

Notice of Proposed Rulemaking
Department of Environmental Protection
Environmental Quality Board
25 PA Code Chapter 78
(Oil and Gas Wells)

Preamble

The Environmental Quality Board (Board) proposes to amend 25 PA Code Chapter 78 (relating to Oil and Gas Wells). The proposed rulemaking would update existing requirements regarding the drilling, casing, cementing, testing, monitoring and plugging of oil and gas wells, and the protection of water supplies. The new and amended sections are §§78.1, .51, .52, .71-.73, .81-.85, .88, .89, .92-.96, .121 and .122. The proposed modifications include updated material specifications and performance testing and revised design, construction, operational, monitoring, plugging, water supply replacement, and gas migration reporting requirements. The additional requirements will minimize gas migration and will provide an increased degree of protection for both public and private water supplies.

This proposal was adopted by the Board at its meeting of (blank) .

A. Effective Date

The amendments will go into effect upon publication in the *Pennsylvania Bulletin* as final rulemaking.

B. Contact Persons

For further information contact Scott Perry, Director, Bureau of Oil and Gas Management, Rachel Carson State Office Building, 5th floor, 400 Market Street, P.O. Box 8765 Harrisburg, PA 17105-8461, 717-772-2199; or Pamela Bishop, Assistant Counsel, Bureau of Regulatory Counsel, P.O. Box 8464, Rachel Carson State Office Building, Harrisburg, PA 17105-8464, (717) 787-7060. Persons with a disability may use the AT&T Relay Service by calling (800) 654-5984 (TDD users) or (800) 654-5988 (voice users). This proposed rulemaking is available on the Department of Environmental Protection's (Department) web site: www.depweb.state.pa.us.

C. Statutory Authority

This proposed rulemaking is being made under the authority of Section 604 of the Oil and Gas Act (58 P.S. § 601.604) which directs the Board to adopt regulations necessary to implement the Act, and Sections 1917-A and 1920-A of The Administrative Code (71 P.S. §§ 510-17 and 510-20). Section 1917-A authorizes and requires the Department to protect the people of this Commonwealth from unsanitary conditions and other nuisances, including any condition that is declared to be a nuisance by any law administered by the Department. Section 1920-A authorizes the Board to promulgate regulations of the Department.

D. Background of the Amendments

A properly cased and cemented oil and gas well is critical to protecting fresh groundwater and public safety. Many of the regulations governing well construction and water supply replacement were promulgated in July 1989 and remain largely unchanged. New well drilling and completion practices used to develop Marcellus Shale wells, as well as recent impacts to drinking water supplies by both traditional and Marcellus Shale wells, caused the Department re-evaluate the existing requirements.

With the development of the oil and gas industry in Pennsylvania, the potential exists for natural gas to migrate from the wellbore (via either improperly constructed or old, deteriorated wells). This stray gas may adversely affect water supplies, as well as accumulate within or adjacent to structures such as residences and businesses. If a well is not properly constructed and operated there could be potential threat of a fire or explosion. These situations represent a threat to public safety, health and welfare.

It was determined that many, if not all, Marcellus well operators met or exceeded the current well casing and cementing regulations. However, it was also determined that the current regulations were not specific enough in detailing the Department's expectations of a properly cased and cemented well. Finally, the Department determined that the existing regulations did not address the need for an immediate response by operators to a gas migration complaint nor did they require routine inspection of existing wells by the operator.

A draft of the proposed rulemaking was presented to the Oil and Gas Technical Advisory Board (TAB) for their consideration on September 17, 2009. Because of the scope of the proposed changes, TAB requested additional time to review and provide comment. As part of their review, TAB formed a technical committee with representatives from various companies, trade groups and consultants. Since the initial meeting in September, the Department has met with TAB and their subcommittee on October 28, 2009, January 14, 2010, January 21, 2010 and March 25, 2010. At the March 25 meeting, TAB voted unanimously to recommend that the Environmental Quality Board offer these regulations as a proposed rulemaking.

In addition to developing the proposed regulations through TAB, the Department solicited comments from the public. On Saturday January 30, 2010, the Department published a notice in the Pennsylvania Bulletin soliciting comments to proposed revisions through the Advanced Notice of Proposed Rulemaking process see 40 *Pa.B.* 623. The public comment period closed March 2, 2010.

