STANDARD OPERATING PROCEDURE

***Instructions for Calibration and Use of an SKC® AirChek HV30 Environmental Air Sampler***

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**KEY WORDS**

Air Sampling, HV30 Pump, HV30 Air sampler

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## 1.0 INTRODUCTION

### 1.1 Purpose

This document provides specific instructions for the use of the SKC® AirChek HV30 Environmental Air Sampler for the collection and estimation of pesticide levels in ambient air.

### 1.2 Scope

This Standard Operating Procedure (SOP) describes the calibration and use of SKC® AirChek HV30 Environmental Air Samplers for collection of air samples.

## 2.0 MATERIALS

**2.1** SKC® AirChek HV30 Environmental Air Sampler

- 2.1.1 Thumb screws (2)
- 2.1.2 Mounting bracket
- 2.1.3 Media mounting rod (2 detachable pieces)
- 2.1.4 Air sampling media holder (for sampling with glass tube)
- 2.1.5 AC power cord
- 2.1.6 Flexible tubing stored in the lid or alternative tubing with appropriate connectors
- 2.1.7 Calibration screwdriver
- 2.1.8 Calibrated field rotameter

**2.2** Energy source: AC power or 12 volt battery
**2.3** Flow meter: i.e. DryCal® DC-Lite Primary Flowmeter or Bios Defender 530-H flow meter
**2.4** Sample tube or hand packed XAD-4 cartridge
**2.5** Chain of Custody Form
**2.6** Sealable polyethylene bag
**2.7** Dry ice and ice chest

## 3.0 PROCEDURES

### 3.1 General

The study methods and sampling procedures depend on the specific study objectives, which should be clearly stated in the study protocol. The chemical(s) being monitored will determine the sample media and tube type.

**3.2 Air Sampling Assembly**

3.2.1 Assembling the SKC® AirChek HV30 Environmental Air Sampler (For Use With Hand Packed Sample Tubes)

3.2.1.1 Loosen the thumb screws on the side of the case (Figure 2).

3.2.1.2 Orient the mounting bracket so the vertical side with the two keyholes is [on the left] immediately adjacent to the thumb screws and the horizontal bar with threaded hole is on top. Align the keyholes in the bracket with the tops of the thumb screws and push bracket toward the case. Once it fits flush to the case, gently press down until the threads of the thumb screws slide into the keyhole slots.

3.2.1.3 Tighten thumb screws.

3.2.1.4 Screw the two pieces of the mounting rod together (Figure 2). ***Note:*** *One section has a slightly longer threaded end. This section should be at the top end of the rod.*

3.2.1.5 Screw the threaded end of the rod into the threaded hole on top of the bracket (Figure 2).

3.2.1.6 Mount air sample tube holder on top of the rod.

3.2.1.7 Attach one end of tubing* to air inlet on the back side of case and other end of tubing to sample tube holder (Figure 3). Install sample tube as instructed on step 3.5.1.
(*stored in the lid or other available suitable tubing)

3.2.2 Assembling the SKC® AirChek HV30 Environmental Air Sampler (Only When Using Hand Packed Cartridges)

3.2.2.1 Attach one end of flexible tubing (available inside of the Sampler Housing) to air inlet on the back side of case (Figure 4).
***Note****: Sampler Housing refers to the large fiberglass container that houses the SKC® AirChek HV30 Environmental Air Sampler and other sampling equipment.*

3.2.2.2 Guide the other end of the flexible tubing underneath the Sampler Housing (Figure 4).

3.2.2.3 Pull tubing out leaving only the portion that is attached to the air inlet of the pump.

3.2.2.4 Using clamps, attach the tubing to the appropriate PVC pipe located on the outside of the housing container structure so that the end of the tubing is attached to top portion of the PVC pipe (Figure 5).

