# WEST VIRGINIA CODE: §22-6-24

**§22-6-24. Methods of plugging well.**

Upon the abandonment or cessation of the operation of any well drilled for natural gas or petroleum, or drilled or converted for the introduction of pressure, whether liquid or gas, or for the introduction of liquid for the purposes provided for in §22-6-25 of this article or for the disposal of pollutants or the effluent therefrom the well operator, at the time of such abandonment or cessation, shall fill and plug the well in the following manner:

(a) Where the well does not penetrate workable coal beds, it shall either be filled with mud, clay or other nonporous material from the bottom of the well to a point 20 feet above the top of its lowest oil, gas or water-bearing stratum; or a permanent bridge shall be anchored 30 feet below its lowest oil, gas or water-bearing stratum, and from such bridge it shall be filled with mud, clay or other nonporous material to a point twenty feet above such stratum; at this point there shall be placed a plug of cement or other suitable material which will completely seal the hole. Between this sealing plug and a point 20 feet above the next higher oil, gas or water-bearing stratum, the hole shall be filled, in the manner just described; and at such point there shall be placed another plug of cement or other suitable material which will completely seal the hole. In like manner the hole shall be filled and plugged, with reference to each of its oil, gas or water-bearing strata. However, whenever such strata are not widely separated and are free from water, they may be grouped and treated as a single sand, gas or petroleum horizon, and the aforesaid filling and plugging be performed as though there were but one horizon. After the plugging of all oil, gas or water-bearing strata, as aforesaid, a cement plug shall be placed approximately 10 feet below the bottom of the largest casing in the well; from this point to the surface the well shall be filled with mud, clay or other nonporous material, except that a final cement plug shall be installed from a point 100 feet below the surface to the surface. In case any of the oil or gas-bearing strata in a well shall have been shot, thereby creating cavities which cannot readily be filled in the manner above described, the well operator shall follow either of the following methods:

(1) Should the stratum which has been shot be the lowest one in the well, there shall be placed, at the nearest suitable point, but not less than 20 feet above the stratum, a plug of cement or other suitable material which will completely seal the hole. In the event, however, that the shooting has been done above one or more oil or gas-bearing strata in the well, plugging in the manner specified shall be done at the nearest suitable point, but not less than 20 feet below and above the stratum shot; or

(2) When such cavity shall be in the lowest oil or gas-bearing stratum in the well, a liner shall be placed which shall extend from below the stratum to a suitable point, but not less than 20 feet above the stratum in which shooting has been done. In the event, however, that the shooting has been done above one or more oil or gas-bearing strata in the well, the liner shall be so placed that it will extend not less than 20 feet above, nor less than 20 feet below, the stratum in which shooting has been done. Following the placing of the liner in the

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manner here specified it shall be compactly filled with cement, mud, clay or other nonporous sealing material.

(b) Where the well penetrates one or more workable coal beds and a coal protection string of casing has been circulated and cemented into the surface, the well shall be filled and securely plugged in the manner provided in subdivision (a) of this section, except that expanding cement shall be used instead of regular hydraulic cement, to a point approximately 100 feet below the bottom of the coal protection string of casing. From the point the well shall be plugged according to the provisions in paragraph (1) or (2) below:

(1) A 200 foot plug of expanding cement shall be placed in the well. From this point, the well shall be filled with mud, clay or other nonporous material to a point 100 feet below the surface and a plug of cement shall be placed from the point 100 feet below the surface to the surface with a monument installed therein extending 30 inches above ground level.

(2) A 100 foot plug of expanding cement shall be placed in the well so that the top of such plug is located at a point just below the coal protection string of casing. After such plug has been securely placed in the well, the coal protection string of casing shall be emptied of liquid from the surface to a point 100 feet below the lowest workable coal bed or to the bottom of the coal protection string of casing, whichever is shallower. A vent or other device approved by the secretary shall then be installed on the top of the coal protection string of casing in such a manner that will prevent liquids and solids from entering the well but will permit ready access to the full internal diameter of the coal protection string of casing when required. The coal protection string of casing and the vent or other device approved by the secretary shall extend, when finally in place, a distance of not less than 30 inches above ground level and shall be permanently marked with the well number assigned by the secretary;

