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**Via Electronic Mail and First Class Mail**

Mr. Scott E. Walters, Chief  
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Division of Municipal and Residual Waste  
Bureau of Waste Management  
P.O. Box 8472  
Harrisburg, PA 17105-8472  
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**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.”<sup>1</sup> 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

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<sup>1</sup> 41 Pa. Bull. 4987 (Sept. 17, 2011).

contaminants.<sup>2</sup> 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.<sup>3</sup> 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.”<sup>4</sup> 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”

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<sup>2</sup> General Permit WMGR064 ¶ 2.

<sup>3</sup> *Id.* ¶ 2.

<sup>4</sup> *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.<sup>5</sup> 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

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<sup>5</sup> *Id.* ¶¶ 2-3, 8-9, 15.

general permit.”<sup>6</sup> In the notice itself, the Bureau labels the proposal a “major modification.”<sup>7</sup> 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,

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<sup>6</sup> 25 Pa. Code § 287.625(b) (emphasis added).

<sup>7</sup> 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.<sup>8</sup> 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”).<sup>9</sup> 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.<sup>10</sup> Even assuming that these

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<sup>8</sup> 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).

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

<sup>10</sup> 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.<sup>11</sup> 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.<sup>12</sup> 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.<sup>13</sup> However, there is some indication that these contaminants can damage soils, harm plant growth, and ultimately result in damage to the road base itself.<sup>14</sup> Damage to trees and roadside vegetation from runoff associated with brine road applications was observed as early as 1944 in Michigan.<sup>15</sup>

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

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<sup>11</sup> 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>.

<sup>12</sup> U.S. EPA, *supra* note 11.

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

<sup>14</sup> *Id.* at 18, 24.

<sup>15</sup> 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.<sup>16</sup> However, in summer dust-suppression uses, a lack of dilution means runoff poses a much larger threat to area groundwater.<sup>17</sup> This threat is even more pronounced in times of drought because less moisture is present to dilute the brine,<sup>18</sup> but periods of drought may result in drier roads, more dust, and therefore increased application of brines.<sup>19</sup> 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.<sup>20</sup> 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.<sup>21</sup> 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

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<sup>16</sup> 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”).

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

<sup>18</sup> *Id.*

<sup>19</sup> 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](http://marcelluscoalition.org/wp-content/uploads/2010/06/Tetra_Tech_TDS_Report.pdf).

<sup>20</sup> Bair & Digel, *supra* note 11, at 100.

<sup>21</sup> *Id.* at 104.

other contaminants stay on the road due to evaporation and crystallization.<sup>22</sup> Brines generally have a very low pH, and repeated use of brines can decrease the pH in the surrounding soil and water.<sup>23</sup> 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.<sup>24</sup> 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.<sup>25</sup> 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.<sup>26</sup>

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

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<sup>22</sup> Bair & Digel, *supra* note 11, at 100.

<sup>23</sup> *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).

<sup>24</sup> Bair & Digel, *supra* note 11, at 103–04.

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

<sup>26</sup> *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,<sup>27</sup> 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.<sup>28</sup>

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<sup>27</sup> General Permit WMGR064 ¶ 2.

<sup>28</sup> 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.<sup>29</sup> 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.”<sup>30</sup>

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.<sup>31</sup> 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

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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.

<sup>29</sup> General Permit WMR064 ¶¶15, 16.

<sup>30</sup> 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).

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



pass.<sup>32</sup> 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.<sup>33</sup> 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.<sup>34</sup> 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.<sup>35</sup> 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.<sup>36</sup> 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.<sup>37</sup>

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

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<sup>32</sup> 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).

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

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

<sup>35</sup> *Id.* at 17.

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

<sup>37</sup> *Id.* at 9.

operations as possible.<sup>38</sup> 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.<sup>39</sup> 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.”<sup>40</sup> 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.<sup>41</sup> 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.<sup>42</sup>

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<sup>38</sup> *Id.* at 10.

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

<sup>40</sup> 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).

<sup>41</sup> 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).

<sup>42</sup> 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.<sup>43</sup> 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

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<sup>43</sup> 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.<sup>44</sup> Elements that present a risk include thorium-230, thorium-232, radium-226, radium-228, potassium-40, and various isotopes of uranium.<sup>45</sup> 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.<sup>46</sup> 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.<sup>47</sup> 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.”<sup>48</sup>

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.

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<sup>44</sup> Memorandum from Nidal Azzam, *supra* note 30.

<sup>45</sup> *Id.*

<sup>46</sup> 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>.

<sup>47</sup> PA Form 26R, *supra* note 11.

<sup>48</sup> 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.<sup>49</sup> 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).<sup>50</sup>

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.<sup>51</sup> 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.”<sup>52</sup> 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,<sup>53</sup> nothing in the text of the permit precludes the use of these

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<sup>49</sup> General Permit WMR064, ¶¶15, 16.

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

<sup>51</sup> Kasey, *supra* note 16.

<sup>52</sup> 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](http://www.epa.ohio.gov/portals/35/pretreatment/marcellus_shale/POTW_Brine_Disposal_Letter_may11.pdf).

<sup>53</sup> *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.

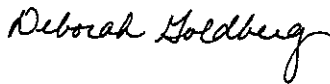
Respectfully submitted,



**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



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Earthjustice  
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New York, NY 10038-5326  
[dgoldberg@earthjustice.org](mailto: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**

## **Appendix A**



March 11, 2010

Project 15085

James Greene  
Operations Supervisor  
PA DEP Northcentral Regional Office  
208 West Third Street, Suite 101  
Williamsport, Pennsylvania 17701



**Subject: Form 26 R Chemical Analysis of Residual Waste Annual Report by Generator**  
Ultra Resources, Inc.  
Tioga and Potter Counties, PA

Dear Mr. Greene:

On behalf of Ultra Resources, Inc. (Ultra), AMEC Geomatrix, Inc. (Geomatrix) is submitting the attached Form 26R Chemical Analysis of Residual Waste Annual Report by the Generator (Form 26R report) for residual wastes generated by Ultra's natural gas exploration and production (E&P) activities in Tioga County. Attachments to this letter include individual Form 26R reports for natural gas well produced water.

Ultra generated produced water from the Marshlands Unit #1 and Marshlands Unit #2 wells in 2009. Approximately 193,788 and 16,800 gallons of produced water were disposed from the Marshlands Unit #1 and Marshlands Unit #2, respectively.

***Process Description***

Water is separated from the natural gas stream at the production facility using glycol dehydration units. Separated water is transferred via pipelines to holding tanks pending transport for disposal.

***Waste Sampling Method***

In 2009, only water produced from Marshlands Unit #1 was sampled. The produced water sample was a grab sample collected directly from the holding tanks.



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

**FORM 26R**  
**CHEMICAL ANALYSIS OF RESIDUAL WASTE**  
**ANNUAL REPORT BY THE GENERATOR**

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 26R, reference the item number and identify the date prepared. The date on attached sheets needs to match the date noted below.

General Reference 287.54

Date Prepared/Revised February 26, 2010

**DEP USE ONLY**

Date Received & General Notes

MAR 15 2010

WASTE MANAGEMENT

**SECTION A. CLIENT (GENERATOR OF THE WASTE) INFORMATION**

Company Name

Ultra Resources, Inc.

If a Subsidiary, Name of Parent Company

Ultra Petroleum Corporation

EPA Generator ID#

n/a

Company Mailing Address Line 1

304 Inverness Way South, Suite 295

Company Mailing Address Line 2

Company Address Last Line - City

Englewood

State

CO

Zip+4

80112

Phone

Ext

Company Contact Last Name

Salinas

First Name

Belinda

MI

G.

Suffix

Ms.

