**FINAL REPORT OF THE**

**HORIZONTAL SLICKWATER HYDRAULIC FRACTURING TASK FORCE**

**Upper Susquehanna Synod ELCA Assembly**

**June 2014**

**INTRODUCTION:**

The Task Force was created as a result of action taken at the Upper Susquehanna Synod’s Annual Assembly on June 15, 2012. The Task Force was directed to “undertake a comprehensive assessment of the justice issues surrounding the natural gas industry” to “develop and/or acquire and make available materials and resources to address the complexities of horizontal slickwater hydraulic fracturing” for use by synodical congregations and organizations; and, to “provide guidance to congregations and ELCA landowners” as they consider leasing their land to companies engaged in this enterprise.

This is the final report of the Task Force as it finishes its work. We have four goals in this report:

1. Provide a “snapshot” of the attitudes and concerns about shale gas and oil drilling in the Upper Susquehanna Synod based on a survey we distributed to members of USS churches and tabulated in 2013.
2. Provide a model for civil bipartisan religious conversation on this issue.
3. Share moral and ethical guidelines based on biblical and Lutheran theological values to help

individuals and congregations understand and interpret the abundance of information, pro and con, that continues to grow and change almost daily.

1. Provide materials and resources for congregations, individuals, and organizations.

This report is divided into those four parts. Part Four included a list of resources for individuals and congregations to engage in their own information-gathering and research into the complexity of issues surrounding the shale gas and oil industry. ***The Task Force has also submitted a resolution to the 2014 Upper Susquehanna Synod Assembly for consideration. That resolution is separate from this report.***

**RATIONALE: *Why* the church should address this issue**

A few respondents to the questionnaire questioned why the Church is addressing shale gas and oil drilling and its related processes. The following will help in understanding why this issue deserves the attention of Christians and the Church. First, we remind readers of the opening “whereas” statements of the resolution adopted by the 2012 USS Synod Assembly:

WHEREAS, God created heaven and earth and everything therein and proclaimed it good (Gen 1:1ff); and God has entrusted humankind with the care of the earth (Gen 2:15); and

WHEREAS, the Evangelical Lutheran Church in America has adopted social policy statements, “Caring for Creation” (1993) and “Sufficient, Sustainable Livelihood” (1999) that call for economic and environmental justice, to protect the health and integrity of creation both for its own sake and for the use and enjoyment of present and future generations, and for economic justice, to consider how our actions affect the ability of all people to provide for their material needs and the needs of their families and communities.

Shale gas and oil drilling and its related processes and industries touch on several aspects of economic and environmental justice. The economic boom associated with the shale gas and oil industry has led to the use of a new term: “shaleionaires” – farmers or other landowners who may have once been subsistence at least, or successful at best, and are now among the economic elite. The full economic impact is like the proverbial high tide that raises all ships, helping to fuel a boom in business in restaurants, hotels, realtors, lawyers and many other aspects of local economies. Vehicle dealers, mechanics, and construction contractors say they are now enjoying the ripple effect of this business. These ripples are major waves in areas of PA north of I-80, but smaller waves continue statewide and into neighboring states.

Like all human endeavors, hydraulic fracturing has both positive and negative impacts on *people* and *God’s Creation.* There are many facts and opinions—both positive and negative—regarding the way people are affected by the industry now, and in the future.  Regarding the human, social, and environmental impacts, there is some agreement, some consensus and some disagreement.

The economics of shale gas and oil extraction, private land leasing, public land use, pipelines and transportation, compressor stations, liquefied natural gas (LNG) facilities, domestic energy, and international exports all involve vast amounts of money and the exercise of power at individual, corporate and governmental levels. The safety and integrity of those natural resources created by God, such as water, air, land, forests, fields, and ecosystems held in the common trust are impacted by the processes of the shale gas and oil industry.

