

REGULATORY AND PERMITTING CHALLENGES IN COAL BED METHANE DEVELOPMENT

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ABSTRACT

Coal-bed methane projects can be successful only through full compliance with the array of regulations that govern the development, operation, and closure phases of a project. This paper reviews the regulatory requirements that are common to most coal bed methane projects in the U.S., and identifies aspects of project planning that are necessary to address these requirements. An understanding of the applicable rules and regulations is needed during the design phase of the project, to ensure that project development goals and schedules are met, and that the costs of implementation are fully understood. For example, development permits are necessary before construction of field equipment can begin, and the time necessary to receive permit approvals should be considered in the overall project schedule. The appropriate regulatory agencies should be contacted very early in the process, to assess what issues they consider most important, within the context of the applicable regulations. In addition, most permit approvals require public notification and an opportunity for the public to comment on the proposed project, and permit approvals can hinge on favorable public participation. In some regions of the U.S., organized private-sector groups have become skilled in influencing natural resource development projects through both public relations campaigns and regulatory pressure. Full, up-front knowledge of the regulatory climate, site-specific characteristics that might influence regulatory action, and the local and regional political climate will go a long way toward ensuring the success of coal bed methane development projects.

INTRODUCTION

State regulatory programs that cover coal bed methane (CBM) project development were reviewed in an effort to ascertain the overall level of industry regulation, and to determine whether significant regional differences exist in the regulation of these projects. Regulations from ten states were obtained and reviewed for this effort, representing most producing regions of the nation. These regulations were reviewed in the context of 60 regulatory criteria, to assess the degree of control and informational requirements on exploration and production (Table 1). A high degree of regulatory control was found throughout the country, although some regional differences exist. The general requirements and differences are explained in this paper. Based on this understanding of the regulatory constraints on exploration and production, conclusions and recommendations are presented to help guide CBM project operators.

STATE REGULATORY PROGRAM REVIEW

Natural resource development regulations exercise varying levels of control over development, operations, and closure, with the intent of minimizing environmental degradation, ensuring proper site restoration at project conclusion, quantifying the production of resources for taxation purposes, generating a written record of public decision-making, keeping the public informed, and providing a forum for the thoughtful resolution of disputes. Only two states in this evaluation, Alabama and Montana, have specific regulatory programs directed at CBM projects, but the other states have oil and gas regulatory programs that cover all facets of CBM exploration and production. Additional environmental permits that may be required for a project, such as water discharge and air quality permits, are outside the scope of this investigation. The following summarizes the general regulatory characteristics found in this investigation and provides suggestions for CBM project developers. Table 2 presents a list of the state agencies that regulate CBM projects.

Public Knowledge

All the states studied have ample provisions in place for public notification of CBM projects. The permitting programs of all ten states require prior notification of planned projects, and failure to obtain a permit results in civil penalties. Public notification is handled by the regulatory agency and/or by the permit applicant, generally through publication in local newspapers. In all cases, the surface landowner must be notified, and some states require notification of all owners of record (the broadest definition of real property ownership, including lease and right-of-way) within a specified distance from proposed well locations. All permit applications require identification of the owners of real property in the area of the planned well, and most states require identification of water, oil, and gas wells in proximity to the planned well. In all cases, hearings can be held to afford the public an opportunity to provide input before permit decisions are made by the regulatory agencies.

Control

The manner in which CBM projects are developed and operated is managed by state agencies through the permitting process and enforcement of regulations. Approval of permits is required before site activity can begin. States also require prior approvals or permits to undertake specific actions at existing operations, such as the setting of casing, seismic testing, or plugging. The permitting process and enforcement of regulations also enable states to exercise control over topics of regional importance. For example, in states where coal is a substantial resource (such as Kentucky, Pennsylvania, and Utah), there are special requirements for notification, well construction, and plugging through mineable coal zones. Pennsylvania also has developed best management practices (BMPs) for the development of well locations because of the hilly nature of the state and the desire to control erosion and sedimentation. Indiana has a less complicated regulatory structure, because lease terms and conditions between resource exploration and development companies and surface owners frequently dictate the manner of operation and surface use.

All states have special provisions for the protection of local potable water sources. For example, Colorado has identified hydrologically sensitive areas where special care must be exercised by operators to protect water resources, and some states (Pennsylvania, Virginia, and Kentucky are examples) expressly require the restoration of potable water when supplies are affected by exploration or production. While there are differences among states in their regulation of CBM projects, most major activities at a location are addressed either in permit application information requests prior to permit approval, or through the enforcement of operations regulations where violations can jeopardize issued operating permits. All states have the ability to inspect operations to ensure compliance, and all have the ability to mandate corrective action.

Resource Production

State knowledge of resource production, whether oil, gas, or coal bed methane, is important for taxation purposes, but states also endeavor to ensure the efficient extraction of the resource and minimization of waste. All states require some form of production reporting, along with identification of the units from which the extraction occurred. Records of production are maintained by the state agencies, and all states have the ability to inspect and ensure proper measurement and reporting. This information is evaluated by regulatory agencies to ensure that complete extraction is achieved, to the extent possible with current technology, and that incidental waste is minimized.

Site Restoration

Site restoration at the conclusion of a project is required by all states, although there are some differences in the degree of specificity laid out in the regulations. Site restoration considers not only the surface but also the manner in which wells are plugged and abandoned. All states have specific requirements for the plugging of wells, with the goal of protecting in-place water, coal, gas, oil, or other natural resources. The degree of regulatory specificity for surface restoration runs the gamut from restoration to “as near as practical to pre-operation conditions” (Indiana) to detailed requirements for land restoration, including the replacement of site topsoil (North Dakota). The amount of detail in the regulations does not imply any difference in the intended outcome of restoration, but can affect the potential for regulatory disputes. The ultimate control over site restoration is found in the bonding requirements for each well or project. Release of the required original bond, which in some states is a substantial amount, is predicated in all cases on the proper plugging and abandonment of project wells, including the restoration of surface lands.

Public Record

The permitting process for CBM projects requires providing information and maps regarding the planned site activities. Most states have standard forms, which must be completed and become part of the permanent record for the project. Regulatory approvals occur only after required project information is provided and announcements of planned permit approvals are published in local newspapers. Agency approvals of permits are reviewed by public commissions established for the oil and gas industry.

Records of the approval process are maintained by the states and are available to the public into the future.

Dispute Resolution

Disputes can occur in the CBM fields, between the project proponent and the regulatory agency, between local private parties (generally the surface landowner) and the project proponent, between the project proponent and other resource developers, and between special interest groups and the regulatory agency. All states have a procedure in place to allow a hearing of the dispute and resolution before a public commission (usually the Oil and Gas Commission). Again, decisions by commissions are made in public meetings. Nothing found in the review of states' regulations affects the access to remedies through civil action.

Federal Land Management Program Summary

This study focused primarily on state regulations and permit requirements for exploration and production, so the body of federal regulations was not analyzed thoroughly. However, a general overview is presented in this section.

