



Harvard Law School
**Emmett Environmental
Law & Policy Clinic**

1563 Massachusetts Avenue
Pound Hall, Room 501
Cambridge, MA, 02138
T: 617-496-2058
F: 617-384-7633

November 16, 2011

Via Electronic Mail and First Class Mail

Mr. Scott E. Walters, Chief
General Permits/Beneficial Use Section
Division of Municipal and Residual Waste
Bureau of Waste Management
P.O. Box 8472
Harrisburg, PA 17105-8472
scwalters@pa.gov

Re: Proposed Modification of General Permit No. WGMR064.

Dear Mr. Walters:

On behalf of the undersigned organizations, Harvard Law School's Emmett Environmental Law and Policy Clinic ("ELPC") and Earthjustice submit the following comments in response to the Bureau of Waste Management's ("Bureau") proposed modifications of General Permit WGMR064 ("General Permit") for the use of natural gas well brines on public roadways for dust suppression and road stabilization. Because the modifications are inadequately explained in the proposal and will potentially result in significant harm to public health and the environment, we urge the Bureau to reject the amendment to the General Permit. In the alternative, the proposed amendment should be renoticed.

The Bureau has failed to meet its statutory mandates both procedurally and substantively. Procedurally, the notice was issued without the information required by 25 Pa. Code § 287.625, which is necessary to allow informed public participation in the permit revision process. Indeed, the notice provides no information at all about the contents of the proposed revision to the

General Permit. At a minimum, the Bureau should reissue the notice so that it includes the terms and conditions that will govern the new proposed uses.

Substantively, the proposed modifications present a risk of damage to human health and the environment and should therefore be rejected. If, however, the Bureau decides to go ahead with the new uses, it should include the following terms in the General Permit in order to substantively comply with its mandate to protect human health and the environment:

- Appropriate acceptance criteria for the new uses;
- Limits on how often brine can be spread for these uses;
- Application rates for the brines in these uses;
- Provisions for regular testing of brines used;
- Provisions for regular testing of soil and groundwater in the vicinity of application;
- Limits on application during rain, before rain, or while the road surface is saturated;
- Limits on the maximum grade of the road to which brines may be applied;
- Limits on how close to bodies of water brines can be applied;
- A prohibition on spreading brines for dust suppression at night;
- Provisions for additional study of the long-term effects of brine use on roads, as well as provisions for testing for accumulations of contaminants;
- Limits on radionuclide levels in brine used on roads; and
- Restriction of the types of “well brines” that can be used in road spreading to production brines, with the express exclusion of “flowback” or drilling brines.

These comments are divided into three sections, each identifying a different type of problem with the proposed modifications. The first section discusses the procedural deficiencies of the Bureau’s notice announcing the proposed modifications, demonstrating why the notice is

insufficient to provide a basis for meaningful comment. The second section focuses on relevant differences between the proposed uses of the brine and the existing uses and shows that permitting the new uses will substantially impact public health and the environment. The third section addresses additional problems that may arise from the increase in the overall use of brines as a result of the new uses and suggests some changes that should be made by the Bureau to the General Permit as a whole if it intends to approve the proposed new uses.

I. THE BUREAU HAS NOT PROVIDED SUFFICIENT NOTICE FOR THE MODIFICATIONS.

The notice fails to meet a number of statutory requirements and as a result omits information necessary for informed public participation in the permit revision process. In particular, 25 Pa. Code § 287.625(c) lists mandatory requirements for the *Pennsylvania Bulletin* notice for a Department-initiated issuance or modification of a general permit. The notice for the modification of the General Permit is deficient with respect to at least three of these requirements. Accordingly, the Bureau should rescind the current notice and reissue a notice that complies with the statutory requirements.

First, the notice fails to provide “a clear and specific description of the category of waste and the category of beneficial use” for the proposed permit modification, in violation of 25 Pa. Code § 287.625(c)(1). The notice published in the *Pennsylvania Bulletin* simply states that the department plans to “authorize the beneficial use of natural gas well brines for (i) dust suppressant and (ii) stabilizer for unpaved secondary roadway systems.”¹ It thus does not provide an adequate description of either the category of waste or the category of beneficial use.

In the General Permit as currently written, the eligible waste is described as “natural gas well brines,” but it is also further described by specification of allowable levels of various

¹ 41 Pa. Bull. 4987 (Sept. 17, 2011).

contaminants.² The permissible contaminant levels differ depending on whether the brine is to be used for pre-wetting or anti-icing and de-icing uses. For example, the “acceptance criteria” include a maximum concentration of 100 mg/l of barium for pre-wetting purposes but only 30 mg/l for anti-icing and de-icing purposes.³ The notice does not indicate whether brine may be used for the new purposes—dust suppression and road stabilization—when it meets the pre-wetting acceptance criteria, the de-icing acceptance criteria, or some other set of acceptance criteria. The current notice’s lack of description of the type of well brines that may be used and the lack of specification of contaminant levels results in a failure to clearly and specifically describe the waste, in violation of section 287.625(c)(1).