(c) Where the well penetrates one or more workable coal beds and a coal protection string of casing has not been circulated and cemented into the surface, the well shall be filled and securely plugged in the manner provided in subsection (a) of this section to a point 50 feet below the lowest workable coal bed. Thereafter, a plug of cement shall be placed in the well at a point not less than 40 feet below the lowest workable coal bed. After the cement plug has been securely placed in the well, the well shall be filled with cement to a point 20 feet above the lowest workable coal bed. From this point the well shall be filled with mud, clay or other nonporous material to a point 40 feet beneath the next overlying workable coal bed, if such there be, and the well shall then be filled with cement from this point to a point 20 feet above such workable coal bed, and similarly, in case there are more overlying workable coal beds. After the filling and plugging of the well to a point above the highest workable coal bed, filling and plugging of the well shall continue in the manner provided in subsection (a) of this section to a point 100 feet below the surface, and a plug of cement shall be installed from the point 100 feet below the surface to the surface with a monument installed therein extending 30 inches above ground level;

(d)(1) Where the well penetrates one or more workable coal beds and a coal protection



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string of casing has not been circulated and cemented into the surface, a coal operator or coal seam owner may request that the well be plugged in the manner provided in subdivision (3) of this subsection rather than by the method provided in subsection (c) of this section. Such request (forms for which shall be provided by the secretary) must be filed in writing with the secretary prior to the scheduled plugging of the well, and must include the number of the well to be plugged and the name and address of the well operator. At the time such request is filed with the secretary, a copy of such request must also be mailed by registered or certified mail to the well operator named in the request.

(2) Upon receipt of such request, the secretary shall issue an order staying the plugging of the well and shall promptly determine the cost of plugging the well in the manner provided in subdivision (3) of this subsection and the cost of plugging the well in the manner provided in subsection (c) of this section. In making such determination, the secretary shall take into consideration any agreement previously made between the well operator and the coal operator or coal seam owner making the request. If the secretary determines that the cost of plugging the well in the manner provided in subsection (c) of this section exceeds the cost of plugging the well in the manner provided in subdivision (3) of this subsection, the secretary shall grant the request of the coal operator or owner and shall issue an order requiring the well operator to plug the well in the manner provided in subdivision (3) of this subsection. If the secretary determines that the cost of plugging the well in the manner provided in subsection (c) of this section is less than the cost of plugging the well in the manner provided in subdivision (3) of this subsection, the secretary shall request payment into escrow of the difference between the determined costs by the coal operator or coal seam owner making the request. Upon receipt of satisfactory notice of such payment, or upon receipt of notice that the well operator has waived such payment, the secretary shall grant the request of the coal operator or coal seam owner and shall issue an order requiring the well operator to plug the well in the manner provided in subdivision (3) of this subsection. If satisfactory notice of payment into escrow, or notice that the well operator has waived such payment, is not received by the secretary within fifteen days after the request for payment into escrow, the secretary shall issue an order permitting the plugging of the well in the manner provided in subsection (c) of this section. Copies of all orders issued by the secretary shall be sent by registered or certified mail to the coal operator or coal seam owner making the request and to the well operator. When the escrow agent has received certification from the secretary of the satisfactory completion of the plugging work and the reimbursable extra cost thereof (that is, the difference between the secretary's determination of plugging cost in the manner provided in subsection (c) of this section and the well operator's actual plugging cost in the manner provided in subdivision (3) of this subsection), the escrow agent shall pay the reimbursable sum to the well operator or the well operator's nominee from the payment into escrow to the extent available. The amount by which the payment into escrow exceeds the reimbursable sum plus the escrow agent's fee, if any, shall be repaid to the coal owner. If the amount paid to the well operator or the well operator's nominee is less than the actual reimbursable sum, the escrow agent shall inform the coal owner, who shall pay the deficiency to the well operator or the well operator's nominee within thirty days. If the coal operator breaches this duty to pay the deficiency, the well operator shall have a right of

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action and be entitled to recover damages as if for wrongful conversion of personality, and reasonable attorney fees.

(3) Where a request of a coal operator or coal seam owner filed pursuant to subdivision (1) of this subsection has been granted by the secretary, the well shall be plugged in the manner provided in subsection (a) of this section, except that expanding cement shall be used instead of regular hydraulic cement, to a point approximately 200 feet below the lowest workable coal bed. A 100 foot plug of expanding cement shall then be placed in the well beginning at the point approximately 200 feet below the lowest workable coal bed and extending to a point approximately 100 feet below the lowest workable coal bed. A string of casing with an outside diameter no less than four and one-half inches shall then be run into the well to a point approximately 100 feet below the lowest workable coal bed and such string of casing shall be circulated and cemented into the surface: *Provided*, That if it is a modern well, then a four and one-half inch casing is not required, if the casing is perforated at the required plug intervals, the cement plugs are placed as necessary to seal the well properly, the cement plugs are tagged to ensure adequate fill within the casing, and plugging within the surface casing circulation will be monitored and information documented to ensure adequate fill within the casing. The casing shall then be emptied of liquid from a point approximately 100 feet below the lowest workable coal bed to the surface, and a vent or other device approved by the secretary shall be installed on the top of the string of casing in such a manner that it will prevent liquids and solids from entering the well but will permit ready access to the full internal diameter of the coal protection string of casing when required. The string of casing and the vent or other device approved by the secretary shall extend, when finally in place, a distance of no less than 30 inches above ground level and shall be permanently marked with the well number assigned by the secretary. Notwithstanding the foregoing provisions of this subdivision, if under particular circumstances a different method of plugging is required to obtain the approval of another governmental agency for the safe mining through of said well, the secretary may approve such different method of plugging if he or she finds the same to be as safe for mining through and otherwise adequate to prevent gas or other fluid migration from the oil and gas reservoirs as the method above specified.

