Kansas Department of Health and Environment

Regulatory Impact Statement

pursuant to K.S.A. 2012 Supp. 77-416

Proposed New Regulations

K.A.R. 28-29-1600
K.A.R. 28-29-1601
K.A.R. 28-29-1602
K.A.R. 28-29-1603
K.A.R. 28-29-1604
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K.A.R. 28-29-1606
K.A.R. 28-29-1607
K.A.R. 28-29-1608

May 2013

Executive Summary of Proposed Amended Regulations

In anticipation of increased horizontal drilling activity in Kansas, KSA 65-3407c was amended to allow land-spreading of solid waste generated by drilling oil and gas wells with the approval of the Kansas Corporation Commission (KCC). The Kansas Department of Health and Environment (KDHE) was charged with developing regulations governing land-spreading of waste generated by drilling oil and gas wells in cooperation with the KCC, groundwater management districts, and others with knowledge and/or experience in the disposal of drilling waste and related matters.

A summary of each of the proposed regulations follows:

KAR 28-29-1600. Land-spreading; definitions and adoptions.

This regulation defines terms that are used in the proposed KAR 28-29-1601 through 28-29-1608 and adopts documents that are referenced in these regulations.

KAR 28-29-1601. Land-spreading; general requirements.

KSA 65-3407c(a)(C)(i) requires that an application be submitted for each land-spreading location. This regulation contains general information about the size of the disposal area, the time period, and the waste that will be covered by a single application.

KAR 28-29-1602. Land-spreading; application.

This regulation describes in detail the information that must be included in a land-spreading application. As required by KSA 65-3407c(a)(C)(i), information concerning the following must be submitted: the land-spreading location, soil characteristics, waste characteristics, drilling mud additives, and the land-spreading method. In addition, this regulation requires the application to include the following:

- Certification that the site meets the conditions for disposal set forth in KAR 28-29-1604;
- Information about the operator of the well from which the drilling waste will be generated;
- Information about the well from which the drilling waste will be generated;
- An affidavit and supporting information concerning the predicted level of naturally occurring radioactive material (NORM) in the drilling waste;
- A sampling and analysis plan to determine the chloride concentration of the drilling waste;
- Information about the ownership and land use of the disposal site and surrounding areas;
- Information concerning irrigation and ground water at the site;
- An aerial map, a topographic map, and a cell identification map for the site;
- Documentation supporting chloride concentration and soil texture information;
- Documentation that the landowner has agreed to the land-spreading;
- An agreement that grants access to the proposed disposal site to KDHE and the KCC for the purposes of observation, inspection, and sampling;
- A contingency plan to be followed if the waste cannot be land-spread;
- A plan describing how the land spreading area will be restored after land-spreading of drilling waste; and
- Any other relevant information required by the KCC to evaluate the application.

The regulation refers the reader to KSA 65-3407c for the amount of the application fee.

KAR 28-29-1603. Land-spreading; sampling and analysis of soils.
This regulation establishes the sampling procedures and the analytical requirements for determining the chloride concentration and the soil characteristics of the land-spreading site.

KAR 28-29-1604. Land-spreading; conditions for disposal.
This regulation describes the criteria that must be met in order for the KCC to approve a land-spreading application. As required by KSA 65-3407c(8), the regulation states that the application will not be approved if the water table is less than 10 feet below the surface, if there is documented groundwater contamination, or if less than three years have passed since the previous land-spreading occurred at the site. In addition, this regulation requires the following:

- The drilling mud must be water-based.
- The predicted NORM level must be no more than 1.5 times the highest NORM level found in drilling waste samples collected from Kansas wells and no more than 370 Bq/kg (10 pCi/g).
- The chloride concentration in the soil must be less than 300 parts per million (ppm) if the disposal site has previously been used for land-spreading and less than 500 ppm if the disposal site has not previously been used for land-spreading.
- The chloride concentration of any irrigation water must be less than 350 ppm.

This regulation also establishes buffer zones and describes the topographic and soil profile criteria that must be met.

KAR 28-29-1605. Land-spreading; sampling and analysis of drilling waste.
This regulation establishes the sampling procedures and the analytical requirements for determining the chloride concentration of the drilling waste.

KAR 28-29-1606. Land-spreading; determination of land-spreading rates.
This regulation describes the procedures that must be followed to determine the amount of drilling waste that may be disposed of at a land-spreading site, based on the chloride concentrations of the soil and the drilling waste. The chloride concentration in the soil after land-spreading occurs must be no more than 900 ppm. The thickness of the drilling waste after it is spread may be no more than two inches.

