cost of remedying the harm, savings resulting to the violator as a result of the violation and any other relevant factor." 58 Pa.C.S. § 3256. Finally, section 3254.1 of the 2012 Oil and Gas Act states that:

> A person liable for a well control emergency is responsible for all response costs incurred by the department to respond to the well control emergency. In an action before a court of competent jurisdiction, the department may recover all its response costs, including the cost of regaining control of the well, controlling the perimeter of the well site, preparing water sprays, establishing trenches or dikes to capture runoff fluids and providing the resources and equipment needs for the incident.

18. Describe any **database** that includes information on spills and releases, and indicate whether such database is analyzed as part of a program effectiveness evaluation [4.2.1.6]

The Department tracks cleanups conducted under the Act 2 program through its eFACTS database. The Land Recycling Program typically prepares an Annual Report

analyzing this data. Modifications are being made to the database to specifically track spills and releases resulting from E&P activities.

19. Describe the **public participation** activities related to E&P environmental activities, including public notice and comment requirements prior to permit issuance, availability of agency records for public review, public outreach to affected parties, and the use of any advisory groups. Give reference to any statutory or regulatory provisions controlling such activities. [4.2.2]

    Well Permits

    The 2012 Oil and Gas Act regulates the issuance of well permits. *See* 58 Pa.C.S. § 3211. Pursuant to section 3211(b), a well permit applicant "shall forward by certified mail a copy of the plat to the surface landowner; the municipality in which the tract of land upon which the well to be drilled is located; each municipality within 3,000 feet of the proposed unconventional vertical well bore; the municipalities adjacent to the well; all surface landowners and water purveyors, whose water supplies are within 1,000 feet of the proposed well location or, in the case of an unconventional well, within 3,000 feet of the proposed unconventional vertical well bore; storage operators within 3,000 feet of the proposed unconventional vertical well bore; the owner and lessee of any coal seams; and each coal operator required to be identified on the well permit application." Pursuant to section 3211(b.1), proof of notification is required to be submitted with the well permit application.

    58 Pa.C.S. § 3212.1 outlines a process for municipalities and storage operators to submit written comments to the department on a proposed well permit application.

    Well permits are public records maintained in the files located at the district offices.

    Erosion and Sediment Control Permits

    On December 29, 2012, the department issued Erosion and Sediment Control General Permit-2 (ESCGP-2) for Earth Disturbance Associated with Oil and Gas Exploration, Production, Processing or Treatment Operations or Transmission Facilities. This general permit was issued under the authority of 25 Pa.Code § 102.5(m) as well as the Clean Streams Law, the 2012 Oil and Gas Act and sections 1905-A, 1917-A of The Administrative Code of 1929 (71 P.S. §§ 510-5, 510-17 and 510-20).

    25 Pa.Code § 102.5(m) outlines the procedure for issuing erosion and sediment control general permits, including publication in the Pennsylvania Bulletin and a public comment period. On January 21, 2012, the department published a proposed amended permit in the *Pennsylvania Bulletin* with a 60-day public comment period. The department assembled a stakeholder group with representatives from industry

and environmental groups for four meetings. The meetings occurred both during and after the public comment period.

Additionally, the Department publishes notice of every approval of coverage under ESCGP-2 in the *Pennsylvania Bulletin*.

105 Permits -- Centralized Impoundments

Pursuant to 25 Pa.Code § 105.21a, the Department will publish notice in the *Pennsylvania Bulletin* upon receipt of an application and again upon the issuance or denial of a permit by the department submitted under this chapter, except for dams, water obstructions and encroachments authorized under 25 Pa.Code §§ 105.12, 105.64 and Subchapter L (relating to waiver of permit requirements; emergency permit; and general permits), or as small projects.

Section 693.8 of the Dam Safety and Encroachments Act provides that "each permit application shall be a matter of public record and shall be available for inspection at the department's offices" and "the department may, at its discretion, hold a public hearing on any application for the purposes of gathering information." 32 P.S. § 693.8.

WGMR 123

On March 24, 2012, the Department finalized General Permit WMGR123 for the processing and beneficial use of oil and gas liquid waste and published notice in the *Pennsylvania Bulletin*. This permit was issued under the authority of 25 Pa.Code §§ 287.623 and 287.625.

On August 6, 2011, the Department published the proposed permit for a 30 day public comment period in the *Pennsylvania Bulletin*. On September 3, 2011, the Department extended the public comments period for another 30 days. After the close of the public comments period, the Department developed a comment response document. Additionally, the proposed permit was available for review on the Department's website and public had the opportunity to request a file review. Further, the Department sent a letter to all permittees that would be impacts regarding the proposed amendments.

20. Describe any **regulatory development process,** including mechanisms for obtaining best available scientific and technical information and economic and energy impacts. [4.2.3]

The regulatory development process utilized by the Department is built upon continuous program evaluation, stakeholder feedback, and technical expertise from leading organizations. This process is consistent with DEP's *Policy for Development, Approval, and Distribution of Regulations* (Technical Guidance #012-0820-001) (*Policy on Regulatory Development)*, which was developed to establish standards and procedures for

the development and review of regulations consistent with Executive Order 1996-1, which is elaborated on below.

Problem definition

Assembling Evidence from Experience

DEP through the District Office of Oil and Gas Operations performs continuous inspections of the oil and gas industry throughout Pennsylvania. Through data from inspector's reports, the Office of Oil and Gas Management analyzes trends in violations and field reports to evaluate the need for additional environmental requirements.

Regulatory Development

The first step in the formal regulatory development process in DEP begins with approval from the Secretary to begin the development of a regulation. The Secretary is accountable to ensure the proposed rulemaking adheres to the principles established in Executive Order 1996-1. Executive Order 1996-1 established regulatory review and promulgation requirements to assure regulations: 1.) address a compelling public interest, 2.) do not cost more than its intended benefits, 3.) are written in clear, concise, and nontechnical language, 4.) address definable public health, safety, or environmental risks, 5.) set compliance as the goal of the regulation, 6.) do not exceed federal standards unless justified by a compelling interest, 7.) are drafted and promulgated with early and meaningful input from the regulated community, and 8.) do not hamper Pennsylvania's ability to compete effectively with other states.

Constructing Alternatives

Once areas for additional environmental requirements are established, DEP's Office of Oil and Gas Management through the Bureau of Oil and Gas Planning and Program Management begins to evaluate regulatory options. The Bureau then presents the options for regulatory enhancement to the Oil and Gas Technical Advisory Board (TAB). The TAB is comprised of five members who are petroleum engineers, petroleum geologists, or experienced drillers, and one member who represents mining interests. By soliciting feedback from leading technical experts, the Bureau is able to obtain multiple perspectives and greater insight into the problems and opportunities for greater environmental protection. At every TAB meeting, the public is welcome to provide comments that represent their personal interests or organization's interests.

After concepts are developed and discussed with the TAB, the Office of Oil and Gas Management through the Bureau of Oil and Gas Planning and Program Management develops the proposed regulatory language.

Projecting Outcomes

After the proposed regulatory language is developed, the Office of Oil and Gas Management meets with additional stakeholders to discuss specific elements of the

proposed regulatory provisions. This step is critical to ensuring that the regulations accomplish their intended purpose and do not create unintended consequences. This helps DEP to forecast the expected regulatory outcome for when the regulation becomes final.

When the Office of Oil and Gas Management was developing the latest rulemaking package related to surface impacts at oil and gas well sites, meetings were held with industry representatives, local government leaders, environmental groups, and other interested stakeholders such as the Department of Conservation and Natural Resources.

Selecting the Alternatives

Once all stakeholder meetings have taken place, the Office of Oil and Gas Management through Bureau of Oil and Gas Planning and Program Management evaluates the feedback received and revises the regulatory language, as necessary. According to DEP's *Policy on Regulatory Development* and Executive Order 1996-1, regulatory strategies should be designed to achieve the desired goal at the lowest possible cost. They should also be drafted in a manner which minimizes the impact on individuals, businesses, and local governments. In addition, where viable non-regulatory alternative exist, they should be preferred over regulations. The order and policy also direct that regulations should focus on performance standards with maximum flexibility versus prescribed specific technologies or equipment.

After DEP drafts the appropriate regulatory language, the draft rulemaking is presented to the TAB for action. Through the TAB, technical and scientific information is evaluated and discussed, including additional alternative regulatory provisions.

As the draft regulatory provisions are developed and finalized, the Office of Oil and Gas Management prepares additional documents to supplement the regulations, including an Executive Summary, Preamble, and Regulatory Analysis Form. The Executive Summary is a one to two page summary of the regulatory proposal prepared for the members of the Environmental Quality Board which identifies that summary of the proposal, its purpose, the groups affected by the proposal, and the DEP advisory committee or committees that were involved in the review of the proposal. The Preamble is published in the *Pennsylvania Bulletin,* along with the proposed regulatory language. The Preamble explains the regulations and their rationale to the general public in non-technical language, including the compelling public interest of the regulations. The Regulatory Analysis Form, created in response to Executive Order 1996-1, requires state agencies to evaluate and address several compelling factors of the rulemaking, including the regulation's impacts to the regulated community, local governments, state governments, and small businesses.

Internal Review

After the proposed rulemaking package has been developed, it is reviewed by the DEP Policy Office for completeness, format and substance; DEP's Office of Chief Counsel for legality; and the Secretary. Once the rulemaking is approved by the Secretary, it is reviewed by the Governor's Office of General Counsel, the Governor's Policy Office and

the Governor's Budget Office.

Regulatory Promulgation Process

Review by the Environmental Quality Board – Proposed Regulation

The Department, unlike other state agencies, does not have independent rulemaking authority. All regulations developed by the Department must be reviewed and approved by the EQB. The EQB is made up of 20 members and includes representation by the Secretary of the Department, as chair, and representatives from the Departments of Health, Community and Economic Development, Transportation, Agriculture, Labor & Industry, Fish and Boat Commission, Game Commission, Public Utility Commission, Historical and Museum Commission, State Planning Board, the Citizen's Advisory Council, and the House and Senate leadership of the General Assembly.

The EQB takes formal action on each rulemaking, including approving the length of the public comment period and the provision for any public meetings and/or hearings on the regulatory proposal. After the EQB approves a proposed regulation, the rulemaking is submitted to the Office of General Counsel and upon approval, is forwarded to the Office of Attorney General for review of form and legality.

Projecting Outcomes

Following approval by the Office of Attorney General, DEP submits the proposed regulation to the Standing Environmental Resources and Energy Committees and the Independent Regulatory Review Commission (IRRC) for review and comment. The rulemaking is also submitted to the Legislative Reference Bureau for publication in the *Pennsylvania Bulletin* to commence the official public comment period on the proposal. All proposed rulemakings are subject to a minimum comment period of at least 30 days. Longer comment periods may be provided in response to statutory requirements or based upon the complexity of the rulemaking. During the public comment period, public information meetings and hearings may be held on the proposed rulemaking. The Office of Oil and Gas Management intends to recommend a 60-day public comment period for the surface activity regulations, with at least 4 public hearings to ensure public engagement and review of the regulatory proposal.

Selecting Alternatives

Once the public comment period closes, IRRC has an additional 30 days to review the rulemaking and the public comments received on the proposal and to submit its own comments on the proposed rulemaking to the EQB. After the conclusion of the public comment period, including IRRC's comment period, the Bureau of Oil and Gas Planning and Program Management will consider each of the comments received. A Comment and Response Document is created which lists each paraphrased comment and commentator with an appropriate DEP response. This process ensures that every single comment and possible alternative is evaluated.

Simultaneously, the TAB, working in collaboration with DEP, may choose to organize workgroups to evaluate the comments received on more technical issues. The committee may then recommend changes or amendments to the regulatory proposal based upon its evaluation of the comments. There will be several workgroups convened for the proposed surface activity regulations. These workgroups include TAB members and other individuals with technical expertise chosen by DEP and the advisory group.

Deciding Best Methods and Recommending Preferred Policies

Once all comments have been considered, the Office of Oil and Gas Management through the Bureau of Oil and Gas Planning and Program Management develops the final regulatory package. This package includes the final regulatory language, Executive Summary, Order, and Regulatory Analysis Form. The final regulatory language is presented to the TAB for consideration.

Internal Review

After the final rulemaking package has been developed, it is reviewed by the DEP Policy Office for completeness, format and substance; DEP Office of Chief Counsel for legality; and the Secretary. Once is it approved by the Secretary, it is reviewed by the Governor's Office of General Counsel, Governor's Policy Office and Governor's Budget Office.

Review by the Environmental Quality Board – Final Regulation

Similar to the proposed rulemaking, the Office of Oil and Gas Management presents the final rulemaking to the EQB and responds to any concerns the members may have. The EQB takes formal action on each rulemaking.

External Review

After approval by the EQB, the rulemaking is submitted to the Standing Environmental Resources and Energy Committees and IRRC for formal action. IRRC has a minimum of 30 days to review the rulemaking and take formal action on it, which occurs at a public meeting of the commission. The Standing Committees have a minimum of 20 days to take action on the rulemaking and can take action up until 24 hours prior to IRRC's public meeting. After IRRC approves the final rulemaking, it is submitted to the Office of Attorney General for review of form and legality. Upon approval by the Office of Attorney General, the final rulemaking is submitted to the Legislative Reference Bureau for publication in the *Pennsylvania Bulletin.*

Implementation

Once the rulemaking is published as final and made effective, it is implemented with new guidance documents, forms, and checklists as developed by the Bureau of Oil and Gas Planning and Program Management. The TAB and other stakeholders have opportunity for input about best available methods and techniques during the development of all of these documents. The District Office of Oil and Gas Operations begins their

implementation through the permitting and inspections processes.

The Office of Oil and Gas Management monitors the outcomes to ensure that the intent of the rulemaking has been achieved. This monitoring is accomplished through review of inspection trends, reports from field offices, and stakeholder feedback from the TAB and other industry meetings.

Evaluation

The Department evaluates all regulations in accordance with the sunset review scheduled published by the department annually. The sunset schedule determines whether the regulation effectively fulfills the goals for which it was intended.

21. Describe the **program planning** and **performance measurement** processes, including the following:

    a. Strategic or short-term planning for regulatory development purposes. [4.2.3.1]

       Program planning occurs in several different ways. The Bureau of Oil and Gas Planning and Program Management develops a two year strategic plan that is continuously reviewed and updated as projects are completed. In addition, the Bureau Directors develop their own short term plans that are reviewed and updated every other week with the Deputy Secretary.

    b. Evaluation of program effectiveness related to the **protection of human health and the environment.** [4.2.3.2.a]

       Inspection violation and enforcement activity is reported and evaluated on a weekly basis.

    c. Use of data management capabilities to assess program effectiveness and timeliness. [4.2.3.2.b]

       DEP's eFACTS database is queried on a routine basis to ascertain compliance with environmental health and safety metrics such as spills and erosion and sediment control.

    d. Establishment of a baseline against which to compare future performance. [4.2.3.2.d]

       Compliance baseline has been established since 2005. All violation and enforcement actions are compared annually to the previous year and to the number of wells drilled in that year.

22. Describe any **financial assurance** requirements for E&P environmental regulatory activities or facilities. Include the activities for which financial assurance is required, the purpose of the assurance (penal or performance), the scope of coverage (i.e., pit closure,

well plugging, water supply replacement), the types of financial assurance instruments accepted (i.e., surety, letters of credit, CD's, non-refundable fees, self-insurance), and procedures to access the assurance funds when necessary. Give reference to any statutory or regulatory provisions governing financial assurance amounts. [4.2.4]

Section 3225 of Act 13 establishes well bonding requirements. Collateral and surety bonds on a form furnished by the Department are acceptable. A bond filed with an application for a well permit is payable to the Commonwealth and conditioned upon the operator's faithful performance of all drilling, water supply replacement, restoration and plugging requirements of Chapter 32 of Act 13. Liability under the bond continues until the well has been properly plugged in accordance with Chapter 32 and for a period of one year after filing of the certificate of plugging with the Department. If a well owner or operator fails or refuses to comply with Chapter 32, the Department's Oil and Gas regulations or conditions of a permit relating to Chapter 32, the Department may declare the bond forfeited.

Prior to Act 13, required bond amounts were established at $2,500 per well or $25,000 for a blanket bond. Bond amounts for conventional wells remain at those levels. 72 P.S. § 1606-E (relating to conventional oil and gas well bonding).

Under section 3225, bond amounts for unconventional wells were increased and established based on well-bore length and number of wells operated, as follows:

For wells with total well bore lengths less than 6,000 feet:

- For up to 50 wells - $4,000/well not to exceed $35,000
- For 51-150 wells - $35,000 plus $4,000/well not to exceed $60,000
- For 151-250 wells - $60,000 plus $4,000/well not to exceed $100,000
- For more than 250 wells - $100,000 plus $4,000/well not to exceed $250,000

For wells with total well bore lengths 6,000 feet or greater:

- For up to 25 wells - $10,000/well not to exceed $140,000
- For 26-50 wells - $140,000 plus $10,000/well not to exceed $290,000
- For 51-150 wells - $290,000 plus $10,000/well not to exceed $430,000
- For more than 150 wells - $430,000 plus $10,000/well not to exceed $600,000

These unconventional well bond amounts are cumulative. Bond amounts may be adjusted every two years by the Environmental Quality Board.

23. Describe any **waste hauler training and certification** requirements for commercial

transportation of E&P wastes in your state. Give reference to any statutory or regulatory provisions relating to this activity. [4.2.5]

Pursuant to the Solid Waste Management Act, 35 P.S. §§ 6018.101 - 6018.1003, gas well fracturing fluids are considered residual waste and must be managed in accordance with applicable laws. Transportation of residual wastes in the Commonwealth is regulated by the Department under Act 90, the Waste Transportation Safety Act. 27 Pa.C.S. §§ 6201 – 6209. The waste transportation regulations are available online at www.pacode.com/secure/data/025/chapter299/subchapBtoc.html

Transporters must meet the following requirements to transport E&P wastes in Pennsylvania.

Signs

According to 25 Pa.Code § 299.220 vehicles that transport residual waste within Pennsylvania are required to have proper identification signs with letters at least 6 inches in height. The signs should include the name and business address of the owner of the vehicle, and shall also indicate the type of waste being transported.

Fire Extinguisher

According to 25 Pa.Code § 299.213 vehicles that transport residual waste within Pennsylvania are required to have proper fire extinguishing equipment.

Leaks

According to 25 Pa.Code § 299.213 equipment to transport residual waste within Pennsylvania is required to be routinely tested, inspected and maintained by the operator to ensure that there is no release or leakage of waste during transportation.

Emergency Equipment

According to 25 Pa.Code §§ 299.216(a)(d) vehicles that transport residual waste within Pennsylvania are required to have safety equipment for use during discharges, fires and other emergencies. The equipment shall include protective clothing and equipment and first-aid supplies. Transportation vehicles shall also be equipped with absorbent mats and material to absorb liquids that might leak from the container.

Daily Operational Record

According to 25 Pa.Code § 299.219 vehicles that transport residual waste within Pennsylvania are required to have a residual waste daily operational record in the cab of the vehicle. The report shall include among other things, the type of waste transported, the weight or volume of the waste, generator information, and the processing or disposal facility information.

PPC Plan (Contingency Plan)

According to 25 Pa. Code § 299.216(d) vehicles that transport residual waste within Pennsylvania are required to have a residual waste contingency plan in the cab of the vehicle.

Act 90 Authorizations

In addition to the above requirements, in order for waste to be transported within Pennsylvania and accepted at certain processing facilities or any disposal facility, you may need to obtain a written authorization from the Department to haul residual waste.

In addition to the requirements listed above, the Department routinely inspects residual waste hauling vehicles to ensure compliance with vehicle safety requirements for the following items:

1. The weight of the load being hauled.
2. Driver's license.
3. Ownership cards.
4. Brake systems.
5. Springs.
6. Tires.

24. Describe any program relating to identification of the **location of closed disposal sites,** including any provisions making this information available for public review. Give reference to any relevant statutory or regulatory provisions regarding such identification. [4.2.6]

Well site disposal is identified on the well site restoration report that is filed pursuant to section 78.65. This includes the location of any cutting burial pit. This is public information.

25. Provide a brief description of the **data management** systems in place in your state for information related to E&P environmental regulatory activities. Include a description of the data elements (e.g., permitting, operating, monitoring) that are included in the system. Please describe the extent to which the program utilizes and/or has considered the utilization of electronic data management systems, and what information is or is not made available to the public. [4.2.7]

    PA DEP has had an institutional enterprise data management system for clients, permits, sites, authorization, and enforcement. Oil & Gas has explored and has begun enhancements and development of an electronic well permit application to improve data quality, permit application review and efficient permit issuance. The enhancements will greatly improve document management. The state has developed and deployed electronic notification and production / waste reporting.

    The proposed rulemaking requires electronic submission of well permit applications and predrill surveys. Additionally, the proposed rulemaking requires all notifications to be submitted electronically.

26. Describe the **administrative support** assigned to the E&P environmental regulatory program. If some of these personnel are also responsible for non-E&P program activities, please provide the percent of time or equivalent full-time support related to E&P matters. Include the number, classifications, functions and duties, and minimum experience and training requirements for these positions. Describe any additional training that is made available to them. Indicate whether this level of administrative staffing is considered adequate. [4.3.1.1]

    Please see Appendix C for the organizational chart attached for the Bureau of Planning and Program Management. Please see the response to question 30 for a response to questions on the training that is available to staff.

    The administration of the oil and gas program is located in the central office of the Bureau of Planning and Program Management. The Bureau has three divisions – Surface Activities, Subsurface Activities and Compliance and Data Management.

    The Surface Activities Division develops regulations and policies for activities related to stormwater management, control and disposal of E&P wastes, and site remediation and reclamation. The Subsurface Activities Division administers the abandoned well plugging program and develops regulations and policies pertaining to well drilling, operation and plugging. The Compliance and Data Management Division develops guidance on enforcement procedures, well permitting and data management protocols. The Division is also responsible for administering and enforcing the production and waste reporting requirements.

    The Bureau of Planning and Program Management is understaffed. The Program intends to add 3 program specialists and a licensed geologist to the Subsurface Activities Division, an environmental engineer to the Surface Activities Division and a clerical supervisor. These positions will be funded by the proposed well permit fee increase.