The beneficial use is also not clearly and specifically described. Dust suppression and road stabilization could have a variety of different meanings. Merely naming these two uses does not adequately describe them. In the General Permit as currently written, each of the uses has at least a short description of what that use entails. For example, pre-wetting is defined as “brines mixed with antiskid materials prior to roadway application.”⁴ It is difficult to comment on potential expansion of uses to dust suppression and road stabilization without any indication of what these beneficial uses entail or how they will be carried out. As a result, this aspect of the notice is also inadequate and in violation of section 287.625(c)(1).

Second, the notice fails to examine the standards in 25 Pa. Code § 287.611(a) or give a brief description of the reasons for the Bureau’s determination that these additional uses are valid, in violation of 25 Pa. Code § 287.625(c)(2). Under section 287.611(a), the wastes must be (1) of similar physical character and composition, (2) used for the “same or substantially similar”

² General Permit WMGR064 ¶ 2.

³ *Id.* ¶ 2.

⁴ *Id.* ¶ 1.

beneficial uses, and (3) “adequately regulated utilizing standardized conditions without harming or presenting a threat of harm to the health, safety, or welfare of the people or environment.”

None of these factors are referenced or even suggested by the notice. Section 287.625(c)(2) also requires that the notice provide “a brief description of the reasons for the Department’s determination that the category of beneficial use or processing is eligible for coverage under a general permit in accordance with” the section 287.611(a) standards. The notice, however, merely states that the Bureau is “proposing to renew General Permit Number WMGR064 and make a major modification.” It does not provide any description of the reasons for the Bureau’s determination that the waste can be used for dust suppression or road stabilization. Accordingly, the notice is inadequate and in violation of section 287.625(c)(2).

Third, the notice fails to give “a brief description of the terms and conditions of the proposed general permit” as required by 25 Pa. Code § 267.625(c)(3). The current General Permit includes many terms and conditions for the application of well brines for pre-wetting, anti-icing, and de-icing purposes. Among other terms and conditions, the permit sets maximum levels for various contaminants, specifies the concentration of brines to be used, sets out requirements for who can spread the brines and how they must be stored, and establishes reporting requirements.⁵ The notice does not explain which, if any, of these terms and conditions will apply to the dust suppressant and road stabilization uses, nor does it specify if there will be any additional or alternative terms and conditions for these new uses.

These requirements are mandated even though this is a modification of a current permit. The section 287.625 notice requirement applies “prior to the issuance *or* modification of a

⁵ *Id.* ¶¶ 2-3, 8-9, 15.

general permit.”⁶ In the notice itself, the Bureau labels the proposal a “major modification.”⁷ Furthermore, the General Permit as now written has different terms and conditions for pre-wetting uses than for anti-icing and de-icing uses. As a result, persons submitting comments cannot know which terms and conditions set out in the current general permit will apply to the dust suppression or road stabilization uses because the permit contains no single set of terms and conditions that apply to all uses.

Failure to comply with the statutory notice requirements vitiates any meaningful opportunity to comment. Persons wishing to submit comments cannot adequately assess the environmental, health, or safety impacts of the new uses without an indication of what terms and conditions will apply to those uses. Neither can commenters engage with the Bureau’s reasoning in broadening the uses of natural gas well brines when no reasoning has been offered. Likewise, it is difficult to determine whether this expansion of the General Permit complies with statutory requirements when those requirements are not even mentioned. For these reasons, the Bureau should withdraw the notice and re-notice the proposed renewal and modification in a manner consistent with the statutory requirements. The public should then be given sixty days from the issuance of the new notice to comment so that it may properly examine the description, justification, and terms and conditions associated with the new uses.

II. THE ADDITIONAL PROPOSED USES WILL CREATE SUBSTANTIAL ENVIRONMENTAL AND HUMAN HEALTH IMPACTS THAT DIFFER FROM THE CURRENT USES.

Under 25 Pa. Code § 287.611(a)(3), the Department of Environmental Protection—here through the Bureau of Waste Management—can issue a general permit for beneficial use of residual waste if it can be used “without harming or presenting a threat of harm to the health,

⁶ 25 Pa. Code § 287.625(b) (emphasis added).