Articles and scientific studies examined by the task force report that the public health and safety of individuals and communities are affected by the use of known toxins and carcinogens in fracking fluids; radioactive material and dissolved solids in flowback water; earthquakes that have been reported; compressor station and train explosions, tank and pipeline leaks, and illegal disposal of waste water have also been reported, all of which pose significant threats to plant, animal and human life, particularly to women, pregnant women, fetuses, infants and children.

As reported by the Howarth/Marino Lab at Cornell University in September 2012, the 20-year time horizon after emission, the greenhouse gas footprint of shale gas is considerably greater than that for coal or diesel oil, when the full effects of the methane emissions are considered. Others dispute these findings due to the stability of CO2 compared to that of methane. These theories need further scientific studies.

At the same time, the ever-growing energy demands of our country and the world have placed shale gas and oil drilling at the forefront of energy extraction. The technique of modern-day slickwater horizontal hydraulic fracturing is a recent industrial development less than twenty years old. Slickwater horizontal hydraulic fracturing began in Pennsylvania around 2007. The speed at which shale gas and oil drilling has spread across the Marcellus and Utica Shale regions (which underlies the northern, central and westerns regions of Pennsylvania), and the rate at which related infrastructure has developed, lends urgency to a civil conversation among all peoples of faith to address this issue.

The Evangelical Lutheran Church in America and its predecessor bodies have a long-standing and honorable history of engaging in politically-charged issues[[1]](#endnote-1) routinely proclaiming a public theology that takes seriously Jesus’ call to care for “the least of these” (Matthew 25:31-46) and his model of engaging publicly with those who control the power and wealth of a society (Matthew 21:12-13). With so much at stake and so many lives and communities (human and other-than-human) impacted by shale gas and oil drilling, this task force took on the task of engaging these topics to begin a dialogue and develop some consensus about what we recommend to our fellow Lutherans in the Upper Susquehanna Synod.

**PART ONE: ATTITUDES TOWARD SHALE GAS AND OIL DRILLING IN THE UPPER SUSQUEHANNA SYNOD**

The survey was distributed at the 2013 Synod Assembly and via the USS website over three months and 100 responses were received. Top issues that people would like to see addressed were (in order according to those who marked 3, 4 or 5 on a scale of most concern):

Public health issues (69%)

Environmental impacts (69%)

Government policy (60%)

Economics and job aspects (60%)

Hearing from people positively and negatively impacted (57%)

Social impacts (56%)

Of less concern:

Landowner leasing issues (52%)

Learning the basics of shale gas and oil drilling (51%)

Theological and ethical issues (46%)

The task force agreed that even though the *theological and ethical* perspective was not among the top five concerns of people who returned the surveys, as a *church* task force, we should apply that lens to each of the areas noted above. Part three of this report will address that concern.

**PART TWO: The Upper Susquehanna Synod SHF Task Force: a model of civil bipartisan religious engagement**

There are ten members of the task force, each coming from different occupations, political affiliations, and family backgrounds. Bishop Driesen made an effort to appoint people to the committee that would bring a variety of interests and views to the topic of shale gas and oil drilling. It is important to acknowledge the different commitments of these individuals in order to understand that the recommendations in this report were developed through consensus, and that despite strong disagreements on many aspects of this issue, consensus and points of agreement emerged.

To give an overview of the makeup of the committee, consider the following:

