

Subject: UIC Permit Application APATT022697  
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Underground Injection Control Section  
Division of Oil and Gas Resources Management  
2045 Morse Road, Columbus, Ohio 43229.  
**Re: Permit Application APATT022697**  
September 6, 2013

Dear Director Zehringer and Chief Simmers,

I am writing to protest granting of the permit by K&H Partners of West Virginia, UIC Permit Application APATT022697 for a Class II Injection Well in Athens County based on a highly deficient application that will not prevent pollution of land, surface water, and drinking water sources as required by Ohio law (OAC 1501:9-3-04). My protests concern the permit application's inability to protect health, safety, and environmental conservation in the county in which I live, work, and recreate.

I request a public hearing in Athens County based on my substantive concerns with the serious deficiencies of this permit application to prevent contamination and pollution of surface of the land, surface water and groundwater, as required by Ohio Administrative Code 1501:9-3-04, which states: (A) All persons engaged in any phase of saltwater disposal operations shall conduct such operations in a manner which [sic] will not contaminate or pollute the surface of the land, or water on the surface or in the subsurface..." My concerns, substantive and relevant to public health, safety, and environmental conservation, merit a public hearing because *Ohio law requires that the Chief grant a public hearing if ANY comments are substantive and relevant to health, safety, or good conservation practices.* (OAC 1501:9-3-06 (H)(2) (c)).

My concerns address the following substantive and relevant deficiencies:

1. The application states, "*K&H #1 Unloading and Containment Facility will be used for the #2 well.*" There is no schematic or description of this facility, built for K&H Partners #1 well. How does this existing facility get evaluated by the public? How does the public know the facility's capacity for containment and mitigation?
2. In #32-D -- nothing attached. Therefore the unloading facility, which can affect the likelihood of spills and explosions and therefore surface contamination of land and water as well as air pollution affecting the health, safety, and environment, including wildlife and environmental protection required by "good environmental conservation" (OAC 1501:9-3-04), cannot receive public scrutiny here. It did not receive scrutiny when K&H 1 was permitted because it was only added to the application after the comment period closed. This is a serious and substantive concern, especially given that the total volume daily for K&H Partners' #1 and 2 wells is 5500 barrels a day or almost 84,000,000 gallons a year to be unloaded ad infinitum at this facility that has not received any public scrutiny.
3. There is no information on how the waste will be transferred from the holding area to the injection well. This is a serious and substantive deficiency of this application that

affects the operator's legal obligation to prevent pollution of the surface of the land, surface, and groundwater and public health, safety, and environmental conservation (OAC 1501:9-3-04). (See also #2 above)

4. *How can a maximum psi also be an average* as stated in the public notice?
5. *How can the average psi be zero as listed on this application?* This is a serious and substantive concern with this application that will affect public health, safety, and environmental conservation, given that the permit application allows up to 4000 barrels a day of injectate, or 60,000,000 gallons a year, more than 10% of the total amount injected into over 170 Ohio Class II wells in 2012. Together with the allowable volumes in the nearby K&H 1, the volumes permitted into the land near Torch and the Ohio River come to more than 83 million gallons a year, more than 125 Olympic size swimming pools worth of fluids ANNUALLY AND WITH NO LIMIT EVER, YEAR AFTER YEAR. This application does not and cannot support the *Division's legal mandate to require that this operation will not pollute groundwater or surface water or area drinking water supplies.*
6. The unrealistically low maximum psi, given the high volumes that can be injected daily into non-porous shale through a 2 3/8" tube, suggest that the psi will likely be increased after the permit is granted as occurred in Youngstown, where levels of 2500 p.s.i. were eventually allowed and earthquakes occurred.
7. Earthquakes associated with injection of fluid have no upper bounds according to emerging peer-reviewed literature. Furthermore, the 5.1 quake in Oklahoma linked to injection wells occurred years after initial injection, and in Colorado, "the largest earthquake (Mw 5.2) occurred on 10 April 1967 more than a year after injection ceased on February 1966 [Healy et al., 1968]."<sup>1</sup>
8. Whether seismic activity occurs immediately or not does not mean it won't happen years later, meaning that reducing pressure at that point may be too late to prevent future quakes. Given that nearby Washington County has experienced recent earthquakes associated with increased deep well activity and that Youngstown, which had never experienced quakes, had close to 100 earthquakes associated with injection wells,<sup>2</sup> please provide to the public, in a manner in which the public can respond before a permit is issued, the evidence used to determine that seismic testing was not necessary for this well and the peer-reviewed science on which this determination was made.
9. The application does not provide information that allows citizens to determine how the director reached the conclusion that seismic testing and a seismic survey were not necessary. Given the huge amount of frack waste liquids permitted for injection in this well and for the nearby K&H #1 and the recent documentation of the problems caused by injection wells in Youngstown, this is a serious and substantive deficiency.
10. What is the seismic detection capability of the region, as is necessary to know if your assessment of no seismic potential (assumed) is incorrect? Authors Kim et al.<sup>3</sup> state that "the locations of these shocks [initial small quakes] were not very accurate due to sparse seismic station coverage." Where is evidence that ODNR has determined that