⁷ 41 Pa. Bull. 4987 (Sept. 17, 2011).

safety or welfare of the people or environment” of the Commonwealth. The proposed expansion of the General Permit to allow the use of well brines for dust suppression and road stabilization presents a threat of harm to the health, safety, and welfare of people and the environment. In particular, natural gas brine use in the summer season results in heavier, more concentrated runoff than the currently-permitted winter uses, which can lead to a greater risk of pollution of soil, surface waters, and groundwater—including drinking water sources. For this reason, the proposed new uses should be rejected. If the Bureau decides to permit them, careful monitoring should be put in place, application should be limited in both concentration and frequency, and limits similar to those imposed by other states should be placed on application methods.

- A. The Bureau should not permit the proposed new uses because runoff from these uses is more dangerous than from existing uses and poses a threat of groundwater and surface water contamination.

Runoff is a persistent concern relating to road application of natural gas well brines and can lead to contamination of groundwater or surface waters.⁸ Several different categories of contaminants occurring naturally in well brines pose threats to public health if they enter the drinking water supply. Brines generally contain salts, which can make drinking water unpleasant to taste; heavy metals, including but not limited to arsenic, mercury, lead, or barium—some of which can be radioactive; hydrocarbons; and volatile organic compounds (“VOCs”).⁹ Pennsylvania is required to regulate many of these contaminants under the federal Safe Drinking Water Act, and the contaminants can pose a threat to human health when ingested in concentrations exceeding minimum levels set by the federal EPA.¹⁰ Even assuming that these

⁸ OHIO DEP’T OF NATURAL RES., SPREADING OIL-FIELD BRINE FOR DUST AND ICE CONTROL IN OHIO: A GUIDANCE FOR LOCAL AUTHORITIES 18 (2nd ed. 2004); MICH. DEP’T OF NATURAL RES., THE USE OF OIL FIELD BRINE ON MICHIGAN ROADWAYS 6 (1984).

⁹ OHIO DEP’T OF NATURAL RES., *supra* note 8, at 18, 20, 21.

¹⁰ 42 U.S.C. §300j-13; 40 C.F.R. pt. 141.

contaminants are diluted 99 percent by the time runoff reaches groundwater sources, a chemical analysis of a well brine recently spread on Pennsylvania roadways indicates that runoff from application of the brine likely exceeded the EPA limits for the following contaminants: alpha emitters, barium, beta emitters, lead, radium-226, radium-228, and xylenes.¹¹ The presence of these contaminants at unacceptable levels in drinking water could cause an increased risk of cancer, an increase in blood pressure, developmental delays in children, kidney problems, and nervous system damage.¹² Other samples of well brines may contain different contaminants and pose different health risks.

Little is known about the long-term effects of accumulation of contaminants in soil and water from the spreading of brines.¹³ However, there is some indication that these contaminants can damage soils, harm plant growth, and ultimately result in damage to the road base itself.¹⁴ Damage to trees and roadside vegetation from runoff associated with brine road applications was observed as early as 1944 in Michigan.¹⁵

The proposed permit modification does not adequately address the impacts of runoff generated by dust suppression and road stabilization applications. The General Permit currently allows only winter uses of well brines. In winter, runoff generally poses less of a threat to

¹¹ A 99 percent dilution rate is based on recent studies of brine spreading in summer, but it may not be accurate in all cases or for all contaminants. See E. Scott Bair & Robert K. Digel, *Subsurface Transport of Inorganic and Organic Solutes from Experimental Road Spreading of Oil-Field Brine*, GROUND WATER MONITORING & REMEDIATION J., Summer 1990, at 94, 101. Contaminant levels in brine were estimated based on recent analysis of one brine from Tioga County Pennsylvania. PA Form 26R, Chemical Analysis of Residual Waste, Ultra Resources, Inc. (Mar. 15, 2010) (attached as Appendix A). Contaminants were listed as potentially problematic if they exceeded EPA limits in drinking water after a 99% dilution. U.S. EPA, *National Primary Drinking Water Regulations* (May 2009), <http://water.epa.gov/drink/contaminants/upload/mcl-2.pdf>.

¹² U.S. EPA, *supra* note 11.

¹³ OHIO DEP'T OF NATURAL RES., *supra* note 8, at 24.

¹⁴ *Id.* at 18, 24.

