APPENDIX F

RTI Laboratories, Inc
Laboratory-Specific SOP for Air Sample Collection

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ACRONYMS AND ABBREVIATIONS

%	percent
”	inches
H20	water
FID	flame ionization detector
FRA	flow restrictor assembly
L	liter
mL/min	milliliter per minute
O.D.	outside diameter
PID	photoionization detector
ppmv	parts per million by volume
SOP	standard operating procedure
VOC	volatile organic compound

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1. SAMPLE TRAIN PURGING

1.1 Soil gas sample collection requires purging to flush stagnant gas from the soil gas probe prior to collection of a sample for laboratory analysis, much the same as purging stagnant water from a well prior to collection of a groundwater sample.

1.2 Purging can be performed in a variety of different ways. Vacuum pumps, personal monitoring pumps and a Tedlar™ bag/lung box apparatus are some of the procedures used. If field testing is to be performed, it is important that the sampling be performed before it goes through any kind of pump other than a personal monitoring pump, to avoid contamination of the sample. 1-3 L at a purge rate of 200-2000 mL/min should be sufficient for purging the sample train.

2. STATIC PRESSURE MEASUREMENT

2.1 Prior to sampling, the static vacuum or pressure in the soil gas probe should be measured and recorded. This is analogous to measuring a static water level in a groundwater monitoring well. These data can be used to assess whether and to what extent pressure gradients might influence soil gas flow. Connect a vacuum gauge to the valve at the top of the soil gas probe using tubing provided with the vacuum gauge. Level and zero the gauge. Open the valve and record the average reading. It may be necessary to shield the vacuum gauge from any wind, which can cause the readings to fluctuate. Record the static pressure or vacuum, along with the date, time, temperature and weather conditions.

3. LEAK CHECKING

3.1 Perform a “shut-in” test, where the pump is used to exert a pressure or vacuum on the sampling train, then all valves are closed and the pressure or vacuum is observed over time to ensure it does not dissipate. A target vacuum or pressure level of 100 in-H20 is appropriate, to maximize the resolution of the observations, and the stress on the sample train.

4. FIELD SCREENING

4.1 Field screening of total VOC vapor concentrations is conducted during purging to verify stable readings before collection of soil gas samples for laboratory analysis. Stable

readings will typically be defined as reading that vary by less than 10% from previous readings and show no consistent trend in either increasing or decreasing concentrations.

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4.2 Samples of the extracted soil gas should be collected for field screening using a portable FID or PID after every purge volume removed (or 1 L if the purge volume is smaller). The FID or PID should be calibrated according to manufacturer's instructions to a span gas (i.e. isobutylene or hexane) of known concentration (typically 50 or 100 parts per million by volume [ppmv]) and to zero gas (in areas of poor outdoor air quality) or ambient outdoor air, immediately prior to use. The calibrations should be confirmed several times during the day to assess potential instrument drift. If the readings show more than 10% drift against the standard gas, or more than +/- 1 ppmv of zero gas or ambient air, the instrument should be recalibrated. The FID or PID reading will be made by connecting the Tedlar bag to the instrument and allowing the instrument to draw a sub-sample at ambient pressure (the bag must not be squeezed because this can cause a bias in the calibration). The time and the steady reading are recorded.

5. COLLECTION OF SAMPLES FOR LABORATORY ANALYSIS

5.1 Samples are collected in Bottle-Vac containers attached to a QT-connector and flow restrictor assembly (FRA). The tubing from the sampling site must be attached to the end of the FRA. To ensure the best seal, a 316-stainless steel union should be attached to the end of the FRA and seated with a ¼" Vespel/graphite or Teflon ferrule. This end of the union must be ¼" swagelok. If non-1/4" O.D. tubing is going to be attached, the other end of the union must be the size appropriate for the O.D. of the tubing that will be attached to it. The tubing should be attached with a Vespel/graphite or Teflon ferrule. See the figures at the end of this document for pictures of the sampling train.

5.2 Only after all of the connections are made, should the QT-connector be attached to the Bottle-Vac, as this is what initiates the sampling

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