

# **RULES AND REGULATIONS**

## **KANSAS CORPORATION COMMISSION**

**(Excerpted)**

**May 2004**

**K.A.R. 82-3-700. Definitions.** As used in these regulations for cathodic protection facilities, the following terms shall have the meanings specified:

- (a) "Annular space" means the space between the surface casing and the borewall or the space between two or more strings of surface casing in a cathodic protection borehole.
- (b) "Anode conductor grout" means a mixture having a minimum of 30 percent solids and weighing not less than 10.1 pounds per gallon. This mixture shall consist of 14 gallons of freshwater and 50 pounds of a commercial, single-sack grout that contains a plugging sodium bentonite blended clay with less than 10 percent of inorganic additives to temporarily inhibit sodium bentonite clay hydration during placement.
- (c) "Aquifer" means any geologic formation capable of yielding water in sufficient quantities so that the water can be diverted for beneficial use.
- (d) "Aquifer completion" means a cathodic protection borehole that is installed in an aquifer.
- (e) "Bedrock" means shale, limestone, sandstone, siltstone, anhydrite, gypsum, salt, or other consolidated rock material that can occur at the surface or underlie unconsolidated material.
- (f) "Bentonite cement" means a mixture weighing not less than 14.1 pounds per gallon and consisting of freshwater, Portland cement, and four to eight percent of sodium bentonite clay additive or an equivalent as approved by the director of the conservation division or the manager of groundwater management district #2 or #5 for cathodic protection boreholes drilled in the respective groundwater management district.
- (g) "Bentonite clay grout" means a mixture weighing not less than 9.4 pounds per gallon. This mixture shall consist of freshwater and commercial grouting or plugging sodium bentonite clay containing a high percentage of solids including those manufactured under the trade names of "Volclay" grout and "HolePlug" or a generic equivalent as approved by the director of the conservation division or the manager of groundwater management district #2 or #5 for cathodic protection boreholes drilled in the respective groundwater management district.
- (h) "Cathodic protection borehole" means any excavation penetrating the water table of an aquifer that is drilled, cored, bored, washed, driven, dug, or otherwise constructed for the intended use or purpose of installing equipment to prevent electrolytic corrosion of metallic equipment or facilities.
- (i) "Cathodic surface casing" means the first nonmetallic casing put in a cathodic protection borehole with the annular space grouted from the bottom of the cathodic surface casing to land surface, which serves to shut out shallow water formations and also acts as a foundation or anchor for all subsequent drilling activity.
- (j) "Concrete" means a mixture consisting of one 94-pound bag of Portland cement, an equal volume of sand having a grain-size diameter not larger than 0.080 inches, and five to six gallons of freshwater.
- (k) "Groundwater management district (GMD)" means a continuous area that overlies one or more aquifers, together with any area in between, that is organized for groundwater management purposes, pursuant to K.S.A. 82a-1020 et seq., and amendments thereto.
- (l) "Grout" means concrete, neat cement, bentonite clay grout, bentonite cement, or any other material that meets the following requirements:
  - 1) Is used to create a permanent, impervious, watertight bond; and

- 2) is approved by the director of the conservation division or the manager of groundwater management district #2 or #5 for cathodic protection boreholes drilled in the respective groundwater management district.
  - (m) "Multiple aquifer completion" means a cathodic protection borehole that penetrates more than one aquifer.
  - (n) "Neat cement" means a mixture consisting of one 94-pound bag of Portland cement and five to six gallons of freshwater.
  - (o) "Pitless casing adapter" means a nonmetallic assembly of parts installed in the cathodic surface casing to permit the installation of a conduit through the wall of the cathodic surface casing and sealed to prevent the entrance of any fluids or contaminants.
- (Authorized by and implementing K.S.A. 55-152; effective Oct. 25, 1996; amended, T-82-1-21-04, Jan. 21, 2004; amended May 14, 2004.)

**K.A.R. 82-3-705. Groundwater management districts #2 and #5: permit to drill cased and uncased cathodic protection boreholes; notification; exceptions; drilling pit application.** This regulation shall apply only within the boundaries of groundwater management districts #2 and #5.