¹⁵ MICH. DEP'T OF NATURAL RES., *supra* note 8, at 6.

groundwater than in the summer because the high volume of melted ice and snow serves to dilute contaminants found in the brines.¹⁶ However, in summer dust-suppression uses, a lack of dilution means runoff poses a much larger threat to area groundwater.¹⁷ This threat is even more pronounced in times of drought because less moisture is present to dilute the brine,¹⁸ but periods of drought may result in drier roads, more dust, and therefore increased application of brines.¹⁹ Furthermore, water in liquid brines will evaporate from roads in the hot summer months, leaving behind the solid contaminants in the brine, which will then crystallize on the road surface.²⁰ When a rainstorm occurs, the contaminants that have accumulated on the road will wash off, resulting in a “concentrated slug,” so that more contaminants reach the water table simultaneously.²¹ This concentration of chemicals could result in impermissible levels of contaminants in the drinking water supply, even where such contaminants are below approved levels during winter use.

Summer uses of brines also have a greater and more prolonged effect on the surrounding soil and water table than winter uses, even after application has stopped, because the salts and

¹⁶ Pam Kasey, *DOH to Use Gas Well Brine to Treat Roads*, THE STATE JOURNAL (Aug. 12, 2010), <http://www.uppermon.org/news/charleston/SJ-Brine-4-Roads-12Aug10.html> (quoting West Virginia Department of Environmental Protection, Water and Waste Management Director Scott Mandirola as saying “in most cases during storm events you’ve go high flow conditions and a lot more dilution available to assimilate the potential contaminants that are used in road salt”).

¹⁷ OHIO DEP’T OF NATURAL RES., *supra* note 8, at 22.

¹⁸ *Id.*

¹⁹ Drought conditions already aggravate threats to surface waters related to natural gas drilling in Pennsylvania. For example, a recent study examining the high concentration of total dissolved solids (TDS) in the Monongahela River attributed at least part of the problem to lack of dilution due to drought conditions. TETRA TECH NUS, INC., EVALUATION OF HIGH TDS CONCENTRATIONS IN THE MONONGAHELA RIVER (Jan. 2009) *available at* http://marcelluscoalition.org/wp-content/uploads/2010/06/Tetra_Tech_TDS_Report.pdf.

²⁰ Bair & Digel, *supra* note 11, at 100.

²¹ *Id.* at 104.

other contaminants stay on the road due to evaporation and crystallization.²² Brines generally have a very low pH, and repeated use of brines can decrease the pH in the surrounding soil and water.²³ Furthermore, volatilization of VOCs during the transport and storage of brine and after it is spread on the road releases these dangerous chemicals into the atmosphere, which can, in large concentrations, lead to human health problems for anyone who inhales them.²⁴ Even simple ions, such as sodium, can cause health problems for people suffering from cardiovascular or kidney diseases if they build up in drinking water.²⁵ All of these potential contamination problems are likely to increase if brines are permitted for use in dust suppression because dust suppression will likely be very popular. For example, in Michigan, where brines have been spread on roads for both de-icing and dust suppression, more than 90% of brines used are spread to control dust.²⁶

The Bureau should reject the permit modifications and not allow the additional proposed uses because of the increased risk of contamination of groundwater, surface waters, and soil. Both the lack of dilution and the greater concentration of runoff suggest that contaminants will enter surface waters and groundwater at higher levels in the summer than in winter months. In addition, the effects of long-term application and accumulation of these brines are not well understood. What little has been understood about accumulation has been shown to be harmful. The Bureau's proposed modifications, which will likely drastically increase the amount of brine

²² Bair & Digel, *supra* note 11, at 100.

²³ *Id.* See also PA Form 26R, *supra* note 11 (showing pH of brine as 4.33, about as acidic as most acid rain, and the pH at which freshwater fish start to die).

²⁴ Bair & Digel, *supra* note 11, at 103–04.

²⁵ MICH. DEP'T OF NATURAL RES., *supra* note 8, at 4.

²⁶ *Id.* at 3.

being spread on Pennsylvania roads, present a threat of harm to the health, safety, and welfare of the people and the environment, and therefore the modifications should be denied.

B. If the modifications are allowed, they should only be allowed with certain strict limits.

While we maintain that the modifications should be rejected due to the serious risk they pose to human health, we suggest that if the Bureau goes ahead with permitting the modifications, it should adopt certain limits on these uses of the natural gas well brines in order to mitigate their negative impacts.

1. *The Bureau should impose stricter acceptance criteria and require monitoring of both the brines used and soil and water surrounding roads where brines are applied.*

As discussed above, the use of brines for dust suppression and road stabilization creates a greater risk of contamination of groundwater, surface water, and soil than the existing uses. As a result, the Bureau should set stricter limits on the levels of contaminants allowed in brines being used for dust suppression and road stabilization, if these uses are to be allowed, than are currently set for pre-wetting, anti-icing, and de-icing uses.