27. Describe how **legal support** is provided to the E&P environmental regulatory program (e.g., in-house lawyers, state attorney general, independent counsel). Indicate the level of support provided and compare it to the level of support considered necessary. [4.3.1.2]

    Legal support is provided by the Bureau of Regulatory Counsel for the Oil and Gas Bureau of Planning and Program Management. Regional Counsel is assigned to District Oil and Gas staff. Hiring external legal staff is possible but internal legal staff levels are sufficient.

28. Describe the **technical staff** assigned to provide geological or engineering support to the E&P environmental regulatory program. If some of these personnel are also responsible for non-E&P program activities, please provide the percent of time or equivalent full-time support related to E&P matters. Include the number, classifications, functions and duties and minimum experience and training requirements for these positions. Describe any additional training that is made available to them. Indicate whether this level of technical staffing is considered adequate. [4.3.1.3]

    Please see Appendix C for an organizational chart of the three district offices. Please also see the response to question 30 for a response to questions on the training that is available to staff. In addition to the geologists and engineers in central office, each oil and gas district office employs licensed professional geologists and engineers who review well permit applications, erosion and sediment control permit applications, stream and wetland crossing permit applications and centralized impoundment applications. The geologists also assist in investigating and resolving water supply complaints.

    The current level of staffing is being increased to ensure more timely and efficient review of erosion and sediment control permit applications, stream and wetland crossing permit applications and centralized impoundment applications. More staffing is also being added to more efficiently address water supply complaints. The Program intends to adequate additional staff to address this need as resources allow.

    Please see Appendix C for the organizational chart. Please also see the responses to question 30 and Section VII, Question 18, below.

29. Describe the **field personnel** assigned to conduct inspections and assure compliance with the E&P environmental regulatory program. If some of these personnel are also responsible for non-E&P program activities, please provide the percent of time or equivalent full time support related to E&P matters. Include the number, classifications, functions and duties and minimum experience and training requirements for these positions. Describe any additional training that is made available to them. Indicate whether this level of field staffing is considered adequate. [4.3.1.4]

    Please see the organizational chart attached. Please also see the response to question 30 for a response to questions on the training that is available to staff. There are currently 83 individuals within the oil and gas program that would be classified as “inspectors”. These positions include Oil and Gas Inspectors who are responsible for overseeing well drilling, completion, servicing, operation and plugging activities. It also includes Water

Quality Specialists who are responsible for overseeing well site and pipeline construction activities as well as investigate spills and water supply complaints. Finally it includes Environmental Protection Specialists who are responsible for waste management activities at well sites and for tracking waste treatment and disposal at commercial facilities. Please also see the responses to Question 30, and Section VII, Question 18, below.

The current level of staffing is not adequate to inspect oil and gas wells at the frequency envisioned by the 2012 Oil and Gas Act. This law requires DEP to inspect well sites before well drilling can commence. It also requires operators to notify DEP prior to the commencement of drilling, before each string of casing is set and before hydraulic fracturing. Given the increased inspections contemplated by these additional notifications, the Program intends to 10 additional inspectors to meet the inspection goals of the 2012 Oil and Gas Act. Please note that the Program also intends to employ 3 additional administrative support staff as part of the overall compliment increase.

30. Describe your program for **training** agency personnel on the regulations, policies and criteria applicable to E&P environmental regulatory matters. [4.3.1.5]

    Please see Appendix E for the Department's Oil and Gas "Boot Camp" training schedule. Please also see the response to Section VII, Question 18, below.

31. Describe the methods used for **funding** the E&P environmental regulatory program in your state (general appropriations, special funds, fees, etc.). If you feel that current funding levels are inadequate, describe the levels of funding needed and the activities that would be conducted. [4.3.2]

    The Oil and Gas Program is completely funded through the well permit fee, erosion and sediment control permit fee, the Act 13 Impact Fee and any fines collected. Please see the answer to question 4, 27, 28 and 29 for discussions on funding and staffing levels.

32. Describe any mechanisms (e.g., memoranda of understanding (MOU), periodic meetings, or coordinated permit review) which are in place to ensure **coordination among state agencies** on E&P environmental regulatory issues. If your state has large tracts of federally administered public lands and/or tribal lands, describe any formal or informal mechanisms in which E&P environmental regulatory programs are coordinated with federal and/or Indian agencies. [4.4]

    On March 8, 2011 Governor Tom Corbett issued Executive Order 2011-01, which formally created the Governor's Marcellus Shale Advisory Commission ("Commission") to undertake a broad review of a multitude of issues related to Marcellus Shale development. Thirty individuals, including the Secretary of the Department of Environmental Protection, Secretary of the Department of Conservation and Natural Resources, the Director of the Pennsylvania Emergency Management Agency, the Secretary of the Department of Agriculture, the Secretary of the Department of Transportation, the Chairman of the Pennsylvania Public Utility

Commission, the Secretary of the Department of Community and Economic development, were appointed by Governor Corbett to serve on the Commission. The review included examining and recommending efforts to mitigate environmental impacts; fostering efforts to promote market development; developing a trained workforce; enhancing emergency response; identifying and mitigating uncompensated local and community impacts; providing for appropriate public health monitoring and analysis; and the responsible and efficient deployment of infrastructure. The Commission issued a report in July 2012 with 96 recommendations. All the environmental recommendations that required a legislative change were incorporated into the 2012 Oil and Gas Act. (For more information, see http://www.portal.state.pa.us/portal/server.pt/community/marcellus_shale_advisory_commission/20074)

Department policy supports the protection of threatened and endangered species and special concern species where applicable during the administration of permit program. The Department uses the Pennsylvania Natural Heritage Program's (PNHP) Pennsylvania Natural Diversity Inventory (PNDI) to achieve those ends. The PNDI system is managed by the Department of Conservation and Natural Resources (DNCR) and included plant and animal species classified by DNCR, the Pennsylvania Game Commission, Pennsylvania Fish and Boat Commission, and the U.S. Fish and Wildlife Service.

Unrelated to federally-administered public lands and/or tribal lands, the Department informally coordinates with EPA Region 3 on underground injection well permits and air quality issues.

III. TECHNICAL CRITERIA

A - GENERAL

1. Describe any **general performance or design standards** applicable to E&P waste management practices used in your state. Describe how these standards prevent contamination of ground water, surface water, soil or air; protect public health, safety and the environment; and prevent property damage. [5.1.a]

   The operator must control and dispose of fluids, residual waste and drill cuttings, including tophole water, brines, drilling fluids, drilling muds, stimulation fluids, well servicing fluids, oil, production fluids and drill cuttings in a manner that prevents pollution of the waters of this Commonwealth and in accordance Chapter 78 and with the statutes under which Chapter 78 was promulgated.

   E&P waste is not managed in Pennsylvania in a manner that varies from the management of any other residual wastes generated by any other industry.

2. Is disposal of E&P waste in **municipal solid waste landfills** allowed? If so, describe the

conditions under which such disposal is allowed. [5.1.c]

In general, no. E&P waste is considered a residual waste under the Solid Waste Management Act and must be managed appropriately as residual waste after leaving the well site.

3. Describe any provisions in the siting, construction or operation criteria for **variances, waivers, or other flexibility** to address site specific or regional conditions. Discuss the circumstances under which such flexibility can be applied. [5.1.d]

   All residual waste permits address site-specific or regional conditions.

4. Provide the **siting** criteria for E&P waste management facilities. If they vary for different types of facilities (pit, landspreading, burial, roadspreading, tank, commercial facility) please list the criteria that apply to each type of facility. [5.1.e]

   As noted above, there are no special requirements for E&P wastes beyond the standard residual waste regulations. Specific chapters of the Department's regulations addressing particular residual waste facilities are as follows:

   Chapter 288. Residual Waste Landfills
   Chapter 289. Residual Waste Disposal Impoundments
   Chapter 290. Beneficial Use of Coal Ash
   Chapter 291. Land Application of Residual Waste
   Chapter 293. Transfer Facilities for Residual Waste
   Chapter 295. Composting Facilities for Residual Waste
   Chapter 297. Incinerators and Other Processing Facilities

   Each chapter contains specific provisions related to the siting of that particular type of residual waste facility. For example, sections 288.121 – 288.128 address proper siting of residual waste landfills, while sections 289.121 – 289.128 address proper siting of residual waste disposal impoundments.

5. Describe any **waste characterization** requirements, including sampling, analysis and quality control procedures. Discuss the purpose and use of the information resulting from the characterizations. Please provide reference to any statutory, regulatory, guidance or policy basis for waste characterization requirements. [5.2]

   E&P waste characterization requirements are provided through the Residual Waste Program implemented by the Department's Bureau of Waste Management. This Bureau provides a reporting mechanism for generators of waste hydraulic fracturing fluids via its Form 26R, Chemical Analysis of Residual Waste, Annual Report by the Generator. This form was modified in 2010 to incorporate a comprehensive list of required analytical parameters for wastewater produced from the drilling, completion and production of unconventional gas wells. For impoundments and tanks, the chemical analysis must represent the volume of wastewater stored in the

impoundment or tank. If large volumes of water, wastewater or other fluids are added to an impoundment, a new chemical analysis must be performed that is representative of the impoundment.

A copy of the updated Form 26R along with instructions detailing proper use and preparation of the form are available at:
http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-10502

6. Are there any **air emission control** requirements applicable to E&P waste management facilities? If so, please describe and provide appropriate references. [5.1.a and 5.10.2.2.c]

   The Department recently released the updated General Permit for Air Pollution Control in Natural Gas Compression and/or Processing Facilities (GP-5). This general permit authorizes the construction, modification, and/or operation of natural gas compression and/or a gas processing facility. The applicability of this general permit may include any of the following:

   - Natural gas-fired spark ignition internal combustion engines
   - Natural gas-fired simple cycle turbines
   - Centrifugal compressors
   - Storage vessels/tanks
   - Glycol dehydration units and associated equipment including Gas-Condensate-Glycol ("GCG") separators (Flash tank separators)
   - Natural gas fractionation process units (such as De-propanizer, De-ethanizer, De-butanizer)
   - Equipment leaks
   - Pneumatic controllers
   - Sweetening units

   A copy of this permit application and instructions is available at
   http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-9747

   Additional information on GP-5 is available at
   http://www.dep.state.pa.us/dep/deputate/airwaste/aq/permits/gp.htm and a presentation to the Citizen's Advisory Council on GP-5 and the proposed Exemption 38 (oil and gas exploration, development, production facilities & associated equipment) is available at
   http://files.dep.state.pa.us/PublicParticipation/Citizens%20Advisory%20Council/CACPortalFiles/Meetings/2013_03/CAC_GP-5_Exempt_38_Presentation_3_19_%202013.pdf

7. Describe any programs promoting a **hierarchy of waste management practices**, including the following in preferred order:

   a. **Source reduction** to reduce the quantity and/or toxicity of waste. [5.3.a]

b. **Recycling or reuse** to reclaim waste. [5.3.b]
c. **Treatment** to reduce the volume or toxicity of the waste. [5.3.c]
d. **Proper disposal** of remaining waste. [5.3.d]

Section 3211(m) of the 2012 Oil and Gas Act requires operators to develop and submit for approval water management plans for the drilling or hydraulic fracture stimulation of any unconventional well. The water management plan must include a reuse plan for fluids that will be used to hydraulically fracture wells. This requirement is fulfilled by complying with the wastewater reduction strategy requirements in 25 Pa.Code § 95.10.

Section 3216(g)(1) of the 2012 Oil and Gas Act allows operators to extend the period for restoration of a well site for up to two additional years if the operator can demonstrate that delayed restoration will result in, *inter alia*, increased water reuse.

Finally, under section 287.53, a person that generates more than an average of 2,200 pounds of residual waste per generating location per month based on generation in the previous year shall prepare a source reduction strategy.

For each type of waste generated, the strategy shall include:

(1) A description of the source reduction activities conducted by the person in the 5 years prior to the date that the strategy is required to be prepared. The description shall quantify reductions in the weight or toxicity of waste generated on the premises.

(2) A statement of whether the person has established a source reduction program.

(3) If the person has established a source reduction program as described in paragraph (2), the strategy shall identify the methods and procedures that the person or municipality will implement to achieve a reduction in the weight or toxicity of the waste generated on the premises, quantify the projected reduction in weight or toxicity of waste to be achieved by each method or procedure and specify when each method or procedure will be implemented.

(4) If the person has not established a source reduction program as described in paragraph (2), the strategy shall include the following:

(i) A waste stream characterization, including source, hazards, chemical analyses, properties, generation rate, management techniques and management costs.

(ii) A description of potential source reduction options.

(iii) A description of how the options were evaluated.

(iv) An explanation of why each option was not selected.

(c) The strategy must be updated when there is a significant change in a type of waste generated on the premises or in the manufacturing process, other than a change described in the strategy as a source reduction method or every 5 years.

(d) If residual waste generated by a person will be processed or disposed of at a solid waste management facility which has applied to the Department for approval to process or dispose of the waste, the person that generated the residual waste shall submit the source reduction strategy required by this section to the facility upon the request of the facility. If residual waste generated by a person is processed or disposed of at a solid waste management facility which has received written approval from the Department to process or dispose of the waste, the person or municipality shall submit the source reduction strategy required by this section to the facility whenever the Department requires the person or municipality to update the strategy.

8. Describe any E&P waste **source reduction opportunities** promoted by the state, such as equipment modifications, procedure changes, product substitution, reduction in use of fresh water, good housekeeping and preventative maintenance, planning, training, and selection of contractors. [5.3.1]

   Please see response to Question 7, above.

9. Describe any E&P **waste recycling or reuse** opportunities promoted by the state. [5.3.2]

   Please see response to Question 7, above.

10. Describe any **program elements** that encourage E&P waste source reduction and recycling through policy, training, technical assistance or incentives. [5.3.3]

    Please see response to Question 7, above. Where 100% of wastewater from a well will be reused, or when stored wastewater will be reused at a well, the Department does not require a residual waste permit for the storage of that wastewater. Instead, the storage is regulated under the 2012 Oil and Gas Act and the proposed rulemaking reflects this policy in sections 78.57 – 78.59c.

B - PITS

11. Do you have specific technical criteria in place in your state for the following **types of pits?** If so, please cite the reference for such criteria. [5.5.1]

    Note: Section 78.57 currently regulates pits for collection of brine and other fluids produced during operation, service and plugging of the well.

In the proposed amendments to Chapter 78, the Department is proposing to prohibit the use of such pits.

	Type	Reference
Y	Reserve pits	78.56
N	Production pits	See note above.
Y	Skimming/settling pits	78.56
N	Produced water pits	See note above.
N	Percolation pits	Prohibited in PA
N	Evaporation pits	Prohibited in PA
N	Special purpose pits	See note above.
N	Blowdown pits	See note above.
Y	Flare pits	78.56
N	Emergency pits	See note above.
N	Basic sediment pits	See note above.
N	Workover pits	See note above.
	Other	

12. Describe briefly how pits are **permitted** in your state. If any types of pits are distinguished or defined separately in the permitting process (e.g., reserve pits, production pits, emergency pits), describe how permit application differs for the different types. [5.5.2.a]

Pits for temporary containment – These facilities are not individually permitted. The installation, construction and maintenance of pits for the temporary containment of pollutional substances and wastes from the drilling, altering, completing, recompleting, servicing and plugging the well, including brines, drilling cuttings, drilling muds, oils, stimulation fluids, well treatment and servicing fluids, plugging and drilling fluids other than gases, is authorized by the well permit so long as the pit complies with the performance and construction standards in 25 Pa.Code § 78.56 (relating to pits and tanks for temporary containment).

Pits for production fluids – 25 Pa.Code § 78.57 provides that "the operator may not use a pit for the control, handling or storage of brine or other fluids produced during operation, service or plugging of a well unless the pit is authorized by a permit under the Clean Streams Law or approval to operate the pit as an impoundment under The Clean Streams Law is obtained from the department under [25 Pa.Code § 78.57(c)]."

In the proposed amendments to Chapter 78, the department is proposing to prohibit the use of pits to store brine and other production fluids generated during the servicing and operation of a well.

Disposal Pits -- These facilities are not individually permitted. An operator may dispose of drill cuttings or residual waste generated by the drilling or production of a well on the well site under the well permit so long as that disposal pit complies with the requirements in 25 Pa.Code § 78.61-62.

Centralized impoundments – These facilities require an individualized permit. Operators seeking to construct a centralized impoundment for wastewater storage from multiple wells must obtain a Dam Permit for a Centralized Impoundment Dam for Oil and Gas Wells. *See* 25 Pa.Code § 105.3.

The proposed amendments to Chapter 78 include a newly added section that seeks to codify existing permitting requirements for centralized impoundments in Chapter 78. This section proposes setback requirements and design and construction standards, including sub-base, secondary liner, leak detection system, and primary liner requirements. Additionally, this section proposes that persons seeking to construct a centralized impoundment must complete a baseline hydrological investigation to document background conditions. Centralized impoundment operators must also install, operate and maintain a water quality monitoring system. Further, this section proposes new requirements for oversight by professional geologists and licensed engineers. This section proposes new restoration requirements for centralized impoundments.

13. Are pits **permitted by rule** in your state? If so, what requirements or limitations (e.g., geographic, geologic, topographic) are included? Give reference to the applicable statutory or regulatory sections. [5.5.2.b]

See response to Question 12 above.

14. Are pits **permitted individually** and/or as part of **facility, operational or general permits?** Give reference to the applicable statutory or regulatory sections. [5.5.2.c]

    See response to Question 12 above.

15. What **notification** is required prior to construction and operation of rule-authorized pits? [5.5.2.d]

    Pits for temporary containment – The proposed amendments to Chapter 78 seek to require operators installing a pit for temporary containment to provide the department 3 business days' notice before the installation of the pit liner. The proposed requirement specifies that notice is not required if the licensed professional engineer or geologist that designed the well site submits a statement on forms provided by the department certifying that the pit and pit liner, as built, are compliant with the regulations. This certification is to be submitted within 10 business days of installation of the pit liner.

    Disposal pits – Proposed amendments to section 78.61 and 78.62 propose to require operators to notify the department 3 business days prior to disposing drill cutting or residual waste pursuant to those sections.

    Pits for production fluids – The proposed amendments to Chapter 78 seek to prohibit the use of pits to store brine and other production fluids generated during the operation of a well.

    Centralized Impoundments – Under 25 Pa.Code § 105.21a, notice is published in the Pennsylvania Bulletin upon receipt of an application for a centralized impoundment and again upon issuance or denial of a permit.

16. Briefly describe any provisions concerning the issuance and use of **emergency permits** for pits. Give reference to the applicable statutory or regulatory sections. [5.5.2.e]

    Not applicable.

17. What requirements are included in statewide regulations regarding the size, depth, berm height and other **construction** parameters for pits? What is the permit review process to assure that these requirements are met? Give reference to the applicable regulatory sections. [5.5.3.a]

    Pits for temporary containment – These facilities are authorized by the well permit in compliance with the construction and performance standards in 25 Pa.Code § 78.56, including minimum freeboard, liner, and minimum distance to seasonal high groundwater table requirements.

    The proposed amendments to this section propose new fencing, seam integrity testing,

seasonal high groundwater determinations, and inspection requirements.

Disposal pits – Section 78.61 and 78.62 outline the construction requirements for disposal pits, including setback, liner, and concentration limits requirements.

Pits for production fluids – The proposed amendments to Chapter 78 seek to prohibit the use of pits to store brine and other production fluids generated during the operation of a well.

Centralized impoundments – The design and construction standards for centralized impoundments are currently provided in Form # 5500-PM-OG0084 (http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-82540/5500-PM-OG0084%20Design%20and%20Construction%20Standards.pdf), including setbacks, site preparation, soils, soil compaction, embankment design, liner system water quality monitoring requirements. The proposed amendments to Chapter 78 include a new provision (section 78.59c) relating to centralized impoundments. These provisions propose setback requirements and design and construction standards, including sub-base, secondary liner, leak detection system, and primary liner requirements. Additionally, this section proposes that persons seeking to construct a centralized impoundment must complete a baseline hydrological investigation to document background conditions. Centralized impoundment operators must also install, operate and maintain a water quality monitoring system. Further, this section proposes new requirements for oversight by professional geologists and licensed engineers. This section proposes new restoration requirements for centralized impoundments.

18. What requirements are in place to assure that there is no adverse **impact to ground water or surface waters** from use of the pit? Give reference to the applicable statutory or regulatory sections. [5.5.3.b]

Pits for temporary containment – The performance and construction standards in section 78.56(a) are in place to prevent the threat of pollution to waters of the Commonwealth. For example, section 78.56(a)(4)(iii) requires the bottom of the pit to be at least 20 inches above the seasonable high groundwater table. Section 78.56 (a)(4) contains liner requirements that ensure that the liner of impermeable and properly installed. Additionally, section 78.56(a)(3) requires that pit be designed, constructed and maintained to be structurally sound and reasonably protected from unauthorized acts of third parties.

The new proposed requirements in section 78.56, including new liner requirements and groundwater determinations provide an additional degree to protection to waters of the Commonwealth.

Disposal pits – The performance and construction standards, included concentration limits, in Sections 78.61 and 78.62 are in place to ensure that disposal pits do not pose a threat of pollution to waters of the Commonwealth.

Centralized impoundments – Form # 5500-PM-OG0084 contains the design and construction standards for centralized impoundments, including setback, site preparation,

soil standard, soil compaction, embankment design, liner system, sub-base, secondary liner, leak detection zone, primary liner, allowable leakage rate, water quality monitoring, and engineer certification requirements. All of these standards were set to prevent the potential for pollution to waters of the Commonwealth.

The proposed amendments to Chapter 78 seek to codify these standards.

19. What requirements are in place to assure **structural integrity** of pits? Give reference to the applicable statutory or regulatory sections. [5.5.3.c]

Pits for temporary containment – 25 Pa. Code § 78.56(a)(3) specifically provides that pits shall be designed, constructed and maintained to be structurally sound and reasonable protected from unauthorized acts of third parties. The new construction requirements in the proposed rulemaking further assure structural integrity of pits, including the liner compatibility standards and seam testing requirements as well as a proposed requirement that the interior slopes have a slope no steeper than 2 horizontal to 1 vertical.

