Excerpts from National Park Service, 2009, *Development of the Natural Gas Resources in the Marcellus Shale (New York, Pennsylvania, Virginia, West Virginia, Ohio, Tennessee, and Maryland)*
http://marcellus.psu.edu/resources/PDFs/marcellusshalereport09.pdf
All excerpts below actual quotes from document:

p. 4: Natural gas drilling and production is an industrial activity with a host of environmental consequences. Effects include water contamination related to drilling and disposal of drilling fluids, reductions in stream flow and ground water levels from operational water requirements, air quality degradation from internal combustion engines on drill rigs and trucks, excess dust from equipment transportation, impacts to terrestrial and aquatic wildlife, disruption of solitude, impacts to night skies, impacts to cultural resources, and safety concerns associated with the large number of trucks needed to support drilling operations (see Section VI., Truck Transportation Needs).

p. 8: Environmental issues associated with natural gas pipelines arise during siting, construction, operation, and maintenance of the lines. The greatest impacts associated with most pipelines typically occur during the construction phase, when vegetation is removed, a trench is dug, the pipe is laid, and the trench backfilled. However, during operation, numerous compressor stations will be necessary to move Marcellus gas from wells to gathering lines and eventually to large transmission lines. Emissions and noise from compressor stations are contentious issues in other shale developments. Pigging (internal pipeline cleaning) operations often generate waste water and liquid hydrocarbons, which must be captured and handled properly.

p. 9:
Air Quality

Air quality issues related to the development of the Marcellus Shale include emissions associated with drilling and pipeline compression operations. The main pollutant of concern is nitrogen oxides (NOx), which can combine with volatile organic compounds (VOCs) to create ozone. Ozone formation may not be an issue on a site-by-site basis but it can have significant impacts to the air quality of the region, especially rural areas that have not traditionally violated the national ozone air quality standards. There are numerous large stationary point sources in the eastern United States that emit ozone-forming pollutants. Accordingly, existing control strategies in this region of the country put emphasis on point sources. Current analyses to predict future attainment status for ozone may not adequately account for large increases in emissions from the natural gas sector of the Marcellus Shale region. The NPS will need to work with air regulatory agencies to address this issue through air quality planning in the future. For more information on ozone pollution and to learn what areas of the Marcellus Shale region have been designated as violating the national standard for ozone, please visit the Environmental Protection Agency (EPA) website: www.epa.gov/air/ozonepollution.

Another important aspect of natural gas development in regards to air quality is the emissions produced by truck transportation. As will be discussed in the next section, a

large number of trucks are needed to transport equipment, supplies and contaminated water to and from drilling sites. Emissions of concern from transportation include particulate matter (PM), NOx and VOCs. Depending on the number of trucks needed, such emissions could be significant and may contribute to violations of National Ambient Air Quality Standards for both PM and ozone. Such violations may have impacts to visitor health and ecological effects, including impacts to ozone-sensitive plant species that have been identified in this area of the country. To identify what areas are currently in violation for National Ambient Air Quality Standards for particulate matter, please visit the EPA website at http://www.epa.gov/oar/particlepollution.

There is also the potential for air quality issues related to hydrogen sulfide (H2S or "sour gas"). The U.S. Department of Energy has reported that H2S is not a problem for drilling operations in gas producing shale formations at this time. However, because gas development in the Marcellus Shale region is still in its early stages, it is unclear if such emissions may be an issue in the future.

p. 10: Oil and gas specialists in the Geologic Resources Division estimate that the "average" oil and gas well requires 320 to 1,365 truckloads of equipment to bring a well into production….

New Well Development

Drill Pad and Road Construction Equipment – 10 to 45 truckloads
Drilling Rig – 30 truckloads
Drilling Fluid and Materials – 25 to 50 truckloads
Drilling Equipment (casing, drill pipe, etc.) – 25 to 50 truckloads
Completion Rig – 15 truckloads
Completion Fluid and Materials – 10 to 20 truckloads
Completion Equipment (pipe, wellhead) – 5 truckloads
Fracture Stimulation Fluids and Materials – 100 to 1000 truckloads
Fracture Stimulation Equipment (pump trucks, tanks) – 100 to 150 truckloads
General Well Maintenance Every 3 to 5 years – 25 to 40 truckloads

Numerous truck-mounted pumps and temporary storage tanks are needed on location to fracture-treat wells. Larger well locations may be needed if hydraulic fracturing is part of a well completion procedure. Refracturing wells after 3 or 4 years has proven effective in the Barnett Shale of Texas. If this practice extends to the Marcellus Shale, then truck traffic will have few lulls.

See also NY Revised Draft SGEIS (http://www.dec.ny.gov/energy/75370.html) on impacts, with extensive projections on truck volume, noise, visual impacts, etc., although the SGEIS is critiqued extensively for not considering public health impacts or evaluating well failure and water contamination potential adequately (see http://catskillcitizens.org/learn_one.cfm?t=26&c=94 for resources and comments)