Butte-Silver Bow Health Department

2012 Environmental Health Studies
Fact Sheet No. 6

Subject: Air Quality and Fine Particulate Studies

Discussion: In November 2008, the Montana Department of Environmental Quality (DEQ) began operating a unique set of air monitors at the Butte Greeley School site. These monitors are used to collect samples of fine particulate ($PM_{2.5}$) that are analyzed for many possible chemical components including organic carbon, elemental carbon, thirty-three (33) different trace elements, nitrate, sulfate, ammonium, sodium, potassium, and total $PM_{2.5}$ mass. Although the analysis of the samples from these monitors does not look at exactly the same components as the University of Montana's 2008 study (see Fact Sheet No. 5), the results from the 2011 data show that organic carbon continues to be the largest portion of the chemical makeup of the fine particles being measured. In total, the organic components, or smoke, are 62% of measured particulate matter. Figure 1 shows these results:

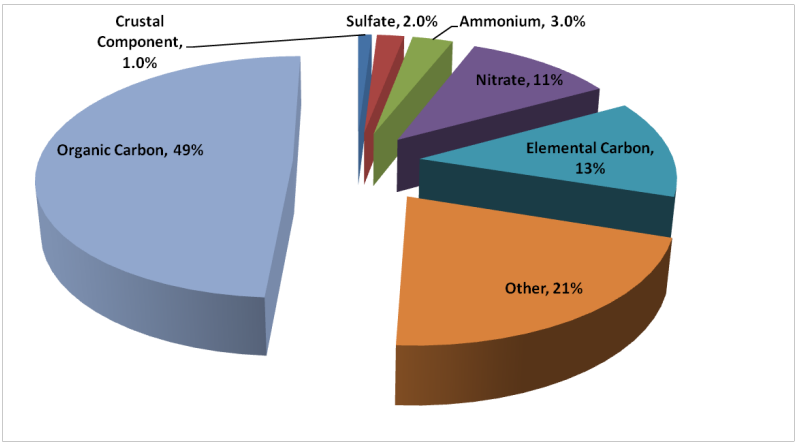

Figure 1. Makeup of Fine Particulate in Butte, 2011.

Together, the DEQ 2011 data and the results of the 2008 University of Montana study show that most of the higher concentrations of fine airborne particulate in the Butte area are due to wood burning during cold, stagnant days in winter.

Wind Direction and $PM_{2.5}$: When comparing the 2011 data from the air samplers at Greeley School with wind direction, the highest concentrations of fine particulate are most often measured when the air comes from the southeast. Figure 2 below shows that relationship. The center of the graph is on the Greeley School site located just southeast of the Berkeley Pit. The colored bars that extend from the center show how much PM2.5 is measured from each of the wind directions around Greeley School, where the darker red color represents the highest particulate contributions:

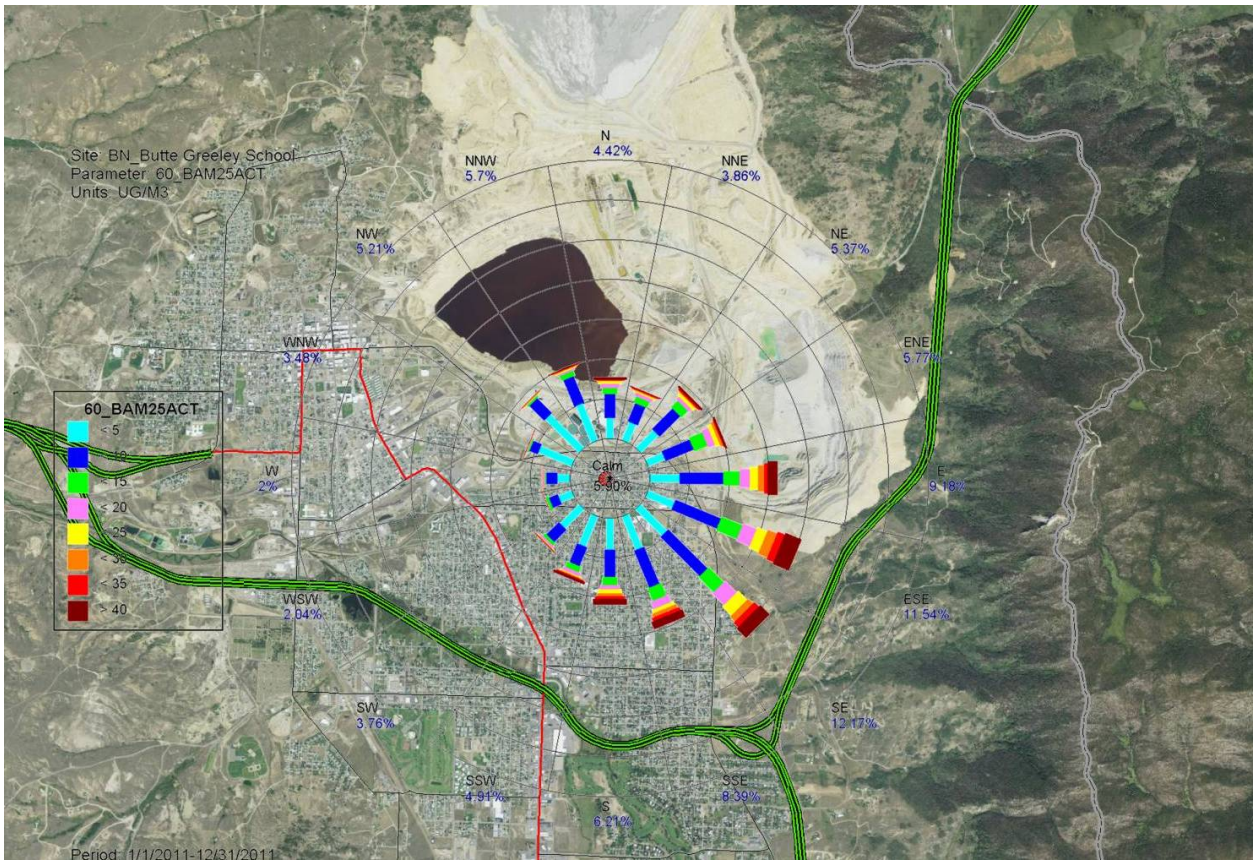

Figure 2. Wind Direction and $PM_{2.5}$ in Butte, 2011.

$PM_{2.5}$ and Wood Burning

To reduce winter-time fine particulate impacts that come from using residential wood stoves, the BSB Health Department has a solid fuel burning regulatory program, which includes a woodstove control program. In short, the program limits or shuts-down woodstove use during times of poor air quality, which usually occurs on cold stagnant winter days. Typically, the number of days that woodstove use will be limited is less than 10 during a given winter. BSB is also regulating new or remodeled installations of wood burning devices by requiring that any installations be EPA-certified devices.

Also, BSB has a new electronic sign located at the health department building, 301 Front Street, to let the public know when residential wood burning is restricted. BSB provides education and outreach opportunities to teach wood stove users of best burning practices and the importance of using cleaner, state-of-the-art, wood stove technologies to reduce health impacts in the community.

The DEQ plans to perform additional monitoring during the winter of 2012-2013 to help better understand the $PM_{2.5}$ in the Butte area.

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