Disposal pits – All disposal pits must be designed, constructed and maintained to be structurally sound and impermeable. *See* 25 Pa.Code §§ 78.61(c)(1), 78.62(a)(9). Specifically, these pits must meet the same liner standards provided in section 78.56(a).

Pits for production fluids – The proposed amendments to Chapter 78 seek to prohibit the use of pits to store brine and other production fluids generated during the operation of a well.

Centralized impoundments -- The design and construction standards for centralized impoundments in Form # 5500-PM-OG0084 and the proposed rulemaking in section 78.59c contain robust construction standards to ensure protection of waters of the Commonwealth.

20. In what ways do construction requirements assure that pits are designed to accommodate fluids which are intended to be contained in them such as oil-based drilling muds or cuttings from salt sections? [5.5.3.d]

Pits for temporary containment -- Currently, 25 Pa.Code § 78.56 requires the liner to be designed, constructed and maintained so that the physical and chemical characteristics of the liner are not adversely affected by the waste. The proposed amendments to 25 Pa. Code § 78.56 seek to address further by requiring that liner be designed meet liner compatibility standards.

Disposal pits – The disposal pit requirements also require that liners be compatible with the waste contained therein. *See* 25 Pa.Code §§ 78.61(c)(1), 78.62(a)(10).

Centralized impoundments -- The design and construction standards for centralized impoundments in Form # 5500-PM-OG0084 and the proposed rulemaking in section 78.59c, including the liner requirements, were specifically developed for wastewaters

associated with oil and gas activities.

21. Do construction standards for pits differ depending on the **waste characteristics** of materials they are to receive? If so, describe the circumstances under which variances or special conditions are used. [5.5.3.e]

    No.

22. Under what conditions are **pit liners** required or **tanks** required in lieu of pits? What are the requirements for liner construction and installation? Give reference to the applicable statutory or regulatory sections. [5.5.3.e]

    Pits for temporary containment – Liners are required under all circumstances. *See* 25 Pa.Code § 78.56(a)(4). Operators may use either pits or tanks.

    The proposed amendments to Chapter 78 seek to also allow operators to use aboveground modular storage facilities upon Department approval.

    Disposal pits – A liner is requirements under all circumstances. See 25 Pa.Code §§ 78.61(c)(1), 78.62(a)(10).

    Centralized impoundments – The design and construction standards for centralized impoundments in Form # 5500-PM-OG0084 and the proposed rulemaking in section 78.59c(e) contain specific liner system requirements, including sub-base, primary liner, secondary liner, leak detection system requirements.

23. What are the requirements for **fencing, netting and caging** of pits? Give reference to the applicable statutory or regulatory sections. [5.5.3.f]

    Pits for temporary containment -- The proposed amendments seek to require new monitoring requirements for pits at unconventional well sites. If the well site is not being attended by an individual at all times, the proposed requirement seek to impose fencing requirements.

    Disposal pits – N/A

24. What are the requirements for the **placement of reserve pits** relative to drilling equipment? [5.5.3.g]

    All of the location restrictions for pits and impoundments apply to waters of the Commonwealth instead of equipment on the well site.

25. What restrictions are placed on the **type and characteristics of wastes** that can be placed in pits? Please specify the requirements by type of pits. Give reference to the applicable statutory or regulatory sections. [5.5.4.a]

Pits for temporary containment – Only pollutional substances and wastes from the drilling, altering, completing, recompleting, servicing or plugging the well may be stored in temporary pits.

Disposal pits – Only drill cuttings and wastes that meet the concentration limits in section 78.62(b) may be disposed of on the well site where those drill cuttings or waste were generated.

Centralized impoundments – In the definitions section of the proposed amendments to Chapter 78, centralized impoundment is defined as "a facility that meets the following:(1) a natural topographic depression, manmade excavation or diked area formed primarily of earthen materials,(2) designed to hold fluids or semi-fluids associated with oil and gas activities, including wastewater, flowback and mine influenced water, the escape of which may result in air, water or land pollution or endanger persons or property, (3) constructed solely for the purpose of servicing multiple well sites.

26. What **security** guidelines or requirements are in place regarding pits? Give reference to the applicable statutory or regulatory sections. [5.5.4.b]

    Pits for temporary containment -- Section 78.56(a)(3) currently requires temporary pits to be constructed and maintained to be reasonably protected from unauthorized acts of third parties. The proposed amendments seek to require new monitoring requirements for pits. If the facility is not monitoring, the proposed requirement seek to impose fencing requirements. These amendments additionally specify that the fencing must be designed to prevent unauthorized acts of third parties and damage caused by wildlife.

27. What are the requirements for maintaining a **freeboard** level in pits and how is this level calculated? Give reference to the applicable statutory or regulatory sections. [5.5.4.c]

    Pits for temporary containment -- Section 78.56(a)(2) requires that the pit be designed, constructed and maintained so that at least 2 feet of freeboard remains at all times.

    Centralized impoundments -- The design and construction standards for centralized impoundments in Form # 5500-PM-OG0084 and the proposed rulemaking in section 78.59c

    Pits for production fluids -- Section 78.57(c)(2)(iv) contains a 2 freeboard requirement. However, the proposed amendments to Chapter 78 would prohibit the use of pits to store brine and other production fluids generated during the operation of a well.

28. How is **liner integrity** maintained and assured in lined pits? [5.5.4.d]

    Pits for temporary containment – The liner requirements, including the subbase standards ensure liner integrity. *See* 25 Pa.Code § 78.56(a)(4)(ii). Section

78.56(a)(4)(iv) specifies that if the liner is torn or loses integrity, the pit shall be managed to prevent the contents from leaking.

The proposed amendments to section 78.56 would require that the pit liner be inspected prior to placing material in the pit.

Pits for production fluids – In addition to liner and subbase requirements in section 78.57, section 78.57(c)(2)(ix) specifies that prior to placing brine or other fluids in the pit, the operator must inspect the liner and correct any damages or imperfections.

Disposal pits – Pits must meet the liner requirements in section 78.62(a)(9)-(15) and must be inspected for lack of uniformity, damage or other imperfections prior to placing material in the pit.

Centralized impoundments – Specific primary and second liner requirements as well as leak detection requirements assure liner integrity.

29. What routine **inspections or monitoring** are required by the operator to assure that pit operational and structural integrity requirements are being met? Are results of these inspections reported? [5.5.4.e]

The proposed rulemaking would require that all surface containment systems be inspected weekly to ensure integrity. If the containment system is damaged or compromised, the well operator must repair the containment system as soon as practicable. The well operator shall maintain records of any repairs until the well site is restored. Stormwater shall be removed as soon as possible and prior to the capacity of secondary containment being reduced by 10% or more. Inspection reports and maintenance records shall be available at the well site for review by the Department.

Pits for temporary containment – The proposed amendments to section 78.56 require that the pit liner be inspected prior to placing material in the pit.

Pits for production fluids – Section 78.57(c)(2)(ix) specifies that prior to placing brine or other fluids in the pit, the operator must inspect the liner and correct any damages or imperfections.

Centralized impoundments – The design and construction standards for centralized impoundments in Form # 5500-PM-OG0084 and the proposed rulemaking in section 78.59c require the following: The operator must inspect the primary and secondary pit liners during construction and installation. The operator shall monitor the leak detection zone weekly to determine whether liquid is flowing from the zone. These records shall be made available to the Department upon request. Weekly leakage rates shall be documented and provided to the Department upon request. These records shall be made available to the Department upon request. Additionally, water samples must be collected from monitoring wells on a minimum frequency of once per calendar quarter. *See* proposed 25 Pa.Code § 78.59c.

30. What are the requirements for **removal/disposal/recycling of hydrocarbons** that accumulate in pits? Give reference to the applicable statutory or regulatory sections. [5.5.4.f]

    The proposed amendments to Chapter 78 specify that "[c]ondensate, whether separated or mixed with other fluids, shall not be stored in any open top structure or pit. Tanks used for storing or separating condensate during well completion shall be monitored and shall have controls to prevent vapors from exceeding the lower explosive limits of the condensate outside the tank. Tanks used for storing or separating condensate shall be grounded." *See* proposed 25 Pa.Code § 78.56(a)(17).

31. What are the requirements for **removal of separated oil or wastes** from unlined skimming/settling pits? [5.5.4.g]

    Unlined pits are not permitted.

32. Are **produced water pits** allowed in your state? If so, what are the requirements for disposal of the water? [5.5.4.h]

    Proposed to be eliminated.

33. Describe any restrictions concerning the use of **percolation pits.** [5.5.4.i]

    They are not permitted.

34. Describe maintenance requirements for **evaporation pits.** Give reference to the applicable statutory or regulatory sections. [5.5.4.j]

    They are not permitted

35. What restrictions are placed on the use of **emergency pits?** Are notification of the regulatory agency and removal of fluids required when they are used? [5.5.4.k]

    Proposed to be eliminated.

36. Is there a prohibition against the use of **unlined basic sediment pits** for oily wastes? Give reference to the applicable statutory or regulatory sections. [5.5.4.1]

    All pits must have a synthetic liner. 25 Pa.Code § 78.56

37. What limitations are placed on the operation of **workover pits?** [5.5.4.m]

    Proposed to be eliminated.

38. What time limit is placed on the **closure of reserve pits?** Give reference to the applicable statutory or regulatory sections. [5.5.5.b]

These pits must be closed within 9 months of the completion of drilling. 58 Pa. C.S. § 3216.

39. What **testing of pit liquids is required before pit closure?** When is on-site disposal of pit liquids authorized and what criteria apply to such disposal? Give reference to the applicable statutory or regulatory sections. [5.5.5.c]

    Only tophole water and uncontaminated precipitation may be disposed of on site. No other fluids may be disposed of at a well site. Section 78.60 further limits the discharge of tophole water to the following: the pH is not less than 6 nor greater than 9 standard units, or is characteristic of the natural background quality of the groundwater and; the specific conductance of the discharge is less than 1,000 µmHos/cm.

40. Under what conditions must pit **liquids be removed** before closure? What are the requirements for disposal of these liquids? [5.5.5.d]

    See above. The free liquid fraction of the waste in a pit must be removed and disposed of at a permitted facility.

41. What are the requirements for **closure and reclamation** of pit sites? Give reference to the applicable statutory or regulatory sections. [5.5.5.e]

    There is a lengthy list of requirements for the closure and reclamation of pits. See 25 Pa.Code §§ 78.61 and 78.62 for pit closure requirements.

42. What **records** are kept of pit sites and what is their availability to the public? Give reference to the applicable statutory or regulatory sections. [5.5.5.f]

See section 78.65. Within 60 days after the restoration of the well site, the operator shall submit a well site restoration report to the Department. The report shall be made on forms provided by the Department and shall identify the following:

(i) The date of land application of the tophole water, the results of pH and specific conductance tests and an estimated volume of discharge.

(ii) A description of the method used for disposal or reuse of the free liquid fraction of the waste, and the name of the hauler and disposal facility, if any.

(iii) The location of the pit in relation to the well, the depth of the pit, the type and thickness of the material used for the pit subbase, the type and thickness of the pit liner, the type and nature of the waste, a description of the pit closure procedures used and the pit dimensions.

(iv) The location of the area used for land application of the waste, and the results of a chemical analysis of the waste soil mixture if requested by the Department.

(v) The types and volumes of waste produced and the name and address of the waste disposal facility and waste hauler used to dispose of the waste.

The proposed rules would further require operators to provide the site restoration report to the surface landowner if cuttings were disposed of onsite and would require unconventional operators to submit the test results demonstrating that the cuttings or waste met the applicable thresholds for onsite disposal.

C - LANDSPREADING (Non-Commercial)

43. Do you have specific **criteria for landspreading** of E&P wastes? If so, give reference to the applicable statutory or regulatory sections. [5.6.1.b]

Yes. Drill cuttings from above the casing seat (uncontaminated drill cuttings) may be land applied according to the provision in section 78.61(b). Drill cutting from below the casing (contaminated drill cuttings) seat may be land applied pursuant to section 78.61(c)(2) according to section 78.63(a)(5)–(18) and (b) (relating to disposal of residual waste–land application). Residual waste generated by the drilling or production of an oil or gas well that is located on the site may be land applied according to section 78.63.

The proposed rulemaking contains restrictions, notification requirements, compliance documentation for land application activities.

44. Is on-site **landspreading of waste containing NORM** above action levels prohibited? [5.6.1.c]

    Section 78.63(b) contains the concentration limits for land applying contaminated drill cuttings and residual waste. This section does not address waste containing NORM.

45. Briefly discuss each of the following **operational requirements** as they apply to landspreading (give reference to any statutory or regulatory requirements): [5.6.3]

    a. Removal of free oil

       According to section 78.61(b)(2), if an operator seeks to land apply drill cuttings from above the casing, they must not be contaminated with pollutional materials, including brines, drilling muds, stimulation fluids, well servicing fluids, oil, production fluids or drilling muds other than tophole water, freshwater or gases. If an operator seeks to land apply drill cutting from below the casing seat or residual waste, they must remove the free liquid fraction and meet concentration limits in section 78.63(b).

    b. Allowable pH range of waste being disposed

       See response to question 45.a.

    c. Spreading of solids and incorporation into the soil

       For uncontaminated drill cuttings, the area must have a minimum depth of 20 inches, the cuttings must be spread and incorporated into the soil and the area must be revegetated. See § 78.61(b)(5)-(10). For contaminated drill cuttings and residual waste, operators must comply with section 78.63(a)(5)-(20).

    d. Application rates, methods and practices for liquids

       Tophole water may be land applied in accordance with section 78.60. Otherwise, any liquid fraction must be removed prior to land application of drill cuttings or residual waste.

    e. Addition of nutrients for biodegradation

       N/A

    f. Waste limitations (e.g., EC, ESP, SAR)

       See response to question 45.a.

g. Limitations on waste-soil ratio by oil and grease content

See response to question 45.a.

h. Limits on salt and hydrocarbon content in final waste-soil mixture

See response to question 45.a.

i. Enhanced techniques available to meet final criteria for salt and hydrocarbons

See response to question 45.a.

j. Soil analysis required prior to landspreading and/or after site closure

Section 78.63(a)(19) specifies that the department may require the owner or operator to conduct soil surveys, monitoring or chemical analysis. The proposed regulations (proposed § 78.63(d)) require operators to document compliance with the concentration limitations in section 78.63(b) and make them available to the department upon request.

k. Any additional criteria for landspreading special wastes

See §§ 78.61 – 78.63

D - BURIAL AND LANDFILLING (Non-Commercial)

46. Do you have specific **regulatory requirements** for burial or landfilling of E&P wastes? If so, give reference to the applicable statutory or regulatory sections. [5.7.2]

    Yes. The Department's current E&P regulations address burial and landfilling of E&P wastes. Section 78.61 (relating to disposal of drill cuttings) and section 78.62 (disposal of residual waste – pits) both relate to this issue.

47. Briefly discuss each of the following **operational requirements** as they apply to burial or landfilling (give reference to any statutory or regulatory requirements): [5.7.3]

    a. Criteria under which waste may be buried or landfilled (if different than landspreading criteria)

    Section 78.61 contains the following requirements:

    (a) Drill cuttings from above the casing seat—pits. The owner or operator may dispose of drill cuttings from above the casing seat in a pit at the well site if the owner or operator satisfies the following requirements:

    (1) The drill cuttings are generated from the well at the well site.

    (2) The drill cuttings are not contaminated with pollutional material, including brines, drilling muds, stimulation fluids, well servicing fluids, oil, production fluids or drilling fluids other than tophole water, fresh water or gases.

    (3) The disposal area is not within 100 feet of a stream, body of water or wetland.

    (4) The disposal area is not within 200 feet of a water supply.

    (5) The pit is designed, constructed and maintained to be structurally sound.

    (6) The free liquid fraction of the waste shall be removed and disposed under § 78.60 (relating to discharge requirements).

    (7) The pit shall be backfilled to the ground surface and graded to promote runoff with no depression that would accumulate or pond water on the surface. The stability of the backfilled pit shall be compatible with the adjacent land.

    (8) The surface of the backfilled pit area shall be revegetated to stabilize the soil surface and comply with § 78.53 (relating to erosion and sedimentation control). The revegetation shall establish a diverse, effective, permanent, vegetative cover

which is capable of self-regeneration and plant succession. Where vegetation would interfere with the intended use of the surface of the landowner, the surface shall be stabilized against erosion.

(b) Drill cuttings from below the casing seat. After removal of the free liquid fraction and disposal in accordance with § 78.60, drill cuttings from below the casing seat may be disposed of in a pit that meets the requirements of § 78.62(a)(5)—(18) and (b) (relating to disposal of residual waste—pits) (see below).

(c) Section 78.62 establishes the requirements for disposal of residual waste in a pit at the well site. After the removal and disposal of the free liquid fraction of the waste, the owner or operator may dispose of residual waste, including contaminated drill cuttings, in a pit at the well site if the owner or operator satisfies the following requirements:

(1) The waste is generated by the drilling or production of an oil or gas well that is located on the well site where the waste is disposed.

(2) The well is permitted or registered.

(3) The operator has filed a surety or collateral bond for wells drilled on or after April 18, 1985.

(4) Compliance is maintained with the act and this title.

(5) The disposal area is not within 200 feet measured horizontally from an existing building, unless the current owner thereof has provided a written waiver consenting to the disposal closer than 200 feet.

(6) The disposal area is not within 100 feet of a stream, body of water or wetland.

(7) The disposal area is not within 200 feet of a water supply.

(8) The bottom of the pit is a minimum of 20 inches above the seasonal high groundwater table.

(9) The pit is designed, constructed and maintained to be structurally sound and impermeable.

(10) The pit is lined with a synthetic flexible liner that is compatible with the waste and has a coefficient of permeability of no greater than 1 x 10-7 cm/sec. The liner shall be of sufficient strength and thickness to maintain the integrity of the liner. The liner thickness shall be at least 30 mils. Adjoining sections of liners shall be sealed together in accordance with the manufacturer's directions to prevent leakage.

(11) The liner shall be designed, constructed and maintained so that the physical and chemical characteristics of the liner are not adversely affected by the waste and the liner is resistant to physical, chemical and other failure during transportation, handling, installation and use. Liner compatibility shall satisfy EPA Method 9090, Compatibility Test for Wastes and Membrane Liners, or other documented data approved by the Department.

(12) The pit shall be constructed so that the liner subbase is smooth, uniform and free of debris, rock and other material that may puncture, tear, cut, rip or otherwise cause the liner to fail. The liner subbase and subgrade shall be capable of bearing the weight of the material above the liner without settling. If the pit bottom or sides consist of rock, shale or other material that may cause the liner to fail and leak, a subbase of at least 6 inches of soil, sand or smooth gravel, or sufficient amount of an equivalent material shall be installed over the area as the subbase for the liner.

(13) Prior to placing material in the pit, the liner shall be inspected for lack of uniformity, damage and other imperfections that may cause the liner to leak. The owner or operator shall correct damages or imperfections before placing waste in the pit, and shall maintain the pit until closure of the pit.

(14) The liner shall be folded over, or an additional liner shall be added, to completely cover the waste and the waste is shaped so that water does not infiltrate the liner and is not confined above the liner.

(15) The pit shall be backfilled to at least 18 inches over the top of the liner and graded to promote runoff with no depressions that would accumulate or pond water on the surface. The stability of the backfilled pit shall be compatible with the adjacent land.

(16) The surface area of the backfilled pit area shall be revegetated to stabilize the soil surface and comply with § 78.53 (relating to erosion and sedimentation control). The revegetation shall establish a diverse, effective permanent vegetative cover which is capable of self-regeneration and plant succession. Where vegetation would interfere with the intended use of the surface by the landowner, the surface shall be stabilized against erosion.

b. liner requirements where salt or hydrocarbon content exceeds allowable limits

As noted above, under section 78.61 drill cuttings cannot be disposed of at the well site if they are contaminated with pollutional material, including brines, drilling muds, stimulation fluids, well servicing fluids, oil, production fluids or drilling fluids other than tophole water, fresh water or gases.

Under 78.62, any disposal of residual waste, including contaminated drill cuttings, must be accomplished through the use of an adequate liner. Even with a liner,

however, a person may not dispose of residual waste, including contaminated drill cuttings, at the well site unless the waste meets the following requirements:

(1) The concentration of contaminants in the leachate from the waste does not exceed 50% of the maximum concentration in § 261.24 Table I (relating to characteristic of toxicity).

(2) The concentration of contaminants in the leachate from the waste does not exceed 50 times the primary maximum contaminant level in effect under § 109.202 (relating to State MCLs, MRDLs and treatment technique requirements).

(3) For other health related contaminants, the concentration of contaminants in the leachate from the waste does not exceed 50 times the safe drinking water level established by the Department.

(4) Leachate characteristics are determined in accordance with methods approved by the Department.

c. requirements for record keeping or recording of locations

Currently, the location must be included in the well site restoration report in accordance with § 78.65.

The proposed rulemaking adds notification requirements to both section 78.61 and section 78.62. Operators disposing of E&P wastes in accordance with these sections must provide notice to the Department at least 3 business days before disposing of drill cuttings pursuant to these sections. This notice shall be submitted electronically to the Department through its website and include the date the cuttings will be disposed. If the date of disposal is extended, the operator shall re-notify the Department of the new date of disposal. This information would be retained as part of the Department's eFACTS database.

E - ROADSPREADING

48. Do you have specific **regulatory criteria** for roadspreading of E&P wastes? If so, give reference to the applicable statutory or regulatory sections. [5.8.2]

Although the current E&P regulations do not contain specific roadspreading regulatory criteria, the Department has developed guidelines that must be followed when spreading brine on unpaved roads. The guidelines were developed under the authority of Clean Streams Law, the Solid Waste Management Act, and 25 Pa.Code Chapters 78 and 91. The guidelines are available at http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-92873/8000-FS-DEP1801.pdf)

The proposed rulemaking adds two sections covering this activity to the Department's E&P regulations, section 78.70 (relating to road-spreading of brine for dust control and road stabilization) and section 78.71 (relating to pre-wetting, anti-icing and de-icing). These proposed sections codify the current practices of the Department relating to roadspreading of brines into regulation.

