comprehensive plans. See, e.g., Ex. 4 at ¶¶ 22-23; Ex. 5 at ¶¶ 22-23; Ex. 11 ¶¶ 10, 25-27, 30-35; Ex. 15 & 16. As Act 13 violates the constitutional basis for zoning, Municipal Petitioners cannot abide by Act 13 without, in turn, violating the Pennsylvania and United States Constitutions.

WHEREFORE, Petitioners request this Honorable Court deny Respondents' Preliminary Objection to Count III.

5. Counts IV & XI states a legally sufficient claim because Act 13 is s "special law" that treats local governments differently and was enacted for the sole and unique benefit of the oil and gas industry in violation of Article III, Section 32 of the Pennsylvania Constitution.

Act 13 violates Article III, Section 32 of the Pennsylvania Constitution because it is a special law that treats local governments differently and was enacted for the sole and unique benefit of the oil and gas industry. PA. CONST. Art. III, Sec. 32.

Article III, Section 32 requires that like persons in like circumstances be treated similarly. Pennsylvania Turnpike Com'n v. Com., 587 Pa. 347, 363-64, 899 A.2d 1085, 1094 (2006). The General Assembly is prohibited from passing any special law for the benefit of one group or industry to the exclusion of others. See Laplacca v. Philadelphia Rapid Transit Co., 265 Pa. 304, 108 A. 612 (1919) (emphasis added). The intent of this provision was to end the enactment of privileged legislation for private purposes. Harrisburg School Dist. v. Hickok, 563 Pa. 391, 761 A.2d 1132 (2000).

Any distinction between groups must seek to promote a legitimate state interest or public value, and bear a "reasonable relationship" to the object of the classification. Pennsylvania Turnpike Com'n v. Com., 587 Pa. at 363-65, 899 A.2d at 1094-1095. A classification may be deemed per se unconstitutional if the class consists of one type of member and is substantially closed to other members. Id. A classification will violate the principles of equal protection if it does not rest upon a difference which bears a reasonable relationship to the purpose of the legislation. Cf. In re Williams, 210 Pa. Super. 388, 234 A.2d 37, 41 (1967).

"[M]anifest peculiarities within a legislative class . . . provide the only permissible justification for a legislative override of the uniformity required by Article III, Section 32." Wings Field Preserv. Ass., L.P. v. Com., Dept. of Transp., 776 A.2d 311, 317 (Pa. 2001). Those peculiarities "clearly distinguish[] those of one class from each of the other classes and imperatively demand[] legislation for each class separately that would be useless and detrimental to the others." Id., quoting Allegheny County v. Monzo, 500 A.2d 1096, 1105 (Pa. 1985).

A. Uniformity of Local Ordinances

No reasonable relationship exists between Act 13's classification and the public benefit. The Act creates a distinction between the oil and gas industry and all other industries in the Commonwealth.[17] It even treats the oil and gas industry differently from other energy extraction and production industries. The purported reason for this difference was to give the oil and gas industry alone increased predictability and uniformity as it operates in various locales across the Commonwealth. See Commonwealth's Brief in Support of Preliminary Objections, at 6; compare 4/17/12 Hearing Transcript Regarding Petitions to Intervene, at 6-7 (discussing the need to intervene because of the "time, energy, and money" expended by industry members to "ensure uniformity and predictability" in local ordinances).

However, the oil and gas industry is not the only industry that operates statewide, and not even the only energy extraction and production industry that operates in numerous municipalities statewide. Further, the oil and gas industry is not alone in its ability to bring potential economic development to the Commonwealth. Also, to the extent the General Assembly assumed the oil and gas industry was "new" in the Commonwealth, which it is not, it is certainly not the one and only fledging industry in the Commonwealth, let alone the only new energy industry.

[17] Respondents' argument that Act 13 does not create a distinction between specific oil and gas companies is unavailing.

Under Act 13, the oil and gas industry is the *only industry* that is permitted to entirely bypass the statutory baselines underlying the constitutionality of zoning, including already-established and designated zoning districts, comprehensive plans and orderly development of the community. No other citizen, business, or industry has been granted such "special treatment" for such intense industrial activity. Further, no other industry has been given *two* ways to bypass entirely the typical municipal zoning hearing board process in order to challenge a local ordinance—a special forum at the PUC exempted from due process procedures, *and* a private right of action in Commonwealth Court. 58 Pa. C.S. §§ 3305(b)-(c), 3306. The Commonwealth has given the oil and gas industry the power to bring significant financial hardship on a municipality under Act 13. Rather than losing a challenge and merely having to rewrite an ordinance, a municipality and its officials now face a threat both of paying an oil and gas operator's attorneys' fees and costs, and being subject to the threat of surcharges against local officials flowing from these municipal losses. See Ex. 4, 5, & 10. Furthermore, the Act limits participation in a challenge at the PUC to only the challenger and the municipality. In contrast, at a zoning hearing board, nearby landowners can seek party status, cross-examine witnesses, present testimony and participate in appeals to protect their property interests. 58 Pa. C.S. § 3305(b)(2); 53 P.S. § 10908(3). Act 13 eliminates this role of landowners, depriving them of due process and providing the oil and gas industry with a benefit no other industry enjoys.

To further illustrate Act 13's special treatment of the oil and gas industry over all others, including other industries, Section 3304 of Act 13 provides a time limitation on municipalities when reviewing zoning applications. The local review period for oil and gas operations may not exceed thirty (30) days for uses permitted by right, or one hundred twenty (120) days for conditional uses. 58 Pa. C.S. § 3304(b)(4). All others who desire to develop land in a district are required to follow the time constraints and procedures already set forth in the MPC.

To pass zoning ordinances or approve applications, municipal officials must consider the evidence introduced from these review processes and base their decision on the information gathered. See, 53 P.S. §§ 10608-09, 10610, 10908, 10913.2. However, under Act 13, approval of the application or the zoning ordinance is mandated in some case *regardless of the evidence gathered.* As such, rather than base a decision on the evidence and public concern presented to them, municipalities will be forced to turn a blind eye to any evidence brought forth by a landowner in a public hearing.

Pennsylvania courts have recognized that landowners' property interests and due process rights may be violated by failing to give public notice or hold a public hearing in accordance with the MPC's zoning procedures. See Luke v. Cataldi, 932 A.2d 45 (Pa. 2007); Glen-Gery Corp. v. Zoning Hearing Bd. of Dover Twp., 907 A.2d 1033 (Pa. 2006); Messina v. East Penn Twp., 995 A.2d 517 (Pa. Commw. Ct. 2010). "The purpose of requiring compliance with the procedural requirements for enacting township ordinances is premised on the importance of notifying the public of impending changes in the law so that members of the public may comment on those changes and intervene when necessary." Schadler v. ZHB of Weisenberg Twp., 578 Pa. 177, 850 A.2d 619, 627 (2004). A landowner has a property interest in the quiet use and enjoyment of his property near any proposed use, as well as a right to participate in the governing body's hearings. In re McGlynn, 974 A.2d 525 (Pa. Commw. Ct. 2009). All other applicants, including all the taxpaying citizens of each municipality, must follow the local zoning procedures, appeals processes, and the time frame set out by the MPC, and employed for the protection of the community.[18]

[18] Likewise, Act 13 authorizes the placement of centralized hazardous waste water impoundments in any zoning district. As determined by the Pennsylvania Commonwealth Court, impoundments are "accessory uses" which are in need of a principle use. Warner Jenkinson Company, Inc. v. Zoning Hearing Bd. of the Twp. of Robeson, 862 A.2d 139, 143 (Pa. Commw. Ct. 2004). As such, Act 13 has created a special classification for frac-water impoundments associated with drilling activities by allowing an accessory use to be placed in any area regardless of whether a corresponding principal use is similarly located.

There is no "manifest peculiarity" that provides a basis for enacting the sweeping changes in Chapter 33 solely for the benefit of the oil and gas industry, Wings Field Preservation Associates, L.P., 776 A.2d at 317, as well as superseding the rights of all other citizens to participate and voice concerns about proposed development. See Ex. 4 & 5 (discussing individual concerns, and the manner in which Act 13 overrides the public hearing and comment process); see also Ex. 11, Ex. 14 ¶¶ 21-22, Ex. 15, ¶¶ 29-33, 40. Catering to an industry not in need of special protection was the initial catalyst for Article III, Section 32, which sought to ensure equal treatment of similarly-situated people. Harrisburg School Dist. v. Hickok, 761 A.2d 1132, 1136 (Pa. 2000). Act 13 therefore achieves precisely what Article III, Section 32 of the Pennsylvania Constitution prohibits.

Further, the Act creates an unconstitutional distinction between densely populated communities and more sparsely populated communities. Densely populated communities and their residents are afforded greater protection and/or privileges under Act 13 than more sparsely populated communities such as Municipal Petitioners. By the passage of Act 13, the General Assembly has mandated that the full maximum capacity of drilling, vertical, horizontal, fracturing or otherwise (along with the corresponding pipelines, compressor stations, impoundments, processing plants, etc.) must be realized and permitted in every zoning district of a community, including residential areas. Due to their dense populations and build-out of real estate within their borders, densely populated communities are basically relieved of the burden of drilling by virtue of the set back requirements. A rural community such as Cecil Township has a tremendous amount of undeveloped land. As a result of this abundance of undeveloped land, Cecil is a prime drilling target for the oil and gas industry. With the passage of Act 13 and its "one-size-fits-all" approach to zoning, Cecil and other similarly situated Municipal Petitioners have been stripped of their ability to protect their residents through zoning. Unlike "built-out" and densely populated towns/cities, these rural communities will be forced to endure unlimited drilling; drilling rigs and transportation of the same; flaring, including

carcinogenic and hazardous emissions; damage to roads; an unbridled spider web of pipeline; installation, construction and placement of impoundment areas; compressor stations and processing plants; and unlimited hours of operation, all of which may take place in residentially zoned areas.

Article III, Section 32 of the Pennsylvania Constitution was adopted to end "[t]he evil [of] interference of the legislature with local affairs without consulting the localities and the granting of special privileges and exemptions to individuals or favored localities." Harrisburg School District v. Hickok, 781 A.2d 221, 227 (Pa. Commw. Ct. 2001). By its application, Act 13 lacks uniformity and creates an unconstitutional distinction between densely populated communities and more sparsely populated communities in violation of Article III, Section 32 of the Pennsylvania Constitution. The difference in treatment between different regions in the Commonwealth is further exacerbated by the fact that shale and/or shale gas is not the same throughout Pennsylvania. As a result of this geological reality, Act 13 will not apply to certain areas in the same way it will apply to and affect the Petitioners. Because it treats similarly-situated municipalities differently, it violates Article III, Section 32 of the Pennsylvania Constitution.

B. Attorneys Fees And Costs

Section 3307 of Act 13 imposes attorney fees and costs upon any local government that "enacted or enforced a local ordinance with willful or reckless disregard" of the MPC or the zoning terms of the Act. These "penalty" provisions place excessive punishments upon local governments and do so exclusively when dealing with regulation of the oil and gas industry. For other industries, a challenge to a local ordinance would merely result in the law being overturned. However, when dealing with local oil and gas ordinances, municipal officials face not only the possibility of the law being overturned, but also the possibility of payment of hundreds of thousands of dollars in attorneys' fees and costs.

In practice, this penalty works to discourage local officials such as Municipal Petitioners from passing laws regulating the oil and gas industry. This is so even if local officials believe such regulations would otherwise be in the best interests of the community and consistent with the law. With the possibility of being sanctioned with attorney fees and costs, local officials will be hesitant to regulate the drilling industry for fear of costing their taxpayers additional funds and potentially being found personally liable if a surcharge action is implemented. See Ex. 4, 5, & 10; see also Ex. 1 (describing financial burdens).

This threat is made more real by the fact that any advisory opinion or other opinion issued by the PUC becomes a part of the record before a court. Consequently, even if a municipality disagreed with the PUC's interpretation of the Act, it would face a difficult decision of whether to enact the ordinance anyway and risk substantial attorneys' fees and costs if litigation were to arise. No other industry could so strongly use state law to threaten great financial harm and do so with the goal of preventing a municipality from doing what it believes to be valid zoning regulation under the MPC.

There is no manifest legitimate justification for this classification whereby the oil and gas industry alone receives additional power to threaten a local municipality. Accordingly, Act 13 constitutes a "special law" in violation of the equal protection principles embodied in Article III, Section 32 of the Pennsylvania Constitution.

C. Notification to Public Drinking Water Systems - § 3218.1

Section 3218.1 provides that, "[a]fter receiving notification of a spill, the department shall, after investigating the incident, notify any public drinking water facility that could be affected by the event that the event occurred ..." As a result of this provision, potentially affected public drinking water facilities will be notified by the DEP in the event an oil and gas driller spills any of its hazardous contaminants on land or into water. Under the Act, no other notifications to any other drinking water sources are required after a spill and possible contamination. The Act creates an

unconstitutional distinction between public drinking water supplies and private water wells in violation of equal protection principles.

The General Assembly has failed to provide any legitimate basis for the distinction between public and private drinking water supplies. While public drinking water has the benefit of receiving notification of a spill, it is also already routinely tested to ensure compatibility with drinking water standards. As a result, there are no special circumstances or need that would justify public drinking water supplies receiving the benefit of notification to the exclusion of private water wells. Quite the contrary, it is private water wells which can in fact demonstrate a special need for notification. Private water wells are neither publicly monitored nor routinely tested and are far more susceptible to contamination. As the majority of drilling is ongoing in more rural areas serviced by private water sources, the rationale for this exception suggests "special" treatment, different from all other uses in a municipality.

This sort of special privilege afforded to a selected group rests on an entirely artificial and arbitrary distinction in violation of Article III, Section 32. Consequently, Act 13 violates Article III, Section 32 of the Pennsylvania Constitution.

D. Regulation of Medical Health Professionals - § 3222.1(b)(11)

As described earlier, Article III, Section 32 of the Pennsylvania Constitution was enacted to end the practice of privileged legislation enacted for private purposes. Harrisburg School Dist. v. Hickok, 761 A.2d 1132 (Pa. 2000). Any legislative classification or distinction between must seek to promote a legitimate state interest or public value, and bear a "reasonable relationship" to the object of the classification. Pennsylvania Turnpike Com'n v. Com., 899 A.2d 1085, 1094-1095 (Pa. 2006).

The General Assembly, through Section 3222.1(b)(10) and (11), created an unconstitutional special law because there is no legitimate state interest in restricting, solely to benefit the natural gas

industry, doctors' access to information, and to preventing doctors from sharing that information with patients and for the development of medical knowledge.[19] Act 13 imposes restrictions on health professionals' abilities to disclose critical diagnostic information necessary for medical treatment solely because such information has been deemed by the natural gas industry as "proprietary" or a "trade secret."

The General Assembly has singled out the natural gas industry for special treatment and protection at the expense of public health and welfare. Chemicals, including products with multiple chemical compounds and so-called "proprietary or trade secret substances," are used daily in a variety of occupations and industries throughout Pennsylvania. Such widespread use of chemicals can lead to human exposure with adverse health effects that may result in disease, illness, and the exacerbation of pre-existing conditions.

The sharing of information between patient and doctor is critical to determine what the disease is. Information-sharing between treating physicians, like emergency room doctors, and specialists is equally as important to afford a patient competent medical care and treatment. In order for a physician to completely and properly treat a patient, it is imperative that a physician properly and correctly diagnose the aliment. To do so, a doctor must consider all of the patient's symptoms as well as his/her occupational, social, medical, and environmental history to perform what is known as a differential diagnosis.[20] It is an essential tool of practicing competent medicine. Without complete information, such as a full chemical exposure history, a doctor could improperly diagnose and treat a patient, making the patient's illness worse and risking a claim of medical malpractice.

---

[19] The Petition at ¶¶ 263, 265, and 267 incorrectly stated that Act 13 does not provide for access to information for non-emergency doctors. Under Act 13, non-emergency doctors have a right of access but only where need is shown *and* a confidentiality agreement is executed. This correction does not change the substance of Petitioners' claim.

[20] A differential diagnosis is a process by which a doctor "rules in," or takes into consideration, and then "rules out" a specific illness or disease process based upon a full disclosure of all of a patient's symptoms, prior medical history, and occupational and environmental exposures.

Pennsylvania law emphasizes the importance of openness among health professionals in the process of evaluating and treating illness. State law imposes numerous affirmative duties on health professionals to ensure that critical and essential information related to the treatment of human illnesses is shared and readily available. 49 Pa. Code §16.95(a); 49 Pa. Code §16.95(c); 49 Pa. Code § 16.95(d); 28 Pa. Code § 27.21a(b)(2); 49 Pa. Code § 16.61(a)(12); 63 P.S. § 422.41(9). Despite the importance and necessity of such information-sharing, Section 3222.1(b)(10) and (b)(11) of Act 13 prohibit health professionals from making *any* disclosure of information that they receive regarding chemicals that the natural gas industry deems as "proprietary" or "trade secrets" *even when such a disclosure is necessary to treat a particular patient or to protect public health.* See 58 Pa. C.S. § 3222.1(b)(10) & (b)(11). Thus, under Act 13, an emergency room doctor who sees a patient with a suspected chemically induced disease and receives from the industry a disclosure of the chemicals to which the patient was exposed would be prohibited from practicing competent medicine as he could not share that information with the specialist to whom the patient is being referred for treatment. These same problems present themselves in Section 3222.1(b)(10), which restricts doctors in non-emergency situations from disclosing information to patients, and also affirmatively requires a doctor in a non-emergency situation to show a need for the information before the information can be obtained. Act 13 forces doctors to practice irresponsible and dangerous medicine.

Section 3222.1(b)(10) and (b)(11) of Act 13 requires health professionals to disregard general ethical duties and affirmative regulatory and statutory obligations and to hide information that they have gained solely because it was produced by an industry favored by the General Assembly. The numerous ethical, regulatory, and statutory obligations of health professionals that are apparently no longer applicable to situations involving potential exposure to a chemical deemed a "trade secret" or "proprietary" by the natural gas industry exemplify how Section 3222.1(b)(11) of Act 13 is a special

law. For further response, see Petition for Review, at ¶¶ 249-272; see also, Summary Judgment Brief, at pp. 62-69.

WHEREFORE, Petitioners request this Honorable Court deny Respondents' Preliminary Objections to Count IV & Count XI.

6. Count V states a legally sufficient claim because Act 13 is an unconstitutional taking for a private purpose and an improper exercise of the Commonwealth's eminent domain power in violation of Article I, Sections 1 and 10 of the Pennsylvania Constitution.

The United States and Pennsylvania Constitutions mandate that private property can only be taken to serve a public purpose. Private property cannot be taken for the benefit of another private property owner. Kelo v. City of New London, 545 U.S. 469 (2005). The Pennsylvania Supreme Court has maintained that to satisfy this obligation of serving a "public purpose," the public must be the primary and paramount beneficiary of any taking. In re Opening Private Rd. for Benefit of O'Reilly, 5 A.3d 246, 258 (Pa. 2010). In considering whether a primary public purpose was properly invoked, the Pennsylvania Commonwealth Court has looked for the "real or fundamental purpose" behind a taking. In re Opening a Private Rd. for Benefit of O'Reilly Over Lands of (a) Hickory on Green Homeowners Ass'n & (b) Mary Lou Sorbara, WL 1709846 (Pa. Commw. Ct. 2011) (on remand from the Pennsylvania Supreme Court). Stated otherwise, the true purpose must primarily benefit the public. Id.

Section 3241 of Act 13 is not supported by any public purpose being served by the appropriation of an interest in real property by a corporation for the storage of natural gas. If this use is a "public purpose," which Petitioners do not concede, then any oil and gas corporation by analogy could have the right to use eminent domain powers to acquire real property for storage reservoirs and protective areas around those reservoirs. Moreover, Section 3241 is inconsistent with the limitations on use of eminent domain under the Property Rights Protection Act. 26 Pa. C.S. § 201 *et seq.*

Because it cannot be justified on the basis of any paramount public purpose, Section 3241 of Act 13 facilitates an unconstitutional taking of private property for a private purpose in violation of Article I, Sections 1 and 10 of the Pennsylvania Constitution. For further response, see Petition for Review, at ¶¶ 167-173; see also, Summary Judgment Brief, at pp. 44-46.

WHEREFORE, Petitioners request this Honorable Court deny Respondents' Preliminary Objection to Count V.

7. Count VI states a legally sufficient claim because Act 13 denies municipalities the ability to fulfill their constitutional obligations to protect public natural resources under Article I, Section 27 of the Pennsylvania Constitution.

Act 13 violates Article I, Section 27 of the Pennsylvania Constitution by denying municipalities the ability to carry out their constitutional obligation to protect public natural resources. PA. CONST. Art. I, Sec. 27 (the "Environmental Rights Amendment"). Municipalities, as agents of the Commonwealth, share duties as trustees to conserve and maintain Pennsylvania's public natural resources for the benefit of its citizens. United Artists Theater Circuit v. City of Philadelphia, 635 A.2d 612, 620 (Pa. 1993). "[M]unicipal agencies have the responsibility to apply the Section 27 mandate as they fulfill their respective roles in planning and regulation of land use, and they, of course, are not only agents of the Commonwealth, too, but trustees of the public natural resources as well ..." Community College of Delaware County v. Fox, 342 A.2d 468, 482 (Pa. Commw. Ct. 1975).

The Pennsylvania Supreme Court has unequivocally recognized that municipalities have a duty to protect the environment. Franklin Tp. v. Com., Dept. of Environmental Resources, 452 A.2d 718, 721-22 (1982) (emphasis added); see also, Community College of Delaware County v. Fox, 20 Pa. Commw. 335, 342 A.2d 468 (1975) (holding that DER could not consider aspects of planning and zoning, and did not have the authority to withhold a permit on non-statutory environmental and land use criteria; instead, these are the concern and responsibility of municipal agencies).

884 A.2d at 881. For further response, see Petition for Review, at ¶¶ 231-248; see also, Summary Judgment Brief, at pp. 59-62.

WHEREFORE, Petitioners request this Honorable Court deny Respondents' Preliminary Objections to Count IX & X.

11. Count XII states a legally sufficient claim because Act 13's restriction on health professionals' ability to disclose critical diagnostic information violates the single-subject rule enunciated in Article III, Section 3 of the Pennsylvania Constitution.

The Pennsylvania Constitution states, "No bill shall be passed containing more than one subject, which shall be clearly expressed in its title, except a general appropriation bill or a bill codifying or compiling the law or a part thereof." PA. CONST. Art. III, Sec. 3. Article III, Section 3 contains two requirements, that a bill: 1) not contain more than one subject; and 2) clearly express that subject in its title.[24] Stilp v. Commonwealth, 905 A.2d 918, 955 (Pa. 2006). As for Act 13, the bill in its various iterations broadly dealt with regulation of the oil and gas industry. During conference committee, a provision was inserted dealing with oil and gas operators' duty to disclose hydraulic fracturing chemicals. At the same time, the legislature restricted doctors in their ability to inform patients exposed to hydraulic fracturing chemicals. For further response, see Petition for Review, at ¶¶ 273-277; see also, Summary Judgment Brief, at pp. 69-70.

WHEREFORE, Petitioners request this Honorable Court deny Respondents' Preliminary Objection to Count XII.

12. Petitioners are entitled to injunctive relief on Counts XIII & XIV because each of the foregoing substantive Counts are legally sufficient.

For the reasons set forth at length herein, Petitioners are entitled to injunctive relief because each of its substantive claims are legally sufficient. Petitioners can show 1) a likelihood of prevailing on the merits; 2) that it will suffer irreparable injury without injunctive relief; 3) that injunctive relief

[24] This restriction also violates this second requirement, as the title says nothing about restrictions on doctors, further exacerbating the problem created by its last-minute addition into the Act.

will not substantially harm the Respondents or the public and 4) that Respondents' conduct is actionable. Maritrans GP, Inc v Pepper Hamilton & Sheetz, 602 A.2d 1277, 1282-1283 (Pa. 1992). Thus, the requested injunctive relief is warranted.

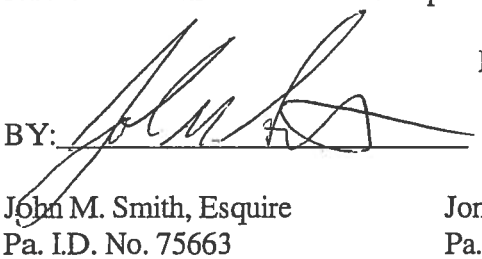
WHEREFORE, Petitioners request this Honorable Court deny Respondents' Preliminary Objections to Count XIII & XIV.

VIII. CONCLUSION

For the foregoing reasons, Respondents' preliminary objections are without merit. Petitioners respectfully request this Honorable Court deny and dismiss with prejudice Respondents' Preliminary Objections to Petitioners' Petition for Review in the Nature of a Complaint for Declaratory and Injunctive Relief.

WHEREFORE, Petitioners respectfully request that the Court deny Respondents' Preliminary Objections. In the alternative, Petitioners respectfully leave to file an Amended Petition for Review in the Nature of a Complaint for Declaratory and Injunctive Relief.

Respectfully Submitted:

BY: 

John M. Smith, Esquire
Pa. I.D. No. 75663
Jennifer Fahnestock, Esquire
Smith Butz, LLC
125 Technology Drive, Suite 202
Bailey Center I, Southpointe
Canonsburg, PA 15317
jmsmith@smitbutzlaw.com

Jonathan M. Kamin, Esquire
Pa. I.D. No. 81958
John Arminas, Esquire
Goldberg, Kamin & Garvin, LLP
1806 Frick Building
Pittsburgh, PA 15219
jonathank@gkgattorneys.com

Jordan B. Yeager, Esquire
Pa. I.D. No. 72947
Lauren M. Williams, Esquire
Curtin & Heefner LLP
Heritage Gateway Center
1980 South Easton Road
Doylestown, PA 18901
JBY@curtinheefner.com

Susan J. Kraham, Esquire
Pa. I.D. No. 310292
Columbia U. School of Law
Environmental Law Clinic
435 West 116th Street
New York, NY 10027
skraha@law.columbia.edu

William A. Johnson, Esquire
Pa. I.D. No. 14609
23 East Beau Street
Washington, PA 15301
wajohnsonesq@yahoo.com

EXHIBIT 4

IN THE SUPREME COURT OF PENNSYLVANIA

Nos. 72 & 73 MAP 2012

ROBINSON TOWNSHIP, ET AL.
Cross-Appellants

v.

COMMONWEALTH OF PENNSYLVANIA, ET AL.
Cross-Appellees

BRIEF OF CROSS-APPELLANTS

Cross-Appeal From The Order Of The Commonwealth Court Entered
On July 26, 2012, Docket No. 284 M.D. 2012

John M. Smith, Esquire
Pa. I.D. No. 75663
Jennifer Fahnestock, Esquire
Smith Butz, LLC
125 Technology Drive, Suite 202
Bailey Center I, Southpointe
Canonsburg, PA 15317
(724) 745-5121

Jordan B. Yeager, Esquire
Pa. I.D. No. 72947
Lauren M. Williams, Esquire
Curtin & Heefner LLP
Heritage Gateway Center
1980 South Easton Road, Suite 220
Doylestown, PA 18901
(267) 898-0570

Jonathan M. Kamin, Esquire
Pa. I.D. No. 81958
John Arminas, Esquire
Goldberg, Kamin & Garvin LLP
1806 Frick Building
Pittsburgh, PA 15219
(412) 281-1119

Susan J. Kraham, Esquire
Pa. I.D. No. 310292
Columbia University School of Law
435 West 116th Street
New York, New York 10027
(212) 854-5008

William A. Johnson, Esquire
Pa. I.D. No. 14906
23 East Beau Street
Washington, PA 15301
(724) 225-3955

COUNSEL FOR CROSS-APPELLANTS

TABLE OF CONTENTS

TABLE OF CITATIONS

Cases

Statutes

Regulations

Rules

I. Statement of Jurisdiction

The Supreme Court of Pennsylvania has jurisdiction over this cross-appeal pursuant to 42 Pa.C.S. § 723(a) and Pa.R.A.P. 1101(a)(1). Section 723(a) provides the Supreme Court with "exclusive jurisdiction of appeals from final orders of the Commonwealth Court entered in any matter which was originally commenced in the Commonwealth Court." 42 Pa. C.S. § 723(a); see also Rule 1101(a)(1) (providing for an appeal as of right to the Supreme Court). Cross-Appellants commenced the action in the Commonwealth Court by way of a Petition for Review in the Nature of a Complaint for Declaratory Judgment and Injunctive Relief ("Petition") under the Court's original jurisdiction over civil actions brought against the Commonwealth. Petition, at 7; see 42 Pa.C.S. § 761(a)(1). Cross-appeals are permitted under Pa.R.A.P. 903(b).

This cross-appeal is taken from a final order of the Commonwealth Court pursuant to Pa.R.A.P. 341. A final order "disposes of all claims and of all parties," Pa.R.A.P. 341(b)(1), which the July 26 Order does. The order granted Cross-Appellants' motion for summary relief as to Counts I, II, III and VIII of the Petition, and dismissed the Petition's remaining Counts.

II. Order or Other Determination in Question

ORDER

AND NOW, this 26th day of July, 2012, the preliminary objections filed by the Commonwealth to Counts IV, V, VI, VII, IX, X, XI and XII are sustained and those Counts are dismissed. The preliminary objections to Counts I, II, III and VIII are overruled.

Petitioners' motion for summary relief as to Counts I, II, and III is granted. 58 P.S. §3304 is declared unconstitutional, null and void. The Commonwealth is permanently enjoined from enforcing its provisions. Other than 58 Pa. C.S. §3301 through §3303 which remain in full force and effect, the remaining provisions of Chapter 33 that enforce 58 Pa. C.S. §3304 are similarly enjoined.

Petitioners' motion for summary relief as to Count VIII is granted and Section 3215(b)(4) is declared null and void.

The cross-motions for summary relief filed by the Pennsylvania Public Utility Commission and Robert F. Powelson in his Official Capacity as Chairman of the Public Utility Commission and by the Department of Environmental Protection and Michael L. Krancer in his Official Capacity as Secretary of the Department of Environmental Protection are denied.

/s/
DAN PELLEGRINI, President Judge

III. Statement of Scope and Standard of Review

"Because the issues involve the proper interpretation of constitutional and statutory provisions, they pose questions of law. As such, this Court's scope of review is plenary and our standard of review is *de novo*." Alliance Home of Carlisle, PA v. Bd. of Assessment Appeals, 591 Pa. 436, 449, 919 A.2d 206, 214 (2007).

IV. Statement of Questions Involved

1. Is Act 13 unconstitutional as a "special law" that treats local governments differently and that was enacted for the sole and unique benefit of the oil and gas industry?

Suggested Answer: Yes.

Answer Below: No.

2. Is Act 13 unconstitutional because it authorizes takings for private purposes?

Suggested Answer: Yes.

Answer Below: No.

3. Does Act 13 deny municipalities the ability to fulfill their constitutional obligations to protect public natural resources under Article I, Section 27 of the Pennsylvania Constitution?

Suggested Answer: Yes.

Answer Below: No.

4. Is Act 13 unconstitutional because it permits the PUC to play an integral role in the exclusively legislative function of drafting legislation and to render opinions regarding the constitutionality of legislative enactments, infringing on a judicial function?

Suggested Answer: Yes.

Answer Below: No.

5. Did the Commonwealth Court err in granting Preliminary Objections and dismissing the claims of Mehernosh Khan, M.D., the Delaware Riverkeeper Network and Maya van Rossum for lack of standing?

Suggested Answer: Yes.

Answer Below: No.

V. Statement of the Case

1. Form of Action and Procedural History

On February 14, 2012, Governor Corbett signed Act 13 of 2012 into law, codified as 58 Pa. C.S. §§ 2301-3504. Act 13 amends the Pennsylvania Oil and Gas Act to establish, in part, a uniform zoning scheme for oil and gas development that applies to every zoning district in every political subdivision in Pennsylvania, as well as a new zoning ordinance review process for only oil and gas matters.

On March 29, 2012, Cross-Appellants filed a fourteen-count Petition for Review in the Nature of a Complaint for Declaratory Judgment and Injunctive Relief ("Petition") in the Commonwealth Court's original jurisdiction over civil actions brought against the Commonwealth. The Petition challenged Act 13's constitutionality and sought declaratory and injunctive relief. The Cross-Appellants are as follows (hereinafter referred to collectively as, "Petitioners"):

- Robinson Township, Washington County, Pennsylvania;
- Brian Coppola, both individually and in his official capacity as a Supervisor of Robinson Township;
- Nockamixon Township, Bucks County, Pennsylvania;
- South Fayette Township, Allegheny County, Pennsylvania;
- Peters Township, Washington County, Pennsylvania;
- David M. Ball, both individually and in his official capacity as a Councilman of Peters Township;
- Cecil Township, Washington County, Pennsylvania;
- Mount Pleasant Township, Washington County, Pennsylvania;

- Yardley Borough, Bucks County, Pennsylvania;
- Delaware Riverkeeper Network;
- Maya Van Rossum, the Delaware Riverkeeper; and
- Mehernosh Khan, M.D.

The named Appellees are as follows (hereinafter collectively referred to as "Commonwealth"):

- Commonwealth of Pennsylvania;
- Pennsylvania Public Utility Commission ("PUC");
- Robert F. Powelson, in his official capacity as PUC Chairman;
- Office of the Attorney General of Pennsylvania;
- Linda L. Kelly, in her official capacity as the Attorney General of the Commonwealth of Pennsylvania;
- Pennsylvania Department of Environmental Protection ("DEP"); and
- Michael L. Krancer, in his official capacity as DEP Secretary.

On April 4, 2012, Petitioners filed a motion seeking a preliminary injunction, to which the Commonwealth responded on April 10, 2012. After a hearing, the Court granted, in part, Petitioners' Application for Preliminary Injunction, stating, in part,

> To the extent that Chapter 33 or any other provision of Act 13 may be interpreted to immediately pre-empt pre-existing local ordinances, a preliminary injunction is issued pending further order of Court. Additionally, the Court agrees with petitioners that 120 days is not sufficient time to allow for amendments of local ordinances and, therefore, will preliminarily enjoin the effective date of Section 3309 for a period of 120 days.

April 11, 2012 Order.[1]

---

[1] Petitions to intervene were also filed by several oil and gas companies and industry groups, as well as by Senator Scarnati and Representative Smith ("legislators"). These were filed on April 5, 2012, and April 16, 2012, respectively. After a hearing on April 17, 2012, Petitioners filed

On April 27, the Court denied the DEP and PUC's application to modify the April 11 Order. The Commonwealth filed appeals to this Court concerning the preliminary injunction order, docketed as Nos. 37 MAP 2012 and 40 MAP 2012. Petitioners have filed motions to dismiss those appeals as moot. The PUC and DEP have filed a motion to stay the appeal pending at Docket No. 40 MAP 2012.

On April 30, 2012, the Commonwealth filed preliminary objections to the Petition.

On May 7, 2012, Petitioners filed a motion for summary judgment, which by Order dated May 10, 2012, the Commonwealth Court converted into a motion for summary relief pursuant to Pa.R.A.P. 1532(b). On May 14, 2012, Petitioners filed an answer and brief in opposition to the Commonwealth's preliminary objections.

On May 21, 2012, the Commonwealth filed an answer and brief in opposition to Petitioners' motion for summary relief. The PUC, its Chairman, the DEP, and its Secretary ("PUC and DEP") also filed a cross-motion for summary relief on May 21, 2012. On June 4, 2012, Petitioners filed an answer to that cross-motion.

On June 6, 2012, an *en banc* panel of the Commonwealth Court heard oral argument on the Commonwealth's preliminary objections, Petitioners' motion for summary relief, and the PUC and DEP's cross-motion for summary relief.

On July 26, 2012, the Commonwealth Court entered an Opinion and Order ("July 26 Order"), which: (1) sustained the Commonwealth's preliminary objections as to Counts IV, V, VI, VII, IX, X, XI and XII of the Petition; (2) granted Petitioners' motion for summary relief as

---

written objections to legislators' intervention, to which legislators responded. The Commonwealth Court denied both petitions to intervene in an opinion and order dated April 20, 2012. Legislators sought reargument in an application filed May 4, 2012, to which Petitioners answered and objected on May 11, 2012. Legislators appealed the April 20, 2012 order, and that appeal is docketed at No. 46 MAP 2012. The Commonwealth Court denied the reargument application on May 25, 2012.

to Counts I, II, III and VIII of the Petition; and (3) denied the Commonwealth's cross-motion for summary relief in its entirety.[2] The Commonwealth filed timely Notices of Appeal and Jurisdictional Statements, which are docketed as Nos. 63 MAP 2012 and 64 MAP 2012. On August 10, 2012, Petitioners filed a consent motion to consolidate these two appeals. On August 17, 2012, Petitioners filed corresponding cross-appeals, which are docketed at Nos. 72 MAP 2012 and 73 MAP 2012.

2. Prior Determinations

All prior determinations are listed above. The slip opinions for the July 26 Order are currently reported as Robinson Township v. Commonwealth, ___A.3d.____, 2012 WL 3030277 (Pa. Commw. 2012).

3. Judges Whose Determination Is To Be Reviewed

The July 26 Order was entered by an *en banc* panel of the Commonwealth Court in 284 MD 2012. The majority opinion was authored by President Judge Dan Pellegrini, who was joined by Judge Bernard L. McGinley, Judge Bonnie Brigance Leadbetter, and Judge Patricia A. McCullough. The dissenting opinion relating to Counts I-III was authored by Judge Kevin Brobson, who was joined by Judge Robert Simpson and Judge Anne E. Covey.[3]

4. Statement of Facts

a. Act 13's Zoning Provisions

As noted above, Act 13 amends the Pennsylvania Oil and Gas Act to establish, in part, a

---

[2] This Brief only addresses those issues raised by Petitioners as Cross-Appellants and does not address the Commonwealth Court's decision concerning Counts I, II, III and VIII, as those will be addressed when Petitioners file their brief as Appellees.

[3] The opinion was filed pursuant to Section 256(b) of the Internal Operating Procedures of the Commonwealth Court. Judge Mary Hannah Leavitt recused herself from this case.

uniform zoning scheme for oil and gas development that applies to every zoning district in every political subdivision in Pennsylvania.

The Act's restrictions on local ordinances are threefold. First, Section 3302 resembles the former preemption provision in the old Oil and Gas Act and was "not intended to change or affect . . . section 602[4] of the Oil and Gas Act." 58 Pa. C.S. § 3302; Section 4(4) of HB 1950. Second, Section 3303 expands the Act's scope to preclude local regulation of oil and gas operations where operations are covered by "environmental acts"[5] — state environmental laws, or federal laws dealing with oil and gas operations — including where local governments are given the authority to regulate under those laws. 58 Pa. C.S. § 3303.