3.2.2.5 After the cartridge is properly installed as instructed on step 3.5.2, raise the PVC pipe until the small punch hole located on the bottom of the PVC pipe aligns with the small punch hole located on the interior of the PVC pipe.

3.2.2.6 Once both punch holes are aligned, insert the removable metal rod (located on top side the PVC pipe) into both punch holes to lock the PVC pipe into place.

## 3.3 Calibration

3.3.1 The SKC® AirChek HV30 Environmental Air Sampler's flow ranges from 10 to 30 liters per minute (lpm) free flow. The project leader will ultimately determine the appropriate flow rate of the sampler pump. To test the variations of media, sampler pump rate, and duration, a trapping efficiency test can be conducted (SOP FSAI003.00).

3.3.2 Attach the vinyl tubing to the DryCal® DC-Lite Primary Flowmeter, the Bios Defender 530-H Flowmeter or the rotameter, and the other end of the tubing to the top of the air sampling media.

3.3.3 Turn on the sampler after completing steps 3.3.3.1 or 3.3.3.2.

3.3.3.1 If using AC power, push the AC power switch on the side of the sampler to the ON position and the control board on/off switch on the sampler control panel to the up (on) position (Figure 1 and 3).

3.3.3.2 If using DC power, push the control board on/off switch on the sampler control panel to the up (on) position. ***Note:*** *The position of the AC power switch on the side of the sampler has no impact on DC operation.*

3.3.4 Use the provided screwdriver to turn the flow adjust screw on the sampler pump control panel clockwise to increase flow or counterclockwise to decrease flow until the flowmeter shows the desired flow rate (Figure 1).

3.3.4.1 Adjust the flow to within ±10 percent of the target flow rate specified in the study protocol.

3.3.4.2 If unable to achieve target rate, replace HV30 sampler with another.

3.3.5 Disconnect flowmeter from sample tube. Leave sampler pump running and record flow rate onto Chain of Custody Form (COC).

## 3.4 Sampler Location

3.4.1 Sample locations will be specific to the experimental plot and the study objective. However, at a minimum the following criteria must be met:

3.4.1.1 The sampler should be located in an area with no restriction of airflow. It should be positioned to avoid exposure to engine exhausts, running motors or other sources of non-target air contaminants that may interfere with sample collection and chemical analysis.

3.4.1.2 The sampler should be accessible to electrical outlets or a generator. If using a generator for a power source, make sure to place the sampler a sufficient distance away to avoid drawing exhaust fumes into sample container.

3.4.1.3 When conducting ambient monitoring in an area of multiple pesticide applications, the sampler inlet should be 2 to 15 meters above ground and at least 1 meter horizontal and vertical distance from supporting structure.

3.4.1.4 The sampler should be placed in an area where the equipment will be secured and access is available when necessary.

## 3.5 Sampling Methods

3.5.1 Glass sample tubes (described in SOP number FSAI001.01)

3.5.1.1 Remove corks from ends of sample tube. Place sample tube in sample tube holder.

3.5.1.2 Place the tubing from either the DryCal® DC-Lite Primary Flowmeter, the Bios Defender 530-H Flowmeter, or the provided rotameter over sample opening and turn sampler on.

3.5.1.3 Adjust flow to within ±10% of flow rate specified in the study protocol (see section 3.3).

3.5.1.4 Remove flowmeter or rotameter tubing from sample. Note the flow rate and starting time on COC.

3.5.1.5 At the end of the sampling period, place tubing from either the DryCal® Primary Flowmeter, the Bios Defender 530-H Flowmeter, or the rotameter over the sample opening and record the ending flow rate on the COC. Remove tubing from sample.

3.5.1.6 Turn sampler off. Remove sample tube and cap both ends with corks. Place sample tube into designated sealable polyethylene bag. Place bag on dry ice.

3.5.1.7 Record ending time and elapsed time reading on COC.

3.5.2 XAD-4 Hand Packed Cartridges

3.5.2.1 Unscrew cartridge end caps. Place black rubber O-ring over inlet port of cartridge, and attach sampler to the cartridge using the connector on the flexible tubing (Figure 6).