49. Briefly discuss each of the following **operational requirements** as they apply to roadspreading (give reference to any statutory or regulatory requirements): [5.8.3]

a. testing criteria that are applicable for wastes proposed for roadspreading (e.g., ignitability, density, metal content, consistency with approved road oils)

A person proposing to conduct roadspreading must determine a representative chemical analysis of the brine for the following parameters: calcium, sodium, chloride, magnesium and total dissolved solids. Free oil must be separated from the brine before spreading.

Under proposed section 78.71, the applicant must perform a chemical analysis of the brine for the parameters required by subsection (e). A representative sample of the brine to be spread may be used, provided that the operator demonstrates that the representative sample is equivalent to the brine being used for pre-wetting, anti-icing and de-icing. Subsection (e) establishes the following standards:

Allowable Level Pre-wetting	Parameter	Allowable Level Anti-icing/De-icing
>170,000 mg/l	TDS	>170,000 mg/l
>80,000 mg/l	Chloride	>80,000 mg/l
>40,000 mg/l	Sodium	>40,000 mg/l
>20,000 mg/l	Calcium	>20,000 mg/l
5 to 9.5	pH	5 to 9.5
<500 mg/l	Iron	<500 mg/l
<100 mg/l	Barium	<30 mg/l
<10 mg/l	Lead	<5 mg/l
<1,000 mg/l	Sulfate	<400 mg/l
<15 mg/l	Oil & Grease	<15 mg/l
<0.5 mg/l	Benzene	<0.5 mg/l
<0.7 mg/l	Ethylbenzene	<0.7 mg/l
<1 mg/l	Toluene	<1 mg/l
<1 mg/l	Xylene	<1 mg/l

b. application rates

The application for approval of a roadspreading plan must include a proposed rate and frequency of application. Brine may only be applied at a rate and frequency necessary to suppress dust and stabilize the road. The rate and frequency of application must be controlled to prevent the brine from flowing or running off into roadside ditches, streams, creeks, lakes and other bodies of water or infiltrating to groundwater.

Recommended spreading rates for dust control and road stabilization: The road should initially be spread at a rate of up to one-half gallon per square yard (typically after the road has been graded in the spring). The road should subsequently be spread at a rate of up to one-third gallon per square yard no more than once per month unless–based on weather conditions, traffic volume or brine characteristics—a greater frequency is needed to control dust and stabilize the road. The application rate for race tracks and mining haul roads should be determined for each site and should not exceed one gallon per square yard.

Recommended spreading rates for pre-wetting, anti-icing and de-icing: 10 gallons per ton for pre-wetting use, less than 50 gallons per lane per mile for anti-icing use, and less than 100 gallons per lane per mile for de-icing.

c. buffer zones

Brine must not be applied within 150 feet of a stream, creek, lake or other body of water. Brine must not be placed on sections of road having a grade exceeding 10 percent. For dust control and road stabilization, brine shall not be spread on wet or frozen roads, during precipitation events, or when precipitation is imminent.

d. produced water testing (for similarity to approved commercial products)

See response to question 49.a.

F - TANKS

50. Describe any requirements pertaining to the **location, use, capacity, age and construction of E&P waste tanks,** including registration, inventories, etc. [5.9.2.a]

Generally speaking, the Department's current regulations in sections 78.56 and 78.57 are relatively limited in terms of specific requirements regarding the location, use, capacity, age and construction of E&P waste tanks. So long as the operator's tanks are in compliance with sections 78.56 and 78.57 they can be used to store E&P wastes. General requirements include:

1. The tank or series and tanks must be constructed and maintained with sufficient capacity to contain all pollutional substances and wastes which are used or produced during drilling, altering, completing and plugging the well.

2. If open tanks are used, the tanks must be maintained so that at least 2 feet of freeboard remain at all times unless the tank is provided with an overflow system to a standby tank or pit with sufficient volume to contain all excess fluid or waste. If an open standby tank is used, it shall be maintained with 2 feet of freeboard.

3. Tanks shall be designed, constructed and maintained to be structurally sound and reasonably protected from unauthorized acts of third parties.

4. A tank that contains drill cuttings from below the casing seat, pollutional substances, wastes or fluids other than tophole water, fresh water and uncontaminated drill cuttings shall be impermeable.

See responses to Questions 52 – 54, below for specific responses.

51. Describe any state program pertaining to **pollution prevention requirements relating to tanks.** [5.9.2.c]

See responses to questions 50, above, and 52 – 53, below.

52. Briefly discuss each of the following **operational requirements** as they apply to E&P waste tanks (give reference to any statutory or regulatory requirements): [5.9.3]

a. corrosion protection

Section 3218.4(b) of the 2012 Oil and Gas Act requires all permanent aboveground and underground tanks must comply with the applicable corrosion control requirements in the Department's storage tank regulations (25 Pa.Code §§ 245.531-534, available at http://www.pacode.com/secure/data/025/chapter245/chap245toc.html).

b. structural integrity

Section 78.56(d) of the proposed regulations establishes structural integrity requirements for tanks used to store production fluids. Tanks, series of tanks or other above ground storage structures approved by the Department used to store brine or other fluids produced during operation of the well, shall be designed, constructed and maintained to be structurally sound in accordance with sound engineering practices adhering to nationally recognized industry standards and the manufacturer's specifications. Tanks that are manifolded together shall be designed in a manner to prevent the uncontrolled discharge of multiple manifolded tanks.

Proposed regulation section 78.56(a)(17) contains specific requirements for tanks storing

condensate. Condensate, whether separated or mixed with other fluids, shall not be stored in any open top structure or pit. Tanks used for storing or separating condensate during well completion shall be monitored and shall have controls to prevent vapors from exceeding the lower explosive limits of the condensate outside the tank. Tanks used for storing or separating condensate shall be grounded.

Section 3215(f) of the 2012 Oil and Gas Act strictly limits the use of tanks to store hazardous materials, chemicals, condensate, wastes, flowback or produced water within the floodway. If a well site will have a tank containing condensate, flowback or produced water within the flood fringe unless all the tanks have adequate floodproofing in accordance with the National Flood Insurance Program standards and accepted engineering practices.

c. protection against overtopping

Section 78.56(a)(2) establishes freeboard requirements. If open tanks are used, the tanks shall be maintained so that at least 2 feet of freeboard remain at all times unless the tank is provided with an overflow system to a standby tank or pit with sufficient volume to contain all excess fluid or waste. If an open standby tank is used, it shall be maintained with 2 feet of freeboard.

Section 78.57(a) of the proposed regulations would ban the use of open-top tanks for the storage of brine and other fluids produced during operation of a well.

d. secondary containment/leak detection

The current regulations do not specify secondary containment or leak detection requirements for tanks storing production fluids.

Section 3218.2 of the 2012 Oil and Gas Act establishes containment requirements for unconventional well sites. Unconventional well sites must be designed and constructed to prevent spills to the ground surface or spills off the well site. Containment practices shall be instituted on the well site during both drilling and hydraulic fracturing operations. Containment must be sufficiently impervious and able to contain spilled material or waste until it can be removed or treated and be compatible with the waste material or waste stored or used within the containment. Permit applicants must submit a plan to the Department describing the containment practices to be utilized and the area of the well site where containment systems will be employed. The plan shall include a description of the equipment to be kept onsite during drilling and hydraulic fracturing operations to prevent a spill from leaving the well site. Containment systems must be used wherever drilling mud, hydraulic oil, diesel fuel, drilling mud additives, hydraulic fracturing additives or hydraulic fracturing flowback are stored. Areas where any additives, chemicals, oils or fuels are to be stored must have sufficient containment capacity to hold the volume of the largest container stored in the area plus 10% to allow for precipitation, unless the container is equipped with individual secondary containment.

Section 78.56(c) of the proposed regulations establishes secondary containment requirements for tanks used to store production fluids. Under the proposal, secondary containment capable of preventing tank contents from entering waters of the Commonwealth is required for all new, refurbished or replaced tanks or other aboveground containment structures approved by the Department, including their associated manifolds, that contain brine and other fluids produced during operation of the well. If one tank in a series of tanks is added, refurbished or replaced, secondary containment is required for the entire series of tanks. The secondary containment area provided by dikes or other methods of secondary containment open to the atmosphere shall have containment capacity sufficient to hold the volume of the largest single tank, plus an additional 10% of volume for precipitation. Compliance with section 78.64 (relating to containment around oil and condensate tanks) or using double walled tanks capable of detecting a leak in the primary container shall fulfill the requirements in this subsection.

Section 78.64 of the current regulations does require secondary containment for a tank (with a capacity of at least 660 gallons) or tanks (with a combined capacity of at least 1,320 gallons) used to contain oil produced from a well which satisfies the requirements under 40 CFR Part 112 (relating to oil pollution prevention) around the tank or tanks which will prevent the tank contents from entering waters of this Commonwealth.

The containment area provided by the secondary containment must have containment capacity sufficient to hold the volume of the largest single tank, plus a reasonable allowance for precipitation based on local weather conditions and facility operation.

e. covers or measures to prevent entry of wildlife

Section 78.56(a)(3) requires that tanks be designed, constructed and maintained to be structurally sound and reasonably protected from unauthorized acts of third parties.

For unconventional well sites, section 78.56(a)(5) of the proposed regulations requires that unless an individual is continuously present at the well site, a fence or fences shall completely surround all pits to prevent unauthorized acts of third parties and damage caused by wildlife.

Section 78.57(g) of the proposed regulations requires all new, refurbished or replaced tanks storing brine or other fluids produced during operation of the well to be reasonably protected from unauthorized acts of third parties. Unless the tank is surrounded by a fence, tank valves and access lids must utilize locks, open end plugs or removable handles and ladders on tanks shall be retractable or other measures that prevent access by third parties.

f. hydrogen sulfide emission control

The Department's E&P regulations do not currently specify standards for hydrogen sulfide emission control relating to tanks used to store production fluids. However, section 78.77 does require operators proposing to drill a well within a 1-mile radius of a well drilled to or

through the same formation where hydrogen sulfide has been found while drilling to install monitoring equipment during drilling at the well site to detect the presence of hydrogen sulfide in accordance with American Petroleum Institute publication RP49, "Recommended Practices for Safe Drilling of Wells Containing Hydrogen Sulfide." Similarly, when hydrogen sulfide is detected in concentrations of 20 ppm or greater, section 78.77 requires that the well be drilled in accordance with American Petroleum Institute publication API RP49.

53. Describe any tank **removal and closure** requirements and provide reference to statutory or regulatory requirements. [5.9.4]

    Section 3216(c) of the 2012 Oil and Gas Act requires the removal of all drilling supplies and equipment not needed for production within nine months after completion of drilling. Section 3216(d) of the 2012 Oil and Gas Act requires the removal of all production or storage facilities, supplies and equipment and restore the well site within nine months after plugging a well.

    Although tanks must be properly removed under these provisions, the Department's E&P regulations do not currently specify standards for tank removal and closure, other than the general restoration requirements (see, e.g., sections 78.57(c)(1)(iv), 78.65).

G - COMMERCIAL AND CENTRALIZED DISPOSAL FACILITIES

54. What agency (agencies) in your state has (have) regulatory **jurisdiction** over these facilities? [5.10.1]

    Permitting and oversight of commercial and centralized waste disposal facilities is conducted mainly by the Department's Bureau of Waste Management (BWM). When waste generated at a well site leaves the well site for processing it is regulated under 25 Pa. Code Chapters 287-299. OOGM does not provide oversight for residual waste operations off of well sites.

55. Do you have any centralized or commercial E&P waste disposal facilities? **How many, and of what type?** Does this include any surface facilities at UIC sites? If so, how many are associated with UIC sites? [5.10.1]

    Permitting and oversight of commercial and centralized waste disposal facilities is conducted mainly by the Department's Bureau of Waste Management (BWM). When waste generated at a well site leaves the well site for processing it is regulated under 25 Pa. Code Chapters 287-299. OOGM does not provide oversight for residual waste operations off of well sites.

56. Discuss each of the following **regulatory requirements** as they apply to commercial and centralized disposal facilities. Give reference to any statutory or regulatory requirements: [5.10.2]

a. Permit requirements
b. Acceptable types and volumes of wastes
c. Waste characteristics and disposal facility compatibility

The above regulatory requirements are implemented by the BWM under 25 Pa. Code Chapters 287 – 299.

57. **What wastes are acceptable** for disposal? Do any of these facilities accept RCRA nonexempt wastes or wastes from other than oil and gas exploration and production activities? [5.10.2]

The types of waste that are acceptable for disposal are determined by BWM and regulated under 25 Pa.Code Chapters 287 – 299.

58. What are the **disposal and treatment methods** employed at these facilities? [5.10.2]

There are many different types of disposal and treatment options available. Some or a combination of the following treatment options are primarily utilized:

- Reduced Pressure Distillation
- Dissolved Air Floatation
- Chemical precipitation
- Coagulation/Flocculation
- Oxidation
- Electrocoagulation
- Belt Filter Press

59. What elements are required as part of the **permit** application (e.g., siting plan, construction plan, operating plan, closure plan, etc.)? [5.10.2.2.a]

Permitting requirements are determined by the BWM and regulated under Pa. Code Chapters 287 – 299.

60. If permit applications are required for **siting,** do they include: [5.10.2.2.b] Names, addresses and phone numbers of the owners or operators of the facility?

The general permitting requirements for residual waste facilities are codified in 25 Pa.Code Chapter 287, Subchapter D (relating to permit review procedures and

standards)
http://www.pacode.com/secure/data/025/chapter287/subchapDtoc.html.

61. Describe any **construction** requirements that will minimize or prevent releases to surface water, ground water, soil and air. In the case of reclamation facilities, describe any such requirements that apply to waste before and after reclamation. [5.10.2.2.c]

    Permitting requirements are determined by the BWM and regulated under 25 Pa.Code Chapters 287-299.

62. If permit applications are required for **operating,** do they include: [5.10.2.2.d]

    _____ An operating plan?

    _____ Volume, rate and type of material to be disposed?

    _____ Identification of the specific facilities that will be used to dispose of each waste stream (e.g., unlined or lined pits, tanks, etc)?

    _____ Contingency plan for reporting, responding to and cleaning up spills, leaks and releases of wastes or waste byproducts, including provisions for notifying emergency response authorities and for taking operator-initiated emergency response actions?

    _____ Ground water monitoring where wastes are managed on the land?

    ____ Plan for routine inspection, maintenance, and monitoring to ensure and demonstrate compliance with permit requirements, and in the case of land farming, ensure that organic wastes are effectively treated?

    ____ Specific engineering plans for preventing or minimizing the generation or emission of hydrogen sulfide gas?

    ____ A plan for the onsite sampling and/or testing to assure that RCRA Subtitle C or other wastes prohibited by the regulatory agency for disposal are not disposed at such a facility?

    _____ Characterization of wastes accepted at the facility?

    ____ Plan for periodic removal and subsequent handling of free oil?

_____ Security plan for the facility?

Permitting requirements are determined by the BWM and regulated under 25 Pa.Code Chapters 287-299.

63. Describe the **closure and post-closure monitoring** and maintenance requirements applicable to commercial facilities, including duration of post-closure care and financial assurance release schedules. [5.10.2.2.e]

Closure/Post-closure

Residual waste disposal facility bonding is mandated by section 503 of the SWMA and such financial assurance covers commercial facilities during operation, closure and post-closure periods. Other requirements determined by the BWM and regulated under 25 Pa.Code Chapters 287 – 299. Specific closure requirements are located in 25 Pa.Code §§ 287.117 (relating to closure plan) and 287.342 (relating to final closure certification).

64. For wastes not moved by pipeline, is there a requirement for **waste tracking?** If so, does it require: [5.10.2.3]

_____ A multi-part form that contains the names, addresses and phone numbers of the waste generator (producer), hauler, and disposal facility operator?

_____ Description and volume of the waste?

_____ Time and date it was collected, hauled and deposited at the disposal facility? Time requirement for maintenance of the form?

_____ Attesting that no illegal dumping occurred?

_____ Certification by the hauler and disposal facility operator that no wastes were dumped illegally or at a location or facility not designated by the generator or permitted to receive the waste, and that no prohibited or hazardous wastes were mixed with the waste during transport?

_____ Reporting of any discrepancies in waste descriptions, volumes or place of origin based on personal observations or information contained in the multi-part form?

Yes. The Solid Waste Management Act, 35 P.S. §§ 6018.101-6018.1003 considers gas well fracturing fluids a residual waste that must be managed in accordance with

applicable laws. 25 Pa. Code § 299.219 pertains to Daily Operational records, and 299.216(d) pertains to Contingency plans.

In addition, section 3218.3 of the 2012 Oil and Gas Act requires unconventional well operators that transport wastewater fluids to maintain records for five years of the amount and destination of fluids transported, and make those records available to the Department upon request. Recordkeeping must include:

(1) The number of gallons of wastewater fluids produced in the drilling, stimulation or alteration of a well.

(2) Upon completion of the well, the name of the person or company that transported the wastewater fluids to a disposal site or to a location other than the well site.

(3) Each location where wastewater fluids were disposed of or transported and the volumes that were disposed of at the location other than the well.

65. Are **waste haulers** permitted or licensed based on a showing of basic knowledge of regulatory requirements? [5.10.2.3]

Yes. 25 Pa Code Chapter 299 covers waste transporters requirements as does Act 90, the Waste Transportation Safety Act. 27 Pa.C.S. §§ 6201 – 6209.

http://www.pacode.com/secure/data/025/chapter299/chap299toc.html

http://www.palrb.us/pamphletlaws/20002099/2002/0/act/0090.pdf

IV. ABANDONED SITES

1. Does your state have a program to **inventory, prioritize and remediate** (as necessary) abandoned oil and gas sites? [6.1]

   The Office of Oil and Gas Management manages and implements the Orphan and Abandoned Well Plugging Program, which inventories, prioritizes and remediates abandoned and orphan wells discovered and reported to DEP. An inventory of these wells is maintained in two DEP databases, the Abandoned and Orphan Well database, and eFACTS. As new wells are added to the database, they are evaluated using a scoring matrix that assigns points relative to criteria based on their impacts to health, safety and the environment. Remediation is accomplished through DEP-managed well plugging contracts, in coordination with the Department's Construction Contracts Program. Generally, wells with high point scores are prioritized and subsequently emphasized in well plugging contracts. Higher-scoring abandoned wells are sometimes "clustered" with lower-scoring wells when determining which wells will constitute a particular well plugging contract. This ensures a more efficient utilization of available plugging fund resources. Additionally, if new abandoned wells are discovered in the course of plugging, they may be added to the ongoing contract via Change Orders to take advantage of the mobilized equipment in the area.

2. Please provide reference to any **definitions** pertaining to abandoned sites or your abandoned well site program, including the types of facilities included in the definitions. [6.2]

   The 2012 Oil and Gas Act provides the following definitions:

   Abandoned well – Any well that has not been used to produce, extract or inject any gas, petroleum or other liquid within the preceding 12 months, or any well for which the equipment necessary for production, extraction or injection has been removed, or any well, considered dry, not equipped for production within 60 days after drilling, redrilling or deepening, except that it shall not include any well granted inactive status.

   Orphan well – Any well abandoned prior to April 15, 1985 that has not been affected or operated by the present owner or operator and from which the present owner, operator or lessee has received no economic benefit, except only as a landowner or recipient of a royalty interest from the well.

3. Briefly describe your program for **identification, inventory and ranking** of abandoned sites. [6.3]

   When the DEP is notified of a suspect well, a District oil and gas inspector (OGI) conducts a site visit to verify that it is an abandoned oil or gas well. If verified, the well's condition and impacts to health, safety and the environment are determined and noted by

the OGI on an Abandoned Well Investigation Report. Wells not previously registered are assigned an identification number by the Permitting Section of either the Northwest or Southwest District Oil and Gas Operations Office, as applicable. Well identification information is entered into the Department's eFACTS database by the District Office.

Included by the OGI in the report are photos and a GPS location of the well(s). A copy of this information is sent to the Well Plugging Section, Bureau of Oil and Gas Planning and Program Management in Harrisburg for review, and a new record (or update) is added in the Abandoned and Orphan Well Database. Data from the Abandoned Well Investigation Report is analyzed, evaluated and subsequently ranked on the Abandoned Well Scoring sheet. Information from the Abandoned Well Investigation Report and the Abandoned Well Scoring sheet are then entered in the Abandoned and Orphan Well Database.

The Department has been proactive in its efforts to identify and inventory other potential sources of abandoned well information. In late January 2012 Deputy Secretary Scott Perry requested assistance from various organizations that might maintain, or be aware of, historical oil and gas mapping resources that could indicate the presence of abandoned wells not in the Department's database. This effort has yielded information on up to 35,000 possible locations that were unrecorded or previously unknown to the Department. Sources include Farm Line maps, WPA maps, K-Sheet and H-Sheet mining maps, in addition to other sources. Potential oil and gas locations on these maps are geo-referenced into a GIS database. These, in turn, can be investigated as potential locations when assembling candidate wells into specific plugging contracts.

Tangential to the above, the Department is proposing new regulations under section 78.52a (relating to abandoned and orphaned well identification) requiring operator identification of abandoned and orphaned wells, within a prescribed distance, prior to hydraulically fracturing a well. For a gas well or horizontal oil well, the operator must identify the location of orphaned or abandoned wells within 1,000 feet measured horizontally from the vertical well bore and 1,000 measured from the surface above the entire length of a horizontal well bore. For a vertical oil well, the operator must identify the location of orphaned or abandoned wells within 500 feet of the wellbore.

In addition to reviewing the Department's Abandoned and Orphan Well Database, this proposed regulation would also require the operator to conduct a review of applicable farm line maps, where accessible. The Farm Line Map Project, as described above, when digitized will provide an additional resource for operators in their efforts to fulfill this proposed requirement. DEP's goal is to have this geo-referenced GIS mapping database available both through DEP and also through PASDA (Pennsylvania Spatial Data Access). PASDA is the official public access geospatial information clearinghouse for the Commonwealth of Pennsylvania and has served for 15 years as Pennsylvania's node on the National Spatial Data Infrastructure. DEP has been working with PASDA specifically on this project and will continue its efforts to make this a helpful resource.