Municipality

Englewood

County

Arapahoe

Contact Phone

(307) 360-9137

Ext

Contact Email Address

belinda.salinas@ultrapetroleum.com

Is the waste generated at the Company Mailing Address (noted above)?

Yes

No

If 'No', describe location of waste generation and storage. Marshlands Unit #1 natural gas pad

Municipality

Gaines Twp.

County

Tioga

State

PA

**SECTION B. WASTE DESCRIPTION**

Residual Waste Code	Residual Waste Code Description	Amount	Unit of Measure		Time Frame
			<input type="checkbox"/> cu yd	<input checked="" type="checkbox"/> gal	
801	Drilling Fluids, Residuals (Produced Water)	193788	<input type="checkbox"/> lb	<input type="checkbox"/> ton	<input type="checkbox"/> One Time

**1. GENERAL PROPERTIES**

a. pH Range 4.33 to 4.33 (based on analyses or knowledge)

b. Physical State  
 Liquid Waste (EPA Method 9095)  
 Solid (EPA Method 9095)  
 Gas (ambient temperature & pressure)

c. Physical Appearance  
 Color clear Odor none  
 Number of Solid or Liquid Phases of Separation 0 - no phase separation  
 Describe each phase of separation. n/a

**2. CHEMICAL ANALYSIS ATTACHMENTS**

- a. The results of a detailed chemical characterization of the waste, as described in the instructions, is attached.  Yes  No
- b. A detailed description of the waste sampling method is attached.  Yes  No
- c. The quality assurance/quality control procedures employed by the laboratory(ies) is attached.  Yes  No
- d. The results of the hazardous waste determination is attached.  Yes  No
- e. If applicable, a detailed explanation supporting use of generator knowledge in lieu of actual chemical analysis is attached.  Yes  No  N/A

3. PROCESS DESCRIPTION & SCHEMATIC ATTACHMENTS			
a.	A detailed description of the manufacturing and/or pollution control processes producing the waste, as specified in the instructions, is attached.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
b.	A schematic of the manufacturing and/or pollution control processes producing the waste, as specified in the instructions, is attached.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
c.	If portions of the information submitted are confidential, the substantiation for a confidentiality claim, as described in the instructions, is attached.	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
SECTION C. MANAGEMENT OF RESIDUAL WASTE			
1. PROCESSING OR DISPOSAL FACILITY(IES)			
The area below (a.-d.) will accommodate the identification of two facilities. Attach additional sheets if necessary.			
a.	Solid waste permit number(s) for processing or disposal facility being utilized. PA0101508		
b.	Facility Name	PA Brine Treatment	
	Address Line 1	5148 US 322	
	Address Line 1		
	Address City State ZIP	Franklin PA 16323	
	Municipality	Franklin Borough	County Cambria
c.	Facility Contact Name	Tracey Harris	
	Title		
	Phone	(814) 437-3593	Email Address
d.	Volume of waste shipped to processing or disposal facility in the previous year. 20,454 <input type="checkbox"/> cu yd <input checked="" type="checkbox"/> gal <input type="checkbox"/> lb <input type="checkbox"/> ton (check one)		
a.	Solid waste permit number(s) for processing or disposal facility being utilized. PA0102784		
b.	Facility Name	Waste Treatment Corporation	
	Address Line 1	P.O. Box 1550, 341 West Harmar Street	
	Address Line 1		
	Address City State ZIP	Warren PA 16365	
	Municipality	Warren	County
c.	Facility Contact Name		
	Title		
	Phone	(814) 726-1500	Email Address
d.	Volume of waste shipped to processing or disposal facility in the previous year. 17934 <input type="checkbox"/> cu yd <input checked="" type="checkbox"/> gal <input type="checkbox"/> lb <input type="checkbox"/> ton (check one)		
2. BENEFICIAL USE			
a.	Has the waste been approved for beneficial use? If "Yes", list the general permit number or approval number.		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
b.	Volume of waste beneficially used in the previous year. n/a <input type="checkbox"/> cu yd <input type="checkbox"/> gal <input type="checkbox"/> lb <input type="checkbox"/> ton (check one)		

**3. PROCESS DESCRIPTION & SCHEMATIC ATTACHMENTS**

- a. A detailed description of the manufacturing and/or pollution control processes producing the waste, as specified in the instructions, is attached.  Yes  No
- b. A schematic of the manufacturing and/or pollution control processes producing the waste, as specified in the instructions, is attached.  Yes  No
- c. If portions of the information submitted are confidential, the substantiation for a confidentiality claim, as described in the instructions, is attached.  Yes  No  N/A

**SECTION C. MANAGEMENT OF RESIDUAL WASTE****1. PROCESSING OR DISPOSAL FACILITY(IES)**

The area below (a.-d.) will accommodate the identification of two facilities. Attach additional sheets if necessary.

- a. Solid waste permit number(s) for processing or disposal facility being utilized.

b. Facility Name Richmond Twp - dust suppression  
 Address Line 1 \_\_\_\_\_  
 Address Line 1 \_\_\_\_\_  
 Address City State ZIP Mansfield PA 16933-9757  
 Municipality Richmond Twp County Tioga

c. Facility Contact Name Deborah Kotulka  
 Title Secretary  
 Phone 570 662 3774 Email Address \_\_\_\_\_

- d. Volume of waste shipped to processing or disposal facility in the previous year.  
 101,640  cu yd  gal  lb  ton (check one)

- a. Solid waste permit number(s) for processing or disposal facility being utilized.

b. Facility Name Troy Twp - for dust suppression  
 Address Line 1 \_\_\_\_\_  
 Address Line 1 \_\_\_\_\_  
 Address City State ZIP Troy PA 16947  
 Municipality Troy Twp County Bradford

c. Facility Contact Name Lonna Bly  
 Title Secretary  
 Phone 570 297 4341 Email Address \_\_\_\_\_

- d. Volume of waste shipped to processing or disposal facility in the previous year.  
 6,300  cu yd  gal  lb  ton (check one)

**2. BENEFICIAL USE**

- a. Has the waste been approved for beneficial use?  Yes  No  
 If "Yes", list the general permit number or approval number.
- b. Volume of waste beneficially used in the previous year.  
 n/a  cu yd  gal  lb  ton (check one)