Many CBM projects in the West are conducted on federal lands that are administered by the Bureau of Land Management or U.S. Forest Service, depending on location. In addition to meeting state regulations and permit requirements, federal approvals for projects are also required, governed by the regulations set forth in CFR Title 43, Section 3160. The primary purposes for federal oversight are to protect trust resources (the broadest definition of resources is implied, including biota, water, soils, archeological values, and other locatable, leaseable, and saleable minerals), ensure proper resource use, and ensure public safety on federal lands. A Use Permit Application and a Plan of Operations must be submitted to start the federal review process, and the decision to approve the Plan is made at the District or Regional level, depending on the expected project impact. The Plan of Operations requires information similar to that required in state regulatory programs, but substantial review of the expected impact to trust resources is required for federal agencies. A Finding of No Significant Impact or an Environmental Assessment (EA) will be required by the federal agency before the Plan of Operations can be approved and a Use Permit issued. If the potential impacts from the planned project are considered significant, an Environmental Impact Statement (EIS) will be required before federal approval of the project occurs. Throughout either the EA or EIS process, public participation and other resource management agency review of the project will be required to ensure full compliance with the many federal resource laws.

Guidance For CBM Projects

Given this understanding of the regulatory control and oversight to which CBM projects are subjected before they are allowed to proceed, companies considering CBM developments are well advised to develop a management strategy to address this regulatory environment. The following sections of this paper identify approaches

intended to support successful project development, and explain the basis for such approaches.

Managing the Regulatory Process

A successful CBM project is implemented as quickly as possible, so that it can begin generating revenue soon after investment capital outlays. A thorough planning process is necessary to bring a project on line in a timely fashion, and the implementation plan must fully consider the regulatory requirements and anticipated schedule for submitting permit applications and receiving approvals. The first step in this plan is to anticipate permit application requirements by developing a comprehensive understanding of local and regional development issues and concerns. Useful information regarding local and regional issues and regulatory concerns can be gained by reviewing previous development permit submittals and meeting with the key regulatory authorities. Holding such meetings early in the planning process affords the regulators an opportunity to express their expectations regarding planned developments, to elucidate key concerns, and to develop a rapport with the company proposing the development. Such meetings can be highly valuable, because permit applications are reviewed by individuals, each of whom has particular interests within a given regulatory construct. Decisions at the state level frequently are made from the bottom up, and developing a professional working relationship with individual permit reviewers can provide invaluable perspective regarding what level of information will be needed for project review and approval. The CBM project proponent can then develop an implementation plan, with a realistic timetable, to address the regulators' key concerns.

Managing Public Perception

Public perception regarding the overall impacts of a planned CBM development can influence the speed and outcome of the project permitting process, and can affect the project during its operating life, both of which have economic implications for the project. The public is afforded substantial opportunity to offer their input during the permitting process, and regulatory agencies are generally acutely aware that issuing permits in the face of public opposition—even if such opposition is predicated on misconceptions—can have political and litigious ramifications. In addition, public opinion can influence such operating factors as the frequency of compliance inspections and the rigor of regulatory scrutiny. Public concern can even lead to the promulgation of new rules and regulations, which could affect the economic viability of an already operating CBM project.

On the other hand, public support for a project can exert a powerful positive influence on regulators, enabling the project to proceed in an atmosphere of cooperation. Managing public perception of a project is therefore extremely important in ensuring its success. Steps for the project proponent to take include full participation in public hearings, and providing prompt, thoughtful responses to concerns expressed within that forum. By providing full, forthcoming responses to concerns of the public, the project proponent can foster an image of a responsible entity that desires to further the community's interests while pursuing its own.

Other avenues for fostering positive public perception include using local news media and public information campaigns to present the project in a positive light. It helps

to put a face to the project (frequently the project's environmental manager), giving the public the comfort that someone is available to listen to any concerns, and that person is in a position to address those concerns promptly and decisively. In planning a CBM project, therefore, it is important to gauge the potential public response at the outset, and to have the appropriate public information program in place before the permit application process begins.

Third-Party Intervention

Organized opposition can play a large role in determining whether permits are issued, how long it takes, and the manner in which the regulators oversee the project during its operating life. Surface landowners can band together, and other interested parties often take the form of organized groups—both these types of groups can exert pressure on state commissions and agencies, especially when environmental impacts are perceived or the terms of operating permits are violated. This pressure can take the form of participation in the public review process, political action, and litigation. The key to managing these influences from third-party groups or individuals is to know up front who they are and what their concerns will be. With this knowledge, project implementation and the associated public information program described above can be planned to account for these concerns and build a rapport with influential groups and individuals. Providing special-interest groups and influential individuals with accurate information regarding CBM projects can go a long way toward reducing misconceptions regarding project impacts, and avoiding delays associated with organized opposition.

Regulatory Challenges to CBM Operations

Because of the degree of regulatory oversight on CBM projects, operators frequently are faced with a number of additional tasks unrelated to the extraction and sale of gas. Commitments made during the permitting process, and the self-monitoring and reporting aspects of many required environmental permits, create additional management challenges. Failure to fulfill all aspects of permit obligations, including monitoring and reporting, can lead to additional regulatory oversight, and even monetary penalties. Managing the burden placed on the operator to fulfill these additional requirements can be accomplished only through proper planning, communication, and training of site personnel.

Without adequate planning and training, operators can find themselves facing a Notice of Violation (NOV) of either permit requirements or operating regulations. The operating company must consider thoughtfully the manner in which it responds to NOVs, because operations must continue into the future with the same regulatory agency performing the oversight. Regulatory compliance is important to maintaining the full value of the project for potential sale—a history of violations can only detract from a project's value.

Finally, financial planning for final site restoration should not be neglected until the waning years of the project, where revenues seldom meet operating costs. Controlling the size of the project's footprint is one of the best ways to reduce the overall cost of final site restoration and financial burden at the end of project life.

Conclusion

A review of regulations covering coal bed methane projects was conducted for ten states. From an analysis of these regulations, it was concluded that there is significant regulatory control over most aspects of gas exploration and production. While some regional differences exist among the various states, these differences relate more to the protection of highly valued resources found in one state compared to another. In all states, the public has ample opportunity during the regulatory process to evaluate planned projects and express concerns. The degree of information required for planned projects, and monitoring and reporting requirements for ongoing operations, make it essential for CBM projects to fully consider the regulatory environment and public perceptions, along with project development and operational details. The financial success of a CBM project is more than a function of resource and price—planning for regulatory requirements and effective public relations can affect the speed of permit approval and the ease of operations. The success of future projects can depend on the success of previous projects, and the intrinsic value of a project for sale to others can be affected by the regulatory and public perception of the project.