* One member has family members who have contracted with the shale gas and oil industry. This member has concerns about the energy needs of our country and believes shale gas and oil drilling is a positive development economically, but is also concerned about water use and conservation issues.
* One member is a biologist and has contracted at different times with the Susquehanna River Basin Commission, the fossil fuel industry, and third-party environmental groups. This member has friends in the shale gas and oil industry, but has concerns about environmental issues.
* One member works for a construction equipment company and works closely with the shale gas and oil industry. While certainly in favor of shale gas and oil drilling, this member has also seen both sides and knows how important safety and best practices are for the industry and communities alike.
* Three members are ordained clergy with backgrounds in ecological theology who are opposed to the shale gas and oil industry and have serious concerns about public health issues and environmental and social justice surrounding the processes of shale gas extraction. Two of those clergy hold PhD degrees in theology and ministry.
* One member is a retired biology teacher who has approached this task force as an opportunity to learn more about shale gas and oil issues, particularly in the Marcellus region, as well as protecting the environment. This member approaches the issues using scientific methodology and offers a neutral, mediating perspective.
* One member works in the agricultural lending industry and has seen the positive financial impact of shale gas and oil drilling for communities, while continuing to be aware of positive and negative aspects of this enterprise. This member hopes for continued vibrant public discussion about this issue.
* One member works in local media and has publicly engaged in numerous discussions with individuals on both sides of the shale gas and oil industry. This member is also an Authorized Lay Worship Leader.
* One member is an associate professor of management at a local university who has researched and published articles addressing the sustainability and social impacts of shale gas and oil drilling on the region.

With the range of attitudes and expertise of the task force in mind, one can imagine the levels of frustration and disagreement that arose at times during meetings. We also discovered that a working model of good humor, thorough research, and respectful conversation with others is one helpful way that this church serves its members and the community. Keeping in mind the biblical examples of the early church engaging in controversial issues, always guided by the Holy Spirit and tempered by the commitment to relate to each other in good faith, the members of this task force volunteered their time, strove to work together to accomplish assigned tasks, and completed this report that offers recommendations to the larger church. Thus we submit our findings and recommendations in hope that our work will inspire others to undertake the challenging but necessary work of engaging issues that affect God’s Creation and all of God’s Children.

**PART THREE: Biblical and Lutheran theological guidelines for approaching the issues related to the shale gas and oil industry**

There are numerous texts from Scripture, Luther’s writings, and the church’s social statement, ***Caring for Creation,*** that are pertinent to this conversation. None of these texts specifically refers to the industry itself, but they do raise questions and concerns that Christians and people of faith and concern can rightly discuss. Specifically, these texts touch on issues of stewardship, resource conservation, and social justice. According to the ELCA Social Statement “Caring for Creation: Vision, Hope and Justice” (1993),

Humans, in service to God, have special roles on behalf of the whole of creation. Made in the image of God, we are called to care for the earth as God cares for the earth. God’s command to have dominion and subdue the earth is not a license to dominate and exploit. Human dominion (Genesis 1:28; Psalm 8), a special responsibility, should reflect God’s way of ruling as a shepherd king who takes the form of a servant (Philippians 2:7), wearing a crown of thorns. According to Genesis 2:15, our role within creation is to serve and to keep God’s garden, the earth. “To serve,” often translated “to till,” invites us again to envision ourselves as servants, while “to keep” invites us to take care of the earth as God keeps and cares for us (Numbers 6:24-26).

It follows, then, that we are to assume a posture of humility and service in our attitude toward God’s Creation and the human community.

In addition, texts from the **Old Testament** have a bearing on conversations about the shale gas and oil industry, including Genesis 3 (the taking of “forbidden fruit” and its consequences for humanity and Creation); Genesis 9:1-7 (God’s charge to humanity after the Flood); and Genesis 21:22-34 and 26:12-33 (community disputes over water rights). Some of the Ten Commandments (Exodus 20:1-17) also have application to issues surrounding shale gas and oil drilling, including the command to forego idolatry and honor God; honor the Sabbath (including the instruction in Leviticus 25:1-6 and 26:34-35 that the land should be given rest); and not to steal (applicable in all economic and natural resource issues). Questions raised might include: “In what way has shale gas and oil been advertised astheanswer to our energy and economic problems, and should we accept this campaign uncritically without considering its long-range impacts and potential for ecological damage?” And, “In what way has the fossil fuel industry taken on god-like status within our contemporary society?”