3.5.2.2 Turn the sampler pump on. Place either the DryCal® Primary Flowmeter, the Bios Defender 530-H Flowmeter, or the rotameter tubing over the intake end of the cartridge.

3.5.2.3 Adjust flow to within ±10% of desired flow specified in the study protocol. Remove flowmeter or rotameter. Record flow reading on COC.

3.5.2.4 At the end of the sampling period, place tubing from either the DryCal® Primary Flowmeter, the Bios Defender 530-H Flowmeter, or the rotameter over the intake end of the sample cartridge and record the ending flow rate on the COC. Remove tubing from sample.

3.5.2.5 Turn sampler pump off and record ending time and elapsed time reading on COC.

3.5.2.6 The cartridge should then be capped and immediately placed in a sealable polyethylene bag and placed on dry ice. Retain the o-ring in sampling supply box.

### 3.6 Troubleshooting

If the sampler pump does not run when turned on, check to see if the “Control Board On/Off switch” is in the “On” position. If it is and the sampler pump is not running, then replace the sampler. If the ending rotameter or flowmeter reading is more than ±20% from the starting flow rate, either recalibrate or replace the sampler with a pre-calibrated sampler available and take another sample.

## 4.0 REPORTING REQUIREMENTS

### 4.1 Chain of Custody

A chain of custody (caps above) (COC) form should be completed for each sample according to SOP ADMN006.01. The following information should be recorded on the COC.

4.1.1 Study number
4.1.2 Start and end date of sampling
4.1.3 Sample site name
4.1.4 Sample number
4.1.5 Sample location code
4.1.6 Sampler identification
4.1.7 Flow rate at beginning and ending of sample period
4.1.8 Exact start and end time of sampling
4.1.9 Exact run time for sampler
4.1.10 Sampling personnel

## 5.0 STUDY-SPECIFIC DECISIONS

The following study-specific decisions are the responsibility of the study project leader, and should be made in consultation with the study field coordinator, senior scientists, and Quality Assurance Officer.