3. PROCESS DESCRIPTION & SCHEMATIC ATTACHMENTS																					
a.	A detailed description of the manufacturing and/or pollution control processes producing the waste, as specified in the instructions, is attached. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																				
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b.	<table> <tr> <td>Facility Name</td> <td colspan="3">Delmar Twp - dust suppression</td> </tr> <tr> <td>Address Line 1</td> <td colspan="3"></td> </tr> <tr> <td>Address Line 1</td> <td colspan="3"></td> </tr> <tr> <td>Address City State ZIP</td> <td>Wellsboro</td> <td>PA</td> <td>16901</td> </tr> <tr> <td>Municipality</td> <td>Delmar Twp</td> <td>County</td> <td>Tioga</td> </tr> </table>	Facility Name	Delmar Twp - dust suppression			Address Line 1				Address Line 1				Address City State ZIP	Wellsboro	PA	16901	Municipality	Delmar Twp	County	Tioga
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Municipality	Delmar Twp	County	Tioga																		
c.	<table> <tr> <td>Facility Contact Name</td> <td colspan="3">Shirley W. Borden</td> </tr> <tr> <td>Title</td> <td colspan="3">Secretary</td> </tr> <tr> <td>Phone</td> <td>570 724 5482</td> <td>Email Address</td> <td></td> </tr> </table>	Facility Contact Name	Shirley W. Borden			Title	Secretary			Phone	570 724 5482	Email Address									
Facility Contact Name	Shirley W. Borden																				
Title	Secretary																				
Phone	570 724 5482	Email Address																			
d.	Volume of waste shipped to processing or disposal facility in the previous year. 5,460 <input type="checkbox"/> cu yd <input checked="" type="checkbox"/> gal <input type="checkbox"/> lb <input type="checkbox"/> ton (check one)																				
a.	Solid waste permit number(s) for processing or disposal facility being utilized.																				
b.	<table> <tr> <td>Facility Name</td> <td colspan="3">Jackson Twp - for dust suppression</td> </tr> <tr> <td>Address Line 1</td> <td colspan="3"></td> </tr> <tr> <td>Address Line 1</td> <td colspan="3"></td> </tr> <tr> <td>Address City State ZIP</td> <td>Liberty</td> <td>PA</td> <td>16930</td> </tr> <tr> <td>Municipality</td> <td>Jackson Twp</td> <td>County</td> <td>Lycoming</td> </tr> </table>	Facility Name	Jackson Twp - for dust suppression			Address Line 1				Address Line 1				Address City State ZIP	Liberty	PA	16930	Municipality	Jackson Twp	County	Lycoming
Facility Name	Jackson Twp - for dust suppression																				
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c.	<table> <tr> <td>Facility Contact Name</td> <td colspan="3">David Zeafla</td> </tr> <tr> <td>Title</td> <td colspan="3">Secretary</td> </tr> <tr> <td>Phone</td> <td>570 324 6343</td> <td>Email Address</td> <td></td> </tr> </table>	Facility Contact Name	David Zeafla			Title	Secretary			Phone	570 324 6343	Email Address									
Facility Contact Name	David Zeafla																				
Title	Secretary																				
Phone	570 324 6343	Email Address																			
d.	Volume of waste shipped to processing or disposal facility in the previous year. 6,300 <input type="checkbox"/> cu yd <input checked="" type="checkbox"/> gal <input type="checkbox"/> lb <input type="checkbox"/> ton (check one)																				
2. BENEFICIAL USE																					
a.	Has the waste been approved for beneficial use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If "Yes", list the general permit number or approval number.																				
b.	Volume of waste beneficially used in the previous year. n/a <input type="checkbox"/> cu yd <input type="checkbox"/> gal <input type="checkbox"/> lb <input type="checkbox"/> ton (check one)																				

**3. PROCESS DESCRIPTION & SCHEMATIC ATTACHMENTS**

- a. A detailed description of the manufacturing and/or pollution control processes producing the waste, as specified in the instructions, is attached.  Yes  No
- b. A schematic of the manufacturing and/or pollution control processes producing the waste, as specified in the instructions, is attached.  Yes  No
- c. If portions of the information submitted are confidential, the substantiation for a confidentiality claim, as described in the instructions, is attached.  Yes  No  N/A

**SECTION C. MANAGEMENT OF RESIDUAL WASTE****1. PROCESSING OR DISPOSAL FACILITY(IES)**

The area below (a.-d.) will accommodate the identification of two facilities. Attach additional sheets if necessary.

a. Solid waste permit number(s) for processing or disposal facility being utilized.

b. Facility Name Clymer Twp - dust suppression  
 Address Line 1 \_\_\_\_\_  
 Address Line 1 \_\_\_\_\_  
 Address City State ZIP Sabinsville PA 16943  
 Municipality Clymer Twp County Tioga

c. Facility Contact Name P. William Plummer  
 Title Secretary  
 Phone 814 628 3611 Email Address \_\_\_\_\_

d. Volume of waste shipped to processing or disposal facility in the previous year.  
 6048  cu yd  gal  lb  ton (check one)

a. Solid waste permit number(s) for processing or disposal facility being utilized.

b. Facility Name Elk Twp - for dust suppression  
 Address Line 1 \_\_\_\_\_  
 Address Line 1 \_\_\_\_\_  
 Address City State ZIP Gaines PA 16921  
 Municipality Elk Twp County Tioga

c. Facility Contact Name Kenneth E. Bonniger  
 Title Secretary  
 Phone 814 274 6140 Email Address \_\_\_\_\_

d. Volume of waste shipped to processing or disposal facility in the previous year.  
 3780  cu yd  gal  lb  ton (check one)

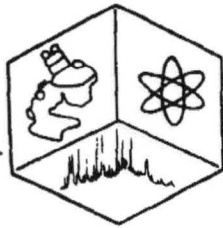
**2. BENEFICIAL USE**

a. Has the waste been approved for beneficial use?  Yes  No  
 If "Yes", list the general permit number or approval number.

b. Volume of waste beneficially used in the previous year.  
 n/a  cu yd  gal  lb  ton (check one)

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b.	<table border="0"> <tr> <td>Facility Name</td> <td colspan="3">Tioga Twp - dust suppression</td> </tr> <tr> <td>Address Line 1</td> <td colspan="3"></td> </tr> <tr> <td>Address Line 1</td> <td colspan="3"></td> </tr> <tr> <td>Address City State ZIP</td> <td>Tioga</td> <td>PA</td> <td>16946</td> </tr> <tr> <td>Municipality</td> <td>Tioga Twp</td> <td>County</td> <td>Tioga</td> </tr> </table>	Facility Name	Tioga Twp - dust suppression			Address Line 1				Address Line 1				Address City State ZIP	Tioga	PA	16946	Municipality	Tioga Twp	County	Tioga
Facility Name	Tioga Twp - dust suppression																				
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c.	<table border="0"> <tr> <td>Facility Contact Name</td> <td colspan="3">Cynthia A. McCormick</td> </tr> <tr> <td>Title</td> <td colspan="3">Secretary</td> </tr> <tr> <td>Phone</td> <td>570 835 5483</td> <td>Email Address</td> <td></td> </tr> </table>	Facility Contact Name	Cynthia A. McCormick			Title	Secretary			Phone	570 835 5483	Email Address									
Facility Contact Name	Cynthia A. McCormick																				
Title	Secretary																				
Phone	570 835 5483	Email Address																			
d.	Volume of waste shipped to processing or disposal facility in the previous year. 12600 <input type="checkbox"/> cu yd <input checked="" type="checkbox"/> gal <input type="checkbox"/> lb <input type="checkbox"/> ton (check one)																				
a.	Solid waste permit number(s) for processing or disposal facility being utilized.																				
b.	<table border="0"> <tr> <td>Facility Name</td> <td colspan="3">Covington Twp - for dust suppression</td> </tr> <tr> <td>Address Line 1</td> <td colspan="3"></td> </tr> <tr> <td>Address Line 1</td> <td colspan="3"></td> </tr> <tr> <td>Address City State ZIP</td> <td>Covington</td> <td>PA</td> <td>16917</td> </tr> <tr> <td>Municipality</td> <td>Covington Twp</td> <td>County</td> <td>Tioga</td> </tr> </table>	Facility Name	Covington Twp - for dust suppression			Address Line 1				Address Line 1				Address City State ZIP	Covington	PA	16917	Municipality	Covington Twp	County	Tioga
Facility Name	Covington Twp - for dust suppression																				
Address Line 1																					
Address Line 1																					
Address City State ZIP	Covington	PA	16917																		
Municipality	Covington Twp	County	Tioga																		
c.	<table border="0"> <tr> <td>Facility Contact Name</td> <td colspan="3">Lisa Everett</td> </tr> <tr> <td>Title</td> <td colspan="3">Secretary</td> </tr> <tr> <td>Phone</td> <td>570 659 5439</td> <td>Email Address</td> <td></td> </tr> </table>	Facility Contact Name	Lisa Everett			Title	Secretary			Phone	570 659 5439	Email Address									
Facility Contact Name	Lisa Everett																				
Title	Secretary																				
Phone	570 659 5439	Email Address																			
d.	Volume of waste shipped to processing or disposal facility in the previous year. 6300 <input type="checkbox"/> cu yd <input checked="" type="checkbox"/> gal <input type="checkbox"/> lb <input type="checkbox"/> ton (check one)																				
2. BENEFICIAL USE																					
a.	Has the waste been approved for beneficial use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If "Yes", list the general permit number or approval number.																				
b.	Volume of waste beneficially used in the previous year. n/a <input type="checkbox"/> cu yd <input type="checkbox"/> gal <input type="checkbox"/> lb <input type="checkbox"/> ton (check one)																				