The Advanced Notice of Proposed Rulemaking ("ANPR") procedure is an optional process, as it is not required by either the Regulatory Review Act or the Commonwealth Documents Law. The purpose of using the process is to solicit public comment on the proposed regulatory changes prior to presenting a proposed rulemaking to the Board. Through the ANPR process, the Department obtained valuable comments that warrant additional consideration by interested stakeholders as the regulations move through the formal rulemaking process.

E. Advanced Notice of Proposed Rulemaking

Summary of Comments and Responses

The ANPR process is used to solicit public comment on proposed regulatory changes before the Department presents a rulemaking package to the Environmental Quality Board. Through the ANPR process, the Department obtained valuable comments that warrant additional consideration by interested stakeholders as the regulations move through the formal rulemaking process.

The Department received comments from 87 individuals, businesses, trade organizations and public interest groups. A summary of the comments received was presented to TAB at its March 25, 2010 meeting for the members' review. The Department received a wide range of comments on the topic of water quality and quantity of replacement water supply. A second area of comments focused on the proposed cementing standards and cementing practices. It is the Department's experience that poorly cemented casing is the reason for many gas migration cases. Many of the commentators offered suggested language for cement standards and for testing cementing jobs. Closely associated with the cement and cementing standards is casing and casing standards. The Department received comments on the pressure testing requirements for the various casing strings as well as the use of centralizers and safety equipment associated with the individual strings.

The Department also received numerous comments concerning issues beyond the scope of these proposed changes or beyond the scope of the Department's statutory authority. It is important to note that these proposed regulatory changes are limited to protecting public safety and groundwater resources through proper well construction, water supply replacement or restoration, well inspection, gas migration investigation and response, and well plugging.

The Department has determined that these issues must be addressed expeditiously. While other potential impacts to the environment from oil and gas well development warrant consideration, such an evaluation will unduly delay the promulgation of these important regulations. The Department intends to engage in another round of rulemaking to address additional issues presented by development of the Marcellus Shale and other unconventional resources such as coalbed methane. To the extent that commentators do not believe their comments have been sufficiently addressed, they may submit additional comments on the regulation as part of the formal rulemaking process and the Department will address them through a formal comment/response document.

F. Summary of Proposed Rulemaking

§ 78.1 Definitions

Definitions for "cement job log", "conductor pipe" and "intermediate casing" were added to strengthen new and existing provisions within Chapter 78. The definitions for "casing seat", "cement" and "surface casing" were amended to reflect current requirements. Finally, the

definition of “retrievable” was removed and the substantive portion of the definition was inserted into the appropriate plugging regulations.

The Board is specifically requesting comments on the definition of “deepest fresh groundwater” which is defined as “the deepest fresh groundwater bearing formation penetrated by the wellbore as determined from drillers logs from the well or from other wells in the area surrounding the well or from historical records of the normal surface casing seat depths in the area surrounding the well, whichever is deeper.” Ascertaining the deepest fresh groundwater zone is important because this is the depth to which surface casing must be set.

§ 78.51 Protection of water supplies

This section has been significantly amended to reflect current caselaw on the requirements for operators to restore or replace a water supply that has been polluted or diminished as a result of gas or oil well drilling. The proposed regulation does not impose new or expanded duties on well operators but does clarify their responsibilities.

Water supplies that are polluted or diminished must be restored or replaced. If the existing supply did not meet safe drinking water standards, the operator must supply a water source that is as good as the preexisting supply. If a supply exceeded safe drinking water standards, the operator need only provide a supply that meets those standards. The owner of the supply may still seek an appropriate legal remedy to obtain a supply that meets preexisting standards if so warranted.

Any increase in operating and maintenance costs must be provided by the operator in perpetuity. If the supply was reasonably intended to provide a greater quantity than was currently used (and was capable of doing so), the operator must provide a supply to meet the anticipated need.

Finally, if an operator is notified by an affected user of the supply that it has been impacted by drilling, the operator must notify the Department in 10 days.

§ 78.52 Predrilling or prealteration survey

Operators must now provide DEP and water supply owners with the results of their predrilling surveys within 10 days of receipt of the results.

§ 78.71 Use of safety devices – well casing

The changes clarify that the casing to which the blow-out prevention equipment may be attached must be cemented in place.

§ 78.72 Use of safety devices – blow-out prevention equipment

The proposed revisions more clearly define when blow-out preventer equipment must be used, where the controls of such equipment must be located in a manner that allows operation in case of an emergency, how defective equipment must be treated and the training a person must have

in order to operate the equipment. The Board is specifically requesting comments on establishing requirements for additional safety equipment and procedures.