KAR 28-29-1607. Land-spreading; operating and management requirements.
This regulation establishes the requirements for managing and land-spreading the drilling waste at the disposal site, including:

- Storage of drilling waste;
- Time frames for land-spreading;
- Prior notification to KCC;
- Determination if spreading can occur based on:
    - The chloride composition of the drilling waste;
    - Updated NORM information, if available; and
    - Weather and soil conditions;
- Land-spreading practices; and
- Land restoration.

If NORM levels in drilling waste that has already been land-spread have been measured and are greater than 370 Bq/kg (10 pCi/g), the operator must notify the KCC, determine the potential impact to the site and, if required, perform corrective measures.

As required by KSA 65-3407c(a)(8), if the land-spreading site is in an area that receives more than 25" of precipitation annually, the drilling waste must be incorporated into the soil. This regulation specifies which counties in Kansas meet the precipitation criterion.

KAR 28-29-1608. Land-spreading; reporting and record-keeping.

This regulation describes what must be included in the land-spreading reports. Within 60 days after land-spreading the operator must submit a report that includes:

- Information about the drilling waste and the well(s) from which it was generated;
- Information about the person who performed the land-spreading;
- An updated cell identification map;
- A description of drilling waste sampling procedures;
- The calculations and analyses that were used to determine the land-spreading and loading rates;
- A description of the land-spreading procedures that were followed; and
- Information concerning corrective measures, if corrective measures were required.

Within one year after land-spreading, the operator must submit a report concerning restoration of the site. Records concerning land-spreading must be maintained for five years.

Environmental Benefit Statement

1) Need for proposed amendments and environmental benefit likely to accrue.

a. Need.

Historically, drilling waste has been disposed of in on-site pits or hauled to landfills, but in some instances land-spreading of drilling waste may be a more cost-effective and environmentally preferable disposal method. These proposed amendments will help ensure that land-spreading of drilling waste is conducted in a manner that is protective of human health and the environment. KSA 65-3407c(a)(8) requires that regulations governing land-spreading of drilling waste be adopted on or before January 1, 2014.

b. Environmental benefit.

Environmentally responsible land-spreading of drilling waste can improve the tilth of certain soils and avoid some of the problems associated with disposal of drilling waste in pits, e.g. hot spots with high concentrations of chloride. When land-spreading is chosen as an alternative to disposal in a landfill, haul distances may be shorter, resulting in reduced air emissions, fossil fuel consumption, and road damage.

2) When applicable, a summary of the research or data indicating the level of risk to the public health or the environment being removed or controlled by the proposed regulations or amendments.

Chlorides

Drilling waste can have high chloride concentrations; this is a particular concern in Kansas due to the prevalence of subsurface salt layers.

The KDHE Bureau of Environmental Remediation (BER) developed policy # BER-RS-13A, "Investigation and Remediation of Salt (Chloride)-Impacted Soil and Ground Water." This policy states:

> "Salt contamination is not normally a hazard to human health; however, it can cause adverse and long lasting environmental impacts to soil and ground water resources because chloride is highly soluble, does not adsorb onto soil particles, does not degrade, and generally inhibits biological processes. Releases of salt onto the ground can damage soils by destroying the soil structure and permeability. The presence of high concentrations of soluble salts can inhibit seed germination and a plant's ability to uptake water. Salt-contaminated soil in the near surface can lose its ability to support agricultural crops, native grasses, or other vegetation if salt levels are high enough, potentially contributing to surface erosion.
>
> "If vertical migration from the near surface soil through the vadose zone to the underlying water table occurs and chloride impacts ground water, degradation of the aquifer can result in long-term loss of value as a source for public or private drinking water supply, irrigation, or industrial purposes."

These regulations set limits on the chloride loading rate and ensure that drilling waste is land-spread in a manner that is protective of the environment, including the condition of the soil and the quality of the groundwater.

NORM

Available sampling results indicate that naturally occurring radioactive material (NORM) levels are not an issue for oil and gas wells drilled in Kansas; however drilling waste from wells drilled in other states can contain NORM levels which, if land-spread in Kansas, could increase the radioactivity in the soil to a level significantly above existing background levels.