Third, Section 3304 creates a uniform zoning scheme for local ordinances dealing with "oil and gas operations." Specifically, it sets forth a list of requirements that a local ordinance must follow in order to provide for the required "reasonable development of oil and gas resources."[6] 58 Pa. Cons. Stat § 3304(a) & (b). Further, it defines "oil and gas operations" broadly to include, among other activities, well location assessment, drilling, hydraulic fracturing, pipeline operations, processing plants, compressor stations, and ancillary equipment. 58 Pa. Cons. Stat § 3301.

Section 3304 restricts a municipality's ability to specify which types of oil and gas

---

[4] Section 602 of the Oil and Gas Act was the prior preemption provision that this Court interpreted in Huntley & Huntley, Inc. v. Borough Council of the Borough of Oakmont, 600 Pa. 207, 964 A.2d 855 (2009) and Range Res. Appalachia, LLC v. Salem Twp., 600 Pa. 231, 964 A.2d 869 (2009).

[5] The Act defines 'Environmental acts' as "All statutes enacted by the Commonwealth relating to the protection of the environment or the protection of public health, safety and welfare, that are administered and enforced by the department or by another Commonwealth agency, including an independent agency, and all Federal statutes relating to the protection of the environment, to the extent those statutes regulate oil and gas operations." 58 Pa. Cons. Stat. § 3301.

[6] The Municipalities Planning Code requires zoning ordinances to "provide for the reasonable development of *minerals* in each municipality." 53 P.S. § 10603(i) (emphasis added).

operations are permitted in which zoning districts, and how to classify those permitted uses. For example, each municipality must allow "oil and gas operations," except for natural gas processing plants, in all zoning districts. See 58 Pa. C.S. § 3304(b)(1) & (b)(5)-(b)(8). Municipalities must allow impoundment areas as uses permitted by-right in all zoning districts, including residential districts, so long as they are not closer than 300 feet from an existing building. 58 Pa. C.S. § 3304(b)(6). Operators often use impoundment areas to store thousands to millions of gallons of hydraulic fracturing wastewater. Under the Act, impoundment areas, because they are now uses permitted by-right in residential districts, receive similar treatment as residential uses such as single-family dwellings.

To illustrate, Municipal Petitioner Cecil Township's R-2 Medium Density Residential Zoning District allows as permitted uses by right farms, single-family dwellings, two-family dwellings, multi-family dwellings, planned residential developments, customary accessory uses such as satellite dishes and garages, home offices and essential services. Houses of Worship and Daycare Centers are conditional uses, which means that although the use may be authorized, the use may only be constructed upon demonstration to the Cecil Township Board of Supervisors that the development plans satisfy ordinance standards following a duly advertised public hearing allowing for participation by potentially affected landowners.

Now under Act 13, Municipal Petitioner Cecil Township must allow impoundment areas of hydraulic fracturing wastewater as permitted uses by right. The result is that the approval of construction of a church or daycare center in the R-2 Zoning District will require greater local scrutiny than the approval of wastewater impoundments because the latter will be not be subject to any local scrutiny at all. Likewise, under the Act, municipalities have a highly-restricted ability to prohibit or classify as a conditional use drilling operations in residential districts, and

this ability is limited to distances of 300 or 500 feet. As such, drill pad construction and drilling, hydraulic fracturing, and well completion operations are now also placed on par with residential uses by Act 13.

In addition, natural gas compressor stations must be a use permitted by-right in agricultural and industrial zoning districts and a conditional use in all other districts, so long as the compressor station is not closer than seven-hundred fifty (750) feet from an existing building and two-hundred (200) feet from any property line, and the noise level does not exceed either 60dBa at the nearest property line or an applicable federal standard. 58 Pa. C.S. § 3304(b)(7). Natural gas processing plants must be a use permitted by-right in all industrial zoning districts and a conditional use in agricultural zoning districts so long as they also meet the basic requirements listed above.

Also, municipalities cannot impose more stringent conditions, requirements, or limitations on the construction of oil and gas operations than those placed on construction activities for other industrial uses within the municipality's boundaries.[7] Similarly, municipalities cannot impose more stringent conditions or limitations on structure height, screening, fencing, lighting, or noise for permanent oil and gas operations than those imposed on other industrial uses or land development in the particular zoning district where the oil and gas operations are situated. See 58 Pa. C.S. § 3304(b)(7)(ii) & (b)(8)(ii).

Municipalities also cannot impose limits or conditions on subterranean operations, hours of operations of compressor stations and processing plants, or hours of operation for oil or gas well drilling, or for drilling rig assembly and disassembly. 58 Pa. C.S. § 3304(b)(10).

---

[7] This is so even though all other industrial uses would be limited to industrial districts and would be prohibited in other districts, such as residential, agricultural, commercial, village, institutional and resource protection districts.

Municipalities cannot increase setbacks identified in the Act. 58 Pa. Cons. § 3304(b)(11).

Lastly, Act 13 mandates no more than a 30-day review period for uses permitted by-right where a complete application is submitted, and no more than a 120-day review period for conditional uses. 58 Pa. C.S. § 3304(b)(4).

b. Ordinance Review Process, Challenges, Timing

The Act creates a pre-enactment advisory role for the Pennsylvania Public Utilities Commission ("PUC"). It also establishes a local ordinance review process under which the PUC or the Commonwealth Court are the first reviewers of a zoning ordinance.[8]

Prior to enacting an ordinance, the Act empowers the PUC to provide advisory opinions to municipalities on whether a proposed local ordinance dealing with oil and gas operations violates either the MPC or the various restrictions on municipal authority contained in Act 13. 58 Pa. C.S. § 3305(a). The PUC's pre-enactment opinion is advisory in nature, and cannot be appealed. 58 Pa. C.S. § 3305(a)(3). The Act exempts the PUC from following Commonwealth agency, Sunshine Act, and PUC hearing procedures. 58 Pa. C.S. § 3305(c).

After an ordinance is enacted, an "aggrieved" oil and gas operation owner or operator, or an "aggrieved" individual in the particular municipality, can request a similar PUC review. 58 Pa. C.S. § 3305(b). Again, the Act exempts the PUC from following Commonwealth agency, Sunshine Act, and PUC hearing procedures. 58 Pa. C.S. § 3305(c). For post-enactment reviews, the PUC's order can be appealed to the Commonwealth Court. 58 Pa. C.S. § 3305(b)(4). Although the PUC's order becomes a record before the Court, the Court will conduct a *de novo* review. 58 Pa. C.S. § 3305(b)(4).

---

[8] For other validity challenges, the municipality's zoning hearing board would generally review the challenges first and they would not arrive at the Commonwealth Court until after an appeal from a Common Pleas Court decision.

Rather than utilize the PUC, or the typical municipal zoning hearing board process, any person aggrieved by an ordinance's enactment or enforcement can challenge the ordinance in Commonwealth Court without going to the PUC first. 58 Pa. C.S. § 3306(1) & (2)(granting private right of action). Any post-enactment determination by the PUC will become a part of the record before the Court. 58 Pa. C.S. § 3306(3).

The direct consequence of an invalid ordinance is that the municipality will lose access to impact fee funds until the ordinance is amended, or the municipality reverses an unfavorable determination on appeal. 58 Pa. C.S. § 3308. Also, a municipality faces the threat of paying the other party's attorney fees and costs if a court finds that the ordinance was enacted or enforced "with willful or reckless disregard" of the MPC and Act 13's limitations on local zoning authority. 58 Pa. C.S. § 3307 (1).

Under the Second Class Township Code, township supervisors can be assessed a surcharge by the township auditor, regardless of whether the supervisor intended to violate Act 13, the MPC, or the Pennsylvania or U.S. Constitutions. 53 P.S. § 65907. If found to have acted, or failed to act, in violation of the law, supervisors can face a summary offense. 53 P.S. § 65801.

Originally, all municipalities were required to bring all zoning ordinances into conformity with Act 13 *within 120 days* of the effective date of Act 13. 58 Pa. C.S. § 3309(b). The Commonwealth Court's preliminary injunction postponed the effective date of Section 3309 for 120 days from the April 11, 2012 order, providing municipalities more time to review and revise local ordinances. The Commonwealth Court, by Order of July 26, 2012 issued a permanent injunction, and by Order of August 15, 2012, granted relief from any automatic supersedeas caused by the Commonwealth's appeal to this Honorable Court.

c. Limits on Physician Disclosures

The Act includes provisions that require that doctors must agree to keep chemical information confidential as a condition of seeking access to that information in order to treat in emergency situations. 58 Pa. C.S. § 3222.1(b)(11). Further, doctors in non-emergency situations must provide a written statement of need and a confidentiality agreement before being able to receive the information. 58 Pa. C.S. § 3222.1(b)(10). The express language of the Act contains no exceptions for disclosure of the information given to the doctors. 58 Pa. C.S. § 3222.1(b)(10), (b)(11).

5. Order To Be Reviewed

The text of the July 26, 2012 Order is printed above.

6. Statement of Place of Raising or Preservation of Issues

Petitioners raised the questions presented for review to this Court most prominently in their Petition, as well as their motion for summary judgment, which was converted to a motion for summary relief, in their answers and briefs in opposition to preliminary objections, and also their response to the PUC and DEP's cross-motion for summary relief. Likewise, Petitioners argued these questions before an *en banc* panel of the Commonwealth Court on June 6, 2012.

The Commonwealth Court reviewed all questions raised in this appeal in its July 26, 2012 decision. As noted in the questions presented above, the Commonwealth Court decided each of these questions in the negative.

VI. Summary of Argument[9]

The Commonwealth Court erred to the limited extent that it dismissed Counts IV, V, VI, and VII and to the extent that ruled that Dr. Kahn, Delaware Riverkeeper Network and Ms. van Rossum, the Delaware Riverkeeper, lack standing.

Count IV should not have been dismissed because Act 13 violates Article III, Section 32 of the Pennsylvania Constitution. Act 13 is a special law that treats local governments differently and was enacted for the sole benefit of the oil and gas industry. The Commonwealth Court failed to provide any reasoning to justify each aspect of Act 13's differential treatment. The Court below committed an error of law because each difference provided for in the law must be justified on the basis of some legitimate state interest and there must be a reasonable relationship between the two.

The Commonwealth Court also erred in dismissing Count V because Section 3241 of Act 13 authorizes unconstitutional takings of private property in violation of Article I, Sections 1 and 10 of the Pennsylvania Constitution. Section 3241 is unconstitutional on its face because it authorizes private corporations to take interests in real property for the storage of natural gas without any public purpose being served.

Count VI should not have been dismissed because Act 13 denies municipalities the ability to fulfill their constitutional obligations to protect public natural resources under Article I, Section 27 of the Pennsylvania Constitution. Despite having initially recognized that, under Section 27, municipalities hold a responsibility to protect Pennsylvania's public natural resources, the Commonwealth Court's ultimate ruling ignored the fact that this is a

---

[9] As noted above, this Brief only addresses those issues raised by Petitioners as Cross-Appellants and does not address the Commonwealth Court's decision concerning Counts I, II, III and VIII, as those will be addressed when Petitioners file their brief as Appellees.

constitutionally mandated obligation. As such, despite the Court's suggestion that a ***statutory*** enactment – Act 13 – can eliminate a governmental body's ***constitutional*** obligations, the legislature cannot abrogate a constitutional directive. Act 13 does not withstand scrutiny because it causes municipalities to violate their constitutional obligations.

Further, the Commonwealth Court's decision to dismiss Count VII was in error because Act 13 violates the constitutionally-mandated separation of powers. Act 13 unconstitutionally permits the PUC to play an integral role in the exclusively legislative function of drafting legislation and to render opinions regarding the constitutionality of legislative enactments, infringing on a judicial function.

Finally, Dr. Kahn, DRN, and Ms. van Rossum each have a substantial, direct, and immediate interest in the controversy and, thus, each has standing. As a practicing doctor who diagnoses and treats patients in the state's gas drilling region, Act 13's confidentiality restrictions force Dr. Kahn to choose between multiple undesirable outcomes: harm patient health, risk medical malpractice, or violate record-keeping laws and other medical and ethical obligations. Because of the serious threat to patient health that results from the confidentiality restrictions, Dr. Khan does not have to wait until a patient arrives in his office to challenge Act 13's restrictions. Lastly, Maya van Rossum—the Delaware Riverkeeper—and DRN have a direct, substantial, and immediate interest in maintaining zoning protections in the Delaware River Basin where she and DRN's members live, work, and recreate. Like individual petitioners Ball and Coppola, whose standing was recognized below, DRN members and Ms. van Rossum rely on zoning ordinances that separate incompatible land uses to protect their property interests, homes, farms, water supplies, health, and recreational interests. They thus have standing to challenge Act 13, which would remove those protections, including public participation rights.

Article III, Section 32. Consequently, Act 13 violates Article III, Section 32 of the Pennsylvania Constitution. The Commonwealth Court's decision granting judgment against Petitioners on Count IV should therefore be reversed. Instead, judgment should be entered on Count IV in favor of Petitioners.

2. Act 13 Is Unconstitutional Because It Authorizes Takings For Private Purposes

Section 3241 of Act 13 authorizes unconstitutional takings of private property for a private purpose in violation of Article I, Sections 1 and 10 of the Pennsylvania Constitution. The Commonwealth Court's decision dismissing Count V should therefore be reversed.

Section 3241 of Act 13, entitled "eminent domain," states, in part:

> [e]xcept as provided in this subsection, a corporation empowered to transport, sell or store natural gas or manufactured gas in this Commonwealth may appropriate an interest in real property located in a storage reservoir or reservoir protective area for injection, storage and removal from storage of natural gas or manufactured gas in a stratum which is or previously has been commercially productive of natural gas.

58 Pa. C.S. § 3241.

In dismissing Petitioners' argument, the Commonwealth Court simply held that the "Petitioners failed to state a claim upon which relief may be granted under Count V because they have failed to allege and there are no facts offered to demonstrate that any of their property has been or is in imminent danger of being taken, with or without just compensation." Robinson Tp. v. Com., --- A.3d ----, 2012 WL 3030277 *16-17 (Pa. Commw. 2012). The Court further stated that "even if they had an interest that was going to be taken, we could not hear this challenge in our original jurisdiction because the exclusive method to challenge the condemnor's power to take property is the filing of preliminary objections to a declaration of taking." Id.

The Petitioners do not allege that they have had property condemned nor do they argue that this is an eminent domain case. By its narrow holding on this issue, the Commonwealth Court is attempting to "sidestep" the thrust of Petitioner's argument that Section 3241 of Act 13 is unconstitutional on its face. This Honorable Court has the ultimate power to interpret the Constitution and determine what is constitutional. Mesivtah Eitz Chaim of Bobov, Inc. v. Pike County Bd. of Assessment Appeals, __ Pa. ____, 44 A.3d 3, 7 (2012). The General Assembly cannot alter the Constitution by purporting to define its terms in a manner inconsistent with judicial construction and interpretation. Id. at 7 (citing Pottstown School District v. Hill School, 786 A.2d 312, 319 (Pa. Commw. 2001)). To that end, this Court has clearly established that "private property can only be taken to serve a public purpose" and that "to satisfy this obligation, the public must be the primary and paramount beneficiary of the taking." In re Opening Private Road for Benefit of O'Reilly, 607 Pa. 280, 299, 5 A.3d 246, 258 (2010). On its face, Section 3241 of Act 13 does not meet this constitutional threshold.[13]

Act 13 is void of any expressly stated public purpose to be served by Section 3241. Act 13 authorizes private corporations to take interests in real property for the storage of natural gas

[13] The United States and Pennsylvania Constitutions mandate that private property can only be taken to serve a ***public*** purpose. In re Opening Private Rd. for Benefit of O'Reilly, 607 Pa. 280, 5 A.3d 246 (2010). Private property cannot be taken for the benefit of another private property owner. Kelo v. City of New London, 545 U.S. 469 (2005). This Honorable Court has held that to satisfy this obligation of serving a "public purpose," the public must be the primary and paramount beneficiary of any taking. In re Opening Private Rd. for Benefit of O'Reilly, 607 Pa. at 299, 5 A.3d at 258. In considering whether a primary public purpose was properly invoked, the Pennsylvania Commonwealth Court has looked for the "real or fundamental purpose" behind a taking. In re Opening a Private Rd. for Benefit of O'Reilly Over Lands of (a) Hickory on Green Homeowners Ass'n & (b) Mary Lou Sorbara, 22 A.3d 291 (Pa. Commw. Ct. 2011) (on remand from the Pennsylvania Supreme Court) (citing Middletown Township v. Lands of Stone, 595 Pa. 607, 617, 939 A.2d 331, 337 (2007)). "Stated otherwise, the true purpose must primarily benefit the public." Id.

without any public purpose being served.[14] If this use is a "public purpose," which Petitioners do not concede, then any oil and gas corporation by analogy could have the right by use of eminent domain powers to acquire real property for storage reservoirs and for protective areas around those reservoirs.

Moreover, Section 3241 is inconsistent with the limitations on the use of eminent domain under the Property Rights Protection Act. 26 Pa. C.S. § 201 *et seq*. Pursuant to the Act, except as set forth in § 204(b), "the exercise by any condemnor of the power of eminent domain to take private property in order to use it for private enterprise is prohibited." 26 Pa. C.S. § 204(a). Specifically, the appropriation of an interest in real property by a corporation for the storage of natural or manufactured gas is not listed as an exception under § 204(b), nor clearly covered under the definition of "public utility," which are those entities allowed to engage in the transportation and sale of gas. See 66 Pa. C.S. § 102. Further, nothing in Section 3241 necessarily limits the eminent domain power to public utility corporations.

Because it cannot be justified on the basis of any paramount public purpose, Section 3241 of Act 13 authorizes unconstitutional takings of private property for a private purpose in violation of Article I, Sections 1 and 10 of the Pennsylvania Constitution. The Commonwealth Court's decision granting judgment against Petitioners on Count V should therefore be reversed. Instead, judgment should be entered on Count V in favor of Petitioners.

3. Act 13 Denies Municipalities The Ability To Fulfill Their Constitutional Obligations To Protect Public Natural Resources Under Article I, Section 27 Of The Pennsylvania Constitution

Act 13 violates Article I, Section 27 of the Pennsylvania Constitution by denying

[14] Petitioners recognize that this provision also existed in the Oil and Gas Act prior to the enactment of Act 13.

EXHIBIT 5

IN THE SUPREME COURT OF PENNSYLVANIA

Nos. 72 & 73 MAP 2012

ROBINSON TOWNSHIP, ET AL.
Cross-Appellants

v.

COMMONWEALTH OF PENNSYLVANIA, ET AL.
Cross-Appellees

REPLY BRIEF OF CROSS-APPELLANTS

Cross-Appeal From The Order Of The Commonwealth Court Entered
On July 26, 2012, Docket No. 284 M.D. 2012

John M. Smith, Esquire
Pa. I.D. No. 75663
Jennifer Fahnestock, Esquire
Smith Butz, LLC
125 Technology Drive, Suite 202
Bailey Center I, Southpointe
Canonsburg, PA 15317
(724) 745-5121

Jonathan M. Kamin, Esquire
Pa. I.D. No. 81958
John Arminas, Esquire
Goldberg, Kamin & Garvin LLP
1806 Frick Building
Pittsburgh, PA 15219
(412) 281-1119

William A. Johnson, Esquire
Pa. I.D. No. 14906
23 East Beau Street
Washington, PA 15301
(724) 225-3955

Jordan B. Yeager, Esquire
Pa. I.D. No. 72947
Lauren M. Williams, Esquire
Curtin & Heefner LLP
Heritage Gateway Center
1980 South Easton Road, Suite 220
Doylestown, PA 18901
(267) 898-0570

Susan J. Kraham, Esquire
Pa. I.D. No. 310292
Columbia University School of Law
435 West 116th Street
New York, New York 10027
(212) 854-5008

COUNSEL FOR CROSS-APPELLANTS

TABLE OF CONTENTS

TABLE OF AUTHORITIES

CASES

STATUTES

Pennsylvania

United States

CONSTITUTIONAL PROVISIONS

I. Summary of Argument

The Commonwealth repeatedly mischaracterizes Petitioners' claims and repeatedly asserts that Act 13 is constitutional, simply because the General Assembly has the power to legislate. In legislating, however, the General Assembly must respect the Constitution. The General Assembly cannot choose to favor the oil and gas industry simply because it wants to. The General Assembly cannot violate the Constitutionally-mandated separation of powers. The General Assembly cannot authorize takings for merely private purposes. The General Assembly cannot require municipalities to breach their obligations under Article 1, Section 27 of the Pennsylvania Constitution. In enacting Act 13, the General Assembly violated each of these dictates. Act 13 is therefore unconstitutional.

II. Argument

A. Act 13 Is A Special Law Because The Statutory Classifications Made By The General Assembly Are Not Reasonably Related To A Legitimate State Purpose

The Commonwealth continually maintains, and has argued repeatedly in its briefs, that the General Assembly may permissibly create statutory classifications in the law without violating Article III, Section 32 of the Pennsylvania Constitution. See Brief of Agency Appellants, at pp. 6-7; see also Brief of Attorney General, at p. 24. Petitioners do not dispute this point. However, the Commonwealth's argument essentially states that because the General Assembly maintains this power, the classifications found within Act 13 are *automatically* constitutional. See Brief of Agency Appellants, at p. 7. This extension is clearly unsupported and unwarranted. If the Commonwealth's position were to be accepted as true, the equal protection principles embodied in Article III, Section 32 would be of no effect and judicial review of the same would be rendered meaningless.

treatment distinct from all other industries, including similarly-situated energy and extraction industries. Nothing unique distinguishes the oil and gas industry from other similarly-situated industries to justify Act 13's distinctions, such as local zoning, and medical diagnosis and treatment. See R.1263a-64a. These distinctions are not related in any way to anything inherently different about the oil and gas industry, except the legislature's unconstitutional desire to provide it with a unique set of benefits.

Based upon the foregoing, there is no rational basis that could sustain the distinctions made in Act 13 to benefit the oil and gas industry. The statutory classifications in Act 13 fail to serve or further a legitimate state purpose. Therefore, this Honorable Court should declare these provisions unconstitutional, and reverse the Commonwealth Court's decision as to Count IV.

B. Act 13 Is Unconstitutional Because It Authorizes Takings For Private Purposes

Section 3241 of Act 13 authorizes unconstitutional takings of private property for a private purpose in violation of Article I, Sections 1 and 10 of the Pennsylvania Constitution. The Commonwealth Court's decision dismissing Count V should therefore be reversed.

Section 3241 of Act 13, entitled "eminent domain," states, in part:

> [e]xcept as provided in this subsection, a corporation empowered to transport, sell or store natural gas or manufactured gas in this Commonwealth may appropriate an interest in real property

---

preserve it. Further, this new argument is not prompted by anything new Petitioners have stated, but rather refers back to Petitioners' prior arguments as they were set forth before the Commonwealth Court. See Brief of Agency Appellants, at p. 9 (citing Brief of Cross-Appellants); cf., e.g., R.744a-52a. As such, the Commonwealth's "incidental operation" argument is not properly before this Court. Moreover, despite the Commonwealth's assertion, Petitioners have simply not argued that Act 13's impact on local municipalities is incidental. Act 13 likewise regulates local municipalities to the extent it limits their ability to draft local ordinances unique to their community for the protection of distinctive regional characteristics, a police power that this Court found to be a proper and prudent exercise. See Huntley, *infra*. Likewise, Act 13's special treatment of the oil and gas industry — e.g., for zoning, for medical care, and for drinking water notification — does not correlate to any unique differences that distinguish this industry from other energy or extraction industries.

> located in a storage reservoir or reservoir protective area for injection, storage and removal from storage of natural gas or manufactured gas in a stratum which is or previously has been commercially productive of natural gas.

58 Pa. C.S. § 3241.

The Commonwealth and PUC argue that Petitioners have set forth no facts to demonstrate that any of the Petitioners' property is in imminent danger of being taken; thus, Petitioners' claim is not ripe for consideration. Although already addressed in their Appellate brief, Petitioners do not allege that they have had property condemned nor do they argue that this is an eminent domain case. To the contrary, Petitioners assert ***that Section 3241 of Act 13 is unconstitutional on its face***. "[P]rivate property can only be taken to serve a public purpose" and that "to satisfy this obligation, the public must be the primary and paramount beneficiary of the taking." In re Opening Private Road for Benefit of O'Reilly, 607 Pa. 280, 299, 5 A.3d 246, 258 (2010). Section 3241 of Act 13 does not meet this constitutional threshold.[4]

While not addressed by the Commonwealth Court in its July 26, 2012, Opinion and Order, both the Commonwealth and PUC again argue that the power of eminent domain set forth in Section 3241 is limited to only public utilities; and not "any oil and gas company." The Commonwealth and the PUC argue that only public utilities are "empowered" to transport, sell or store natural gas or manufactured gas in this Commonwealth. The express language of Act 13 does not support their position. At a minimum, oil and gas companies and their transporters cannot meet the definition of a "public utility" as they are not producers of natural gas engaged in distribution of such gas directly to the public for compensation. See 66 Pa.C.S. §102.

Moreover, glaringly absent from Section 3241 is any language limiting the eminent domain power to only "public utility" corporations. Private oil and gas companies and their

---

[4] See Brief of Cross-Appellants, pp. 29-31.

transporters throughout this Commonwealth "transport, sell or store natural gas." Thus, if Section 3241 is found Constitutional, these oil and gas companies and their transporters would also enjoy the power of eminent domain pursuant to Section 3241.

Section 3241 is also inconsistent with the limitations on the use of eminent domain under the Property Rights Protection Act. 26 Pa. C.S. § 201 *et seq*. Pursuant to the Act, except as set forth in § 204(b), "the exercise by any condemnor of the power of eminent domain to take private property in order to use it for private enterprise is prohibited." 26 Pa. C.S. § 204(a). Specifically, the appropriation of an interest in real property by a corporation for the storage of natural or manufactured gas is not listed as an exception under § 204(b), nor clearly covered under the definition of "public utility." Moreover, as explained above, Section 3241 is not limited to only public utilities but includes other private companies that transport, sell or store natural gas in the Commonwealth.

C. Act 13 Violates Article I, Section 27 Of The Pennsylvania Constitution

The Commonwealth's arguments against Petitioners' Section 27 claims are premised on mischaracterizations of the municipalities' position.

The Commonwealth agencies argue that "Section 27 cannot be used to expand a government entity's powers beyond those granted by the General Assembly." Brief of Agency Appellants, at 13 (citing Belden & Blake Corp. v. Comm. Dep't of Conserv. & Natural Res., 600 Pa. 559, 567, 969 A.2d 528, 532-33 (2009) and Community Coll. of Delaware County v. Fox, 20 Pa. Commw. 335, 342 A.2d 468 (1975)). This argument mischaracterizes Petitioners' claim. Municipal Petitioners do not assert that Section 27 expands their powers. Rather, Section 27 limits their powers. Section 27 limits the ability of Municipal Petitioners to act in a manner that fails to "conserve and maintain" Pennsylvania's public natural resources "for the benefit of all

Pennsylvania Constitution.

Act 13 fundamentally upsets the notions of separation of powers and checks and balances that have been the hallmark of our government since the 1780's, with the legislature in charge of making laws, the executive overseeing enforcement and the judicial responsible for interpretation. Wayman v. Southard, 23 U.S. 1 (1825). Each branch of government has its own unique powers that are not shared with other branches. Citizens' Savings and Loan Ass'n v. City of Topeka, 87 U.S. 655 (1874). By Act 13, the PUC, an administrative agency appointed by the executive branch, has been delegated a purely judicial function that is violative of separation of powers principles. Accordingly, it is respectfully requested that this Honorable Court reverse the decision of the Commonwealth Court as it relates to Count VII.

E. Dr. Khan, The Delaware Riverkeeper Network, And Maya Van Rossum Have Standing And Dr. Khan Is Entitled To Summary Relief

Act 13 substantially, directly and immediately impacts Dr. Khan, the Delaware Riverkeeper Network ("DRN"), and Maya van Rossum. Dr. Khan is a practicing physician in Allegheny County now subject to restrictions that threaten his ability to effectively treat his patients, including communicating with necessary specialists. DRN's members live, work, and recreate in areas protected by local ordinances, protections that Act 13 will eviscerate. The Commonwealth now raises new arguments that were previously waived and misrepresents Petitioners' interests in order to minimize Act 13's impact. Petitioners respond to each of these points, including the Commonwealth's discussion of the merits of Dr. Khan's claims.

1. Dr. Khan Has Standing And Is Entitled To Summary Relief

In attacking Dr. Khan's standing and the merits of his claims, the Commonwealth makes a number of incorrect assertions in order to avoid the fact that Act 13 impacts Dr. Khan as a practicing physician in gas drilling country. Each of these assertions, including a newly-raised

and incorrect claim about federal chemical disclosure laws, will be addressed in turn. Dr. Khan has standing, and this Honorable Court should therefore consider Dr. Kahn's claims and grant summary relief, or remand to the Commonwealth Court for such consideration.

a) Dr. Khan's Standing

The Commonwealth first incorrectly asserts that Dr. Khan assumes that he can "freely obtain and disclose proprietary information from other entities." Brief of Agency Appellants, at p. 28. The Commonwealth also incorrectly claims that Dr. Khan seeks to use the information for *non*-medical purposes. Brief of Attorney General, at p. 23. Nothing Petitioners have set forth supports such statements.

Dr. Khan is concerned with his basic ethical and legal obligations to his patients as a practicing doctor in the Commonwealth of Pennsylvania, and how Act 13 conflicts with and impinges on those obligations. He is likewise concerned with how these restrictions threaten his ability to competently practice medicine and to properly treat his patients. Act 13 burdens information-sharing in the patient treatment process, including between doctors and specialists, raising significant threats to patient health.[7] These are concrete and real risks that Dr. Khan now faces given Act 13's restrictions.

The Commonwealth tries extensively to belittle such risks, including by newly and wrongly claiming that Act 13's restrictions are equivalent to standards under federal chemical disclosure laws. Brief of Agency Appellants, at pp. 25-26. The Commonwealth has never before claimed that Dr. Kahn lacks standing on this basis, and therefore waived this issue. Further, even if this new argument were properly before this Court, Act 13's doctor restrictions are not "the

[7] Further, Act 13 prevents valuable and proper information sharing between medical professionals for the purpose of building a medical and public health base of knowledge to address adverse health effects of oil and gas operations and develop proper treatment protocols.

Pennsylvania equivalent" of standards under the federal Emergency Planning and Community Right-to-Know Act ("EPCRA").[8] Brief of Agency Appellants, at 25. If this were so, Act 13 would be superfluous. Rather, Act 13 is more restrictive than the EPCRA and its state counterpart, the Pennsylvania Hazardous Material Emergency Planning and Response Act ("Pa. Chemical Disclosure Law"). The Commonwealth's misrepresentations cannot detract from the fact that Dr. Khan is indeed subject to new restrictions under Act 13 that prevent him from communicating as he needs to in order to treat his patients effectively and to fulfill his ethical and legal obligations as a doctor in the Commonwealth of Pennsylvania.

First, while the EPCRA and its Pennsylvania counterpart are explicit in that they do not override health care professionals' information-sharing and record-keeping obligations, Act 13 contains no such limitation. Cf. 42 U.S.C. § 11041(a)(1) & (a)(3), 35 P.S. § 6022.304(b). Second, unlike EPCRA, Act 13 burdens doctors' communication from the very beginning of an emergency by requiring verbal acknowledgements of both confidentiality and that the information will be used solely for the health needs asserted *at the beginning of the emergency*, regardless of whatever issues may arise during the particular treatment process. 58 Pa.C.S. § 3222.1(b)(11); cf. 42 U.S.C. § 11043(b).

---

[8] The EPCRA is a comprehensive federal law that addresses chemical disclosure. 42 U.S.C. §§ 11001-11050. It details procedures for determining when information is a "trade secret," and for ensuring that adverse effects of chemicals withheld as trade secrets are still publicly available. 42 U.S.C. § 11042, see also 42 U.S.C. § 11042(h). It provides for disclosure of chemical information such as material safety data sheets ("MSDSs") to emergency personnel. 42 U.S.C. §§ 11021-22. Also, it provides for disclosure of chemical information, including trade secrets, for both medical treatment and preventative medical or public health assessments. 42 U.S.C. § 11043. The EPCRA does not preempt state law. 42 U.S.C. § 11041(a)(1). The Pennsylvania law that both supplements and complements the EPCRA is the Pennsylvania Hazardous Material Emergency Planning and Response Act ("Pa. Chemical Disclosure Law"). 35 P.S. § 6022.304(a), see 35 P.S. §§ 6022.101-6022.307. Neither the EPCRA nor the Pa. Chemical Disclosure Law preempts or supersedes obligations under other federal or state laws. 42 U.S.C. § 11041(a)(1) & (a)(3), 35 P.S. § 6022.304(b).

Third, unlike EPCRA, Act 13 blocks non-physicians, including epidemiologists and toxicologists, from accessing trade secrets and "confidential proprietary information" for diagnosis and treatment. 58 Pa.C.S. § 3222.1(b)(10)-(b)(11); 58 Pa.C.S. § 3203 (defining "health professional"); cf. 42 U.S.C. § 11043(a), (c), & (d). As illustrated in Petitioners' briefs, this is a significant and dangerous barrier for doctors trying to determine the cause of illnesses as non-physician specialists like toxicologists are integral to the diagnosis and treatment process. R.772a-76a.

Fourth, unlike EPCRA, Act 13 lacks any basic statutory guidelines as to scope and breadth of confidentiality agreements. Act 13 gives the Environmental Quality Board ("EQB") complete discretion over the terms of these confidentiality agreements, creating additional uncertainty for practitioners. 58 Pa.C.S. § 3222.1(b)(10)-(b)(11); 58 Pa.C.S. § 3274; cf. 42 U.S.C. § 11043(d). Lastly, unlike EPCRA, Act 13 bars access to trade secrets and confidential proprietary information for preventative public health assessments, including assessments of the hazards of exposure to chemicals posed to those living in a local community. Cf. 42 U.S.C. § 11043(c)(2)(A).

As such, Act 13 differs sharply from the EPCRA and its state counterpart, reflecting the new restrictions that Dr. Khan must now confront and the new limitations on his ability to properly diagnose and treat his patients. See Bayada Nurses, Inc. v. Com. of Pennsylvania, Dept. of Labor and Industry, 607 Pa. 527, 542-45, 8 A.3d 866, 875-876 (2010); Arsenal Coal Co. v. Com., Dept. of Envtl. Res., 505 Pa. 198, 209-10, 477 A.2d 1333, 1339-40 (1984).

Further, such harm is imminent as Dr. Khan is *currently* a *practicing* physician who serves patients in an area with active gas drilling and development activity—Allegheny County—and not some location far away from hydraulic fracturing. As such, this Court should

reject the Commonwealth's continued arguments that Dr. Kahn's harm is merely speculative.

With standing, the "concern is to distinguish those who have suffered some individual injury from those asserting only the common right of the entire public that the law be obeyed." William Penn Parking Garage, Inc. v. City of Pittsburgh, 464 Pa. 168, 203, 346 A.2d 269, 287 (1975)(plurality). Dr. Khan is not just some member of the public. Rather, the harm of Act 13's restrictions on Dr. Khan "is removed from the cause by only a single short step." 464 Pa. at 208; 346 A.2d at 289. That "single short step" is the patient's arrival in Dr. Khan's office seeking treatment for a serious illness or other reaction due to direct or ambient exposure to chemicals from hydraulic fracturing operations in both Allegheny and surrounding counties. As much as the Commonwealth attempts to belittle the issue, Act 13 now restricts the doctor's ability to treat his patients in accord with his ethical and legal obligations, threatening the very patients coming in for treatment.[9] Dr. Khan simply cannot ask his patient to wait while he challenges the Act's restrictions because the patient could die in the meantime or suffer serious health complications. As such, Dr. Khan has standing and the Commonwealth Court's decision in this regard should be reversed.

b) Merits Of Dr. Kahn's Claims[10]

Should this Court choose to address the merits of Dr. Khan's claims, rather than remand

[9] In contrast, in Pittsburgh Palisades Park the petitioners could only show remote harm because they would have sooner *benefited* from the statute's operation than have suffered harm; the harm depended on a variety of external events including Gaming Board changes. Pittsburgh Palisades Park, LLC v. Com., 585 Pa. 196, 205, 888 A.2d 655, 660-61 (2005). Further, the petitioners in that case had not even applied for a gaming license, or begun development. Id. at 205, 660-61. Also, the presence or lack thereof of agency regulations has no impact here because Act 13, by its plain language, restricts Dr. Khan's ability to practice medicine in accordance with ethical and legal obligations. Agency regulations cannot change the language of the statute. Likewise, agency regulations cannot make constitutional an otherwise unconstitutional statutory provision.

[10] Because the Commonwealth raised a new argument as to existing chemical disclosure laws, Petitioners address the impact of this new argument on the merits of Dr. Khan's claims.

to the Commonwealth Court, this Court should enter judgment in favor of Dr. Kahn on those claims. Act 13's doctor restrictions violate Article III, Section 32 of the Pennsylvania Constitution because they constitute a special law. R.770a-77a. Also, these restrictions violate the single-subject rule in Article III, Section 3 of the Pennsylvania Constitution. R.777a-78a. Rather than restate Petitioners' arguments on the merits of these claims, Petitioners respectfully incorporate arguments previously briefed at R.770a-78a. Petitioners limit the discussion here to the new issues raised in the Commonwealth's briefs.

First, the Commonwealth admits that the purpose of Act 13's doctor restrictions is to "protect the economic interests of the oil and gas industry," rather than to regulate oil and gas development. Brief of Attorney General, at p. 23. There is no "manifest peculiarit[y]" pertaining to the oil and gas industry that justifies such restrictions on doctors solely to benefit the oil and gas industry. Allegheny County v. Monzo, 509 Pa. 26, 44, 500 A.2d 1096, 1105 (1985) (citing Commonwealth v. Gumbert, 256 Pa. 532, 534, 100 A. 990, 991 (1917)).

Second, the sharp contrast outlined above between Act 13 and both the EPCRA and the Pa. Chemical Disclosure Law demonstrates the single-subject violation and the irrationality of the General Assembly's classification in Act 13.[11] Act 13 blocks preventative health assessments of the effects of hydraulic fracturing chemicals, burdens doctors in emergency situations with additional confidentiality requirements, and changes the rules for confidentiality agreements by giving complete discretion over the agreements to the EQB. Act 13 imposes such diagnosis and treatment barriers despite the fact the chemical disclosure laws applicable to all other chemical users and industries do not do so, while still providing trade secret protection.

---

[11] Contrary to the Commonwealth's argument, the existence of a federal law or purportedly similar statutes in other states is not relevant to whether the physician gag-rule provisions of Act 13 violate the Pennsylvania Constitution. See Brief of Agency Appellants, at p.25 & n.8.