3. PROCESS DESCRIPTION & SCHEMATIC ATTACHMENTS			
a.	A detailed description of the manufacturing and/or pollution control processes producing the waste, as specified in the instructions, is attached.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
b.	A schematic of the manufacturing and/or pollution control processes producing the waste, as specified in the instructions, is attached.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
c.	If portions of the information submitted are confidential, the substantiation for a confidentiality claim, as described in the instructions, is attached.	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
SECTION C. MANAGEMENT OF RESIDUAL WASTE			
1. PROCESSING OR DISPOSAL FACILITY(IES)			
The area below (a.-d.) will accommodate the identification of two facilities. Attach additional sheets if necessary.			
a.	Solid waste permit number(s) for processing or disposal facility being utilized.		
b.	Facility Name	Roseville Borough - dust suppression	
	Address Line 1	South Elmira Road	
	Address Line 1		
	Address City State ZIP	Mansfield PA	16933
	Municipality	Roseville	County Tioga
c.	Facility Contact Name		
	Title		
	Phone	(570) 549-2840	Email Address
d.	Volume of waste shipped to processing or disposal facility in the previous year.		
	6972	<input type="checkbox"/> cu yd	<input checked="" type="checkbox"/> gal <input type="checkbox"/> lb <input type="checkbox"/> ton (check one)
a.	Solid waste permit number(s) for processing or disposal facility being utilized.		
b.	Facility Name		
	Address Line 1		
	Address Line 1		
	Address City State ZIP		
	Municipality	County	
c.	Facility Contact Name		
	Title		
	Phone	Email Address	
d.	Volume of waste shipped to processing or disposal facility in the previous year.		
		<input type="checkbox"/> cu yd	<input type="checkbox"/> gal <input type="checkbox"/> lb <input type="checkbox"/> ton (check one)
2. BENEFICIAL USE			
a.	Has the waste been approved for beneficial use?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
	If "Yes", list the general permit number or approval number.		
b.	Volume of waste beneficially used in the previous year.		
	n/a	<input type="checkbox"/> cu yd	<input type="checkbox"/> gal <input type="checkbox"/> lb <input type="checkbox"/> ton (check one)



ESTABLISHED 1939

# SEEWALD LABORATORIES, INC.

ENVIRONMENTAL & AGRICULTURAL TESTING

1403 WEST FOURTH STREET • WILLIAMSPORT, PA 17701

## REPORT OF ANALYSES

Attn: STEVE WRIGHT  
 AMEC GEOMATRIX  
 1824 LAST CHANCE GULCH  
 HELENA, MT 59601-

PROJECT NAME: MARSHLAND UN. 1  
 DATE: 01/15/10

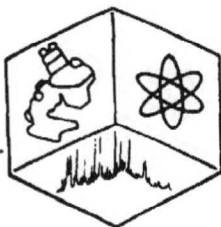
Page 1 of 4

SAMPLE NUMBER- 368800  
 SAMPLE ID- MARSHLANDS UNIT #1  
 SAMPLED BY- JRH  
 DELIVERED BY- JRH  
 RECEIVED BY- BSL

DATE SAMPLED- 12/30/09  
 TIME SAMPLED- 1030  
 SAMPLE TYPE- Grab  
 DATE RECEIVED- 12/30/09  
 TIME RECEIVED- 1300

ANALYSIS	METHOD	ANALYSIS		DATA		RESULT UNITS	MDL
		DATE	TIME	ANALYST	FLAG		
ACIDITY AS CaCO <sub>3</sub>	SM 2310B	01/08/10	1400	TD		148 MG/L CaCO <sub>3</sub>	2
ALKALINITY AS CaCO <sub>3</sub>	SM 2320B	01/08/10	1445	TD		8.00 MG/L CaCO <sub>3</sub>	2
BROMIDE	EPA 300.0	12/31/09	1120	TD		1980 MG/L	0.1
CHLORIDE	EPA 300.0	12/31/09	1120	TD	L	151000 MG/L	0.2
HARDNESS AS CaCO <sub>3</sub>	2340C.EDTA	12/30/09	1420	KGC		96400 MG/L CaCO <sub>3</sub>	2
AMMONIA NITROGEN	4500NH <sub>3</sub> -C	01/05/10	0845	BDB		4.20 MG/L	0.56
TOTAL KJELDAHL NITROGEN	4500Norg-B	01/06/10	0840	BDB		140 MG/L	0.56
NITRATE-NITRITE AS N	4500-NO <sub>3</sub> -E	01/07/10	0912	KGC		< 0.25 MG/L	0.05
OIL & GREASE	EPA 1664A	01/07/10	0845	BDB		< 5 MG/L	5
BOD 5 DAY	SM 5210B	01/06/10	0845	VNB	E	22 MG/L	3
CHEMICAL OXYGEN DEMAND	SM 5220D	01/05/10	1030	TD		5030 MG/L	10.0
PH (LAB)	SM 4500H+	12/30/09	1355	VNB		4.33 STD UNITS	
PHENOLICS	EPA 420.1	01/12/10	0830	TD		< 0.05 MG/L	0.05
TOTAL DISSOLVED SOLIDS @ 180 C	SM 2540C	01/04/10	1439	KGC		358000 MG/L	5
TOTAL SUSPENDED SOLIDS	SM 2540D	01/04/10	0830	VNB		1020 MG/L	5
SPECIFIC CONDUCTANCE	SM 2510B	12/30/09	1605	KGC		> 200000 UMHOS/CM	0.50
SULFATE	EPA 300.0	12/31/09	1120	TD	D	< 100 MG/L	0.10
SURFACTANTS MBAS	SM 5540C	12/30/09	1423	KGC		0.20 MG/L	0.05
FIELD PH	SM 4500H+B	12/30/09	1030	JRH		5.8 STD UNITS	
TEMPERATURE	SS 2550 B	12/30/09	1030	JRH		3.6 DEGREES C	
ALUMINUM, TOTAL	EPA 200.7	01/05/10	1215	SM		36.2 MG/L	0.05
ARSENIC, TOTAL	EPA 200.7	01/04/10	1600	SM		< 0.02 MG/L	0.02
BARIIUM, TOTAL	EPA 200.7	01/04/10	1220	SM	D	1160 MG/L	0.01
BERYLLIUM, TOTAL	EPA 200.7	01/04/10	1600	SM		< 0.001 MG/L	0.001