5.0.1 Sampling location
5.0.2 Flow rate
5.0.3 Sampling frequency
5.0.4 Sampling interval duration
5.0.5 Sampling media

**Figure 1. SKC® AirChek HV30 Environmental Air Sampler Control Panel**

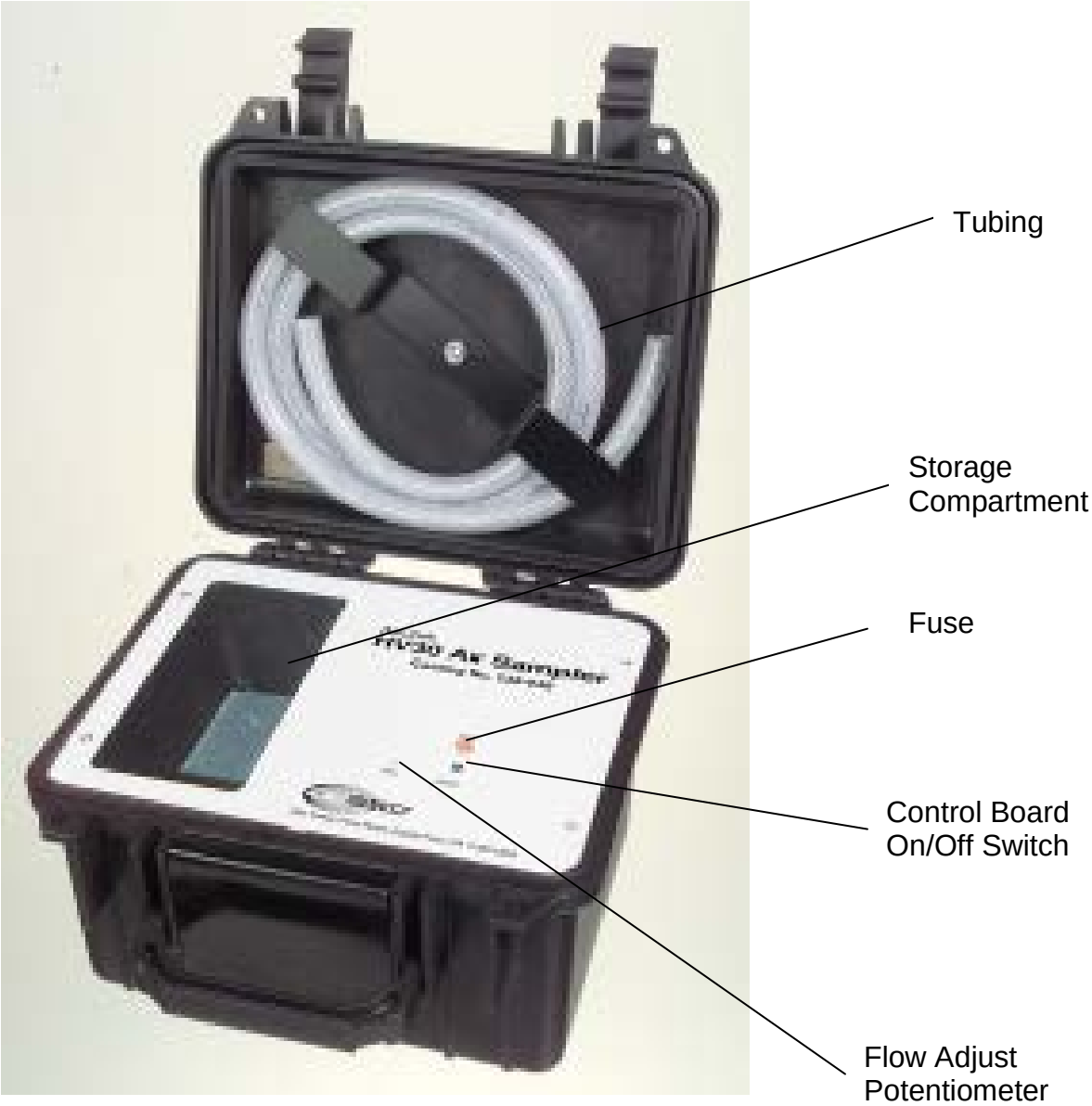

**Figure 2. SKC® AirChek HV30 Environmental Air Sampler with Media Mounting Rod Installed**