There is no rational reason for such preferential treatment of the oil and gas industry, and the Commonwealth essentially admits as much. Brief of Attorney General, at p. 23 (indicating Act 13's doctor restrictions "protect the economic interests of the oil and gas industry").

Further, the Commonwealth continues to claim that the doctor restrictions are germane to oil and gas regulation.[12] Brief of Agency Appellants, p. 28. They are not. As this Court has noted in rejecting a similar unsuccessful effort to justify differential treatment, "no two subjects are so wide apart that they may not be brought into a common focus, if the point of view be carried back far enough." City of Philadelphia v. Com., 575 Pa. 542, 578, 838 A.2d 566, 588 (2003) (citing Payne v. School Dist. of Borough of Coudersport, 168 Pa. 386, 389, 31 A. 1072, 1074 (1895)(per curiam)). That is the case here. The doctor restrictions in Act 13 do not *regulate* the oil and gas industry. Rather, the provisions only *benefit* the oil and gas industry by giving it additional protection for "trade secret[s] or confidential proprietary information" that other industries do not enjoy.

Indeed, if the legislature had placed Act 13's physician gag order provisions in the Pa. Chemical Disclosure Law, the uniqueness of the carve-out for the oil and gas industry would be even more obvious.[13] The provisions impose physician restrictions that only apply to the oil and gas industry and that are not contained in the chemical disclosure and public health framework that applies to every other chemical user and industry.

---

[12] The Commonwealth also claims that a law is not an unconstitutional "special law" if it incidentally impacts those who are not directly the subject of the legislation. Brief of Agency Appellants, at pp.9-10, 28. As noted earlier, the Commonwealth waived this argument by failing to raise it below. Further, even if that contention were true, it would support Dr. Kahn's claim that Act 13 violates the single-subject rule. To say, as the Commonwealth does, that Act 13 only impacts doctors "incidentally" is to acknowledge that Act 13's restrictions on the practice of medicine are unrelated to the expressed subjects of the Act.

[13] Instead, the General Assembly inserted the doctor restrictions into Act 13 during conference committee shortly before the final law was voted on. R.778a.

Act 13's provisions force doctors to risk the health of patients potentially exposed to hydraulic fracturing chemicals because of restricted communication, and a complete bar on preventative health assessments of those same chemicals. As such, this Court should enjoin Act 13's doctor restrictions.

2. DRN And Ms. van Rossum Have Standing

The Commonwealth again attempts to avoid DRN and Ms. van Rossum's standing by falsely claiming that the only interest asserted is in "Act 13's alleged failure to adequately protect the environment." Brief of Attorney General, at p. 22 & n.3, n.4; Brief of Agency-Appellants, at p. 29. As detailed extensively throughout this litigation, DRN's and Ms. van Rossum's interests encompass those of landowners, business owners, and community members who live, work, and recreate in areas ***currently protected by local zoning ordinances.*** Like Petitioners Ball and Coppola, who were found to have standing, DRN Petitioners' property, business, and recreational interests will be severely damaged if Act 13 stands. Act 13 will eviscerate these protective local ordinances without respect for due process and without a meaningful opportunity to be heard. Brief of Cross-Appellants, at p.56-64; see also, e.g., R.1065a-67a (Brief in Response to Preliminary Objections). As such, DRN and Ms. van Rossum have standing.

III. Conclusion

For the foregoing reasons, and those detailed in Petitioners' prior briefs, Petitioners respectfully respect that the Court enter judgment in favor of Petitioners on Counts IV, V, VI, VII, XI and XII.

EXHIBIT 6

Diesel spill polluted Greene Co. waterway

3/8/2012 3:32 AM

Officials in Greene County were unaware a 480-gallon diesel spill had leaked into a high-quality waterway in Center Township in December until they were contacted by news media this week.

"We were never notified," said Edward "Butch" Deter, chairman of the township's board of supervisors and president of Center Township Volunteer Fire Department.

Deter said he knows the state Department of Environmental Protection was under no obligation to notify the township but considered it a common courtesy to do so.

The spill occurred at an EQT Corp. well site when a worker there was transferring fuel from one tank to another and did not realize it was seeping out, said John Poister, a spokesman for the DEP.

EQT alerted the DEP about the spill that entered nearby Patterson Run. The company contained the spill and cleaned up the surrounding land and water, Poister said.

"There could have been several scenarios that played where we needed to know this happened," Deter said. "As a fire department and township official, we have been called several times to assist with spills."

Deter said it may be a far reach, but if someone were drafting water from the creek and it still contained diesel fuel, it could be a problem, especially if it were being used to fight a fire.

"You would have thought we would have been notified somehow just as a courtesy, more as an informational item, but that did not happen," said Jeff Marshall, chief clerk for Greene County. Marshall said with the One Call system, it would have been simple to alert township and county officials.

Poister said the DEP followed its regulations for a call such as this, which did not require notifying local municipalities.

"We did not consider this to be a major incident. Anytime a high quality waterway is impacted, we want to respond quickly," Poister said. "We have seen EQT's soil and water testing results. What we have seen downstream is the readings are low. They are below the minimum approved contamination levels."

Poister said there is another inspection taking place, and additional samplings will be taken at that time, but the DEP did not believe there is anything in the water now.

He said in the case of a major spill, municipalities would be notified by the first responders who were called to assist.

"If nothing else, it would have helped to know what is going on there if someone asked," Deter said. "It doesn't reflect well on us if someone called and we couldn't tell them."

Deter said he saw buoys on the property but thought they were part of excavation work taking place.

"It is private property. We were not aware there was a problem," he said. "I spoke with Morris

Township, and they did not know either."

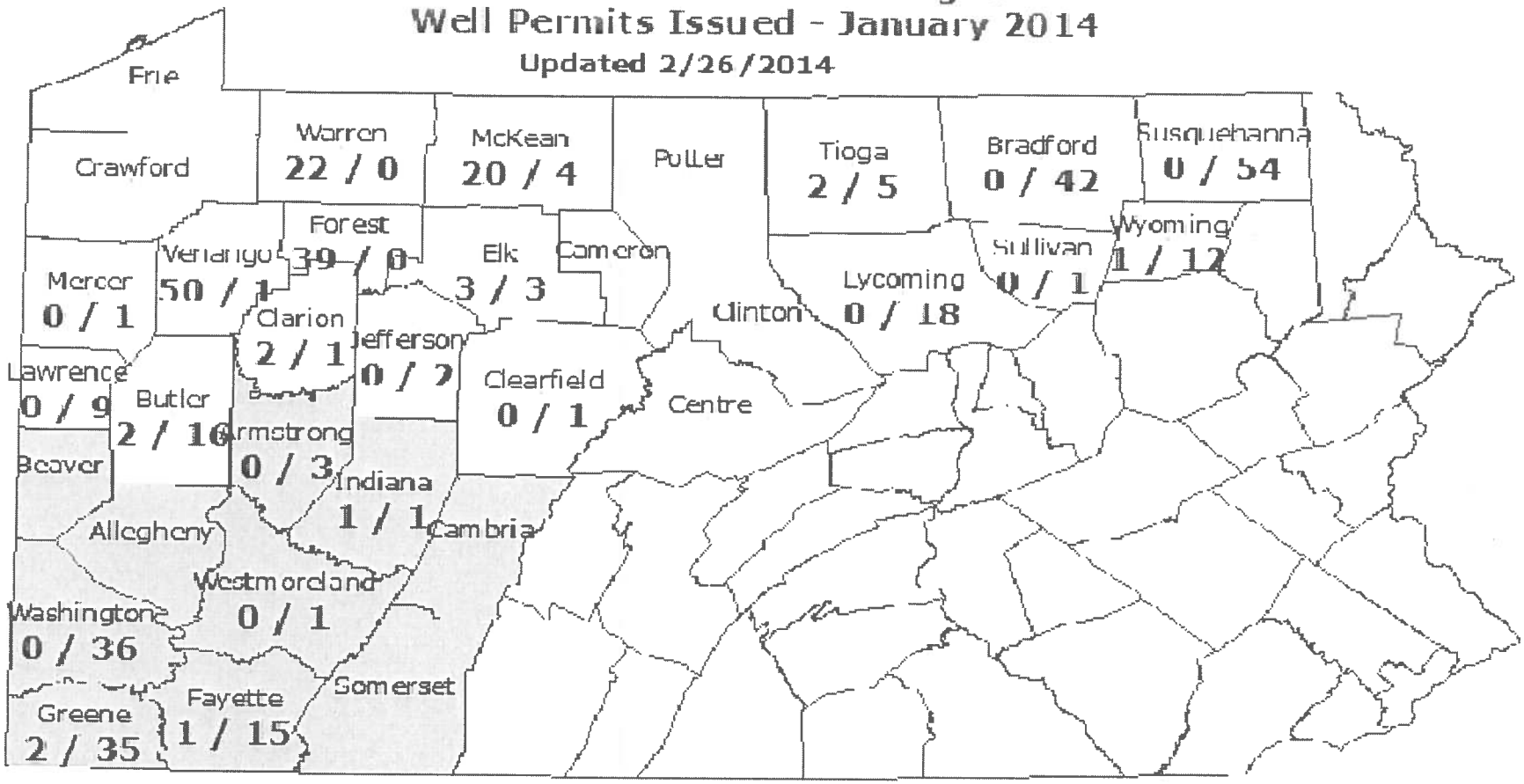
Patterson Run extends through both Center and Morris Townships.

The DEP began its investigation Dec. 8. A notice of violation was issued to EQT and a fine is possible, Poister said. He was unsure of the actual date of the spill but believed it to have been either Dec. 7 or Dec. 8.

A call to EQT Wednesday was not returned.

EXHIBIT 7

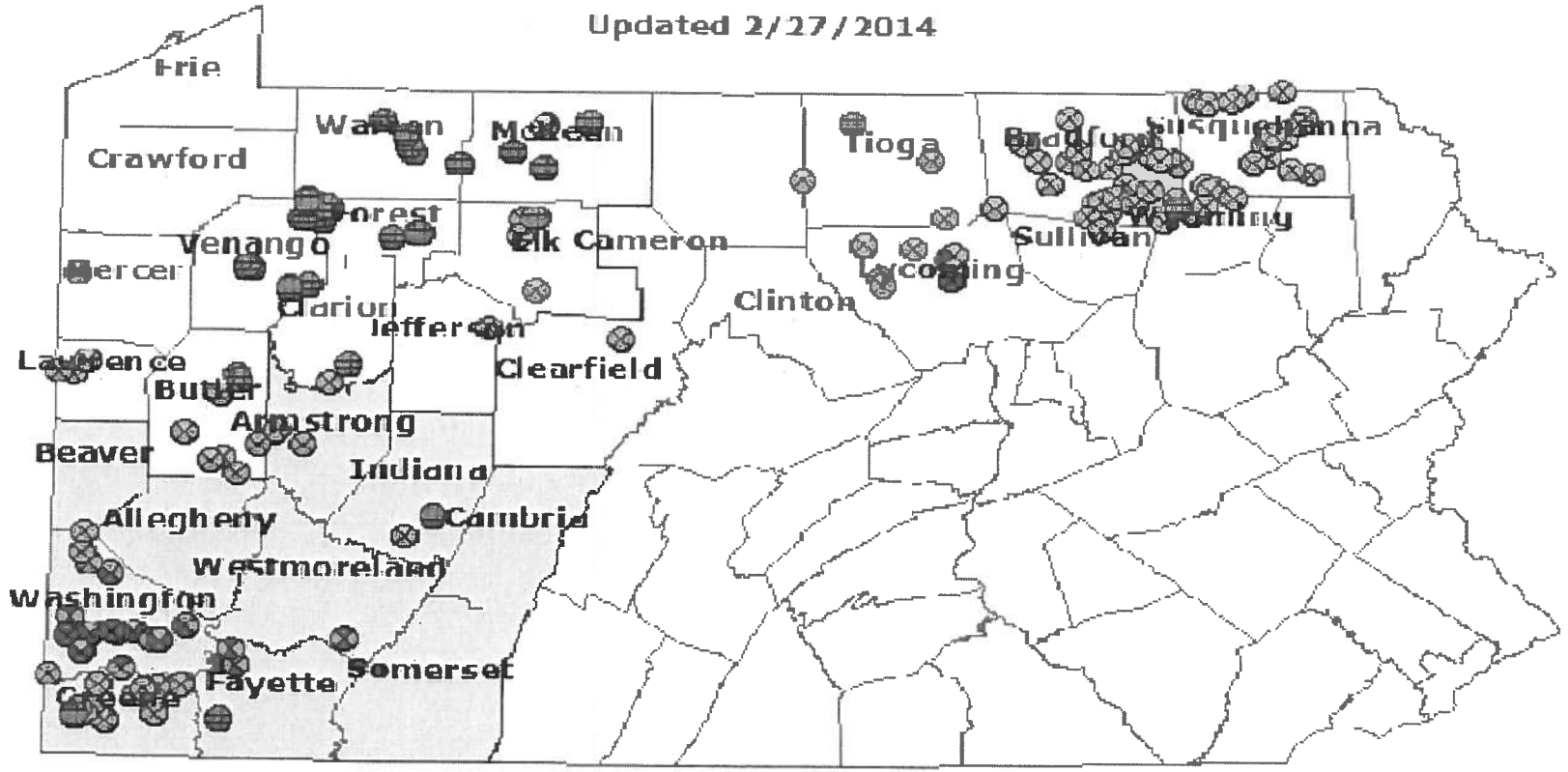
Department of Environmental Protection
Office of Oil and Gas Management
Well Permits Issued - January 2014
Updated 2/26/2014



Conventional - 145 + Unconventional - 261 = Total - 406

Department of Environmental Protection
Office of Oil and Gas Management
Wells Drilled Locations - January 2014

Updated 2/27/2014

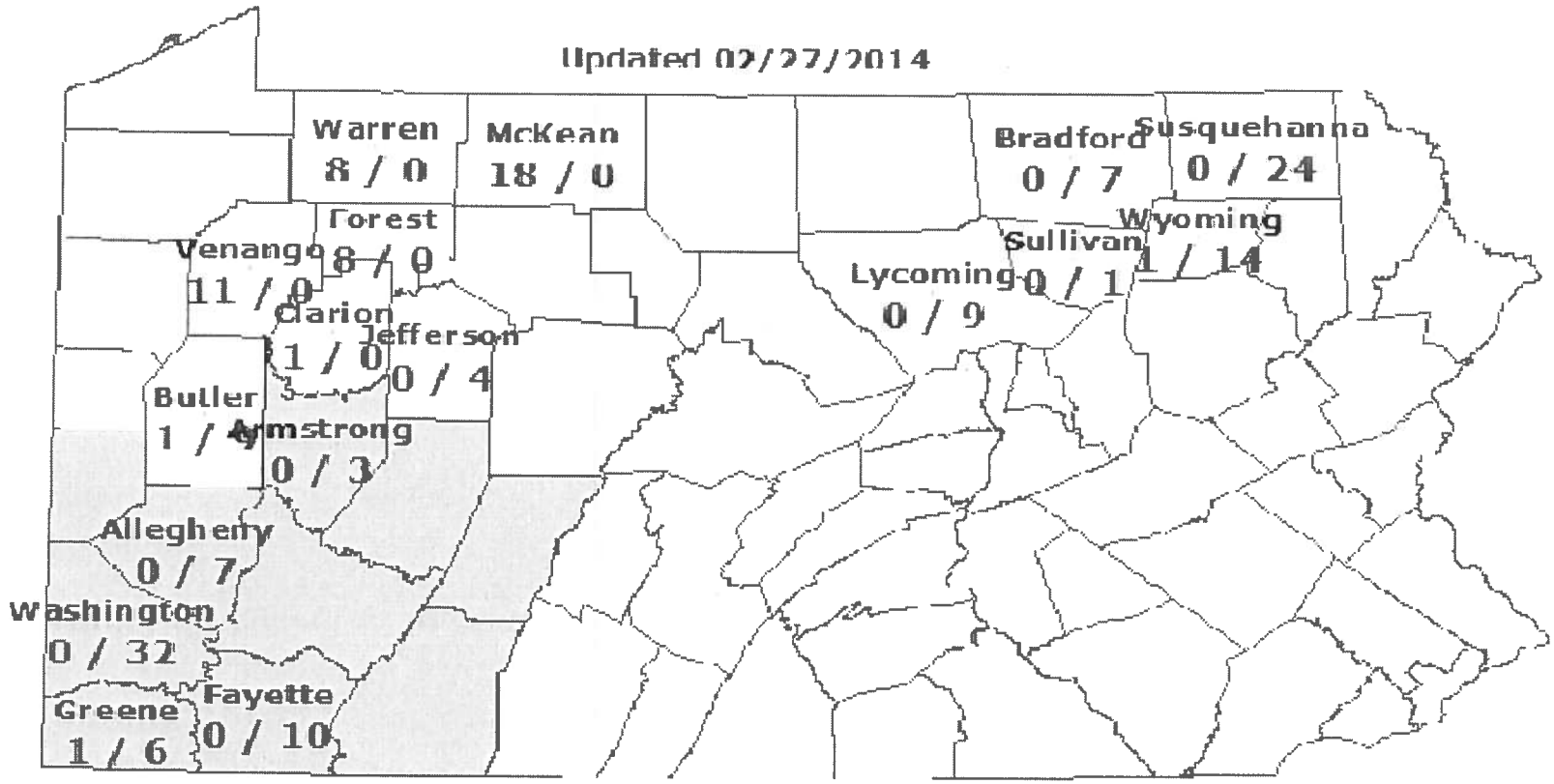


Conventional Wells Unconventional Wells

Conventional - 145 + Unconventional - 261 = Total - 406

Department of Environmental Protection
Office of Oil and Gas Management
Wells Drilled - January 2014

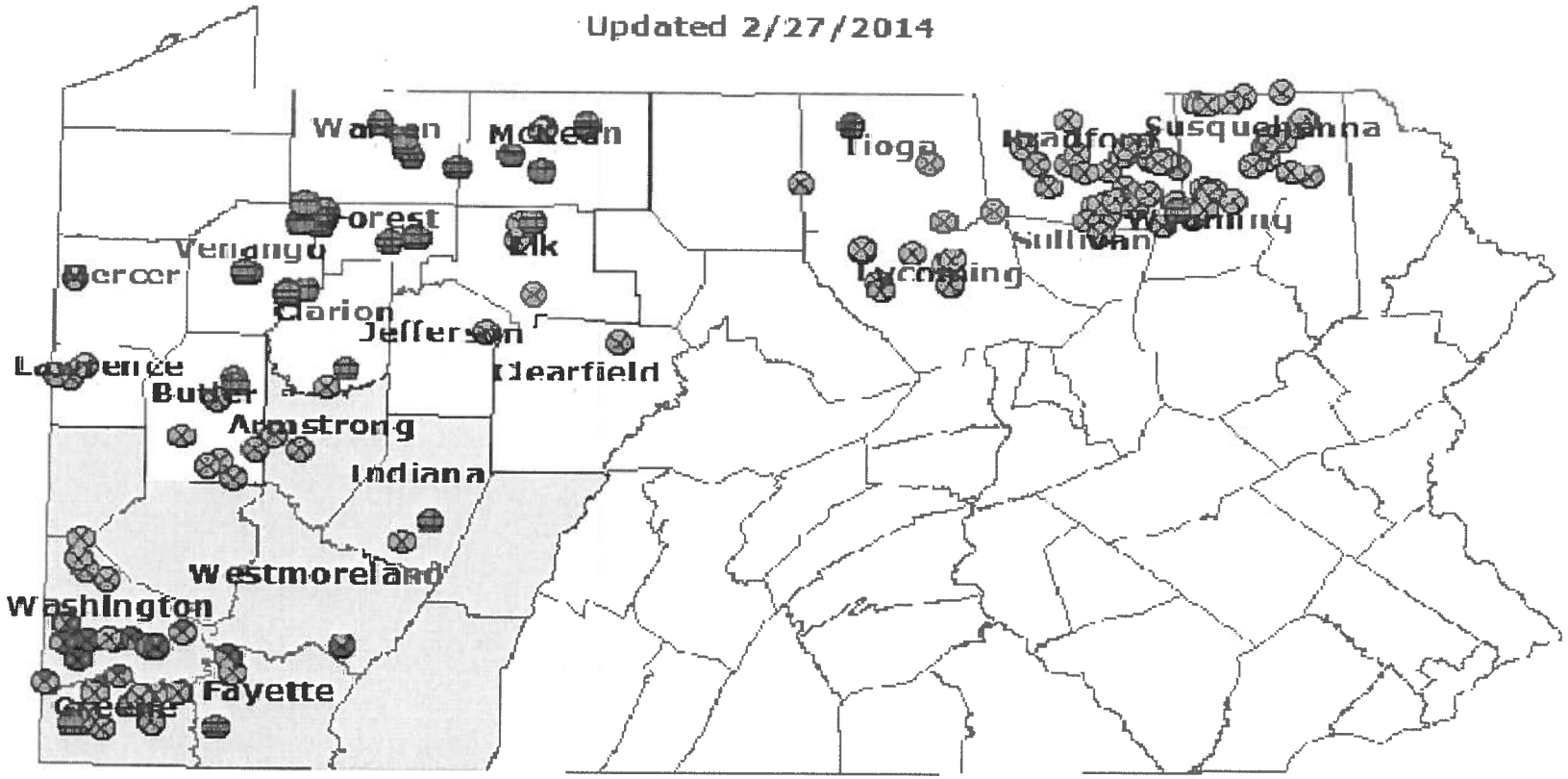
Updated 02/27/2014



(Conventional) - 49 + (Unconventional) - 126 = Total - 175

Department of Environmental Protection
Office of Oil and Gas Management
Wells Drilled Locations January 2014

Updated 2/27/2014

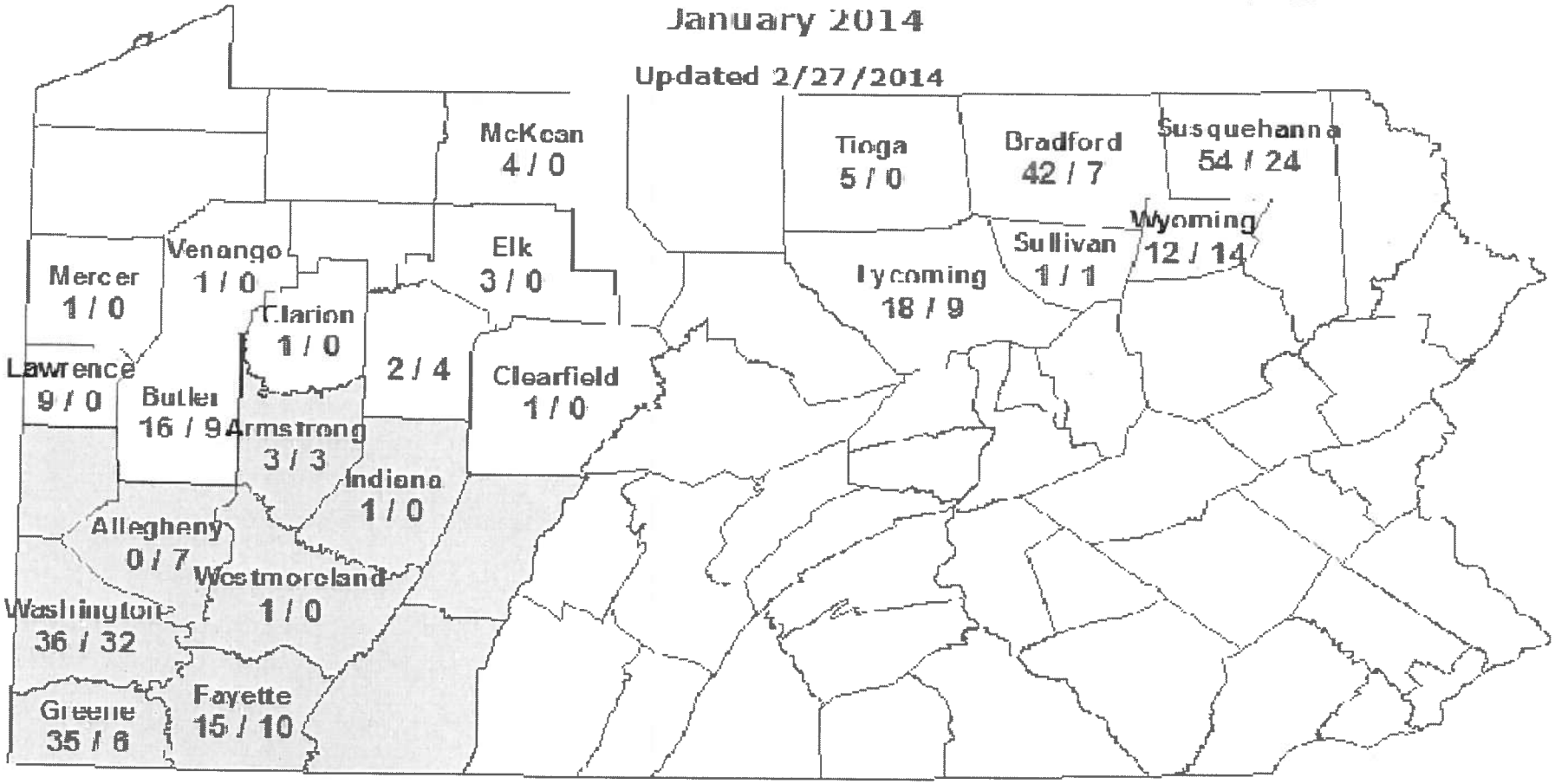


Conventional Wells Unconventional Wells

Conventional - 145 + Unconventional - 261 = Total - 406

Department of Environmental Protection
Office of Oil and Gas Management
Unconventional Well Permits Issued and Wells Drilled
January 2014

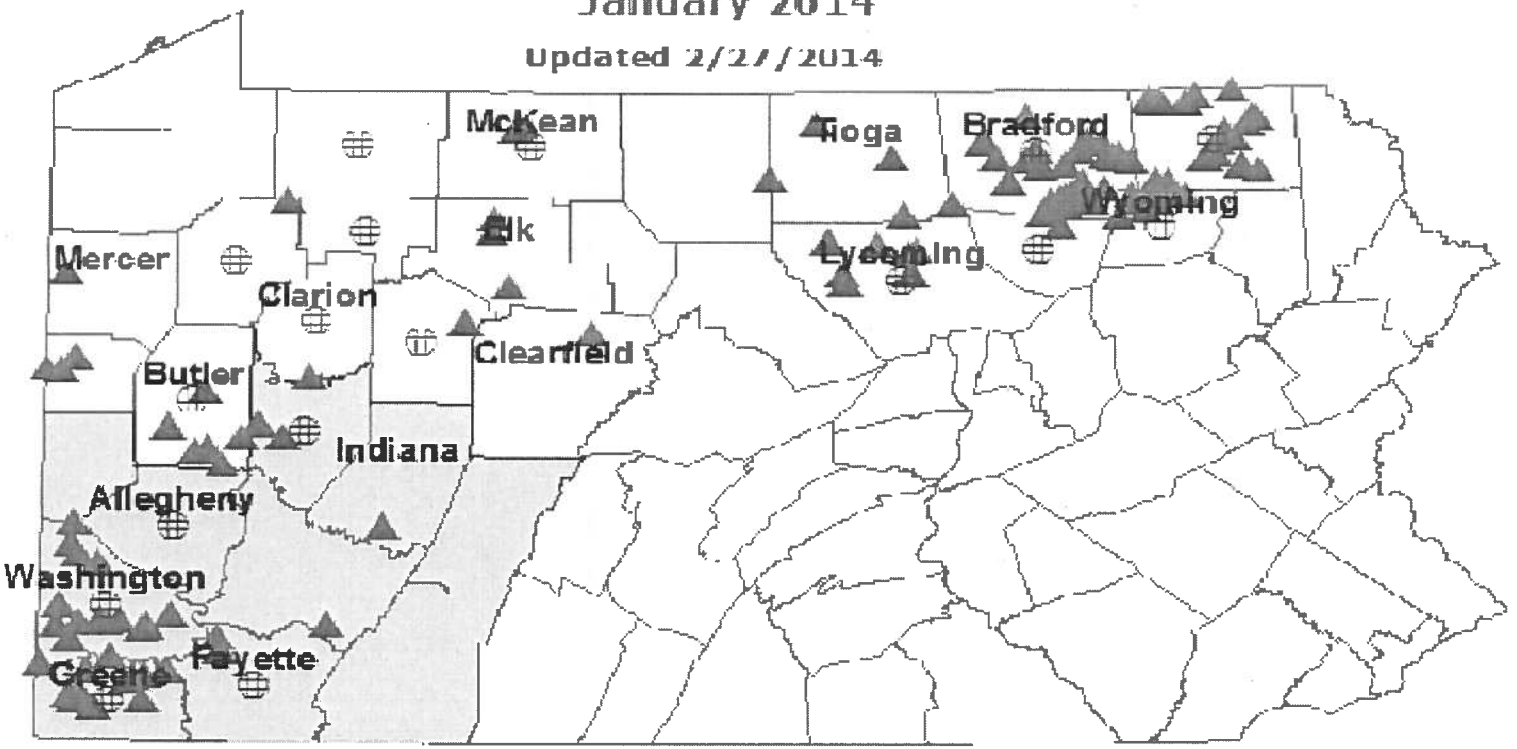
Updated 2/27/2014



Unconventional Permits Issued - 261 Unconventional Wells Drilled - 126

Department of Environmental Protection
Office of Oil and Gas Management
Unconventional Well Permits Issued and Wells Drilled Locations
January 2014

Updated 2/27/2014

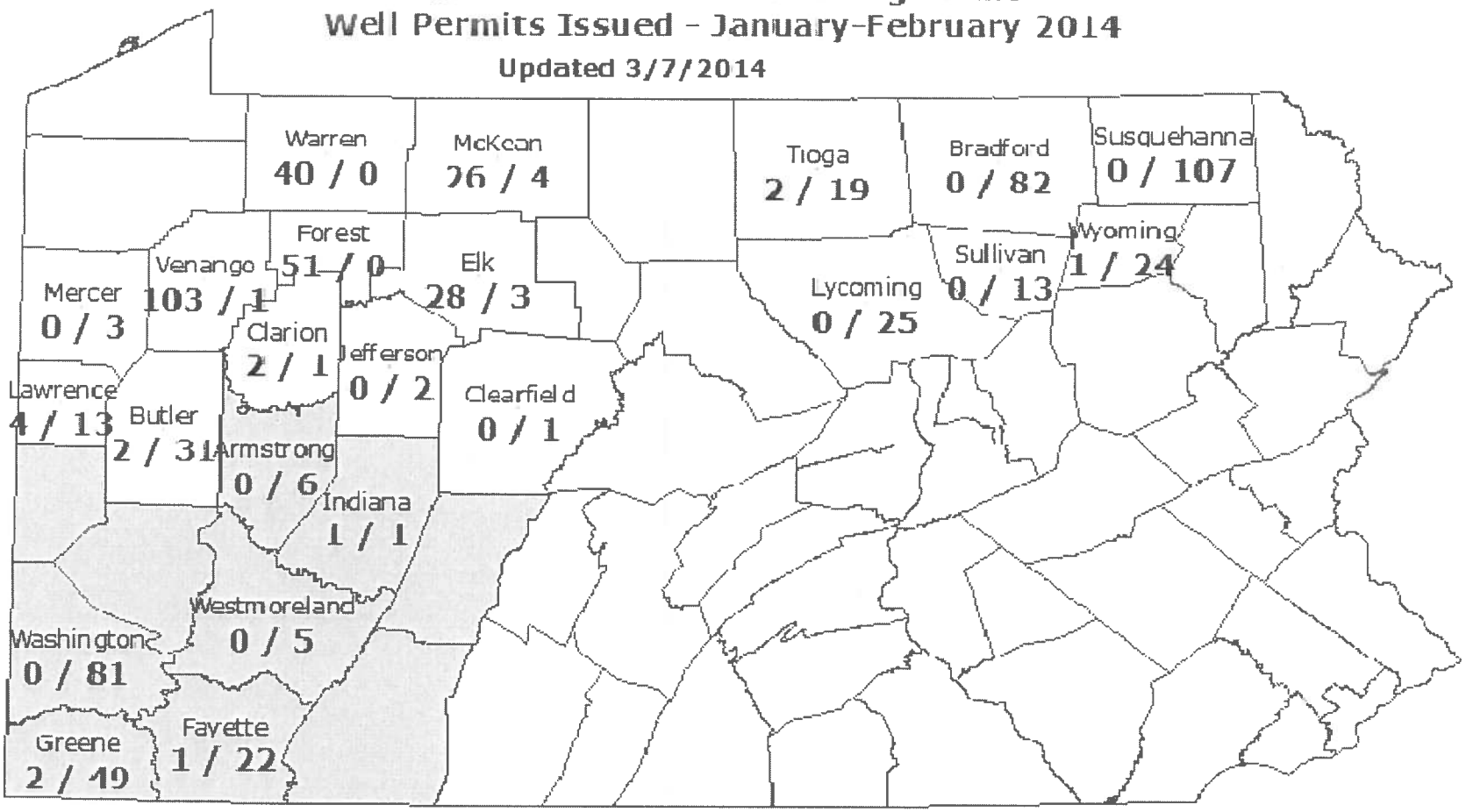


Unconventional Permits Issued - 261

Unconventional Wells Drilled - 126

Department of Environmental Protection
Office of Oil and Gas Management
Well Permits Issued – January-February 2014

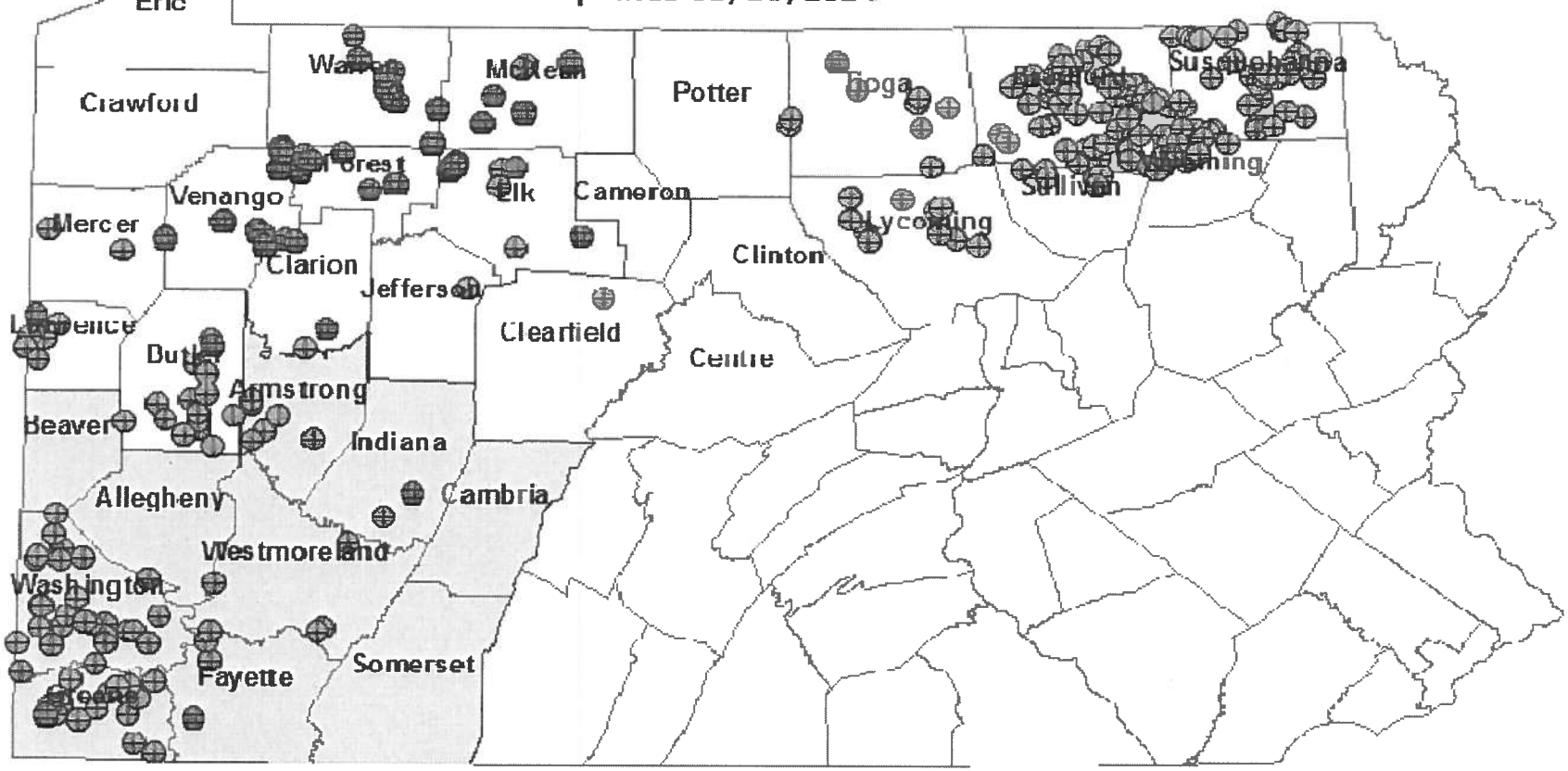
Updated 3/7/2014



Conventional - 263 + Unconventional - 493 = Total - 756

Department of Environmental Protection
Office of Oil and Gas Management
Well Permits Issued Locations - January - February 2014