§ 78.73 General provision for well construction and operation

The proposed revisions reduce the allowable pressure that may be exerted on the surface casing seat. This proposal will significantly reduce the possibility of a gas migration event by adding a margin of error onto the assumed hydrostatic pressure being exerted on the surface casing seat. A new requirement for check flow valves that prevent backflow from the pipeline has been included.

§ 78.75a Area of alternative methods

Section 211 of the Oil and Gas Act provides that any well construction or plugging regulation may be modified by an alternative method approved by the Department. This new section will broaden the Department's ability to use the "area of alternative methods" for geological regions where existing regulations do not necessarily provide sufficient protection of the environment. This procedure would be used to establish environmentally necessary protective measures on an area wide basis as opposed to a well by well basis. Establishing such an area requires notice in the *Pennsylvania Bulletin* and an opportunity for the public to comment.

§ 78.76 Drilling within a gas storage reservoir area

The amendments would require operators to submit a casing and cementing plan to the Department for approval prior to drilling through a gas storage reservoir area or protective area.

§ 78.81 General provisions

The amendments would delete subsection (c), which stated that certain sections of the regulation do not apply to production or intermediate casing, to reflect new requirements.

§ 78.82 Use of conductor pipe

The amendments would further delineate the requirements for conductor pipe that is used to stabilize the top hole of a well such that it protects fresh groundwater.

§ 78.83 Surface and coal protective casing and cementing procedures

The amendments would prohibit the use of surface casing as production casing and requires an additional string of casing to be installed in a well unless the well is only used to produce oil that does not present a threat to groundwater or if the operator of a gas well demonstrates that all gas and fluids will be contained in the well.

Additional amendments require the use of air or freshwater based fluids when drilling through the fresh groundwater zone; delete subsection (c) that gives operators the ability to drill to producing zones prior to isolating fresh groundwater under certain circumstances; and mandate

the use of centralizers to position the casing in the wellbore.

The Board is specifically requesting comments on the placement of centralizers to ensure that the casing is properly located within the wellbore and that the well bore is sufficiently wide to ensure proper placement of cement. General references to API standards are not as helpful as these standards are not generally available to the public.

§ 78. 83a Casing and Cementing Plan

This new section requires operators to develop a casing and cementing plan that the Department can review at the well site. The plan must describe the casing used and the cementing practices to be employed. The Department can request submittal of the plan for approval prior to drilling.

§ 78. 83b Casing and cementing – lost circulation

This new section requires operators to notify the Department when cement used to protect fresh groundwater is not returned to the surface despite pumping more than 120% of the estimated required volume.

If cement is not returned to the surface, unless the well only produces oil off a vented production pipe, additional strings of casing must be run and cemented.

§ 78.83c Intermediate and production casing

This new section specifies the cementing requirements for intermediate and production casing and specifies the pressure limitation for wells that produce gas off the annulus of the intermediate casing string.

§ 78. 84 Casing standards

This section has been significantly revised to require pressure testing of casing attached to a blow out preventer with a pressure rating of 3,000 psi, as well as pressure testing for used or welded casing. For casing attached to a blow-out preventer, a passing pressure test is holding 120% of the maximum anticipated working pressures to which the casing will be exposed for 30 minutes without a 10% decrease in pressure. Passing pressure tests for other casing is holding the maximum anticipated working pressures to which the casing will be exposed for 30 minutes without a 10% decrease in pressure. The 10% decrease is included to account for normal variation in pressure gauges.

Additional welded casing standards include requiring 3 welded passes and certification for welders who do not have 10 years of experience welding casing.

§ 78. 85 Cement standards

This section was amended to provide additional objectives for well casing cement to meet as well as to reference new ASTM standards in addition to American Petroleum Institute standards.

Subsection (b) was amended to eliminate actions that could disturb the cement while it sets over the mandated 8 hour wait time. New subsections (d) and (e) were added to require notification to the Department prior to cementing operations to ensure proper inspection of the cement job and to require the availability of the cement job log at the well site for inspection.

The Board is requesting additional comments on the concept of creating a zone of critical cement at the casing seat. Commentators in the ANPR process proposed that the zone of critical cement would include a 72-hour compressive strength standard of 1,200 psi. The zone of critical cement would also be required to meet the API free water separation standard conformance standard of no more than six milliliters per 250 milliliters of cement tested in accordance with the current API RP 10B.

