Health Issues

Gas emissions from wells, trucks, and equipment can impact health. But a detailed 2010 National Research Council Study indicates that air pollution associated with shale gas development will be far outweighed by the reduction of pollution associated with the conversion of coal to gas electricity generation. This report is summarized here, but briefly the report calculates that the U.S. health impact from life cycle use of coal (90% used in electricity generation) is $62 billion per year. The life cycle (non-climate) health impact of natural gas is 20 times less. Thus replacing gas for coal in electricity generation would save ~$59 billion in health damage per year.

A study of 9 old Michigan coal electrical plants (summarized here) provides a specific illustration. The 9 plants cost Michigan $1.5 billion and the U.S. (the pollution spills across state boundaries) $5.4 billion per year in extra health costs. In Michigan the plants cause 176 additional pre-mature deaths each year (660 in the U.S.), 76 additional cases of chronic bronchitis (280 in the U.S.), and 68,000 additional asthma exacerbations (250,000 in the U.S.). Against these numbers that the health impacts of the temporary air pollution associated with drilling, site preparation, and initial production of natural gas would appear to be very minor. The one study that exists in the peer-reviewed literature examining the impact of air emission from shale gas operations suggests benzene and ethylbenzene are the main contributors to cancer risk. It finds that levels of these pollutants are elevated near drilling operations, but only to about the levels that exist in urban areas of the U.S. (p 10 of report by Public Health England).

The City of Ft. Worth commissioned from the Eastern Research Group (ERG) to quantify health risk from hydrocarbon leakage related to Barnett gas production within city limits. The surveying and monitoring spanned 2 months. Eight sites were selected and monitored (1 background, one downwind of major highways, 2 in pre-production areas, 3 in high gas activity areas, and 1 in a medium production area. Forty weather and meterological stations near and in the city were used to define wind directions and carry out dispersion modeling. Point source emissions at 338 sites and at least 10% of the all the components at each site that could leak were also monitored. The conclusions: (1) no observed emissions during fracking or well drilling but some during well completion, (2) three fourths of emissions were associated with well pads, (3) extremely good repeatability of total leakage between first and second surveys at two sites, (4) strong leaks at some tank hatches, (5) most frequent leaks were at pneumatic valve controllers, and (6) no significant health threats were identified.

There have been at least some serious health impacts on humans and animals, however. Animal harm is related to their drinking spilled return brines. Humans appear to have been most seriously impacted from airborne chemicals (with As most suspected). The cases are few and the causes of the impacts not determined from what I have been able to find (see documentation here). Storage of water in containers with closed loop water handling would appear to eliminate these health risks, and industry is already doing this, at least in Pennsylvania.
Finally, when considering health economic impacts should not be forgotten. The BBC reported recently on a study published in the Journal of Psychology that showed the economic crisis led to an acceleration in suicides and estimated, for example, that the economic crisis led to 4,750 additional suicides in the U.S. and 7,950 more in Europe. Delaying resource prosperity may thus also have health impacts.