- (a) Except as specified in subsection (g), it shall be a violation of this regulation for the operator, owner, or person responsible to drill or construct either a cased or uncased cathodic protection borehole without first applying for and obtaining a permit to drill and construct a cathodic protection borehole.
- (b) Each individual seeking a permit shall submit an application to the appropriate GMD office at least 60 days before planned construction, on a form furnished by the appropriate GMD. The permit application shall contain the following:
  - 1) The name and address of the owner;
  - 2) the quarter section, section, range, township, and county;
  - 3) the distance from the borehole to the section's southeast corner, in exact footage;
  - 4) the top and bottom depths of any freshwater aquifer;
  - 5) the total borehole depth;
  - 6) the number and depths of the anodes;
  - 7) the top and bottom depths of the anode conductor or anode conductor grout; and
  - 8) any other relevant information requested by the manager of the appropriate GMD.
- (c) Each manager of a GMD shall submit one copy of each cathodic protection borehole application upon which action has been taken to the production department of the conservation division within 10 days of approval.
- (d) The operator, owner, or person responsible shall notify the appropriate GMD office at least 72 hours before drilling each cathodic protection borehole.
- (e) When required by the manager of the appropriate GMD, the operator, owner, or person responsible shall submit a surface pit permit approved by the director of the conservation division with the application for a permit to drill and construct a cathodic protection borehole.
- (f) Drilling a cased or an uncased cathodic protection borehole without an approved permit shall be punishable by a penalty of up to \$1,000. Drilling any cased or uncased cathodic protection borehole without providing notice to the appropriate GMD office in accordance with subsection (d) shall be punishable by a penalty of up to \$1,000.
- (g) No permit shall be required for a cathodic protection anode system that meets the following conditions:
  - 1) Is constructed to a maximum depth below the land surface of 25 feet or less; and
  - 2) does not penetrate an aquifer.

(Authorized by K.S.A. 55-152 and K.S.A. 2003 Supp. 82a-1028; implementing K.S.A. 55-152, K.S.A. 2003 Supp. 55-164, and K.S.A. 2003 Supp. 82a-1028; effective, T-82-1-21-04, Jan. 21, 2004; effective May 14, 2004.)

**K.A.R. 82-3-706. Groundwater management districts #2 and #5: drilling contractor; logging; construction; reports.** This regulation shall apply only within the boundaries of groundwater management districts #2 and #5.

- (a) Only a driller or water well contractor licensed with the Kansas department of health and environment under K.S.A. 82a-1201 et seq., and amendments thereto, shall drill and construct each cathodic protection borehole.
- (b) The total depths of the borehole and the bottom of the cathodic surface casing shall not exceed the authorized depths in the approved permit to drill and construct a cathodic protection borehole.
- (c) The cathodic protection borehole shall be logged according to the following requirements:
  - 1) The drill cuttings shall be sampled and recorded at intervals not greater than five feet or more frequently, if needed, to produce an accurate lithologic or driller's log of the complete cathodic protection borehole.
  - 2) The electrical readings or log and any other geophysical readings or logs of the complete cathodic protection borehole shall be recorded and made a permanent record.
- (d) No uncased cathodic protection borehole shall be drilled or completed below shale or impermeable bedrock surface.
- (e) The minimum diameter of each cathodic protection borehole shall be one of the following:
  - 1) Eight inches for uncased boreholes; or
  - 2) six inches greater than the outside diameter (OD) of the surface casing for cased boreholes.
- (f) Except for uncased cathodic protection boreholes, each borehole shall be constructed according to the following requirements:
  - 1) Nonmetallic casing equipped with centralizers shall be installed in the borehole when the drilling penetrates 20 feet into either shale or impermeable bedrock.
  - 2) The casing shall be new, clean, serviceable, and free of defects.
  - 3) The casing shall have a standard dimension ratio (SDR) of 21 or less and shall be calculated by dividing the casing's outside diameter (OD) by its minimum wall thickness (MWT).
  - 4) Centralizers shall be installed along the entire length of the casing at intervals not greater than 40 feet, starting at the bottom end of the casing.
  - 5) The annular space shall be grouted, and the grout shall be installed using a grout tremie pipe or as recommended by the grout manufacturer's instructions and allowed to set undisturbed as recommended by the grout manufacturer's specifications.
  - 6) No opening shall be made through the casing, except for the installation of a pitless casing adapter.
- (g) Measurements shall be made as necessary to determine the depth, dimensions, or spacing of the borehole, casing, anode, anode conductor, grout, and other borehole materials.
- (h) Drilling products and borehole materials containing organic polymers shall not be used to either drill or construct the borehole.
- (i)
  - 1) If the manager of the appropriate GMD determines that the use of a drilling pit threatens to contaminate groundwater, the operator, owner, or person responsible shall ensure that the pit meets one of the following requirements:

- i. Be constructed so that the bottom and sides have a hydraulic conductivity no greater than  $1 \times 10^{-7}$  cm/sec during use;
    - ii. be constructed aboveground; or
    - iii. consist of a portable aboveground tank.
  - 2) All fluids that threaten to contaminate the groundwater shall be removed from the drilling pit and disposed of upon closure of the pit, in accordance with K.A.R. 82-3-602.
  - (j) If drilling and construction operations are temporarily suspended or interrupted by an unforeseen circumstance, the following requirements shall apply:
    - 1) All drilling and grouting equipment shall be removed from the borehole.
    - 2) The borehole shall be secured to prevent the following:
      - i. The entry of contaminating or polluting materials into the borehole; and
      - ii. unauthorized access.
    - 3) The borehole shall be maintained in a stable condition to prevent collapse.
  - (k) Two copies of the following information shall be submitted to the appropriate GMD office within 30 days after the cathodic protection borehole is completed:
    - 1) The well completion form provided by the commission and completed by the operator;
    - 2) any electrical or geophysical readings or logs; and
    - 3) an as-built plan.

The manager of the appropriate GMD shall provide one copy of this information to the conservation division within 30 days of receipt by the GMD office.
  - (l) 1) Each failure to construct a cathodic protection borehole in accordance with these regulations shall be punishable by a penalty of up to \$2,500.
  - 2) Each failure to submit the report required under subsection (k) to the appropriate GMD office shall be punishable by a penalty of \$100.
- (Authorized by K.S.A. 55-152 and K.S.A. 2003 Supp. 82a-1028; implementing K.S.A. 55-152, K.S.A. 2003 Supp. 55-164, and K.S.A. 2003 Supp. 82a-1028; effective, T-82-1-21-04, Jan. 21, 2004; effective May 14, 2004.)

**K.A.R. 82-3-707. Groundwater management districts #2 and #5: anode, anode conductor, and anode conductor grout requirements for cased and uncased boreholes.** This regulation shall apply only within the boundaries of groundwater management districts #2 and #5.

- (a) Each operator, owner, or person responsible shall install anodes and anode conductor in each cased cathodic protection borehole starting five feet below the bottom of the cathodic surface casing.
- (b) Each operator, owner, or person responsible shall install anodes and anode conductor grout in uncased boreholes according to the following requirements:
  - 1) Each anode for use in a public water supply system shall meet or exceed the requirements specified in section 4.2.3, "anode materials," in the American water works association's standard D104-01, as approved in 2001. Section 4.2.3 of this document is hereby adopted by reference.
  - 2) Each anode shall be installed from a minimum of three feet above the shale or impermeable bedrock surface to a maximum of 20 feet below land surface.
  - 3) The anode conductor grout shall be placed from the total depth to five feet above the anode nearest the land surface, using a grout tremie pipe or as recommended by the grout manufacturer.
  - 4) The anode conductor grout shall be certified by the national sanitation foundation to meet the criteria specified in section 8 of "drinking water treatment chemicals—health effects," NSF/ ANSI 60-2003e, as revised in October 2003. Section 8 of this document, titled

"miscellaneous water supply products" and consisting of pages 27 through 34, is hereby adopted by reference.

- 5) Anode conductor grout containing bentonite clay or any other similar material shall not be used if the salinity equals or exceeds 2,000 mg/L chloride in any portion of an aquifer.
  - (c) Each failure to install anodes or grouting material in accordance with this regulation shall be punishable by a penalty of up to \$2,500.
- (Authorized by K.S.A. 55-152 and K.S.A. 2003 Supp. 82a-1028; implementing K.S.A. 55-152, K.S.A. 2003 Supp. 55-164, and K.S.A. 2003 Supp. 82a-1028; effective, T-82-1-21-04, Jan. 21, 2004; effective May 14, 2004.)

**K.A.R. 82-3-708. Groundwater management districts #2 and #5: surface construction requirements for cased cathodic protection boreholes.** This regulation shall apply only within the boundaries of groundwater management districts #2 and #5.