Table 1. State regulatory summary covering coal bed methane projects

State	Alabama
Regulatory Program	
CBM Specific	400-3-1
O&G Regulations	--
Name of Authority	State Oil and Gas Board of Alabama
Regulator	State Oil and Gas Supervisor
Well Permitting	
Permits Required	Exploration, injection, well conversion
Requirements	Forms with specific information
Fees	\$300, \$150, or Blanket \$1,000
Well Deepening	Permit
Directional Drilling	Permit
Permit Duration	6 months
Bonds	
Well Drilling	\$5,000–\$50,000 depending on depth
Other Facilities	Many types of facilities covered
Pollution Prevention	Bond can be increased in areas of high environmental risk.
General Reporting	
Organizational Reports	Every 2 years
Change of Operator	Immediately upon sale
Well Spacing	
Spacing	Special Field Rules or 40 acre
Boundary Offsets	330 feet from exterior of field
Housing Offsets	200 feet from permanent residence
Exemptions	Approved by Board
Notification and Approval	
Well Status Reports	Weekly
Prior Notification	Setting casing, perforating, testing, logging, coring, swabbing
Condition Change	Sale or assignment, loss of logging equipment, fire, leak, spill, blow out
Approval Activities	Most field activities require approval from Supervisor
Drilling	
Well Identification	Signage Specifications
Pollution Protection	Prevent current and future pollution of freshwater resources, quality, and pressures
Well Records	Significant information furnished to Board in 30 days
Core Storage	Core location provided to Board, core submitted to Board after 1 yr.
Directional surveys	Surveys filed with Supervisor in 30 days
Lost Logging Source	Notification requirement, abandonment requirements, signage
Fracturing	Approval requirement, corrosion control, reporting.
Casing	Minimum depth requirements, API standards, other specifications
Cementing	Circulate to surface, other specifications
Pressure Testing	Depth-dependent pressure specification, other specifications
Blow-out Prevention	Well control required, drilling fluids not required
Production Casing	Specifications
Production Testing	Approval from Supervisor; reporting, testing requirements
Venting	Approval required, 20 ft above ground
Pit Const. & Maint.	Prior approvals, const. specifications, inspection requirements
Pit Fluids	Proper disposal or recycling in 30 days
Pit Closure	Compaction and filling in 90 days, surface owner requests
P&A of Wells	Plugged within 30 days of completion; notifications, specifications, reports
Location Restoration	Within 90 days, plan approval, erosion control, landowner variance
Temporary Abandonment	1 yr., approval required, 1 yr. extensions, site is to be maintained, well safeguards
Shut-ins	1 yr., approval required, 1 yr. extensions, site is to be maintained, well safeguards
Freshwater conversions	Surface owner request, bonding
Seismic and Other Holes	Plugged to protect all fresh water
Reworking	Approval for Supervisor, reporting in 30 days
Production	
Facilities	Based on sound engineering principles. Site arrangement plan requirements.
Holding Ponds	Maintained to permit and regulation
Produced Water	No discharge to land, streams, or rivers
Commingling	Allowed for distinct pools
Tanks	Signage requirements, dike requirements
Dikes	Lined containment area, volume requirements, saltwater removal
Site maint.	Access roads, equipment removal, vegetation, Supervisor approval
Transportation	
Certification	Operator's Certificate of Compliance and Authorization to Transport Oil, Gas & Condensate
Gathering Lines	Interstate gathering lines per standards, flow lines excluded
Compressor Stations	Map of facilities required prior to installation
Maintenance, Abandonment	Maintained in safe manner, purged with water or inert material
General Safety and Environment	
Notifications	Immediate Supervisor notification for spill, leak, fire, blowout
Clean-up	Immediate cleanup of spills, leaks, fires, and blow outs
Drinking Water Sources	Hydrologic fracturing shall not endanger drinking supplies, prior approvals, depth provisions
Surrounding Wells	Special provisions when water wells are within 1/4 mile
Class II Injection wells	
Program	Program and includes monthly reporting.

Note: -- Topic not explicitly addressed in program reviewed.

Disclaimer: Table prepared for illustration only & should not be used for decision-making without consulting appropriate regulatory or legal authority.

Table 1. State regulatory summary covering coal bed methane projects

State	Colorado
Regulatory Program	
CBM Specific	--
O&G Regulations	Title 34, Article 60
Name of Authority	Colorado Oil and Gas Conservation Commission
Regulator	Director of the Oil and Gas Conservation Commission
Well Permitting	
Permits Required	Drill, Deepen, Re-Enter, Recomplete, and Operate
Requirements	Forms with specific information
Fees	--
Well Deepening	Permit
Directional Drilling	Permit
Permit Duration	1 year
Bonds	
Well Drilling	Financial assurance of \$2,000, \$5,000 or Blanket \$25,000
Other Facilities	Bonding requirements
Pollution Prevention	Environmental Surety, remediation of sites, soil test and cleanup requirements
General Reporting	
Organizational Reports	Form requirement and approval prior to commencement of operations
Change of Operator	Operator change within 30 days, 15 days for Class II wells
Well Spacing	
Spacing	Depth dependent
Boundary Offsets	200 to 600 feet from lease boundary
Housing Offsets	150 feet, closer if well equipped with pressure drop valves
Exemptions	Approved by Director
Notification and Approval	
Well Status Reports	Monthly reporting
Prior Notification	Drilling any well, 30-day notice to Director, surface owner, and local gov. notice rules
Condition Change	24-hr. notice of loss of well control, 15 written report
Approval Activities	Most well-head activities require notification and approval of forms
Drilling	
Well Identification	Signage Specifications
Pollution Protection	Prevent significant adverse impact, no violation of water quality standards, exemptions
Well Records	Logging requirements, submittal of information
Core Storage	--
Directional surveys	Approval for directional drilling, survey filed within 30 days
Lost Logging Source	Covered by other statute
Fracturing	--
Casing	Casing program for each well and dependent on formation knowledge
Cementing	Specifications for surface and intermediate and production casing
Pressure Testing	Specifications provided
Blow-out Prevention	All necessary precautions to keep well under control, Director can specify protection
Production Casing	Casing program for each well and dependent on formation knowledge
Production Testing	Reporting within 20 days of completion
Venting	Safe distance, prior notice to local emergency dispatch required
Pit Const. & Maint.	Pit permit required, surface soils removed and stored, pits to be fenced, lining requirements
Pit Fluids	No open storage of petroleum except in emergency
Pit Closure	Specifications for range land and crop land settings
P&A of Wells	Approach needs approval from Director, specifications provided, must leave surface casing
Location Restoration	Restored to condition of pre-operation, includes topsoiling
Temporary Abandonment	Approval of the Director for 6 months, extensions available, pressure testing specifications
Shut-ins	Approval of the Director for 6 months, extensions available, pressure testing specifications
Freshwater conversions	Landowner assumes plugging responsibility in writing
Seismic and Other Holes	7-day prior notice, approval from Director, bonding required, plugging and reclamation specifications
Reworking	--
Production	
Facilities	Spacing requirements for tanks, heater-treaters, wells near buildings, setback specifications
Holding Ponds	Operated in a manner to protect waters of the State, oil removal in 24 hrs., lining requirements
Produced Water	Cannot violate water quality specifications of the State
Commingling	Commingling of producing zones encouraged to reduce wells
Tanks	Tanks to meet API and UL standards
Dikes	2 feet of freeboard above water level
Site maint.	Operated in manner consistent with regulations
Transportation	
Certification	Identification of transporter required on operations notification form
Gathering Lines	Flow lines designed for conditions, pressure tested, maintenance and repair specifications
Compressor Stations	Spacing and offset specifications
Maintenance, Abandonment	Reclamation of site required
General Safety and Environment	
Notifications	Any spill over 20 bbl. reported to Director immediately upon discovery, notification for 5-bbl spills
Clean-up	Cleaned up as soon as possible, Director may require additional action
Drinking Water Sources	Sensitive Areas have been established with specific operations regulations. Groundwater monitoring can be required.
Surrounding Wells	Notification for registered wells, casing requirements in some areas
Class II Injection wells	
Program	Approval required, public notification, special regulations

Note: -- Topic not explicitly addressed in program reviewed.
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Table 1. State regulatory summary covering coal bed methane projects

