

Ms. McDonough,

I appreciate you passing on the article. However, there is no information regarding our concerns of the health and safety of children near unconventional natural gas extraction activities.

The Mars Parent Group is made up of many folks with very different ideas and thoughts and what binds us together as a group is our concern for the health and safety of our children. This has been our message from the beginning and continues. Our viewpoints have not been clouded by politics, economics, or by our job. We are an intelligent and thoughtful group capable of reasoning through data to understand the implications. All our requests are reasonable. They may require extra money in the way of technology and training on industry's part but that is the cost of doing business so close to where people go to school, play, work, and live.

Here are the facts from a community's perspective:

- Children are more susceptible to environmental hazards than adults as documented by the American Lung Association <http://www.stateoftheair.org/2013/health-risks/health-risks-children.html>
- Unconventional natural gas extraction creates hazardous air pollutants (HAP) like the BTEX group. http://www.epa.gov/oaqps001/community/details/oil-gas_addl_info.html#activity1
- It is already proven that these hazardous air pollutants adversely affect health. <http://toxnet.nlm.nih.gov/http://www.epa.gov/iris/>
- Current air monitoring techniques use averages that make elevated readings appear within acceptable range. For example, if there is an elevated spike of Benzene, the current monitoring technology will capture that reading and average it out over a 24 hour period (or longer) and make the reading appear to be within limits. Smoothing out the spike. That does not mean the spike of Benzene did not affect a person's health who breathed it into their lungs. Repeating that damage 2 weeks later compounds the health effect and the cellular change is permanent. This is what leads to temporary health effects today and latent health effects to be expressed in the future. A latency of 10–40 years between first exposure and diagnosis is commonly anticipated. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3083662/>
I'm sure you are familiar with the preliminary findings of OSHA/NIOSH and Benzene at the work site. <http://blogs.cdc.gov/niosh-science-blog/2014/08/21/flowback-2/> The reality is that hazardous air pollutants don't know boundaries of the well pad.
- Current air monitoring techniques do not account for the way that individual hazardous air pollutants act together. For example, current guidelines have a threshold for Benzene and a separate threshold for Toluene. When both are present at the same time, there is a synergistic effect and the cellular damage is exponentially greater. The combined effect of the substances acting together is greater than the sum of the effects of the substances acting by themselves. Benzene is linked to childhood leukemia and there is already evidence that all exposures constitute some risk in a linear and additive fashion. Both benzene and toluene can affect the reproductive and central nervous systems.
- Air monitoring once per quarter will most likely not catch episodic hazardous air pollutant spikes that can affect people's health who live within a 2 mile radius.
- FLIR monitoring once per quarter will rarely catch fugitive emissions just as they are happening. This needs to be done daily.
- There is a large increase in truck traffic associated with unconventional gas extraction activities which means an increase in diesel particulate matter emissions. The drill rig uses diesel fuel and operates 24/7 which is a constant emitter of diesel particulate matter. All equipment running at the well pad uses diesel fuel that will create diesel particulate matter. The World Health Organization has classified diesel exhaust as a human carcinogen. <http://www.cancer.org/cancer/news/world-health-organization-says-diesel-exhaust-causes-cancer>

Switching over to natural gas engines would be a cleaner burning fuel with lower emissions and would certainly be worth promoting your own energy sector. While you are transitioning over to natural gas engines, the use of a diesel particulate filter reduces diesel particulate matter emissions. These filters work best when using ultra low sulfur diesel fuel. <http://www.epa.gov/cleandiesel/technologies/retrofits.htm>

- Real-time monitoring 24 hours a day with alarms is the only way to catch periodic spikes. This technology should be used at well pads where once you see a trend rising, the operator can remediate the problem before there are fugitive emissions to the point that it does health damage to nearby workers/residents. Thus, eliminating emission spikes. Having this information fed to a community accessed web page in real time would help to establish a level of trust from the community.

In summary, our question is, "What impact does the process of unconventional natural gas extraction activities have on children's health and safety?" You had written in a previous e-mail correspondence that Rex Energy will be hydraulic fracturing for at least the next ten years in our area. That is a long time of exposure for our children. Air monitoring once a quarter and FLIR monitoring once a quarter is not protecting children's health. Only by participating in a 3rd party unbiased study involving 24/7 Real-Time air monitoring from start to finish can you gather enough information to begin to understand the impact unconventional natural gas extraction activities have on the health of our children. Real-Time fence line air quality monitoring technology with community access web based real-time data already exists. An epidemiology study would also need to be conducted.

Before ever bringing unconventional natural gas extraction close to where people go to school, play, work, and live there should have been studies showing there are no harmful effects to people's health. The onus of proof lies on those who profit from the activity.

As you can see, I have received all my information from reputable neutral sources.

We have seen air monitors at the Geyer property and the DEP has stated they are not conducting baseline air monitoring. Is Rex Energy doing this?

Thank you,

Patrice Tomcik
Mars Parent Group