Updated 03/10/2014

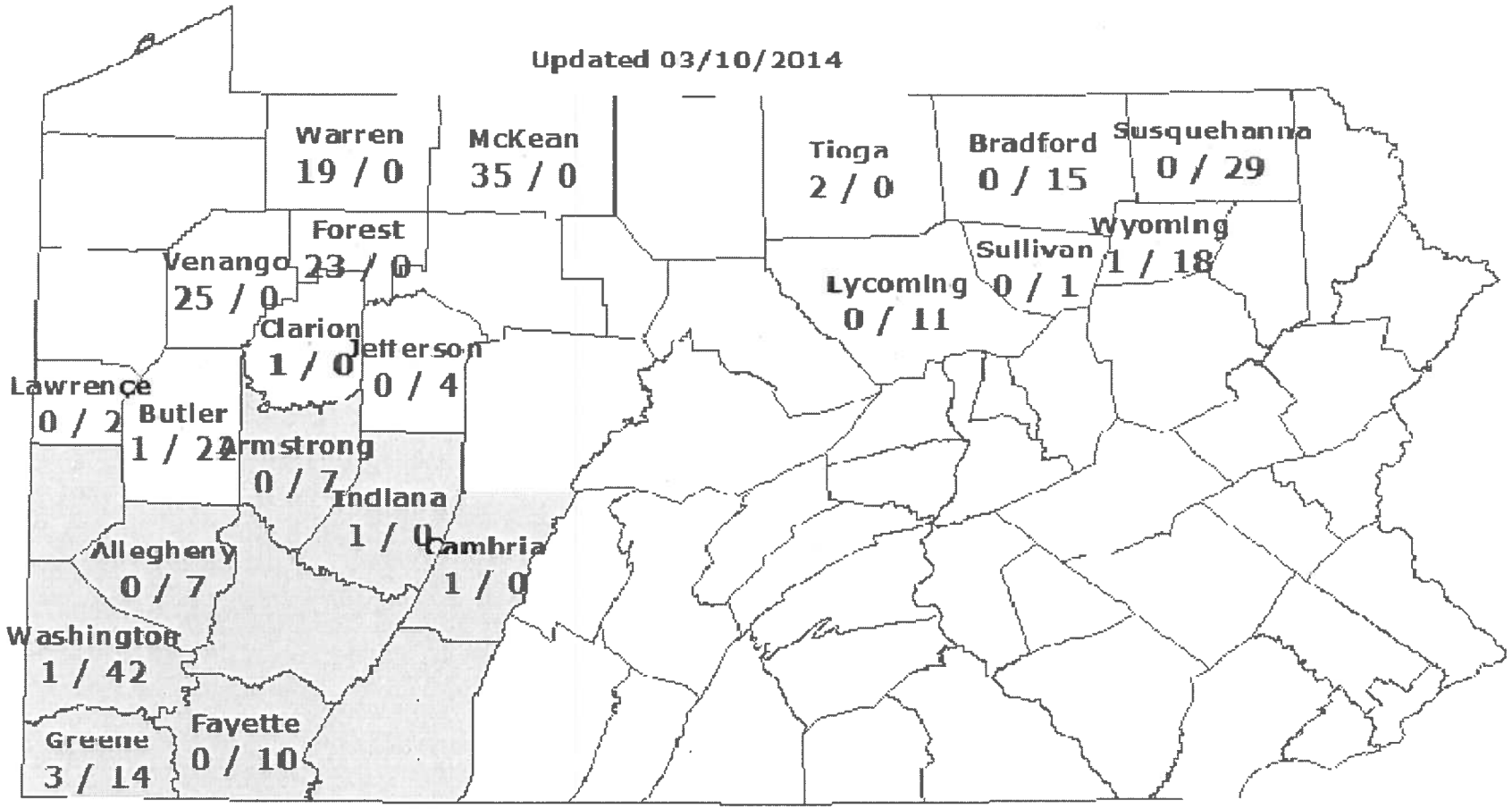


● Conventional Wells ● Unconventional Wells

Conventional - 263 + Unconventional - 493 = Total - 756

Department of Environmental Protection
Office of Oil and Gas Management
Wells Drilled - January - February 2014

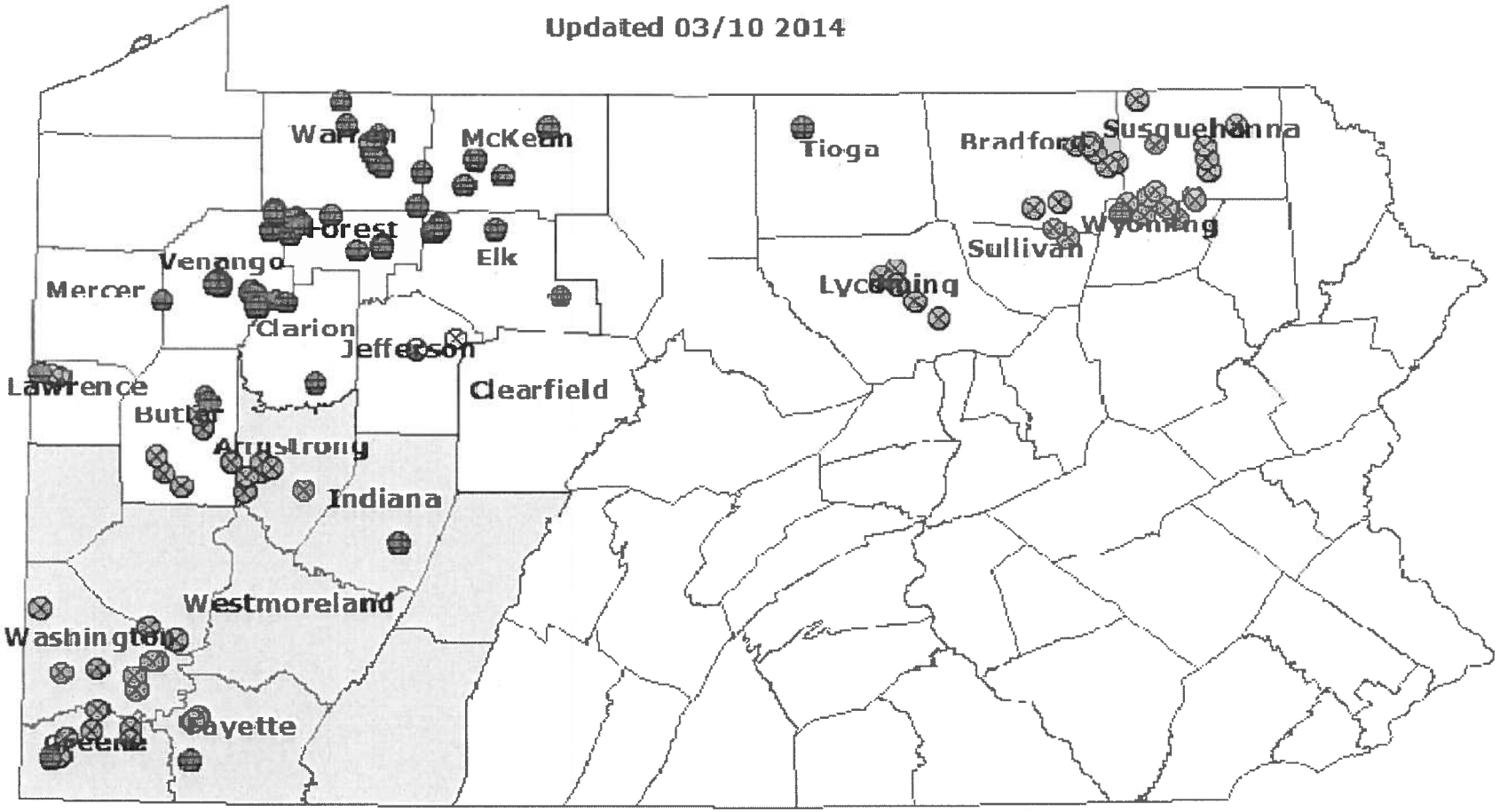
Updated 03/10/2014



(Conventional) - 113 + (Unconventional) - 182 = Total - 295

Department of Environmental Protection
Office of Oil and Gas Management
Wells Drilled Locations - January - February 2014

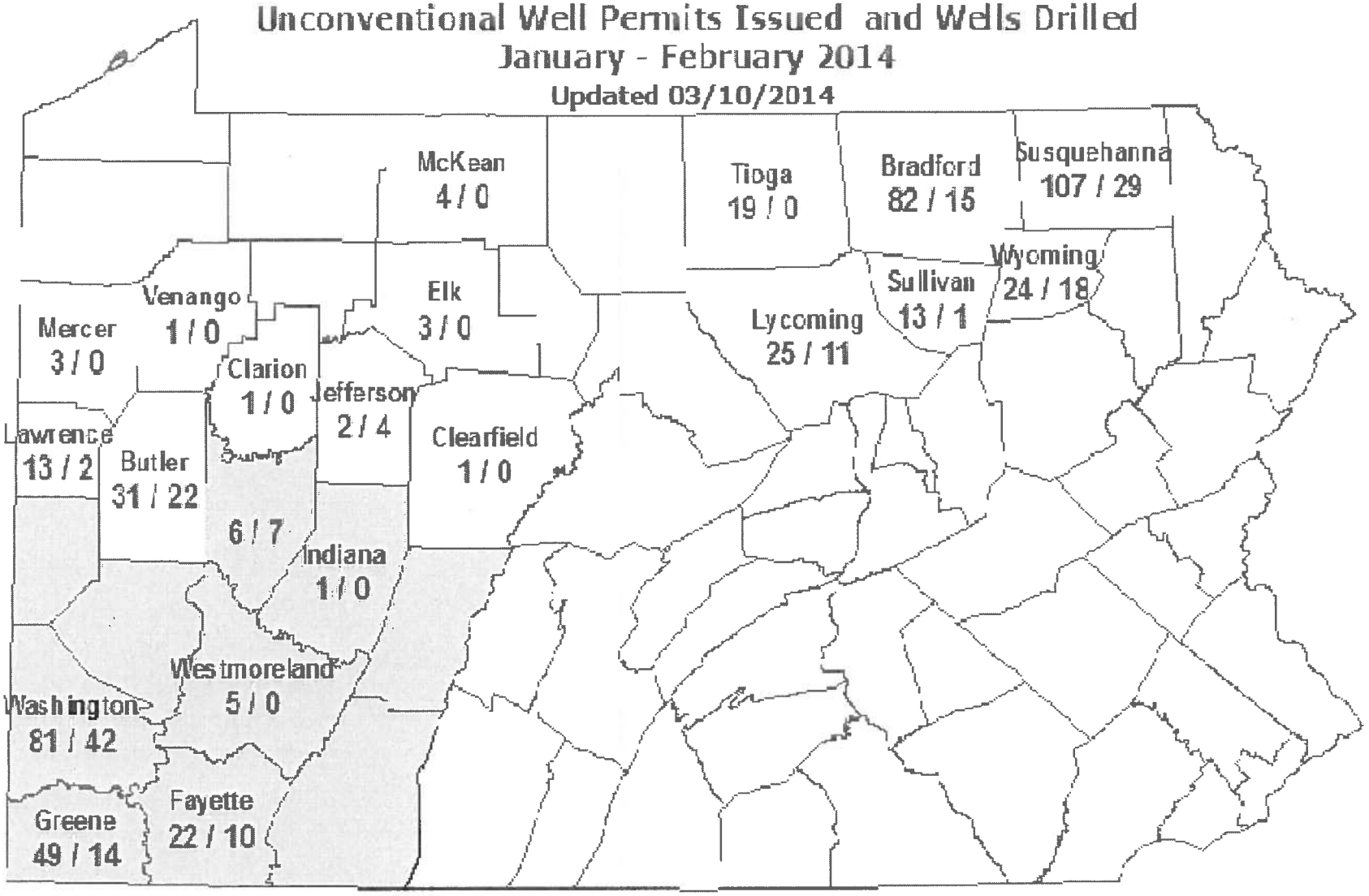
Updated 03/10 2014



● Conventional Wells ● Unconventional Wells

(Conventional) - 113 + (Unconventional) - 182 = Total - 295

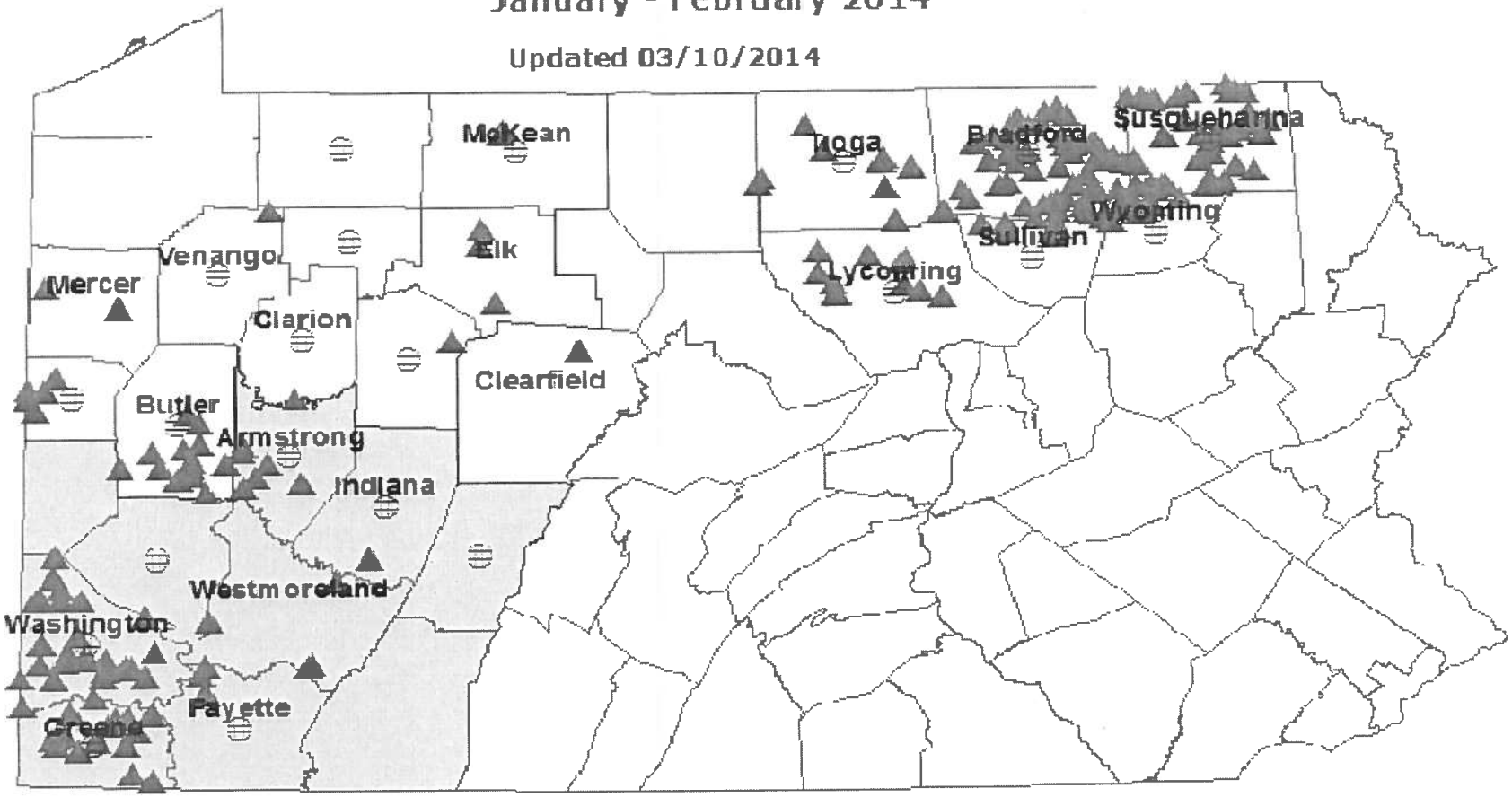
Department of Environmental Protection
Office of Oil and Gas Management
Unconventional Well Permits Issued and Wells Drilled
January - February 2014
Updated 03/10/2014



Unconventional Permits Issued - 493 Unconventional Wells Drilled - 182

Department of Environmental Protection
Office of Oil and Gas Management
Unconventional Well Permits Issued and Wells Drilled Locations
January - February 2014

Updated 03/10/2014



Unconventional Permits Issued - 493

Unconventional Wells Drilled - 182

EXHIBIT 8

IN THE COMMONWEALTH COURT OF PENNSYLVANIA

TOWNSHIP OF ROBINSON, Washington County, Pennsylvania, et.al.	)	Docket No. 284 MD 2012
Petitioners,	)	
vs.	)	
COMMONWEALTH OF PENNSYLVANIA, et al.	)	
Respondents.	)	

AFFIDAVIT OF GREG SWARTZ

I, Greg Swartz, verify that the following statements are true and correct to the best of my knowledge, information, and belief:

1. My name is Greg Swartz. I reside at 25 Stone House Road, Damascus Township, Wayne County, Pennsylvania ("the farm" or "the farm property") along with my wife and our young son.

2. This property is approximately one mile away from the Delaware River, and its tributary, Hollister Creek, flows along my property. The twelve-acre property includes three acres of federally designated wetlands.

3. I also lease a property on Syloro Lane, located in Damascus, Pennsylvania and sitting directly alongside the Delaware River.

4. I am a member of the Delaware Riverkeeper Network. I am also a member of the Catskill Mountainkeeper, the Delaware Highlands Conservancy, the Northeast Organic Farming Association of New York (NOFA-NY), and the Pennsylvania Association for Sustainable Agriculture.

5. I operate an organic farm on both properties, and have done so since 2007.

6. Both drinking water and water utilized for farming are provided from two wells located on the property.

7. All produce grown on the farm is sold within sixty miles of the farm—to restaurants and retail stores, at farmers' markets, or through our Community Supported Agriculture (CSA) program.

8. Each week, the farm feeds hundreds of people in the local community. Thirty families participate in the CSA program. In addition to weekly pick-up of vegetables, CSA members also participate in educational events at the farm, take tours, and stay for potlucks.

9. The farm also provides educational opportunities for people interested in becoming farmers through the Collaborative Regional Alliance for Farmer Training.

10. School groups, families, researchers, and members of the media all visit the farm throughout the year to learn about organic farming; these visitors often make purchases as well.

11. I bought the farm property in 2007 with the intention of starting my own organic farm after seven years of working in an apprenticeship capacity at several farms in Sullivan County, New York. I spent those seven years working, reading, going to conferences, and learning all I could about the occupation of farming.

12. Initial costs for infrastructure such as green houses, water wells, and fencing reached close to $200,000.

13. Two years after purchasing this land, I quit all other employment and began managing the farm full-time.

14. In 2009, NOFA-NY certified the farm as organic and operating in accordance with the standards of the USDA's National Organic Program. The application process required

the creation of an Organic Farm Plan, whereby I submitted how I planned to grow each crop every year. This is intended to create an audit trail from seed to customer. Every year, NOFA-NY requires that this plan be updated. In addition to the initial application fee, I now pay annual fees to maintain my certification. NOFA-NY makes one routine annual inspection of the farm and may make unannounced inspections at any time.

15. Maintaining the organic farm is time and money intensive; it involves significant soil management and an investment in improving and maintaining the land for the long term.

16. Immediately upon moving to the area eleven years ago, I was captured by the natural beauty of the Catskill Mountains and the Delaware River. I had grown up in suburbia surrounded by a depressing landscape of shopping malls and failing farms; in the Delaware River Valley, I knew I had found my home.

17. The occupation of farming attracted me because of its multi-faceted and always evolving nature. It is challenging intellectually as well as physically. Life as an organic farmer is rewarding; it allows me to work with the natural world and to be an integral part of the community.

18. Moreover, my farm is an example of sustainable development in rural communities—proof that we need not turn to extractive industries to prosper.

19. Gas drilling threatens fertile farmland and natural wonder alike, the two things that first drew me to this area I call home. I am concerned that gas drilling in the basin -- particularly without local zoning protections -- will have a adverse effect on my property and my business, as well as the pristine natural beauty and irreplaceable environmental resources of the Delaware River Basin.

20. I fear this heavy industrialization of the natural landscape of the Delaware River Basin, including Damascus Township, from natural gas development – particularly without meaningful local zoning in place – will negatively affect the way in which I interact with the River on an aesthetic, recreational, professional, personal, and family level.

21. I recognize that local zoning is an essential part of Pennsylvania's system of environmental protection; through zoning, municipalities such as the one where I live can identify which zoning districts are appropriate for which land uses.

22. By exercising their zoning authority, municipalities, including Damascus Township, have had the ability to use their local knowledge to identify those areas where drilling would pose the greatest threat to the resources of the river basin, hold public hearings with notice to affected landowners, and enact ordinance provisions that limit the location of this industrial activity just like the location of other industrial activities is limited.

23. Act 13 eliminates this central role of municipalities, upon which I have relied to protect the integrity of my well water, my family and their health, my organic farm business, and local natural resources that my family and I enjoy, including the Upper Delaware Scenic and Recreational River Corridor.

24. I first heard about drilling for natural gas in the Marcellus Shale in 2007—only eight months after my wife and I had purchased the farm. I have been concerned about the future of my farm, my home, and my family since that time. A landman working for a gas drilling company came to my property six times during 2009 in an attempt to lease my oil and gas rights. In an early visit, he gave me a map of the immediate area, from which I could tell that all but one of my surrounding neighbors had leased their land. I refused to lease, and still own

my oil and gas rights. The first gas drilling rig in Wayne County was drilled in the spring of 2010, eight miles away from my property.

25. In the summer of 2010, Newfield Appalachia PA, LLC drilled an exploratory well a half-mile away from my farm. Before the drilling commenced, seismic testing trucks stopped traffic and thumped on the road directly next to my farm. Other heavy trucks such as excavators, dump trucks, and bulldozers congested the road. The industrial activity was an unwelcome disruption to the rural character of our community.

26. The rig, once erected, was visible from my house. It was illuminated twenty-four hours a day, created large amounts of noise, and at times drilling-related activities shook my porch.

27. The families who participate in our CSA program must come to the farm each week to pick up their food shares; upon seeing the rig for the first time, the CSA members almost uniformly commented on the well and expressed their concerns about the well site's proximity to my farm where they get their food. Even now, my customers raise concerns about the prospect of drilling.

28. I am concerned by those impacts that are the inevitable result of any heavy industrialization of an area, particularly a natural area, including: increased truck traffic and air pollution; spills and accidents resulting in toxic discharges to our streams and waterways; forest fragmentation and invasive species infestation due to pipeline installation; increased stormwater runoff volume and associated pollution, and erosion and sedimentation discharges into waterways from increased construction activities.

29. Currently, our property at 25 Stone House Road is zoned Rural Residential. For Rural Residential properties, the Damascus Township zoning ordinance allows oil and gas wells and pads only as a conditional use.

30. Our leased property on Syloro Lane, also used for farming, is located in the Township's River District, which coincides with the Upper Delaware Scenic and Recreational River Corridor ("River Corridor"). No new industrial activities are allowed in this area, both under Damascus Township's zoning ordinance, and the River Management Plan that governs the River Corridor.

31. Under Act 13, the protections afforded to us and the scenic resources immediately surrounding our properties by the Township's ordinances will be eliminated.

32. Now, under the Act, Damascus Township must allow as uses permitted by-right oil and gas wells and pads less than a tenth of a mile from our home and farm at 25 Stone House Road.

33. Likewise, an impoundment area of hydraulic fracturing wastewater must be allowed near our property by-right, and only 300 feet from our home. The prospect of groundwater contamination from spills and leaks, as well as the off-gassing of chemicals from these open pits of wastewater will threaten my drinking water, and the viability of my organic farming business.

34. Also, as Act 13 assumes Damascus Township has clearly defined "residential" and "agricultural" districts, we currently do not know if the Township must allow compressor stations by-right just over a tenth of a mile from our organic farm fields.

35. Our property at Syloro Lane is currently protected by the River District. Act 13 renders this district useless, particularly as a mechanism to protect the River Corridor from heavy industrial activities.

36. The prospect of extensive drilling and other oil and gas operations, particularly so close our home and farm, is extremely concerning.

37. I fear my customers will lose confidence in my produce and stop buying from my farm. This loss would threaten the economic viability of my farm.

38. I worry my customers' fears would be justified. I place my name on my product. If I cannot ensure that the product is what I represent it to be—healthy, organic produce free of contaminants—then I cannot in good conscience continue to farm the land here at all.

39. My farm is my home and my livelihood. Should gas development contaminate my soil or water, I would be forced out of business and out of my home; I am deeply concerned about this possibility. I use well water to irrigate the main farm property and process our vegetables. I also irrigate the main farm from Hollister Creek. I irrigate the Syloro Lane field from the Delaware River. The water my family uses to drink, cook, and bathe with is also supplied from an on-site well.

40. Shale gas development has the potential to contaminate all of these water sources and until now, Damascus Township's zoning ordinance provided us with protection from these threats. The ordinance, by allowing drilling as a conditional use, also allowed us to voice our concerns about proposed drilling operations near our property. Act 13 has taken that away.

41. Act 13 also forces the Township to enact zoning in the River Corridor that is inconsistent with the River Management Plan. This now means that the River Corridor in

Pennsylvania is now threatened by heavy industrialization, in contravention of the River Management Plan, established to carry out the federal Wild and Scenic Rivers Act.

42. These local zoning protections are the backbone of the River Management Plan's protections for the River Corridor.

43. My family and I go swimming in the Delaware at least once a week during the summer months. We also canoe and take walks along the river, and are able to watch eagles that nest in the area.

44. Friends in the community fish in the Delaware River and give them to me for my family to eat.

45. I would no longer swim or canoe in the Delaware if natural gas drilling occurred in the River Corridor and I would never allow my son to do so.

46. From all that I have learned about the chemicals used in hydraulic fracturing, I fear the pollution in the water, whether through accidents, runoff, or wastewater discharge following inadequate treatment, would make us sick.

47. For the same reason, I would no longer eat fish caught in the Delaware River or area streams.

48. Even without a decrease in water quality, the industrialization of the land for gas drilling would destroy animal habitat—meaning that my family would no longer be able to watch eagles nesting either.

49. My wife and I have already made a contingency plan for the worst case scenario that would force my family to leave our home, farm, and community. We have invested everything we make back into the farm, but I will not be able to continue operating the farm if I cannot assure the quality of my product and, even more importantly, the safety of my family.

Our hope is that even if the land were unsuitable for farming, we could at least sell it for enough to cover existing debt; we would leave with nothing but our health and the hope of starting anew somewhere else.

50. My use and enjoyment of my properties, including my organic farming business, my well water, and the scenic resources immediately surrounding them that help my farming business, will be negatively affected if gas drilling is able to proceed in the basin without the protections afforded by locally enacted zoning ordinances.

The foregoing is true and correct to the best of my knowledge, information and belief and I understand that any false statements made are subject to the penalties of 42 Pa. C.S. § 4904 relating to unsworn falsification to authorities.

Date: 5-10-12

GREG SWARTZ

IN THE COMMONWEALTH COURT OF PENNSYLVANIA

TOWNSHIP OF ROBINSON, Washington County, Pennsylvania, et.al.	)	Docket No. 284 MD 2012
Petitioners,	)	
vs.	)	
COMMONWEALTH OF PENNSYLVANIA, et al.	)	
Respondents.	)	

AFFIDAVIT OF TANNIS KOWALCHUK

I, Tannis Kowalchuk, verify that the following statements are true and correct to the best of my knowledge, information, and belief:

1. My name is Tannis Kowalchuk. I am a co-founder, actress, and artistic director at the North American Cultural Laboratory (NACL) Theatre in Highland Lake, Sullivan County, New York.

2. I live in Wayne County with my husband Greg Swartz and our three-year-old son. Our address is 25 Stone House Road, Damascus, Pennsylvania, 18415.

3. In addition to our main property, we lease a field at Syloro Lane, also situated in Wayne County.

4. I am a member of the Delaware Riverkeeper Network.

5. We have lived in this region for eleven years and in our current home since 2007.

6. We own and operate a twelve acre organic farm on our Stone House Road property. Our Stone House Road property is one mile from the Delaware River.

7. Tributaries to the Delaware, including Hollister Creek, run through our property. In addition to the purchase of our home, we have invested over $200,000 on structures, equipment, and materials for the farm.

8. The field on Syloro Lane, adjacent to the river, also provides produce for our business.

9. We have two water wells on our Stone House property, one for drinking water and one for irrigation.

10. We own our mineral, oil, and gas rights and have not leased them to anyone, despite six visits from a landman seeking a gas lease from us. However, it is my understanding that nearly all of our neighbors have leased their gas rights, including most of the land directly adjacent to our farm and home. I am very concerned that oil and gas operations located nearby will cause direct harm to my family and my community.

11. I am concerned that gas drilling in the basin -- particularly without local zoning protections -- will have a deleterious effect on my property and my business, as well as the pristine natural beauty and irreplaceable environmental resources of the Delaware River Basin.

12. I fear this heavy industrialization of the natural landscape of the Delaware River Basin, including Damascus Township, from natural gas development – particularly without meaningful local zoning in place – will negatively affect the way in which I interact with the River on an aesthetic, recreational, professional, personal, and family level.

13. I recognize that local zoning is an essential part of Pennsylvania's system of environmental protection; through zoning, municipalities such as the one where I live can identify which zoning districts are appropriate for which land uses.

14. By exercising their zoning authority, municipalities, including Damascus Township, have had the ability to use their local knowledge to identify those areas where drilling would pose the greatest threat to the resources of the river basin, hold public hearings with notice to affected landowners, and enact ordinance provisions that limit the location of this industrial activity just like the location of other industrial activities is limited.

15. Act 13 eliminates this central role of municipalities, upon which I have relied to protect the integrity of my well water, my family and their health, our organic farm business, and local natural resources that my family and I enjoy, including the Upper Delaware Scenic and Recreational River Corridor.

16. The Woodland Mgmt Partners exploratory well was erected one half mile away from our home during the summer of 2010. The rig was visible from our home and the noise of construction was constant. We could hear and feel the drilling of the well from our home at all hours; the disturbance was intense enough to shake our porch from one half mile away. The rig was brightly illuminated at all hours of the day and night. This lasted for well over a month.

17. Due to Act 13, we now face the very real threat of these disturbances much closer to our home. I am concerned by those impacts that are the inevitable result of any heavy industrialization of an area, particularly a natural area, including: increased truck traffic and air pollution; spills and accidents resulting in toxic discharges to our streams and waterways; forest fragmentation and invasive species infestation due to pipeline installation; increased stormwater runoff volume and associated pollution, and erosion and sedimentation discharges into waterways from increased construction activities.

18. Currently, our property at 25 Stone House Road is zoned Rural Residential. For Rural Residential properties, the Damascus Township zoning ordinance allows oil and gas wells and pads only as a conditional use.

19. Our leased property on Syloro Lane, also used for farming, is located in the Township's River District, which coincides with the Upper Delaware Scenic and Recreational River Corridor ("River Corridor").

20. No new industrial activities are allowed in this area, both under Damascus Township's zoning ordinance, and the River Management Plan that governs the River Corridor.

21. Under Act 13, the protections afforded to us and the scenic resources immediately surrounding our properties by the Township's ordinances will be eliminated.

22. Now, under the Act, Damascus Township must allow as uses permitted by-right oil and gas wells and pads less than a tenth of a mile from our home and farm at 25 Stone House Road.

23. Likewise, an impoundment area of hydraulic fracturing wastewater must be allowed near our property by-right, and only 300 feet from our home.

24. The prospect of groundwater contamination from spills and leaks, as well as the off-gassing of chemicals from these open pits of wastewater will threaten my drinking water, and the viability of our organic farming business.

25. I also fear the contamination of the tributaries to the Delaware River, including Hollister Creek, that run through our property.

26. Also, as Act 13 assumes Damascus Township has clearly-defined "residential" and "agricultural" districts, we currently do not know if the Township must allow compressor stations by-right just over a tenth of a mile from our Stone House Road property.

27. Our property at Syloro Lane is currently protected by the Township's River District. Act 13 renders this district useless, particularly as a mechanism to protect the River Corridor from heavy industrial activities.

28. Also, the proximity of oil and gas operations to our organic farm is of great concern because we pride ourselves on the ability to guarantee the pure nature of our produce.

29. We are very concerned that any contamination of our land or wells, whether through industrial activity, spills, blowouts, or subsurface methane migration, would destroy our ability to claim our produce is safe to eat, let alone organic. A contamination event would put our farm out of business.

30. Moreover, because the farm is our primary asset and we have invested heavily in it, a contamination event would wipe us out financially. Though this is definitely not the time in life to start over, we would count ourselves lucky if the sale-price of our land, once contaminated, would cover our mortgage and allow us to walk away.

31. Even lacking proof of contamination, public knowledge of our farm's proximity to producing gas wells might diminish revenue. Those customers who came to the farm to pick up produce (as do all members of our Community Supported Agriculture program) while the Woodlands Mgmt Partners well was under construction were clearly uncomfortable seeing the rig so close to our farm. I worry that if shale gas development proceeds, and the well is fracked, our customers will stop buying our produce as a precaution.

32. Harm to the farm would also affect my career as artistic director of the NACL Theatre. I often host events, from picnics to festival celebrations, on the farm in association with my work with the theatre. I also use the farm to host artists during the NACL Theatre's yearly festival. I am worried that I will no longer be able to host events or artists on the farm in the

event drilling proceeds and our farm is affected by contamination, noise, or other drilling-related factors.

33. Even greater than my concern for the farm and my family's economic well-being is my fear for my own health and safety and that of my family. I would be afraid to drink water from our well or shower with it. I would even be afraid to breathe the air. I am particularly concerned for my young son; he drinks the well water and eats food grown in our fields. I know young children are especially susceptible to harmful chemicals.

34. My family and I currently use the river for recreational purposes. In the summer months, I take my son to swim in the river at least once each week for an hour or two at a time. I also enjoy canoeing and walking along the river. Additionally, my family eats fish caught from the river.

35. If drilling proceeds in this area, particularly the River Corridor, I will not feel safe doing any of these activities for fear that the water will be contaminated and unsafe. I would no longer swim in the river and I would not allow my son to do so. I would not eat fish caught locally. I could still walk along the river, but I am afraid I will not want to once the landscape is industrialized and the environment fouled.

36. On a very fundamental level, I am concerned about the impact gas drilling will have on our community and the culture of our region. The Delaware River is the centerpiece of our community. This area has a rich history of having a river culture. Culturally, we and our neighbors consider ourselves part of an Upper Delaware River Valley community. The River is what draws new community members to the area and what causes old ones to stay. The River is really that one thing that we all have together—we are joined by an appreciation of its natural beauty and have purposefully ordered our lives around it.

37. If the Delaware is harmed by drilling, it will, in turn, threaten the fabric of this community. The activity surrounding drilling would industrialize a region that prides itself on pure, natural beauty.

38. Act 13 decimates this history, community atmosphere, and natural setting by forcing the Township to enact zoning in the River Corridor that is inconsistent with the River Management Plan. This now means that the River Corridor in Pennsylvania is now threatened by heavy industrialization, in contravention of the River Management Plan, established to carry out the federal Wild and Scenic Rivers Act. These local zoning protections are the backbone of the River Management Plan's protections for the River Corridor.

39. My use and enjoyment of my properties, including our organic farming business, my well water, the streams on my property, and the scenic resources immediately surrounding our land that help our farming business, will be negatively affected if gas drilling is able to proceed in the basin without the protections afforded by locally enacted zoning ordinances.

The foregoing is true and correct to the best of my knowledge, information and belief and I understand that any false statements made are subject to the penalties of 42 Pa. C.S. § 4904 relating to unsworn falsification to authorities.

Date: 5/10/12

TANNIS KOWALCHUK

EXHIBIT 9

IN THE COMMONWEALTH COURT OF PENNSYLVANIA

TOWNSHIP OF ROBINSON, Washington County, Pennsylvania, et.al.	)	Docket No. 284 MD 2012
Petitioners,	)	
vs.	)	
COMMONWEALTH OF PENNSYLVANIA, et al.	)	
Respondents.	)	

AFFIDAVIT OF STACEY HANEY

I, Stacey Haney, swear and affirm that the following statements are true and correct to the best of my knowledge, information, and belief:

1. My name is Stacey Haney. I am above the age of eighteen (18) years old and am fully competent to all matters contained in this affidavit.

2. I am a Registered Nurse currently employed at the Washington Hospital in Washington, PA. I am a mother of two young children and a current lease holder with Range Resources-Appalachia, LLC for the development of oil and gas beneath the surface of my property.

3. I am a life-long resident of Amwell, PA. I currently own a residence located at 1049 McAdams Road, Amwell, PA. My residence consists of a farmhouse, barn, and land where I, along with my children, have raised animals for 4H and as pets. I, and my extended family, have lived in that residence on and off for the past one-hundred (100) years. The water supply to that residence for the past one-hundred years has been well water. The well water has always been of good quality and quantity until natural gas drilling began in my area. Prior to natural gas

drilling activities beginning in my area, the water from my well was of such good quality, I supplied my local church as well as my parents with water from the well.

4. My residence sits approximately 1530 feet from the drilling operations known as the Yeager Drill Site. The Yeager Drill Site consists of three wells, a frac water impoundment, and a drill cuttings pit. My home sits approximately fifteen feet off of McAdams Road. McAdams Road had always been a single-car wide, dirt road and was never paved since my family took up residence there a century ago. McAdams Road, prior to natural gas drilling activities began, was a quiet, desolate road used by only the residents living on it. McAdams Road and my home sit in the middle of rolling hills and valleys. No industrial activity, prior to natural gas drilling, had taken place in this area.

5. When construction activities began for the Yeager drill site, the Oil and Natural Gas Company building that site used McAdams Road as its main access road to the drill site. As a result, there was continuous, twenty-four hour a day, seven days a week heavy truck traffic which caused huge amounts of dirt and dust from the McAdams dirt road to the be constantly kicked up into the air making it difficult to breath, work outside on the farm, and impossible to sit outside and enjoy the once fresh country air. The dust was so heavy from the constant truck traffic that it continuously coated the outside of my farmhouse, windows, cars, equipment, and animals with dust and dirt. The amount of constant dust in the air restricted my children from playing outside at our home for any length of time. The dust in the air only became bearable if it was raining out and McAdams dirt road became wet.

6. The dust created by the constant truck traffic on the dirt road of McAdams Road was so intense that the Oil and Natural Gas Company constructing the Yeager Drill site took to wetting down the roads three (3) times a day, which still was not enough, especially in the

summer months, to keep the dust and dirt out of the air and from covering my house, car, porch furniture, and animals.

7. In addition to the dust created by the twenty-four hours a day, seven days a week truck traffic headed to the Yeager Drill Site, the constant truck traffic caused the collapse of the dirt road that was McAdams Road. The constant truck traffic on the dirt road caused huge pot holes, uneven wearing out of the road, and caused parts of the dirt road to give away.

8. The complete destruction of McAdams road by the constant truck traffic caused me to sustain nine (9) flat tires in a period of three-four months as well as a cracked rim on the wheel of my car.

9. Additionally, given that my farmhouse sits only fifteen feet from McAdams Road, the constant truck traffic caused a shift in the foundation of my, more than one-hundred year old farmhouse, causing my three basement doors not to close and the porch of my house to pull away from its foundation. As a result of this damage to my home, the Oil and Natural Gas Company paid to have repairs made to my home.

10. As a result of the extensive damage to McAdams Road, the Oil and Natural Gas Company constructing the Yeager Drill Site widened and paved McAdams Road to accommodate the ongoing truck traffic associated with natural gas production at the Yeager Drill Site.

11. In addition to all of the dirt and dust created by the truck traffic, there was considerable high levels of noise created by the truck traffic and drilling related activity that continued seven days a week, twenty-four hours a day. The constant noise kept my children and I up at night, making it impossible to get a good night's rest. Given the location of my home

being so close to McAdams road, the constant noise and vibrations from the trucks pounding the road caused my house to shake and would also keep us up at night.