In addition, the acceptance criteria should be expanded to address more of the contaminants typically found in natural gas well brines. The current permit requires testing for fourteen different substances,²⁷ but, given the increased danger of groundwater contamination from runoff, the Bureau should require testing of the brines for all sixty chemicals typically required on Form 26R, the annual report required on the makeup of residual waste generated in natural gas wells, before these brines can be spread on the road.²⁸

²⁷ General Permit WMGR064 ¶ 2.

²⁸ These annual reports are collected by the Bureau of Waste Management pursuant to 25 Pa. Code § 287.54. They require testing for sixty different chemical substances or characteristics, including many substances that may be particularly harmful if they reach drinking water sources, such as heavy metals and radionuclides. The chemicals and characteristics tested under this annual report that are not currently

Furthermore, the current permit requires brine to be analyzed for contaminants within fifteen days after the permit is issued and then only once every three years.²⁹ Given the enhanced risk of concentrated runoff, we recommend the Bureau implement more frequent testing of brines used in dust suppression and road stabilization if these uses are to be permitted. In addition, to ensure that the General Permit complies with the Safe Drinking Water Act, the Bureau should also institute testing of groundwater and surface waters proximate to roads that receive frequent well brine applications. The federal EPA, in its comments on New York regulations, has specifically stated that “such operations need to take into consideration the Safe Drinking Water Act.”³⁰

2. *The Bureau should limit the amount of well brines that can be applied in a single summer season.*

To reduce the runoff of harmful chemicals from brine applications, the minimum amount of brine necessary should be applied the minimum number of times to effect dust suppression and road stabilization. Operators have found that dust suppression requires about half the brine necessary for road stabilization.³¹ At least one operator has found that runoff can be reduced in road stabilization uses if the brine is applied in two passes, half the load being applied in each

addressed by the General Permit are: acidity, alkalinity, aluminum, ammonia nitrogen, arsenic, beryllium, biochemical oxygen demand, boron, bromide, cadmium, chromium, cobalt, copper, ethylene glycol, gross alpha, gross beta, hardness, lithium, magnesium, manganese, MBAS (surfactants), mercury, molybdenum, nickel, nitrate-nitrate nitrogen, phenolics, radium-226, radium-228, selenium, silver, specific conductance, strontium, thorium, total kjeldahl nitrogen, total suspended solids, uranium, and zinc.

²⁹ General Permit WMR064 ¶¶15, 16.

³⁰ Memorandum from Nidal Azzam, Senior Health Physicist, Div. of Env'tl. Planning and Prod., U.S. EPA, to Lingard Knutson, Env'tl. Scientist, Div. of Env'tl. Planning and Prod., U.S. EPA (Nov. 9, 2009) (attached as Appendix B).

³¹ MICH. DEP'T OF NATURAL RES., *supra* note 8, at 3.

pass.³² In high-calcium brines, even lower application rates may be appropriate, as calcium will combine with chloride, forming calcium chloride, which will crystallize on the road and pull moisture out of the air when the relative humidity is 25% or higher.³³ Also, if trucks travel at a lower speed, the concentration of brine on the road will increase even if the spreader bar is set at an appropriate rate.³⁴ The Bureau has not specified what, if any, application rate will be set for brines used in dust suppression, and if the Bureau is going to permit this use it should adopt strict application rates, including both gallons/lane/mile and the minimum speed at which application trucks must travel.

Natural gas well brines, which generally must be applied 4-6 times in a summer season, are not as efficient as commercially produced brines that only have to be applied 1-2 times each season.³⁵ However, if natural gas well brines are going to be used, the Bureau should also limit the number of times that permittees can apply brines for dust suppression each season. Brines should be applied no more frequently than once a month.³⁶ This frequency of application should be sufficient to maintain safe road conditions, and, although it may not keep roads completely dust free, a “no dust” policy is excessive.³⁷

State agency regulation of frequency is necessary because citizens may complain about any amount of dust, even if it does not present safety issues, and oil and gas companies have a powerful financial incentive to cheaply dispose of as much brine as possible as close to their

³² Letter from Lory B. Irwin, Vice-President, Al-Kleen, LLC, to Tom Lynch, NY State Dep’t of Env’tl. Conservation (May 28, 2010) (attached as Appendix C).

³³ MICH. DEP’T OF NATURAL RES., *supra* note 8, at 3.

³⁴ OHIO DEP’T OF NATURAL RES., *supra* note 8, at 12.

³⁵ *Id.* at 17.

³⁶ MICH. DEP’T OF NATURAL RES., *supra* note 8, at 4.

³⁷ *Id.* at 9.

operations as possible.³⁸ Indeed, other states have recognized that because brines are a waste product and not a commodity, they are more likely to be overused than commercial dust suppression products.³⁹ For these reasons, the Bureau should set maximum frequencies of spreading, and take careful steps to enforce these maximum frequencies, if it is going to allow this less efficient method of dust suppression at all.