State	Indiana
Regulatory Program	
CBM Specific	--
O&G Regulations	IC 14-37 and 312 IAC 16
Name of Authority	Department of Natural Resources
Regulator	Division of Oil and Gas
Well Permitting	
Permits Required	Permit required to drill, deepen, operate, or convert a well for oil and gas
Requirements	Detailed specifications for permit application
Fees	\$100
Well Deepening	Permit required
Directional Drilling	Permit required
Permit Duration	Drilling must commence in 1 yr.
Bonds	
Well Drilling	Required in 10 days. \$2,000 per well up to \$30,000 for blanket bond
Other Facilities	--
Pollution Prevention	--
General Reporting	
Organizational Reports	Registration with Sec. Of State
Change of Operator	Transfer of well permits requires notification, permit and approval.
Well Spacing	
Spacing	20 or 40 acre, depending on depth. Exemptions available
Boundary Offsets	From 165 ft to 330 ft depending on location. 660 ft from other wells
Housing Offsets	--
Exemptions	--
Notification and Approval	
Well Status Reports	Logging of completed wells required and filed with the Division, includes core and cuttings
Prior Notification	48-hour prior notice for coring, removing casing, and plugging operations
Condition Change	--
Approval Activities	Drilling in mineable coal seams
Drilling	
Well Identification	Signage required
Pollution Protection	--
Well Records	--
Core Storage	--
Directional surveys	--
Lost Logging Source	--
Fracturing	--
Casing	Specifications for surface and intermediate casing.
Cementing	API standards
Pressure Testing	Testing of plugs
Blow-out Prevention	--
Production Casing	Limited specifications for production casing and cementing.
Production Testing	--
Venting	Must request a hearing before the Commission but allowed if not market.
Pit Const. & Maint.	Constructed to prevent escape of oil and high enough to eliminate surface water. Liner required for some applications.
Pit Fluids	--
Pit Closure	Closed as soon as possible with restoration to pre-drilling condition.
P&A of Wells	Plugging specifications with protection of oil, gas, and water resources.
Location Restoration	Closed as soon as possible with restoration to pre-drilling condition.
Temporary Abandonment	Specification for well and site conditions before temporary abandonment. Approved by Division. 5 yr period.
Shut-ins	--
Freshwater conversions	Approved by the Division with necessary information submitted.
Seismic and Other Holes	Bonds required for geophysical surveys
Reworking	--
Production	
Facilities	--
Holding Ponds	--
Produced Water	--
Commingling	--
Tanks	Surrounded by dikes capable of 1&1/2 storage capacity.
Dikes	Must be impermeable and not breached. 2 feet of freeboard.
Site maint.	All sources of fire hazard must be removed.
Transportation	
Certification	--
Gathering Lines	--
Compressor Stations	--
Maintenance, Abandonment	Covered by lease terms
General Safety and Environment	
Notifications	--
Clean-up	--
Drinking Water Sources	Special protection of aquifers identified by the Department
Surrounding Wells	Operations cannot cause a violation of drinking water standards.
Class II Injection wells	
Program	Specifications for injection wells, notifications.

Note: -- Topic not explicitly addressed in program reviewed.
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Table 1. State regulatory summary covering coal bed methane projects

State	Kentucky
Regulatory Program	
CBM Specific	--
O&G Regulations	KRS 353
Name of Authority	Department of Mines and Minerals
Regulator	Department Director
Well Permitting	
Permits Required	Permits required. Substantial information needed, wells penetrating coal-bearing strata have additional information requirements
Requirements	Operations and reclamation plan required. Mediation Report for severed resources. Surface owner notification.
Fees	\$300 per well
Well Deepening	Can be completed without new permit under certain circumstances. Otherwise, permit required.
Directional Drilling	Must be approved by permit
Permit Duration	1 yr.
Bonds	
Well Drilling	\$500 to \$5,000 per well depending on depth, Blanket bonds up to \$10,000
Other Facilities	--
Pollution Prevention	--
General Reporting	
Organizational Reports	Certificate of Compliance required for any production.
Change of Operator	Form required with proof that the new operator understands the manner in which the site is to be operated and reclaimed.
Well Spacing	
Spacing	Special rules for wildcat wells. Special field order request in 60 or 120 days.
Boundary Offsets	200 to 2,000 feet from boundary depending on well type, exceptions for unfavorable topography
Housing Offsets	150 feet
Exemptions	Approved by Director
Notification and Approval	
Well Status Reports	Annual reports of monthly production. Informational specifications.
Prior Notification	Landowner notification 30 days before commencement. Prior notification for directional drilling or plugging.
Condition Change	--
Approval Activities	All activities must be covered in Operations and Reclamation Plan. Drilling in mineable coal seams has special provisions.
Drilling	
Well Identification	--
Pollution Protection	Casing and cementing requirements.
Well Records	Within 90 days after termination of operations, submittal of all logs and other information.
Core Storage	Drill cuttings can be required by director.
Directional surveys	Permit for directional or horizontal drilling required. Surveys every 1,000 ft or at every joint, depending on well type.
Lost Logging Source	--
Fracturing	Cannot destroy the usefulness of strata for oil, gas, or water.
Casing	Casing specifications. Special casing requirements for coal and gas near coal areas.
Cementing	Cementing specifications.
Pressure Testing	Testing requirements and reporting
Blow-out Prevention	Required for deep wells, specifications.
Production Casing	Sufficient for known formation pressures.
Production Testing	--
Venting	Waste of gas is not allowed.
Pit Const. & Maint.	Must be operated per Operations and Reclamation Proposal permit.
Pit Fluids	Must be operated per Operations and Reclamation Proposal permit.
Pit Closure	Must be operated per Operations and Reclamation Proposal permit.
P&A of Wells	Notification required. Plugging immediately. Plugging affidavit required. Plugging specifications for coal and non-coal areas.
Location Restoration	Return the surface and improvements to as near as practical the original condition. Compensation for damages.
Temporary Abandonment	2-yr. period without plugging. Casing and capping requirements.
Shut-ins	--
Freshwater conversions	Written authority is needed from the landowner.
Seismic and Other Holes	--
Reworking	--
Production	
Facilities	Must be operated per Operations and Reclamation Proposal permit.
Holding Ponds	--
Produced Water	--
Commingling	--
Tanks	Signage required or oil holding facilities with specifications.
Dikes	--
Site maint.	Must be maintained per the Operations and Reclamation Proposal permit.
Transportation	
Certification	--
Gathering Lines	Must be operated per Operations and Reclamation Proposal permit.
Compressor Stations	Must be operated per Operations and Reclamation Proposal permit.
Maintenance, Abandonment	Per specifications of the Operations and Reclamation Proposal permit.
General Safety and Environment	
Notifications	Written notice to Department when final reclamation is complete.
Clean-up	--
Drinking Water Sources	Replace water supply used for legitimate purposes
Surrounding Wells	--
Class II Injection wells	
Program	Permit, bonding, and operation requirements. Prior certification of compliance notification required. Mechanical integrity testing.

Note: -- Topic not explicitly addressed in program reviewed.