12. As oil and natural gas drilling operations continued, there was a noticeable change in my well water quality as well as the air quality surrounding my home. After drilling and fracking began at the Yeager Drill Site, my well water began to stink like rotten eggs and garbage with a sulfur chemical smell. When my children and I would take showers, the entire house would fill up with a rotten egg/garbage smell so pungent we would have to open all of the windows while showering or immediately after showering to get rid of the stench in our home from the water.

13 Further, once drilling and fracking operations began at the Yeager Drill site, when running water to take a bath, my bathtub filled up with black sediment and again smelled like rotten eggs. As a result, my entire family stopped bathing in our bath tub. Shortly after noticing the change in our air and water quality, our family dog became ill, refused to drink our well water and subsequently died. Thereafter, our 4H prized goat aborted its fetuses which were deformed and later died after consuming our well water.

14. Given the complete degradation of my family's well water, we were given an alternative water source, in the form of a water buffalo, to replace our well water by the Oil and Natural Gas Company responsible for the oil and gas operations in my area.

15. In addition to our well water going bad, the air surrounding our house also started to smell of rotten eggs, sulfur, and chemicals. The stench in the air was so intense at times it physically made my children and I ill. Further, the rotten egg, sulfur, and chemical smell penetrated our home, seeping into our clothing, furniture, and bedding which made the inside of

our home carried that same rotten egg, garbage, putrid smell that existed in the air outside our home.

16. As a result of the constant rotten egg, garbage, sulfur chemical smell in the air and water, my children and I began to suffer from a variety of different health problems, including but not limited to, nosebleeds, constant and debilitating headaches, nausea, severe abdominal pain, difficulty breathing and shortness of breath, skin rashes, facial rashes and lesions, bone and muscle pain, inability to concentrate, and severe fatigue.

17. All of these symptoms caused my children and I to begin treatment with a variety of different physicians, internists, pulmonologists, dermatologists, gastroenterologists, and toxicologists. As a result of my family's continuous exposure to the putrid smelling air and consumption of putrid smelling water and ongoing severe health problems, my family's treating doctors recommended and ordered that my family abandon our farmhouse to avoid further exposure to the air and water they determined were causing our health problems.

18. On the advice of my family's treating doctors, my children and I abandoned our family home to move in with friends and family to avoid further exposure.

19. Periodically, I have had to return to our family home to tend to maintenance of it and most recently had to return to give the Environmental Protection Agency (EPA) access to my home to collect water samples, as my home was selected by the EPA as one of the residences to include in its two year study of the impacts of hydraulic fracking on groundwater. When I was there to meet the EPA and give them access to my well, I immediately began experiencing symptoms of headache, nausea, metal taste in my mouth and light-headedness. The chemicals in the air became so overwhelming to me, I left the EPA at my home to remove myself from any further exposure to the air. That night, I experienced intense headaches, nausea, severe sore

throat, and burning eyes. The next day while on shift at the Washington Hospital, I passed out outside of a patient's room and was taken to the emergency room department of the hospital. The doctors of Washington Hospital determined I had had a severe over exposure to chemicals at my home the day before that caused me to pass out while on duty at the hospital the next day.

20. The industrial activity has taken place at this location for several years, at times twenty-four hours a day, seven days a week.

I swear/affirm that the contents of this affidavit are true and correct to the best of my knowledge, information and belief.

Stacey J. Haney

Stacey Haney

Sworn to and subscribed before this 3rd day of May, 2012.

Darlene D. Shape

Notary Public

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Darlene D. Shape, Notary Public
Cecil Twp., Washington County
My Commission Expires Feb. 7, 2016
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

EXHIBIT 10

Transcript of the Testimony of **Alan Eichler**

Date: January 29, 2014
Volume: I
Case: Kiskadden v. Department of Environmental Protection

Eagle Feather Reporting
Phone: 724-746-3383
Fax: 724-746-3383
Email:eaglefeatherreporting@comcast.net

don't agree with that because it's too broad of a statement; is that right?

A Well, it does provide information necessary. I mean, I think I have said several times that the analysis of the water supply is maybe the most important bit of information we have. I mean, it doesn't say it's all the information that we need.

And my point earlier was that there are other things that we take into consideration before we make our determination.

Q That's not what Secretary Krancer states in this letter; correct?

A I am not sure I agree with you there. It just says it provides with the information necessary. That is necessary information. It just isn't all the information that we might need to make a determination. And I suspect if I talk to former Secretary Krancer he would agree.

Q And so when he says that the information provided in 946 is the information necessary to satisfy its legal requirement, do you have any idea what he is talking about there?

MR. WATLING: Objection. Asked and

answered. You can answer. You can stand by your answer, too.

A The law says that when we get a complaint we have to make a determination. If we get a complaint that a water supply has been impacted by oil and gas activities, drilling activities we have to make a determination. I suspect that's what he means.

BY MS. SMITH:

Q And if you turn to page four, paragraph three, that last sentence in paragraph three, Secretary Krancer states this is because the parameters included in --

A I am sorry, Ms. Smith. What page are you on?

Q Page four, paragraph three, last sentence.

MR. WATLING: Are you there?

THE WITNESS: Yes.

BY MS. SMITH:

Q It says: "This is because the parameters included in the standard analysis code 946 are indicative of impacts from drilling. The additional parameters do not typically provide additional information with respect to information from drilling." Did I read that right?

A Yes.

MR. WATLING: Feel free to read the whole sentence, Alan, and the whole paragraph.

A All right.

BY MS. SMITH:

Q Do you agree with that statement?

A What statement?

Q The last one that I read that Secretary Krancer stated in this letter? The last sentence of paragraph three? Do you agree with his statement?

A In the context of the entire paragraph I probably do agree with the statement.

Q Okay. And so in the case of comparing 942 and 946, 946 provides the DEP with more information that according to Secretary Krancer is indicative of impacts from drilling; correct?

A That's what he is saying.

Q And if we turn to page five, the third paragraph, last sentence. It says: "The DEP, has, however, determined Marcellus shale drilling has impacted the water supplies of 25 separate water supply complainants since 2009." Did I read that correctly?

A Yes.

Q And his letter is dated April 12, 2013; correct?

A Yes.

Q And are you aware of anymore than 25 separate water supply complainant's water being impacted by Marcellus shale drilling activities?

A First of all, I don't know where that 25 is. I am not sure what the end date -- certainly, we have had water supply impacts after the date of this letter.

Q Do you know how many?

A Well, I should say we have made determinations after this letter.

Q Do you know how many?

A I know of one. And there are a couple others that we're still considering.

Q And the one determination that has been made has that been reduced to writing?

A Yes.

Q And was that Mr. Yeager's water supply?

A No. It wasn't Mr. Yeager's water supply.

Q Is Mr. Yeager's water supply, that determination, still one of the ones pending or has that already been made by the DEP?

A I don't remember when -- we did make a positive

determination on Mr. Yeager's water supply. I just don't remember the date of that. I don't know if it's included in this 25 or not.

Q Okay. And after making that positive determination that Mr. Yeager's water had been impacted by oil and gas operations at the Yeager site did the DEP issue a Notice of Violation?

A No, we did not.

Q Why not?

A Well, we drafted an order, water supply replacement order.

Q Has that order been signed and issued?

A It wasn't issued.

Q Why not?

A Well, we were informed by our central office that Range Resources had worked out a settlement with Mr. Yeager.

Q And because Range worked out a settlement with Mr. Yeager the DEP did not issue a Notice of Violation of the law?

A Usually relative to water supplies the enforcement action that a company would see would be the order that was issued. We didn't typically issue Notices of Violation. Once --

let me back up. Once we made the determination that they had impacted a water supply, generally the enforcement action that we took was issuing the order. Most cases we never sent a separate NOV. The notification to the operator that he had impacted the supply was -- turned out to be the order.

Q Well, given in this case that there was no order why wasn't a Notice of Violation issued for Range Resources contaminating Mr. Yeager's drinking water from the drilling operations at the Yeager site?

A Well, I don't know exactly. We had prepared the order and that was to be as we had done in previous cases. That was to be basically the enforcement action that we took against the company. When they settled -- and I think Mr. Yeager had signed a release, we felt that that complaint had essentially been closed.

Q Well, as a result of contaminating Mr. Yeager's drinking water from the Yeager drill site did Range Resources have to pay a penalty to the DEP for violating the law?

A No, we did not issue a penalty.

Q Why not?

A As I said earlier, we have discretion. And generally in water supply replacement cases we have not issued penalties. We have required the operator to resolve the issues either under our order or by a settlement with the homeowner.

Q So then how would the public know that Mr. Yeager's drinking water had been impacted and contaminated by Range Resources' drilling operations at the Yeager site if there is no Notice of Violation, no order issued, and no penalty paid?

A I have to think about that. Without a determination letter, without an order I am not -- it's not clear to me how the public would find out that we had issued a positive determination on his water supply. It's not clear to me at this point. I just can't think of maybe how the public would know that.

Q And if there was no Notice of Violation issued and there was no penalty issued by the DEP for the contamination of Mr. Yeager's drinking water, then there would be no open order at the time Range applied for application to drill Yeager one and two horizontally; correct?

A That's correct.

Q So in making that determination the DEP never considered the fact that Mr. Yeager's water had been contaminated and the DEP made that determination before they issued those permits?

MR. WATLING: Objection to the form. Vague and ambiguous.

A Yeah. The determination we made on the Yeager water supply did not -- yes, did not play into the consideration, I assume, you mean of the drill deepers for one and two?

BY MS. SMITH:

Q Yes?

A Correct. Because of the settlement and the sign-off from Mr. Yeager we believe the complaint had been closed. That there were no outstanding obligations that Range had under the Oil and Gas Act relative to Mr. Yeager's water supply.

MR. KOMOROSKI: I will object to the relevance of the line of questioning in this proceeding. Again, this is a case where Mr. Kiskadden is complaining that the wrong determination was made when the Department determined that his water supply had not been

effected by Range's operations. Now you're going into the Haney case. Where, actually, Mr. Yeager has joined in opposing your appeal of those drilling permits. So he's certainly aware of what he needs to be aware of. I just don't understand how this could possibly be relevant in this case.

BY MS. SMITH:

Q So there would have been no way for Mr. Kiskadden to look up on E-Facts, read in the paper, go to the DEP files, do a Right-to-Know request to know that his neighbor who lives uphill from him his drinking water had been contaminated as a result of the drilling operations at the Yeager site?

A Well, I can't speak for the papers, Lord knows. But, no, when I think about what information we have on file and what Mr. Kiskadden would have access to it's not clear to me how he might become aware of a problem at the Yeager water supply. I just can't think of --

MR. WATLING: Sounds like you're a little worn out. It's 5:05. Why don't we resume tomorrow at 9:00? Unless you have a question that you wanted to finish out.

MS. SMITH: Can I?

MR. WATLING: One last question.

BY MS. SMITH:

Q The determination letter -- well, the determination that the DEP made with regard to Mr. Kiskadden's water becoming contaminated as a result of the drilling operations was that ever put in writing?

MR. WATLING: What was the question? Can you repeat it, Candie?

BY MS. SMITH:

Q The determination that the DEP made with regard to Mr. Yeager's water becoming contaminated as a result of the oil and gas operations at the Yeager site, was that ever put in writing, reduced to writing?

A Well, at that time for positive determinations the order was essentially a positive determination letter of sorts. Now we issue separate letters. But really up to that time and including the Yeager issue we did not -- we were not issuing separate determination letters. The homeowner would be given a copy of the order that we issued to the company.

Q Okay. And the order that was drafted never got

sent out; right, the restore water order for Mr. Yeager?

A You mean to Range? To Mr. Yeager?

Q To Mr. Yeager?

A I don't remember that being sent because the order was never issued.

Q And so how is the DEP -- how do they keep track of that positive determination that was made as to Mr. Yeager's water supply if it's not in a determination letter, there's no order that was issued for it, there's no Notice of Violation as a result of that, and Range Resources never paid a penalty for contaminating Mr. Yeager's water?

A Well, we would have record of it in our Complaint Tracking System where -- and we have a hard copy file of the complaint.

Q But I am talking about the determination that the DEP made?

A Well, I think all of that would be in the file. And that would be in the CTS record for this complaint.

Q And the CTS records, are they public records?

A No.

JUDGE RENWAND: What does CTS mean?

THE WITNESS: Complaint tracking system.

MR. WATLING: Okay.

THE VIDEOGRAPHER: The time is 5:06 p.m. We're now off the record.

(Whereupon, the deposition was concluded at 5:06 p.m.)

EXHIBIT 11

5500-FM-OG0004 Rev. 2/2001

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS MANAGEMENT PROGRAM

DEP USE ONLY

Site Id	Primary Facility Id
Client Id	Sub-facility Id

WELL RECORD AND COMPLETION REPORT

Well Operator	DEP ID#	Well API # (Permit / Reg)	Project Number	Acres
Range Resources – Appalachia, LLC	141142	37-125-24024		583

Address	Well Farm Name	Well #	Serial #
380 Southpointe Blvd. Suite 300	Sierzega	6H	

City	State	Zip Code	County	Municipality
Canonsburg	PA	15317	Washington	Amwell

Phone	Fax	USGS 7.5 min. quadrangle map
724-743-6700	724-743-6790	Amity

Check all that apply: ☒ Original Well Record x Original Completion Report ☐ Amended Well Record ☐ Amended Completion Report

WELL RECORD

Also complete Log of Formations on back (page 2)

Well Type: ☒ Gas ☐ Oil ☐ Combination Oil & Gas ☐ Injection ☐ Storage ☐ Disposal

Drilling Method: ☐ Rotary – Air ☒ Rotary – Mud ☐ Cable Tool

Date Drilling Started	Date Drilling Completed	Surface Elevation	Total Depth – Driller	Total Depth - Logger
4/9/2010	6/26/2010	1147ft.	11920 ft	11920 ft

Casing and Tubing

Cement returned on surface casing? ☒ Yes ☐ No
Cement returned on coal protective casing? ☒ Yes ☐ No ☐ N/A

Hole Size	Pipe Size	Wt.	Thread / Weld	Amount in Well (ft)	Material Behind Pipe Type and Amount	Packer / Hardware / Centralizers Type	Size	Depth	Date Run
30"	26"	106#	Thread	32'	Driven	—	26"	32'	4/9/10
24"	20"	81.3#	Thread	337'	Class A Gas Block,360sx	GS	20"	337'	5/10/10
17-1/2"	13-3/8"	54.5#	Thread	1103'	Class A Gas Block, 820 sx	GS	13-3/8"	1103'	5/12/10
-1/4"	9-5/8	40#	Thread	2939'	Class A Gas Block, 950 xk	GS	9-5/8"	2939'	5/16/10
8-3/4"	5-1/2"	20#	Thread	11891'	Extendacem, 890 sx	FS	5-1/2"	11891"	6/26/10
					Hal light, 690sx, Fraccem 360sx				

COMPLETION REPORT

Perforation Record

Date	Interval Perforated From	To
12/28/2011	11,771'MD	8,667'MD

Stimulation Record

Date	Interval Treated	Fluid Type	Fluid Amount	Propping Agent Type	Propping Agent Amount	Average Injection
1/5/2011	Marcellus Shale	Slick H20	90,082 bbl	Sand	5,594 Klb	63.2 bpm

Natural Open Flow	Too small to measure	Natural Rock Pressure	Too small to measure	Hours	Days
After Treatment Open Flow	0mcf/d@24 hrs post treatment	After Treatment Rock Pressure	NA@24 hrs post treatment	Hours	Days

Well Service Companies -- Provide the name, address, and phone number of all well service companies involved.

Name	Address	City - State - Zip	Phone
Patterson UTI	4501 Lamesa Highway	Snyder, TX 79549	325-574-6300
Universal Well Services	730 Braddock View Dr	Mt. Braddock, PA 15465	724-430-6201
Frac Tech	16858 IH20	Cisco, TX 76437	817-850-1008

5500-FM-OG0004 Rev. 2/2001

LOG OF FORMATIONS

Well API#: 37-125-24024

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Fill	0'	40'				Drillers Log
Sand	40'	160'				Drillers Log
Shale	160'	220'				Drillers Log
Sand	220'	340'				Drillers Log
Sandy Shale	340'	611'				Drillers Log
Shale	611'	685'				Drillers Log
Coal, Shale and Sand	685'	803'				Drillers Log
Sand and Shale	803'	931'				Drillers Log
Sandy Shale	931'	995'				Drillers Log
Shale	995'	1059'				Drillers Log
Sand, Shale and Coal	1059'	1125'				Drillers Log
Shale Coal	1125'	1172'				Drillers Log
Shale	1172'	1301'				Drillers Log
Sandy Shale	1301'	1355'				Drillers Log
Shale	1355'	1370'				Drillers Log
Coal	1370'	1382'				Drillers Log
Sandy Shale	1382'	1455'	1438			Drillers Log
Shale and Coal	1455'	1460'				Drillers Log
Shale	1460'	1478'				Drillers Log
Coal	1478'	1484'				Drillers Log
Shale	1484'	1650'				Drillers Log
Sandy Shale	1650'	1765'			¼"wtr@1684	Drillers Log
Shale	1765'	1803'				Drillers Log
Sandy Shale	1803'	1817'				Drillers Log
Sand	1817'	2068'	1860			Drillers Log
Sand	2068'	2101'				Drillers Log
Shale	2101'	2164'				Drillers Log
Sand and Shale	2164'	2325'				Drillers Log
Sandy Shale	2325'	2401'				Drillers Log
Sand	2401'	2500'				Drillers Log
Sandy Shale	2500'	2555'				Drillers Log
White Sand	2555'	2668'				Drillers Log
Sandy Shale	2668'	2832'	2600			Drillers Log
Shale	2832'	3104'	2882			Drillers Log
Sand and Shale	3104'	3167'				Drillers Log
Shale	3167'	3710'				Drillers Log
Sand and Shale	3710'	5470'				Drillers Log
Shale	5470'	6120'	5690			Drillers Log
Limestone	6120'	7330'				Drillers Log
Shale	7330'	7440'	7370			Drillers Log
Limestone	7440'	7450'				Drillers Log
Horizontal						Drillers Log
Shale	5810'	8050'				Drillers Log
Limestone	8050'	8170'				Drillers Log
Shale	8170'					Drillers Log
Drillers Total Depth		11920'				Drillers Log

Please delete empty rows if necessary to make all of page 2 fit on one page.

Well Operator's Signature:

Title: Completion Engineer. Mike Hurey

Date: 1/31/2011

DEP USE ONLY

Reviewed by:

Date:

Comments:

RANGE RESOURCES

Sierzega Unit #6H
Well API: 37-125-24024

Completion Date: 12/28/10 - 1/5/11
Township: Amwell

% Composition of Hydraulic Fracture Fluid (by volume)

Product Name	Additive	Purpose	Use and Dilution	Volume	Overall %	Common Uses
Water	Carrier Fluid	Creates fracture network in shale and carry proppant to the formation	Primary constituent	3,779 446 gal	93 84%	Water is the most abundant molecule on the Earth's surface
Sand	Sand	Allows fractures to remain open so gas can escape	Second most common constituent, making up almost 8% of the fluid	252,887 gal	6 20%	Drinking water filtration, play sand
FRW-200 & FRW-300	Friction Reducer	Reduces friction between fluid and pipe	Diluted at one-half gallon per 1,000 gallons of water	1,958 gal	0 05%	Water treatment, soil conditioner, some children's toys
MC B-8642/Biobar	Antimicrobial Agent	Eliminates bacteria in the water that produce corrosive byproducts	Diluted at one-half gallon per 1,000 gallons of water	1,076 gal	0.03%	Water treatment, disinfectant; sterilize medical and dental equipment and surfaces
MX 588-2	Scale Inhibitor	Prevents scaling in pipe	Diluted at one-tenth gallon per 1,000 gallons of water	370 gal	0 01%	Water treatment, household cleaners, de-icing agent
HCL Acid	Pert Clean-Up	Dissolves cement and minerals to help initiate fractures	139 gallons per stage (non-diluted chemicals)	602 gal	0.01%	Swimming pool and household cleaner

Composition of Hydraulic Fracture Fluid (by volume)

Composition of Components in Marcellus Shale Hydraulic Fracturing Fluid

RANGE RESOURCES

Common Name & Supplier	Supplier Chemical Name	Common Description	Hazardous Component listed on MSDS	Purpose	MSDS Component Weight % of Chemical	Gallons MSDS Component in Well	Maximum Concentration of MSDS Component of Total Stage Fluid	
							% Vol	% Weight
7.5% HCl Mixture (FracTech)	37% HCL	concentrated HCl Acid	HCL	Cleans perforation	37.0%	602.26	0.0149%	0.0059%
	CI-100	Corrosion Inhibitor	Methanol	Protects casing	95.0%	18.57	0.0005%	0.0003%
			Propargyl Alcohol	Protects casing	5.0%	0.60	0.0000%	0.0000%
	NE100	Non-Emulsifer	No hazardous ingredients	Prevents emulsions	0.0%	N/A	N/A	N/A
	FE100L	Iron Chelator	No hazardous ingredients	Prevents precipitation	0.0%	N/A	N/A	N/A
						TOTAL	0.0154%	0.0063%
Friction Reducer (FracTech)	FRW-200 & FRW-3	Friction Reducer	No hazardous ingredients	Reduce friction down casing	0.0%	N/A	N/A	N/A
Scale Inhibitor (Multichem)	MX 588-2	Scale Inhibitor	No hazardous ingredients	prevents scale deposits	0.0%	N/A	N/A	N/A
Antibacterial Agent (Multichem)	Bioban	Antibacterial Agent	4,4-Dimethyloxazolidine	eliminates bacteria in water	78.0%	591.19	0.0148%	0.0133%
			3,4,4-Trimethyloxazolodine		5.0%	38.70	0.0010%	0.0009%
			2-Amino-2-methyl-1-propanol		1.0%	8.11	0.0002%	0.0002%
			Formaldehyde Amine		0.5%	3.53	0.0001%	0.0001%
	BMC B-8842	Antibacterial Agent	Glutaraldehyde	eliminates bacteria in water	60.0%	133.20	0.0033%	0.0045%
			n-alkyl dimethyl benzyl ammonium chloride		10.0%	22.20	0.0006%	0.0007%
			Ethanol		1.0%	2.22	0.0001%	0.0001%
						TOTAL	0.0159%	0.0144%

	by vol %	by weight %
SUMMARY	0.031%	0.021%

INDUSTRIAL COMPOUNDING LLC.
2500 HWY 62 WEST
CHICKASH, OK. 73018

MATERIAL SAFETY DATA SHEET

I.

PRODUCT NAME : FRW-200, POLYMERIZED FRICTION REDUCER
FORMULA: Polymeric Hydrocarbon Mixture
CHEMICAL FAMILY: Polymeric Mixture
DOT HAZARD CLASSIFICATION:NON-REGULATED

MATERIALS	% W/W	HAZARD DATA (TWA, ETC.)

TELEPHONE NUMBER: 1-800-349-9355
EMERGENCY NUMBER: 1-800-535-5053

II. PHYSICAL DATA/ PRODUCT CHARACTERISTICS

BOILING POINT: Not Determined
SPECIFIC GRAVITY: .96 – .99@ 77 deg. F
FREEZING POINT: Not Determined
SOLUBILITY IN WATER: Miscible
PHYSICAL STATE: Liquid
ODOR: Aromatic

III. FIRE & EXPLOSION INFORMATION

FLASH POINT: > 200 DEG F
EXTINGUISHING MEDIA: Foam or Dry Chemical
UNUSUAL FIRE OR EXPLOSION HAZARDS: NONE KNOWN

IV. REACTIVITY INFORMATION

STABILITY: STABLE
HAZARDOUS DECOMPOSITION PRODUCTS: Cox, NOx, SOx
INCOMPATIBILITY: Oxidizing Agents, concentrated Sulfuric or Nitric Acid
CONDITIONS TO AVOID:Flames, , heat above flash point

V. HEALTH HAZARD INFORMATION

PRIMARY ROUTES OF ENTRY FOR INJURY CAUSING EXPOSURE:

EYES: IRRITATION
SKIN: POSSIBLE IRRITATION, Skin absorbtion possible to harmful limits
INHALATION: IRRITATION, CNS depression, dizziness, confusion, nausea
CARCINOGENICITY: UNKNOWN
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: UNKNOWN

VI. FIRST AID RECOMMENDATIONS

EYES: FLUSH EYES WITH WATER OF AT LEAST 15 MINUTES, HOLDING EYELIDS APART. CALL PHYSICIAN
SKIN: WASH AFFECTED AREA WITH SOAP AND WATERINGESTION: DO NOT
INHALATION: REMOVE VICTIM TO FRESH AIR, IF SYMPTOMS PERSIST CALL PHYSICIAN.

VII. PERSONAL PROTECTIVE INFORMATION

VENTILATION REQUIREMENTS:
GENERAL ARE EXHAUST: X
LOCAL EXHAUST: X

PERSONAL PROTECTIVE EQUIPMENT:
EYE PROTECTION: GOGGLES OR FACE SHIELD
SKIN PROTECTION: RUBBER GLOVES, BOOTS, AND SPLASH APRON
RESPIRATORY PROTECTION: VAPOR MASK
OTHER REQUIRED EQUIPMENT:

VIII. SPILL PROCEDURES & WASTE TREATMENT

SPILL PROCEDURES: ABSORB SPILL AND CONTAINERIZE FOR DISPOSAL

WASTE TREATMENT: DISPOSE OF ACCORDING TO FEDERAL, STATE, AND LOCAL LAWS.

IX. SUBSTANCE CONTROL ACT INFORMATION

This product contains one or more substances listed as hazardous, toxic or flammable air pollutants under Section 112 of the Clean Air Act.
Consult Benzene standard 29 CFR 1910.1028
There may be specific regulations at the local level that pertain to this product

CONDITIONS: THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS, AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE AND THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, WE MAKE NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIM ALL LIABILITY FOR RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

PREPARED:

HMIS RATING
HEALTH: 1 FLAMMABILITY: 1 REACTIVITY: 0

EXHIBIT 12

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

DRISPAC® (Regular and SUPERLO®) Polymer

Product Use: Drilling Mud Additive
Product Number(s): 0001016806, 0001016803
Synonyms: Viscosifier, Water loss control agent
Product Cas No.: Proprietary

Company Identification:
Chevron Phillips Chemical Company LP
Drilling Specialties Company LLC
10001Six Pines Drive
The Woodlands,TX 77380

Product Information:
MSDS Requests: (800) 852-5530
Technical Information: (800) 221-1956

24-Hour Emergency Telephone Numbers
HEALTH:Chevron Phillips Emergency Information Center 866.442.9628 (North America) and 1.832.813.4984 (International)
TRANSPORTATION: North America: CHEMTREC 800.424.9300 or 703.527.3887
ASIA: +1.703.527.3887
EUROPE: BIG .32.14.584545 (phone) or .32.14.583516 (telefax)
SOUTH AMERICA SOS-Cotec Inside Brazil: 0800.111.767
Outside Brazil: 55.19.3467.1600

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENT	CAS NUMBER	AMOUNT	EINECS	SYM	R-PHRASES
Proprietary	Proprietary	100 % weight	EXEMPT	NA	NA

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Proprietary	CPCHEM	Not Established	NA	NA	NA

Control as Particulate Not Otherwise Classified (PNOC). The ACGIH Guideline* for respirable dust is 3.0 mg/m3 and 10.0 mg/m3 for total dust. The OSHA PEL for respirable dust is 5.0 mg/m3 and 15.0 mg/m3 for total dust.

* This value is for inhalable (total) particulate matter containing no asbestos and < 1.0% crystalline silica.

SECTION 3 HAZARDS IDENTIFICATION

****

EMERGENCY OVERVIEW

Free flowing powder.

- DUST MAY PRODUCE MECHANICAL IRRITATION TO THE MUCOUS MEMBRANES OF THE EYES, NOSE, THROAT AND UPPER RESPIRATORY TRACT

****

IMMEDIATE HEALTH EFFECTS:

Eye: Not expected to cause prolonged or significant eye irritation. Material is dusty and may scratch the surface of the eye.

Skin: Not expected to be harmful to internal organs if absorbed through the skin. Contact with the skin is not expected to cause prolonged or significant irritation.

Ingestion: Not expected to be harmful if swallowed.

Inhalation: The dust from this material may cause respiratory irritation.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with running water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

Skin: To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse. Get medical attention if any symptoms develop.

Ingestion: If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get immediate medical attention. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

SECTION 5 FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:

Classification (29 CFR 1910.1200): Not flammable or combustible. This material will burn although it is not easily ignited.

NFPA RATINGS: **Health:** 0 **Flammability:** 0 **Reactivity:** 0

FLAMMABLE PROPERTIES:

Flashpoint: NA

Autoignition: NA

Flammability (Explosive) Limits (% by volume in air): **Lower:** NA **Upper:** NA

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: Material will not burn unless preheated. Clear fire area of all non-emergency personnel. Only enter confined fire space with full gear, including a positive pressure, NIOSH-approved, self-contained breathing apparatus. Cool surrounding equipment, fire-exposed containers and structures with water. Container areas exposed to direct flame contact should be cooled with large quantities of water (500 gallons water per minute flame impingement exposure) to prevent weakening of container structure.

Combustion Products: No data available.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Wear appropriate personal protective equipment when cleaning up spills. Refer to Section 8.
Spill Management: Avoid creating dust clouds. Shovel, sweep up or use industrial vacuum cleaner to pick up. Place in container for proper disposal. Reduce airborne dust and prevent scattering by moistening with water.
Reporting: U.S.A. regulations require reporting spills of this material that could reach any surface waters. Report spills to local authorities and/or the National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL . REFER TO PRODUCT LABEL OR MANUFACTURERS TECHNICAL BULLETINS FOR THE PROPER USE AND HANDLING OF THIS MATERIAL .

Precautionary Measures: Use caution to avoid creation of dusts and to prevent inhalation of product dust (fines). Avoid contact with product dust. Airborne dust concentrations above 20 mg/l may create a dust explosion hazard. Avoid breathing vapors or fumes which may be released during thermal processing. Do not breathe dust at levels above the recommended exposure limits. Avoid breathing material. Keep container closed. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations, which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids, National Fire Protection Association (NFPA 77), Recommended Practice on Static Electricity' (liquids, powders and dusts), and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents' (liquids).
General Storage Information: Treat as a solid that can burn. Store away from oxidizing materials, in a cool, dry place with adequate ventilation. Bond and ground transfer equipment. DO NOT USE OR STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.
Container Warnings: Containers, even those that have been emptied, can contain residues of dusts or solid particulates which may create both health and fire/explosion hazards.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3) applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
If heated material generates vapor or fumes, use process enclosures, local exhaust ventilation, or other engineering controls to control exposure.

PERSONAL PROTECTIVE EQUIPMENT:

Eye/Face Protection: Wear eye protection such as safety glasses, chemical goggles, or faceshields if engineering controls or work practices are not adequate to prevent eye contact.
Skin Protection: Wear impervious protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Users should determine acceptable performance characteristics of protective clothing. Consider physical requirements and other substances present when selecting protective clothing. Suggested materials for protective gloves include: Nitrile Rubber
Respiratory Protection: If user operations generate harmful levels of airborne material that is not adequately controlled by ventilation, wear a NIOSH approved respirator that provides adequate protection. Use the following elements for air-purifying respirators: Air-Purifying Respirator for Dusts and Mists

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Proprietary	CPCHEM	Not Established	NA	NA	NA

Control as Particulate Not Otherwise Classified (PNOC). The ACGIH Guideline* for respirable dust is 3.0 mg/m3 and 10.0 mg/m3 for total dust. The OSHA PEL for respirable dust is 5.0 mg/m3 and 15.0 mg/m3 for total dust.

* This value is for inhalable (total) particulate matter containing no asbestos and < 1.0% crystalline silica.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Free flowing powder.
pH: NA
VAPOR PRESSURE: NA
VAPOR DENSITY (AIR=1): NA
BOILING POINT: NDA
SOLUBILITY (in water): Completely Soluble
DENSITY: 1.5 g/cm3 @ 20 °C (60°F)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Conditions to Avoid: No Data Available
Incompatibility With Other Materials: No data available
Hazardous Decomposition Products: No Data Available
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS:

Acute Oral Toxicity: LD50 / rat / > 2500 mg/kg
Acute Dermal Toxicity: LD50 / rabbit / > 2000 mg/kg
Acute Inhalation Toxicity: LC50 / rat / > 2000 mg/m3 / 4 hour(s)

Eye Irritation: This material is not expected to be irritating to the eyes.
Skin Irritation: This material is not expected to be irritating to the skin.

ADDITIONAL TOXICOLOGY INFORMATION:
The toxicological properties of this product have not been tested or have not been tested completely and

its handling or use may be hazardous. EXERCISE DUE CARE.

Long-term exposure to high dust concentrations may cause non-debilitating lung changes.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY:
The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.

ENVIRONMENTAL FATE:
This material is expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

Shipping Descriptions per regulatory authority.

US DOT
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

ICAO / IATA
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

IMO / IMDG
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

RID / ADR
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

SECTION 15 REGULATORY INFORMATION

SARA 311/312 CATEGORIES:

1.	Immediate (Acute) Health Effects:	NO
2.	Delayed (Chronic) Health Effects:	NO
3.	Fire Hazard:	NO
4.	Sudden Release of Pressure Hazard:	NO
5.	Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01= CA Prop 65	17 = FDA 178	33 = RCRA Waste Appendix VIII
02 = LA RTK	18 = FDA 179	34 = RCRA Waste D-List
03 = MA RTK	19 = FDA 180	35 = RCRA Waste P-List
04 =MN Hazardous Substance	20 = FDA 181	36 = RCRA Waste U-List
05 =NJ RTK	21 = FDA 182	37 = SARA Section 311/312
06 = PA RTK	22 = FDA 184	38 = SARA Section 313
07 = CAA Section 112 HAPs	23 = FDA 186	39 = TSCA 12 (b)
08 = CWA Section 307	24 = FDA 189	40 = TSCA Section 4
09 = CWA Section 311	25 = IARC Group 1	41 = TSCA Section 5(a)
10 =DOT Marine Pollutant	26 = IARC Group 2A	42 = TSCA Section 8(a) CAIR
11 = FDA 172	27 = IARC Group 2B	43 = TSCA Section 8(a) PAIR
12 = FDA 173	28 = IARC Group 3	44 = TSCA Section 8(d)
13 = FDA 174	29 = IARC Group 4	45 = WHIMS - IDL
14 = FDA 175	30 = NTP Carcinogen	46 = Germany D TAL
15 = FDA 176	31 = OSHA Carcinogen	47 = Germany WKG
16 = FDA 177	32 = OSHA Highly Hazardous	

No components of this material were found on the regulatory lists above.

WHMIS CLASSIFICATION:
This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

CHEMICAL INVENTORY LISTINGS:
AUSTRALIA: All the components of this material are listed on the Australian Inventory of Chemical Substances (AICS).
CANADA: All the components of this material are on the Canadian Domestic Substances List (DSL).
PEOPLE'S REPUBLIC OF CHINA: All the components of this product are listed on the draft Inventory of Existing Chemical Substances in China.
EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh Amendment Directive 92/32/EEC.
JAPAN: All the components of this product are on the Existing & New Chemical Substances (ENCS) inventory in Japan, or have an exemption from listing.
KOREA: All the components of this product are on the Existing Chemicals List (ECL) in Korea.
PHILIPPINES: All the components of this product are listed on the Philippine Inventory of Chemicals and Chemical Substances (PICCS).
UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

EU RISK AND SAFETY PHRASES:
S22: Do not breathe dust.

EU Symbols: NA

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 0 Reactivity: 0 Special: NA

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index

recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA).

REVISION STATEMENT: This revision updates all sections of the MSDS please review.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	Threshold Limit Value	TWA	Time Weighted Average
STEL	Short-term Exposure Limit	PEL	Permissible Exposure Limit
ACGIH	American Conference of Government Industrial Hygienists	OSHA	Occupational Safety & Health
NIOSH	National Institute of Safety & Health	NFPA	National Fire Protection Agency
WHMIS	Workplace Hazardous Materials Information System	IARC	Intl. Agency for Research on Cancer
EINECS	European Inventory of existing Commercial Chemical Sales	RCRA	Resource Conservation Recovery Act
SARA	Superfund Amendments and Reauthorization Act.	TSCA	Toxic Substance Control Act
EC50	Effective Dose	LC50	Lethal Concentration
LD50	Lethal Dose	CAS	Chemical Abstract Service Number
NDA	No Data Available	NA	Not Applicable
<=	Less Than or Equal To	>=	Greater Than or Equal To
CNS	Central Nervous System	MAK	Germany Maximum Concentration Values

This data sheet is prepared according to the latest adaptation of the EEC Guideline 67/548.
This data sheet is prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200).
This data sheet is prepared according to the ANSI MSDS Standard (Z400.1).
This data sheet was prepared by EHS Product Stewardship Group, Chevron Phillips Chemical Company LP, 10001 Six Pines Drive, The Woodlands, TX 77380.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

EXHIBIT 13

FracFocus
Chemical Disclosure Registry (/)

Chemicals serve many functions in hydraulic fracturing. From limiting the growth of bacteria to preventing corrosion.

LEARN MORE > (/chemical-use)

Looking for information about a *well site near you?*

(http://www.fracfocusdata.org/DisclosureSearch/)

Search for nearby well sites that have been hydraulically fractured to see what chemicals were used in the process.

Groundwater Protection: Priority Number One

Oil and natural gas producers have stringent requirements for how wells must be completed. The genesis of these requirements is water safety.

Casing is the first line of defense used to protect freshwater aquifers.

More About Groundwater Protection » (/node/34)

FAQs

(#) 1 / 3 (#)

How is water used in hydraulic fracturing?

Water acts as the carrier fluid for the chemical additives and propping agents (typically sand) that are used to fracture the producing formation.

All FAQs » (/faq)

News & Updates »

Ask a Question »

(#)

1/7/2014 University of Oklahoma offers free course to public (/node/351)

The University of Oklahoma is offering an on-line course on "Hydraulic Fracturing and Water Resources", free of charge to the public. The course begins January 13th. You can register for the course at https://janux.ou.edu/landing (https://janux.ou.edu/landing) . This is a good opportunity to learn more about the process of hydraulic fracturing and the water resources related to the process.

Read more (/node/351)

GROUNDWATER PROTECTION COUNCIL (http://www.gwpc.org/) Oil & Gas (http://www.iogcc.state.ok.us/)

Terms of Use (/terms-of-use)

FracFocus
Chemical Disclosure Registry (http://www.fracfocus.org)

0
Find a Well

Map Search (MapSearch.aspx)
Standard Search
(StandardSearch.aspx)

SEARCH OPTIONS

(#dialog)

STATE:	COUNTY:	WELLS IN COUNTY:	OPERATOR:
Pennsylvania	Fayette	Teslovich 30H	Choose One

API WELL NUMBER: WELL NAME:

__-___-____

FIND CAS NUMBER _____-__-_ clear

BUILD DATE FILTER clear

INGREDIENT LIST clear

SEARCH RESET (Note: One search option is required to do a search.)

