

# Special Toxics Study Scope of Work

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## Problem Description

Recently analyzed toxics data from the Bountiful and West Valley sites showed that several gaseous organic toxic compounds regularly exceed the public health risk thresholds. However, due to the fact that the West Valley monitor only operated for a two year period from 2000 to 2002, the spatial distribution of the toxic compounds could not be properly correlated with those from the current Bountiful monitoring site. The trends in the toxics data from the West Valley site were also found to be unreliable because of the age of the dataset. A new toxics study is proposed that would help to identify the distribution of toxics across Utah and Salt Lake Valley while providing insight into the seasonal variations in those pollutants for the two areas.

## Scope of Work

- The study will consist of three monitors spread across the Utah and Salt Lake valleys located in North Provo, West Valley City, and Bountiful. The monitors will collect concurrent samples on a one-in-three days basis for a year, yielding approximately 120 samples per monitor. This number of samples will be sufficiently large to estimate the spatial and seasonal variabilities in the ambient concentrations of HAPs within statistically significant limits. Additionally, a new West Valley monitoring site located in the proximity of the original one will allow the comparison of the gathered data with the dataset collected between 2000 and 2002. The new site will likely be established at the Air Monitoring Center (AMC) laboratory and storage facility. The Bountiful site already has an operational air toxics monitor that runs once every six days. Acquisition of two additional air toxics monitors and increasing the frequency of the Bountiful monitor to once every three days will be necessary to conduct the study. The expected length of the study will be one calendar year, during which 300 samples are expected to be collected.
- TO-11a, a method for the analysis of aldehydes and ketones will be used at each of the monitoring locations. The samples will be collected on a special cartridge supplied by the contracted laboratory. TO-15, a method for the analysis of VOCs will be used to identify the rest of the toxics. The samples will be collected using the evacuated stainless steel SUMA canisters provided by the same contracted laboratory.
- PM<sub>10</sub> filters will be collected at each of the sites. The collected particulate matter will be analyzed for hazardous metals: lead, cadmium, manganese,

arsenic, chromium, antimony, nickel, beryllium, cobalt and selenium. The PM<sub>10</sub> samples will be collected concurrently with the toxics VOC and aldehyde samples.

- The study will involve significant operator presence. The study monitors will be serviced by the DAQ staff (Roman Kuprov), as well as the interns. Their responsibility will include installing and gathering of the collection canisters and PM10 filters, initiating sampling protocols, performing flow audits, sample handling and storage. AMC staff will be responsible for the shipment of the collected samples and the reception of the fresh canisters.
- The bidding process to identify an appropriate laboratory that will conduct toxics sample analysis will begin in August 2014. The company that will be able to demonstrate the ability to accurately perform all of the necessary analyses at the lowest price will be awarded the contract.
- The data analysis will be conducted internally by DAQ as well as by the University of Utah, Department of Chemical Engineering.
- The collaboration between the Department of Chemical Engineering and the DAQ will include sharing, reviewing, and analyzing the collected data, the preparation of intermittent progress reports as well as of the final report. The Chemical Engineering representatives will work with DAQ to review and analyze the air toxics data. Specifically, they will look for:
  - Signature-like patterns in individual species concentrations and ratios of different compounds, which may help identify source types.
  - Associations between compounds and wind speed, wind direction and other meteorological variables.
  - Spatial and temporal concentration patterns at the three monitoring sites.
  - Comparison between current and historical data.
  - Develop selected maps of concentration, which will help explain the results to a more general audience.
  - Preparation of periodic and the final progress report

## Schedule of Costs and Deadlines

The following steps must be taken for the successful launch of the study.

Task	Expected Expense	Deadline
1. Receive bids for the TO-15 and	\$110,000	Sept 2014

TO-11a analysis from the interested laboratories.		
2. Set up the monitoring locations		Dec 2014
3. Identify and train the interns		Dec 2014
4. Primary Sampling Campaign		Jan 1 <sup>st</sup> , 2015
5. Analyze the monitoring data		Mar 2016
6. Final Report		May 2016

#### **Schedule of Deliverables**

Item	Cost (range)
Primary Sample Analysis	\$110,000
Interns	\$7,000
Shipping	\$3,600
UoU Collaboration & Analysis	\$10,000
Metals Analysis	\$14,400