The prophetic tradition, too, can offer guidance regarding ethical questions surrounding economic and natural resources. Micah 6:8 urges us to “act justlyand to love mercy and to walk humblywith your God,” which provides a mandate for raising awareness about injustice, speaking truth to power, advocating for those most vulnerable within our society, and calling for repentance, justice and righteousness.

Jesus’ teachings in the **Gospels** and the writings of the **New Testament epistles**, while certainly not addressing the modern day practice of energy extraction, do provide a lens for us to approach the contemporary issue of shale gas and oil drilling. For example, Jesus’ injunction to care for “the least of these” (Matthew 25) has ramifications for impoverished rural families and communities, the health of the unborn, children, women and men, and the lives and health of all Earth’s living things – flora, fauna, and fish. One question the Church should ask is: Why has our current economic system allowed rural families and communities to fall into such financial instability that they would consider allowing an extraction process that carries so much risk?

New Testament teachings on wealth have implications for the economic boom cycle of shale gas and oil drilling. Paul writes to Timothy:

Of course, there is great gain in godliness combined with contentment; 7for we brought nothing into the world, so that we can take nothing out of it; 8but if we have food and clothing, we will be content with these. 9But those who want to be rich fall into temptation and are trapped by many senseless and harmful desires that plunge people into ruin and destruction.10For the love of money is a root of all kinds of evil, and in their eagerness to be rich some have wandered away from the faith and pierced themselves with many pains (1 Timothy 6:6-10).

By the same token, “You cannot serve God and wealth,” Jesus states in Matthew 6:24, a teaching that is found within a chapter that also addresses storing up perishable wealth (6:19-21) and worrying about physical needs (6:25-34). Should the Church raise questions about the lures of “easy money” that comes from the shale gas and oil boom? Might the Church raise concern about the ethics of individuals or corporations benefitting so handsomely while God’s Creation and others in society bear the costs?

Immediately following in chapter seven of Matthew, Jesus warns against hypocritically judging others (7:1-5), especially when one’s own faults are so clearly visible. Applied to the complexity of issues surrounding shale gas and oil extraction, those who would criticize must also be aware of their own complicity in the demand for inexpensive forms of energy. How should we heed Paul’s observations about resisting “the powers and principalities” (Ephesians 6:12), the unseen forces with more than human power to influence and tempt us in negative ways? In what ways can we confront political and societal institutions that foster injustice, recognizing the larger global corporate systems that have little accountability to any governmental oversight and hidden levels of control over wealth and information dispersal on a global level? The ELCA Social Statement “Caring for Creation” offers the following observation*:*

Alienated from God and from creation, and driven to make a name for ourselves (Genesis 11:4), we become captives to demonic powers and unjust institutions (Galatians 4:9; Ephesians 6:12; Revelation 13:1-4). In our captivity, we treat the earth as a boundless warehouse and allow the powerful to exploit its bounties to their own ends (Amos 5:6-15). Our sin and captivity lie at the roots of the current crisis (3)*.*

Another story from the Gospels that has interesting application to the process of hydraulic fracturing, particularly surrounding the question of water use, is the narrative about the Samaritan woman at the well in John 4:1-42. The Samaritan woman is an outcast, “the least of these,” without protection within a patriarchal system of domination. Jesus offers her “living water,” along with recognition of her personhood, dignity and reconnection with her community. Relating this story to the contemporary issue of shale gas and oil drilling, those who bear the brunt of suffering from hydraulic fracturing are often women who struggle to care for their families when their water has been compromised by the hydraulic fracturing process. As evidenced by the growing number of complaints filed and cases of water contamination, the concern is that families are offered little to no protection within the current system of governance and corporate decision-making. How can the Church offer “living water” to those who are suffering, along with recognition of their rights, dignity, and restoration of their health and community? At the same time, how can we protect the actual living water of Creation from the processes of hydraulic fracturing and human error or deliberate violation?