LABORATORY DIRECTOR



ESTABLISHED 1939

# SEEWALD LABORATORIES, INC.

ENVIRONMENTAL & AGRICULTURAL TESTING

1403 WEST FOURTH STREET • WILLIAMSPORT, PA 17701

## REPORT OF ANALYSES

Attn: STEVE WRIGHT  
AMEC GEOMATRIX  
1824 LAST CHANCE GULCH  
HELENA, MT 59601-

PROJECT NAME: MARSHLAND UN. 1  
DATE: 01/15/10

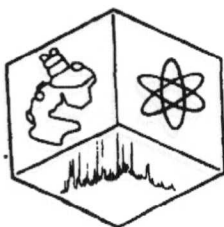
Page 2 of 4

SAMPLE NUMBER- 368800  
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DATE SAMPLED- 12/30/09  
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DATE RECEIVED- 12/30/09  
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ANALYSIS	METHOD	ANALYSIS		DATA		RESULT UNITS	MDL
		DATE	TIME	ANALYST	FLAG		
BORON, TOTAL	EPA 200.7	01/04/10	1600	SM		11.6 MG/L	0.01
CADMIUM, TOTAL	EPA 200.7	01/04/10	1600	SM		0.007 MG/L	0.003
CALCIUM, TOTAL	EPA 200.7	01/04/10	1220	SM	D	31900 MG/L	<0.05
CHROMIUM, TOTAL	EPA 200.7	01/04/10	1600	SM,		< 0.01 MG/L	0.01
COBALT, TOTAL	EPA 200.7	01/04/10	1600	SM		0.06 MG/L	0.05
COPPER, TOTAL	EPA 200.7	01/04/10	1600	SM		0.04 MG/L	0.01
IRON, TOTAL	EPA 200.7	01/05/10	0950	SM	D	280 MG/L	0.01
IRON, DISSOLVED	EPA 200.7	01/05/10	0950	SM	D	127 MG/L	0.01
LEAD, TOTAL	EPA 200.7	01/04/10	1600	SM		0.31 MG/L	0.01
LITHIUM, TOTAL	EPA 200.7	01/04/10	0950	SM	D	145 MG/L	0.01
MAGNESIUM, TOTAL	EPA 200.7	01/04/10	1220	SM	D	1940 MG/L	0.01
MANGANESE, TOTAL	EPA 200.7	01/05/10	0950	SM	D	72.8 MG/L	0.01
MERCURY, TOTAL	EPA 245.1	01/04/10	0930	GF		< 0.0004 MG/L	0.0002
MOLYBDENUM, TOTAL	EPA 200.7	01/04/10	1600	SM		0.44 MG/L	0.01
NICKEL, TOTAL	EPA 200.7	01/04/10	1600	SM		0.14 MG/L	0.01
SELENIUM, TOTAL	EPA 200.7	01/04/10	1600	SM		< 0.02 MG/L	< 0.10
SILVER, TOTAL	EPA 200.7	01/05/10	0950	SM		0.01 MG/L	0.01
SODIUM, TOTAL	EPA 200.7	01/04/10	0950	SM	D	73200 MG/L	0.02
STRONTIUM, TOTAL	EPA 200.7	01/04/10	1220	SM	D	4280 MG/L	0.01
ZINC, TOTAL	EPA 200.7	01/04/10	1600	SM		4.61 MG/L	0.005
PURGEABLE ORGANICS BY GC/MS	EPA 624	01/07/10	1722	CMF			
BROMODICHLOROMETHANE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
BROMOFORM	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
BROMOMETHANE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0





ESTABLISHED 1939

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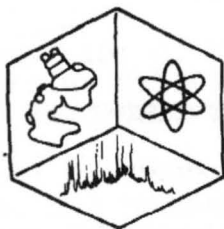
Page 3 of 4

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DATE RECEIVED- 12/30/09  
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ANALYSIS	METHOD	ANALYSIS		DATA		RESULT UNITS	MDL
		DATE	TIME	ANALYST	FLAG		
CARBON TETRACHLORIDE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
CHLOROBENZENE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
CHLOROETHANE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
2-CHLOROETHYLVINYL ETHER	EPA 624	01/07/10	1722	CMF		< 10 PPB	10
CHLOROFORM	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
CHLOROMETHANE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
DIBROMOCHLOROMETHANE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
1,2-DICHLOROBENZENE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
1,3-DICHLOROBENZENE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
1,4-DICHLOROBENZENE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
DICHLORODIFLOROMETHANE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
1,1-DICHLOROETHANE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
1,2-DICHLOROETHANE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
1,1-DICHLOROETHENE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
TRANS-1,2-DICHLOROETHENE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
1,2-DICHLOROPROPANE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
CIS-1,3-DICHLOROPROPENE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
TRANS-1,3-DICHLOROPROPENE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
METHYLENE CHLORIDE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
1,1,2,2-TETRACHLOROETHANE	EPA 624	01/07/10	1722	CMF	B	< 5 PPB	5.0
TETRACHLOROETHENE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
1,1,1-TRICHLOROETHANE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
1,1,2-TRICHLOROETHANE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
TRICHLOROETHENE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0

LABORATORY DIRECTOR



ESTABLISHED 1939

# SEEWALD LABORATORIES, INC.

## ENVIRONMENTAL & AGRICULTURAL TESTING

1403 WEST FOURTH STREET • WILLIAMSPORT, PA 17701

### REPORT OF ANALYSES

Attn: STEVE WRIGHT  
AMEC GEOMATRIX  
1824 LAST CHANCE GULCH  
HELENA, MT 59601-

PROJECT NAME: MARSHLAND UN. 1  
DATE: 01/15/10

Page 4 of 4

SAMPLE NUMBER- 368800  
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SAMPLE TYPE- Grab  
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ANALYSIS	METHOD	ANALYSIS		DATA		RESULT UNITS	MDL
		DATE	TIME	ANALYST	FLAG		
TRICHLOROFLUOROMETHANE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
VINYL CHLORIDE	EPA 624	01/07/10	1722	CMF		< 5 PPB	5.0
BENZENE	EPA 624	01/07/10	1722	CMF	R	< 5 PPB	5.0
ETHYL BENZENE	EPA 624	01/07/10	1722	CMF		8.85 PPB	5.0
TOLUENE	EPA 624	01/07/10	1722	CMF		64.3 PPB	5.0
TOTAL XYLENES	EPA 624	01/07/10	1722	CMF		114 PPB	15
ACROLEIN	EPA 624	01/07/10	1722	CMF	Q	< 50 PPB	50
ACRYLONITRILE	EPA 624	01/07/10	1722	CMF		< 50 PPB	50
SUBCONTRACT RADIOCHEMISTRY		01/08/10		SUB		ATTACHED	
SUBCONTRACT GAS CHROMAYOGRAPHY	SUB	01/08/10		SUB		ATTACHED	

LABORATORY DIRECTOR



Tentatively Identified Compound (LSC) summary

Operator ID: C. FULLER Date Acquired: 7 Jan 2010 5:22 pm

Data File: D:\2010\010710WW\368800.D

Name: ~~AMEC UNIT #7~~

Misc:

Method: C:\HPCHEM\1\METHODS\FULLER~1\SEEWALD2.M (RTE Integrator)

Title: EPA Method 8260 Volatile Organics

Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
Isopropyl Alcohol	9.02	10.5	ug/L	390033	ISTD01	14.33	1861320	50.0
2-Propanol, 2-methyl	10.09	13.6	ug/L	506084	ISTD01	14.33	1861320	50.0
1-Butanol	16.08	8.5	ug/L	390273	ISTD02	15.55	2291560	50.0
Undecane	27.02	39.1	ug/L	1719200	ISTD04	26.84	2201240	50.0
1-Hexanol, 2-ethyl-	27.30	6.2	ug/L	273625	ISTD04	26.84	2201240	50.0
1-Octanol	28.30	7.7	ug/L	339390	ISTD04	26.84	2201240	50.0
4-Dodecene, (E)-	29.20	9.3	ug/L	407804	ISTD04	26.84	2201240	50.0
Dodecane	29.34	90.6	ug/L	3988520	ISTD04	26.84	2201240	50.0
Cyclohexane, 1,1,2,3	29.66	15.1	ug/L	664959	ISTD04	26.84	2201240	50.0
Naphthalene, 1,2,3,4	30.60	6.1	ug/L	267898	ISTD04	26.84	2201240	50.0
1-Nonanol	30.70	14.6	ug/L	641901	ISTD04	26.84	2201240	50.0
Tridecane	31.73	88.4	ug/L	3890490	ISTD04	26.84	2201240	50.0
Cyclohexanol	32.06	6.4	ug/L	281126	ISTD04	26.84	2201240	50.0
1-Methylpyrrolidine	33.66	9.0	ug/L	395726	ISTD04	26.84	2201240	50.0
Tetradecane	34.42	82.7	ug/L	3639090	ISTD04	26.84	2201240	50.0

368800.D SEEWALD2.M

Fri Jan 08 08:07:55 2010

INSTRUMENT1



**SUMMIT**  
ENVIRONMENTAL TECHNOLOGIES, INC.  
*Analytical Laboratories*

## LABORATORY REPORT

**Client**

Seewald Laboratories, Inc.  
1403 West Fourth St.  
Williamsport, PA 17701

**Order Number**

0917259

**Project Number**

N/A

**Issued**

Tuesday, January 12, 2010

**Total Number of Pages**

5 (excluding C.O.C. and cooler receipt form)

Approved By :

  
QA Manager

NELAC Accreditation #E87688



**SUMMIT**

ENVIRONMENTAL TECHNOLOGIES, INC.