4. Briefly describe **funding** mechanisms available to the state for abandoned site remediation. [6.4]

Section 3271 of the 2012 Oil and Gas Act provides the statutory mechanism for the majority of monies used to fund the orphan and abandoned Well Plugging Program. This legislation continues the surcharge fee structure originally established by the Oil and Gas Act of 1984. Specifically, a $50 surcharge is added to the permit application fee for any new oil or gas well, and allocated to the Abandoned Well Plugging Fund. An additional surcharge of either $100 (for oil wells) or $200 (for gas wells), is added to the permit application fee and allocated to the Orphan Well Plugging Fund.

The Act 13 Marcellus Legacy Fund will also provide approximately $14 million in funding to support certain conservation projects and environmental protection measures, including plugging abandoned wells. This funding is available through a grant program administered by the Commonwealth Financing Authority (CFA) and the Department of Community and Economic Development (DCED). Section 2315(c) of Act 13 directs DEP to review applications for grant funding as requested by the CFA. DEP will also provide technical assistance to the DCED as grant-eligible projects are initiated.

5. Briefly describe the criteria used in your **abandoned site prioritizing** system. [6.5]

   The criteria used to prioritize an abandoned well site are based on impacts to health, safety and the environment. The threat a well poses relative to these criteria is assessed, and "scored" via the Abandoned Well Scoring sheet. The score of a well is a key factor in enabling the Well Plugging Program to assemble plugging contracts that address the highest priority wells in an expeditious and efficient manner.

   The Abandoned Well Scoring sheet considers ten overall factors, each of which is subdivided into addition relevant subcomponents. The overall criteria on the scoring sheet include (1) type/degree of hazard (e.g. fire, explosion, asphyxiation, gas migration); (2) presence/type of environmental hazard; (3) known or visual problems (e.g. jacks collapsing, open holes, discharges, site erosion); (4) presence/type of fluid discharges; (5) proximity to occupied buildings; (6) complaints received; (7) if groundwater or water supplies are affected; (8) if the distance from surface water is less than 200 ft.; (9) relative rating of the well with others in the same county; and (10) presence of workable coal.

6. What are the state's abandoned site remediation **goals? How** is progress measured? [6.5.1]

   The Department's remediation goal is to greatly reduce, if not eliminate, the impacts to health, safety and the environment that abandoned wells currently pose to the citizens of the Commonwealth. A tangent goal is to reduce the substantial inventory of known abandoned wells in the State. Both goals are addressed when the abandoned well is properly plugged according to DEP regulations and contract-specific Technical Specifications/Conditions in the well plugging contracts.

   Upon completion of the well plugging operation, site restoration is required within the confines of the project area, which includes reclamation of the access road to the

well and other areas disturbed by the plugging and clean-up operation. The project site is restored by backfilling, grading, leveling, and seeding, mulching etc. Site restoration also consists of cleanup and removal of all other equipment, supplies, debris, and any other material not removed during demobilization. The project area is to be restored to its original or better condition in accordance with regulations and must be approved by the Department.

Plugging contract progress is measured monthly by project tracking in the "DEP – Status of Construction Projects" report maintained by the Construction Contracts Office. Also, upon completion of a plugging contract, a final inspection is conducted by the Oil and Gas Plugging Inspector. A One-Year Warranty Inspection is conducted after the completion of the project. The plugging contractor must remedy, without cost to the DEP, any defects which may develop within one year from the date of completion and acceptance of the work performed under the contract, provided said defects, in the judgment of the Department, are caused by defective or inferior materials or workmanship.

7. Briefly describe the state's program relating to establishing **liability** for the remediation of abandoned sites. Provide references to any statutory or regulatory allocation of responsibility. [6.5.2]

   The 2012 Oil and Gas Act provides the statutory basis in determining liability for abandoned well sites. Under the Act, a well is considered "abandoned" if the well: (1) has not been used to produce, extract or inject any gas, petroleum or other liquid within the preceding 12 months; or (2) the equipment necessary for production, extraction or injection has been removed; or (3) is considered dry, and not equipped for production within 60 days after drilling, redrilling or deepening. Abandoned wells do not include any well granted inactive status. If the well is considered abandoned relative to the above criteria, an operator or owner of the well(s) must plug the well according to DEP regulations established under Chapter 78.

   Determinations of liability for remediation of abandoned sites are primarily conducted in the Oil and Gas District Offices when an abandoned well investigation is done, as described earlier. The OGI checks if there is a responsible owner or operator for the well. If the well meets the abandoned well criteria, the owner/operator must plug the well. Section 3253 of the 2012 Oil and Gas Act gives the Department the authority to issue enforcement orders to an operator/owner to plug an abandoned well. This is done through enforcement and compliance at the District level. Overall liability for an owner/operator to plug a well is provided under Section 3220 (Plugging Requirements) of the Act.

   If there is no responsible party, the well may be placed in the Abandoned and Orphan Well Database.

8. Please provide reference to any **standards for abandoned site remediation.** [6.6]

   Standards for abandoned site remediation are stipulated under Section 3220 of the 2012 Oil and Gas Act, as well regulatory requirements provided in Chapter 78, Oil and Gas

Wells, Subchapter D, Well Drilling, Operation and Plugging, Sections 78.91 through 78.98.

9. Briefly describe the state's **abandoned well remediation** program, including any flexibility allowed in plugging procedures. [6.6.1]

   The abandoned well remediation program is established under the statutory authority of the 2012 Oil and Gas Act and provides the Commonwealth a mechanism to properly plug orphan and abandoned wells that may constitute a threat to health, safety and the environment. It is administered through Well Plugging Contracts in coordination with DEP's Construction Contracts Office in adherence to both standard Commonwealth contracting requirements and to the plugging regulations established by regulation in sections 78.91-78.98. Plugging contracts are funded by two surcharges on new oil and gas permit applications, under the authority of the 2012 Oil and Gas Act. Well plugging contracts are assembled, written, reviewed and ultimately issued and advertised to solicit bids from qualified plugging contractors. The awarded contractor must abide by the above-cited plugging regulations as well as the contract's Technical Specifications to perform the work in a specified time frame. Ongoing partial payments and inspections are performed throughout the active stage of the plugging contract through completion and site reclamation.

   Flexibility in plugging procedures is provided in the Chapter 78 regulations, which allows alternative methods as described in section 78.75, Alternative Methods for Casing, Plugging or Equipping a Well. Any proposed alternative method must satisfy the goals of the Act and Chapter 78. Alternative methods must be approved by the Department before the method is implemented.

10. Briefly describe the state's program for **surface remediation** of abandoned sites, including any requirements regarding present or future land use and consultation with surface owners. [6.6.2]

    Surface remediation of abandoned well sites is accomplished after the well plugging activity. Upon completion of the well plugging operation, site restoration is required within the confines of the project area, which includes reclamation of the access road to the well and other areas disturbed by the plugging and clean-up operation. The project site is restored by backfilling, grading, leveling, and seeding, mulching etc. Site restoration also consists of cleanup and removal of all other equipment, supplies, debris, and any other material not removed during demobilization. The project area is to be restored to its original or better condition in accordance with regulations and must be approved by the Department. Additional general cleanup of the project site may also be necessary, requiring the removal of associated tanks, gathering lines, etc. as stipulated in the Technical Specifications of the well plugging contract.

    During the plugging contract's development stage, a PNDI is conducted to determine if rare or endangered flora or fauna exist within the boundary of the well reclamation

project site. Avoidance is emphasized as applicable and this is stipulated in the plugging contract. Mitigation may be required in some instances.

Consultation with surface owners is conducted during the initial development stage of the plugging contract, and certain specifications (e.g. a buried monument) are written into the plugging contract. During the active contract process, the landowner's land use is normally suspended until the conclusion of the contract. Equipment damages and liabilities are minimized with this requirement. Insurance is obtained when bonding is acquired for the awarded contractor.

Future land use is generally not indicated in plugging contract provisions.

11. What is the program for **maintenance of records** of remediated sites? How is public access assured? [6.6.3]

    Records of remediated sites are in the form of a Certificate of Well Plugging that contains information as to when, where, by whom, the well was plugged. These are maintained and available at DEP District Offices and the OOGM Central Office in both a hard copy and electronic format. The public has access to these documents. Information on abandoned and plugged wells may also be accessed by the public using the eFACTS database.

12. Describe any **public participation** activities associated with the abandoned sites program, including public access to information, public participation in rulemaking associated with the program, and participation regarding the priority of sites on the inventory and level of remediation. [6.7]

    Public participation activities have been occurring for many years by local individuals and environmental groups. These groups have been especially proactive in searching for abandoned oil and gas wells. Two such groups involved in this effort are the Senior Environmental Corp, who searched for abandoned wells in Oil Creek State Park in Venango County. Another local group is "Save Our Streams PA" and is involved in finding abandoned wells in Potter and McKean County, PA. They typically contact DEP and submit their observations/findings to the applicable District Office; OGI's subsequently inspect those wells and ascertain ownership/compliance as well as conditions of the wells, and their impacts to health, safety and the environment. Information on these wells is available to the public by contacting the District Office or accessing the information via the publicly-available eFACTS database.

    Public participation is encouraged in rulemaking and provides an opportunity for the public to express their opinions and comments on oil and gas-related regulatory issues. Consideration of this input is important when regulations are being added or updated.

    The level of remediation is dictated by the specific well conditions and the overall site conditions. They may vary considerably. Wells with either deteriorated or

removed well casing typically require additional time and money to safely plug the well. Wells located near houses or in streams require careful precautions in the plugging procedures. Wells with high pressures require extra equipment such as blow out preventers in order to protect public safety. Certain wells require vents. Wells located in coal or non-coal areas must be plugged correctly, which may require additional efforts to comply with the plugging regulations.

Additionally, DEP staff often attend public meetings, and conduct well plugging program presentations at the local, township, county and State level. This interaction also provides the public with an opportunity to participate in the priority of sites and inventory of abandoned wells.

V. NATURALLY OCCURRING RADIOACTIVE MATERIAL

1. Discuss any activities the state has undertaken to determine the **occurrence and need for regulation** of NORM. [7.2]

   On January 24, 2013, the Department announced that it would undertake a study to look at naturally occurring legal of radioactivity in by-products associated with oil and natural gas development. This is intended to be the most extensive and comprehensive study ever done to examine the levels of naturally occurring radiation in a variety of equipment, materials and media associated with oil and gas development, as well as the potential environmental impact and exposure to the public and workers. For more information, see: http://www.portal.state.pa.us/portal/server.pt/community/oil__gas_related_topics/20349/radiation_protection/986697.

2. Briefly discuss each of the following **program elements** as they apply to the NORM regulatory program (give reference to any statutory or regulatory requirements): [7.3]

   DEP does not have a specific regulatory program for NORM associated with E&P operations. Instead, these wastes are managed in a consistent manner regardless of how they are generated. The following guidance document describes DEP's radioactive material waste management program in detail: http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48961/250-3100-001.pdf

   a. definitions [7.3.1]

   DEP considers radioactive material that is generated during oil and gas exploration or production activities to be technologically enhanced (TENORM). TENORM is defined as "a technologically enhanced naturally occurring radioactive material is not subject to regulation under the laws of the Commonwealth or the Atomic Energy Act, whose radionuclide concentrations or potential for human exposure have been increased above levels encountered in the natural state by human activities." 25 Pa. Code § 287.1

   b. action levels [7.3.2]

   As part of DEP's evaluation of radiation Action Plans at waste disposal or processing facilities, the public and occupational annual dose limits utilized ware as follows:

   Facility staff - 5,000 mrem (considered as occupationally exposed)
   Facility staff - 100 mrem (if considered member of the public)
   Vehicle driver - 100 mrem (considered member of the public)
   General Public - 4 mrem (for the drinking water path way)
   General Public - 10 mrem (for the air pathway)
   General Public - 25 mrem (all pathways combined)

Action Plans should address the two basic scenarios, or Action Levels, when radiation is detected from a truck or waste container:

> Action Level One: A radiation monitor alarm at the facility indicating the potential presence of radioactive material in a waste load. This requires DEP notification and an evaluation of the material and the ability of the waste facility to accept the waste.
>
> Action Level Two: Radiation dose rates of 20 μSv h-1 (2 mrem h-1) or greater in the cab of the waste transport vehicle, 500 μSv h-1 (50 mrem h-1) or greater from any other surface, or the detection of contamination on the outside of the vehicle shall require immediate notification of the Department, and isolation of the vehicle.

Commercial facilities that receive E&P wastes for treatment or disposal must monitor incoming loads for radioactivity. DEP regulations require a gamma exposure rate from a cesium .137 source, at a level no higher than 10 μR h-1 above the average local background.

c. surveys [7.3.3]

The TENORM study described above will entail a comprehensive survey of all equipment that may come into contact with E&P TENORM.

d. worker protection [7.3.4]

Unless the worker is considered to be a "radiation worker" pursuant to NRC rules, DEP does not oversee worker safety with respect to TENORM. OSHA oversees TENORM worker safety in Pennsylvania.

e. licensing/permitting [7.3.5]

Facilities that accept E&P wastes that may contain TENORM must be permitted pursuant to the Solid Waste Management Act. The Radiation Monitoring guidance document referenced above describes the recommendations for Action Plans required by these facilities.

f. removal/remediation [7.3.6]

DEP has not promulgated numeric criteria for the remediation of E&P TENORM (radium). Thus, any remedial action would be evaluated on a case by case basis using the risk based site specific standard. See
http://www.pacode.com/secure/data/025/chapter250/subchapDtoc.html

g. storage [7.3.7]

DEP has not promulgated regulations specific to the storage of E&P TENORM containing wastes.

h. transfer of land and equipment for continued use [7.3.8]

DEP rules do not limit the transfer of land and equipment that may contain TENORM for continued use.

i. release of sites, materials, and equipment [7.3.9]

The TENORM study referenced above will inform DEP's judgment as to whether limits on TENORM containing sites, materials and equipment should be set or at what levels they should be set.

j. disposal [7.3.10]

Please see the guidance document referenced above.

k. interagency coordination [7.3.11]
l. public participation [7.3.12]

The proposal for the TENORM study referenced above was subject to a peer review and interested members of the public were able to comment on the study documents. However, the study documents are not intended to be subject to a formal public comment and response process. Any policies or regulations developed as a result of the study would be developed through a comprehensive public participation process that would include presentations and discussions at DEP advisory boards as well as a formal public comment period.

VI. STORMWATER MANAGEMENT

1. Describe any state program requirements for the **management of storm water** and the basis for its development. [8.1]

   The Department regulates erosion and sediment control and stormwater runoff under 25 Pa. Code Chapters 78, 93 and 102 as well as the 2012 Oil and Gas Act and the Clean Streams Law. The Department has established standards for erosion and sediment control during construction activities and for post construction stormwater management after construction activities are complete. On December 29, 2013, the Department published the *Policy for Erosion and Sediment Control and Stormwater Management for Earth Disturbance Associated with Oil and Gas Exploration, Production, Processing or Treatment Operations or Transmission Facilities* (Document ID 800-2100-008) which describes erosion and sediment control and stormwater management requirements for oil and gas activities in Pennsylvania. The policy is available on the Department's website at the following link:

   http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-92195/800-2100-008.pdf

   This policy was developed through a rigorous public participation process which included a 60-day public comment period, multiple stakeholder meetings and with input from the TAB. The Department received 149 unique written comments on this policy during the public comment period and provided a formal response to each one in a formal comment and response document available on the Department's website at the following link: http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-92177/Comment%20and%20Response%20Policy.pdf

2. Describe any state regulatory **program mechanisms** for storm water management or erosion control such as permits/authorizations, compliance evaluation, outreach and training, and program evaluation. [8.2]

   All persons performing earth disturbance activities associated with oil and gas must implement and maintain Erosion and Sediment Control Best Management Practices (E&S BMPs) to minimize the potential for accelerated erosion and sedimentation. A person proposing earth disturbances activities must develop a written Erosion and Sediment Control Plan (E&S Plan) when earth disturbance activities will result in total earth disturbances of 5,000 square feet or more, the earth disturbance activity has the potential to discharge to water classified as High Quality or Exceptional Value under 25 Pa. Code Chapter 93 (relating to water quality standards), or if the person is required to develop an E&S Plan under 25 Pa.Code Chapter 102 or other Department regulations (e.g., 25 Pa.Code Chapter 105).

The Department has permit requirements for oil and gas activities depending on the type and scope of the proposed project. Any oil and gas activity which proposes 5 acres or more of earth disturbance over the life of the project must obtain a permit prior to commencing earth disturbance. Comprehensive stormwater management and erosion and sediment control permitting and planning requirements are described in the *Policy for Erosion and Sediment Control and Stormwater Management for Earth Disturbance Associated with Oil and Gas Exploration, Production, Processing or Treatment Operations or Transmission Facilities* which is available at the link above.

On December 29, 2012 the Department issued Erosion and Sediment Control General Permit -2 (ESCGP-2) to replace ESCGP-1, which expired on April 12, 2013. A copy of a sample permit is available at the following link: http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-92174/8000-PM-OOGM0005%20Permit%20doc.pdf

A summary of major changes to ESCGP-2 is available at the following link: http://www.pabulletin.com/secure/data/vol42/42-52/2529.html

This permit was developed through a rigorous public participation process which included a 60-day public comment period, multiple stakeholder meetings and with input from the TAB. The Department received 191 unique written comments on this permit during the public comment period and provided a formal response to each one in a formal comment and response document available on the Department's website at the following link: http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-92166/Comment%20and%20Response%20Permit.pdf

ESCGP-2 requires permittees to provide notification to the Department prior to commencement of earth disturbance and after establishment of perimeter Best Management Practices (BMPs). Permittees are also required to notify the Department if they find inoperative or ineffective BMPs which have resulted in or may result in pollution. Permittees are also required to provide self-inspections weekly and after runoff events (rainfall, snow melt, etc.). By receiving notification of such events, the Department is better able to evaluate compliance with permit conditions and the applicable regulations.

The Department conducted outreach and training including both internal and external training regarding the development and implementation of ESCGP-2. The proposed changes were presented to the Oil and Gas Technical Advisory Board on 10/21/2011 and 5/16/2012, the Citizens Advisory Council Water Committee on 2/21/2012, the State Conservation Commission's 102/105/NPDES Committee on 3/14/2012 and statewide Department and Conservation District Staff on 10/25/2012. The Department also conducted a webinar to present the proposed permit and policy on 2/27/2012. Additionally, proposed changes were covered in the Departments annual Oil

and Gas Industry Training Seminars in 2012. Industry training seminars were conducted during 2012 at six locations throughout the oil and gas producing region of the state and were attended by approximately 1,150 industry representatives, Department staff and members of the general public.

After the permit was published as final, the Department conducted internal staff training on the new permit and policy during February and March of 2013. In addition, industry training seminars focusing exclusively on the new permit and policy will be held at 3 locations throughout the oil and gas producing region of the state and will be attended by approximately 1,100 industry representatives. The first two seminars were held on April 24, 2013 in Greensburg and were attended by approximately 325 industry representatives.

3. Describe any regulatory **program criteria,** including:

    a. Planning requirements with respect to site development. [8.3.1]

    Under 25 Pa. Code Chapter 102, a person proposing earth disturbance activities must develop and implement a written Erosion and Sediment Control Plan (E&S Plan) when earth disturbance activities will result in total earth disturbance of 5,000 square feet or more, the earth disturbance activity has the potential to discharge to water classified as High Quality or Exceptional Value water under 25 Pa. Code Chapter 93 (relating to water quality standards), or if the person is required to develop an E&S Plan under 25 Pa. Code Chapter 102 or other DEP regulations (e.g. 25 Pa. Code Chapter 105, relating to water obstructions and encroachments and dam safety).

    For oil and gas activities where greater than 5 acres of earth disturbance is proposed over the life of the project, an erosion and sediment control permit is required. For projects where a permit is required, the applicant must submit an erosion and sediment control and post construction stormwater management plans to the Department with the Notice of Intent (NOI). They must also conduct an online natural resources inventory search of the project area to ensure that threatened and/or endangered species will not be adversely impacted by the proposed project. Full planning requirements for permit applications are described in the NOI, NOI Instructions and Permit Submission Checklist which are available on the Department's website at the following links.

    NOI: http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-92170/8000-PM-OOGM0005%20NOI%20Application.pdf

NOI Instructions:
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-92173/8000-PM-OOGM0005%20NOI%20Instructions.pdf

Permit Submission Checklist:
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-92172/8000-PM-OOGM0005%20NOI%20Checklist.pdf

These documents were developed through a rigorous public participation process which included a 60-day public comment period, multiple stakeholder meetings and with input from the TAB. They include a significant amount of technical guidance that has been summarized from other Department technical guidance documents.

b. Construction standards or management practices appropriate for the area. [8.3.2]

The Department maintains the Pennsylvania Stormwater Best Management Practices Manual (Document ID 363-0300-002) and the Erosion and Sediment Pollution Control Program Manual (Document ID 363-2134-008) which are both available at the links below. These are technical reference manuals to be used when preparing erosion and sediment control and post construction stormwater management plans. These manuals are used for all types of construction and are not specific to oil and gas.

Pennsylvania Stormwater Best Management Practices Manual:
http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-8305

Erosion and Sediment Pollution Control Program Manual:
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-88925/363-2134-008.pdf

c. Operation and maintenance measures to control sediment until the site is restored. [8.3.3]

All persons performing earth disturbance activities associated with oil and gas activities must implement and maintain Erosion and Sediment Control Best Management Practices (BMPs) to minimize the potential for accelerated erosion and sedimentation. This requirement requires use of BMPs for all earth disturbance activities regardless of the scope.

In addition, the Department considers well sites to be under construction until post drilling restoration takes place which means that any erosion and sediment control permit for a well site remains active until the site is restored and permanently stabilized. This allows the Department to

conduct regular inspections and holds permittees to all of the reporting requirements referenced above.

d. Restoration and reclamation standards. [8.3.4]

The Department requires restoration within 9 months of completion of drilling and completion of plugging of all wells on the well site. Section IV of the *Policy for Erosion and Sediment Control and Stormwater Management for Earth Disturbance Associated with Oil and Gas Exploration, Production, Processing or Treatment Operations or Transmission Facilities* addresses site restoration and reclamation standards for oil and gas well sites.