The Board is also requesting additional comments on a provision providing the Department the ability to set more stringent local standards if needed for pollution prevention, and to establish quantitative temperature limits for water used in cement mixing.

§ 78.88 Mechanical integrity of operating wells

This new section requires operators to inspect their wells at least quarterly for signs of physical degradation of the well in addition to determining whether the pressure in the well is within allowable limits. Wells that fail inspection must be attended to immediately and the Department must be notified.

§ 78.89 Gas migration response

This new section requires well operators to notify the Department if the operator is notified or becomes aware of a gas migration event and to take investigative and corrective measures if so required by the Department. The section specifies that emergency responders and the Department must be notified immediately if the level of natural gas detected is greater than 10% of the lower explosive limit of natural gas.

§ 78.92 – 78.95 Plugging

These sections have been modified to incorporate the substantive requirements of the eliminated definition of “retrievable” along with requiring an additional attempt to remove uncemented casing prior to plugging a well. The revised sections also require cement to be placed across the formerly producing formation as opposed to placing the cement plug on top of the formation as is the current requirement.

§ 78.96 Marking the location of a plugged well

The amendments to this section permit the use of materials other than cement and metal to mark and hold a marker for a plugged well.

§ 78.121 Annual production report

This section has been amended to incorporate the requirements of Act 15 of 2010 which requires semi-annual production reporting of Marcellus Shale wells. The reporting date for all wells has been changed from March 31 to February 15 to match Act 15. Marcellus operators must also report on August 15 each year. The Department is required to post the production of Marcellus wells on its website. To accomplish this reporting requirement, the Department is mandating electronic production reporting.

§ 78.122 Well record and completion report

This section has been amended to require certification by the operator of the proper construction of the well and to require additional information in the stimulation record including water source identification and volume as well as a list of chemicals used to stimulate the well.

G. Benefits, Costs and Compliance

Benefits

Both the residents of this Commonwealth and the regulated community will benefit from this regulation.

The public will benefit in several ways. The updated casing and cementing requirements will provide an increased degree of protection for homeowners and both public and private water supplies. The proposed construction standards will align Pennsylvania's regulations with other states' rules as well as current industry standards. Pressure testing the casing and certain casing seats will detect construction deficiencies before a well could create a potential safety or environmental problem. Minimizing annular pressure will reduce the potential for gas migration. The new quarterly inspections and annual reporting will be a vital tool for operators to use in detecting potential safety or environmental impacts before they may become an issue. The proposed regulations also outline the procedures the operator and the Department will utilize if there is a reported gas migration event.

The new construction standards and the well remediation measures will far outweigh the liability to the operator from the potential impacts to public safety and harm to the environment from gas migration or from polluting water resources that may result without these additional precautions.

Most of the updates are codifying existing best practices employed by prudent operators. These operators should not see much, if any, increased cost as a result of the regulation. Any increased cost of constructing the well in time and materials will decrease the risk of gas migrations resulting from defective casing or cementing. As new areas of the Commonwealth are developed for natural gas, these proposed regulations will avoid many potential health, safety and environmental issues.

Costs

This rulemaking will impose minimal additional costs on the Department. This proposal will help the Department offset the potential health, safety and environmental issues.

The Department finds that most gas migration issues stem from inadequate cement procedures, cement returns, or combinations of inadequate casing and cementing or over-pressured casing seats. Because the Department is proposing regulations that are predominately codifying existing industry standards, any increased cost associated with drilling and operating oil and gas wells will be minimal. All of the potential increases in cost to an operator will be associated with assuring a well is properly completed, operated and plugged.

The potential increase in cost is minor when compared to the overall cost of well construction. Where cement is not returned to the surface or when excessive pressure is placed on the surface casing seat, the revised regulations require the operator to install an additional string of casing. The construction cost for the additional string of casing is about \$10,000 per well.

Used casing, welded casing and casing attached to a high pressure blow out preventer must be pressure tested to demonstrate its ability to withstand the highest anticipated working pressures to which the casing will be exposed. If the casing fails this test, the operator must repair or replace the casing and ultimately pass the pressure test. In the Department's estimation, less than 5% of the casing used is anticipated to fail a pressure test. The cost to repair or replace the defective casing is completely outweighed by the environmental damage that would result from a failed string of casing and the fact that the casing would still need to be repaired or replaced.

The typical cost to develop a Marcellus Shale well is around \$5,000,000. The additional cost of compliance would only be approximately 0.2% of the overall cost to develop a Marcellus Shale well.