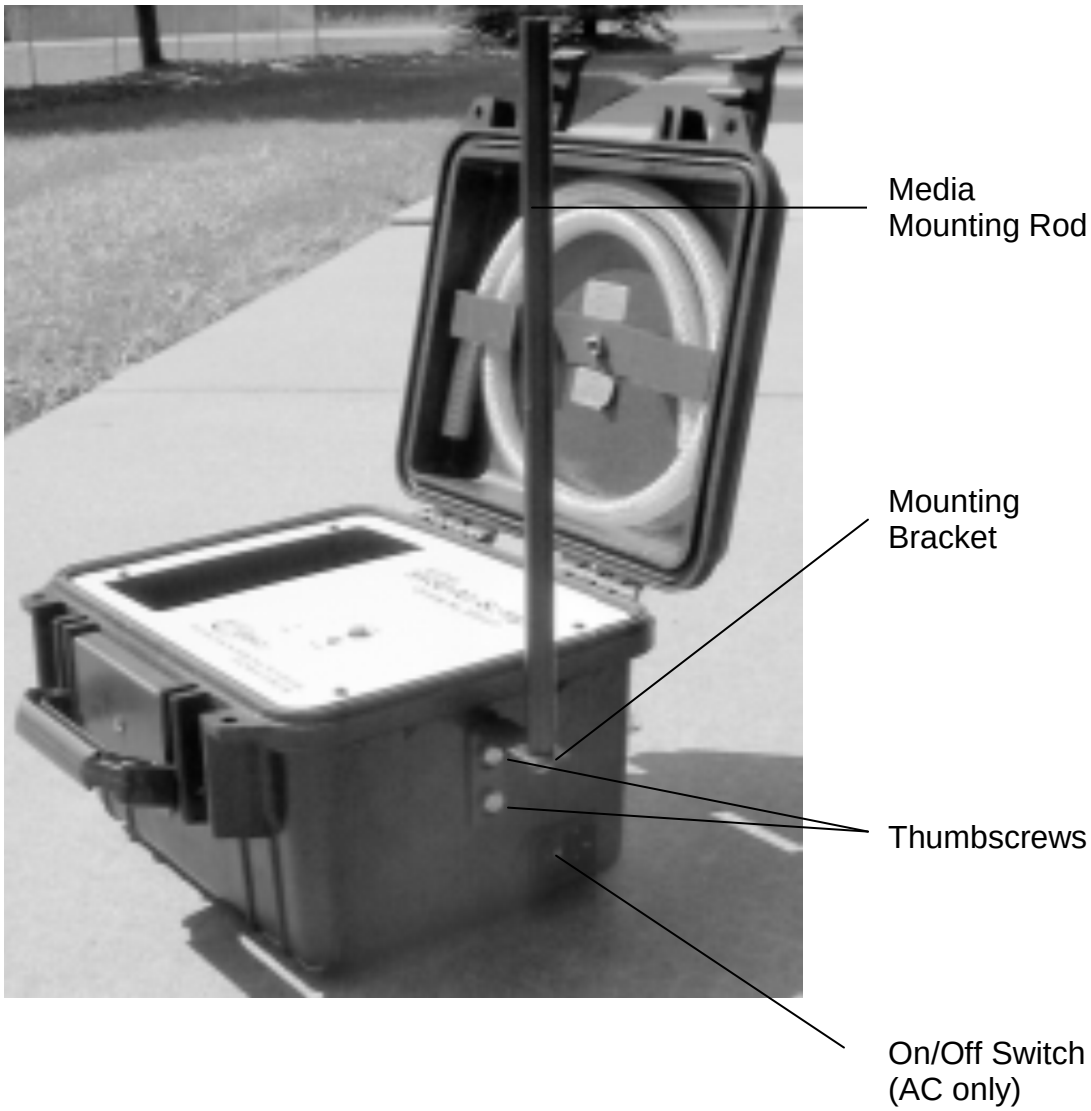

**Figure 3. SKC® AirChek HV30 Environmental Air Sampler Side and Back View**

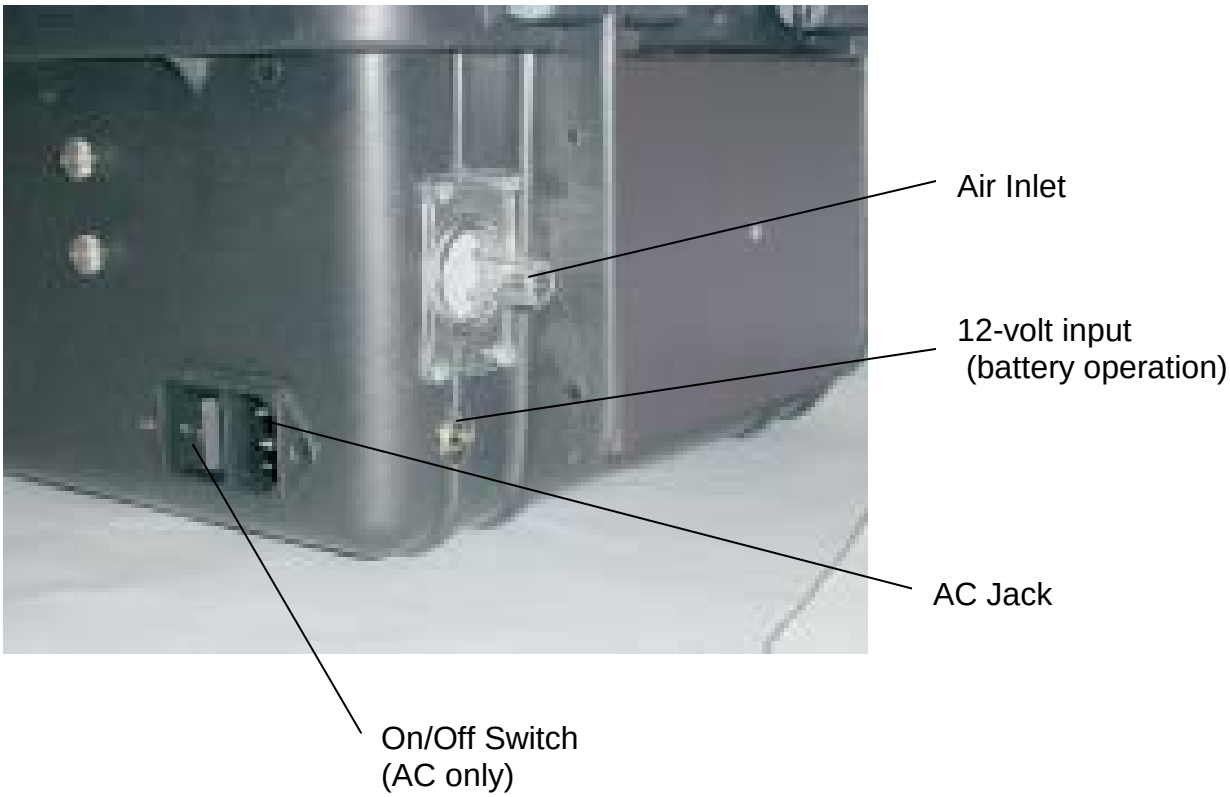