3. *The Bureau should prescribe how the brines will be applied, adopting restrictions similar to those adopted in other states.*

Other states have adopted regulations imposing more stringent requirements on summer applications of natural gas brines, and if the Bureau is going to allow summer uses, it should follow these states. For example, in New York brine for dust suppression and road stabilization cannot be applied “after daylight hours, within fifty feet of a stream, creek, lake or other body of water, on sections of road having a grade exceeding ten percent, or on wet roads, during rain, or when rain is imminent.”⁴⁰ Rain is considered imminent when there is a greater than 25% probability of precipitation in the application area as forecasted by the National Weather Service.⁴¹ Ohio also states that brine for dust suppression cannot be applied within twelve feet of bodies of water or drainage ditches, on saturated services, directly to nearby vegetation, or at night.⁴²

³⁸ *Id.* at 10.

³⁹ OHIO DEP’T OF NATURAL RES., *supra* note 8, at 9.

⁴⁰ Letter from Thomas J. Lynch, Chief, Beneficial Use & Special Projects Section, N.Y. State Dep’t of Env’tl. Conservation, to James Call, A.D. Call & Sons Excavating (Apr. 16, 2010) (attached as Appendix D).

⁴¹ Letter from Thomas J. Lynch, Chief, Beneficial Use & Special Projects Section, N.Y. State Dep’t of Env’tl. Conservation, to Lori B. Irwin, Vice President, Al-Kleen, LLC (June 15, 2010) (attached as Appendix E).

⁴² Ohio Rev. Code § 1509.226.

In fact, a previous program run by the Office of Oil and Gas Management in Pennsylvania, allowing brine spreading for dust suppression on a yearly basis with an approved plan, enforced many of these requirements: brine could not be applied within 150 feet of a body of water, it could not be applied on sections of road where the grade was greater than ten percent, and it could not be applied during rain, when the road was wet, or if rain was imminent.⁴³ At a minimum, the Bureau should adopt similar regulations specifying the distance brine can be applied from surface water, the maximum grade of the road on which brine spreading is permitted, prohibitions on spreading brine during rainfall or on wet roads, and a prohibition on spreading at night for dust suppression and road stabilization.

III. THE GREATER VOLUME OF SPREADING THAT WILL RESULT FROM THE APPROVAL OF NEW USES WILL AGGRAVATE EXISTING ENVIRONMENTAL PROBLEMS FROM THE USE OF NATURAL GAS WELL BRINES.

There are also serious problems with renewing the permit even for the currently-approved de-icing, anti-icing, and pre-wetting purposes. In particular, the General Permit does not regulate naturally-occurring radioactive materials in brines. Nor does it specify which types of brines may be applied on roads, which leaves open the possibility that flowback from hydraulic fracturing may be used. These problems will be aggravated by expanding the General Permit to allow dust suppression and road stabilization uses because the proposed new uses will likely result in substantial increases in the amount of brine being spread on Pennsylvania roads.

A. The Bureau should regulate the levels of naturally occurring radioactive materials in these brines, which are currently not constrained under the permit.

Fluid from natural gas operations contains a high level of radioactive materials, which can be dangerous to human health from exposure alone—through either skin contact or

⁴³ PA Dep't of Env'tl. Protection, Fact Sheet, Roadspreading of Brine for Dust Control and Road Stabilization (Dec. 1998), *available at* <http://www.dep.state.pa.us/dep/deputateminres/oilgas/fs1801.htm>.

inhalation—and also when ingested in drinking water. Data from production brines shows that the brines contain elevated radionuclide levels, which can pose an “unacceptable human health risk” through skin contact, inhalation, or inadvertent ingestion.⁴⁴ Elements that present a risk include thorium-230, thorium-232, radium-226, radium-228, potassium-40, and various isotopes of uranium.⁴⁵ EPA limits radium-226 in the soil to a level of 5 pCi/g and recognizes that higher levels create a danger of intense gamma-radiation that can be harmful to human health.⁴⁶ Recent analysis of one brine sample used for dust suppression in Pennsylvania showed that the radium-226 level in the liquid brine was 892 pCi/l.⁴⁷ The State of New York Department of Health has warned that the high levels of radioactive elements in Marcellus shale indicate that “handling and disposal of this wastewater could be a public health concern” and that the New York Department of Environmental Protection should prohibit use of these brines on roads as a de-icer or a dust suppressant “unless the radium can be substantially removed.”⁴⁸

The current General Permit does not regulate radioactive material in brines spread on roads, and it does not require testing of brines for radioactivity. To prevent serious public health risks, the Bureau should limit permissible levels of the radioactive elements mentioned above and monitor radionuclide levels in brines and soil around application sites before permitting any additional road uses of brine in Pennsylvania.