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Table 1. State regulatory summary covering coal bed methane projects

State	Montana
Regulatory Program	
CBM Specific	Docket 130-99
O&G Regulations	Rule 36-22
Name of Authority	Board of Oil and Gas Conservation
Regulator	Designated agent
Well Permitting	
Permits Required	Permit required, CBM wells considered "wildcat" under Oil and Gas Regulations
Requirements	Same as for wildcat drilling
Fees	\$25 to \$150 per well depending on depth
Well Deepening	Fees required for additional depth. No removal of any casing with out approval
Directional Drilling	Permit required for planned deviation
Permit Duration	6 months, re-file if not spudded in 6 months
Bonds	
Well Drilling	Bonding required of \$5,000 to \$10,000.
Other Facilities	Plugging and restoration bond of \$1,500 to \$50,000
Pollution Prevention	--
General Reporting	
Organizational Reports	Organization Report form
Change of Operator	Supplemental report required immediately
Well Spacing	
Spacing	Special field rules, only one production well per legal subdivision
Boundary Offsets	660 or 990 feet from 1/4 section lines,
Housing Offsets	--
Exemptions	Special provisions can be approved
Notification and Approval	
Well Status Reports	Completion reports in 30 days; includes other well completion activities. Monthly reporting thereafter.
Prior Notification	Permit required prior to any drilling, stratigraphic testing, or coring.
Condition Change	--
Approval Activities	--
Drilling	
Well Identification	Signage requirements
Pollution Protection	Solid or produced waste disposed to protect water or soil, offsite disposal in alluvial valleys
Well Records	Logging must be completed and sent to Board in 30 days
Core Storage	Cuttings delivered to Board in 6 mo., core in 3 yrs.
Directional surveys	Approval of directional drilling required with survey submitted in 30 days
Lost Logging Source	--
Fracturing	Reporting within 30 days of activity
Casing	Casing through water- and oil-producing zones depends on drilling method
Cementing	Cementing required with pressure testing
Pressure Testing	Within 30 days, pressure testing required on all wells
Blow-out Prevention	Required on all wells with specifications.
Production Casing	Gas production casing must be set through well casing
Production Testing	--
Venting	No wasting of gas, requirements for flaring, variance in writing only
Pit Const. & Maint.	Prior permit approval, cut into ground and lined, maintained in working order
Pit Fluids	Hydrocarbons removed in 10 days, unlined pits for emergency use only
Pit Closure	Pits closed per Board specifications in 1 yr.
P&A of Wells	Notice and report of intent to abandon a well. Plugged in 1 yr. Marker requirement. Report requirement after 15 days
Location Restoration	Restored to original grade and productive condition. Applies to all wells.
Temporary Abandonment	Report required if well is idle for 6 consecutive months.
Shut-ins	--
Freshwater conversions	Landowner approval form. Bonding required of \$5,000 to \$10,000.
Seismic and Other Holes	1/4 mile setback from buildings, wells, or springs; plugging and restoration requirements
Reworking	--
Production	
Facilities	--
Holding Ponds	Fenced, screened, and netted. Lined if receive saltwater
Produced Water	Reported separately from oil on a monthly basis
Commingling	--
Tanks	When necessary, tanks must be surrounded by dikes
Dikes	Dikes to contain 1 1/2 volume of tanks, kept free of fluid and veg.
Site maint.	All material that constitutes a fire hazard must be 150 ft from site. Site maintained in good working order.
Transportation	
Certification	Certification of Compliance required. Monthly reporting for all transporters
Gathering Lines	--
Compressor Stations	--
Maintenance, Abandonment	--
General Safety and Environment	
Notifications	Immediate notification of spill, blow out, leak, or release of 50 bbl.
Clean-up	Promptly control and clean up leak, regardless of volume
Drinking Water Sources	Mitigation of wells and springs within 1/2 mile, water replacement
Surrounding Wells	Notification to water right holders, mitigation plan required, reporting of water production
Class II Injection wells	
Program	Prior Board approval. EPA-approved regulatory program with specifications.

Note: -- Topic not explicitly addressed in program reviewed.

Disclaimer: Table prepared for illustration only & should not be used for decision-making without consulting appropriate regulatory or legal authority.

Table 1. State regulatory summary covering coal bed methane projects

State	North Dakota
Regulatory Program	
CBM Specific	--
O&G Regulations	NDAC 43-02-03
Name of Authority	Industrial Commission, Oil and Gas
Regulator	Director
Well Permitting	
Permits Required	Approved permit required for surface-disturbing activity or recompletion.
Requirements	Specifications.
Fees	--
Well Deepening	Approved permit required.
Directional Drilling	Permit required with survey.
Permit Duration	1 yr. after approval
Bonds	
Well Drilling	\$15,000-\$50,000 depending on number of wells
Other Facilities	Treatment plant bond required.
Pollution Prevention	A fund is established to reclaim lands and plug wells. Operators pay into fund.
General Reporting	
Organizational Reports	Principal or agent shall file notification
Change of Operator	New organization report required
Well Spacing	
Spacing	1/4 section unless otherwise set.
Boundary Offsets	660 feet from boundary, 1000 feet to nearest well in pool.
Housing Offsets	--
Exemptions	--
Notification and Approval	
Well Status Reports	Well completion reports required within 30 days. Monthly reporting of production.
Prior Notification	--
Condition Change	Notification and reporting for fires, leaks, spills, or blowouts.
Approval Activities	--
Drilling	
Well Identification	Signage requirements.
Pollution Protection	No disposal of wastes to land or water, site reclamation, well casing and cementation specifications.
Well Records	All records are to be kept at the site.
Core Storage	Core analysis must be filed with the director. Core samples sent to State Geologist, specifications.
Directional surveys	Surveys required every 1,000 feet. Surveys filed with Director for directional drilling. Permit required.
Lost Logging Source	--
Fracturing	If well damaged, corrective measures or plugging.
Casing	Casing and cement must be sufficient to isolate oil, gas, and water formations. Formation specifications.
Cementing	Casing and cement must be sufficient to isolate oil, gas, and water formations. Cement specifications.
Pressure Testing	Required on any discovery well. Specifications.
Blow-out Prevention	Necessary precautions to keep well under control
Production Casing	Must be of sufficient strength to withstand formation pressures.
Production Testing	Production testing from new well into a pool required
Venting	Venting allowed with specification on flaring. Volume of gas vented must be reported.
Pit Const. & Maint.	Constructed and reclaimed to prevent pollution of land and fresh water. Fencing can be required.
Pit Fluids	Fencing required for saltwater and oil. Proper disposal of fluids and solids.
Pit Closure	Within 1 year, notification required. Use of stockpiled soils.
P&A of Wells	Notice of intent to plug with plugging procedure. Plugging record (form) filed with director in 30 days.
Location Restoration	Reclamation specification for plugged well site.
Temporary Abandonment	Failure to produce gas in one year constitutes abandonment, requires plugging.
Shut-ins	Failure to produce gas in one year constitutes abandonment, requires plugging.
Freshwater conversions	Application must be approved by the Commission.
Seismic and Other Holes	Permit required with plugging and reporting requirements.
Reworking	Approvals and reporting of projects.
Production	
Facilities	Specifications on central production facilities.
Holding Ponds	--
Produced Water	No storage in earthen pits except for emergency purposes. Volume of water reported monthly to Director.
Commingling	Production from separate pools cannot be commingled
Tanks	Dikes required. Removal of tank bottoms requires approval.
Dikes	Impermeable dikes required around tanks and production facilities. Size requirement.
Site maint.	--
Transportation	
Certification	A report (form) is required for any transporter, as are monthly reports of gas taken.
Gathering Lines	--
Compressor Stations	--
Maintenance, Abandonment	Equipment can be sold if abandoned to pay for site reclamation
General Safety and Environment	
Notifications	--
Clean-up	--
Drinking Water Sources	All freshwater strata sealed off with tubing and cement.
Surrounding Wells	--
Class II Injection wells	
Program	Underground Injection Control regulations 43-02-05

Note: -- Topic not explicitly addressed in program reviewed.

Disclaimer: Table prepared for illustration only & should not be used for decision-making without consulting appropriate regulatory or legal authority.