VII. HYDRAULIC FRACTURING

1. Has the state evaluated potential **risks associated with hydraulic fracturing,** taking into account factors such as depth of the reservoir to be fractured, proximity of the reservoir to fresh water resources, well completion practices, well design, and volume and nature of fluids? [9.2]

   The 2012 Oil and Gas Act contemplates the risks associated with hydraulic fracturing by defining and handling "unconventional" and "conventional" resources differently. Generally speaking, "unconventional" resources, which are defined as black shales deeper/older than a certain stratigraphic unit, are subject to more stringent requirements in terms of setbacks, presumptive liability, bonding, and certain reporting/recordkeeping requirements. In addition, impact fees are also required for unconventional production. These more stringent statutory obligations are intended to manage the risks commensurate with high-volume hydraulic fracturing.

   Well design/construction requirements were significantly enhanced via new regulations effective February 5, 2011. These enhancements provided more robust casing and cementing standards for new well construction.

   The Department is also proposing to amend section 78.73 (relating to general provision for well construction and operation) to require operators to monitor orphaned or abandoned wells identified under proposed section78.52a during stimulation activities. Specifically, the proposed requirement would require operators to visually monitor any orphaned or abandoned well that likely penetrates the formation being stimulated, and immediately notify the Department of any change to the orphaned or abandoned well being monitored, and take action to prevent pollution of waters of the Commonwealth or discharges to the surface. In addition, an operator that alters an orphaned or abandoned well by the hydraulic fracturing would be required to plug the altered well.

2. Has the state developed **standards to prevent the contamination** of groundwater and surface water from hydraulic fracturing? [9.2]

   The state has voluntarily asked that operators not dispose of flowback/brines from unconventional reservoirs at certain wastewater treatment plants incapable of handling high TDS and other parameters pursuant to an exception in 25 Pa. Code § 95.10. This request was accompanied by marked increases in recycling and deep injection well disposal. Additionally, wastewater impoundments used to store flowback must meet certain construction specifications and groundwater monitoring requirements. Further, operators wishing to defend themselves against the presumptive liability of the 2012 Oil and Gas Act are obligated to collect predrill samples at water supplies to characterize baseline conditions prior to drilling, completion, and stimulation. Finally, the 2012 Oil and Gas Act also requires that water withdrawals for the purposes of supplying base fluids to conduct stimulation activities in association with unconventional resources may not in any way adversely affect the quality

or quantity of water in the watershed or that being relied upon by other users of the same water source.

3. Describe how state standards for **casing and cementing** meet anticipated pressures associated with hydraulic fracturing to protect other resources and the environment. [9.2.1]

   All casing must be rated to withstand internal pressures at least 20% greater than the anticipated maximum pressures to which it will be exposed. Used or welded casing, or casing intended to server as an anchor for BOPs with pressure ratings in excess of 3,000 psi must be pressure tested and hold the maximum anticipated pressure to which they will be exposed by not exhibiting more than a 10% decrease in pressure over a 30-minute period. The joints of welded casing must be subjected to at least three passes, with cleaning in between each pass; and welders must be certified or registered.

   Generally, cement used in the surface casing must isolate the wellbore from fresh groundwater; contain pressures from drilling, completion, and production; protect the casing from the geochemical effects of the subsurface; and prevent gas flow in the annulus, using additives as necessary. Centralizers are required on all cemented casing strings to ensure uniform distribution of cement in the annular space. The rules also define a zone of critical cement for the surface casing that must meet certain compressive strength and free-water specifications. A minimum eight (8)-hour WOC time is also established for every casing string and departures from this must be accompanied by specific lab and field demonstrations per a recently developed policy. Further, all chemicals used in hydraulic fracturing must be reported on well completion reports and entered into a national registry.

4. Discuss how the program identifies and, where deemed appropriate, manages risks associated with **potential conduits for fluid migration** in the area of hydraulic fracturing. [9.2.1]

   The program is in the final stages of implementing a quarterly well integrity program for all operating wells that will assess for the presence of fluid conduits on all casing strings. Additionally, operators are required to report instances of defective cementing or casing and notify the program within 24 hours of the discovery and correct the defect. If the defect cannot be addressed immediately, a corrective action plan is due within 30 days.

5. Describe program requirements that address actions to be taken in **response to unanticipated operational or mechanical changes** encountered during hydraulic fracturing that may cause concern. [9.2.1]

   As mentioned above, operators are required to report instances of defective cementing or casing and notify the program within 24 hours of the discovery and correct the defect. If the defect cannot be addressed immediately, a corrective action plan is due within 30 days. This regulation also applies to failures during stimulation activities.

6. Briefly describe how **surface controls** associated with hydraulic fracturing, such as dikes,

pits or tanks, meet Sections 5.5 and 5.9 of the guidelines. [9.2.1]

OOGM regulations pertaining to pits and tanks have been subject to previous STRONGER reviews. OOGM regulations at 25 Pa. Code §§ 78.56 and 78.57 specify the requirements for temporary storage of pollutional substances and wastes – including stimulation fluids and the associated flow back. These substances must be contained in pits or tanks that are structurally sound, protected from unauthorized acts and constructed and maintained with sufficient capacity to contain all pollutional substances and wastes which are used or produced during drilling, altering, completing and plugging the well.

Pits and open tanks must maintain 2 feet of freeboard. The sub-base of any pit must be free of rocks or debris and the pit must be lined with an impermeable liner that is of sufficient strength and thickness to maintain the integrity of the liner. The liner shall be designed, constructed and maintained so that the physical and chemical characteristics of the liner are not adversely affected by the waste and the liner is resistant to physical, chemical and other failure during transportation, handling, installation and use.

Liners or secondary containment around tanks or other facilities storing pollutional substances are not required but are recommended practices. Pits must be closed within 9 months of completion of well drilling. Free liquid must be removed from the pit and the chemical constituencies of any cuttings or residual waste that will be encapsulated in the pit must not exceed regulatory standards.

In addition to the containment requirements above, section 3218.2 of the 2012 Oil and Gas Act establishes surface containment requirements for unconventional well sites. Unconventional well sites are required to be designed and constructed to prevent spills to the ground surface or of the well site. The Act requires containment practices to be implemented on the site during drilling and hydraulic fracturing and to be sufficiently impervious and compatible with the waste material to prevent or contain a spill until it can be removed or treated. Full containment requirements are described in the proposed regulations at section 78.64a beginning on page 43 of the following document establishes surface containment requirements for unconventional well sites.

http://files.dep.state.pa.us/OilGas/BOGM/BOGMPortalFiles/OilGasReports/2012/TAB%20MEETINGS/FEB202013/130122Ch78SubchCANNEXA.pdf

Additional information regarding implementation of these requirements is available through the Act 13 FAQ available on the Department's website at the following link: http://www.portal.state.pa.us/portal/server.pt/community/act_13/20789/act_13_faq/1127392

1) Pits or impoundments that contain pollution substances are in compliance with this section provided they meet all requirements in 25 Pa.Code § 78.56 (relating to pits and tanks for temporary containment; AND

2) Centralized wastewater impoundments utilize a double liner system as part of their permit requirements.

The double liner system qualifies as individual secondary containment. These could also consist of any impermeable container made of a material that is compatible with the waste stored or used within the containment. Such possibilities include high density polyethylene, stainless steel or aluminum. Any containment material that meets the coefficient of permeability of no greater than 1×10^{-10} cm/sec and has supporting documentation of the permeability, chemical compatibility and other applicable QA/QC standards is acceptable for use for containment. Subsurface liners are protected from activities that may damage them, and they eliminate the "slip, trip and fall" hazards that are associated with surface liners. If localized subsurface liners are used, departmental staff can require that sections of the liner be removed for inspection and sampling if a spill occurred. This is to ensure that the liner prevented a release onto the ground or into the waters of the Commonwealth.

Regarding capacity requirements, section 3218.2(d), containment areas must be sufficient to contain the "volume of the largest container stored in the area plus 10% to allow for precipitation, unless the container is equipped with individual secondary containment." For example, a containment area around a single 100,000-gallon aboveground storage tank must contain 110,000 gallons of fluid. A containment area around two 50,000-gallon aboveground storage tanks would only be required to contain 55,000 gallons of fluid. In either scenario, if the tanks are double-walled, then the containment is provided by the second wall of the tank itself.

For pits or impoundments, compliance with the two feet of freeboard requirements in sections 78.56(a) (2) and (a) (4) (v) of the Department's regulations is required.

Storage tanks may also need to meet the requirements in the PA Storage Tank Regulations

The Clean Streams Law also provides overarching authority for the Department to regulate surface controls associated with fracturing activity.

7. Briefly describe how **contingency planning and spill risk management** procedures related to hydraulic fracturing meet Section 4.2.1 of the guidelines. [9.2.1]

OOGM's contingency planning has been reviewed previously by STRONGER. As described above and per 25 Pa.Code § 78.55, prior to generation of waste, the well operator shall prepare and implement a PPC plan for the control and disposal of

fluids, including top-hole water, brines, drilling fluids, additives, drilling muds, stimulation fluids, well servicing fluids, oil, production fluids and drill cuttings from the drilling, alteration, production, plugging or other activity associated with oil and gas wells.

Additionally as described above, section 3218.2 of the 2012 Oil and Gas Act requires operators to prepare and submit to the Department a well site containment plan describing the containment practices to be utilized and the area of the well site where containment practices will be employed.

The proposed rulemaking at section 78.55 seeks to incorporate planning requirements from section 3218.2 of the 2012 Oil and Gas Act into the Chapter 78 regulations.

8. Briefly discuss how hydraulic fracturing **waste characterization requirements,** including, as appropriate, testing of fracturing fluids, are consistent with Section 5.2 of the guidelines. [9.2.1]

   Hydraulic fracturing waste characterization requirements are provided through the Residual Waste Program implemented by the DEP Bureau of Waste Management. This Bureau provides a reporting mechanism for generators of waste hydraulic fracturing fluids via its Form 26R, *Chemical Analysis of Residual Waste, Annual Report by the Generator*. The form is available at the following link.

   http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-10502

   This form was recently modified to incorporate a comprehensive list of required analytical parameters for wastewater produced from the drilling, completion and production of Marcellus or other gas wells. For impoundments and tanks, the chemical analysis must represent the volume of wastewater stored in the impoundment or tank. If large volumes of water, wastewater or other fluids are added to an impoundment, a new chemical analysis must be performed that is representative of the impoundment.

   Although not directly related to waste characterization of hydraulic fracturing fluids, Section 3222.1 of the 2012 Oil and Gas Act requires disclosure of hydraulic fracturing chemicals to the Department. Hydraulic fracturing chemical disclosure provides information that can be used to identify future chemical analysis requirements.

9. Briefly describe how the **waste management hierarchy** contained in Section 5.3 of the guidelines (source reduction, recycling, treatment and disposal), including the provisions relating to toxicity reduction, are promoted for hydraulic fracturing. [9.2.1]

   The waste reduction policies of DEP have been previously reviewed by STRONGER and are equally applied to hydraulic fracturing activities. OOGM has been proactive

in encouraging drilling operators and the generators of hydraulic fracturing fluid wastes, as well as other wastes associated with the drilling, completion and stimulation phases of well drilling, to develop and expand source reduction and recycling opportunities. Hydraulic fracturing fluids are being increasingly recycled for use at subsequent fracing operations at other wells, which reduces the amount of fresh water employed in the stimulation process. OOGM inspectors have instructed operators to improve, modify and/or better maintain their spill containment measures, which has reduced the amount of waste generated at the well pad.

In August 2010, the Department promulgated revised regulations at 25 Pa. Code §95.10(b)(2) which requires a wastewater source reduction strategy to be developed by the well operator by August 22, 2011, and submitted to the Department upon request. The source reduction strategy must identify the methods and procedures the operator shall use to maximize the recycling and reuse of flow back or production fluid either to fracture other natural gas wells, or for other beneficial uses approved under Chapter 287 (relating to residual waste management—general provisions). The strategy shall be updated annually and include, at a minimum, the following information:

> (i) A complete characterization of the operator's wastewater stream including chemical analyses, TDS concentrations and monthly generation rate of flowback and production fluid at each natural gas well.
>
> (ii) A description and evaluation of potential wastewater source reduction options through recycling, reuse or other beneficial uses.
>
> (iii) The rationale for selecting the source reduction methods to be employed by the operator.
>
> (iv) Quantification of the flowback and production fluid generated by each well which is recycled or reused either to fracture other natural gas wells or for other approved beneficial uses.

Additionally, well servicing companies that perform hydraulic fracturing operations at well sites are developing more environmentally-friendly, or more "green" substitutes for certain additives employed in the fracing operation. This evolving process is supported by DEP.

All parties involved in the gas extraction process, from private companies, to regulatory agencies, to the public, all have vested interests in waste minimization, recycling, and the proper treatment and disposal of gas extraction related waste products. The Department now prohibits the disposal of fracturing related fluids in publicly owned waste water treatment plants. This policy has been the primary driving force behind maximizing recycling and minimizing disposal of fracturing related waste water. This policy has also inspired creative and innovative waste water treatment technologies which will continue to advance.

Ultimately PADEP regulates the processing and transportation of all waste water generated from oil and gas sites under the 2012 Oil and Gas Act or the Solid Waste Management Act. Other site related wastes are regulated by the Solid Waste Management Act and Residual Waste Regulations, all of which seek to minimize waste and protect the environment and the public.

10. Briefly describe how the **tracking of hydraulic fracturing waste** disposed at commercial or centralized facilities meets the requirements of Section 5.10.2.3 of the guidelines. [9.2.1]

    As a residual waste, hydraulic fracturing waste generation, transportation and disposal tracking requirements are integrated into DEP's Residual Waste regulations. 25 Pa Code Chapter 287 specifies the reporting, recordkeeping and waste stream analytical requirements for generators of hydraulic fracturing wastes. Form 26R, described above, provides the analytical and reporting requirements for generators of hydraulic fracturing wastes. This form also requires information on the processing or disposal facilities that will accept the waste. 25 Pa. Code Chapter 299 provides standards for transportation of residual waste to a commercial or centralized facility.

    These include requirements for transportation to permitted facilities, accident prevention and contingency planning, emergencies, wastes from accidents and spills, recordkeeping and reporting, and appropriate signage on transportation vehicles. Waste haulers are required to be permitted and are subject to the requirements of the Department's Waste Transportation and Safety Program.

    Records pertaining to waste volumes and the location of disposal or recycling facilities are submitted annually to OOGM as part of an operator's annual waste and production reporting responsibilities.

    Section 3218.3 of the 2012 Oil and Gas Act provides specific requirements for transportation records for wastewater fluids which are listed below:

> (a) Requirements.--A well operator of an unconventional well that transports wastewater fluids shall do all of the following:
>
> > (1) Maintain records for five years, in accordance with regulations under subsection (b) and on a form approved by the department, of the amount and destination of the fluids transported.
> > (2) Make the records under paragraph (1) available to the department upon request.
>
> (b) Recordkeeping.--Recordkeeping requirements shall be determined by the department and shall include the following:
>
> > (1) The number of gallons of wastewater fluids produced in the drilling, stimulation or alteration of a well.

(2) Upon completion of the well, the name of the person of or company that transported the wastewater fluids to a disposal site or to a location other than the well site.
(3) Each location where wastewater fluids were disposed of or transported and the volumes that were disposed of at the location other than the well site.
(4) The method of disposal.

11. Briefly describe how procedures in place for receipt of **complaints** related to hydraulic fracturing are consistent with Section 4.1.2.1 of the guidelines. [9.2.1]

    The DEP home page prominently features a link to "Report an Incident" that provides phone numbers for the public to call if they observe a pollution event occurring. These phone lines are staffed 24 hours per day and designated DEP staff are on call to respond to emergencies at all times. Complaint reports are generated and transmitted to the appropriate DEP office for follow up investigations. If an emergency related to an oil or gas well is reported, OOGM inspectors are dispatched immediately on site. See 58 Pa.C.S. § 3218(b).

12. Describe any required **notification** prior to, and reporting after completion of hydraulic fracturing operations. [9.2.2]

    Section 3211(f)(1) of the Oil and Gas Act requires operators to notify DEP 24 hours prior to commencement of well drilling. If there is a break in drilling of 30 days or more, the well operator shall notify the Department at least 24 hours prior to the resumption of drilling.

    Section 3211(f)(2) of the Oil and Gas Act requires operators to notify DEP 24 hours prior to cementing all casing strings, conducting pressure tests of the production casing, stimulation and abandoning or plugging an unconventional well.

    Chapter 78 currently requires a well completion report to be filed within 30 days of completion of the well. 25 Pa.Code § 78.122(b). Information provided on this report includes: a perforation record, a stimulation record including fluid type and amount, propping agent information, average injection rate, open flow before and after treatment, rock pressure and well service company name. The proposed regulations will require a complete list of the chemicals used hydraulic fracturing the well along with the volume of recycled flowback water used. The Department is evaluating the need to require the exact proportions of the hydraulic fracturing chemicals as part of revisions to the proposed regulations.

13. Is notification sufficient to allow the **presence of field staff** to monitor hydraulic fracturing activities? [9.2.2]

    Section 3211(f)(2) of the 2012 Oil and Gas Act requires operators to give the Department 24 hours' notice of, inter alia, commencement of stimulation. Field

inspectors are notified via email through standard issue BlackBerrys of this information, providing sufficient notice to allow for monitoring of these activities.

14. Describe **reporting requirements** for hydraulic fracturing activities and whether they include the identification of materials used, aggregate volumes of fracturing fluids and proppant used, and fracture pressures recorded. [9.2.2]

    Chapter 78 currently requires a well completion report to be filed within 30 days of completion of the well. Information provided on this report includes: a perforation record, a stimulation record including fluid type and amount, propping agent information, average injection rate, open flow before and after treatment, rock pressure and well service company name. The proposed regulations will require a complete list of the chemicals used hydraulic fracturing the well along with the volume of recycled flowback water used. The Department is evaluating the need to require the exact proportions of the hydraulic fracturing chemicals as part of revisions to the proposed regulations.

15. Describe any mechanisms for **disclosure of information on chemical constituents** used in hydraulic fracturing fluids to the state in the event of an investigation or to medical personnel in the event of a medical emergency. [9.2.2]

    OOGM regulations at 25 Pa.Code §§ 78.55 and 91.34 require operators to develop and implement a preparedness, prevention and contingency plan (PPC).

    The first objective in preparing and implementing PPC plan is for the operator to review their operations and identify all pollutional substance and wastes, both solid and liquid that will be used or generated, and identify the methods for control and disposal of those substances or wastes.

    As part of the PPC plan operators must list the chemicals or additives utilized and the different wastes generated during hydraulic fracturing. The PPC plan includes Material Safety Data Sheets, cleanup procedures, toxicological data and waste chemical characteristics. The approximate quantities of each material and the method of storage (sack, barrels, tanks, etc.) should be specified.

    PPC plans should be available the well site and must be submitted to DEP upon request. When new operators apply for permits in Pennsylvania, OOGM staff request a copy of the operator's PPC plan prior to permit issuance as was the case with all Marcellus Shale well operators. In addition, the Pennsylvania Worker and Community Right to Know Act, 35 P.S. §§ 7301-7320, provides: "Every employer shall make readily available, in every work area, the Material Safety Data Sheet for every hazardous substance or hazardous mixture to which the employees working in said work area may be exposed. The Material Safety Data Sheets shall be made available in such a manner and in such numbers as to give every employee in that work area easy and unhindered access to the Material Safety Data Sheets without permission or intervention of management or any supervisor."

16. Briefly describe how hydraulic fracturing information submitted that is of **a confidential business nature,** is treated consistent with Section 4.2.2 of the guidelines. [9.2.2]

    In the event that confidential business proprietary information (CBI) is submitted, Pennsylvania's Right-to-Know Law contains provisions to protect this information. See 58 Pa.C.S. § 3222.

    The Right-to-Know Law, 65 P.S. §§ 67.101-67.3104 ("RTKL"), outlines when a Commonwealth agency must provide a "public record" to a person requesting a record under the RTKL. A "public record" is defined very broadly, with the two following relevant exceptions: (1) records that constitute or reveal a trade secret or confidential proprietary information, see 65 P.S. §§ 67.102, 67.708(11); and (2) records exempt from being disclosed under any other Federal or State law or regulation, 65 P.S. § 67.102.

    Section 102 defines confidential proprietary information ("CPI") and trade secret as follows:

    > "Confidential proprietary information." as "[c]ommerical of financial information received by an agency: (1) which is privileged or confidential; and (2) the disclosure of which would cause substantial harm to the competitive position of the person that submitted the information."
    >
    > "Trade Secret." Information, including a formula, drawing, pattern, compilation, including a customer list, program, device, method, technique or process that: (1) derives independent economic value, actual or potential, from not being generally known to and not being readily ascertainable by proper means by other persons who can obtain economic value from its disclosure or use; or (2) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

    Section 707(b) of the RTKL outlines the procedure for production of records containing CPI or a trade secret. Under this section, a party that submits a record to a Commonwealth agency may include a written statement indicating that the record contains CPI or a trade secret. If the party has submitted a written statement with the record stating that it contains CPI or a trade secret, when a requester seeks that record the agency shall notify the party of the request. The party claiming CPI or a trade secret may then provide input on the release of the record. The agency then either denies the request or releases the record and must notify the party claiming CPI or a trade secret of its decision. If the Commonwealth agency denies the request for a record containing CPI or a trade secret, it bears the burden of demonstrating that the record is exempt from public access by the preponderance of the evidence.

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

hydraulic fracturing. [9.2.3]

In 2009, OOGM increased its well permit fees for the first time since the Oil and Gas Act was enacted in 1984. Pennsylvania's oil and gas program is now completely funded by well permit fees. The increase in permit fees also allowed DEP to increase the size of its permitting, compliance and enforcement staff. Additionally, OOGM's orphan and abandoned well plugging program continues to be completely funded by a surcharge on operator's well permit fees. OOGM added 37 oil and gas staff in 2009 and opened a new Oil and Gas Office in Williamsport to serve the needs of a region that has and will continue to see increased Marcellus Shale activity over the next few in the future. In addition, in 2010 the Governor directed OOGM to hire an additional 68 staff in response to the continued dramatic growth of the Marcellus Shale development. This year OOGM also opened a new office in Scranton dedicated to oversight of oil and gas drilling in the northeastern counties.

The total complement of staff regulating oil and gas well development in Pennsylvania is 196 people. This number includes administrative and legal staff in addition to inspectors, permitting and management staff.