**Lutheran theology** also adds to our ethical lens for interpreting the contemporary situation of shale gas and oil drilling. Martin Luther insisted that **sin and captivity** (manifest today in threats to the environment and human community), are not the last word. God addresses our predicament with gifts of “forgiveness of sins, life, and salvation” (*Small Catechism*). By the cross and resurrection of Jesus Christ, God frees us from our sin and captivity, and empowers us to be loving servants to creation.

Luther’s teaching on the **sacraments** (*Large Catechism,* Fourth and Fifth Parts*)* reminds us how important it is to preserve the sanctity of those elements of Creation, God’s Word made visible in water, bread and wine that are essential for Holy Baptism and Holy Communion. As Lutheran Christians, we are called to take this reality into consideration when addressing the complexities of any human energy extraction process that affects those basic elements.

In addition, Luther’s teaching on **law** gives us a basis for understanding how it can be applied in the modern process of shale gas and oil extraction and related industries. The *Formula of Concord* states:

The law has been given to people for three reasons: first, that through it external discipline may be maintained against the unruly and the disobedient; second, that people may be led through it to a recognition of their sins; third, after they have been reborn—since nevertheless the flesh still clings to them—that precisely because of the flesh they may have a sure guide, according to which they can orient and conduct their entire life (*Formula of Concord,* VI, “Concerning the Third Use of the Law,” edited by Robert Kolb and Timothy J. Wengert, Minneapolis: Fortress Press, p. 502).

The law, then, could be said to provide for justice in relationships that leads to “honoring the integrity of creation, and striving for fairness within the human family” (*Caring for Creation,* 6*).*

With this in mind, we can invoke this teaching on the law to 1) call for all entities—individual, corporate, governmental, and community—to restrain against those practices and human laws that bring harm to God’s Creation and the human community; 2) hold a mirror up to our own economic and material concupiscence and the reality of the ways in which we (individually and communally) are “curved in upon ourselves,” thinking only of our desire for energy that harms environmental and human health, and accumulation of wealth and comfort at the expense of others and God’s Creation; and 3) guide us to make decisions within a robust context of moral deliberation about how we are to live, heat our homes, transport ourselves and our goods, and power our energy needs.

**PART FOUR: RESOURCES FOR DISCUSSING SHALE GAS AND OIL DRILLING**

RECOMMENDED BY THE HYDRAULIC FRACTURING TASK FORCE

OF THE UPPER SUSQUEHANNA SYNOD OF THE

EVANGELICAL LUTHERAN CHURCH OF AMERICA

To the 2014 Synod Assembly

There is a maze of websites about hydraulic fracturing and the issues surrounding it. While the task force has worked to provide helpful and multifaceted information, we recognize that not every resource listed here is unbiased. The websites listed below are some that the task force feels can be helpful for individuals and congregations to understand horizontal hydraulic fracturing for natural gas and oil. As new information is presented, websites update or change. Scientific studies in the area of hydraulic fracturing are young. The Environmental Protection Agency’s study of hydraulic fracturing for oil and gas and its potential impact on drinking water resources is due later this year (<http://www2.epa.gov/hfstudy>). University resources such as Penn State, Duke, and West Virginia can also be helpful as sources for additional information. We encourage each individual and entity utilizing this listing to be mindful of any inherent bias they may discern as these resources are researched and utilized.

**GENERAL INFORMATION**

**\*Highly recommended by task force:** “Shallionaires,” 60 Minutes, CBS News (Overview of shale gas drilling pros and cons). (13 minutes) Available on Youtube: <http://www.youtube.com/watch?v=Vr6b-WzIcyo>

Wikipedia articles:

<http://en.wikipedia.org/wiki/Hydraulic_fracturing>

<http://en.wikipedia.org/wiki/Marcellus_Formation>

Fractracker (exploring data, sharing perspectives, and mapping impacts of the oil and gas industry): <http://www.fractracker.org/>