**Figure 4. SKC® AirChek HV30 Environmental Air Sampler Located Inside of Sampler Housing.**

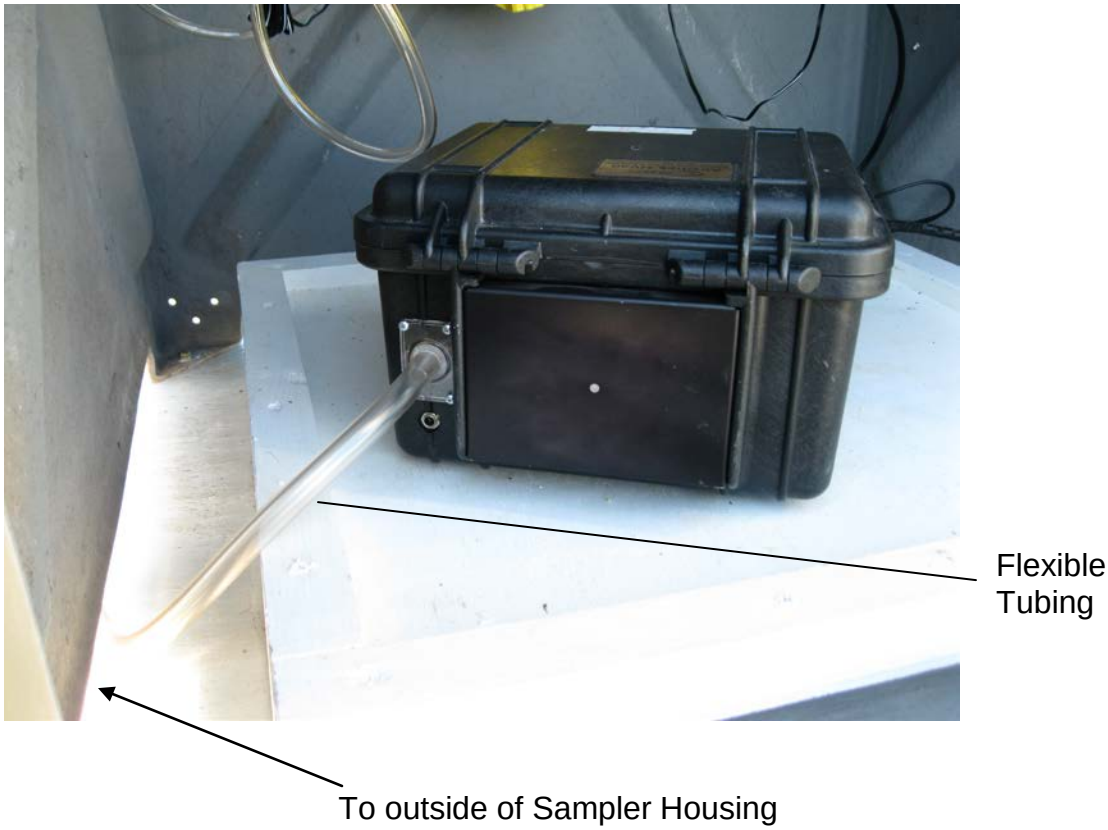

**Figure 5. Flexible Tubing Set-Up on the Sampler Housing Exterior.