⁴⁴ Memorandum from Nidal Azzam, *supra* note 30.

⁴⁵ *Id.*

⁴⁶ Memorandum from Stephen D. Luftig and Larry Weinstock, U.S. EPA, re: Use of Soil Cleanup Criteria in 40 CFR Part 192 as Remediation Goals for CERCLA Sites (Feb. 12, 1998), *available at* <http://www.epa.gov/superfund/health/conmedia/soil/cleanup.htm>.

⁴⁷ PA Form 26R, *supra* note 11.

⁴⁸ Supplemental Generic Environmental Impact Statement on the Oil and Gas Regulatory Program Well permit issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and other Low-Permeability Gas Reservoirs: NYSDOH Bureau of Environmental Radiation Protection Comments, July 21, 2009 (attached as appendix F).

B. Contaminants and radioactive materials are especially prevalent in flowback brines, which could be used under this General Permit because “brine” is not clearly defined.

The current version of the General Permit simply states that it allows “the beneficial use of natural gas well brines” for various applications.⁴⁹ No definition of “well brine” is provided, and “well brine” is not explicitly defined in the Pennsylvania Oil and Gas Act or regulations. The term is susceptible to different interpretations. For example, in Ohio, “well brine” can generally include brine produced while drilling the well (drilling brine), brine produced while fracking the well (flowback), and brine produced while using the well (production brine).⁵⁰

The ambiguity inherent in the term “well brine” should be addressed by explicitly excluding flowback from permissible road application materials. Flowback and drilling brines generally have higher levels of contaminants than production brines.⁵¹ Ohio, for example, permits local governments to make surface applications of brine pursuant to Ohio Rev. Code § 1509.226. Under Ohio Rev. Code § 1509.226(B)(10), however, this permission is “strictly limit[ed],” such that “[o]nly brine that is produced from a well shall be allowed to be spread on a road. Fluids from the drilling of a well, flowback from the stimulation of a well, and other fluids used to treat a well shall not be spread on a road.”⁵² Although spokespeople for the Department of Environmental Protection have claimed that the General Permit does not allow for the use of Marcellus Shale brines on roads,⁵³ nothing in the text of the permit precludes the use of these

⁴⁹ General Permit WMR064, ¶¶15, 16.

⁵⁰ OHIO DEP’T OF NATURAL RES., *supra* note 8, at 1.

⁵¹ Kasey, *supra* note 16.

⁵² Letter from Scott J. Nally, Director, Ohio Environmental Protection Agency, to David Mustine, Ohio Department of Natural Resources (May 16, 2011), *available at* http://www.epa.ohio.gov/portals/35/pretreatment/marcellus_shale/POTW_Brine_Disposal_Letter_may11.pdf.

⁵³ *See, e.g.*, Sandy Long, *DEP Seeks Use of Natural Gas Well Brines on Secondary Road Systems*, THE RIVER REPORTER (Nov. 2, 2011), <http://www.riverreporteronline.com/news/14/2011/11/02/dep-seeks-use-natural-gas-well-brines-secondary-road-systems>.

brines. The General Permit should be revised to prohibit explicitly the use of brines from the drilling or stimulation of oil or gas wells or the production of oil or gas from shale or other unconventional sources.

Due to uncertainties over the definition of “brine,” blanket permission to apply “well brines” to roads is not sufficient to protect public health. In addition, the potential for great variation in the characteristics of brines calls into question the appropriateness of issuing a general permit at all, given that 25 Pa. Code § 287.611(a)(1) requires that residual waste under a general permit be “generated by the same or substantially similar operations and have the same or substantially similar physical character and chemical composition.” Thus, Pennsylvania should similarly “strictly limit” its surface applications of brine such that flowback and drilling fluids are explicitly excluded from permissible materials.

IV. CONCLUSION: ALLOWING THE PERMIT MODIFICATIONS WOULD RESULT IN A SUBSTANTIAL RISK OF HARM TO PUBLIC HEALTH AND THE ENVIRONMENT.