In states where disclosure using FracFocus is not a state requirement, well site information is voluntarily provided by participating oil and natural gas operators. The FracFocus system is designed to contain disclosures for wells fractured after January 1, 2011. See the full list of participating production companies (http://www.fracfocus.org/links). Only disclosures that match your search parameters are presented. There may be more than one disclosure presented for a single well. NOTE: To maximize search efficiency, the total number of disclosures returned from a single search may not exceed 2000.

The disclosures that match your search are presented. There may be more than one disclosure presented for a single well.

GROUNDWATER PROTECTION COUNCIL (http://www.gwpc.org/) Oil & Gas (http://www.iogcc.state.ok.us/)

Terms of Use (http://www.fracfocus.org/terms-of-use)

FracFocus
Chemical Disclosure Registry (http://www.fracfocus.org)

0
Find a Well

Back To Search (javascript:WebForm_DoPostBackWithOptions(new WebForm_PostBackO

API No. (javascript:__doPostBack('ctl00$MainContent$GridView1','Sort$APINumber'))	Job Start Dt (javascript:__doPostBack('ctl00$MainContent$G
37-051-24417-00-00	10/4/2011

GROUNDWATER PROTECTION COUNCIL (http://www.gwpc.org/) Oil & Gas (http://www.iogcc.state.ok.us/)

Terms of Use (http://www.fracfocus.org/terms-of-use)

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date	10/4/2011
State:	Pennsylvania
County:	Fayette
API Number:	37-051-24417
Operator Name:	Atlas Resources LLC
Well Name and Number:	Teslovich 30H
Longitude:	-79.766389
Latitude:	39.961667
Long/Lat Projection:	NAD83
Production Type:	Gas
True Vertical Depth (TVD):	8,048
Total Water Volume (gal)*:	4,045,620

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
7.5% Acid	Reagent/PPG	Concentrated HCl Acid	HCl	7647-01-0	7.50%	0.28670%	
Unihib G	Geosafe	Corrosion Inhibitor	Glycol Ether	112-34-5	50.00%	0.00071%	
Unihib G	Geosafe	Corrosion Inhibitor	Ethoxylated Alcohol	Proprietary	35.00%	0.00050%	
Unihib G	Geosafe	Corrosion Inhibitor	Resin Based Nonionic Inhibitor	Proprietary	35.00%	0.00050%	
Friction Reducer B	Nalco	Friction Reducer	No Hazardous Components	NA	0.00%	0.00000%	
Unislik ST 50	CESI	Friction Reducer	Hydrotreated Light Distillate	64742-47-8	30.00%	0.01477%	
ScaleHib A	Nalco	Scale Inhibitor	Ethylene Glycol	107-21-1	30.00%	0.00650%	
WGA-3 (CMHPG)	Ashland	Gelling Agent	Carboxymethyl-hydroxypropyl Guar Blend	Mixture	100.00%	0.00198%	
EC6116A	Nalco	Biocide	Dibromoacetonitrile	3252-43-5	5.00%	0.00106%	
EC6116A	Nalco	Biocide	2,2-Dibromo-3-nitrilopropionamide	10222-01-2	30.00%	0.00637%	
EC6116A	Nalco	Biocide	Polyethylene Glycol	25322-68-3	60.00%	0.01274%	
Iron Control A	Nalco	Iron Control	Ethylene Glycol	107-21-1	30.00%	0.00584%	
LEB-10X	Clearwater	Enzyme Breaker	Ethylene Glycol	107-21-1	60.00%	0.00001%	
Sand		Proppant	Silica	14808-60-7	99.90%	7.35194%	
Water		Carrier Fluid				92.17368%	

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.

HERCULES

MATERIAL SAFETY DATA SHEET

Hercules Incorporated
Aqualon Division
Hercules Plaza
1313 North Market Street
Wilmington, DE 19894
(302) 594-5000 24 HOURS

MSDS NO.: 999 8000 0210 **VER:** 02
SAP CODE: 100GR1042A00000044
ISSUE DATE: 02/24/2009
SUPERSEDES: 999 8000 0210 **VER:** 01

1 PRODUCT IDENTIFICATION

PRODUCT NAME	**UNIGEL CMHPG GUAR PRODUCT**
CHEMICAL/COMMON NAME	carboxymethylhydroxypropyl guar blend
CAS NUMBER	mixture

2 COMPOSITION / INFORMATION ON INGREDIENTS

This product is considered hazardous according to the OSHA Hazard Communication Standard 29CFR1910.1200 due to flammable dust potential.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
WARNING!

Static charges generated by emptying package in or near flammable vapors may cause flash fire.
May form flammable dust-air mixtures.
May cause eye irritation by mechanical abrasion.
May cause skin irritation by mechanical abrasion.
Inhalation of dust may cause respiratory tract irritation.
Surfaces subject to spills may become slippery.

Refer to Section 5 for Hazardous Combustion Products, and Section 10 for Hazardous Decomposition/Hazardous Polymerization Products.

4 FIRST AID MEASURES

SKIN
Wash thoroughly with soap and water. Get medical attention if irritation develops or persists.

EYE
Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get medical attention if irritation persists.

INHALATION
Remove to fresh air. Get medical attention if nasal, throat or lung irritation develops.

INGESTION
Not an ingestion hazard under anticipated conditions of use. For accidental ingestion: Do NOT induce vomiting. Get immediate medical attention.

5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
Water spray, dry chemical, foam, carbon dioxide or clean extinguishing agents may be used on fires involving this product.

FIRE FIGHTING PROCEDURES
Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH approved (or equivalent) and full protective gear when fighting fires involving this product.

CONDITIONS TO AVOID
None known.

HAZARDOUS COMBUSTION PRODUCTS
Combustion products include: carbon monoxide , carbon dioxide and smoke

6 ACCIDENTAL RELEASE MEASURES

Ventilate area. Avoid dust formation. Clean up spills immediately. If product is not contaminated, scoop into clean containers for use. If product is contaminated, scoop into containers, and dispose appropriately. In case of accidental spill or release, refer to Section 8, Personal Protective Equipment and General Hygiene Practices.

7 HANDLING & STORAGE

GENERAL MEASURES
Ground all equipment.
Blanket vessel with inert gas when emptying bags where flammable vapors may be present.
Ground operator and pour material slowly into conductive, grounded chute.
Store in a cool, dry, well ventilated area.
Keep container closed when not in use.

MATERIALS OR CONDITIONS TO AVOID
Avoid conditions that generate dust; product may form flammable dust-air mixtures.
Avoid emptying package in or near flammable vapors; static charges may cause flash fire.
Keep away from heat, flame, sparks and other ignition sources.
Do not store near flammable materials.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

WORK PRACTICES & ENGINEERING CONTROLS
Eyewash fountains and safety showers should be easily accessible.
Provide adequate ventilation.
If upper respiratory tract irritation occurs, use an approved dust/mist respirator to minimize exposure.
Keep floors clean and dry. Clean up spills immediately.

GENERAL HYGIENIC PRACTICES
Avoid contact with eyes, skin, and clothing.
Avoid breathing dust.
Handle in areas with adequate ventilation.
Avoid contamination of food, beverages, or smoking materials.
Wash thoroughly after handling, and before eating, drinking or smoking.
Remove contaminated clothing promptly and clean thoroughly before reuse.

RECOMMENDED EXPOSURE LIMITS
No exposure limit has been established. This product may irritate the upper respiratory tract if used under conditions that create dust or mist particulates.

PERSONAL PROTECTIVE EQUIPMENT
Safety glasses
Impervious gloves
Appropriate protective clothing
Wear approved dust/mist respirator if user operations create dust/mist that causes irritation.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE
Eliminate ignition sources and prevent build-up of static electrical charges.
Completely isolate and thoroughly clean all equipment, piping, or vessels before beginning maintenance or repairs.
Keep area clean.

9 PHYSICAL & CHEMICAL PROPERTIES

PHYSICAL STATE:	powder
COLOR:	off-white to pale yellow
ODOR:	mild

Percent Volatile	7
Viscosity	25 cps
Solubility In Water	miscible with water; limited by viscosity
pH Value	6.5 - 7.5 (1% solution)
Bulk Density	Not determined
Particle Size	100 % through 60 USBS mesh sieve

10 STABILITY & REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS
None anticipated under normal or recommended handling and storage conditions.

HAZARDOUS POLYMERIZATION
Not anticipated under normal or recommended handling and storage conditions.

GENERAL STABILITY CONSIDERATIONS
Stable under recommended handling and storage conditions.

INCOMPATIBLE MATERIALS
None known

11 TOXICOLOGICAL INFORMATION

CARCINOGENICITY INFORMATION
Not listed as a carcinogen by NTP. Not regulated as a carcinogen by OSHA. Not evaluated by IARC.

REPORTED HUMAN EFFECTS
No human toxicity studies have been carried out with this product. Due to the physical nature of this material, may cause eye, skin and respiratory irritation.

REPORTED ANIMAL EFFECTS
No animal toxicity studies have been carried out with this product.

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
No ecological studies have been carried out on this product.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL
Landfilling in a permitted solid or hazardous waste facility is recommended. Handling, transportation, and disposal of material should be conducted in a manner to prevent a nuisance dust hazard. Fully containerize the material before handling, and protect from exposure to the outdoors. Ensure there are no restrictions on disposing of bulk or semi-bulk quantities of waste material. Disposal should be in accordance with all Federal, State and local regulations.

14 TRANSPORT INFORMATION

GENERAL
This product is not subject to DOT regulations. For specific information regarding transportation of this product, please call the Hercules representative at (905) 279-3338.

15 REGULATORY INFORMATION

CHEMICAL INVENTORIES
U.S. TSCA: The components of this product are included on the TSCA Inventory.
Canadian CEPA : Included on DSL Inventory.

SARA TITLE III - SECTIONS 302/304
This product is not an Extremely Hazardous Substance subject to reporting under 40CFR355.

SARA TITLE III - SECTIONS 311 AND 312
NHH: Not a health hazard
HC-3: Fire hazard

SARA TITLE III - SECTION 313
This product does not contain any chemicals subject to reporting under Section 313 of Title III of the Superfund Amendments and Reauthorization Act and 40CFR372.

CERCLA
This product does not contain any chemicals subject to reporting as a CERCLA Hazardous Substance under 40CFR302.4.

RCRA
This product is not a hazardous waste as listed in 40CFR261.33. It does not exhibit any of the hazardous characteristics listed in 40CFR261, Subpart C.

16 OTHER INFORMATION

HMIS RATINGS:

Health	1	Slight Hazard
Flammability	1	Slight Hazard
Reactivity	0	Minimal Hazard

LIST OF ACRONYMS
ACGIH: American Conferences of Governmental Industrial Hygienists
AIHA WEEL: American Industrial Hygienists Association - Workplace Environmental Exposure Level
CASRN: Chemical Abstracts Service Registry Number
CERCLA: Comprehensive Emergency Response, Compensation and Liability Act
HMIS: Hazardous Materials Identification System
IARC: International Agency for Research on Cancer
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration
PEL: OSHA Permissible Exposure Limit
RCRA: Resource Conservation and Recovery Act
RQ: Reportable Quantity
SARA: Superfund Amendment Reauthorization Act
STEL: Short-Term Exposure Limit
TLV: Threshold Limit Values (registered trademark of ACGIH)
TPQ: Threshold Planning Quantity
TSCA: Toxic Substance Control Act
TWA: Time Weighted Average

DISCLAIMER
The information and recommendations contained in this Material Safety Data Sheet have been compiled from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to safely use this product, either alone or in combination with other products, and determine its environmental regulatory compliance obligations under any applicable federal or state laws.

MSDS STATUS

Supersedes Date	MSDS Revision(s)
10/24/2006	Section 9

Engineered Chemistry™

Material Safety Data Sheet

LEB 10X

1. Product and Company Identification

Material name	**LEB 10X**
Patent Number	Not available
Version No.	2
CAS #	Mixture
Product use	Gel Breaker
Manufacturer information	Clearwater International L.L.C. 100 Leetsdale Industrial Drive Leetsdale, PA 15056 US CHEMTREC 1-800-424-9300/703-527-3887
Emergency	CHEMTREC 1-800-424-9300/703-527-3887
Supplier information	Universal Well Services, Inc. 18360 Technology Drive Meadville, PA 16335 US

2. Hazards Identification

Emergency overview	Harmful if swallowed. Prolonged exposure may cause chronic effects. Components of the product may be absorbed into the body by inhalation, ingestion and through the skin.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Eyes	Do not get this material in contact with eyes.
Skin	Do not get this material in contact with skin.
Inhalation	Prolonged inhalation may be harmful. Do not breathe dust/fume/gas/mist/vapors/spray.
Ingestion	May cause delayed lung damage. Do not ingest. Components of the product may be absorbed into the body by ingestion.
Target organs	Central nervous system. Eyes. Lungs. Respiratory system. Skin.
Chronic effects	Shortness of breath. May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue, mental confusion, and blurred vision) and/or damage. May cause delayed lung damage.
Signs and symptoms	Discomfort in the chest. Shortness of breath. Narcosis. Decrease in motor functions. Behavioral changes. Cough.
Potential environmental effects	May cause long-term adverse effects in the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Ethylene Glycol	107-21-1	30 - 60

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists.
Skin contact	Wash off with soap and water. Get medical attention if irritation develops or persists.
Inhalation	If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Get medical attention immediately.
Ingestion	If swallowed, seek medical advice immediately and show this container or label. Do not induce vomiting without medical advice.
Notes to physician	Symptoms may be delayed.
General advice	Call a physician if symptoms develop or persist. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties	Combustible by OSHA criteria.
Extinguishing media	
Suitable extinguishing media	Water. Alcohol foam. Polymer foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use a solid water stream as it may scatter and spread fire.
Protection of firefighters	
Protective equipment and precautions for firefighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. ALWAYS stay away from tanks engulfed in flame. Withdraw immediately in case of rising sound from venting safety devices or any discoloration of tanks due to fire. Move containers from fire area if you can do it without risk. Do not scatter spilled material with high pressure water streams. Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out.

6. Accidental Release Measures

Personal precautions	Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering. Keep unnecessary personnel away. Stay upwind. Keep out of low areas.
Methods for containment	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use water spray to reduce vapors or divert vapor cloud drift. Prevent entry into waterways, sewers, basements or confined areas.

Methods for cleaning up	Should not be released into the environment. Large Spills: Dike far ahead of liquid spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. After removal flush contaminated area thoroughly with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean contaminated surface thoroughly. Never return spills in original containers for re-use.

7. Handling and Storage

Handling	Use only with adequate ventilation. Avoid release to the environment. Wash thoroughly after handling. Avoid prolonged exposure.
Storage	Store in a closed container away from incompatible materials. Store in accordance with local/regional/national/international regulation.

8. Exposure Controls / Personal Protection

Exposure limits

ACGIH

Components	CAS #	TWA	STEL	Ceiling
Ethylene Glycol	107-21-1	Not established	Not established	100 mg/m3

Engineering controls	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Personal protective equipment	
Eye / face protection	Wear chemical goggles.
Skin protection	Wear chemical protective equipment that is specifically recommended by the manufacturer. It may provide little or no thermal protection. Protective gloves.Impervious gloves.
Respiratory protection	Wear positive pressure self-contained breathing apparatus (SCBA). When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
General hygeine considerations	When using do not eat or drink. Keep away from food and drink. Handle in accordance with good industrial hygiene and safety practice.

9. Physical & Chemical Properties

Appearance	Liquid.
Color	clear yellow
Odor	Not available.
Odor threshold	Not available
Physical state	Liquid.
Form	Liquid.
pH	6 - 8
Melting point	12.2 °F (-11.25 °C) estimated
Freezing point	Not available

Boiling point	386.6 °F (197 °C) estimated
Flash point	200 °F (93.3 °C)
Evaporation rate	Not available
Flammability	Not available.
Flammability limits in air, upper, % by volume	Not available
Flammability limits in air, lower, % by volume	Not available
Vapor pressure	Not available
Vapor density	Not available
Specific gravity	1.19 - 1.22
Relative density	1.2049 g/cm3 estimated
Solubility (water)	Not available
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	748.4 °F (398 °C) estimated
Decomposition temperature	Not available
VOC	32.77 % estimated

10. Chemical Stability & Reactivity Information

Chemical stability	Stable at normal conditions.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Amines. Isocyanates. Strong oxidizing agents. Strong acids. Caustics.

11. Toxicological Information

Acute effects Acute LD50: 9501 mg/kg estimated, Rat, Oral

Component analysis - LD50

Toxicology Data - Selected LD50s and LC50s

Ethylene Glycol	107-21-1	Oral LD50 Rat: 4000 mg/kg; Dermal LD50 Rabbit:9530 µL/kg

Sensitization Not expected to be hazardous by OSHA criteria.

Chronic effects Hazardous by OSHA criteria. Repeated absorption may cause disorder of central nervous system, liver, kidneys and blood. Prolonged or repeated exposure may cause lung injury. Prolonged exposure may cause chronic effects.

Carcinogenicity Not expected to be hazardous by OSHA criteria.

ACGIH - Threshold Limits Values - Carcinogens

Ethylene Glycol	107-21-1	A4 - Not Classifiable as a Human Carcinogen

Neurological effects Hazardous by OSHA criteria.

Further information Symptoms may be delayed.

12. Ecological Information

Ecotoxicity Components of this product have been identified as having potential environmental concerns.

Ecotoxicity - Freshwater Algae Data

Ethylene Glycol	107-21-1	96 Hr EC50 Selenastrum capricornutum: 6500-1300 mg/L

Ecotoxicity - Freshwater Fish Species Data

Ethylene Glycol	107-21-1	96 Hr LC50 Oncorhynchus mykiss: 41000 mg/L; 96 Hr LC50 Lepomis macrochirus: 27500 mg/L; 96 Hr LC50 Oncorhynchus mykiss: 40761 mg/L [static]; 96 Hr LC50 Pimephales promelas: 49000 mg/L [static]; 96 Hr LC50 Poecilia reticulata: 16000 mg/L [static]

Ecotoxicity - Microtox Data

Ethylene Glycol	107-21-1	30 min EC50 Photobacterium phosphoreum: 620.0 mg/L; 30 min EC50 Photobacterium phosphoreum: 620 mg/L; 16 Hr EC50 Pseudomonas putida: 10000 mg/L

Ecotoxicity - Water Flea Data

Ethylene Glycol	107-21-1	48 Hr EC50 water flea: 46300 mg/L

Environmental effects

Ecotoxicity - Freshwater Algae Data

Ethylene Glycol	107-21-1	96 Hr EC50 Selenastrum capricornutum: 6500-1300 mg/L

Ecotoxicity - Freshwater Fish Species Data

Ethylene Glycol	107-21-1	96 Hr LC50 Oncorhynchus mykiss: 41000 mg/L; 96 Hr LC50 Lepomis macrochirus: 27500 mg/L; 96 Hr LC50 Oncorhynchus mykiss: 40761 mg/L [static]; 96 Hr LC50 Pimephales promelas: 49000 mg/L [static]; 96 Hr LC50 Poecilia reticulata: 16000 mg/L [static]

Ecotoxicity - Microtox Data

Ethylene Glycol	107-21-1	30 min EC50 Photobacterium phosphoreum: 620.0 mg/L; 30 min EC50 Photobacterium phosphoreum: 620 mg/L; 16 Hr EC50 Pseudomonas putida: 10000 mg/L

Ecotoxicity - Water Flea Data

Ethylene Glycol	107-21-1	48 Hr EC50 water flea: 46300 mg/L

13. Disposal Considerations

Disposal Instructions Do not allow this material to drain into sewers/water supplies. This product, in its present state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4 (b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. Dispose in accordance with all applicable regulations.

14. Transport Information

Department of Transportation (DOT) Requirements

Not regulated as hazardous goods.

Department of Transportation (DOT) Requirements

Bulk

Not regulated as hazardous goods.

Department of Transportation (DOT) Requirements

Not regulated as dangerous goods.

Canadian Transportation of Dangerous Goods (TDG) Requirements

Not regulated as hazardous goods.

IMDG

Not regulated as hazardous goods.

IATA

Not regulated as hazardous goods.

15. Regulatory Information

Labelling

Contains Ethylene Glycol

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

Ethylene Glycol	107-21-1	1.0 % de minimis concentration

Occupational Safety and Health Administration (OSHA)

29 CFR 1910.1200 hazardous chemical Yes

CERCLA (Superfund) reportable quantity

Ethylene Glycol: 5000.0000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

Section 302 extremely hazardous substance No

Section 311 hazardous chemical Yes

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of New and Existing Chemicals (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

International regulations

Canada - WHMIS - Ingredient Disclosure List

Ethylene Glycol	107-21-1	1 %

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

U.S. - Massachusetts - Right To Know List

Ethylene Glycol	107-21-1	Present

U.S. - Minnesota - Hazardous Substance List

Ethylene Glycol	107-21-1	Present (particulate and vapor)

U.S. - New Jersey - Right to Know Hazardous Substance List

Ethylene Glycol	107-21-1	sn 0878

U.S. - Pennsylvania - RTK (Right to Know) List

Ethylene Glycol	107-21-1	Environmental hazard

U.S. - Rhode Island - Hazardous Substance List

Ethylene Glycol	107-21-1	Toxic; Flammable

U.S. - Texas - Effects Screening Levels - Long Term

Ethylene Glycol	107-21-1	10 ppb ESL (46% Ethylene glycol); 26 µg/m3 ESL (46% Ethylene glycol)

U.S. - Texas - Effects Screening Levels - Short Term

Ethylene Glycol	107-21-1	100 ppb ESL (46% ethylene glycol); 260 µg/m3 ESL (46% ethylene glycol)

16. Other Information

HMIS® ratings
Health: 1*
Flammability: 1
Physical hazard: 0

NFPA ratings
Health: 1
Flammability: 1
Instability: 0

Prepared by
Amanda L. Ruston
4420 South Flores Road
Elmendorf, Texas 78112
210-626-0850

Disclaimer
THIS PRODUCT'S HEALTH AND SAFETY INFORMATION IS PROVIDED TO ASSIST OUR CUSTOMERS IN ASSESSING COMPLIANCE WITH HEALTH, SAFETY AND ENVIRONMENTAL REGULATIONS. THE INFORMATION CONTAINED HEREIN IS BASED ON DATA AVAILABLE TO US, AND IS BELIEVED TO BE ACCURATE, ALTHOUGH NO GUARANTEE OR WARRANTY IS PROVIDED OR IMPLIED BY THE COMPANY IN THIS RESPECT. SINCE THE USE OF THIS PRODUCT IS WITHIN THE EXCLUSIVE CONTROL OF THE USER, IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE CONDITIONS OF SAFE USE. SUCH CONDITIONS MUST COMPLY WITH ALL GOVERNMENTAL REGULATIONS.

MSDS sections updated Product and Company Identification: Alternate Trade Names

EXHIBIT 14

UNITED STATES HOUSE OF REPRESENTATIVES
COMMITTEE ON ENERGY AND COMMERCE
MINORITY STAFF
APRIL 2011

CHEMICALS USED IN HYDRAULIC FRACTURING

PREPARED BY COMMITTEE STAFF FOR:

Henry A. Waxman
Ranking Member
Committee on Energy and Commerce

Edward J. Markey
Ranking Member
Committee on Natural Resources

Diana DeGette
Ranking Member
Subcommittee on Oversight and Investigations

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

Hydraulic fracturing has helped to expand natural gas production in the United States, unlocking large natural gas supplies in shale and other unconventional formations across the country. As a result of hydraulic fracturing and advances in horizontal drilling technology, natural gas production in 2010 reached the highest level in decades. According to new estimates by the Energy Information Administration (EIA), the United States possesses natural gas resources sufficient to supply the United States for approximately 110 years.

As the use of hydraulic fracturing has grown, so have concerns about its environmental and public health impacts. One concern is that hydraulic fracturing fluids used to fracture rock formations contain numerous chemicals that could harm human health and the environment, especially if they enter drinking water supplies. The opposition of many oil and gas companies to public disclosure of the chemicals they use has compounded this concern.

Last Congress, the Committee on Energy and Commerce launched an investigation to examine the practice of hydraulic fracturing in the United States. As part of that inquiry, the Committee asked the 14 leading oil and gas service companies to disclose the types and volumes of the hydraulic fracturing products they used in their fluids between 2005 and 2009 and the chemical contents of those products. This report summarizes the information provided to the Committee.

Between 2005 and 2009, the 14 oil and gas service companies used more than 2,500 hydraulic fracturing products containing 750 chemicals and other components. Overall, these companies used 780 million gallons of hydraulic fracturing products – not including water added at the well site – between 2005 and 2009.

Some of the components used in the hydraulic fracturing products were common and generally harmless, such as salt and citric acid. Some were unexpected, such as instant coffee and walnut hulls. And some were extremely toxic, such as benzene and lead. Appendix A lists each of the 750 chemicals and other components used in hydraulic fracturing products between 2005 and 2009.

The most widely used chemical in hydraulic fracturing during this time period, as measured by the number of compounds containing the chemical, was methanol. Methanol, which was used in 342 hydraulic fracturing products, is a hazardous air pollutant and is on the candidate list for potential regulation under the Safe Drinking Water Act. Some of the other most widely used chemicals were isopropyl alcohol (used in 274 products), 2-butoxyethanol (used in 126 products), and ethylene glycol (used in 119 products).

Between 2005 and 2009, the oil and gas service companies used hydraulic fracturing products containing 29 chemicals that are (1) known or possible human carcinogens, (2) regulated under the Safe Drinking Water Act for their risks to human health, or (3) listed as hazardous air pollutants under the Clean Air Act. These 29 chemicals were components of more than 650 different products used in hydraulic fracturing.

The BTEX compounds – benzene, toluene, xylene, and ethylbenzene – appeared in 60 of the hydraulic fracturing products used between 2005 and 2009. Each BTEX compound is a regulated contaminant under the Safe Drinking Water Act and a hazardous air pollutant under the Clean Air Act. Benzene also is a known human carcinogen. The hydraulic fracturing companies injected 11.4 million gallons of products containing at least one BTEX chemical over the five year period.

In many instances, the oil and gas service companies were unable to provide the Committee with a complete chemical makeup of the hydraulic fracturing fluids they used. Between 2005 and 2009, the companies used 94 million gallons of 279 products that contained at least one chemical or component that the manufacturers deemed proprietary or a trade secret. Committee staff requested that these companies disclose this proprietary information. Although some companies did provide information about these proprietary fluids, in most cases the companies stated that they did not have access to proprietary information about products they purchased "off the shelf" from chemical suppliers. In these cases, the companies are injecting fluids containing chemicals that they themselves cannot identify.

II. BACKGROUND

Hydraulic fracturing – a method by which oil and gas service companies provide access to domestic energy trapped in hard-to-reach geologic formations — has been the subject of both enthusiasm and increasing environmental and health concerns in recent years. Hydraulic fracturing, used in combination with horizontal drilling, has allowed industry to access natural gas reserves previously considered uneconomical, particularly in shale formations. As a result of the growing use of hydraulic fracturing, natural gas production in the United States reached 21,577 billion cubic feet in 2010, a level not achieved since a period of high natural gas production between 1970 and 1974.[1] Overall, the Energy Information Administration now projects that the United States possesses 2,552 trillion cubic feet of potential natural gas resources, enough to supply the United States for approximately 110 years. Natural gas from shale resources accounts for 827 trillion cubic feet of this total, which is more than double what the EIA estimated just a year ago.[2]

Hydraulic fracturing creates access to more natural gas supplies, but the process requires the use of large quantities of water and fracturing fluids, which are injected underground at high volumes and pressure. Oil and gas service companies design fracturing fluids to create fractures and transport sand or other granular substances to prop open the fractures. The composition of these fluids varies by formation, ranging from a simple mixture of water and sand to more complex mixtures with a multitude of chemical additives. The companies may use these

---

[1] Energy Information Administration (EIA), *Natural Gas Monthly (Mar. 2011)*, Table 1, U.S. Natural Gas Monthly Supply and Disposition Balance (online at www.eia.gov/dnav/ng/hist/n9070us1A.htm) (accessed Mar. 30, 2011).

[2] EIA, *Annual Energy Outlook 2011 Early Release* (Dec. 16, 2010); EIA, *What is shale gas and why is it important?* (online at www.eia.doe.gov/energy_in_brief/about_shale_gas.cfm) (accessed Mar. 30, 2011).

chemical additives to thicken or thin the fluids, improve the flow of the fluid, or kill bacteria that can reduce fracturing performance.[3]

Some of these chemicals, if not disposed of safely or allowed to leach into the drinking water supply, could damage the environment or pose a risk to human health. During hydraulic fracturing, fluids containing chemicals are injected deep underground, where their migration is not entirely predictable. Well failures, such as the use of insufficient well casing, could lead to their release at shallower depths, closer to drinking water supplies.[4] Although some fracturing fluids are removed from the well at the end of the fracturing process, a substantial amount remains underground.[5]

While most underground injections of chemicals are subject to the protections of the Safe Drinking Water Act (SDWA), Congress in 2005 modified the law to exclude "the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities" from the Act's protections.[6] Unless oil and gas service companies use diesel in the hydraulic fracturing process, the permanent underground injection of chemicals used for hydraulic fracturing is not regulated by the Environmental Protection Agency (EPA).

Concerns also have been raised about the ultimate outcome of chemicals that are recovered and disposed of as wastewater. This wastewater is stored in tanks or pits at the well site, where spills are possible.[7] For final disposal, well operators must either recycle the fluids for use in future fracturing jobs, inject it into underground storage wells (which, unlike the fracturing process itself, are subject to the Safe Drinking Water Act), discharge it to nearby surface water, or transport it to wastewater treatment facilities.[8] A recent report in the *New York*

---

[3] U.S. Environmental Protection Agency, *Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs* (June 2004) (EPA 816-R-04-003) at 4-1 and 4-2.

[4] For instance, Pennsylvania's Department of Environmental Protection has cited Cabot Oil & Gas Corporation for contamination of drinking water wells with seepage caused by weak casing or improper cementing of a natural gas well. *See Officials in Three States Pin Water Woes on Gas Drilling*, ProPublica (Apr. 26, 2009) (online at www.propublica.org/article/officials-in-three-states-pin-water-woes-on-gas-drilling-426) (accessed Mar. 24, 2011).

[5] John A. Veil, Argonne National Laboratory, *Water Management Technologies Used by Marcellus Shale Gas Producers*, prepared for the Department of Energy (July 2010), at 13 (hereinafter "*Water Management Technologies*").

[6] 42 U.S.C. § 300h(d). Many dubbed this provision the "Halliburton loophole" because of Halliburton's ties to then-Vice President Cheney and its role as one of the largest providers of hydraulic fracturing services. *See The Halliburton Loophole*, New York Times (Nov. 9. 2009).

[7] *See* EPA, *Draft Hydraulic Fracturing Study Plan* (Feb. 7, 2011), at 37; *Regulation Lax as Gas Wells' Tainted Water Hits Rivers*, New York Times (Feb. 26, 2011).

[8] *Water Management Technologies*, at 13.

Times raised questions about the safety of surface water discharge and the ability of water treatment facilities to process wastewater from natural gas drilling operations.[9]

Any risk to the environment and human health posed by fracturing fluids depends in large part on their contents. Federal law, however, contains no public disclosure requirements for oil and gas producers or service companies involved in hydraulic fracturing, and state disclosure requirements vary greatly.[10] While the industry has recently announced that it soon will create a public database of fluid components, reporting to this database is strictly voluntary, disclosure will not include the chemical identity of products labeled as proprietary, and there is no way to determine if companies are accurately reporting information for all wells.[11]

The absence of a minimum national baseline for disclosure of fluids injected during the hydraulic fracturing process and the exemption of most hydraulic fracturing injections from regulation under the Safe Drinking Water Act has left an informational void concerning the contents, chemical concentrations, and volumes of fluids that go into the ground during fracturing operations and return to the surface in the form of wastewater. As a result, regulators and the public are unable effectively to assess any impact the use of these fluids may have on the environment or public health.

III. METHODOLOGY

On February 18, 2010, the Committee commenced an investigation into the practice of hydraulic fracturing and its potential impact on water quality across the United States. This investigation built on work begun by Ranking Member Henry A. Waxman in 2007 as Chairman of the Committee on Oversight and Government Reform. The Committee initially sent letters to eight oil and gas service companies engaged in hydraulic fracturing in the United States. In May 2010, the Committee sent letters to six additional oil and gas service companies to assess a

---

[9] *Regulation Lax as Gas Wells' Tainted Water Hits Rivers*, New York Times (Feb. 26, 2011).

[10] Wyoming, for example, recently enacted relatively strong disclosure regulations, requiring disclosure on a well-by-well basis and "for each stage of the well stimulation program," "the chemical additives, compounds and concentrations or rates proposed to be mixed and injected." *See* WCWR 055-000-003 Sec. 45. Similar regulations became effective in Arkansas this year. *See* Arkansas Oil and Gas Commission Rule B-19. In Wyoming, much of this information is, after an initial period of review, available to the public. *See* WCWR 055-000-003 Sec. 21. Other states, however, do not insist on such robust disclosure. For instance, West Virginia has no disclosure requirements for hydraulic fracturing and expressly exempts fluids used during hydraulic fracturing from the disclosure requirements applicable to underground injection of fluids for purposes of waste storage. *See* W. Va. Code St. R. § 34-5-7.

[11] *See Ground Water Protection Council Calls for Disclosure of Chemicals Used in Shale Gas Exploration*, Ground Water Protection Council (Oct. 5, 2010) (online at www.wqpmag.com/Ground-Water-Protection-Council-Calls-for-Disclosure-of-Chemicals-in-Shale-Gas-Exploration-newsPiece21700) (accessed Mar. 24, 2011).

broader range of industry practices.[12] The February and May letters requested information on the type and volume of chemicals present in the hydraulic fracturing products that each company used in their fluids between 2005 and 2009.

The 14 oil and gas service companies that received the letter voluntarily provided substantial information to the Committee. As requested, the companies reported the names and volumes of the products they used during the five-year period.[13] For each hydraulic fracturing product reported, the companies also provided a Material Safety Data Sheet (MSDS) detailing the product's chemical components. The Occupational Safety and Health Administration (OSHA) requires chemical manufacturers to create a MSDS for every product they sell as a means to communicate potential health and safety hazards to employees and employers. The MSDS must list all hazardous ingredients if they comprise at least 1% of the product; for carcinogens, the reporting threshold is 0.1%.[14]

Under OSHA regulations, manufacturers may withhold the identity of chemical components that constitute "trade secrets."[15] If the MSDS for a particular product used by a company subject to the Committee's investigation reported that the identity of any chemical component was a trade secret, the Committee asked the company that used that product to provide the proprietary information, if available.

IV. HYDRAULIC FRACTURING FLUIDS AND THEIR CONTENTS

Between 2005 and 2009, the 14 oil and gas service companies used more than 2,500 hydraulic fracturing products containing 750 chemicals and other components.[16] Overall, these companies used 780 million gallons of hydraulic fracturing products in their fluids between 2005 and 2009. This volume does not include water that the companies added to the fluids at the well site before injection. The products are comprised of a wide range of chemicals. Some are seemingly harmless like sodium chloride (salt), gelatin, and citric acid. Others could pose a severe risk to human health or the environment.

---

[12] The Committee sent letters to Basic Energy Services, BJ Services, Calfrac Well Services, Complete Production Services, Frac Tech Services, Halliburton, Key Energy Services, RPC, Sanjel Corporation, Schlumberger, Superior Well Services, Trican Well Service, Universal Well Services, and Weatherford.

[13] BJ Services, Halliburton, and Schlumberger already had provided the Oversight Committee with data for 2005 through 2007. For BJ Services, the 2005-2007 data is limited to natural gas wells. For Schlumberger, the 2005-2007 data is limited to coalbed methane wells.

[14] 29 CFR 1910.1200(g)(2)(i)(C)(1).

[15] 29 CFR 1910.1200.

[16] Each hydraulic fracturing "product" is a mixture of chemicals or other components designed to achieve a certain performance goal, such as increasing the viscosity of water. Some oil and gas service companies create their own products; most purchase these products from chemical vendors. The service companies then mix these products together at the well site to formulate the hydraulic fracturing fluids that they pump underground.

Some of the components were surprising. One company told the Committee that it used instant coffee as one of the components in a fluid designed to inhibit acid corrosion. Two companies reported using walnut hulls as part of a breaker—a product used to degrade the fracturing fluid viscosity, which helps to enhance post-fracturing fluid recovery. Another company reported using carbohydrates as a breaker. One company used tallow soap—soap made from beef, sheep, or other animals—to reduce loss of fracturing fluid into the exposed rock.

Appendix A lists each of the 750 chemicals and other components used in the hydraulic fracturing products injected underground between 2005 and 2009.

A. Commonly Used Chemical Components

The most widely used chemical in hydraulic fracturing during this time period, as measured by the number of products containing the chemical, was methanol. Methanol is a hazardous air pollutant and a candidate for regulation under the Safe Drinking Water Act. It was a component in 342 hydraulic fracturing products. Some of the other most widely used chemicals include isopropyl alcohol, which was used in 274 products, and ethylene glycol, which was used in 119 products. Crystalline silica (silicon dioxide) appeared in 207 products, generally proppants used to hold open fractures. Table 1 has a list of the most commonly used compounds in hydraulic fracturing fluids.

Table 1. Chemical Components Appearing Most Often in Hydraulic Fracturing Products Used Between 2005 and 2009

Chemical Component	No. of Products Containing Chemical
Methanol (Methyl alcohol)	342
Isopropanol (Isopropyl alcohol, Propan-2-ol)	274
Crystalline silica - quartz (SiO2)	207
Ethylene glycol monobutyl ether (2-butoxyethanol)	126
Ethylene glycol (1,2-ethanediol)	119
Hydrotreated light petroleum distillates	89
Sodium hydroxide (Caustic soda)	80

Hydraulic fracturing companies used 2-butoxyethanol (2-BE) as a foaming agent or surfactant in 126 products. According to EPA scientists, 2-BE is easily absorbed and rapidly distributed in humans following inhalation, ingestion, or dermal exposure. Studies have shown that exposure to 2-BE can cause hemolysis (destruction of red blood cells) and damage to the spleen, liver, and bone marrow.[17] The hydraulic fracturing companies injected 21.9 million gallons of products containing 2-BE between 2005 and 2009. They used the highest volume of products containing 2-BE in Texas, which accounted for more than half of the volume used. EPA recently found this chemical in drinking water wells tested in Pavillion, Wyoming.[18] Table 2 shows the use of 2-BE by state.