- (a) Each operator, owner, or person responsible shall ensure that the top of the cathodic protection borehole casing of each cased borehole meets one of the following requirements:
  - 1) Terminates a minimum of three feet above land surface or one foot above the highest known flood elevation greater than three feet above land surface;
  - 2) is equipped with a water-resistant and structurally sound vault; or
  - 3) terminates a minimum of three feet below land surface.
- (b) The minimum construction requirements for each cased cathodic protection borehole shall be the following:
  - 1) The top of the cathodic protection borehole casing shall meet the following requirements:
    - i. Be constructed to prevent damage to the cathodic protection borehole casing, prevent entry of contaminants, and deter unauthorized access to the installation;
    - ii. be constructed so that surface drainage is directed away from the installation;
    - iii. be equipped with a watertight seal, cover, or an equivalent device approved by the appropriate GMD office; and
    - iv. be equipped with an easily visible sign identifying the cathodic borehole permit number and the borehole owner.
  - 2) The borehole shall be vented of any gases according to the following requirements:
    - i. The vent pipe shall terminate a minimum of either three feet above land surface or one foot above the highest known flood elevation greater than three feet above land surface.
    - ii. The aboveground terminus end of the vent pipe shall be turned 180 degrees and equipped at the terminus end with a 16-mesh or greater brass, bronze, or copper screen, or other material with similar properties if that material is approved by the manager of the appropriate GMD office.
    - iii. Gases shall not be vented or released if the release is a hazard to public health and safety or the environment.
  - 3) The cathodic protection borehole casing vault shall meet the following requirements:
    - i. Be strong enough to support vehicular traffic where this traffic could occur; and
    - ii. contact the cathodic protection borehole casing to form a water-resistant and structurally sound seal and connection.
  - 4) The cathodic protection borehole casing installation terminated below land surface shall meet the following minimum requirements:
    - i. Grout shall be placed in the borehole from a minimum of five feet below the bottom of the nonmetallic cathodic protection borehole casing to the top of the

nonmetallic cathodic protection borehole casing by using a tremie pipe or by following the recommendation of the grout manufacturer.

- ii. The borehole shall be backfilled with clean and compacted topsoil from the top of the nonmetallic cathodic protection borehole casing to the land surface.
  - (c) Each operator, owner, or person responsible shall ensure that any concrete pad constructed around an aboveground cathodic protection borehole casing or vault meets the following requirements:
    - 1) Is a minimum of four inches thick;
    - 2) is sloped so that surface drainage is directed away from the installation;
    - 3) is free of cracks, voids, and other defects that detract from its watertightness; and
    - 4) has a joint between the base and the nonmetallic cathodic protection borehole casing that is structurally resistant to sound and water.
  - (d) Each failure to complete surface construction requirements for cathodic protection boreholes in accordance with this regulation shall be punishable by a penalty of up to \$500.
- (Authorized by K.S.A. 55-152 and K.S.A. 2003 Supp. 82a-1028; implementing K.S.A. 55-152, K.S.A. 2003 Supp. 55-164, and K.S.A. 2003 Supp. 82a-1028; effective, T-82-1-21-04, Jan. 21, 2004; effective May 14, 2004.)

**K.A.R. 82-3-709. Groundwater management districts #2 and #5: construction specifications for uncased cathodic boreholes.** This regulation shall apply only within the boundaries of groundwater management districts #2 and #5. Each operator, owner, or person responsible shall ensure that the requirements of this regulation are met.

- (a) The construction features of each uncased cathodic protection borehole shall prevent physical damage to the installation and prevent the entry of pollutants and contaminants into fresh and usable groundwater.
- (b) Each uncased borehole shall be grouted from the top of the anode conductor grout to three feet below land surface with either of the following:
  - 1) Grout; or
  - 2) anode conductor grout.
- (c) From three feet below land surface to the land surface, each uncased borehole shall be backfilled with clean, compacted topsoil and sloped so that surface drainage or runoff is directed away from the installation.
- (d) A vent pipe or other gas-venting device shall not be installed in any uncased borehole.
- (e) In any area having a saline concentration of 500 ppm or higher, or as determined by the manager of the appropriate GMD office after consideration of ambient water quality data taken from the area within a ½-mile radius of the proposed uncased borehole, a log of a test well located within 20 feet of the proposed uncased borehole shall accompany each uncased cathodic borehole application submitted pursuant to K.A.R. 82-3-705 and shall include the following information:
  - 1) A 10-acre tract legal description of the test well location;
  - 2) the depth to bedrock;
  - 3) the depth to the water table;
  - 4) a description of drill cuttings sampled and recorded at intervals not greater than five feet and more frequently, if necessary, to produce an accurate lithologic log; and
  - 5) the analyses of groundwater samples collected in a manner approved by the manager of the appropriate GMD office from the upper, middle, and lower portions of an aquifer.These analyses shall meet the following requirements:

- i. Consist of chloride, specific conductance, and any other parameter analysis specified by the manager of the appropriate GMD office; and
    - ii. be performed by a laboratory certified by the Kansas department of health and environment.
  - (f) Each failure to construct any uncased cathodic protection borehole in accordance with this regulation shall be punishable by a penalty of up to \$2,500.
- (Authorized by K.S.A. 55-152 and K.S.A. 2003 Supp. 82a-1028; implementing K.S.A. 55-152, K.S.A. 2003 Supp. 55-164, and K.S.A. 2003 Supp. 82a-1028; effective, T-82-1-21-04, Jan. 21, 2004; effective May 14, 2004.)

**K.A.R. 82-3-710. Groundwater management districts #2 and #5: abandonment, plugging methods, and procedures for cathodic protection boreholes, reports, and restoration.** This regulation shall apply only within the boundaries of groundwater management districts #2 and #5.

- (a) A cathodic protection borehole shall be deemed abandoned when any of the following conditions exists:
  - 1) The cathodic protection borehole is not completed due to unforeseen circumstances.
  - 2) The cathodic protection borehole either threatens to contaminate or contaminates a freshwater aquifer.
  - 3) Uncontrollable fluid or gas flow is present in the cathodic protection borehole.
  - 4) The cathodic protection borehole is not operational or is in a state of disrepair.
- (b) The operator, owner, or person responsible shall plug each abandoned cathodic protection borehole.
- (c) The minimum plugging requirements for an abandoned cathodic protection borehole shall be the following:
  - 1) At least 72 hours before plugging operations are scheduled to begin, the operator, owner, or person responsible shall submit a plugging plan to the appropriate GMD office. The operator, owner, or person responsible shall not begin plugging operations until the plugging plan is approved.
  - 2) As part of initial plugging operations, any cables and anodes, the vent pipe and anode conductor, and any other cathodic equipment or materials installed in the borehole shall be removed as necessary to ensure that the borehole is properly plugged and to facilitate proper plugging.
  - 3) All surface casing shall be cut off a minimum of three feet below the land surface and removed.
  - 4) Each cased cathodic protection borehole shall be plugged with grout from a minimum of five feet below the bottom of the surface casing to the top of the surface casing.
  - 5) Each uncased cathodic protection borehole shall be plugged with grout from the bottom of the borehole to three feet below the land surface.
  - 6) All grout shall be placed with a tremie pipe or in a manner recommended by the grout manufacturer.
  - 7) Each borehole shall be backfilled with clean topsoil and compacted from three feet below land surface to the land surface.
  - 8) Each vent pipe not removed from a cased cathodic protection borehole shall be completely filled with grout.
  - 9) Wherever subsurface fluid or gas pressure flow is encountered, a pressure sufficient for placement of the grout shall be maintained long enough for the grout to set.

10) The operator shall submit a final plugging report to the manager of the appropriate GMD office within 60 days after plugging operations are completed, on forms prescribed by the manager of the appropriate GMD office.

(d) Each former cathodic protection borehole site shall be restored, as close as practical to predrilling conditions, by removing from the site any cables and anodes, the vent pipe and anode conductor, any surface casing sections, and any other material installed at the surface or in the borehole.

(e) 1) Each failure to provide notice under paragraph (c)(1) shall be punishable by a penalty of up to \$1,000.

2) Each failure to properly plug any cathodic protection borehole in accordance with this regulation shall be punishable by a penalty of up to \$2,500

(Authorized by K.S.A. 55-152 and K.S.A. 2003 Supp. 82a-1028; implementing K.S.A. 55-152, K.S.A. 2003 Supp. 55-164, and K.S.A. 2003 Supp. 82a-1028; effective, T-82-1-21-04, Jan. 21, 2004; effective May 14, 2004.)