“Marcellus Shale: A Citizen’s View,” Citizens Marcellus Shale Commission, October 2011, Print. <http://pennbpc.org/sites/pennbpc.org/files/CMSC-Final-Report.pdf>

The Institute for Public Policy and Economic Development: <http://www.institutepa.org/MarcellusShale.html>

“Extracting the Facts: An Investor Guide to Disclosing Risks from Hydraulic Fracturing Operations,” Interfaith Center on Corporate Responsibility, Investor Environmental Health Network, Richard Liroff, principal author; Print. <http://iehn.org/documents/frackguidance.pdf>

Department of Environmental Protection:

 General: <http://www.depweb.state.pa.us/portal/server.pt/community/oil_and_gas/6003>

Any laws having to do with the industry: [www.depweb.state.pa.us](http://www.depweb.state.pa.us/)

Citizen’s Guide to Marcellus Drilling in Pennsylvania (Prepared by the National Sea Grant Law Center and the Pennsylvania Sea Grant): <https://docs.google.com/a/ltsp.edu/viewer?a=v&q=cache:k-aiTA1G-AcJ:www.mde.state.md.us/programs/Land/mining/marcellus/Documents/marcellus_citizens_guide.pdf+animations+of+fracturing+of+marcellus+shale+in+pa&hl=en&gl=us&pid=bl&srcid=ADGEEShgtnUBnUN4W6Ly61fT6QOBxviwTtoLrXiOunYbGiUV5m5YP7nQ5XPT3-PgzcuVORAntrO7hL5TVlvEprQHgoD2gnTMepFEyqSZP1iep5IgeLGJTfKXfbZ7nfcueGnEYrBJV3JF&sig=AHIEtbSxux9E9Sc0U5jAVccft1h-DjQs_g>

*New Solutions: A Journal of Environmental and Occupational Health Policy*, Volume 23, No. 1 (2013): Scientific, Economic, Social, Environmental, and Health Policy Concerns Related to Shale Gas Extraction: <http://www.newsolutionsjournal.com/index.php/newsolutionsournal/issue/view/19>

“Marcellus Shale Development and the Susquehanna River: An Exploratory Analysis of Cross-Sector Attitudes on Natural Gas Hydraulic Fracturing,” Mark A. Heuer and Zui Chih Lee, *Organization and Environment*, January 23, 2014; <http://oae.sagepub.com/content/early/2014/01/22/1086026613520510>

**Glossary of Terms:** <http://www.newsworks.org/index.php/local//healthscience/6068-the-shale-game-natural-gas-glossary>

**Current news:** <http://stateimpact.npr.org/pennsylvania/tag/fracking/>

<http://www.portal.state.pa.us/portal/server.pt/community/marcellus_shale/20296>

**CHURCHWIDE, BIBLICAL, THEOLOGICAL AND INTERFAITH RESOURCES**

ELCA (includes different perspectives): <http://blogs.elca.org/advocacy/care-for-creation/pennsylvania-lutherans-talk-about-fracking-23>

Lutheran Advocacy Ministry of Pennsylvania (LAMPa): <http://lutheranadvocacypa.org/marcellus-shale-resources/>

Pennsylvania Council of Churches Resolution on Marcellus Shale Natural Gas Extraction: Moratorium on New Well Development:<http://www.pachurchesadvocacy.org/index_files/web_attachments/Marcellus%20Shale%20Moratorium%20Resolution%202012.pdf>

Interfaith Power and Light: <http://www.interfaithpowerandlight.org/public-policy/>

Pennsylvania Interfaith Power and Light: <http://www.paipl.us/2012/09/17/shale-drilling/>

Video on interfaith perspectives (10 minutes): “On Faith and Fracking” <http://www.onfaithandfracking.com/>

**ECONOMICS AND JOBS**

Industry focused but general info on multiple topics: <http://themarcellusshale.com>