Analytical Laboratories

2

### Sample Summary

Client: Seewald Laboratories, Inc.

Order Number: 0917259

---

Laboratory ID	Client ID	Matrix	Sampling Date
0917259-01	368800	Liquid	12/30/2009
0917259-02	368798	Liquid	12/30/2009



**SUMMIT**  
ENVIRONMENTAL TECHNOLOGIES, INC.  
Analytical Laboratories

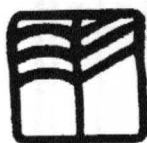
January 12, 2010

Client: Seewald Laboratories, Inc.  
Address: 1403 West Fourth St.  
Williamsport, PA 17701

Received: 12/31/2009

Project #: N/A

<u>Client ID#</u>	<u>Lab ID#</u>	<u>Collected</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Matrix</u>	<u>Method</u>	<u>DF</u>	<u>LOQ</u>	<u>Run</u>	<u>Analyst</u>
368800	0917259-01	30-Dec-09	Thorium	ND	mg/L	L	200.8	1	0.02	04-Jan-10	RHB
368800	0917259-01	30-Dec-09	Ethylene glycol	ND	mg/L	L	8015	2	50	04-Jan-10	RHB
368800	0917259-01	30-Dec-09	Gross Alpha	10356.0 +/- 2186.0	pci/l	L	EPA 900.0	1	3	05-Jan-10	MO
368800	0917259-01	30-Dec-09	Gross Beta	11595.0 +/- 723.0	pci/l	L	EPA 900.0	1	4	05-Jan-10	MO
368800	0917259-01	30-Dec-09	Radium-226	892.0 +/- 32.2	pci/l	L	EPA 903.0	1	1	05-Jan-10	MO
368800	0917259-01	30-Dec-09	Radium-228	2589.0 +/- 128.0	pci/l	L	EPA904.0	1	1	11-Jan-10	MO
368800	0917259-01	30-Dec-09	Uranium	ND	pci/l	L	EPA 908.0	2.5	2	07-Jan-10	MO
368798	0917259-02	30-Dec-09	Thorium	ND	mg/L	L	200.8	1	0.02	04-Jan-10	RHB
368798	0917259-02	30-Dec-09	Ethylene glycol	ND	mg/L	L	8015	2	50	04-Jan-10	RHB
368798	0917259-02	30-Dec-09	Gross Alpha	7530.0 +/- 1141.0	pci/l	L	EPA 900.0	1	3	05-Jan-10	MO



**SUMMIT**  
ENVIRONMENTAL TECHNOLOGIES, INC.  
Analytical Laboratories

January 12, 2010

Client: Seewald Laboratories, Inc.

Address: 1403 West Fourth St.  
Williamsport, PA 17701

Received: 12/31/2009

Project #: N/A

<u>Client ID#</u>	<u>Lab ID#</u>	<u>Collected</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Matrix</u>	<u>Method</u>	<u>DF</u>	<u>LOQ</u>	<u>Run</u>	<u>Analyst</u>
368798	0917259-02	30-Dec-09	Gross Beta	2683.0 +/- 372.0	pci/l	L	EPA 900.0	1	4	05-Jan-10	MO
368798	0917259-02	30-Dec-09	Radium-226	561.7 +/- 25.6	pci/l	L	EPA 903.0	1	1	05-Jan-10	MO
368798	0917259-02	30-Dec-09	Radium-228	648.0 +/- 67.0	pci/l	L	EPA904.0	1	1	11-Jan-10	MO
368798	0917259-02	30-Dec-09	Uranium	ND	pci/l	L	EPA 908.0	2.5	2	07-Jan-10	MO

## **Appendix B**



**U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION II**

Division of Environmental Planning and Protection  
Radiation and Indoor Air Branch  
290 Broadway, 25th Floor  
New York, New York 10007-1866

**MEMORANDUM**

DATE: November 09, 2009

SUBJECT: Comments on the Draft Supplemental Generic Environmental Impact Statement (DSGEIS) On the Oil, Gas and Solution Mining Regulatory Program prepared by Bureau of Oil & Gas Regulation NYSDEC Division of Mineral Resources dated September 2009, received October 2009.

TO: Lingard Knutson, Environmental Scientist  
DEPP, Strategic Planning Multi-Media Programs Branch

FROM: Nidal Azzam, Senior Health Physicist, Scientist  
DEPP, Radiation and Indoor Air Branch

Below you will find the comments on the DSGEIS. You should note that EPA does not regulate the gas industry, and as such we can't impose the regulatory requirements. However, the radionuclide concentrations specified in the DSGEIS represent elevated radionuclide concentrations and need to be handled, managed, and disposed of appropriately to avoid unnecessary exposure to workers, the public, and the environment.

**General Comments**

1. The reported radiological data from well operations (footnote 99), limited data from PA and WV Table 5-10), and from the Marcellus shale production brine (Appendix 13) represent elevated levels that need to be controlled and disposed of appropriately. Such operations need to take into consideration the Safe Drinking Water Act and the Uranium Mill Tailing Standard as applicable or relevant and appropriate requirements (ARARs) to ensure the safety of the public health and the environment.
2. Should the NY state implement a program to manage the generated NORM from the drilling activities, then such program needs to be at least as stringent as the EPA regulations.

### Specific Comments

3. **Section 4.4, page 4-17, last paragraph** – The last sentence reports uranium concentrations in terms of parts per million (ppm) instead of pico-Curie per gram (pCi/g) or pico-Curie per liter (pCi/L). Based on past experience and correlation between such units, the ppm could significantly underestimate the uranium concentration when uranium reaches a certain concentration. As such, cautions must be used when relying on reporting the results in ppm units to avoid underestimating the radionuclide concentrations.
4. **Section 4.6, page 4-36, 1<sup>st</sup> paragraph, last sentence** – Recommend revising the last sentence to eliminate the use of “government scrutiny” so that the sentence can read “...NORM need to be handled appropriately to ensure adequate protection of human health and the environment.”
5. **Section 5.2.4.2, page 5-30, 1<sup>st</sup> paragraph** – The text mentions “Table 5.2” while the associated table heading is “Table 5-2”. Revise for consistency.
6. **Section 6.1.9.1, page 6-40, 1<sup>st</sup> paragraph** – The sentence states “..., *NORM levels in cuttings are not likely to pose problem.*” Need to be specific by what is meant by “problem” (e.g., waste disposal problem, radiation exposure problem) and provide data on the NORM levels.
7. **Section 6.8, page 6-130** – Need to reference the document that contains the radionuclide concentrations referred to as reported by the USEPA in this section (i.e., 9000 pCi/L in produced water and 100,000 pCi/g in pipe and tank scale). Also such concentrations are considered elevated and may pose unacceptable human health risk mainly via external exposure, inhalation of radon and thoron decay products, and to some degree via inadvertent ingestion. Although, most states have not yet formally classified oil and gas drill rig personnel as occupational radiation workers, at least health and safety measures should be considered to educate the personnel about radiation exposures and reduce their exposure to as low as reasonably achievable. The pipe scale and filter media could be the major sources of radiation exposure and need to be handled and disposed of appropriately.