Table 2. States with the Highest Volume of Hydraulic Fracturing Fluids Containing 2-Butoxyethanol (2005-2009)

State	Fluid Volume (gallons)
Texas	12,031,734
Oklahoma	2,186,613
New Mexico	1,871,501
Colorado	1,147,614
Louisiana	890,068
Pennsylvania	747,416
West Virginia	464,231
Utah	382,874
Montana	362,497
Arkansas	348,959

[17] EPA, *Toxicological Review of Ethylene Glycol Monobutyl Ether* (Mar. 2010) at 4.

[18] EPA, *Fact Sheet: January 2010 Sampling Results and Site Update, Pavillion, Wyoming Groundwater Investigation* (Aug. 2010) (online at www.epa.gov/region8/superfund/wy/pavillion/PavillionWyomingFactSheet.pdf) (accessed Mar. 1, 2011).

B. Toxic Chemicals

The oil and gas service companies used hydraulic fracturing products containing 29 chemicals that are (1) known or possible human carcinogens, (2) regulated under the Safe Drinking Water Act for their risks to human health, or (3) listed as hazardous air pollutants under the Clean Air Act. These 29 chemicals were components of 652 different products used in hydraulic fracturing. Table 3 lists these toxic chemicals and their frequency of use.

Table 3. Chemicals Components of Concern: Carcinogens, SDWA-Regulated Chemicals, and Hazardous Air Pollutants

Chemical Component	Chemical Category	No. of Products
Methanol (Methyl alcohol)	HAP	342
Ethylene glycol (1,2-ethanediol)	HAP	119
Diesel[19]	Carcinogen, SDWA, HAP	51
Naphthalene	Carcinogen, HAP	44
Xylene	SDWA, HAP	44
Hydrogen chloride (Hydrochloric acid)	HAP	42
Toluene	SDWA, HAP	29
Ethylbenzene	SDWA, HAP	28
Diethanolamine (2,2-iminodiethanol)	HAP	14
Formaldehyde	Carcinogen, HAP	12
Sulfuric acid	Carcinogen	9
Thiourea	Carcinogen	9
Benzyl chloride	Carcinogen, HAP	8
Cumene	HAP	6
Nitrilotriacetic acid	Carcinogen	6
Dimethyl formamide	HAP	5
Phenol	HAP	5
Benzene	Carcinogen, SDWA, HAP	3
Di (2-ethylhexyl) phthalate	Carcinogen, SDWA, HAP	3
Acrylamide	Carcinogen, SDWA, HAP	2
Hydrogen fluoride (Hydrofluoric acid)	HAP	2
Phthalic anhydride	HAP	2
Acetaldehyde	Carcinogen, HAP	1
Acetophenone	HAP	1
Copper	SDWA	1
Ethylene oxide	Carcinogen, HAP	1
Lead	Carcinogen, SDWA, HAP	1
Propylene oxide	Carcinogen, HAP	1
p-Xylene	HAP	1
Number of Products Containing a Component of Concern		**652**

[19] According to EPA, diesel contains benzene, toluene, ethylbenzene, and xylenes. *See* EPA, *Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs* (June 2004) (EPA 816-R-04-003) at 4-11.

1. *Carcinogens*

Between 2005 and 2009, the hydraulic fracturing companies used 95 products containing 13 different carcinogens.[20] These included naphthalene (a possible human carcinogen), benzene (a known human carcinogen), and acrylamide (a probable human carcinogen). Overall, these companies injected 10.2 million gallons of fracturing products containing at least one carcinogen. The companies used the highest volume of fluids containing one or more carcinogens in Texas, Colorado, and Oklahoma. Table 4 shows the use of these chemicals by state.

Table 4. States with at Least 100,000 Gallons of Hydraulic Fracturing Fluids Containing a Carcinogen (2005-2009)

State	Fluid Volume (gallons)
Texas	3,877,273
Colorado	1,544,388
Oklahoma	1,098,746
Louisiana	777,945
Wyoming	759,898
North Dakota	557,519
New Mexico	511,186
Montana	394,873
Utah	382,338

2. *Safe Drinking Water Act Chemicals*

Under the Safe Drinking Water Act, EPA regulates 53 chemicals that may have an adverse effect on human health and are known to or likely to occur in public drinking water systems at levels of public health concern. Between 2005 and 2009, the hydraulic fracturing companies used 67 products containing at least one of eight SDWA-regulated chemicals. Overall, they injected 11.7 million gallons of fracturing products containing at least one chemical regulated under SDWA. Most of these chemicals were injected in Texas. Table 5 shows the use of these chemicals by state.

---

[20] For purposes of this report, a chemical is considered a "carcinogen" if it is on one of two lists: (1) substances identified by the National Toxicology Program as "known to be human carcinogens" or as "reasonably anticipated to be human carcinogens"; and (2) substances identified by the International Agency for Research on Cancer, part of the World Health Organization, as "carcinogenic" or "probably carcinogenic" to humans. See U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, *Report on Carcinogens, Eleventh Edition* (Jan. 31, 2005) and World Health Organization, International Agency for Research on Cancer, *Agents Classified by the IARC Monographs* (online at http://monographs.iarc.fr/ENG/Classification/index.php) (accessed Feb. 28, 2011).

The vast majority of these SDWA-regulated chemicals were the BTEX compounds – benzene, toluene, xylene, and ethylbenzene. The BTEX compounds appeared in 60 hydraulic fracturing products used between 2005 and 2009 and were used in 11.4 million gallons of hydraulic fracturing fluids. The Department of Health and Human Services, the International Agency for Research on Cancer, and EPA have determined that benzene is a human carcinogen.[21] Chronic exposure to toluene, ethylbenzene, or xylenes also can damage the central nervous system, liver, and kidneys.[22]

Table 5. States with at Least 100,000 Gallons of Hydraulic Fracturing Fluids Containing a SDWA-Regulated Chemical (2005-2009)

State	Fluid Volume (gallons)
Texas	9,474,631
New Mexico	1,157,721
Colorado	375,817
Oklahoma	202,562
Mississippi	108,809
North Dakota	100,479

In addition, the hydraulic fracturing companies injected more than 30 million gallons of diesel fuel or hydraulic fracturing fluids containing diesel fuel in wells in 19 states.[23] In a 2004 report, EPA stated that the "use of diesel fuel in fracturing fluids poses the greatest threat" to underground sources of drinking water.[24] Diesel fuel contains toxic constituents, including BTEX compounds.[25]

EPA also has created a Candidate Contaminant List (CCL), which is a list of contaminants that are currently not subject to national primary drinking water regulations but are known or anticipated to occur in public water systems and may require regulation under the Safe Drinking Water Act in the future.[26] Nine chemicals on that list—1-butanol, acetaldehyde, benzyl

---

[21] U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, *Public Health Statement for Benzene* (Aug. 2007).

[22] EPA, *Basic Information about Toluene in Drinking Water*, *Basic Information about Ethylbenzene in Drinking Water*, and *Basic Information about Xylenes in Drinking Water* (online at http://water.epa.gov/drink/contaminants/basicinformation/index.cfm) (accessed Oct. 14, 2010).

[23] Letter from Reps. Henry A. Waxman, Edward J. Markey, and Diana DeGette to the Honorable Lisa Jackson, Administrator, U.S. Environmental Protection Agency (Jan. 31, 2011).

[24] EPA, *Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs* (June 2004) (EPA 816-R-04-003) at 4-11.

[25] *Id.*

[26] EPA, *Contaminant Candidate List 3* (online at http://water.epa.gov/scitech/drinkingwater/dws/ccl/ccl3.cfm) (accessed Mar. 31, 2011).

chloride, ethylene glycol, ethylene oxide, formaldehyde, methanol, n-methyl-2-pyrrolidone, and propylene oxide—were used in hydraulic fracturing products between 2005 and 2009.

3. Hazardous Air Pollutants

The Clean Air Act requires EPA to control the emission of 187 hazardous air pollutants, which are pollutants that cause or may cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects.[27] Between 2005 and 2009, the hydraulic fracturing companies used 595 products containing 24 different hazardous air pollutants.

Hydrogen fluoride is a hazardous air pollutant that is a highly corrosive and systemic poison that causes severe and sometimes delayed health effects due to deep tissue penetration. Absorption of substantial amounts of hydrogen fluoride by any route may be fatal.[28] One of the hydraulic fracturing companies used 67,222 gallons of two products containing hydrogen fluoride in 2008 and 2009.

Lead is a hazardous air pollutant that is a heavy metal that is particularly harmful to children's neurological development. It also can cause health problems in adults, including reproductive problems, high blood pressure, and nerve disorders.[29] One of the hydraulic fracturing companies used 780 gallons of a product containing lead in this five-year period.

Methanol is the hazardous air pollutant that appeared most often in hydraulic fracturing products. Other hazardous air pollutants used in hydraulic fracturing fluids included formaldehyde, hydrogen chloride, and ethylene glycol.

V. USE OF PROPRIETARY AND "TRADE SECRET" CHEMICALS

Many chemical components of hydraulic fracturing fluids used by the companies were listed on the MSDSs as "proprietary" or "trade secret." The hydraulic fracturing companies used 93.6 million gallons of 279 products containing at least one proprietary component between 2005 and 2009.[30]

---

[27] Clean Air Act Section 112(b), 42 U.S.C. § 7412.

[28] HHS, Agency for Toxic Substances and Disease Registry, *Medical Management Guidelines for Hydrogen Fluoride* (online at www.atsdr.cdc.gov/mhmi/mmg11.pdf) (accessed Mar. 24, 2011).

[29] EPA, *Basic Information about Lead* (online at www.epa.gov/lead/pubs/leadinfo.htm) (accessed Mar. 30, 2011).

[30] This is likely a conservative estimate. We included only those products for which the MSDS says "proprietary" or "trade secret" instead of listing a component by name or providing the CAS number. If the MSDS listed a component's CAS as N.A. or left it blank, we did not count that as a trade secret claim, unless the company specified as such in follow-up correspondence.

The Committee requested that these companies disclose this proprietary information. Although a few companies were able to provide additional information to the Committee about some of the fracturing products, in most cases the companies stated that they did not have access to proprietary information about products they purchased "off the shelf" from chemical suppliers. The proprietary information belongs to the suppliers, not the users of the chemicals.

Universal Well Services, for example, told the Committee that it "obtains hydraulic fracturing products from third-party manufacturers, and to the extent not publicly disclosed, product composition is proprietary to the respective vendor and not to the Company."[31] Complete Production Services noted that the company always uses fluids from third-party suppliers who provide an MSDS for each product. Complete confirmed that it is "not aware of any circumstances in which the vendors who provided the products have disclosed this proprietary information" to the company, further noting that "such information is highly proprietary for these vendors, and would not generally be disclosed to service providers" like Complete.[32] Key Energy Services similarly stated that it "generally does not have access to the trade secret information as a purchaser of the chemical(s)."[33] Trican also told the Committee that it has limited knowledge of "off the shelf" products purchased from a chemical distributor or manufacturer, noting that "Trican does not have any information in its possession about the components of such products beyond what the distributor of each product provided Trican in the MSDS sheet."[34]

In these cases, it appears that the companies are injecting fluids containing unknown chemicals about which they may have limited understanding of the potential risks posed to human health and the environment.

VI. CONCLUSION

Hydraulic fracturing has opened access to vast domestic reserves of natural gas that could provide an important stepping stone to a clean energy future. Yet questions about the safety of hydraulic fracturing persist, which are compounded by the secrecy surrounding the chemicals used in hydraulic fracturing fluids. This analysis is the most comprehensive national assessment to date of the types and volumes of chemical used in the hydraulic fracturing process. It shows that between 2005 and 2009, the 14 leading hydraulic fracturing companies in the United States used over 2,500 hydraulic fracturing products containing 750 compounds. More than 650 of these products contained chemicals that are known or possible human carcinogens, regulated under the Safe Drinking Water Act, or listed as hazardous air pollutants.

---

[31] Letter from Reginald J. Brown to Henry A. Waxman, Chairman, Committee on Energy and Commerce, and Edward J. Markey, Chairman, Subcommittee on Energy and Environment (Apr. 16, 2010).

[32] Letter from Philip Perry to Henry A. Waxman, Chairman, Committee Energy and Commerce, and Edward J. Markey, Chairman, Subcommittee on Energy and Environment (Aug. 6, 2010).

[33] E-mail from Peter Spivack to Committee Staff (Aug. 5, 2010).

[34] E-mail from Lee Blalack to Committee Staff (July 29, 2010).

Appendix A. Chemical Components of Hydraulic Fracturing Products, 2005-2009[35]

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
1-(1-naphthylmethyl)quinolinium chloride	65322-65-8	1
1,2,3-propanetricarboxylic acid, 2-hydroxy-, trisodium salt, dihydrate	6132-04-3	1
1,2,3-trimethylbenzene	526-73-8	1
1,2,4-trimethylbenzene	95-63-6	21
1,2-benzisothiazol-3	2634-33-5	1
1,2-dibromo-2,4-dicyanobutane	35691-65-7	1
1,2-ethanediaminium, N, N'-bis[2-[bis(2-hydroxyethyl)methylammonio]ethyl]-N,N'-bis(2-hydroxyethyl)-N,N'-dimethyl-,tetrachloride	138879-94-4	2
1,3,5-trimethylbenzene	108-67-8	3
1,6-hexanediamine dihydrochloride	6055-52-3	1
1,8-diamino-3,6-dioxaoctane	929-59-9	1
1-hexanol	111-27-3	1
1-methoxy-2-propanol	107-98-2	3
2,2`-azobis (2-amidopropane) dihydrochloride	2997-92-4	1
2,2-dibromo-3-nitrilopropionamide	10222-01-2	27
2-acrylamido-2-methylpropanesulphonic acid sodium salt polymer	*	1
2-bromo-2-nitropropane-1,3-diol	52-51-7	4
2-butanone oxime	96-29-7	1
2-hydroxypropionic acid	79-33-4	2
2-mercaptoethanol (Thioglycol)	60-24-2	13
2-methyl-4-isothiazolin-3-one	2682-20-4	4
2-monobromo-3-nitrilopropionamide	1113-55-9	1
2-phosphonobutane-1,2,4-tricarboxylic acid	37971-36-1	2
2-phosphonobutane-1,2,4-tricarboxylic acid, potassium salt	93858-78-7	1
2-substituted aromatic amine salt	*	1
4,4'-diaminodiphenyl sulfone	80-08-0	3
5-chloro-2-methyl-4-isothiazolin-3-one	26172-55-4	5
Acetaldehyde	75-07-0	1
Acetic acid	64-19-7	56
Acetic anhydride	108-24-7	7
Acetone	67-64-1	3
Acetophenone	98-86-2	1
Acetylenic alcohol	*	1
Acetyltriethyl citrate	77-89-4	1
Acrylamide	79-06-1	2
Acrylamide copolymer	*	1
Acrylamide copolymer	38193-60-1	1

[35] To compile this list of chemicals, Committee staff reviewed each Material Safety Data Sheet provided to the Committee for hydraulic fracturing products used between 2005 and 2009. Committee staff transcribed the names and CAS numbers as written in the MSDSs; as such, any inaccuracies on this list reflect inaccuracies on the MSDSs themselves.

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Acrylate copolymer	*	1
Acrylic acid, 2-hydroxyethyl ester	818-61-1	1
Acrylic acid/2-acrylamido-methylpropylsulfonic acid copolymer	37350-42-8	1
Acrylic copolymer	403730-32-5	1
Acrylic polymers	*	1
Acrylic polymers	26006-22-4	2
Acyclic hydrocarbon blend	*	1
Adipic acid	124-04-9	6
Alcohol alkoxylate	*	5
Alcohol ethoxylates	*	2
Alcohols	*	9
Alcohols, C11-15-secondary, ethoxylated	68131-40-8	1
Alcohols, C12-14-secondary	126950-60-5	4
Alcohols, C12-14-secondary, ethoxylated	84133-50-6	19
Alcohols, C12-15, ethoxylated	68131-39-5	2
Alcohols, C12-16, ethoxylated	103331-86-8	1
Alcohols, C12-16, ethoxylated	68551-12-2	3
Alcohols, C14-15, ethoxylated	68951-67-7	5
Alcohols, C9-11-iso-, C10-rich, ethoxylated	78330-20-8	4
Alcohols, C9-C22	*	1
Aldehyde	*	4
Aldol	107-89-1	1
Alfa-Alumina	*	5
Aliphatic acid	*	1
Aliphatic alcohol polyglycol ether	68015-67-8	1
Aliphatic amine derivative	120086-58-0	2
Alkaline bromide salts	*	2
Alkanes, C10-14	93924-07-3	2
Alkanes, C13-16-iso	68551-20-2	2
Alkanolamine	150-25-4	3
Alkanolamine chelate of zirconium alkoxide (Zirconium complex)	197980-53-3	4
Alkanolamine/aldehyde condensate	*	1
Alkenes	*	1
Alkenes, C>10 alpha-	64743-02-8	3
Alkenes, C>8	68411-00-7	2
Alkoxylated alcohols	*	1
Alkoxylated amines	*	6
Alkoxylated phenol formaldehyde resin	63428-92-2	1
Alkyaryl sulfonate	*	1
Alkyl (C12-16) dimethyl benzyl ammonium chloride	68424-85-1	7
Alkyl (C6-C12) alcohol, ethoxylated	68439-45-2	2
Alkyl (C9-11) alcohol, ethoxylated	68439-46-3	1
Alkyl alkoxylate	*	9
Alkyl amine	*	2

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Alkyl amine blend in a metal salt solution	*	1
Alkyl aryl amine sulfonate	255043-08-04	1
Alkyl benzenesulfonic acid	68584-22-5	2
Alkyl esters	*	2
Alkyl hexanol	*	1
Alkyl ortho phosphate ester	*	1
Alkyl phosphate ester	*	3
Alkyl quaternary ammonium chlorides	*	4
Alkylaryl sulfonate	*	1
Alkylaryl sulphonic acid	27176-93-9	1
Alkylated quaternary chloride	*	5
Alkylbenzenesulfonic acid	*	1
Alkylethoammonium sulfates	*	1
Alkylphenol ethoxylates	*	1
Almandite and pyrope garnet	1302-62-1	1
Aluminium isopropoxide	555-31-7	1
Aluminum	7429-90-5	2
Aluminum chloride	*	3
Aluminum chloride	1327-41-9	2
Aluminum oxide (alpha-Alumina)	1344-28-1	24
Aluminum oxide silicate	12068-56-3	1
Aluminum silicate (mullite)	1302-76-7	38
Aluminum sulfate hydrate	10043-01-3	1
Amides, tallow, n-[3-(dimethylamino)propyl],n-oxides	68647-77-8	4
Amidoamine	*	1
Amine	*	7
Amine bisulfite	13427-63-9	1
Amine oxides	*	1
Amine phosphonate	*	3
Amine salt	*	2
Amines, C14-18; C16-18-unsaturated, alkyl, ethoxylated	68155-39-5	1
Amines, coco alkyl, acetate	61790-57-6	3
Amines, polyethylenepoly-, ethoxylated, phosphonomethylated	68966-36-9	1
Amines, tallow alkyl, ethoxylated	61791-26-2	2
Amino compounds	*	1
Amino methylene phosphonic acid salt	*	1
Amino trimethylene phosphonic acid	6419-19-8	2
Ammonia	7664-41-7	7
Ammonium acetate	631-61-8	4
Ammonium alcohol ether sulfate	68037-05-8	1
Ammonium bicarbonate	1066-33-7	1
Ammonium bifluoride (Ammonium hydrogen difluoride)	1341-49-7	10
Ammonium bisulfate	7783-20-2	3
Ammonium bisulfite	10192-30-0	15

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Ammonium C6-C10 alcohol ethoxysulfate	68187-17-7	4
Ammonium C8-C10 alkyl ether sulfate	68891-29-2	4
Ammonium chloride	12125-02-9	29
Ammonium fluoride	12125-01-8	9
Ammonium hydroxide	1336-21-6	4
Ammonium nitrate	6484-52-2	2
Ammonium persulfate (Diammonium peroxidisulfate)	7727-54-0	37
Ammonium salt	*	1
Ammonium salt of ethoxylated alcohol sulfate	*	1
Amorphous silica	99439-28-8	1
Amphoteric alkyl amine	61789-39-7	1
Anionic copolymer	*	3
Anionic polyacrylamide	*	1
Anionic polyacrylamide	25085-02-3	6
Anionic polyacrylamide copolymer	*	3
Anionic polymer	*	2
Anionic polymer in solution	*	1
Anionic polymer, sodium salt	9003-04-7	1
Anionic water-soluble polymer	*	2
Antifoulant	*	1
Antimonate salt	*	1
Antimony pentoxide	1314-60-9	2
Antimony potassium oxide	29638-69-5	4
Antimony trichloride	10025-91-9	2
a-organic surfactants	61790-29-8	1
Aromatic alcohol glycol ether	*	2
Aromatic aldehyde	*	2
Aromatic ketones	224635-63-6	2
Aromatic polyglycol ether	*	1
Barium sulfate	7727-43-7	3
Bauxite	1318-16-7	16
Bentonite	1302-78-9	2
Benzene	71-43-2	3
Benzene, C10-16, alkyl derivatives	68648-87-3	1
Benzenecarboperoxoic acid, 1,1-dimethylethyl ester	614-45-9	1
Benzenemethanaminium	3844-45-9	1
Benzenesulfonic acid, C10-16-alkyl derivs., potassium salts	68584-27-0	1
Benzoic acid	65-85-0	11
Benzyl chloride	100-44-7	8
Biocide component	*	3
Bis(1-methylethyl)naphthalenesulfonic acid, cyclohexylamine salt	68425-61-6	1
Bishexamethylenetriamine penta methylene phosphonic acid	35657-77-3	1
Bisphenol A/Epichlorohydrin resin	25068-38-6	5
Bisphenol A/Novolac epoxy resin	28906-96-9	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Borate	12280-03-4	2
Borate salts	*	5
Boric acid	10043-35-3	18
Boric acid, potassium salt	20786-60-1	1
Boric acid, sodium salt	1333-73-9	2
Boric oxide	1303-86-2	1
b-tricalcium phosphate	7758-87-4	1
Butanedioic acid	2373-38-8	4
Butanol	71-36-3	3
Butyl glycidyl ether	2426-08-6	5
Butyl lactate	138-22-7	4
C10-C16 ethoxylated alcohol	68002-97-1	4
C-11 to C-14 n-alkanes, mixed	*	1
C12-C14 alcohol, ethoxylated	68439-50-9	3
Calcium carbonate	471-34-1	1
Calcium carbonate (Limestone)	1317-65-3	9
Calcium chloride	10043-52-4	17
Calcium chloride, dihydrate	10035-04-8	1
Calcium fluoride	7789-75-5	2
Calcium hydroxide	1305-62-0	9
Calcium hypochlorite	7778-54-3	1
Calcium oxide	1305-78-8	6
Calcium peroxide	1305-79-9	5
Carbohydrates	*	3
Carbon dioxide	124-38-9	4
Carboxymethyl guar gum, sodium salt	39346-76-4	7
Carboxymethyl hydroxypropyl guar	68130-15-4	11
Cellophane	9005-81-6	2
Cellulase	9012-54-8	7
Cellulase enzyme	*	1
Cellulose	9004-34-6	1
Cellulose derivative	*	2
Chloromethylnaphthalene quinoline quaternary amine	15619-48-4	3
Chlorous ion solution	*	2
Choline chloride	67-48-1	3
Chromates	*	1
Chromium (iii) acetate	1066-30-4	1
Cinnamaldehyde (3-phenyl-2-propenal)	104-55-2	5
Citric acid (2-hydroxy-1,2,3 propanetricarboxylic acid)	77-92-9	29
Citrus terpenes	94266-47-4	11
Coal, granular	50815-10-6	1
Cobalt acetate	71-48-7	1
Cocaidopropyl betaine	61789-40-0	2
Cocamidopropylamine oxide	68155-09-9	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Coco bis-(2-hydroxyethyl) amine oxide	61791-47-7	1
Cocoamidopropyl betaine	70851-07-9	1
Cocomidopropyl dimethylamine	68140-01-2	1
Coconut fatty acid diethanolamide	68603-42-9	1
Collagen (Gelatin)	9000-70-8	6
Complex alkylaryl polyo-ester	*	1
Complex aluminum salt	*	2
Complex organometallic salt	*	2
Complex substituted keto-amine	143106-84-7	1
Complex substituted keto-amine hydrochloride	*	1
Copolymer of acrylamide and sodium acrylate	25987-30-8	1
Copper	7440-50-8	1
Copper iodide	7681-65-4	1
Copper sulfate	7758-98-7	3
Corundum (Aluminum oxide)	1302-74-5	48
Crotonaldehyde	123-73-9	1
Crystalline silica - cristobalite	14464-46-1	44
Crystalline silica - quartz (SiO2)	14808-60-7	207
Crystalline silica, tridymite	15468-32-3	2
Cumene	98-82-8	6
Cupric chloride	7447-39-4	10
Cupric chloride dihydrate	10125-13-0	7
Cuprous chloride	7758-89-6	1
Cured acrylic resin	*	7
Cured resin	*	4
Cured silicone rubber-polydimethylsiloxane	63148-62-9	1
Cured urethane resin	*	3
Cyclic alkanes	*	1
Cyclohexane	110-82-7	1
Cyclohexanone	108-94-1	1
Decanol	112-30-1	2
Decyl-dimethyl amine oxide	2605-79-0	4
Dextrose monohydrate	50-99-7	1
D-Glucitol	50-70-4	1
Di (2-ethylhexyl) phthalate	117-81-7	3
Di (ethylene glycol) ethyl ether acetate	112-15-2	4
Diatomaceous earth	61790-53-2	3
Diatomaceous earth, calcined	91053-39-3	7
Dibromoacetonitrile	3252-43-5	1
Dibutylaminoethanol (2-dibutylaminoethanol)	102-81-8	4
Di-calcium silicate	10034-77-2	1
Dicarboxylic acid	*	1
Didecyl dimethyl ammonium chloride	7173-51-5	1
Diesel	*	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Diesel	68334-30-5	3
Diesel	68476-30-2	4
Diesel	68476-34-6	43
Diethanolamine (2,2-iminodiethanol)	111-42-2	14
Diethylbenzene	25340-17-4	1
Diethylene glycol	111-46-6	8
Diethylene glycol monomethyl ether	111-77-3	4
Diethylene triaminepenta (methylene phosphonic acid)	15827-60-8	1
Diethylenetriamine	111-40-0	2
Diethylenetriamine, tall oil fatty acids reaction product	61790-69-0	1
Diisopropylnaphthalenesulfonic acid	28757-00-8	2
Dimethyl formamide	68-12-2	5
Dimethyl glutarate	1119-40-0	1
Dimethyl silicone	*	2
Dioctyl sodium sulfosuccinate	577-11-7	1
Dipropylene glycol	25265-71-8	1
Dipropylene glycol monomethyl ether (2-methoxymethylethoxy propanol)	34590-94-8	12
Di-secondary-butylphenol	53964-94-6	3
Disodium EDTA	139-33-3	1
Disodium ethylenediaminediacetate	38011-25-5	1
Disodium ethylenediaminetetraacetate dihydrate	6381-92-6	1
Disodium octaborate tetrahydrate	12008-41-2	1
Dispersing agent	*	1
d-Limonene	5989-27-5	11
Dodecyl alcohol ammonium sulfate	32612-48-9	2
Dodecylbenzene sulfonic acid	27176-87-0	14
Dodecylbenzene sulfonic acid salts	42615-29-2	2
Dodecylbenzene sulfonic acid salts	68648-81-7	7
Dodecylbenzene sulfonic acid salts	90218-35-2	1
Dodecylbenzenesulfonate isopropanolamine	42504-46-1	1
Dodecylbenzenesulfonic acid, monoethanolamine salt	26836-07-7	1
Dodecylbenzenesulphonic acid, morpholine salt	12068-08-5	1
EDTA/Copper chelate	*	2
EO-C7-9-iso-, C8-rich alcohols	78330-19-5	5
Epichlorohydrin	25085-99-8	5
Epoxy resin	*	5
Erucic amidopropyl dimethyl betaine	149879-98-1	3
Erythorbic acid	89-65-6	2
Essential oils	*	6
Ethanaminium, n,n,n-trimethyl-2-[(1-oxo-2-propenyl)oxy]-,chloride, polymer with 2-propenamide	69418-26-4	4
Ethanol (Ethyl alcohol)	64-17-5	36
Ethanol, 2-(hydroxymethylamino)-	34375-28-5	1
Ethanol, 2, 2'-(Octadecylamino) bis-	10213-78-2	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Ethanoldiglycine disodium salt	135-37-5	1
Ether salt	25446-78-0	2
Ethoxylated 4-nonylphenol (Nonyl phenol ethoxylate)	26027-38-3	9
Ethoxylated alcohol	104780-82-7	1
Ethoxylated alcohol	78330-21-9	2
Ethoxylated alcohols	*	3
Ethoxylated alkyl amines	*	1
Ethoxylated amine	*	1
Ethoxylated amines	61791-44-4	1
Ethoxylated fatty acid ester	*	1
Ethoxylated nonionic surfactant	*	1
Ethoxylated nonyl phenol	*	8
Ethoxylated nonyl phenol	68412-54-4	10
Ethoxylated nonyl phenol	9016-45-9	38
Ethoxylated octyl phenol	68987-90-6	1
Ethoxylated octyl phenol	9002-93-1	1
Ethoxylated octyl phenol	9036-19-5	3
Ethoxylated oleyl amine	13127-82-7	2
Ethoxylated oleyl amine	26635-93-8	1
Ethoxylated sorbitol esters	*	1
Ethoxylated tridecyl alcohol phosphate	9046-01-9	2
Ethoxylated undecyl alcohol	127036-24-2	2
Ethyl acetate	141-78-6	4
Ethyl acetoacetate	141-97-9	1
Ethyl octynol (1-octyn-3-ol,4-ethyl-)	5877-42-9	5
Ethylbenzene	100-41-4	28
Ethylene glycol (1,2-ethanediol)	107-21-1	119
Ethylene glycol monobutyl ether (2-butoxyethanol)	111-76-2	126
Ethylene oxide	75-21-8	1
Ethylene oxide-nonylphenol polymer	*	1
Ethylenediaminetetraacetic acid	60-00-4	1
Ethylene-vinyl acetate copolymer	24937-78-8	1
Ethylhexanol (2-ethylhexanol)	104-76-7	18
Fatty acid ester	*	1
Fatty acid, tall oil, hexa esters with sorbitol, ethoxylated	61790-90-7	1
Fatty acids	*	1
Fatty alcohol alkoxylate	*	1
Fatty alkyl amine salt	*	1
Fatty amine carboxylates	*	1
Fatty quaternary ammonium chloride	61789-68-2	1
Ferric chloride	7705-08-0	3
Ferric sulfate	10028-22-5	7
Ferrous sulfate, heptahydrate	7782-63-0	4
Fluoroaliphatic polymeric esters	*	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Formaldehyde	50-00-0	12
Formaldehyde polymer	*	2
Formaldehyde, polymer with 4-(1,1-dimethyl)phenol, methyloxirane and oxirane	30704-64-4	3
Formaldehyde, polymer with 4-nonylphenol and oxirane	30846-35-6	1
Formaldehyde, polymer with ammonia and phenol	35297-54-2	2
Formamide	75-12-7	5
Formic acid	64-18-6	24
Fumaric acid	110-17-8	8
Furfural	98-01-1	1
Furfuryl alcohol	98-00-0	3
Glass fiber	65997-17-3	3
Gluconic acid	526-95-4	1
Glutaraldehyde	111-30-8	20
Glycerol (1,2,3-Propanetriol, Glycerine)	56-81-5	16
Glycol ethers	*	9
Glycol ethers	9004-77-7	4
Glyoxal	107-22-2	3
Glyoxylic acid	298-12-4	1
Guar gum	9000-30-0	41
Guar gum derivative	*	12
Haloalkyl heteropolycycle salt	*	6
Heavy aromatic distillate	68132-00-3	1
Heavy aromatic petroleum naphtha	64742-94-5	45
Heavy catalytic reformed petroleum naphtha	64741-68-0	10
Hematite	*	5
Hemicellulase	9025-56-3	2
Hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine (Triazine)	4719-04-4	4
Hexamethylenetetramine	100-97-0	37
Hexanediamine	124-09-4	1
Hexanes	*	1
Hexylene glycol	107-41-5	5
Hydrated aluminum silicate	1332-58-7	4
Hydrocarbon mixtures	8002-05-9	1
Hydrocarbons	*	3
Hydrodesulfurized kerosine (petroleum)	64742-81-0	3
Hydrodesulfurized light catalytic cracked distillate (petroleum)	68333-25-5	1
Hydrodesulfurized middle distillate (petroleum)	64742-80-9	1
Hydrogen chloride (Hydrochloric acid)	7647-01-0	42
Hydrogen fluoride (Hydrofluoric acid)	7664-39-3	2
Hydrogen peroxide	7722-84-1	4
Hydrogen sulfide	7783-06-4	1
Hydrotreated and hydrocracked base oil	*	2
Hydrotreated heavy naphthenic distillate	64742-52-5	3
Hydrotreated heavy paraffinic petroleum distillates	64742-54-7	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Hydrotreated heavy petroleum naphtha	64742-48-9	7
Hydrotreated light petroleum distillates	64742-47-8	89
Hydrotreated middle petroleum distillates	64742-46-7	3
Hydroxyacetic acid (Glycolic acid)	79-14-1	6
Hydroxyethylcellulose	9004-62-0	1
Hydroxyethylethylenediaminetriacetic acid, trisodium salt	139-89-9	1
Hydroxylamine hydrochloride	5470-11-1	1
Hydroxypropyl guar gum	39421-75-5	2
Hydroxysultaine	*	1
Inner salt of alkyl amines	*	2
Inorganic borate	*	3
Inorganic particulate	*	1
Inorganic salt	*	1
Inorganic salt	533-96-0	1
Inorganic salt	7446-70-0	1
Instant coffee purchased off the shelf	*	1
Inulin, carboxymethyl ether, sodium salt	430439-54-6	1
Iron oxide	1332-37-2	2
Iron oxide (Ferric oxide)	1309-37-1	18
Iso amyl alcohol	123-51-3	1
Iso-alkanes/n-alkanes	*	10
Isobutanol (Isobutyl alcohol)	78-83-1	4
Isomeric aromatic ammonium salt	*	1
Isooctanol	26952-21-6	1
Isooctyl alcohol	68526-88-0	1
Isooctyl alcohol bottoms	68526-88-5	1
Isopropanol (Isopropyl alcohol, Propan-2-ol)	67-63-0	274
Isopropylamine	75-31-0	1
Isotridecanol, ethoxylated	9043-30-5	1
Kerosene	8008-20-6	13
Lactic acid	10326-41-7	1
Lactic acid	50-21-5	1
L-Dilactide	4511-42-6	1
Lead	7439-92-1	1
Light aromatic solvent naphtha	64742-95-6	11
Light catalytic cracked petroleum distillates	64741-59-9	1
Light naphtha distillate, hydrotreated	64742-53-6	1
Low toxicity base oils	*	1
Maghemite	*	2
Magnesium carbonate	546-93-0	1
Magnesium chloride	7786-30-3	4
Magnesium hydroxide	1309-42-8	4
Magnesium iron silicate	1317-71-1	3
Magnesium nitrate	10377-60-3	5

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Magnesium oxide	1309-48-4	18
Magnesium peroxide	1335-26-8	2
Magnesium peroxide	14452-57-4	4
Magnesium phosphide	12057-74-8	1
Magnesium silicate	1343-88-0	3
Magnesium silicate hydrate (talc)	14807-96-6	2
Magnetite	*	3
Medium aliphatic solvent petroleum naphtha	64742-88-7	10
Metal salt	*	2
Metal salt solution	*	1
Methanol (Methyl alcohol)	67-56-1	342
Methyl isobutyl carbinol (Methyl amyl alcohol)	108-11-2	3
Methyl salicylate	119-36-8	6
Methyl vinyl ketone	78-94-4	2
Methylcyclohexane	108-87-2	1
Mica	12001-26-2	3
Microcrystalline silica	1317-95-9	1
Mineral	*	1
Mineral Filler	*	1
Mineral spirits (stoddard solvent)	8052-41-3	2
Mixed titanium ortho ester complexes	*	1
Modified alkane	*	1
Modified cycloaliphatic amine adduct	*	3
Modified lignosulfonate	*	1
Monoethanolamine (Ethanolamine)	141-43-5	17
Monoethanolamine borate	26038-87-9	1
Morpholine	110-91-8	2
Mullite	1302-93-8	55
n,n-dibutylthiourea	109-46-6	1
N,N-dimethyl-1-octadecanamine-HCl	*	1
N,N-dimethyloctadecylamine	124-28-7	3
N,N-dimethyloctadecylamine hydrochloride	1613-17-8	2
n,n'-Methylenebisacrylamide	110-26-9	1
n-alkyl dimethyl benzyl ammonium chloride	139-08-2	1
Naphthalene	91-20-3	44
Naphthalene derivatives	*	1
Naphthalenesulphonic acid, bis (1-methylethyl)-methyl derivatives	99811-86-6	1
Natural asphalt	12002-43-6	1
n-cocoamidopropyl-n,n-dimethyl-n-2-hydroxypropylsulfobetaine	68139-30-0	1
n-dodecyl-2-pyrrolidone	2687-96-9	1
N-heptane	142-82-5	1
Nickel sulfate hexahydrate	10101-97-0	2
Nitrilotriacetamide	4862-18-4	4
Nitrilotriacetic acid	139-13-9	6

