Kennecott Utah Copper

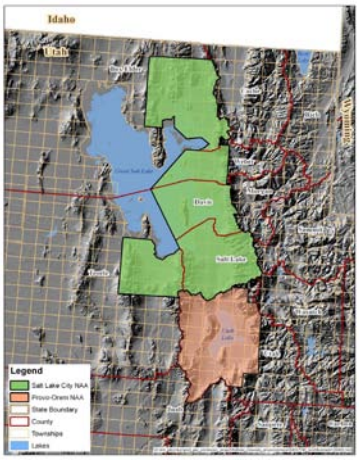
$PM_{2.5}$ airshed and emissions frequently asked questions

February 2012

1. **Why do some people incorrectly claim that Kennecott is responsible for 30% of pollution?**
   Though we don't know how the 30% figure was calculated, we can guess that they may have calculated Kennecott's emissions as 30% because $PM_{2.5}$ and precursor emissions were incorrectly added together. For example, Salt Lake County's $PM_{2.5} + NO_X + SO_2 = 41{,}072.13$ tons per year. Kennecott's emission of $PM_{2.5} + NO_X + SO_2 = 12{,}601.02$ tons per year, or approximately 30% of the total above. This methodology is incorrect because it does not include VOCs, defined as precursor to $PM_{2.5}$, and because the emissions from the remainder of the airshed (Davis, Weber, Box Elder, and Tooele Counties) are missing.

2. **What is an airshed?**
   An airshed is a part of the atmosphere that behaves in a consistent way with respect to the scattering of pollutants. The geographic extent of airsheds are pollutant specific because pollutants, such as $PM_{2.5}$ do not behave the same, even in the same general area. Thus, the airshed for each pollutant is based on the pollutant's ability to scatter, which is also affected by topography, meteorology, and climate.

3. **What is the $PM_{2.5}$ airshed?**
   The Environmental Protection Agency (EPA) has designated our $PM_{2.5}$ airshed as Salt Lake County, Davis County, and parts of Weber, Box Elder and Tooele Counties.



4. **How is total $PM_{2.5}$ determined?**
   $PM_{2.5}$ can be emitted directly from sources as particles or can be emitted as a precursor. Precursor emissions are those that are not particles originally but can turn into particles when they react in the atmosphere. Pollutants that can react to form $PM_{2.5}$ are SO_2, NO_X, and VOCs.

   Direct $PM_{2.5}$ + SO_2 +NO_X + VOC = Total $PM_{2.5}$ emissions

5. **What are the total $PM_{2.5}$ emissions?**
   The Utah Division of Air Quality (UDAQ) creates a statewide inventory of emissions every three years. The most recent statewide inventory is from 2008. The 2008 inventory can be viewed, by county, on the UDAQ website.

   The total $PM_{2.5}$ airshed emissions can be determined by adding together the total emissions, in the 2008 statewide inventory, for $PM_{2.5}$, SO_2, NO_X and VOC in Salt Lake County, Davis County, Weber County, Box Elder County, and Tooele County.

   Total airshed $PM_{2.5}$ emissions = 231,462.79 tons per year

	$PM_{2.5}$ (tpy)	SO_X (tpy)	NO_X (tpy)	VOC (tpy)	Total
SALT LAKE CO Total	3,756.61	6,314.71	31,000.81	41,860.55	82,932.68
DAVIS CO Total	1,071.01	1,048.28	8,173.28	17,566.33	27,858.90
WEBER CO Total	936.73	154.54	5,581.28	14,369.32	21,041.87
BOX ELDER CO Total	1,651.51	190.80	6,089.31	40,140.02	48,071.64
TOOELE CO Total	1,245.71	280.39	6,970.88	43,060.72	51,557.70
$PM_{2.5}$ AIRSHED Total	8,661.57	7,988.72	57,815.56	156,996.94	231,462.79

6. **What percentage of $PM_{2.5}$ emissions are from Kennecott?**
   In order to determine what percentage of $PM_{2.5}$ emissions are from Kennecott, emissions from all Kennecott facilities must be added together for $PM_{2.5}$, SO_2, NO_X and VOC.

	$PM_{2.5}$ (tpy)	SO_X (tpy)	NO_X (tpy)	VOC (tpy)	Total
Smelter and Refinery	149.52	970.08	154.25	8.66	1,282.51
Mine and Concentrator	737.65	2.79	4845.85	446.27	6,032.56
Power Plant, Lab, Tailings	38.9	3144.97	2555.18	14.72	5,753.77
Barney's Canyon	0.09	0.05	1.69	0.09	1.92
Total	926.16	4,117.89	7,556.97	469.74	13,070.70

Total emissions of $PM_{2.5}$ and precursors from Kennecott = 13,070.76 tons per year.

Since the total $PM_{2.5}$ airshed emissions = 231,462.79 tons per year, Kennecott's emissions of 13,070.76 tons per year, are equal to **5.65%** of the total emissions.