8. **Section 7.8, page 7-98, 2<sup>nd</sup> paragraph** – Should the extracted NORM from the drilling activities present an impact on human health and the environment, implementation of a regulatory program should be considered.
  
9. **Section 7.8, page 7-99, 2<sup>nd</sup> paragraph, 1<sup>st</sup> bullet** – This is statement does not achieve compliance with 40CFR192 which should be considered as an ARAR because to prevent future ingrowth the limits for thorium-230 and thorium-232, which are the respective parents of radium-226 and radium-228, should be set at the same limits of radium-226 and radium-228.
  
10. **Section 7.8, page 7-99, 2<sup>nd</sup> paragraph, 1<sup>st</sup> bullet** – Does the 150 pCi/g also apply to potassium-40?
  
11. **Section 7.8, page 7-99, 2<sup>nd</sup> paragraph, 2<sup>nd</sup> bullet** – Given the long half-life of some of the radionuclides in the uranium and thorium series, considerations should also be given to inaccessible points/locations because of the potential that such inaccessible points/locations could become accessible in the future. Also, how was the 50 R/hr limit derived? Is it dose-based or instrument limitation-based?
  
12. **Section 7.8, page 7-100, last paragraph, 1<sup>st</sup> bullet** – How were the 50 R/hr and 50 pCi/g limits derived? Are they dose-based or instrument limitation-based? These limits exceed the limits specified in 40CFR192 and could pose unacceptable health risks to the public if disposed of inappropriately.
  
13. **Appendix 13, NYS Marcellus Radiological data from Production Brine** – A program must be implemented to properly manage the elevated radionuclide concentrations in the brine to protect the worker health, public health, and the environment.

## **Appendix C**



# Al-Kleen, LLC

PO Box 385  
40 South Main Street  
Earlville, NY 13332  
315-691-5536 \* 888-855-5336  
lbirwin@frontiernet.net

May 28, 2010

NYS Dept. of Environmental Conservation  
Attn: Tom Lynch  
625 Broadway Street  
Albany, NY 12233-7253

RECEIVED

JUN -1 2010

BUREAU OF WASTE  
REDUCTION AND RECYCLING  
DIVISION OF SOLID AND  
HAZARDOUS WASTES

**RE: Salt Brine Spreading for Road Stabilization**

Dear Mr. Lynch;

We have been working with several towns, using salt brine for road stabilization. Due to the economic condition of late and the need for towns to curb spending and its benefit as a 'road hardener', towns are contacting us daily wanting the salt brine applied to their roads as they are working them.

Currently when a town notifies us, if they are not already a part of our BUD permit, we have them write a letter of intent, fill out a Part 364 Part D and give us a list of roads and map of the town roads they would like us to apply brine to. Then, along with a letter from us, we send all of the information to your department and wait for approval. The towns are a bit anxious, as they are notifying us either a day prior or the day of them 'reworking' their roads. We are hoping there might be an easier way to get approval for road stabilization; dust/ice control can remain the same.

According to the towns we have spoken with, when they 'rework' a road, they regrade the road, roll it, and then apply a binding agent. The binding agents currently used are calcium, magnesium, road oil and tree syrup. The costs for these applications range from \$0.89/gal for tree syrup to \$1.13/gal for the others. Our price for the salt brine from Teppco to the towns is \$0.15/gal. The cost savings is great and the binding action according to the towns is very comparable. The Town of Preston is very impressed and is telling other towns. The Towns of Columbus, Lebanon, and Smyrna also utilize the brine but at a larger cost savings, as they utilize brine from the Norse Energy natural gas wells, which Norse Energy pays all costs associated with spreading their brine.

We are permitted to spread 1,500 gallons of brine per lane mile for road stabilization and ice/dust control. According to the Town of Columbus and Cincinnatus this is approximately the same application rate as calcium. The Town of Sempronius used tree syrup in the past for three (3) town roads, approximately 7 lane miles total. The cost was \$8,010 for the syrup plus the cost to spread it themselves. Salt brine would cost them \$1,575 applied. The Town of Columbus appropriates approximated \$55,000 for road stabilization/dust control annually; by using gas well brine they save that entire amount as Norse absorbs the cost.

When we spread brine for road stabilization, we do not apply the entire 1,500 gallons per lane mile in one pass. We have found that by applying half the amount at a time, then going back over the road approximately an hour later with the other half eliminates any runoff. Also, we do not apply 1,500 gallons of brine per lane mile for dust/ice control. We have found that approximately 500 gallons per lane mile works very well.


We would like to receive approval to automatically apply salt brine for road stabilization as needed by the towns and/or county highway departments with monthly reports sent to you listing the date, facilities, roads and

amount used. We will continue to send applications for approval for dust/ice control and if needed for road stabilization.

We thank you for your continued help in this process.

If you are in need of any further information or have any questions or comments, please contact me at (315) 691-5536 or (315) 691-5120.

Sincerely,

A handwritten signature in black ink, appearing to read "Lory B. Irwin", written in a cursive style.

Lory B. Irwin  
Vice-President

## **Appendix D**

# New York State Department of Environmental Conservation

## Division of Solid & Hazardous Materials

Bureau of Solid Waste, Reduction and Recycling, 9<sup>th</sup> Floor

625 Broadway, Albany, NY 12233-7253

Phone: (518) 402-8678 • Fax: (518) 402-9024

Website: [www.dec.ny.gov](http://www.dec.ny.gov)



Alexander B. Grannis  
Commissioner

Mr. James Call  
A.D.Call & Sons Excavating  
6400 Main Road  
P.O. Box 60  
Stafford, NY 14143

Dear Mr. Call:

Re: BUD- Brine for Dust Control.  
Permit # 8A-729

We have reviewed the information submitted in your February 12, 2010 and March 13, 2010 petitions for the proposed beneficial use of production brines from Medina, Theresa, and Queenston gas wells and Inergy LP Storage. This use is approved pursuant to 6 NYCRR 360-1.15(d) when conducted in accordance with your petitions and the following:

- All vehicles transporting and spreading brine must have a valid Part 364 permit.
- Brine is approved for roadspreading use at the locations listed on Table A and delivery to the locations specified on Table B.
- All roadspreading activities must be conducted in accordance with your roadspreading plan and in a manner that prevents brine from flowing or running off into streams, creeks, lakes and other bodies of water.
- Brine must be applied by use of a spreader bar or similar spray device with shut-off controls in the cab of the truck; and with vehicular equipment that is dedicated to this use or cleaned of previously transported waste materials prior to this use.
- Brine spread for dust suppression and road stabilization purposes must not be applied: after daylight hours; within 50 feet of a stream, creek, lake or other body of water; on sections of road having a grade exceeding 10 percent; or on wet roads, during rain, or when rain is imminent.
- The Part 364 Annual Report must include the amount of brine applied at each location listed on Table A and the amount delivered to the locations listed on Table B.

You must keep a copy of this letter, including Tables A and B, and the Part 364 Permit in all vehicles used for roadspreading or delivering brine. The Department reserves the right to rescind or modify this determination at any time, should conditions warrant. Additional locations can be added to Tables A & B upon request. This determination does not exempt the AD Call & Sons from any other local, state, or federal requirements.

Please contact me at (518) 402-8706 if you have any questions or need any additional information.