Table 1. State regulatory summary covering coal bed methane projects

State	Pennsylvania
Regulatory Program	
CBM Specific	--
O&G Regulations	25 Pa. Section (chapter) 78
Name of Authority	Department of Environmental Protection, Oil and Gas Management Program
Regulator	Department
Well Permitting	
Permits Required	Permit required to drill or alter any well. Well must also be registered. Special provisions for Onondaga Formation.
Requirements	--
Fees	--
Well Deepening	Permit required
Directional Drilling	Permit required
Permit Duration	1 year
Bonds	
Well Drilling	Owner or operator bond. \$2,500 per well, blanket bond \$25,000
Other Facilities	--
Pollution Prevention	--
General Reporting	
Organizational Reports	Annual production and waste reports
Change of Operator	30-day prior written approval from Department, all obligations transfer to new party.
Well Spacing	
Spacing	By request for a spacing order, specification for request.
Boundary Offsets	330 ft from outside lease boundary
Housing Offsets	--
Exemptions	--
Notification and Approval	
Well Status Reports	30 days after completion or alteration. Annual reporting of production and disposal method for wastes.
Prior Notification	--
Condition Change	Reporting required for any release that threatens pollution of waters; includes corrective actions.
Approval Activities	--
Drilling	
Well Identification	--
Pollution Protection	Erosion control BMPs for site development and operation. Erosion control plan for sites. \$500 fee for permit
Well Records	--
Core Storage	--
Directional surveys	Directional drilling by approval only, survey required.
Lost Logging Source	Approval required to leave source. Abandonment requirements. Marker.
Fracturing	--
Casing	Sufficient strength to prevent blow-out or collapse and prevent migration of gas or fluid to fresh water or coal.
Cementing	Cementing specification based on well depth.
Pressure Testing	--
Blow-out Prevention	BPE required with high wellhead pressures or in areas of unknown pressure
Production Casing	Casing design criteria for various conditions.
Production Testing	--
Venting	Venting prohibited if it produces a hazard.
Pit Const. & Maint.	2 ft of freeboard required at all times, liner requirements, bottom of pit above water table. Clean Streams Permit required.
Pit Fluids	Plan required for the control and disposal of wastes. No disposal to ground or water unless meets Clean Streams Law.
Pit Closure	Within 9 months of well completion, 3 months for servicing and plugging. Backfill of pit required.
P&A of Wells	All abandoned wells plugged. Plugging specs, provisions for plugging in mineable coal seams. Permanent marker. Certificate of Plugging.
Location Restoration	Land restoration required within 30 days after expiration of drilling permit.
Temporary Abandonment	Inactive well status must make showing of well construction and protection of other resources. Annual monitoring.
Shut-ins	Inactive status for 5 years, after which it must be plugged.
Freshwater conversions	--
Seismic and Other Holes	--
Reworking	All reworking of well must have a permit.
Production	
Facilities	BMP for erosion and sediment control
Holding Ponds	Dike, freeboard, and liner requirements.
Produced Water	Treatment and disposal requirements.
Commingling	--
Tanks	Dikes required around tanks.
Dikes	Standards for construction and maintenance.
Site maint.	Maintained in a workman-like manner. Fire protection requirements.
Transportation	
Certification	--
Gathering Lines	--
Compressor Stations	--
Maintenance, Abandonment	--
General Safety and Environment	
Notifications	--
Clean-up	--
Drinking Water Sources	Restore or replace private or public water supply
Surrounding Wells	Pre-drilling water quality survey to document existing condition
Class II Injection wells	
Program	Injection wells covered under well permitting regulations but with additional submittal of approved federal UIC documents.

Note: -- Topic not explicitly addressed in program reviewed.
Disclaimer: Table prepared for illustration only & should not be used for decision-making without consulting appropriate regulatory or legal authority.

Table 1. State regulatory summary covering coal bed methane projects

State	Utah
Regulatory Program	
CBM Specific	--
O&G Regulations	Title 40 Chap. 06 R649-1
Name of Authority	Board of Oil, Gas and Mining
Regulator	Division of Oil, Gas and Mining
Well Permitting	
Permits Required	Application for Permit to Drill, Deepen, or Plug Back. 24-hr. notice of spudding
Requirements	--
Fees	--
Well Deepening	Application for Permit to Drill, Deepen, or Plug Back
Directional Drilling	Permit required, surveys must be run and submitted to Division
Permit Duration	--
Bonds	
Well Drilling	\$1,000 to \$40,000 per well depending on depth, blanket bonds
Other Facilities	Bonds for exploration, production, and reclamation
Pollution Prevention	--
General Reporting	
Organizational Reports	Designation of Agent or Operator
Change of Operator	Promptly reported to Division in writing
Well Spacing	
Spacing	Center of 40-acre tracts, special orders available
Boundary Offsets	920 feet to other well, 660 feet to boundary
Housing Offsets	--
Exemptions	Exemptions to spacing approved by Division
Notification and Approval	
Well Status Reports	Monthly status reports for each well
Prior Notification	Pre-drill evaluation of site within 30 days of application, surface owner participation
Condition Change	Immediate notification and reporting in 5 days for fires, leaks, breaks, spills, blowouts, etc. Specifications
Approval Activities	Special provisions for drilling in Designated Potash, Workable Coal Bed, and Oil Shale areas
Drilling	
Well Identification	Signage specifications on each well
Pollution Protection	All reasonable care to avoid polluting land and water
Well Records	Well Completion or Recompletion Report and Log and tests within 30 days
Core Storage	--
Directional surveys	Permit required for directional drilling, reporting with survey within 30 days of completion
Lost Logging Source	--
Fracturing	--
Casing	Casing below usable fresh water. Protection of oil and gas zones, no commingling
Cementing	Cementing specifications for wildcat areas
Pressure Testing	Pressure testing required with specifications
Blow-out Prevention	Keep well under control at all times, monthly testing of BOPE
Production Casing	Specifications for cementing
Production Testing	Pressure testing of formation is required
Venting	All non-poisonous gas vented and flared a safe distance from site, specifications
Pit Const. & Maint.	Designed to contain liquid and cause no pollution to land or water. Pre-drill site evaluation establishes location, permit
Pit Fluids	Reserve pits to be lined. Other requirements at pre-drill evaluation
Pit Closure	Closed in 1 yr., numeric clean-up standards or removal.
P&A of Wells	Notice of intent, specifications, reporting of activity within 30 days of P&A, signage requirements
Location Restoration	Within 1 yr. Meet either specifications by Division or Surface Use Agreement requirements
Temporary Abandonment	12 consecutive months, no longer than 5 yrs. Division can relinquish bond
Shut-ins	12 consecutive months, no longer than 5 yrs. Division can relinquish bond
Freshwater conversions	Land owner has opportunity to convert
Seismic and Other Holes	Application to Conduct Seismic Activities approval needed, can be revoked at any time. Significant specifications.
Reworking	Prior approval required, same requirements as for new drilling
Production	
Facilities	--
Holding Ponds	Facilities for treatment and disposal of E&P wastes must be permitted.
Produced Water	Facilities for treatment and disposal of E&P wastes must be permitted.
Commingling	--
Tanks	Maintain tanks in workman-like manner. All crude and produced water tanks to have tops.
Dikes	Height and width to contain volume of largest tank
Site maint.	Fire hazard material removed 100 ft from site.
Transportation	
Certification	--
Gathering Lines	--
Compressor Stations	--
Maintenance, Abandonment	--
General Safety and Environment	
Notifications	E&P waste management plan required each year.
Clean-up	--
Drinking Water Sources	Reporting of all freshwater-producing sands.
Surrounding Wells	--
Class II Injection wells	
Program	Prior approval of any down-hole disposal, injection well program in place.