(e) Notwithstanding anything in this section to the contrary, where the well to be plugged is an abandoned well that has no known responsible party and the well operator is also a coal operator that intends to mine through the well, the well shall, at a minimum, be plugged as provided in subdivisions (1) and (2) of this subsection.

(1) The well will be cleaned out and prepared for plugging or replugging as follows:

(A) If the total depth of the well is less than 4,000 feet, the operator shall completely clean out the well from the surface to at least 200 feet below the base of the lowest workable coal bed, but the secretary may require cleaning to a greater depth due to excessive pressure within the well. If the total depth of the well is 4,000 feet or greater, the operator shall completely clean out the well from the surface to at least 400 feet below the base of the lowest workable coal bed. The operator shall provide to the secretary all information it

possesses concerning the geological nature of the strata and the pressure of the well, and shall remove all material from the entire diameter of the well, wall to wall;

(B) The operator shall prepare down-hole logs for each well. The logs shall consist of a caliper survey and log(s) suitable for determining the top, bottom, and thickness of all coal seams and potential hydrocarbon-producing strata, as well as the location for a bridge plug. The secretary may approve the use of a down-hole camera survey in lieu of down-hole logs. In addition, the owner shall maintain a journal that describes the depth of each material encountered; the nature of each material encountered; the bit size and type used to drill each portion of the hole; the length and type of each material used to plug the well; the length of casing(s) removed, perforated or ripped, or left in place; any sections where casing was cut or milled; and any other pertinent information concerning cleaning and sealing the well. The operator shall maintain all invoices, work orders, and other records relating to all work on the well as part of the journal and provide to the secretary upon request;

(C) When cleaning, the operator shall make a diligent effort to remove all the casing in the well. If it is not possible to remove all the casing, then the operator shall take appropriate steps to ensure that the annulus between the casing and between the casings and the well walls are filled with expanding cement, with a minimum five tenths of one percent expansion upon setting, and contain no voids. If the casing cannot be removed, it must be cut or milled at all workable coal bed levels. Any casing which remains shall be perforated or ripped. If the total depth of the well is less than 4,000 feet, perforations or rips are required every 50 feet from 200 feet below the base of the lowest mineable coal bed up to one hundred feet above the uppermost workable coal bed. If the total depth of the well is 4,000 feet or greater, perforations or rips are required every 50 feet from 400 feet below the base of the lowest workable coal bed up to 100 feet above the uppermost workable coal bed. If the operator, using a casing bond log, demonstrates to the satisfaction of the secretary that all annuli in the well are already adequately sealed with cement, then the operator shall not be required to perforate or rip the casing. When multiple casing and tubing strings are present in the workable coal bed, any casing which remains shall be ripped or perforated and filled with expanding cement in accordance with this paragraph. The operator shall maintain a casing bond log for each casing and tubing string if used in lieu of ripping or perforating multiple strings;

(D) If the secretary concludes that the completely cleaned well emits excessive amounts of gas, the operator must place a mechanical bridge plug in the well. If the total depth of the well is less than 4,000 feet, the mechanical bridge plug shall be placed in a competent stratum at least 200 feet below the base of the lowest workable coal bed, but above the top of the uppermost hydrocarbon-producing stratum. If the total depth of the well is 4,000 feet or greater, the mechanical bridge plug shall be placed in a competent stratum at least 400 feet below the base of the lowest mineable coal bed, but above the top of the uppermost hydrocarbon-producing stratum: *Provided*, That the secretary may require a greater distance to set the mechanical bridge plug, regardless of the total depth of the well, based upon excessive pressure within the well. The operator shall provide the secretary with all information the operator possesses concerning the geologic nature of the strata and



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pressure of the well. If it is not possible to set a mechanical bridge plug, an appropriately sized packer may be used; and

(E) If the upper-most hydrocarbon-producing stratum is within 300 feet of the base of the lowest workable coal bed, the operator shall properly place mechanical bridge plugs as described in paragraph (D) of this subdivision to isolate the hydrocarbon-producing stratum from the expanding cement plug. Nevertheless, if the total depth of the well is less than 4,000 feet, the operator shall place a minimum of 200 feet of expanding cement below the lowest workable coal bed. If the total depth of the well is 4,000 feet or greater, the operator shall place a minimum of 400 feet of expanding cement below the lowest mineable coal bed: *Provided*, That the secretary may require a greater distance to set the mechanical bridge plug, regardless of the total depth of the well, based upon excessive pressure within the well.

