

Executive Summary

Background

Increased oil and gas development activity within Garfield County has generated concerns about potential public health impacts. The Colorado Department of Public Health and Environment (CDPHE) has been providing technical assistance to Garfield County Public Health (GCPH) since 2002 to assess these potential impacts. The findings of the 2007 and 2010 CDPHE health risk assessments of air toxics data suggested potential for cancer and noncancer acute and/or chronic health effects (CDPHE 2007, 2010). Based on the results and recommendations of these studies, GCPH has conducted enhanced air quality monitoring since 2008 by analyzing samples for 78 speciated non-methane organic compounds (SNMOCs) and 12 carbonyls, increasing the frequency of sampling to a weekly or bi-weekly basis, and focusing on 4 of the original 14 monitoring sites of 2007. The findings of the ambient air quality monitoring studies from 2008 to 2012 indicated that some of the primary chemicals (e.g., light alkanes, benzene, toluene, ethylbenzene, and xylene) associated with petroleum and natural gas emission sources were higher in rural Garfield County than in other urban areas (e.g., Grand Junction) outside the County. However, no compounds at any of the Garfield County monitoring sites have shown consistent increases since monitoring began in 2008. As per GCPH reports, the 2011 and 2012 air quality monitoring studies indicated consistently decreasing concentrations of many compounds at some monitoring sites since 2008.

Purpose

The GCPH requested that the CDPHE evaluate the impact of a trend in decreasing concentrations of air toxics between 2008 and 2012 on health risk estimates. This evaluation will help better understand community risk in Garfield County related to airborne exposures of measured air toxics such as SNMOCs and carbonyls.

The findings of this health risk assessment based on air monitoring data collected over a period of five years (2008 to 2012) will help guide risk management decision-making and future air monitoring by the GCPH. It is important to note that health risk assessments provide predictions of hypothetical health risks, which are intended as screening tools for risk managers and cannot be viewed as actual cases of health outcomes or cannot be used to make realistic predictions of biological effects resulting from air pollution. The information presented in this report uses screening-level risk estimates to focus attention on those compounds and chemical groups that are likely to present the greatest cancer and noncancer effects.

Approach

This report provides an overview of EPA's risk assessment approach, potential exposure scenarios, results, and conclusions regarding the potential for health effects, accounting for associated uncertainties where possible. Risks are determined using data collected by the GCPH during the 2008 to 2012 air quality monitoring studies. Two types of health effects are evaluated: 1) increased risk of cancer in a lifetime; and, 2) noncancer hazards

Table ES-1. Summary of Major Changes in the Estimated Chronic Risk Pattern from 2008 to 2012 at the Bell, Parachute and Rifle Monitoring Sites.

Cumulative Risk at Monitoring Sites	2008		2012	
	Chronic Health risk	Risk driving chemical groups (% contribution)	Chronic Health risk	Risk driving chemical groups (% contribution)
CANCER RISK ESTIMATES*				
BELL	351 in one million	- Carbonyls without acetone (29%) -SNMOCs without hydrocarbons (4%) -Hydrocarbons (67%)	166 in one million (2-fold decrease)	- Carbonyls without acetone (87%) - SNMOCs without hydrocarbons (6%) -Hydrocarbons (7%)
PARACHUTE	443 in one million	- Carbonyls without acetone (20%) - SNMOCs without hydrocarbons (6%) -Hydrocarbons (74%)	98 in one million (4.5 fold decrease)	-Carbonyls without acetone (70%) - SNMOCs without hydrocarbons (15%) -Hydrocarbons (15%)
RIFLE	178 in one million	- Carbonyls without acetone (74%) - SNMOCs without hydrocarbons (12%) --Hydrocarbons (14%)	125 in one million (1.4- fold decrease)	Carbonyls without acetone (77%) - SNMOCs without hydrocarbons (12%) -Hydrocarbons (11%)
NONCANCER HAZARD ESTIMATES (Hazard Index)**				
BELL	1.1	- Carbonyls without acetone (27%) - SNMOCs without hydrocarbons (18%) - Hydrocarbons (55%)	0.5 (2-fold decrease)	- Carbonyls without acetone (40%) - SNMOCs without hydrocarbons (40%) -Hydrocarbons (20%)
PARACHUTE	1.8	- Carbonyls without acetone (22%) - SNMOCs without hydrocarbons (33%) -Hydrocarbons (45%)	0.6 (3-fold decrease)	- Carbonyls without acetone (33%) - SNMOCs without hydrocarbons (50%) -Hydrocarbons (17%)
RIFLE	1.0	-Carbonyls without acetone(50%) - SNMOCs without hydrocarbons (40%) -Hydrocarbons (10%)	0.7 (1.4 fold decrease)	- Carbonyls without acetone (43%) - SNMOCs without hydrocarbons (43%) -Hydrocarbons (14%)

*EPA's acceptable cancer risk range is one to one-hundred in one million; ** EPA's acceptable noncancer health based benchmark or acceptable level is one.