KDHE publication "Naturally Occurring Radioactive Material" (June 28, 2010) state that "Soil samples in Kansas typically contain 1 to 4 pCi/g of ^{266}Ra." The proposed regulations set the maximum predicted NORM level in drilling waste that will be land-spread at no more than 1.5 times the highest NORM level found in drilling waste samples collected from Kansas wells and no more than 370 Bq/kg (10 pCi/g).

3) If specific contaminants are to be controlled by the proposed regulation or amendment, a description indicating the level at which the contaminants are considered harmful according to current available research.

Chlorides

The U.S. Environmental Protection Agency has promulgated a secondary maximum contaminant level (SMCL) of 250 milligrams per liter (mg/L) for chloride in drinking water. Above this level the water will taste salty. Water used for irrigation can have an even higher chloride level before crop yields are affected. Based on the drinking water SMCL of 250 mg/L, BER policy # BER-RS-13A states that the soil can have a chloride concentration of up to 1,000 milligrams per kilogram (mg/Kg) without negatively impacting groundwater quality. These regulations ensure that chloride concentrations in soil will be below this level after land-spreading.

NORM

The Public Health Statement for Radium published by the U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry states the following:

"There is no clear evidence that long-term exposure to radium at the levels that are normally present in the environment (for example, 1 pCi of radium per gram of soil) is likely to result in harmful health effects. However, exposure to higher levels of radium over a long period of time may result in harmful effects including anemia, cataracts, fractured teeth, cancer (especially bone cancer), and death."

"The relationship between the amount of radium that you are exposed to and the amount of time necessary to produce these effects is not known. Although there is some uncertainty as to how much exposure to radium increases your chances of developing a harmful health effect, the greater the total amount of your exposure to radium, the more likely you are to develop one of these diseases."

"The EPA has set a drinking water limit of 5 picocuries per liter (5 pCi/L) for radium-226 and radium-228 (combined)."

"The EPA has set a soil concentration limit for radium-226 in uranium and thorium mill tailings of 5 picocuries per gram in the first 15 centimeters of soil and 15 picocuries per gram in deeper soil."

Economic Impact Statement

1) Are the proposed regulations or amendments mandated by federal law as a requirement for participating in or implementing a federally subsidized or assisted program?

No.

2) Do the proposed regulations or amendments exceed the requirements of applicable federal law?

No, there are no Federal regulations concerning land-spreading of drilling waste.

3) Description of costs to agencies, to the general public and to persons who are affected by, or are subject to, the regulations:

a. Capital and annual costs of compliance with the proposed regulations or amendments and the persons who will bear those costs.

Well operators are only required to comply with these regulations if they choose to dispose of drilling waste by land-spreading rather than disposing of it in an on-site pit or in an off-site permitted landfill. Land-spreading may be chosen as a disposal method for a number of reasons, including: economic savings, environmental concerns, lease agreements, or to avoid company concerns associated with disposal in pits. Since no one is required to choose land-spreading as a disposal method, there are no capital costs or annual costs associated with complying with these regulations; in many cases the operator will save money by choosing this method.

b. Initial and annual costs of implementing and enforcing the proposed regulations or amendments, including the estimated amount of paperwork, and the state agencies, other governmental agencies or other persons or entities who will bear the costs.

KCC will be the lead agency for implementing and enforcing these regulations, with technical and/or enforcement support from KDHE as needed. No additional staff will be required to

implement these regulations beyond staff added by KCC in response to the increase in horizontal drilling and hydraulic fracturing.

c. Costs which would likely accrue if the proposed regulations or amendments are not adopted, the persons who will bear the costs and those who will be affected by the failure to adopt the regulations.
If these regulations are not adopted, persons who are drilling wells will not have the opportunity to dispose of drilling waste by land-spreading, which may be the most cost-effective disposal option.

d. A detailed statement of the data and methodology used in estimating the costs used in the statement.
Not applicable.

e. Description of any less costly or less intrusive methods that were considered by the agency and why such methods were rejected in favor of the proposed regulations.
There were no less intrusive or less costly methods available for consideration by KDHE to achieve the purposes of the proposed amendment.

f. Consultation with League of Kansas Municipalities, Kansas Association of Counties, and Kansas Association of School Boards.
Municipalities, counties, and school boards will not incur any costs as a result of the regulatory changes. However a copy of this Regulatory Impact Statement will be sent electronically to each of these organizations at the start of the public comment period.

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