The typical cost to develop a shallow gas well is \$250,000 and the typical cost to develop an oil well is \$200,000. In either situation, the additional cost of compliance would only be approximately 4% to 5% of the overall cost of the well.

All of the additional measures are proposed to reduce the potential for gas mitigation. If an operator fails to prevent a pollution event of a water supply, the anticipated cost to permanently replace one private water supply would be approximately \$4,000 to drill a new water well or \$30,000 to provide and permanently pay for a treatment system.

Compliance Assistance Plan

The Department has worked extensively with representatives from the regulated community and leaders from the several industry trade organizations have attended the advisory committee meetings where these regulations have been discussed. Therefore the requirement of the proposed regulation are well known.

However, the Department has scheduled several training sessions for the regulated community

that address the Department's regulatory requirements. The Department will use these training sessions as an opportunity to further educate the industry about the new requirements.

Paperwork requirements

Annual well inspection report, the semi-annual production report mandated by Act 15, and the additional information required in the well completion report will require the submittal of two additional forms and additional information on an existing form.

H. Pollution Prevention

The Federal Pollution Prevention Act of 1990 established a national policy that promotes pollution prevention as the preferred means for achieving state environmental protection goals. DEP encourages pollution prevention, which is the reduction or elimination of pollution at its source, through the substitution of environmentally-friendly materials, more efficient use of raw materials, or the incorporation of energy efficiency strategies. Pollution prevention practices can provide greater environmental protection with greater efficiency because they can result in significant cost savings to facilities that permanently achieve or move beyond compliance.

This proposed rulemaking will continue to assure that the citizens and the environment of this Commonwealth experience the advantage of our oil and gas resources. The proposed regulations will minimize gas migration and will provide an increased degree of protection for both public and private water supplies.

The proposed modifications include updated material specifications and performance testing. The proposal adds more specific design, construction, operational and monitoring requirements. The plugging, water supply replacement, and gas migration reporting regulations have been modified to ensure that public safety and fresh groundwater are protected.

I. Sunset Review

These regulations will be reviewed in accordance with the sunset review schedule published by the Department to determine whether the regulation effectively fulfills the goals for which it was intended.

J. Regulatory Review

In accordance with Section 5(a) and (f) of the Regulatory Review Act (71 P.S. §§ 745.1—745.15), the Department submitted a copy of the proposed amendments, on _____, to the Legislative Reference Bureau for publication of notice of proposed rulemaking in the *Pennsylvania Bulletin*, and to the Independent Regulatory Review Commission (Commission). In accordance with Section 5(f) of the Act (71 P. S. § 745.5(f)), the Department will submit the proposed regulations and the required material to the Chairpersons of the House Environmental Resources and Energy Committee and the Senate Environmental Resources and Energy Committee (Committees) no later than the second Monday after the date by which both Committees designations have been published in the *Pennsylvania Bulletin*. In addition to

submitting the proposed amendments, the Department has provided the Commission and will provide the Committees with a copy of a detailed Regulatory Analysis Form. A copy of this material is available to the public upon request.)

Under Section 5(g) of the Regulatory Review Act, IRRC may convey any comments, recommendations or objections to the proposed regulations within 30 days of the close of the public comment period. The comments, recommendations or objections shall specify the regulatory review criteria that have not been met. The Act specifies detailed procedures for review of these issues by the Department, the General Assembly and the Governor prior to final publication of the regulations.

K. Public Comments

Written Comments – Interested persons are invited to submit comments, suggestions, or objections regarding the proposed regulation to the Environmental Quality Board, P.O. Box 8477, Harrisburg, PA 17105-8477 (express mail: Rachel Carson State Office Building, 16th Floor, 400 Market Street, Harrisburg, PA 17101-2301). Comments submitted by facsimile will not be accepted. Comments, suggestions or objections must be received by the Board by _____ (blank) _____. Interested persons may also submit a summary of their comments to the Board. The summary may not exceed one page in length and must also be received by _____ (blank) _____ (within ____ days following publication in the *Pennsylvania Bulletin*). The one-page summary will be provided to each member of the Board in the agenda packet distributed prior to the meeting at which the final regulation will be considered.

Electronic Comments – Comments may be submitted electronically to the Board at RegComments@state.pa.us and must also be received by the Board by _____ date _____. A subject heading of the proposal and a return name and address must be included in each transmission.

BY:

JOHN HANGER
Chairperson
Environmental Quality Board