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<sup>1</sup> Kim, W.-Y. (2013), Induced seismicity associated with fluid injection into a deep well in Youngstown, Ohio, J. Geophys. Res. Solid

<sup>2</sup> ibid.

<sup>3</sup> op cit. p. 3508

drinking water, surface land and water, public health and safety can be adequately protected per state and federal mandates if this issue is nowhere addressed?

11. No analysis is provided to show how the maximum p.s.i and maximum allowable injectate volume were determined. If Ohio were not a state with primacy, the following would be required of the applicant to determine maximum p.s.i. How does this application provide comparable protection of groundwater, surface water, and public health and safety as required by Ohio law? Where is the data to show that these legal requirements are met? How can the specific gravity of the heaviest brine be determined, as necessary to be protective of water resources and public health and safety in setting maximum p.s.i., if OHIO DOES NOT REQUIRE REPORTING OR ANALYSIS OF COMPLETE WASTE COMPOSITION? This is a substantive concern relevant to public health, safety, and environmental conservation that warrants a public hearing.

#### USEPA REQUIREMENTS TO DETERMINE MAXIMUM P.S.I.:

As a reminder to operators, permit conditions in Class II UIC permits are established at the time the application is reviewed and the final permit issued. **It is UIC Branch's policy when calculating [maximum injection pressure](#) (MIP) for Class II commercial wells to use the [specific gravity](#) of the heaviest brine from the various approved sources of fluids because the maximum injection pressure is dependent on the specific gravity.** As you can see in the equation below, the allowable pressure decreases with an increase in specific gravity. **Therefore, any proposed new source with a specific gravity higher than the value used to calculate the permitted MIP will require a recalculation of the MIP using the higher specific gravity. This revised MIP will be incorporated into the permit by a minor permit modification to reflect the appropriate reduction in the maximum injection pressure.** [emphasis added]

USEPA permit application for a Class II injection well require the operator to list “Specific gravity from chemical analysis: \_\_\_\_+.05 = \_\_\_\_” and “Composition of the annulus fluid.”

How can this much less specific, restrictive Ohio application possibly be comparably protective of groundwater, surface water, health, safety, and environmental conservation as required by Ohio and federal law when this information is totally lacking and *unavailable because Ohio does not require tracking of this data?*

12. How does merely setting a number of cement bags to be used insure that the cement will actually create the required thickness and adhere to the rock surface as necessary in order to assure well integrity when no further documentation is required to assess whether the cement creates the required bonds rather than merely filling subsurface voids and caverns? Given that Ohio Code: 1501:9-3-04 requires “Prevention of contamination and pollution: (A) All persons engaged in any phase of saltwater disposal operations shall conduct such operations in a manner which [sic] will not contaminate or pollute the surface of the land, or water on the surface or in the subsurface...” this question is relevant and substantive to health, safety, and environmental conservation.
13. Weight and thickness of 2 3/8” tubing are not specified. How can the applicant assure that it will hold up under continued exposure to unknown corrosive chemical mixtures for eternity? How will ODNR know whether tubing or casing has failed given that no monitoring of surrounding soil and groundwater is required or done?