Sincerely,

Thomas J. Lynch, P.E.  
Chief  
Beneficial Use & Special Projects Section

## **Appendix E**

# New York State Department of Environmental Conservation

## Division of Solid & Hazardous Materials

### Bureau of Solid Waste, Reduction & Recycling

625 Broadway, 9<sup>th</sup> Floor, Albany, New York 12233-7253

Phone: (518) 402-8678 • Fax: (518) 402-9024

Website: [www.dec.ny.gov](http://www.dec.ny.gov)



Alexander B. Grannis  
Commissioner

JUN 15 2010

Lori B. Irwin  
Vice President  
Al-Kleen, LLC.  
PO Box 385  
40 South Main Street  
Earlville, NY 13332

Re: BUD- Brine for Town/County Highway Department  
Road Stabilization Projects  
Permit # 7A-649

Dear Ms. Irwin:

We have reviewed the information submitted in your May 30, 2010 petition for the proposed beneficial use of brine from Teppco and Nornew, Inc. natural gas wells (Oneida, Herkimer, and Vernon formations) in conjunction with Town/County Highway Department road stabilization projects as an alternate to commercial products. This brine spreading use is approved pursuant to 6 NYCRR 360-1.15(d) when conducted in accordance with your May 30, 2010 petition and the following. This BUD revision does not apply to brine spreading for dust control and road deicing under your current BUD.

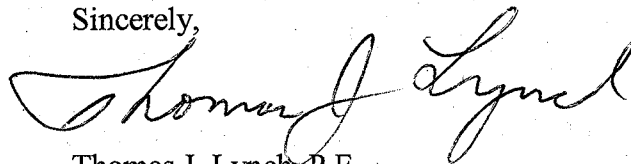
- All vehicles transporting and spreading brine must have a valid Part 364 permit.
- All brine application activities for road stabilization purposes must be conducted in a manner that prevents brine from running off the traveled portion of the roadway.
- Brine must be applied by use of a spreader bar or similar spray device with shut-off controls in the cab of the truck; and with vehicular equipment that is dedicated to this use or cleaned of previously transported waste materials prior to this use.
- Brine spread for road stabilization purposes must not be applied after daylight hours.
- Brine must not be applied or handled in a manner that could result in spillage or application within 100 feet of a wetland regulated by New York State, or 50 feet of all other water bodies and bridges.
- No application shall be conducted when the National Weather Service forecasts greater than 25% probability of precipitation in the application area to occur within 24 hours.
- Applications shall not be conducted when the ground is saturated (due to precipitation or wetting) as defined by visible pools of water at or in the vicinity of the application, in order to prevent movement of brine beyond the shoulder of the road.



- Al Kleen must send bimonthly reports listing for each Town/County road stabilization project: the date and time of application, source of brine, County and Town name, road name and length, and the amount of brine used for road stabilization.
- The Part 364 Annual report must contain the amount of brine applied for each Town/County.
- This BUD is for road stabilization projects in the Towns of Cinncinatus, Columbus, Georgetown, German, Greene, Lebanon, McDonough, Pharsalia, Pitcher, Pittsfield, Preston, and Smyrna. Additional Towns may be added upon request.

You must keep a copy of this letter and the Part 364 Permit in all vehicles used for spreading brine. The New York State Department of Environmental Conservation reserves the right to rescind or modify this determination at any time, should conditions warrant. This determination does not exempt the Al-Kleen, LLC from any other local, state, or federal requirements. Please contact me at (518) 402-8706 if you have any questions or need any additional information.

Sincerely,

A handwritten signature in cursive script that reads "Thomas J. Lynch".

Thomas J. Lynch, P.E.

Chief

Beneficial Use & Special Projects Section

## **Appendix F**

**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**

Analysis of three production brine samples provided by DEC<sup>1</sup> shows elevated gross alpha and gross beta results, ranging 14,530 - 123,000 picocuries per liter (pCi/L). Isotopic analysis of these samples found concentrations of radium-226 in the production brine in the range of 2,472 - 16,030 pCi/L. If these measurements are representative of production brine from gas wells in the Marcellus, handling and disposal of this wastewater could be a public health concern. Furthermore, these data suggest that similar radiological sampling and analysis of frac flowback water is needed. Additional production brine sampling results as well as from the water treatment systems should provide information on how to resolve the concerns listed below.

Radium is a naturally occurring radioactive material (NORM). The presence of high levels radium-226 in the production brine brings up several issues that need to be considered for gas drilling of the Marcellus. The issues raised are not-trivial but are also not insurmountable, many can be addressed using common engineering controls and industry best practices. The issues are summarized below:

- References<sup>2,3</sup> to the Marcellus Shale as having a higher radioactive material content than other shale formations, along with results of analysis<sup>1</sup> performed on production brine from Marcellus Shale showing radium-226 levels ranging 2,600 - 16,000 pCi/L, indicate that naturally occurring radioactive materials (NORM) will need to be evaluated for gas wells in this formation. This conclusion is based on data from three wells, so it is suggested that additional production brine samples be collected to determine whether this is a common occurrence and what precautions may need to be taken during operations.
- An assessment of the levels of NORM in production brine is needed to determine if there is a need for additional treatment for their removal. Water filtration or treatment media may concentrate the radioactive materials and require them to be disposed of at a facility prepared to handle this waste. If production brine is to be sent to the POTW for treatment, additional precautions and personnel monitoring for radiation doses (dosimetry) should be considered for the workers.
- Production brine from other formations has been used as spray-down water for dust suppression on unpaved roads or vehicle race tracks. It has also been used to deice roadways. The high levels of NORM in production brine from the Marcellus may prohibit this or other potential beneficial uses unless the radium can be substantially removed.
- NORM may concentrate in piping or other equipment as precipitates or scale and may require their disposal as radioactive waste. Personnel monitoring for exposure to gamma radiation may be required if build up of NORM as pipe scale, sediment in settling ponds or on water treatment media is detected. Also, the facility may need to apply for a radioactive materials license pursuant to 10 NYCRR Part 16.
- Disposal of the NORM waste produced may be problematic due to the potentially high concentrations of radioactive materials in the waste stream. For reference, the effluent water discharge limit for radium-226 is 6E-08 microCi/ml (60 pCi/L) (NYCRR Part 16, Appendices), and the drinking water standard (maximum contaminant level) for radium-226 and radium-228 combined is 5 pCi/L and for gross alpha activity is 15 pCi/L. (NYCRR 10, 5-1.52, Table 7 -

<http://www.nyhealth.gov/environmental/water/drinking/part5/tables.htm#table1>)

Until more data are available, gas drilling in the Marcellus should include sampling of drill tailings, frac flowback water and production brine. Analysis of gross alpha activity, gross beta activity and some gamma spectroscopy analysis should be adequate to assess whether further characterization of radioactive material is needed. The counting efficiency for a total gross alpha sample that has high dissolved solids is very low, resulting in considerable uncertainty (error) for estimating possible radiation exposure. However, total gross alpha activity is an inexpensive (but effective) screening tool, and if the value is greater than 15 pCi/L then additional analysis is performed. These data also suggest that baseline sampling of residential or public wells prior to drilling should include analysis of radioactivity (gross alpha and gross beta).

The New York State Department of Environmental Conservation has regulatory authority for releases of radioactive material to the environment and disposal of radioactive waste. This includes the drill tailings and fluids generated from Marcellus shale drilling. We can provide technical support on the issues raised in these comments as necessary.

#### **References**

1. Pace Project No. 301059 Report of Laboratory Analysis - Pace Analytical for NYS DEC, 2008
2. Pennsylvania Geology Vol. 38, No. 1, Harper - PA Bureau of Topographic and Geologic Survey, p 9, Spring 2008
3. Fractured Shale Gas Potential in New York, Hill & Lombardi - TICORA Geosciences and Martin - NYSERDA, p 8, 2004