Pennsylvania Independent Oil and Gas Association (industry-sponsored with multiple areas of coverage): [www.pioga.org/education/pa-oil-and-gas/](http://www.pioga.org/education/pa-oil-and-gas/)

Marcellus Coalition (industry-sponsored): <http://marcelluscoalition.org/>

Energy In Depth (industry-sponsored): <http://energyindepth.org/>

Shale Training and Education Center: [www.shaletec.org](http://www.shaletec.org/)

Job postings: <http://www.indeed.com/q-Marcellus-Shale-l-Pennsylvania-jobs.html>

Pennsylvania Department of Community and Economic Development (Articles that encourage the future of lower energy costs, jobs, community enhancements, and business opportunities in Pennsylvania.): <http://www.newpa.com/>

**ENVIRONMENTAL IMPACTS**

Wikipedia on environmental impacts:<http://en.wikipedia.org/wiki/Environmental_impact_of_hydraulic_fracturing>

Penn Environment: <http://www.pennenvironment.org/programs/pae/keep-pennsylvania-safe-drilling>

Sierra Club: <http://content.sierraclub.org/naturalgas/>

<http://pennsylvania.sierraclub.org/PA_Chapter_2008/Conservation/Energy/MarcellusDrillingResourcePage.htm>

Protecting Our Waters: <http://protectingourwaters.wordpress.com/>

Shale Justice Coalition: <http://shalejustice.org/>

Duke University: <http://sites.nicholas.duke.edu/avnervengosh/duke-study-on-shale-gas-and-fracking/>

**GOVERNMENT**

Tracking contributions from natural gas companies to elected officials (a project of Common Cause and the Conservation Voters of Pennsylvania): <http://www.marcellusmoney.org/>

<http://www.commoncause.org/atf/cf/%7Bfb3c17e2-cdd1-4df6-92be-bd4429893665%7D/DEEP%20DRILLING%20DEEP%20POCKETS%20NOV%202011.PDF>

**LANDOWNER RESOURCE:**

*(Landowners are urged to contact a knowledgeable lawyer in addition to utilizing these resources.)*

“A Landowner’s Guide to Leasing Land in Pennsylvania”: <http://pubs.cas.psu.edu/FreePubs/pdfs/ua448.pdf>

“Natural Gas Pipeline Right-of-Ways: Understanding Landowner Rights and Options”: <http://extension.psu.edu/naturalgas/news/2010/04/pipelineinfo>

**PUBLIC HEALTH AND SAFETY**

Guthrie Health and Geisinger collaboration on Marcellus Shale research effort: <http://www.guthrie.org/press-releases/guthrie-health-and-geisinger-collaborate-marcellus-shale-research-effort>

Bamberger, Michelle, Oswald, Robert E., “Impacts of Gas Drilling on Human and Animal Health,” *New Solutions*, Vol. 22 (1) 51-77, 2012. <http://www.psehealthyenergy.org/data/Bamberger_Oswald_NS22_in_press.pdf>

“Potential Health Impacts of Natural Gas Extraction Using High Volume, Slickwater Hydraulic Fracturing from Long Laterals,” Jerome A. Paulson, MD, FAAP, Associate Professor of Pediatrics and Public Health, George Washington University, Medical Director for National and Global Affairs, child Health Advocacy Institute and Director, Mid-Atlantic Center for Children’s Health and the Environment, Children’s National Medical Center. <http://www.childrensnational.org/files/PDF/MACCHE/PAAAP-Secure.pdf>

List of approximately 28 researched and peer-reviewed studies: <http://nodrilling.wordpress.com/fracking/fracking-research-peer-reviewed-published-studies-independent-expert-opinions/>

Issues faced by gas workers: <http://www.avvo.com/legal-guides/ugc/issues-faced-by-injured-marcellus-shale-gas-workers>

 “List of the Harmed”: <http://www.damascuscitizensforsustainability.org/2012/05/list-of-the-harmed/>

1. [↑](#endnote-ref-1)