Due to the current economic outlook, use of widely available and inexpensive natural gas well brines for dust suppression and road stabilization is financially attractive. However, the current proposed modification does not meet the statutory requirements procedurally or substantively, as it fails to give notice of the terms and conditions that will apply to the new uses and fails to ensure that the new uses will be possible without substantial harm to public health and the environment. Use of natural gas well brines for dust suppression and roadway stabilization poses significant health and environmental risks because of its potential to contaminate groundwater, surface water, and soil. The Bureau should therefore deny the proposed modifications. If the Bureau decides to permit the modifications, it should impose strict standards on the allowable concentrations of contaminants, the frequency and application rate of the brines, the distance between the road and water sources, and the circumstances

surrounding application. Furthermore, the Bureau should study the long-term effects of accumulation of contaminants and limit the radionuclide levels allowed before permitting this increase in the level of brines applied to Pennsylvania roads. Finally, the Bureau should limit the type of “well brines” used to production brines, and specifically prohibit the spreading of fracking “flowback” on Pennsylvania roads.

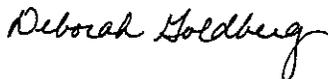
Respectfully submitted,



Shaun A. Goho
Staff Attorney and Clinical Instructor
sgoho@law.harvard.edu
Ph: 617.496.5692



Amanda Frye
Clinical Student
afrye@jd13.law.harvard.edu



Deborah Goldberg
Managing Attorney
Earthjustice
156 William Street, Suite 800
New York, NY 10038-5326
dgoldberg@earthjustice.org
212-791-1881 x8227

On behalf of:

Dorothy Bassett
Group Convener
All One Water

Karen Feridun
Founder
Berks Gas Truth

Deborah L. Harter
Interim Executive Director
Center for Coalfield Justice

JoAnne Wagner
Group Leader
Cherry Valley Lakeview Estates Residents for Safe Gas Drilling

Scott Hoffman
President
Chestnut Ridge Chapter of Trout Unlimited

Vera Scroggins
Member
Citizens for Clean Water, Susquehanna County, PA

Matt Walker
Community Outreach Coordinator
Clean Air Council

Gerald Smith
Volunteer Coordinator
Coalition for a Healthy County

Anne Harris Katz
Secretary
Coalition for Responsible Growth & Resource Conservation (CRGRC)

Margaret Weber
Corporate Responsibility Director
Congregation of St. Basil

Loretta Weir
Founder
Communities United for Rights and Environment (C.U.R.E.)

B. Arrindell
Director
Damascus Citizens for Sustainability

Tracy Carluccio
Deputy Director
Delaware Riverkeeper Network

Nadia Steinzor
Marcellus Regional Organizer
Earthworks

JoAnne Wagner
VP & Chairperson Heath & Safety Committee
Fort Cherry Elementary Center PTA, Inc.

Barbara Jarmoska
President
Freshlife, Inc.

Paula Chaiken
Board Member
Gas Drilling Awareness Coalition, Luzerne County, PA

Jay Sweeney
Secretary, Wyoming County
Green Party of Pennsylvania

Terri Davin
President
Greene County Watershed Alliance

Rachel Filippini
Executive Director
Group Against Smog and Pollution

Cathy Frakenberg
Founder
Lehigh Valley Gas Truth

Donald W. Miles
Chair
Lehigh Valley Group, Pennsylvania Sierra Club

Diane Sipe
Member
Marcellus Outreach Butler

Gary Thornbloom
Chair
Moshannon Group Sierra Club

Beverly Braverman
Executive Director
Mountain Watershed Association

Maria Payan
Director
Peach Bottom Concerned Citizens Group, York County, PA

Erika Staaf
Clean Water Advocate
PennEnvironment

Ron Evans
Chair
Pennsylvania Environmental Defense Foundation

Richard A. Martin
Coordinator
Pennsylvania Forest Coalition

Anna Gullickson
Founding Member
Preservation Advocates for Center Township (PACT)

John A. Trallo
Member
Protect Eagles Alliance
Citizens Marcellus Shale Commission

Iris Marie Bloom
Director
Protecting Our Waters

Ralph Kisberg
President of the Board of Directors
Responsible Drilling Alliance

Mary Ann Williams
Member
Rush for Clean Water

Thomas Au
Conservation Chair
Sierra Club, Pennsylvania Chapter

Nora M. Nash
Director, Corporate Social Responsibility
Sisters of St. Francis of Philadelphia

Michael Helfrich
Lower Susquehanna RIVERKEEPER®
Stewards of the Lower Susquehanna, Inc.

Lynn Senick
Moderator
Susquehanna County Gas Forum

Ron Slabe and Debra Borowiec
Co-Founders
Upper Burrell Citizens Against Marcellus Pollution

Valerie Heinonen, o.s.u.
Director, Shareholder Advocacy
Ursuline Sisters of Tildonk, U.S. Province

Juliane Arena
Marketing Director
Villa Maria Community Center

Bonnie Vello
Group Leader
Western Pennsylvania Citizens for Sustainability