Note: -- Topic not explicitly addressed in program reviewed.
Disclaimer: Table prepared for illustration only & should not be used for decision-making without consulting appropriate regulatory or legal authority.

Table 1. State regulatory summary covering coal bed methane projects

State	Virginia
Regulatory Program	
CBM Specific	--
O&G Regulations	4VAC25-150
Name of Authority	Department of Mines, Minerals and Energy, Division of Oil and Gas
Regulator	Director of Department, or Chief of Division
Well Permitting	
Permits Required	Permit required for wells and geophysical work. Special requirements for tidewater areas.
Requirements	Operations plan required. Use of fresh water during drilling. Detailed requirements for plats.
Fees	\$200 per application, \$100 for modifications
Well Deepening	Permit required.
Directional Drilling	Permit required.
Permit Duration	24 months; if no activity is initiated, extension allowed with \$250 fee
Bonds	
Well Drilling	Not less than \$10,000 per well and \$2,000 per disturbed acre. Blanket bonds.
Other Facilities	Successful reclamation of disturbed lands required for bond release.
Pollution Prevention	Gas and Oil Plugging and Restoration Fund requires annual payments
General Reporting	
Organizational Reports	Registration of Organization and Agent required. Annual reporting with production summaries
Change of Operator	Director approval of any transfer of rights, \$50 fee.
Well Spacing	
Spacing	Well to be within 3 feet of permit location, 1,000 ft from other CBM wells, 500 ft from gob wells.
Boundary Offsets	Special precautions for drilling within 200 feet of coal mine area.
Housing Offsets	200 feet to occupied building
Exemptions	--
Notification and Approval	
Well Status Reports	Well completion reports in 30 days. Monthly status reports, includes shut-in wells. Logs of well in 2 yrs.
Prior Notification	Notification at least 2 working days for any ground-disturbing activities or plugging.
Condition Change	Notification by quickest available means of any well-site failure, spill, fire, blow out. Report.
Approval Activities	--
Drilling	
Well Identification	Signage requirements for exploration and production activities.
Pollution Protection	Erosion and sediment control plans required. Soil segregation. Temporary stabilization requirements. Use of sediment basins.
Well Records	Blasting records must be kept. Drillers logs, gamma kept on site.
Core Storage	--
Directional surveys	Required to bottom of coal for any well deviating 1 degree.
Lost Logging Source	Quickest means of notification. Every reasonable effort to recover. Plugging and marker requirements.
Fracturing	--
Casing	Water and coal protection and void string requirements.
Cementing	Cementing requirements for coal and water protection.
Pressure Testing	--
Blow-out Prevention	Required with 1,000 lbs. pressure or unknown conditions.
Production Casing	--
Production Testing	Production testing required using ANSI or AGA procedures.
Venting	No more than 7 days of venting or flaring for completed wells. Exceptions provided.
Pit Const. & Maint.	Not for surface water. Properly maintained and lined. 2 feet of freeboard. Operation shut down when pit fails.
Pit Fluids	Proper disposal of fluids
Pit Closure	Reclaimed when operations complete.
P&A of Wells	Permit required. 2-day notification requirement. Special plugging in coal mine areas. Plugging and marker specifications.
Location Restoration	Erosion and sediment control standards. Temporary and Final reclamation standards.
Temporary Abandonment	Temporary reclamation standards.
Shut-ins	Measurement of pressure required and records kept for wells shut in for 12 months.
Freshwater conversions	Permit modification required. Surface owner to pay for tubing.
Seismic and Other Holes	--
Reworking	--
Production	
Facilities	Special provisions for gob well and CBM facilities.
Holding Ponds	Handled in proper manner to pit or tank. Permanent disposal plan required.
Produced Water	Handled in proper manner to pit or tank. Permanent disposal plan required.
Commingling	--
Tanks	Good condition and repaired as needed. Annual inspections and reports.
Dikes	Required around tanks.
Site maint.	Maintained in workman-like condition.
Transportation	
Certification	--
Gathering Lines	Permit required for installation and operation. May be permitted separate from wells. Specifications. Annual inspections. Record keeping.
Compressor Stations	--
Maintenance, Abandonment	--
General Safety and Environment	
Notifications	--
Clean-up	--
Drinking Water Sources	Protection requirements of all freshwater sources. Water replacement requirements for interruption of domestic supply.
Surrounding Wells	--
Class II Injection wells	
Program	Permit required for all wells and conversions. Need federal permit.

Note: -- Topic not explicitly addressed in program reviewed.
Disclaimer: Table prepared for illustration only & should not be used for decision-making without consulting appropriate regulatory or legal authority.

Table 1. State regulatory summary covering coal bed methane projects

State	West Virginia
Regulatory Program	
CBM Specific	Title 35
O&G Regulations	--
Name of Authority	Bureau of Environment, Division of Environmental Protection
Regulator	Chief of the Office of Oil and Gas
Well Permitting	
Permits Required	Permit for CBM Well required.
Requirements	Notice to surface owners of record, public notice in newspaper.
Fees	\$250 application, \$100 reclamation fee, env. permit fees, \$100 general registration fee.
Well Deepening	Permit required.
Directional Drilling	--
Permit Duration	Permits expire in 24 months if drilling not initiated.
Bonds	
Well Drilling	Bond required for each CBM well, blanket bonds available
Other Facilities	--
Pollution Prevention	Special reporting when 2 reportable discharges occur in any 12-mo. period. Adequate provisions to prevent surface & groundwater pollution.
General Reporting	
Organizational Reports	Registration required with the Chief
Change of Operator	Written notification in 5 days. 60 days to replace bond.
Well Spacing	
Spacing	No closer than 1,600 feet to an existing CBM well.
Boundary Offsets	100 feet from the outside boundary
Housing Offsets	200 feet from water well or dwelling without gaining written consent from owner.
Exemptions	Approved by Chief.
Notification and Approval	
Well Status Reports	Reporting in 90 days after completions. Annual reporting.
Prior Notification	Public notification in newspaper, surrounding land owner notification
Condition Change	Broad notification for spills.
Approval Activities	--
Drilling	
Well Identification	Identification attached or stamped on well.
Pollution Protection	BMPs for site arrangement. Permits not approved if environmental protection inadequate. Testing of surrounding wells & springs.
Well Records	Complete set of records kept on site for all permitted activities.
Core Storage	--
Directional surveys	All logs must be provided if requested by Chief.
Lost Logging Source	--
Fracturing	--
Casing	Casing and cementing through freshwater strata and 30 ft below. Similar provisions for non-target coal seams and gob.
Cementing	Cementing must return to surface. If not, other approaches approved by Chief. Strength and wait-time requirements.
Pressure Testing	--
Blow-out Prevention	BOPE equipment for drilling and reworking below any casing string. Training requirement.
Production Casing	Cemented or use of packer to prevent migration of stimulation pressure or fluid. Coal protection string can be used for gas
Production Testing	Logging specifications.
Venting	Venting requirements, marker.
Pit Const. & Maint.	Prevent seepage, leakage, overflow. Protected from surface runoff. No overflow to waters of the State. Liners required if soils are open.
Pit Fluids	No overflow or unpermitted discharge.
Pit Closure	Closure procedures approved by Chief during permit review process.
P&A of Wells	Permit to plug or replug required. Detailed specifications. Special provisions in coal seams that will be mined. Permanent Marker.
Location Restoration	Reclamation plans required for permit approval for most site facilities.
Temporary Abandonment	Wells can have an inactive status if found not to be a potential source of contamination. Otherwise, plugging.
Shut-ins	Wells can have an inactive status if found not to be a potential source of contamination. Otherwise, plugging.
Freshwater conversions	Conversion to vent hole after well is transferred to mining permit. Bond released.
Seismic and Other Holes	--
Reworking	--
Production	
Facilities	All production facilities shall have containment to protect waters of the State. Flowline maintenance.
Holding Ponds	--
Produced Water	Saltwater zones isolated with mud and foam.
Commingling	--
Tanks	Secondary containment for full volume of largest tank, tank inspections, fail-safe engineering
Dikes	Full containment except during rain events, oil returned for storage or disposal
Site maint.	Maintained to prevent surface runoff and sedimentation.
Transportation	
Certification	--
Gathering Lines	Production and gathering lines should be buried where practical. Chief can require specifications. Variances allowed.
Compressor Stations	--
Maintenance, Abandonment	--
General Safety and Environment	
Notifications	--
Clean-up	--
Drinking Water Sources	Special provisions for drilling and casing off freshwater-producing sands. Groundwater remediation plan if requested by Chief.
Surrounding Wells	Water testing of surrounding wells and springs before drilling.
Class II Injection wells	
Program	Operational regulations on liquid injection and waste disposal wells. Notifications and reporting.