14. What is the expected longevity of this well and how was it determined, given that Ohio well standards do not even meet industry standards for well construction? Given requirements of OAC 1501:9-3-04 and 40 CFR 144.12 to prevent pollution and contamination of drinking water, land, surface, and subsurface waters, this question is relevant and substantive to health, safety, and environmental conservation.
15. How can ODNR claim that its permitted wells have not caused contamination when it does no monitoring of surface or groundwater to determine how often contamination has already occurred? Since this monitoring is not done, on what basis should county residents be assured that this well will not contaminate our ground-, surface waters and drinking water supplies per OAC 1501:9-3-04 and 40 CFR 144.12?
16. Whether or not some of the toxic material injected as “brine” into Class II wells has been exempted from regulation as “hazardous waste” does not mean it is not highly toxic. Benzene is benzene is benzene. According to USEPA documents, “We all should recognize...that some Class II fluids are ten times nastier than some Class I injectates...” (<http://water.epa.gov/learn/training/dwatrainig/upload/dwaUIC-uicpermit.pdf>, p.1 -7) This USEPA document further states, “There are many solvents, for example, that would be classified as hazardous and the wells injecting them as Class I if they were not used in conjunction with oil and gas production... On any given day, the injectate of a Class II-D well has the potential to contain hazardous concentrations of solvents, acids, and other listed and characteristic RCRA hazardous wastes.” (p. 1-8) Whether or not the injectate has been exempted from hazardous waste regulation does not obviate the Ohio UIC program of PREVENTING POLLUTION AND CONTAMINATION by THESE TOXIC, RADIOACTIVE WASTE CONSTITUENTS per OAC 1501 and 40 CFR 144.12.
17. Ohio is required to protect drinking water sources per 40 CFR 144.12. Primacy is based on being able to fulfill this requirement. See USEPA Commercial Class II Injection Well permit application requirements to see what an application requires when protecting groundwater resources is actually considered. If Ohio did not have primacy over its UIC – underground injection well control program and a USEPA permit were required, K&H Partners would be subject to USEPA Region 5 Commercial Class II well permit requirements because K&H Partners will be injecting waste that it does not produce. ([epa.gov/r5water/uic/forms/commercial.htm](http://epa.gov/r5water/uic/forms/commercial.htm)) This USEPA Commercial Class II permit would mandate, among other requirements:
- *Restrictions on injected fluids, approval of new sources and exceptional circumstances [Part I(E)(18)],...*
  - *Restriction of fluids injected to a list approved by USEPA for injection into the commercial well and contained in the permit [Part III(D)];*
  - *Submission of the brine manifest records (or equivalent information) associated with hauling brine to the well [Part II(B)(3)]; and*
  - *Submission of quarterly analyses of samples taken from the location identified in the permit [Part II(B)(3)] for the normal brine constituents: sodium, calcium, total iron, magnesium, barium, sulfate, chloride, bicarbonate, carbonate, sulfide, total dissolved solids, pH, resistivity, and specific gravity,...*
- An owner/operator applying for a new (proposed) commercial permit must include the following information with the permit application:*
- *Information regarding site security;*

- *Brine analysis, locational information, field name\* and formation name for each source known at the time of the application. [further requirements must be met for additional sources the operator wishes to add later]*

Other USEPA requirements that are not met by this Ohio application include provision in the application of information on:

- *For Class II wells the testing program must be designed to obtain data on fluid pressure, estimated fracture pressure, physical and chemical characteristics of the injection zone...*
- *Construction Procedures -Discuss the construction procedures (according to §146.22 for Class II) to be utilized. This should include details of the casing and cementing program, logging procedures, deviation checks, and the drilling, testing and coring program, and proposed annulus fluid.*
- *Operating Data- source and analysis of the physical and chemical characteristics of the injection fluid. [Instructions director the applicant to:] Estimate the proposed maximum injection rate in barrels per day (BBL/Day). The proposed maximum injection pressure should be calculated using the following formula:  $P_{max} = \{ [0.8 - (0.433) (\text{specific gravity of injection fluid} + 0.05) ] \times \text{upper depth of injection formation} \} - 14.7$ . For a fracture gradient above 0.8 psi/ft, the owner/operator needs to submit justification data such as charts, graphs and jobs tickets from a step rate test or fracturing operation. Field data from a well in the same field, which is injecting in the same formation, may be used to justify a fracture gradient of greater than 0.8 psi/ft. This data should include charts, graphs and job tickets from a step rate test or fracturing operation on the well....*
- *Formation Testing Program: The testing program, if necessary, must be designed to obtain data on fluid pressure, estimated fracture pressure, physical characteristics of the injection zone. The permittee must notify the UIC Branch at least (30) days prior to any testing and wait for approval.*
- *Construction Procedures-This should include details of the casing and cementing program, logging procedures, deviation checks, drilling, testing program, and the nature of the annulus fluid.*
  - *Surface casing size and **weight**, setting depth, # of sacks of cement, hole size*
  - *Intermediate casing size and weight, setting depth, # of sacks of cement, hole size*
  - *Longstring casing size and weight, setting depth, # of sacks of cement, hole size*
  - *Size **and weight** and length of the tubing,*
  - *Size and model of the packer and the setting depth ...*
- *Attachment M: Construction Details-Submit schematic or other appropriate drawings of the surface and subsurface construction details of the well. **Include a description of the exact point at which the injection fluid will be sampled.** Sample well schematics are attached...*
- *Attachment R: Necessary Resources: Submit evidence to verify that the financial resources that are necessary to close, plug and abandon the well are available. One of the following mechanisms may be used to meet the UIC requirements:*
  - *A Surety Bond along with a Standby Trust Fund*
  - *A Letter of Credit along with a Standby Trust Fund*
  - *A Trust Fund*
  - *State Mechanisms (the permittee needs to provide a copy of the state mechanism such as a surety bond, a letter of credit, a certificate of deposit or a blanket bond) along with a letter requesting acceptance of the state mechanism. Whenever a state blanket bond is used as a financial mechanism to cover the cost of plugging the well, the permittee is required to provide a list of all wells (producers and injectors) covered by the blanket bond and the estimated plugging cost for each well.*