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Nitrilotriacetonitrile	7327-60-8	3
Nitrogen	7727-37-9	9
n-Methylpyrrolidone	872-50-4	1
Nonane, all isomers	*	1
Non-hazardous salt	*	1
Nonionic surfactant	*	1
Nonyl phenol ethoxylate	*	2
Nonyl phenol ethoxylate	9016-45-6	2
Nonyl phenol ethoxylate	9018-45-9	1
Nonylphenol	25154-52-3	1
Nonylphenol, ethoxylated and sulfated	9081-17-8	1
N-propyl zirconate	*	1
N-tallowalkyltrimethylenediamines	*	1
Nuisance particulates	*	2
Nylon fibers	25038-54-4	2
Octanol	111-87-5	2
Octyltrimethylammonium bromide	57-09-0	1
Olefinic sulfonate	*	1
Olefins	*	1
Organic acid salt	*	3
Organic acids	*	1
Organic phosphonate	*	1
Organic phosphonate salts	*	1
Organic phosphonic acid salts	*	6
Organic salt	*	1
Organic sulfur compound	*	2
Organic titanate	*	2
Organiophilic clay	*	2
Organo-metallic ammonium complex	*	1
Other inorganic compounds	*	1
Oxirane, methyl-, polymer with oxirane, mono-C10-16-alkyl ethers, phosphates	68649-29-6	1
Oxyalkylated alcohol	*	6
Oxyalkylated alcohols	228414-35-5	1
Oxyalkylated alkyl alcohol	*	1
Oxyalkylated alkylphenol	*	1
Oxyalkylated fatty acid	*	2
Oxyalkylated phenol	*	1
Oxyalkylated polyamine	*	1
Oxylated alcohol	*	1
Paraffin wax	8002-74-2	1
Paraffinic naphthenic solvent	*	1
Paraffinic solvent	*	5
Paraffins	*	1
Perlite	93763-70-3	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Petroleum distillates	*	26
Petroleum distillates	64742-65-0	1
Petroleum distillates	64742-97-5	1
Petroleum distillates	68477-31-6	3
Petroleum gas oils	*	1
Petroleum gas oils	64741-43-1	1
Phenol	108-95-2	5
Phenol-formaldehyde resin	9003-35-4	32
Phosphate ester	*	6
Phosphate esters of alkyl phenyl ethoxylate	68412-53-3	1
Phosphine	*	1
Phosphonic acid	*	1
Phosphonic acid	129828-36-0	1
Phosphonic acid	13598-36-2	3
Phosphonic acid (dimethlamino(methylene))	29712-30-9	1
Phosphonic acid, [nitrilotris(methylene)]tris-, pentasodium salt	2235-43-0	1
Phosphoric acid	7664-38-2	7
Phosphoric acid ammonium salt	*	1
Phosphoric acid, mixed decyl, octyl and ethyl esters	68412-60-2	3
Phosphorous acid	10294-56-1	1
Phthalic anhydride	85-44-9	2
Pine oil	8002-09-3	5
Plasticizer	*	1
Poly(oxy-1,2-ethanediyl)	24938-91-8	1
Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched (Nonylphenol ethoxylate)	127087-87-0	3
Poly(oxy-1,2-ethanediyl), alpha-hydro-omega-hydroxy	65545-80-4	1
Poly(oxy-1,2-ethanediyl), alpha-sulfo-omega-(hexyloxy)-, ammonium salt	63428-86-4	3
Poly(oxy-1,2-ethanediyl),a-(nonylphenyl)-w-hydroxy-, phosphate	51811-79-1	1
Poly-(oxy-1,2-ethanediyl)-alpha-undecyl-omega-hydroxy	34398-01-1	6
Poly(sodium-p-styrenesulfonate)	25704-18-1	1
Poly(vinyl alcohol)	25213-24-5	2
Polyacrylamides	9003-05-8	2
Polyacrylamides	*	1
Polyacrylate	*	1
Polyamine	*	2
Polyanionic cellulose	*	2
Polyepichlorohydrin, trimethylamine quaternized	51838-31-4	1
Polyetheramine	9046-10-0	3
Polyether-modified trisiloxane	27306-78-1	1
Polyethylene glycol	25322-68-3	20
Polyethylene glycol ester with tall oil fatty acid	9005-02-1	1
Polyethylene polyammonium salt	68603-67-8	2
Polyethylene-polypropylene glycol	9003-11-6	5

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Polylactide resin	*	3
Polyoxyalkylenes	*	1
Polyoxyethylene castor oil	61791-12-6	1
Polyphosphoric acid, esters with triethanolamine, sodium salts	68131-72-6	1
Polypropylene glycol	25322-69-4	1
Polysaccharide	*	20
Polyvinyl alcohol	*	1
Polyvinyl alcohol	9002-89-5	2
Polyvinyl alcohol/polyvinylacetate copolymer	*	1
Potassium acetate	127-08-2	1
Potassium carbonate	584-08-7	12
Potassium chloride	7447-40-7	29
Potassium formate	590-29-4	3
Potassium hydroxide	1310-58-3	25
Potassium iodide	7681-11-0	6
Potassium metaborate	13709-94-9	3
Potassium metaborate	16481-66-6	3
Potassium oxide	12136-45-7	1
Potassium pentaborate	*	1
Potassium persulfate	7727-21-1	9
Propanol (Propyl alcohol)	71-23-8	18
Propanol, [2(2-methoxy-methylethoxy) methylethoxyl]	20324-33-8	1
Propargyl alcohol (2-propyn-1-ol)	107-19-7	46
Propylene carbonate (1,3-dioxolan-2-one, methyl-)	108-32-7	2
Propylene glycol (1,2-propanediol)	57-55-6	18
Propylene oxide	75-56-9	1
Propylene pentamer	15220-87-8	1
p-Xylene	106-42-3	1
Pyridinium, 1-(phenylmethyl)-, ethyl methyl derivatives, chlorides	68909-18-2	9
Pyrogenic silica	112945-52-5	3
Quaternary amine compounds	*	3
Quaternary amine compounds	61789-18-2	1
Quaternary ammonium compounds	*	9
Quaternary ammonium compounds	19277-88-4	1
Quaternary ammonium compounds	68989-00-4	1
Quaternary ammonium compounds	8030-78-2	1
Quaternary ammonium compounds, dicoco alkyldimethyl, chlorides	61789-77-3	2
Quaternary ammonium salts	*	2
Quaternary compound	*	1
Quaternary salt	*	2
Quaternized alkyl nitrogenated compound	68391-11-7	2
Rafinnates (petroleum), sorption process	64741-85-1	2
Residues (petroleum), catalytic reformer fractionator	64741-67-9	10
Resin	8050-09-7	2

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Rutile	1317-80-2	2
Salt of phosphate ester	*	3
Salt of phosphono-methylated diamine	*	1
Salts of oxyalkylated fatty amines	68551-33-7	1
Secondary alcohol	*	7
Silica (Silicon dioxide)	7631-86-9	47
Silica, amorphous	*	3
Silica, amorphous precipitated	67762-90-7	1
Silicon carboxylate	681-84-5	1
Silicon dioxide (Fused silica)	60676-86-0	7
Silicone emulsion	*	1
Sodium (C14-16) olefin sulfonate	68439-57-6	4
Sodium 2-ethylhexyl sulfate	126-92-1	1
Sodium acetate	127-09-3	6
Sodium acid pyrophosphate	7758-16-9	5
Sodium alkyl diphenyl oxide sulfonate	28519-02-0	1
Sodium aluminate	1302-42-7	1
Sodium aluminum phosphate	7785-88-8	1
Sodium bicarbonate (Sodium hydrogen carbonate)	144-55-8	10
Sodium bisulfite	7631-90-5	6
Sodium bromate	7789-38-0	10
Sodium bromide	7647-15-6	1
Sodium carbonate	497-19-8	14
Sodium chlorate	7775-09-9	1
Sodium chloride	7647-14-5	48
Sodium chlorite	7758-19-2	8
Sodium cocaminopropionate	68608-68-4	2
Sodium diacetate	126-96-5	2
Sodium erythorbate	6381-77-7	4
Sodium glycolate	2836-32-0	2
Sodium hydroxide (Caustic soda)	1310-73-2	80
Sodium hypochlorite	7681-52-9	14
Sodium lauryl-ether sulfate	68891-38-3	3
Sodium metabisulfite	7681-57-4	1
Sodium metaborate	7775-19-1	2
Sodium metaborate tetrahydrate	35585-58-1	6
Sodium metasilicate, anhydrous	6834-92-0	2
Sodium nitrite	7632-00-0	1
Sodium oxide (Na2O)	1313-59-3	1
Sodium perborate	1113-47-9	1
Sodium perborate	7632-04-4	1
Sodium perborate tetrahydrate	10486-00-7	4
Sodium persulfate	7775-27-1	6
Sodium phosphate	*	2

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Sodium polyphosphate	68915-31-1	1
Sodium salicylate	54-21-7	1
Sodium silicate	1344-09-8	2
Sodium sulfate	7757-82-6	7
Sodium tetraborate	1330-43-4	7
Sodium tetraborate decahydrate	1303-96-4	10
Sodium thiosulfate	7772-98-7	10
Sodium thiosulfate pentahydrate	10102-17-7	3
Sodium trichloroacetate	650-51-1	1
Sodium tripolyphosphate	7758-29-4	2
Sodium xylene sulfonate	1300-72-7	3
Sodium zirconium lactate	174206-15-6	1
Solvent refined heavy naphthenic petroleum distillates	64741-96-4	1
Sorbitan monooleate	1338-43-8	1
Stabilized aqueous chlorine dioxide	10049-04-4	1
Stannous chloride	7772-99-8	1
Stannous chloride dihydrate	10025-69-1	6
Starch	9005-25-8	5
Steam cracked distillate, cyclodiene dimer, dicyclopentadiene polymer	68131-87-3	1
Steam-cracked petroleum distillates	64742-91-2	6
Straight run middle petroleum distillates	64741-44-2	5
Substituted alcohol	*	2
Substituted alkene	*	1
Substituted alkylamine	*	2
Sucrose	57-50-1	1
Sulfamic acid	5329-14-6	6
Sulfate	*	1
Sulfonate acids	*	1
Sulfonate surfactants	*	1
Sulfonic acid salts	*	1
Sulfonic acids, petroleum	61789-85-3	1
Sulfur compound	*	1
Sulfuric acid	7664-93-9	9
Sulfuric acid, monodecyl ester, sodium salt	142-87-0	2
Sulfuric acid, monooctyl ester, sodium salt	142-31-4	2
Surfactants	*	13
Sweetened middle distillate	64741-86-2	1
Synthetic organic polymer	9051-89-2	2
Tall oil (Fatty acids)	61790-12-3	4
Tall oil, compound with diethanolamine	68092-28-4	1
Tallow soap	*	2
Tar bases, quinoline derivatives, benzyl chloride-quaternized	72480-70-7	5
Tergitol	68439-51-0	1
Terpene hydrocarbon byproducts	68956-56-9	3

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Terpenes	*	1
Terpenes and terpenoids, sweet orange-oil	68647-72-3	2
Terpineol	8000-41-7	1
Tert-butyl hydroperoxide	75-91-2	6
Tetra-calcium-alumino-ferrite	12068-35-8	1
Tetraethylene glycol	112-60-7	1
Tetraethylenepentamine	112-57-2	2
Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione (Dazomet)	533-74-4	13
Tetrakis (hydroxymethyl) phosphonium sulfate	55566-30-8	12
Tetramethyl ammonium chloride	75-57-0	14
Tetrasodium 1-hydroxyethylidene-1,1-diphosphonic acid	3794-83-0	1
Tetrasodium ethylenediaminetetraacetate	64-02-8	10
Thiocyanate sodium	540-72-7	1
Thioglycolic acid	68-11-1	6
Thiourea	62-56-6	9
Thiourea polymer	68527-49-1	3
Titanium complex	*	1
Titanium oxide	13463-67-7	19
Titanium, isopropoxy (triethanolaminate)	74665-17-1	2
Toluene	108-88-3	29
Treated ammonium chloride (with anti-caking agent a or b)	12125-02-9	1
Tributyl tetradecyl phosphonium chloride	81741-28-8	5
Tri-calcium silicate	12168-85-3	1
Tridecyl alcohol	112-70-9	1
Triethanolamine (2,2,2-nitrilotriethanol)	102-71-6	21
Triethanolamine polyphosphate ester	68131-71-5	3
Triethanolamine titanate	36673-16-2	1
Triethanolamine zirconate	101033-44-7	6
Triethanolamine zirconium chelate	*	1
Triethyl citrate	77-93-0	1
Triethyl phosphate	78-40-0	1
Triethylene glycol	112-27-6	3
Triisopropanolamine	122-20-3	5
Trimethylammonium chloride	593-81-7	1
Trimethylbenzene	25551-13-7	5
Trimethyloctadecylammonium (1-octadecanaminium, N,N,N-trimethyl-, chloride)	112-03-8	6
Tris(hydroxymethyl)aminomethane	77-86-1	1
Trisodium ethylenediaminetetraacetate	150-38-9	1
Trisodium ethylenediaminetriacetate	19019-43-3	1
Trisodium nitrilotriacetate	18662-53-8	8
Trisodium nitrilotriacetate (Nitrilotriacetic acid, trisodium salt monohydrate)	5064-31-3	9
Trisodium ortho phosphate	7601-54-9	1
Trisodium phosphate dodecahydrate	10101-89-0	1
Ulexite	1319-33-1	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Urea	57-13-6	3
Wall material	*	1
Walnut hulls	*	2
White mineral oil	8042-47-5	8
Xanthan gum	11138-66-2	6
Xylene	1330-20-7	44
Zinc chloride	7646-85-7	1
Zinc oxide	1314-13-2	2
Zirconium complex	*	10
Zirconium dichloride oxide	7699-43-6	1
Zirconium oxide sulfate	62010-10-0	2
Zirconium sodium hydroxy lactate complex (Sodium zirconium lactate)	113184-20-6	2

** Components marked with an asterisk appeared on at least one MSDS without an identifying CAS number. The MSDSs in these cases marked the CAS as proprietary, noted that the CAS was not available, or left the CAS field blank. Components marked with an asterisk may be duplicative of other components on this list, but Committee staff have no way of identifying such duplicates without the identifying CAS number.*

EXHIBIT 15

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SECRETARY

April 12, 2013

Dear Ms. Steinzor, et al.,

I am writing in response to a number of questions relating to the Pennsylvania Department of Environmental Protection's (DEP) oil and gas investigations and lab testing practices that you asked Alisa Harris, Special Deputy Secretary for External Affairs, in an e-mail dated January 25, 2013. As you know, that correspondence occurred in the context of scheduling a meeting between DEP and representatives from various environmental advocacy organizations to discuss these matters further. It is my understanding that these groups now refuse to meet with DEP. Thus, I will try to address your questions as best I can in writing.

Before directly speaking to the questions and points you have raised, I would like to first point out that this administration takes methane migration very seriously and that it was this administration that levied a $1 million penalty, the largest single fine against an oil and gas driller in the history of Pennsylvania, in a case involving methane migration. I would also like to point out that DEP's Bureau of Laboratories, which as part of its duties provides analytical support to DEP's investigations and also accredits laboratories operating in the state, recently received a glowing peer review from the independent, non-profit Association of Public Health Laboratories. The association found DEP's lab to be "well-managed, efficient and highly functional," capable of meeting the varied needs of a statewide regulatory agency. Given these facts, it is absurd to assert that DEP is either unwilling or incapable of upholding its mission to protect public health, safety and the environment.

DEP takes every complaint it receives very seriously. In response to complaints alleging water supply impacts from oil and gas activities, the state's Oil and Gas Act obligates DEP to initiate an investigation and determine if oil and gas drilling impacted a private water supply (58 Pa.C.S. § 3218). Generally, this involves interviewing the complainant, sampling the water supply, analyzing the sample, comparing sampling results to pre-drill sampling results if available and to other reference material, and making a determination. We provide homeowners with verified sampling results as we receive them.

One of the questions you raised was why "DEP [would] state in letters to homeowners that 'The sample results taken by the Department did not show any evidence that your water was affected by oil and gas drilling activities,' even if the results indicate elevated levels of [certain] substances[?]". While we cannot speak to any one case or investigation in particular, should exceedences of MCLs exist in pre-drill sampling data and remain unchanged, DEP staff would not be able to conclude that the levels of such parameters were attributable to an impact from oil and gas drilling. Given the potential for groundwater to change, multiple rounds of testing may be necessary. Elevations of a single parameter is not necessarily evidence of a well drilling incident but could instead be part of a naturally fluctuating aquifer. This is why DEP conducts multiple rounds of sampling.

Groundwater in Pennsylvania at background levels does not always meet safe drinking water standards. As the Center for Rural Pennsylvania has noted in several studies, many private water supplies contain some level of background contamination or, specifically, contamination not attributable to oil and gas drilling. Further, while DEP has in place regulations protecting private water supplies from impacts from mining and oil and gas activities, Pennsylvania does not regulate the construction of or the quality of water contained in private water wells.

Impacts from oil and gas drilling can be quite diverse, ranging from the introduction of air into subsurface strata and causing oxidation of iron and manganese, discoloring the water, to methane migration resulting from improper casing and cementing. There may also be impacts resulting from leaks or spills at pits or impoundments temporarily storing flowback water or other wastes. An investigation into alleged methane migration would require different methods of fact-finding than would an investigation into alleged introduction of oil and gas fluids into a water supply from an impoundment. Further, each investigation is necessarily fact-specific and site-specific, and our inspectors have the discretion and tools to conduct thorough and complete investigations based on the facts. The facts of a particular investigation may include data collected on the water supply, as well as an examination of the activities at the well site and the existing local geology and hydrology.

In order to assist inspectors with their field work, DEP's scientists and technical experts have developed 624 standard analysis codes and 161 suite codes for inspectors to choose from when requesting an analysis of a particular sample from DEP's labs. In an oil and gas fluids investigation, DEP inspectors consistently employ SAC 946 (the parameters of which are included as an enclosure, as are the parameters of SAC 942 and 944). After reviewing the initial verified results, DEP inspectors may also request the laboratory test for additional parameters beyond those originally requested.

DEP's use of suite codes is an evolving process. DEP's scientists and technical staff will change the parameters and analytes tested for in existing standard analysis codes or develop new standard analysis codes based upon the results of field research and science. For example, DEP originally developed SAC 942 in 1991 to identify constituent elements that would indicate contamination from a gas extraction operation. In 2008 and 2009, DEP staff undertook a broad survey of fluids associated with Marcellus shale development. The results of that survey confirmed that SAC 942 tested for the correct analytes and also identified additional parameters that may be useful. The result of this was SAC 946, which has now replaced SAC 942 as a matter of practice in private water supply impact investigations. SAC 946 is particularly useful as it tests for parameters that are most indicative of an impact from oil and gas fluids—namely, chlorides, calcium, sodium and total dissolved solids. The additional parameters included in the standard analysis code are at times useful for determining the extent of the impact. SAC 946 continues to be a practical and sufficient set of tests for the purposes of these types of investigations, as was discussed at length in a November 9, 2012 letter to a State Representative, which I have enclosed. As the enclosed letter explains, all of SAC 946's analytes and parameters have been demonstrated to be present in fluids associated with oil and gas development, such as produced water, flowback, and fracturing fluids.

In another such instance of DEP adding parameters to what it can test for, at the request of the region, DEP's Bureau of Laboratories demonstrated their technical expertise by finding a way to test for glutaraldehyde, an anti-bacteriological agent used in flowback impoundments to reduce odors, using a testing method for a similar compound. DEP's lab sought and received accreditation from the National Environmental Laboratory Accreditation Program to test water samples for the compound, which can serve as an additional tool in water supply investigations due to the use of glutaraldehyde in the oil and gas industry.

DEP may also develop standard analysis codes for long-term monitoring surveys. Such codes would not be suitable for the purposes of a field investigation of a particular water supply. In specific regard to one of your questions, SAC 944 was created on October 28, 2008 for the purpose of surveying wastewater and wastewater treatment related to Marcellus shale operations. It was not designed to assist with investigating whether oil and gas drilling fluids impacted private water supplies. SAC 944 is a hybrid of oil and gas parameters and National Pollutant Discharge Elimination System (NPDES) parameters, analyzing the fluid that entered wastewater treatment facilities and analyzing the fluids discharged from those wastewater treatment facilities to the waters of the Commonwealth. The logistics and sampling protocols involved with the number of parameters in SAC 944 do not lend themselves to field investigatory work. In comparison, SAC 946 is both robust and readily useful in the field. That is why it is the principal standard analysis code used in water supply investigations, and that is why it provides DEP with the information necessary to satisfy its legal requirement to determine if oil and gas drilling has impacted a water supply.

A question presented in your e-mail referenced third-party testing, or sampling conducted by an operator and analyzed by an independent laboratory. There are some investigations where the only sampling that occurs is conducted by DEP field staff. In others, sampling is conducted by both DEP and one or more oil and gas operators. In such cases, DEP would compare the analytical results. If a discrepancy is noted, DEP staff may request and review raw data from its lab or the third-party lab. In extremely rare cases where DEP staff are unable to directly sample a water supply, DEP will obtain from the operator and the third-party lab the raw data, the quality assurance and quality control measures used, and chain of custody documents to verify the analytical results. If the review of this information does not result in any discrepancies or errors with the analysis, the results are considered suitable for use in making a determination.

In your e-mail correspondence, you have asked a number of questions concerning the training and qualifications of our staff. DEP provides its field staff with training, as outlined in the Bureau of Laboratories Sample Protocol manual, which can be accessed at this link http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-83716/COMBINED.pdf . Notably, this manual includes SAC 946. In addition to the background in sampling this training provides, DEP inspectors and water quality specialists are also provided with in-the-field training regarding investigations.

DEP's chemists who work in the labs and provide the analytical support must possess college degrees and professional experience. In addition, in order for DEP's lab to be accredited, DEP's lab staff must take part in Initial Demonstrations of Capability, which occur annually and require DEP's lab analysts to correctly test for and identify the levels of various samples, some with samples of unknown concentration to the analyst. DEP staff are well-trained, receive continual training and, in the case of the laboratory, must continue to demonstrate technical proficiency in the application of required laboratory methodologies.

I would also like to address the continuing confusion surrounding why DEP does not provide raw, non-QA/QC'ed laboratory readings to homeowners. The standard analysis codes identify parameters and analytes that lab personnel must test for and the results of which must be verified. In order to determine the levels of certain parameters and analytes of a standard analysis code, DEP staff use approved methodologies. EPA Test Method 200.7 "Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emissions Spectrometry" revision 4.4, is such a recognized methodology for determining the concentrations of many metals in drinking water or wastewater samples and as such is used for determining the concentrations of the metals included in SAC 946.

The Bureau of Laboratories' equipment is calibrated to test for the range of metals in EPA Test Method 200.7 so that a batch of samples may include the parameters listed in SAC 946, as well as other SACs that include different metals. Use of EPA Test Method 200.7 generates additional raw numbers or readings for other metals that are not relevant to DEP's statutory obligation to determine if drilling activities have impacted a water supply. Those extra, unverified laboratory readings are not requested to be analyzed because they are not relevant to an oil and gas fluids investigation. DEP's study of oil and gas fluids shows that even if this extra, non-requested, unverified information were to show the presence of non-SAC 946 metals, that information is unlikely to further the investigation. This is because the parameters included in SAC 946 are indicative of impacts from drilling; the additional parameters do not typically provide additional information with respect to impacts from drilling.

What is left are unverified raw numbers – and, often, pages of such numbers that are not readily understood by the general public. Those numbers are not verified and often include levels below detection or reporting limits, or even varied levels for the very same analyte. Those variables are caused by normal laboratory processes, such as multiple runs of the sample at different dilution levels when some results exceed calibration levels. By definition, the raw numbers are not useful on their own. No laboratory, whether private or government, would consider them to be so. It would be irresponsible for DEP to provide such unrequested, unverified, and incomplete raw laboratory readings to a homeowner. I must note, though, that DEP will and does provide such raw, unvalidated information to homeowners when it is requested.

You may also be interested to know that the Citizens' Advisory Council (CAC) also had this topic addressed in a presentation made to them by Barbara Hall of TestAmerica during the CAC meeting of February 26, 2013. Former Secretary of DEP Dave Hess, who is now a CAC Member (appointed by Senator Scarnati), described what Ms. Hall told the CAC this way,

Barbara Hall with TestAmerica, Inc., a laboratory which provides water testing services in the Marcellus Shale regions of the state to private clients and DEP, gave Council a briefing on water testing protocols. During its last two meetings Council has been presented with concerns and allegations about DEP "hiding" some water sampling results from homeowners. As a result of the presentation, it became clear there has been a misunderstanding about how test results are generated at a modern lab like TestAmerica. Ms. Hall clarified that while modern testing equipment frequently provides sample results on a broad spectrum of substances in a sample at the same time, the client or DEP requests the individual results it wants by substance or parameter. For example, in the controversy presented to Council, DEP was doing investigative sampling trying to determine if a water supply was affected by Marcellus drilling. Ms. Hall pointed out only a handful of parameters are necessary to make that determination and those are the results they report to their clients or DEP, even though their equipment might have automatically analyzed the sample for many more substances. Ms. Hall said, unlike other states, Pennsylvania does not have a set list of parameters drilling companies should use to analyze water wells around their drilling sites, at a minimum within 2,500 feet. The Marcellus Shale Coalition, an industry group, Ms. Hall said will soon be publishing its own suite of water sampling parameters for member companies to use.

Finally, I must repeat again how seriously this administration takes impacts to private water supplies. The results of a positive determination have significant consequences, and as such DEP reviews significant actions through an internal process known as the Major Action Advisory (MAA) process, which was implemented and used by prior administrations. As the name of the process implies, the purpose is to advise DEP management staff of significant actions proposed to be taken by field staff. It would not be a responsible way to run an organization where management is not apprised of such actions. This process will not delay DEP in notifying homeowners of any issues with their water supplies as indicated by verified laboratory results.

One of your requests asked DEP to identify homeowners whose water supplies have been impacted from drilling. As DEP is sensitive to the privacy of homeowners who wish to remain anonymous in these matters, we will not disclose this information. DEP has, however, determined Marcellus shale drilling has impacted the water supplies of 25 separate water supply complainants since 2009.

As you can see, DEP inspectors have all the tools needed to satisfy our legal requirement to conduct a full and thorough water supply impact investigation and to make a sound determination based on fact, established science and the law. As you correctly noted, millions of Pennsylvanians rely on private water supplies. I hope that this letter has sufficiently explained how our regulations, investigations and field staff protect such supplies. I would like to close by again expressing my disappointment with your decision not to work with us on rescheduling a

meeting with myself and my experts and representatives from you and your fellow environmental and conservation advocacy organizations. That was a dialogue I was very much looking forward to having.

If you should have any questions on this matter, please contact Alisa E. Harris, Special Deputy Secretary for External Affairs, by e-mail at aliharris@pa.gov or by telephone at 717.787.6490.

Sincerely,

Michael L. Krancer
Secretary

Enclosures

EXHIBIT 16

Sunday Times review of DEP drilling records reveals water damage, murky testing methods

BY LAURA LEGERE (STAFF WRITER)

Published: May 19, 2013

First of two parts

State environmental regulators determined that oil and gas development damaged the water supplies for at least 161 Pennsylvania homes, farms, churches and businesses between 2008 and the fall of 2012, according to a cache of nearly 1,000 letters and enforcement orders written by Department of Environmental Protection officials and obtained by The Sunday Times.

The determination letters are sent to water supply owners who ask state inspectors to investigate whether oil and gas drilling activities have polluted or diminished the flow of water to their wells.

View interactive map:

Gas Drilling Complaints Map

Inspectors declared the vast majority of complaints - 77 percent of 969 records - unfounded, lacking enough evidence to tie them definitively to drilling or caused by a different source than oil and gas exploration, like legacy pollution, natural conditions or mining.

One in six investigations across the roughly five-year period - 17 percent of the records - found that oil and gas activity disrupted water supplies either temporarily or seriously enough to require companies to replace the spoiled source.

The letters confirming contamination or water loss from drilling and the orders that require companies to fix the damage provide what is likely the best official count of the industry's impact on individual water supplies in Pennsylvania because the state does not track the disruptions.

The Sunday Times requested the records in late 2011, and received access to them late last year after a state appeals court ruled that the DEP had to release the documents regardless of whether it was hard for the agency to find them in its files.

While the records compiled by the newspaper offer a more complete tally of the number of affected properties than was previously available, the count is not exhaustive:

- DEP tracks oil and gas-related disruptions to water supplies based on broad incidents, each of which might affect one or many water supplies, making comparisons between the totals difficult. A case of gas migrating into Dimock Twp. drinking water, for example, is considered one incident by DEP even though the state determined it affected 18 water wells used by 19 families. DEP spokesman Kevin Sunday said the agency compiles "some information" on the number of affected water wells and springs, but DEP's statistics on impacted water supplies differ from the numbers documented in the letters and orders released to The Sunday Times. Between 2010 and 2012, DEP counted 103 impacted water supplies - six more than were documented for those years in the records released to the newspaper.

- DEP repeatedly argued in court filings during the open records case that it does not count how many determination letters it issues, track where they are kept in its files or maintain its records in a way that would allow a comprehensive search for the letters, so there is no way to assess the completeness of the released documents.

- Before a 2011 regulatory update, solutions worked out privately between homeowners and drillers were not required to be reported to the department. The Sunday Times requested the notices of potential water contamination that now have to be passed on to DEP by drilling companies that receive them from residents, but the request was denied by DEP and the state's Office of Open Records because the documents are considered part of protected investigations.

- The conclusions described in the determination letters are seldom absolute because substances read as signals of drilling-related contamination are also routine signs of other man-made or natural influences.

For regulators, tracking broad cases is more useful from a technical standpoint than counting impacted water wells, Mr. Sunday said in an email.

"The number of water supplies impacted is not always reflective of the scope of the problem," he said.

Using its definition of incidents, DEP counted 83 cases of drilling-related impacts on water supplies between 2008 and 2012, roughly the same period covered by the records released to The Sunday Times. The state has confirmed water supply impacts in 128 broad cases since 1987, he said.

The state's case-based tally suggests the rate of drilling-related contamination incidents increased with the start of the Marcellus boom. Drilling damaged water supplies at a rate of more than 16 cases per year during the past five years, according to the state's accounting. For the 20 years prior to 2008, the incidence rate was fewer than three cases per year.

Mr. Sunday said the increase can be attributed to a shift from drilling in western areas of the Commonwealth with a long history of oil and gas extraction to central and eastern regions where the shallow geology is complex, gas-rich and less studied. Those factors mean "that there will be an adjustment period during which operators refine casing and cementing practices in order to most effectively establish and maintain the highest standards of well integrity," he said.

The most recent trends - DEP counted five contamination cases that impacted roughly 19 water supplies in 2012 compared to 18 cases that impacted 27 water supplies in 2011 - suggest that the improvements are working, he said.

Transparency questioned

The department's water testing and reporting protocols have come under scrutiny in recent months as environmental activists and homeowners whose drilling-related complaints were dismissed have come to doubt the determinations' accuracy and value.

DEP recently changed its policy for issuing water contamination notices to require administrators in Harrisburg to approve them before they are sent out from the regional field offices that conduct the investigations. The state's laboratory technical director, deposed when a resident appealed the DEP's conclusion that drilling activities had not polluted his water supply, acknowledged that DEP reviews and reports back to homeowners only those contaminants it considers indicative of drilling-related contamination, not all of the contaminants that might surface in its water tests - a common practice for tailoring laboratory analysis but one that spurred critics to question the thoroughness and transparency of DEP's investigations.

In January, state Auditor General Eugene A. DePasquale announced his office is conducting a performance audit of the DEP's water testing program to "determine the adequacy and effectiveness of DEP's monitoring of water quality as potentially impacted by shale gas development activities" between 2009 and 2012.

Debate over the safety of oil and gas extraction - especially the combined tools of horizontal drilling and hydraulic fracturing used in pursuit of fuel from unconventional sources like the Marcellus Shale - is often characterized as an argument between activists who exaggerate claims of damage and industry public relations teams who minimize them.

But the determination letters released by the state reveal a widespread suspicion among water supply owners - farmers and summer residents, school board members and mini-mart operators, churches and a Wyoming County municipal water authority - that when their water seems soured, gas drilling operations might be to blame.

According to the state's records, they are sometimes right and for a myriad of reasons.

More than half of the records of contaminated water supplies confirmed by the state involved gas, loosened by drilling, seeping into drinking water aquifers. Faulty natural gas wells channeled methane into the water supplies for 90 properties, the letters show. Three of those cases were tied to old wells, one of which caused an explosion at a home after gas entered through a floor drain and accumulated in a basement.

Drilling-related road construction contaminated water at two homes, while construction for a large water-storage pond called an impoundment contaminated another. Pipeline construction twice polluted water supplies with sediment. Stray cement or rock waste displaced by drilling, called cuttings, contaminated seven water supplies.

The state has never implicated the underground gas extraction process known as hydraulic fracturing, or fracking, in a contamination incident, but inspectors noted that brine contamination suggesting "an infiltration of frac water into the shallow ground water," damaged six fresh-water springs used for drinking water in northwestern Pennsylvania.

Some of the problems were short-lived: the DEP letters describe 20 of the confirmed contamination incidents as temporary.

Regulations needed

The incidents documented in the letters reinforce why the state and industry have focused on strengthening standards for above-ground activities so materials don't infiltrate the surface and well construction to ensure the cemented casings that protect groundwater are sound, Marcellus Shale Coalition CEO Kathryn Klaber said.

The natural gas industry has worked on several fronts to investigate and respond to contamination complaints, including providing drinking water to homeowners while their concerns are investigated, she said. The organization and university partners are also compiling a database of pre-drilling groundwater quality to help researchers assess background water quality and insulate operators from misplaced blame.

The letters obtained by The Sunday Times describe an array of problems that exist in Pennsylvania water supplies unrelated to oil and gas exploration, like high metal, salt and methane content and bacteria from surface water or nesting creatures invading poorly built water wells.

A 2011 Penn State study found that about 40 percent of water wells it tested prior to gas well drilling failed at least one federal drinking water standard, usually for coliform bacteria, turbidity or manganese. Pennsylvania is one of only a few states in the nation that does not have private water well construction standards.

"It really is time for Pennsylvania to put in place some standards for private water wells," Ms. Klaber said.

Regulations could help address pre-existing water quality problems and make sure water wells are stable enough to handle any nearby industrial activity, including oil and gas operations, she said. "When you've got vibration and activity proximate to an unlined water well you're going to get infiltration of dirt and other materials. That turbidity, usually temporary, is going to affect that water."

Presumed responsible

Indicators of drilling-related contamination might equally point to past pollution or natural systems changing with weather or seasons, so the contaminants DEP cites as evidence of a drilling impact in one letter can be cited as evidence of background water conditions in another.

Manganese, iron and a measure of the salts and minerals dissolved in the water known as total dissolved solids (TDS) are among the elevated parameters most frequently noted by DEP inspectors in water wells they determined were not influenced by drilling, but in at least 30 cases where the DEP determined that oil and gas drilling had contaminated water supplies, increases in manganese, iron or TDS were described as a primary or sole indicator of a problem.

Letters sent to nine McKean County homeowners during an involved investigation of drilling-related contamination captured the difficulty of drawing conclusions based on substances that can indicate both normal conditions and harm: "An elevated level of these compounds is not uncommon in this region and can occur naturally," the investigator in the case wrote, "but it is also recognized that they can become elevated as a result of drilling oil and gas wells."

DEP does not rely only on water test results to determine whether a water supply was affected by drilling, Mr. Sunday said. "We employ a very complex analysis in these investigations." Inspectors "consider things like local water well and gas well integrity, a geochemical evaluation of the water supply, and the local rock formations and how water flows through them," he said.

In many cases, the failure that led to contamination is left as opaque as turbid water.

DEP blamed a Marcellus Shale driller in Susquehanna County for water contamination in 2010 after the salt, barium, strontium and gas concentrations in the Rush Twp. home's water supply spiked after the company drilled and fracked a well 600 feet away.

- Abington Heights High School teachers refuse to write letters of recommendation
- H.S. BASKETBALL: Bucciarelli out as Abington Heights coach
- False report leads to police converging on Scranton home
- Lackawanna County Court Notes 3/28/2014
- Man charged in child assault has been violent before, records suggest
- NEW DEP investigating pungent odor blanketing region
- Scranton man arrested on bench warrant; search finds stolen handgun

JOBS570
HEAD GIRLS BASKETBALL COACH (Throop, PA)
Plasma Donors
CHIEF ENGINEER HOUSEKEEPING
BREAKFAST ATTENDANT
Technician
ROAD SAW OPERATORS TRUCK DRIVERS CDL DRIVERS LABORERS

- Abington Heights High School teachers refuse to write letters of recommendation
  87 comments 0 minutes ago
- Letters to the Editor - 3/27/2014
  243 comments 43 minutes ago
- Letters to the Editor - 3/28/2014
  41 comments 1 hour ago
- Letters to the Editor - 3/26/2014
  312 comments 6 hours ago
- PLCB reform: drip, drip, drip
  25 comments 6 minutes ago

REALESTATE570
3 Scranton
1 Scranton
2 Scranton
2 SCRANTON WEST

More top homes

- Abington Heights High School teachers refuse to write letters of recommendation
- NEW DEP investigating pungent odor blanketing region
- H.S. BASKETBALL: Bucciarelli out as Abington Heights coach

The post-drilling barium levels reached 47 milligrams per liter - more than 23 times the safe level of the toxic metal in drinking water - while the TDS, chloride and sodium levels peaked at more than 10,800, 5,800 and 3,800 milligrams per liter, respectively - more than 20 times the guidance levels set for aesthetic reasons like taste and appearance.

The determination letter and the subsequent order requiring the driller, Stone Energy, to replace the water well do not describe the mechanism for the pollution. Instead, Mr. Sunday said, the company was presumed responsible for the contamination based on the timing of the impact and the distance from the gas well and the company did not rebut the state's finding.

Stone Energy believed its drilling activity was not to blame for the pollution, but agreed to drill the homeowner a new water well and repay him for out-of-pocket living expenses without admitting to causing the problem, according to the enforcement order.

High TDS, chlorides, sodium, barium and strontium - all potential signatures of contamination from Marcellus development wastewaters - "also occur in brackish or saline groundwater which have been documented at relatively shallow depths in this part of the state," Mr. Sunday said. Although the concentrations of those elements surged to levels between 46 and 142 times the pre-drill concentration measured on the property, the post-drilling samples were taken from a different, deeper water well and so could have been affected by the shallow brine.

Critics of natural gas drilling say the ambiguity left by DEP investigations means the state needs more robust tools and a stronger will to pursue clues about contamination to its source.

Anthony Ingraffea, Ph.D., an engineering professor at Cornell University and a vocal critic of the oil and gas industry he once worked for, said that when DEP says it cannot find a connection between water well contamination and nearby gas activity it does not mean there is no link.

"If DEP sent me a letter that said, 'We can find no connection,' my natural question as a scientist would be, 'How did you look?'" he said.

He was concerned by DEP's practice of counting cases without counting individually impacted water supplies, which he said "makes their statistics look better."

"It doesn't help answer the question, which is how many individual families' private drinking water wells have been contaminated by oil and gas activities," he said. "No one knows the answer. Who should know the answer? DEP."

Contact the writer: llegere@timesshamrock.com

We welcome user discussion on our site, under the following guidelines:

To comment you must first create a profile and sign-in with a verified DISQUS account or social network ID. Sign up here.

Comments in violation of the rules will be denied, and repeat violators will be banned. **Please help police the community by flagging offensive comments for our moderators to review.** By posting a comment, you agree to our full terms and conditions. Click here to read terms and conditions.

Comments for this thread are now closed.

51 Comments The Times-Tribune Login

Sort by Best Share Favorite

JimBarth