Note: -- Topic not explicitly addressed in program reviewed.

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Table 2. State agency contacts for coalbed methane projects

State	Regulatory Agency	Contact	Title	Phone Number
Alabama	State Oil and Gas Board	Donald F. Oltz	Oil and Gas Supervisor	205.349.2852
Alaska	Oil and Gas Conservation Commission	Cammy Oechsli Taylor	Commissioner, Chair	907.279.1433
Alaska	Department of Natural Resources, Division of Oil and Gas	Mark Myers	Director	907.269.8800
Arizona	Arizona Geological Survey	Larry D. Fellows	Director and State Geologist	520.770.3500
Arizona	Arizona Geological Survey	Steven L. Rauzi	Oil and Gas Administrator	520.770.3500
Arizona	Arizona Geological Survey, Oil and Gas Conservation Commission	J. Dale Nations	Chairman	
Arkansas	Oil and Gas Commission	Grant E. Black	Director	870.862.4965
California	California Department of Conservation, Division of Oil, Gas and Geothermal Resources	William F. Guerard, Jr.	State Oil and Gas Supervisor	916.323.1777
California	California Department of Conservation, Division of Oil, Gas and Geothermal Resources	Kenneth P. Henderson	Chief Deputy	916.323.1777
Colorado	Oil and Gas Conservation Commission	Richard T. Griebing	Director	303.894.2100
Colorado	Oil and Gas Conservation Commission	Brian J. Macke	Deputy Director	303.894.2100
Florida	Florida Geological Survey, Dept. of Environmental Protection	Walter Schmidt	Chief/State Geologist	850.488.4191
Illinois	Department of Natural Resources, Office of Mines and Minerals, Division of Oil and Gas	Lawrence E. Bengal	Division Supervisor	217.782.1689
Indiana	Department of Natural Resources, Division of Oil and Gas	James A. Slutz	Director	317.232.4059
Kansas	Kansas Corporation Commission	Jeff S. Wagaman	Executive Director	785.271.3166
Kansas	Oil And Gas Conservation Division	M.L. Korphage	Director	316.337.6200
Kentucky	Department of Mines and Minerals, Division of Oil and Gas	Rick Bender	Director	502.573.0147
Kentucky	Department of Mines and Minerals, Division of Oil and Gas	John L. Franklin	Commissioner	
Louisiana	Louisiana Department of Natural Resources, Office of Conservation	Philip N. Asproditos	Commissioner of Conservation	225.342.5500
Maryland	Maryland Department of the Environment, Water Management Administration	Robert Summers	Acting Director	410.631.3567
Maryland	Maryland Department of the Environment, Water Management Administration, Minerals, Oil and Gas Division	C. Edmon Larrimore	Program Manager	410-631-8055
Michigan	Michigan Department of Environmental Quality	Russell J. Harding	Director	517.241.7390
Michigan	Michigan Department of Environmental Quality, Geological Survey Division	Hal Fitch	Chief and Assistant Supervisor of Wells	517.334.6923
Montana	Montana Board of Oil and Gas Conservation	Thomas P. Richmond	Administrator and Petroleum Engineer	406.656.0040
Nebraska	Oil and Gas Conservation Commission	William H. Sydow	Director	308.254.6919
New Mexico	Energy, Minerals & Natural Resources Department, Oil Conservation Division	Lori Wrotenbery	Division Director	505.476.3460
New York	Department of Environmental Conservation, Division of Mineral Resources	Bradley J. Field	Director	518.402.8076
North Dakota	North Dakota Industrial Commission, Oil and Gas Division	Lynn D. Helms	Director of Oil and Gas Division	701.328.8020
North Dakota	North Dakota Industrial Commission, Oil and Gas Division	Bruce E. Hicks	Assistant Director of Oil and Gas Division	701.328.8020
Ohio	Department of Natural Resources, Division of Mineral Resources Management	Michael L. Sponsler	Chief	614.265.6893

Table 2. (cont.)

State	Regulatory Agency	Contact	Title	Phone Number
Ohio	Department of Natural Resources, Division of Mineral Resources Management, Division of Oil and Gas	Thomas G. Tugend	Chief	614.265.6922
Oklahoma	Oklahoma Corporation Commission	Bob Anthony	Chairman	405.521.2261
Oklahoma	Oil and Gas Conservation Division	Larry Fiddler	Acting Director	405.521.2500
Oregon	Oregon Department of Geology and Mineral Industries	John Beaulieu	State Geologist	503.731.4100
Pennsylvania	Department of Environmental Protection, Pennsylvania Bureau of Oil & Gas Management	James E. Erb	Director	717.772.2199
South Dakota	South Dakota Department of Environment and Natural Resources	Fred V. Steece	Oil and Gas Supervisor	605.394.2229
Texas	Railroad Commission of Texas, Energy Operations Division	Ronald L. Kitchens	Director	512.463.7068
Texas	Railroad Commission of Texas, Energy Operations Division	Steve Pitner	Director	512.463.7938
Texas	Railroad Commission of Texas, Oil and Gas Division	Richard A. Varela	Director	512.463.6840
Utah	Department of Natural Resources, Division of Oil, Gas and Mining	Lowell P. Braxton	Director	801.538.5370
Virginia	Department of Mines, Minerals and Energy	O. Gene Dishner	Director	804.692.3200
Virginia	Department of Mines, Minerals and Energy, Division of Gas and Oil	B.R. Wilson	Director	276.676.5423
Washington	Department of Natural Resources, Division of Geology and Earth Resources	Raymond Lasmanis	Oil and Gas Supervisor	360.902.1450
West Virginia	West Virginia Division of Environmental Protection, Office of Oil and Gas	John Johnston	Chief	304.558.6076
Wyoming	Wyoming Oil & Gas Conservation Commission	Don J. Likwartz	State Oil and Gas Supervisor	307.234.7147