**

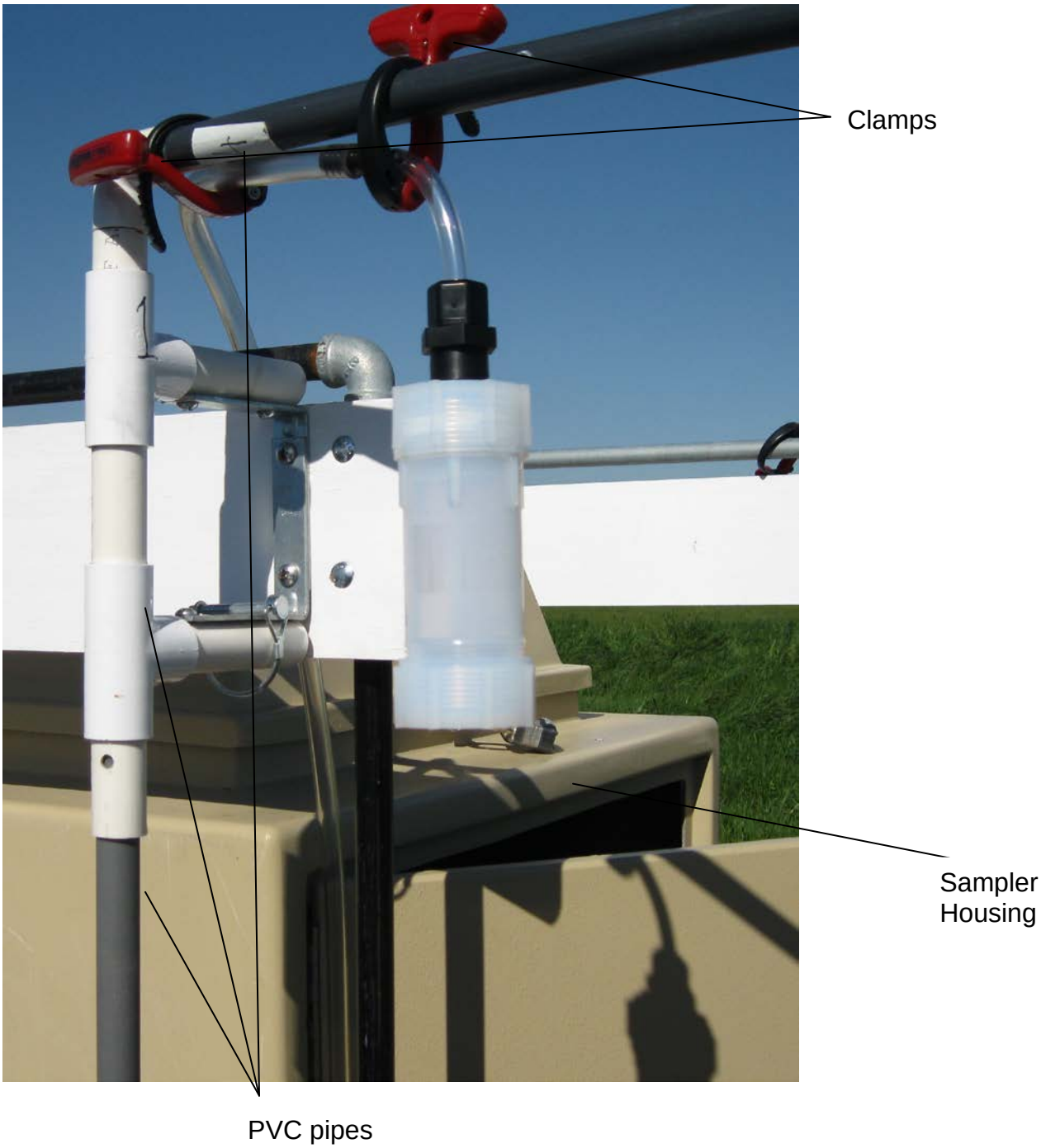
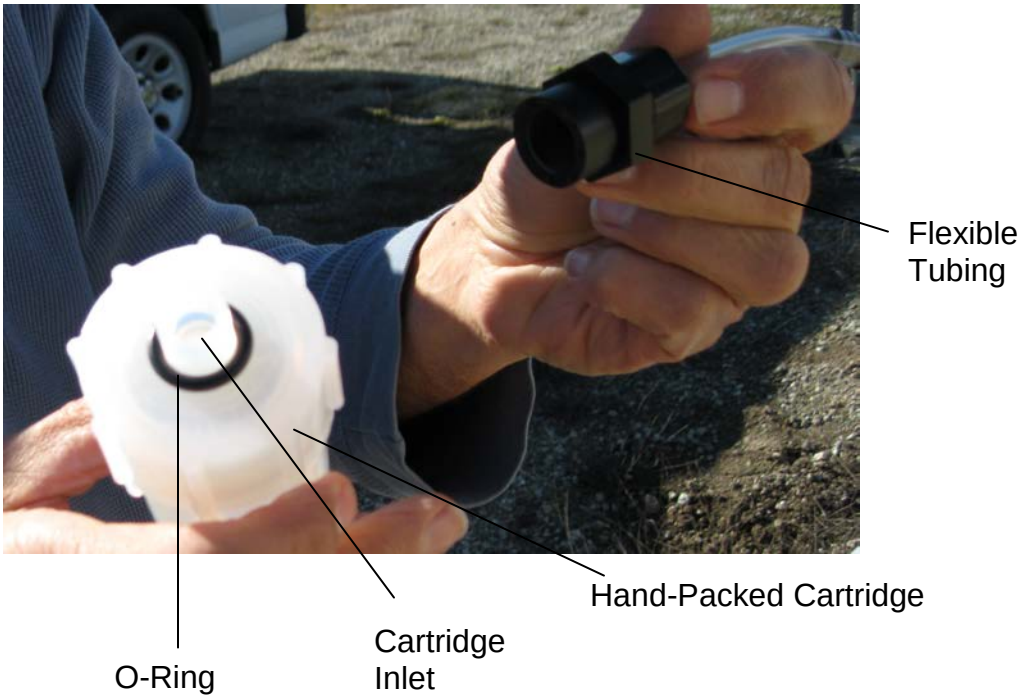
**Figure 6. O-ring Fitted Over the Inlet of a Hand-Packed Cartridge**