The Department anticipates taking a proposed rulemaking to raise the unconventional well permit fee to the Environmental Quality Board for approval as proposed in July 2013. A copy of the proposed rulemaking and supporting documents are available on the TAB website at http://www.portal.state.pa.us/portal/server.pt/community/oil_and_gas_technical_advisory_board_(TAB)/18260 under the April 23, 2013 meeting.

18. Describe staff **training** to stay current with new and developing hydraulic fracturing technology. [9.2.3]

Briefly describe how the state agency provides for **dissemination of educational information** regarding well construction and hydraulic fracturing to bridge the knowledge gap between experts and the public as provided in Section 4.2.2.2 of the guidelines. This is especially important in areas where development has not occurred historically and in areas where high volume water use for hydraulic fracturing is occurring. [9.2.4]

Given the enormous interest in the development of the Marcellus Shale, opportunities for dissemination of educational information regarding well construction and hydraulic fracturing have been significant. Testimony has been given to the Pennsylvania Legislature on these subjects several times. Public speaking events and conferences attended by the above as wells as regional program managers and other BOGM staff have allowed for dozens of further engagement opportunities. Correspondence by letter, email and phone has been prolific and oil and gas staff has answered all inquiries.

The well construction and TDS regulation developments described above have also provided an opportunity for DEP to receive and respond to thousands of comments by the public. Finally, oil and gas staff maintain a website that has provided information regarding the chemicals used at Marcellus wells since 2007. This list has recently been updated and a description of the fracing process has also been added.

The Department routinely provides annual training opportunities to Oil and Gas field inspectors and permitting staff. This training is typically provided on an annual basis and is tailored to meet the specific needs of these staff.

The training that is provided to field inspectors is called "**Monitoring and Compliance Training**".

Monitoring and compliance (M&C) staff include field inspectors and compliance enforcement staff and includes the following employee classifications:

> Water Quality Specialists, WQS Supervisors, Oil & Gas Inspectors, OGI Supervisors, Hydrogeologist, Environmental Protection Specialists (formally O&G Solid Waste Specialists), Environmental Protection Compliance Specialists, Environmental Group Managers (a.k.a. Compliance Section Chiefs) and Environmental Program Managers.

The training that is provided to permitting staff is called "**Technical Services Training**". Technical Services section staff include the following employee classifications:

> Geology Specialists, Professional Geologists, Environmental Engineering Specialists, Environmental Engineers, Biologists, Biologist Supervisors, Environmental Group Managers (a.k.a. Technical Services Section Chiefs) and Environmental Program Managers.

Environmental Program Managers (EPMs) are listed twice because they oversee both sections in the O&G Program so both of these training opportunities are made available to EPMs.

In addition to the M&C and Technical Services Training, numerous additional training opportunities are provided to inspectors and water quality specialists depending on current training needs and opportunities along with the amount of funding that is available to support such training requests. Examples of such trainings are listed below.

The information provided below was provided by District Oil & Gas staff and provides information that is available regarding specific training opportunities that were provided to DEP's Oil & Gas Inspection staff during the audit period. Also attached are training records for each District O&G program for which a record exists

within the Department's Ingenium system. It provides training records for current Oil & Gas program employees.

General, District and Statewide Training

- Statewide Monitoring & Compliance Staff Training 8/25-26/2010 - State College
- Statewide Oil & Gas Well Operations Boot Camp for Subsurface Activities staff 11/17-18/2010 – Williamsport (See Appendix E).
- Statewide Oil & Gas Environmental Protection Boot Camp for Surface Activities staff 12/14-16/2010 – Williamsport (See Appendix E).
- Statewide Technical Services Staff Training 3/29-30/2011 - Meadville
- Statewide Water Quality Specialist Supervisor Inspection Report Revision & Field Inspection Exercise 3/18-19/2011 - State College/Moshannon
- Statewide Monitoring & Compliance Staff Training 6/22-23/2011 - Washington, Washington County
- U.S. Army Corps of Engineers Wetlands Training (WQS & Biologists) 7/18-22/2011 Monroe County
- CPESC/E&S BMP training for WQS 10/12-13/2011 - Ebensburg
- Statewide Technical Services Staff Training 3/20-21/2012 - Williamsport
- Statewide Monitoring & Compliance Staff Training 6/27-28/2011 - Meadville

- April 21, 2009 – Industry Training Holiday Inn Clarion
    - WQS, Inspectors, Section Chiefs
- September 14-17, 2009, DEP – Bureau of Watershed Management - Erosion and Sediment Control Boot Camp –Fort Indiantown Gap, PA
- January 11 & 12, 2010 – PA DEP , Regulatory Training for O&G Industry and DEP, State College, PA
- February 24, 2010 – 8-hour HazWoper Safety Training
    - Inspectors, WQS, Geologist, Hydrogeologist, Engineers, Biologist
- June 21-25, 2010 – U.S. Army Corp of Engineers Wetland Training, Northcentral/Northeast
- August 25-26, 2010 – Statewide Monitoring and Compliance Meeting, State College
    - Inspectors, WQS, WQS supervisors, Inspector supervisors, Hydrogeologist, Chiefs, Managers
- September 2010 – Wild Well Control – Well Control School, California, PA
    - Inspectors, Chiefs
- September 21, 2010 – Erosion & Sedimentation Control Training, Meadville
    - WQS, WQS supervisors, Engineers, Biologist, Chiefs, Manager
- November 17-18, 2010 – Statewide Oil & Gas Well Operations Boot Camp, Williamsport
    - Inspectors, WQS, WQS supervisors, Inspector supervisors, Hydrogeologist, Chiefs, Managers
- March 9, 2011 – 8-hour HazWoper Safety Training
    - Inspectors, WQS, Geologist, Hydrogeologist, Engineers, Biologist

- March 18-19, 2011 – Statewide Water Quality Specialist Supervisor Inspection Report Revision & Field Inspection Exercise, State College / Moshannon
    - WQS supervisors
- March 29-30, 2011 – Statewide Technical Services staff training, Meadville
    - Geologists, Engineers, Biologist, Geologist Manager, Program Manager
- April 7, 2011 - Industry Training Holiday Inn Clarion
    - 2 – WQS supervisor, Manager
- June 8, 2011 – Industry Training, Bradford
    - 2 WQS & Chief
- June 22-23, 2011 – Statewide Monitoring & Compliance Staff Training, Washington, Washington Co.
    - Inspectors, WQS, WQS supervisors, Inspector supervisors, Hydrogeologist, Chiefs, Managers
- July 18-22, 2011 – U.S. Army Corp of Engineers Wetland Training, Monroe Co.
    - WQS
- October 4, 2011 – Special Protection watershed training
    - WQS, WQS supervisors, Engineers, Biologist, Chiefs, Manager
- October 5, 2011 – Industry Training, Franklin
    - 15 staff: WQS, Inspectors, Engineers, Supervisors, Chief
- October 20-21, 2011 – CPESC/E&S BMP Training, Ebensburg
    - Select WQS
- March 9, 2012 – 8-hour HazWoper Safety Training
    - Inspectors, WQS, Geologist, Hydrogeologist, Engineers, Biologists
- March 20-21, 2012 – Statewide Technical Services Staff Training, Williamsport
    - Geologists, Engineers, Biologist, Geologist Manager, Program Manager
- June 27-28, 2012 – Statewide Monitoring & Compliance Staff mtg, Universal Well Service, Meadville
    - Inspectors, WQS, WQS supervisors, Inspector supervisors, Hydrogeologist, Chiefs, Managers
- December 12, 2012 - Industry Training Holiday Inn Clarion
    - 28 staff: WQS, Inspectors, Engineers, Supervisors, Chiefs, Manager
- March 7, 2013 – 8-hour HazWoper Safety Training
    - Inspectors, WQS, Geologist, Hydrogeologist, Engineers, Biologists
- March 12, 2013 – ESCGP2 Training, Meadville
    - 24 staff: WQS, WQS supervisors, Engineers, Biologist, Chiefs, Manager
- March 25-26, 2013 – Right To Know Training, Meadville
    - 50 staff: Inspector, WQS, Supervisors, Engineers, Biologist, Geologist, Clerical, Chief, Manager

COURSE	SOURCE	TRAINING DATE	ATTENDEES
WQS Field Inspection Report	OG Staff	2012-Feb	14 (WQS's and WQS Supervisors)
Pipeline Installation	Willbros	11/20/201	34 (WQS's, OGI's, biologists,

		0	geologists, and engineers)
Erosion and Sedimentation	CPESC	10/12/2011	14 (WQS's, biologists, and engineers)
Groundwater	EPA	2012-June	8 (WQS's)
ESCGP-2	DEP Staff	2013-March	20 (WQS's, supervisors, engineers, biologists)
Right-to-Know	OCC	2011-Nov	25 (WQS's, OGI's, and supervisors)
Source Water Protection	DEP Staff	5/20/2010	12 (Geologists,engineer)
Marcellus Shale Formation Eval.	Schlumberger	5/19/2010	12 (Geologists,engineer)
Shale Completion Logistics	Universal Well Services	5/20/2010	13 (Geologists, engineer)
Stray Gas Migration	DEP Staff	6/17/2010	31 (Geologists, WQS, biologists, OGI, Comp. Spec.)
Soils Training/Well site Constr.	DEP Staff	9/30/2010	21 (Geologists, WQS, biologists, engineers)
Reverse Osmosis Leachate Treat.	Bernie Reider	11/17/2010	23 (Geologists, engineers)
Primer-Oil& Gas Reservoirs	DCNR Staff	11/17/2010	40 (Geologists, WQS, biologists, engineers)
Gas Storage Seminar	Dominion Transmission Staff	11/30/2011	42 (Geologists, OGI, engineers, WQS, Comp. Spec.)
Gas Condensate Processing	Range Resources/Mark West	6/12/2012	25 (OGI's, WQS's, supervisors, geologists)
Horizontal Directional Drilling	Range Resources/Mark West	6/12/2012	35 (WQS's, OGI's, supervisors, engineers, biologists, geologists)
Marcellus Overview	K&L Gates	2009-April	12 (OGI's and WQS')
Marcellus Overview	K&L Gates	2010-April	15 (OGI's and WQS's)
Marcellus Overview	K&L Gates	2011-April	15 (OGI's and WQS's)
Marcellus Overview	K&L Gates	2012-April	12 (OGI's and WQS's)
Wetland ID Workshop	USACE	June 5-7, 2012	8 (WQS's and biologists)
Annual 102/105 Training	DEP Staff	October 22-25, 2012	2 (chief and biologist)
PT Macro Taxonomy ID Training	EPA	December 11-13, 2012	3 (biologists)
E&S Manual Training	DEP Staff	April 17-18, 2012	5 (chief, biologists, engineers)
GIS Training	DEP Staff	August 7-9, 2012	5 (chief, biologists, engineers)
PNDI Training	DCNR Staff	12/14/2012	6 (chief, supervisor, biologists, engineers)

Annual 102/NPDES/105 Training	DEP Staff	October 20-22, 2009	1 (engineer)
Training for the Water Management Plan	DEP Staff	December 21-22, 2009	1 (engineer)
DEP regulatory training for oil and gas industry	DEP Staff	January 11-12, 2010	1 (engineer)
Industry Wetland Training	DEP Staff	4/21/2010	1 (engineer)
Chapter 105 Environmental Staff Training Workshop SW	DEP Staff	August 4-5, 2010	1 (engineer)
Chapter 102 Regulation Revisions	DEP Staff	9/28/2010	1 (engineer)
Oil and Gas Environmental Protection Standards Boot Camp	DEP Staff	December 13 -16, 2010	2 (engineers)
PASPGP-4 staff training	ACOE	June 14-16, 2011	2 (engineers)
eFACTS PRP and PDG training	DEP Staff	10/16/2012	5 (chief, biologists, engineers)
E&S Manual Training	DEP Staff	2011-April	14 (WQS's)
Seasonal High Groundwater	DEP Staff	2011	14 (WQS's)

19. Fundamental differences exist from state to state, and between regions within a state, in terms of geology and hydrology. Describe how the state evaluated and addressed, where necessary, the **availability of water for hydraulic fracturing** in the context of all competing uses and potential environmental impacts resulting from the volume of water used for hydraulic fracturing. [9.3]

Fracing can require large volumes of fresh water. Withdrawal of water from surface and groundwater sources has the potential to reduce stream flow to the point that thermal or other sources of pollution can occur. In 2002 the Water Resources Planning Act was enacted and required entities withdrawing more than 300,000 gallons over a 30 day period to register their water withdrawal. By registering water use, DEP began the process of tracking this activity outside the Susquehanna and Delaware River basins.

As a result of the development of the Marcellus Shale, in 2008 OOGM began requiring water management plans (WMPs) to identify where water would be withdrawn and the volumes of withdrawal. The 2012 Oil and Gas Act codified this requirement, stating that no person may use water from water sources in Pennsylvania for the drilling or hydraulic fracture stimulation of any unconventional natural gas well

except in accordance with a WMP. Full requirements are outlined in section 3211(m) of the Act and in the proposed rulemaking at § 78.69.

The purpose of WMPs is to ensure that water quality standards are maintained and protected. By law, DEP cannot issue permits for an activity that will violate the laws it administers. Because large volume withdraws on surface water can, individually or cumulatively, impact water quality DEP must assure that excessive withdraws do not occur. DEP follows water withdrawal guidance promulgated by the Susquehanna River Basin Commission to ensure uniform statewide evaluation of water withdrawals. The Delaware River Basin Commission also has a role in evaluating impacts within that river basin. The DRBC is in the process of promulgating regulations to address Marcellus Shale well drilling within its jurisdiction.

20. Describe how the availability and use of alternative water sources for hydraulic fracturing, including recycled water, is encouraged. [9.3]

    Unfortunately, Pennsylvania has many water sources that are influenced by acid mine drainage from mining operations known as mine influenced water (MIW).

    Use of this water for hydraulic fracturing purposes is encouraged by DEP. DEP provides funding to watershed groups that treat MIW and DEP promotes the sale of this water for fracing purposes so that additional MIW resources can be restored. In 2012, the Department developed a white paper titled *Utilization of Mine Influenced Water for Natural Gas Extraction Activities* that outlines the process by which an oil and gas operator or 3rd party water supplier can obtain all necessary authorizations to utilize MIW in well development operations. The white paper also outlines other requirements and attempts to incentivize the use of MIW in natural gas development. The white paper is available on the Department's website at the following link.

    http://files.dep.state.pa.us/Mining/Abandoned%20Mine%20Reclamation/AbandonedMinePortalFiles/MIW/Final_MIW_White_Paper.pdf

21. Briefly describe how **waste** associated with hydraulic fracturing is managed consistent with Section 4.1.1 and Section 7 of the guidelines. [9.3]

    Wastewater generated by hydraulic fracturing operations is managed four different ways in Pennsylvania: 1) Treatment and discharge to surface water; 2) Underground injection wells; 3) Reused to frac additional wells and; 4) Transported to out of state facilities.

    The vast majority of the wastewater generated by traditional well drillers is treated at centralized waste treatment facilities that discharge to surface waters and have been operating in Pennsylvania for many years. A small percentage of this wastewater can be taken to Class II UIC wells. However, Pennsylvania only has a small number of commercial disposal wells. The majority of wastewater that is

disposed in UIC wells is disposed in UIC wells that are located outside of Pennsylvania.

In August 2010, the Department promulgated regulations at 25 Pa.Code § 95.10 which included provisions to limit total dissolved solids (TDS) concentrations in discharges from facilities that treat wastewater resulting from fracturing, production, field exploration, drilling or well completion of natural gas wells. The regulation limits these discharges to 500 mg/L TDS including no more than 250 mg/L chlorides, 10 mg/L total barium and 10 mg/L total strontium. The regulation also includes grandfathering provisions to allow previously authorized facilities to continue to discharge at the previously authorized concentrations.

Prior to May 19, 2011, wastewater generated by Marcellus Shale operators could be taken these facilities. On April 19, 2011, the Department issued a 'call to action' requesting Marcellus Shale operators to cease delivering wastewater to 15 discharge facilities that were still able to accept it under the grandfathering provision in section 95.10. The Marcellus Shale operators agreed to comply with the request. As a result, Marcellus wastewater is increasingly being reused to stimulate additional wells.

The wastewater that must be disposed can only be taken to facilities that are approved to receive it. These facilities include centralized treatment facilities. Most centralized treatment facilities have no discharge and instead sell the treated water back to operators.

PADEP regulates the processing of wastewater generated from oil and gas wells at these centralized treatment facilities under the 2012 Oil and Gas Act, 58 Pa.C.S. §§ 3201-3274, or the Solid Waste Management Act (SMWA), 35 P.S. §§ 6018.101-1003. The approval mechanism is general permit WMGR123 which is administered by the Waste Management Program.

Wastewater that is either: (1) processed at the well site where it was generated, or (2) processed at the well site where it will be beneficially used to complete a well is regulated under a request for Approval of Alternate Waste Management Practices (OG-71), which is administered under by OOGM.

Regardless of how oil and gas well waste water processing occurs, there are important differences between the OG-71 approval and the WMGR123 permit. WMGR123 contemplates long-term operation of the facility serving many well sites and contains specific provisions for bonding; public notices and participation; siting; self-inspection; record keeping and reporting. OG-71 does not contain any of those requirements because it is limited to only the waste generated or used at an individual well site and OGA specifies that waste processing activity ceases within nine months of completion of well drilling activity. Because of the differences in operation and potential environmental threats, approval of an OG-71 can occur readily, whereas approval of the WMGR123 typically takes approximately 90 days after the application is determined to be administratively and technically complete.

PADEP seeks to encourage the processing and beneficial use of waste water generated from oil and gas wells. At the same time, long term facility present potential for environmental impacts that warrants closer regulation, such as bonding, siting and oversight.

22. Discuss how the state encourages the efficient development of adequate **capacity and infrastructure** for the management of hydraulic fracturing fluids, including the transportation, recycling, treatment and disposal of source water and hydraulic fracturing wastes. [9.3]

    The Chapter 95 regulations described above promote the development of new treatment capacity for non-discharge treatment systems or treatment systems that discharge water that meets Safe Drinking Water Act standards for TDS. Treatment costs for these technologies are expected to decline as competition increases to provide services now that uncertainty regarding the passage of the rule has been lifted.

    In addition, the Department implements the OG-71 authorization which allows operators to provide wastewater treatment on the well site without overly time consuming administrative and technical reviews. The Department believes that the combination of the temporary nature of the on-site treatment facilities and the ease of use built into the OG-71 process is a good fit to provide adequate environmental protection while promoting recycling of wastewater.

    The Department has also developed a permitting process to allow the construction and operation of centralized wastewater storage impoundments. This permit allows construction of an impoundment to service multiple well sites over a period of up to several years without the need for restoration until after the final well site has been serviced. Centralized impoundments have the potential to create large available storage volumes which facilitates recycling of wastewater.

    DEP fully supports complete reuse of flowback and produced water to frac additional wells. In addition, the use of mine influenced water (MIW) as a source of fracing water is promoted by the Department. Use of MIW water provides a means to conserve fresh water while utilizing a water pollution source in Pennsylvania.

23. Discuss how the state encourages the efficient development of adequate capacity and infrastructure for the management of hydraulic fracturing fluids, including the transportation, recycling, treatment and disposal of source water and hydraulic fracturing wastes. [9.3]

    There are no additional permit requirements needed to re-use flowback at another well site and transportation of recycled water – either by truck or by pipeline - is not subject to permitting requirements beyond those already established for waste transporters or stream crossings. OOGM welcomes any recommendation the STRONGER review team may have with this issue.

Appendix A

Statutes

Statute Name	Citation	Activity	Description	Definitions	Promulgating Authority	Link
2012 Oil and Gas Act	58 Pa.C.S. §§ 3201-3274	Oil and Gas Well Development	This statute sets forth the permitting, financial responsibility, drilling, casing, operating, reporting, plugging and site restoration requirements for oil and gas wells.	58 Pa.C.S. § 3203	58 Pa.C.S. § 3274	2012 Oil and Gas Act
Oil and Gas Conservation Law, the act of July 25, 1961	P.L. 825, No. 359, as amended, 58 P.S. §§ 401-419	Well Spacing	This law governs well spacing and drilling units.	58 P.S. § 402	58 P.S. § 405	Link to all other laws
Coal and the Gas Resource Coordination Act, the act of December 18, 1984	P.L. 1069, No. 214, 58 P.S. §§ 501-518	Permitting	This law governs the coordination of drilling permits with respect to workable coal seams, and plugging requirements.	58 P.S. § 502	58 P.S. § 507	

The Clean Streams Law, the act of June 22, 1937	P. L. 1987, as amended, 35 P.S. §§ 691.1*et seq.*	Permitting	This statute provides the Department with the basic legal authority to prevent and abate water pollution in Pennsylvania and to reclaim and restore all waters of the Commonwealth. This statute also establishes basic permit requirements for certain activities. The Department issues many different permits under this law, including permits under the National Pollutant Discharge and Elimination System (NPDES) pursuant to Chapter 92a.	35 P.S. § 691.1	35 P.S. § 691.5	

Dam Safety and Encroachments Act, the act of November 26, 1978	P.L. 1375, No. 325, as amended, 32 P.S. §§ 693.1 *et seq.*	Water Obstructions and Encroachments	This statute provides the Department with the authority to regulate construction, operation, maintenance and removal of water obstructions and encroachments. The Department issues various permits under this statute, including those for stream crossings under Chapter 105.	32 P.S. § 693.3	32 P.S.§ 693.5	
Solid Waste Management Act, the act of July 7, 1980	P.L. 380, No. 97, as amended, 35 P.S. §§ 6018.101 *et seq.*	Solid Waste	This law establishes requirements for regulation of solid waste storage, collection, transportation, processing, treatment, and disposal. The Department issues various permits pursuant to this statute, including those for beneficial use of residual wastes.	35 P.S. § 6018.103	35 P.S. § 6018.105	

Air Pollution Control Act, the act of Jan. 8, 1960	P.L. 2119, No. 787, 35 P.S. §§ 4001, *et seq.*	Air Quality	The primary law that governs all air quality issues in Pennsylvania, including the permitting, monitoring, and enforcement of all air contamination sources.	35 P.S. § 4003	35 P.S. § 4004	
Storage Tank and Spill Prevention Act, the act of July 6, 1989	P. L. 169, No. 32, 35 P.S. §§ 6021.101, *et seq.*	Storage Tanks	This statute governs use of storage tanks and cleanup of spills.	35 P.S. § 6020.103	35 P.S. § 6020.106	
Water Resources Planning Act, the act of December 16, 2002	P.L. 1776, No. 220, 27 Pa. C.S. §§ 3101, *et seq.*	Water Withdrawals	This law requires the development of a State Water Plan, establishment of statewide Water Resource Committee, and registration, record keeping and periodic reporting of certain water withdrawals and withdrawal uses. It also provides for designation of critical water planning areas.	27 Pa.C.S. § 3102	27 Pa.C.S. § 3204	

Noncoal Surface Mining Reclamation and Control Act, the act of December 19, 1984	P.L. 1093, No. 219, 52 P.S. §§ 3301, *et seq.*	Non-Coal Mining	This statute authorizes DEP to regulate noncoal surface mining activities and requires persons engaging in noncoal surface mining activities to obtain a noncoal surface mining license and permit prior to commencing such activities.	§ 3303	§3311	
Act 14-Section 1905-A of The Administrative Code	71 P.S. § 510-5	Notification of Municipalities	Requires permit applicants for certain permits to give written notice to municipalities in which the proposed activities are			
Environmental Laboratory Accreditation Act, the act of June 29, 2002	P.L.l559, No. 169, 27 P.S. §§ 4101, *et seq.*	Laboratory Accreditation	This statute authorizes the Department to issue regulations establishing accreditation program for environmental laboratories.			