- *Financial Statement Coverage - the following are required when financial statement coverage is used as financial mechanism: chief financial officer's letter, an independent auditor's opinion of examination of the company's financial statements and a public accounting firm's statement of validation of the financial information in the chief financial officer's letter. Enclosed is a brochure discussing financial mechanisms.*
  - *Attachment S: Aquifer Exemptions-If an aquifer exemption is requested, submit data necessary to demonstrate that the aquifer meets the following criteria: (1) does not serve as a source of drinking water; (2) cannot now and will not in the future serve as a source of drinking water; and (3) the TDS content of the ground water is more than 3,000 and less than 10,000 mg/l and is not reasonably expected to supply a public water system. Submit data to demonstrate that the aquifer is expected to be mineral or hydrocarbon producing, or can be demonstrated by a permit applicant as part of a permit application for a Class II operation to contain hydrocarbons that considering their quantity and location are expected to be commercially producible. ([epa.gov/region5/water/uic/forms/act-samp.pdf](http://epa.gov/region5/water/uic/forms/act-samp.pdf))* among other requirements. Please explain how with this permit application ODNR can provide a comparable level of protection as required to protect water resources (OAC 1501:9-3-04 and 40 CFR 144.12), *given especially that corrosive action of fracking waste increases the rate of well degradation and likelihood of leaks.* This deficiency of this application to be comparably protective of water resources is substantive and relevant to health, safety, and good conservation practices.
15. This application lacks description of aquifers in the area or “method of identification and/or sources of information used to identify the USDW location” as would be required under a USEPA application. How does this application provide comparable protection of surface and groundwater supplies per Ohio law and 40 CFR 144.12?
  16. According to USEPA, primacy means a state program has to be “at least as stringent” as USEPA’s program; 40 CFR 144.120 requires the state protect drinking water sources. To meet this standard would require that the K&H application list “all USDWs that may be affected by the injection operation. Note that this may require evaluation of formations extending some distance from the site, especially in areas where pressures may be affected by injection activities for a significant lateral area from the injection well. The list must include the geologic name and the depth to the base of all USDWs that may be affected. Again, unless some extraordinary circumstance arises, it is likely that any USDW near the facility is going to potentially be affected by injection, especially if one considers a worst case scenario of a release into USDWs from a major mechanical integrity failure in a well...The permit applicant should provide detailed information regarding USDWs. Citations should be provided that will allow...review [of] information the applicant used and check it to see if it is accurate and complete.” ([water.epa.gov/learn/training/dwatrainng/upload/dwaUIC-uicpermit.pdf](http://water.epa.gov/learn/training/dwatrainng/upload/dwaUIC-uicpermit.pdf))
  17. This K&H application lacks complete information on Geologic Data on Injection and Confining Zones as would be required for a non-primacy state under USEPA jurisdiction. USEPA requires the applicant to “Provide the name, depth, thickness, and lithologic descriptions of the injection and confining zones.” How does this application provide comparable protection of surface and groundwater supplies as required by OAC 1501:9-3-04? No mapping of geology is provided. USEPA documents state, “There are multiple ways that injected fluids could get into a USDW to endanger it. The review of geologic data helps ensure that natural conduits do not

exist that may endanger a USDW. It is important that the formations intended to seal the injection interval from the USDWs are free of intersecting faults and fractures. If faults or fractures are present, the injected fluid, introduced into the injection interval at an elevated pressure, will seek the path of lower pressure and move upward into a USDW.” ([water.epa.gov/learn/training/dwatraining/upload/dwaUIC-uicpermit.pdf](http://water.epa.gov/learn/training/dwatraining/upload/dwaUIC-uicpermit.pdf) per 40 CFR 146.22(a)) *Where is this review and the necessary assurance that there are no faults, fractures, or fissures that could provide pathways for toxic injectate to get into drinking water sources?*

18. There are no core samples or reports of porosity and permeability of the formation. Is there data available to determine the structural setting of the reservoir? Where is a geologist’s report with any reference to the formation into which the waste will be injected? The assumption made by ODNR apparently is that whatever formation is in this permit application is already deemed safe with no explanation of why there would NEVER be any penetration of the formation by the toxic, radioactive waste. This is a written response from ODNR to a written question asked at an open house last November in Athens about how a rock formation is determined to be impermeable: “Rocks are designated as impermeable due to the minute size of pore spaces or lack of permeability that is typical of fine grained rocks. Low permeability rock typically restricts vertical or horizontal migration of fluids and/or gas and are known as confining zones.” *“Typically”?! This certainly does not meet the standards of NO POLLUTION OR CONTAMINATION that are required by OAC 1501:9-3-04.*
19. What provisions are made to determine the financial viability of the company and capability to plug or remediate well failure as required by USEPA for commercial Class II well applications? (reference [epa.gov/region5/water/uic/forms/techrev2.pdf](http://epa.gov/region5/water/uic/forms/techrev2.pdf)) Where is documentation of these provisions? Given that OAC 1501:9-3-04 requires prevention of contamination and pollution, this question is substantive and relevant to health, safety, and environmental conservation.
20. What emergency provisions are in place to protect the surrounding communities and water supplies in the event of accidents or well failure? Given that OAC 1501:9-3-04 requires prevention of contamination and pollution of “surface of the land, or water on the surface or in the subsurface” this question is substantive and relevant to health, safety, and environmental conservation.
21. If Ohio did not have primacy and this operator were subject to USEPA application requirements, he would be subject to the following rules:

*Should upward fluid migration occur through the well bore of any previously unknown, improperly plugged or unplugged well due to injection of permitted fluids, injection will be shut in until proper plugging can be accomplished. The Underground Injection Control Branch of the USEPA must be notified immediately. Should any problems develop in the casing of the injection well, injection will be shut-in until such repairs can be made to remedy the situation. Operations shall not be resumed until the Director gives approval to recommence injection in writing. ([epa.gov/region5/water/uic/forms/act-samp.pdf](http://epa.gov/region5/water/uic/forms/act-samp.pdf))*

How does this application, with no equivalent requirements, provide sufficient protection of surface and groundwater supplies as required by OAC 1501:9-3-04?
22. How can the local water system, Tupper Plains, whose wells are downstream from this injection well and which serves 13-14,000 people, be assured that their water source — groundwater obtained from water wells drawn from the Ohio River Valley Aquifer — is protected as required by Ohio law, based on this highly deficient

application that does not even map nearby aquifers? Where are the maps to show that this application will not lead to aquifer contamination?

23. Where is the evidence on which you base your repeated claims that Ohio injection well permitting does not lead to contamination? Where are the latest EPA reports on ground water surveys that have been conducted since the increase in the number of new injection wells in Ohio? Since there are no laws requiring monitoring wells for Class II wells, how is it determined that there is no contamination? Heidi Hetzel-Evans' baseless statement to me at Wayne National Forest Headquarters in July, 2012, that "We would know if there was contamination" is not reassuring.
24. On what basis will the operator be limited to the "brine" specified in #31 of the application since tracking of truck contents is not required except in an annual report that does not specify complete contents of the injectate?
25. How will radiological testing of this frack waste be conducted and reported that would assure the public that workers and anyone exposed to the injectate or the equipment over time will not be exposed to unsafe levels of the strontium, barium, and other radiologically active materials found in Marcellus waste at over 3600 times safe drinking water levels by U.S. Geological Survey in 2011? How will the complete lack of testing for radiation comply with OAC 1501:9-3-04 that this permit will not lead to pollution or contamination of surface land, surface water, ground water, or drinking water supplies?

It is clear that this application can not assure the public that this well will meet USEPA's requirement that "All UIC wells are prohibited from endangering USDWs (40 CFR 144.12). The prohibition on endangerment includes not only everyday operations, but construction, conversion, well maintenance and plugging and abandonment. The entire purpose of EPA's requiring permits, your reviewing the application and writing conditions into the permit is focused on this one goal. The non-endangerment standard applies from the time the well begins construction until the end of time! As stated in the nonendangerment standard of 144.12: 'The applicant for a permit shall have the burden of showing that the requirements of this paragraph are met.' So, the permit application must clearly demonstrate that USDWs will be protected and will not be contaminated throughout well construction through the operational life of the well, and even during and after plugging and abandonment of the well."

([water.epa.gov/learn/training/dwatraining/upload/dwaUIC-uicpermit.pdf](http://water.epa.gov/learn/training/dwatraining/upload/dwaUIC-uicpermit.pdf) p. 1-25)

Damaged aquifers and contaminated water sources cannot be restored to their original state. This is a significant concern since there are over 55,300 oil and gas wells in Ohio, 197 injection wells and less than 50 inspectors. These and other public health and safety issues need to have answers in place BEFORE this new injection well is permitted.

Thank you for your consideration. I look forward to a Public Hearing in Athens County on this permit application to be announced within the next 30 days.

\_\_\_\_\_ name

\_\_\_\_\_ county of residence

CC: Sen. L, Gentile, ; Rep. D. Phillips; R. Harvey, S. Hedman