(2) After the well is completely cleaned pursuant to subdivision one of this subsection, the operator shall plug or replug the well to the surface as follows:

If the total depth of the well is less than 4,000 feet, the operator shall pump expanding cement slurry down the well to form a plug which runs from at least 200 feet below the base of the lowest workable coal bed to the surface. If the total depth of the well is 4,000 feet or greater, the operator shall pump expanding cement slurry down the well to form a plug which runs from at least 400 feet below the base of the lowest workable coal bed to the surface: *Provided*, That the secretary may, regardless of the total depth of the well, require a lower depth based upon excessive pressure within the well. The expanding cement slurry will be placed in the well under a pressure of at least 200 pounds per square inch. Portland cement shall be used to fill the area from 100 feet above the top of the uppermost workable coal seam to the surface: *Provided*, That the secretary may require a higher distance based upon excessive pressure within the well;

(f) Any person may apply to the secretary for an order to clean out and replug a previously plugged well in a manner which will permit the safe mining through of such well. Such application shall be filed with the secretary and shall contain the well number, a general description of the well location, the name and address of the owner of the surface land upon which the well is located, a copy of or record reference to a deed, lease or other document which entitles the applicant to enter upon the surface land, a description of the methods by which the well was previously plugged, and a description of the method by which such applicant proposes to clean out and replug the well. At the time an application is filed with the secretary, a copy shall be mailed by registered or certified mail to the owner or owners of the land, and the oil and gas lessee of record, if any, of the site upon which the well is located. If no objection to the replugging of the well is filed by any such landowner or oil and gas lessee within 30 days after the filing of the application, and if the secretary determines that the method proposed for replugging the well will permit the safe mining through of such well, the secretary shall grant the application by an order authorizing the replugging of the well. Such order shall specify the method by which the well shall be replugged, and copies thereof shall be mailed by certified or registered mail to the applicant and to the



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owner or owners of the land, and the oil and gas lessee, if any, of the site upon which such well is located. If any such landowner or oil and gas lessee objects to the replugging of the well, the secretary shall notify the applicant of such objection. Thereafter, the director shall schedule a hearing to consider the objection, which hearing shall be held after notice by registered or certified mail to the objectors and the applicant. After consideration of the evidence presented at the hearing, the secretary shall issue an order authorizing the replugging of the well if the secretary determines that replugging of the well will permit the safe mining through of such well. Such order shall specify the manner in which the well shall be replugged and copies thereof shall be sent by registered or certified mail to the applicant and objectors. The secretary shall issue an order rejecting the application if the secretary determines that the proposed method for replugging the well will not permit the safe mining through of such well;

(g) In addition to any other exception set forth in law, an operator will be exempted from the standard requirements for pulling production casing from the well when either of the following circumstances are met:

(1) Where intermediate and freshwater casing strings are not cemented to the surface, any uncemented production casing strings must be removed, but the remaining uncemented casing strings may remain in place and be perforated at depths where cement plugs are set according to existing requirements and standards, to allow for cement to enter the casing annulus as plugs are set. No more than two strings of casing will be perforated at once. Additional casing strings will be pulled when needed to prevent perforating more than two casing strings. Cement plugs must be tagged to ensure adequate fill within the casing. Plugging within the surface casing circulation will be monitored and information documented to ensure adequate fill within the casing.

(2) Where all freshwater and intermediate casing strings are cemented to the surface and production and conductor casing strings are uncemented to surface, production casing is not required to be pulled from the well. Production casing that is uncemented and left in place must be perforated at depths where cement plugs will be set according to existing requirements and standards as set forth in law, to allow for cement to enter the casing annulus as plugs are set. Cement plugs must be tagged to ensure adequate fill within the casing. Plugging within the surface casing circulation will be monitored and information documented to ensure adequate fill within the casing.

(h) All persons adversely affected, by a determination or order of the secretary issued pursuant to the provisions of this section shall be entitled to judicial review in accordance with the provisions of §29A-5-1 *et seq*. and §29A-6-1 *et seq*. of this code.

(i) For the purposes of this section, a "modern well" means a well where all casing strings, other than the production and conductor strings, are cemented to the surface. Any well that is not defined as a "modern well" shall be defined as a "non-modern well."

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