Delaware River Basin Compact, the act of July 7,1961	P.L. 518, No. 268, as amended, 32 P.S. §§ 815.101, *et seq.*	Compact	This statute codifies the Compact entered into by Pennsylvania.			
Susquehanna River Basin Compact, the act of July 17, 1968	P. L. 368, No. 181, as amended, 32 P.S. §§ 820.1, *et*	Compact	This statute codifies the Compact entered into by Pennsylvania.			
Great Lakes - St. Lawrence River Basin Water Resources Compact, the act of July 4, 2008	P.L. 526, No. 43, 32 P.S. §§ 817.21, *et seq.*	Compact	This statute prohibits any diversions of the Great Lakes Basin with limited exceptions and provides the Department with regulatory authority over withdrawals that equal or exceed 100,000 gallons per day and joint authority over consumptive uses exceeding 5 million gallons per day.			

Hazardous Material Emergency Planning and Response Act, the act of December 7, 1990	P.L. 639, No. 165, as amended, 35 P.S. §§ 6022.101 *et seq.*	Emergency Response	This statute governs hazardous material emergency planning and response.			
Hazardous Sites Cleanup Act, the act of October 18, 1988	P.L. 756, No. 108, as amended, 35 P.S. §§ 6020.101	Emergency Response	This statute governs hazardous sites cleanup.			
PA Safe Drinking Water Act, the act of May 1, 1984	P. L. 206, No. 43, as amended, 35 P.S. §§ 721.1, *et seq.*	Water Supplies	This statute governs public water supplies.			
The Radiation Protection Act, the act of July 10, 1984	P.L. 688, No.147, 35 P.S. §§ 7110.101-7110.703	Radiation	This statute governs radiation protection.			

The Waste Transportation Safety Act, the act of June 29, 2008	P.L. 596, No. 90, 27 Pa. C.S.A. §§ 6201, *et seq.*	Waste	This statute establishes a waste transportation safety program for the transport of municipal and residual waste, including requirements for authorization from the Department.			
Flood Plain Management Act, the act of October 4, 1978	P. L. 851, No. 166, as amended, 32 P.S. §§ 679.101, *et seq.*	Flood Plains	This statute governs management of flood plains.			

Regulations – NOTE: All regulations listed may be found at http://www.pacode.com/secure/data/025/025toc.html

Regulation/Citation	Activity	Description
25 Pa. Code Chapter 78	Oil and Gas Wells	Chapter 78 implements, *inter alia,* the Oil and Gas Act; contains basic requirements for natural gas well drilling, including operating standards for drilling, casing, cement, testing, monitoring and plugging of oil and gas wells to minimize gas migration and protect water supplies.
25 Pa. Code Chapter 79	Oil and Gas Conservation	Chapter 79 implements, inter alia, the Oil and Gas Conservation Law, the Oil and Gas Act and the Gas Resource Coordination Act; addresses well spacing.
25 Pa. Code Chapter 102	Erosion and Sediment Control	Chapter 102 requires persons proposing earth disturbance activities to develop and maintain best management practices to minimize the potential for accelerated erosion and sedimentation and the manage post construction stormwater.
25 Pa. Code Chapter 105	Dam Safety and Waterway Management	Chapter 105 implements, *inter alia,* the Dam Safety and Encroachments Act, and the Flood Plain Management Act; provides for the comprehensive regulation and supervision of dams, reservoirs, water obstructions and encroachments.
25 Pa. Code Chapter 93	Water Quality Standards	Chapter 93 defines specific water quality criteria and designated water uses to be protected and maintained for all surface waters in Pennsylvania; contains the water quality antidegradation program for protecting and maintaining existing water quality for exceptional value and high quality waters and existing uses of all surface waters.

25 Pa. Code Chapter 95	Wastewater Treatment Requirements	Chapter 95 sets forth minimum treatment requirements for new and expanding mass loadings of Total Dissolved Solids, all industrial wastes and oil bearing wastes and discharges affected by Acid Mine Drainage.
2.5 Pa. Code Chapter 96	Water Quality Standards Implementation	Chapter 96 establishes processes for achieving and maintaining water quality standards; addresses TMDLs.
25 Pa. Code Chapter 91	Water	Chapter 91sets forth several general provisions for administration and enforcement of Pennsylvania's water pollution control requirements; establishes specific application requirements, fee schedules, and conditions for the approval and permitting of the construction and operation of waste treatment facilities in Pennsylvania; sets forth requirements for reporting of releases that may cause pollution.
25 Pa. Code Chapter 92a	NPDES	Chapter 92a implements the federal NPDES program by the Department.
25 Pa.Code Chapter 106	Floodplain Management	Chapter 106 implements, inter alia, the Floodplain Management Act; contains permitting requirements for construction, modification or removal of obstructions in floodplains; provides for local management of floodplains.
25 Pa. Code Chapter 110	Water Resources Planning	Chapter 110 Implements the Water Resources Planning Act; establishes the requirements for registration of water sources, and record keeping and reporting of water withdrawal and use information.

25 Pa. Code Chapters 121- 129 and 131-145	Air	This regulation implements the Air Pollution Control Act; contains national standards of performance for new stationary sources, standards for contaminants, national emission standards for hazardous air pollutants, motor vehicle and fuels programs, construction, modification, reactivation and operation of resources, alternative emission reduction limitations, standards for sources, ambient air quality standards, local air pollution agencies, reporting of sources, air pollution episodes, sampling and testing, variances and alternate standards, disbursements from the clean air fund and interstate pollution transport reduction.
25 Pa. Code Chapters 287- 299	Waste	This regulation implements, *inter alia,* the Solid Waste Management Act; contains general provisions, residual waste landfills, residual waste disposal impoundments, beneficial use of coal ash, land application of residual waste, transfer facilities for residual waste, incinerators and other processing facilities, management of waste oil and storage and transportation of residual waste.
25 Pa. Code Chapters 260- 270	Waste	This regulation implements, *inter alia,* the Solid Waste Management Act; contains hazardous waste management system: general, identification and listing of hazardous waste, standards applicable to generators of hazardous waste, transporters of hazardous waste, owners and operators of hazardous waste treatment, storage and disposal facilities, interim status standards for owners and operators of hazardous waste treatment, storage and disposal facilities, management of specific hazardous wastes and specific types of hazardous waste management facilities, universal waste management, land disposal restrictions and hazardous waste permit program.

25 Pa. Code Chapters 215-240	Radiation	This regulation implements, *inter alia,* implements, *inter alia,* the Radiation Protection Act; contains general provisions, registration of radiation-producing machines, licensing of radioactive material, fees, standards for protection against radiation, notices, instructions and reports to workers; inspections, x-rays in the healing arts, veterinary medicine, medical use of radioactive material, radiation safety requirements for industrial radiographic operations, radiation safety requirements for wireline service operations and subsurface tracer studies, radiation safety requirements for analytical x-ray equipment, x-ray gauging equipment and electron microscopes, radiation safety requirements for particle accelerators, packaging and transportation of radioactive material, low-level radioactive waste management and disposal, rebuttable presumption of liability of the operator of the regional low-level waste facility and radon certification.
25 Pa. Code Chapters 803-808	Compact	This regulation implements, *inter alia,* the Delaware River Basin Compact; contains review and approval of projects, water withdrawal registrations and hearings and enforcement actions.
25 Pa. Code Chapters 901.1 - 901.5	Compact	This regulation implements, *inter alia,* the Susquehanna River Basin Compact; contains, rules of practice and procedure, comprehensive plan and water quality, water supply charges, flood plains and groundwater protection area, Southeastern Pennsylvania.

25 Pa. Code Chapter 245	Storage Tanks	Chapter 245 implements, *inter alia,* the Storage Tank and Spill Prevention Act; contains general provisions, certification program for installers and inspectors of storage tanks and storage tank facilities, permitting of underground and aboveground storage tank systems and facilities, corrective action process for owners and operators of storage tanks and storage tank facilities and other responsible parties, technical standards for underground storage tanks, technical standards for aboveground storage tanks and facilities, simplified program for small aboveground storage tanks and financial responsibility requirements for owners and operators of underground storage tanks and storage tank facilities

APPENDIX B

DEP Regional Emergency Contact Numbers

Northwest Region
230 Chestnut Street
Meadville, PA 16335-3481
814-332-6945
(8:00 a.m. to 4:30 p.m. M-F)
1-800-373-3398
(After hours, weekends and holidays)
Counties: *Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Venango and Warren*

Northcentral Region
208 W. Third Street, Suite 101
Williamsport, PA 17701
570-327-3636
(24-hour number including weekends and holidays)
Counties: *Bradford, Cameron, Clearfield, Centre, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga and Union*

Northeast Region
2 Public Square
Wilkes-Barre, PA 18701-1915
570-826-2511
(24-hour number including weekends and holidays)
Counties: *Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne and Wyoming*

Southwest Region
400 Waterfront Drive
Pittsburgh, PA 15222
412-442-4000
(24-hour number including weekends and holidays)
Counties: *Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington and Westmoreland*

Southcentral Region
909 Elmerton Avenue
Harrisburg, PA 17110
877-333-1904
(24-hour number including weekends and holidays)
Counties: *Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry and York*

Southeast Region
2 East Main Street
Norristown, PA 19401
484-250-5900
(24-hour number including weekends and holidays)
Counties: *Bucks, Chester, Delaware, Montgomery and Philadelphia*

APPENDIX C

OFFICE OF OIL AND GAS MANAGEMENT

ORGANIZATION CHART

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APPENDIX D

CHAIN OF CUSTODY FORM

Chain of custody.pdf

APPENDIX E

OIL AND GAS ENVIRONMENTAL

PROTECTION STANDARDS BOOT CAMP AGENDA

AND

OIL AND GAS WELL OPERATIONS BOOT CAMP AGENDA

OIL AND GAS ENVIRONMENTAL
PROTECTION STANDARDS BOOT CAMP

I. OIL AND GAS WELL OPERATIONS

MONDAY, DECEMBER 13, 2010

12:30 – 12:45 Welcome and Opening Remarks

12:45 - 4:30 Industry Practices for Oil and Gas Wells – Universal Well Services Training Division – Marcellus well drilling and completion, pressure and forces, fire safety, cementing, hydro fracturing fluids and fluids management during fracturing.

TUESDAY, DECEMBER 14, 2010

II. GENERAL ORIENTATION

8:00 – 10:00 Overview of DEP's Regulatory Program, the Oil and Natural Gas Industry, Underground Storage of Natural Gas and Common Oil and Gas Terms – Gilius
Based on SIC Code 13 description and EPA Oil and Gas E&P Industry Sector Notebook,

Pa Oil and Gas Geology and History – Gilius, Bradford and Venango fields, Bradford wells of Indiana County vicinity, shallow sands of Greene/Washington Counties vicinity, oil fields of Allegheny/Beaver county area, Medina wells, wells of the Council Run Field, Oriskany type wells, TBR wells, and Marcellus and other deep shale wells.

Mineral Rights, Leases and Royalties – Gilius –Based on fact sheet "Landowners and Oil and Gas Leases in Pennsylvania", minimum royalties 58 P.S. § 33, deeds, leases, severed estates, county court of common pleas

Overview of Oil and Gas & Environmental Laws for the Field Inspector – Gilius – Includes overview of program authority - Oil and Gas Act, Coal and Gas Resource Coordination Act, Conservation Law, Clean Streams Law, Dams and Encroachments Act, Solid Waste Management Act, Air Pollution Control Law.

Oil Gas Safety Policy - Gilius - Overview of Oil and Gas Safety Standard Operating Standards and **Inspection Policy –** Review of inspection policy

III. WELL PERMITS AND APPROVALS

10:00 – 12:00 Well Permits, Waivers and Variances, Operations on Public Lands, and Other Permits and Approvals – Eric Draper and Brian Babb Permits requirements, permit terms and renewals, alteration, expiration or cancellations,

application requirements, coal owners and operators, water supplies, distance restrictions, house variances, stream and wetland waivers, filing objections by landowners and owners of water supplies, denial of permits, coordination with coal mines and landfills, permit conditions, alternate methods, and protection of public resources and threatened and endangered species.

IV. ENVIRONMENTAL PERMITS, APPROVALS AND PERFORMANCE STANDARDS

1:00 – 2:00 Protection of Water Supplies, Complaint Investigation and Certified Labs – Nolan, Ryder, Kline - Complaints, investigations, presumption, testing, certified labs, replacement/restoration standards for quality and quantity, orders, water treatment systems, long term O&M costs.

2:00 – 2:45 Water Sources and Withdrawals – Derek Smith and Dillemuth– Review of Water Management Plans, approval process, inventory of approved sources, 105 and Erosion and Sediment controls for site construction, inspection checklist, coordination with SRBC and DRBC.

2:45 – 3:30 Reuse and Offsite Disposal of Wastewater and Residual Wastes – Adams – Review requirements for reuse of frac fluids and requirements for offsite disposal, include a summary of the approved treatment facilities, STPs, DWs, and include a review of the treatment processes at the facilities

3:30 – 4:15 Waste Tracking, Waste Transportation and Disposal – Tersine – include a review of the waste testing requirements, Form 26 R, Form U, and logs and PPC plans for transporters and treatment facilities, inspection checklist

4:15 – 4:30 Emergency Responses – **Perry** - Emergency Contracts and Contractors (Cudd and Wild Well)

WEDNESDAY, DECEMBER 15, 2010

8:00 – 12:00 Explosive Atmospheres, Use of Gas Meters, Confined Spaces – Jeff Stanchek DMS Include LEL, UEL, oxygen deficient atmospheres, CO2, condensate, use of meters. **Kline** - Use of new methane detection meters and fire retardant clothing.

1:00 – 3:00 Erosion, Sediment and Stormwater Management, Special Protection Watershed BMPs and Anti-degradation Policy and Site Restoration – Fuller - Review and approval of ESCGPs, BMPs, review of Anti-degradation Policy and BMPs, field review of erosion and sediment control plans, site restoration and stormwater management BMPs, inspection checklist

3:00 – 4:30 Protection of Streams and Wetlands (Kline) – Review 105 requirements for water obstruction and encroachment permits and protection of wetlands, GPs and joint permits, review of inspection checklist

THURSDAY, DECEMBER 16, 2010

8:00 – 8:30 Pits and Impoundments at the Well Location and Disposal of Drill Cuttings and Tophole water – Kline – Review standards for disposal of drill cuttings, testing requirements, site restoration reports, tophole water standards

8:30 – 9:15 Centralized Impoundments – Adams – Review permit requirements for centralized impoundments, siting and construction standards and inspection checklist.

9:15 – 10:45 Pollution, Prevention and Contingency (PPC) Plans – Tersine – Review content of PPC plans and review and inspection guidelines.

10:45 – 11:30 Spills, Reporting and Cleanup – Brokenshire – Review what constitutes a reportable spills, reporting, and cleanup standards, reporting

OIL AND GAS WELL OPERATIONS BOOT CAMP

TUESDAY, NOVEMBER 16, 2010

I. GENERAL ORIENTATION

8:00 – 8:15 Welcome and Opening Remarks

8:15 – 9:15 Overview of DEP's Regulatory Program, the Oil and Natural Gas Industry, Underground Storage of Natural Gas and Common Oil and Gas Terms – Gilius Based on SIC Code 13 description and EPA Oil and Gas E&P Industry Sector Notebook,

Pa Oil and Gas Geology and History – Gilius Bradford and Venango fields, Bradford wells of Indiana County vicinity, shallow sands of Greene/Washington Counties vicinity, oil fields of Allegheny/Beaver county area, Medina wells, wells of the Council Run Field, Oriskany type wells, TBR wells, and Marcellus and other deep shale wells.

Mineral Rights, Leases and Royalties – Gilius –Based on fact sheet "Landowners and Oil and Gas Leases in Pennsylvania", minimum royalties 58 P.S. § 33, deeds, leases, severed estates, county court of common pleas

Overview of Oil and Gas & Environmental Laws for the Field Inspector – Gilius – Includes overview of program authority - Oil and Gas Act, Coal and Gas Resource Coordination Act, Conservation Law, Clean Streams Law, Dams and Encroachments Act, Solid Waste Management Act, Air Pollution Control Law.

9:15 – 10:00 Oil Gas Safety Policy Review of Oil and Gas Safety Standard Operating Standards.

Inspection Policy – Review of inspection policy

II. WELL PERMITS AND APPROVALS

10:00 – 12:00 Well Permits, Waivers and Variances, Operations on Public Lands, and Other Permits and Approvals – Eric Draper and Brian Babb Permits requirements, permit terms and renewals, alteration, expiration or cancellations, application requirements, coal owners and operators, water supplies, distance restrictions, house variances, stream and wetland waivers, filing objections by landowners and owners of water supplies, denial of permits, coordination with coal mines and landfills, permit conditions, alternate methods, and protection of public resources and threatened species.

III. OIL AND GAS WELL OPERATIONS

1:00 – 3:00 Well Drilling, Casing and Cementing, Hydraulic Fracturing and Completion, and Safety Equipment - Gene Pine, Regulatory requirements for rig mobilization, BOPs, well drilling, casing standards, casing depth, cement standards, cementing, packers, surface casing, coal protective casing, intermediate casing, production casing, allowable pressures, plug and skid, inspection checklist, well tags and signs.

3:00 – 4:00 Horizontal Drilling – Stivanson – Horizontal drilling equipment, techniques and methodology.

4:00 – 4:30 Emergency Responses – Perry - Review of DEP's emergency response protocol , and emergency response contractors.

WEDNESDAY, NOVEMBER 17, 2010

8:00 – 12:00 Explosive Atmospheres, Use of Gas Meters, Confined Spaces – Jeff Stanchek DMS, and Kline Include LEL, UEL, oxygen deficient atmospheres, CO2 and condensate

1:00 – 2:30 Well Plugging – Pine, Ghoweri, Swanson, and Stivanson Definition of abandoned well, plugging wells in coal areas and wells in non-coal areas, filing intent to plug, coordination with Deep Mine Safety, inspections and inspection checklist, review of plugging certificates, orders to plug wells in coal area.

2:30 – 3:15 Abandoned and Orphan Wells Program - Ghoweri and Pine Define abandoned and orphan well, review inventory, field review by inspector, filing reports, plugging contracts, contract oversight, and completing reports. Also include emergency contracts.

3:15 – 4:10 Alternate Methods – English Define alternate methods, criterion for approval, review of form/request, process timeframes, issuing approvals, review of example

4:10 – 4:30 Inactive Status – English Define inactive status and abandoned wells, criterion for approval, mechanical integrity review, future utility, review of form/ request, process timeframes, issuing approvals, review of example.

THURSDAY, NOVEMBER 18, 2010

V. ENVIRONMENTAL PERMITS, APPROVALS AND PERFORMANCE STANDARDS

8:00 – 9:30 Protection of Water Supplies, Complaint Investigation and Certified Labs – Malone Complaints, investigations, presumption, testing, certified labs, replacement/restoration standards for quality and quantity, orders, water treatment systems, long term O&M costs.

9:30 – 12:30 Overview of Environmental Protection Performance Standards

Erosion, Sediment and Stormwater Management, Special Protection Watershed BMPs and Anti-degradation Policy and Site Restoration – Fuller

Protection of Streams, Wetlands, and Water Obstruction/Encroachment Permits - Kline

Water Management Plans, Water Sources and Withdrawals -

Pollution, Prevention and Contingency (PPC) Plans – Tersine

Spills, Reporting and Cleanup - Brokenshire

Disposal of Drill Cuttings, Tophole Water, Pits and Impoundments at the Well Site, and Centralized Impoundments – Kline and Adams

Offsite Disposal of Wastewater and Other Residual Wastes – Adams - Include discussion of reuse, list of the approved treatment facilities, STPs, and DWs, and landfills

Waste Transportation 26 R, Form U – Fuller

APPENDIX F

OFFICE OF OIL AND GAS MANAGEMENT

Guidance Documents

Operation & Monitoring –

Oil and Gas Operator's Manual - 550-0300-001
http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-8295

Oil and Gas Wastewater Permitting Manual - 550-2100-002
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48256/550-2100-002.pdf

Approval of Brine Roadspreading Plans - 550-2100-007
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48261/550-2100-007.pdf

Compliance Monitoring of Oil and Gas Wells and Related Facilities and Activities - 550-3000-001
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48286/550-3000-001.pdf

Production / Waste Reporting -

https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/Welcome/Welcome.aspx

Permitting – General -

Oil and Gas Well Drilling Permits and Related Approvals - 550-2100-003
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48257/550-2100-003.pdf

Enforcement –

Enforcement Actions by DEP's Oil and Gas Management Program - 550-4000-001
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48291/01%20550-4000-001.pdf

Civil Penalty Assessments in the Oil and Gas Management Program - 550-4180-001
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48287/550-4180-001.pdf