

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division	NUMBER IH75501
	REVISION SHSD Final rev0b
INDUSTRIAL HYGIENE GROUP Standard Operating Procedure: Field Procedure	DATE 01-17-02
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SUBJECT: INSTRUMENT OPERATION: Bacharach Sentinel 44 Gas Monitor	

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1.0 Purpose/Scope

This procedure provides a standardized method for operation for the Bacharach Sentinel 44 Gas Monitor. It provides a method for easy and accurate analysis of up to four atmospheric hazards, typically: Oxygen Deficiency, Combustible Gas, Carbon Monoxide, and Hydrogen Sulfide.

The Sentinel 44 should be used in conjunction with the IH procedure IH75180: *Atmospheric Testing Using Direct Reading Instruments*. The Sentinel 44 is meter often used in Confined Space testing and should be used in conjunction with the IH procedure IH99000 series SOPs that document confined space testing protocols.

2.0 Responsibilities

- 2.1 Personnel that perform exposure monitoring with this instrument are responsible to follow all steps in this procedure.
- 2.2 The data collected using this meter must have an appropriate evaluation of the hazard and risk by a skilled Industrial Hygiene professional.

3.0 Definitions

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- 3.1 *ACGIH TLV*: American Conference Of Governmental Industrial Hygienist, Threshold Limit Value. An occupational exposure limit set by the ACGIH. Can be either eight-hour time weighted average (TWA); 15 minute short-term exposure limit (STEL); or Ceiling (C).
- 3.2 *OSHA PEL*: Occupational Safety & Health Administration, Permissible Exposure Limit. An eight-hour TWA or 15-minute TWA occupational exposure limit, or Immediate Dangerous to Life and Health (IDLH) level.
- 3.3 *Interferences*: chemicals that can cause the meter to give a false response. Example, hydrogen gas causes the carbon monoxide sensor to indicate the presence of CO even when none is present.

4.0 Prerequisites

4.1 **Training prior to using this meter:**

- 4.1.1 HAZCOM or Lab Standard.
- 4.1.2 Other appropriate training for the area to be entered (check with ESH coordinator or FS Representative for the facility).
- 4.1.3 Note: If meter is to be used for confined space purposes, Confined Space Entry training and OJT Monitoring Confined Space Atmospheres using direct reading instruments qualification is required.

4.2 **Qualification Criteria:** The use of the Sentinel 44 is limited to persons who have demonstrated competency, as determined by satisfactorily use the procedures and the associated meter, to the satisfaction of their supervision or existing qualification criteria set by their organization. Submit records of SHSD personnel who have passed the competency test listed in Attachment 8.5 to the Office of Training and Qualification for retention. If significant and substantive changes to the procedure are made, *Qualified Samplers* will be notified of the changes.

4.3 **Area Access:**

- 4.3.1 Contact the appropriate Facility Support Representative or Technician to obtain approval to enter radiological areas.
- 4.3.2 Verify with the appropriate Facility Support Representative or Technician if a Work Permit or Radiological Permit is needed or is in effect. If so, review and sign the permit.

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5.0 Precautions

5.1 Hazard Determination:

- 5.1.1 The operation of this meter does not cause exposure to any chemical, physical, or radiological hazards. The meter design does not cause significant ergonomic concerns in routine use. The meter does not generate Hazardous Waste.
- 5.1.2 By its very nature as a toxic gas monitor, this meter may be used in areas where atmospheric hazards are known or suspected to be present. Inhalation of toxic gases or oxygen deficient atmospheres can have significant health consequences. The meter readings must be observed continuously when entering areas of potential hazards and the user should leave the area if the OSHA PEL or ACGIH TLV levels are exceeded, if 10% LEL is exceeded, or the meter alarms or meter indicates flooding which indicates that an explosive concentration may have been reached.
- 5.1.3 There may be significant chemical or radiological hazards in areas where this meter is used. These hazards must receive a hazard evaluation by a cognizant ESH professional.
- 5.1.4 Sensitivity of combustible sensors may be inhibited by certain compounds called poisons. Tetraethyl lead, and silicone are the most critical. Sensors should not be exposed to aerosol sprays, polishes, waxes or lubricants containing silicones or lead.
- 5.1.5 Interferences (chemicals that can cause the meter to give a false response):
Known interferences are:
 - 5.1.5.1 Hydrogen may cause false positives on the CO sensor.
 - 5.1.5.2 Tetraethyl lead causes false negatives (poison the sensor) on the Combustible Gas (LEL) sensor.
 - 5.1.5.3 Silicone compounds (from polishes, waxes, and lubricants) may cause false negatives (poison the sensor) on the Combustible Gas (LEL) sensor.
 - 5.1.5.4 Ethyl Alcohol may cause false positives on the Oxygen sensor.
- 5.1.6 When the warning “EEPROM FAILURE” appears. The alarm points aren’t properly stored in memory, and the instrument is unsafe to operate. Do not operate until alarm points are properly set.

- 5.2 **Personal Protective Equipment (PPE):** The use of this meter typically does not require PPE. The following considerations may be necessary based on hazards of an area:

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- 5.2.1 **Hand:** Use of this meter in areas of known or suspected surface contamination requires the use of disposable gloves. Exam-style, splash gloves are acceptable in: Nitrile, Neoprene, PVC, Butyl, Natural Rubber, Viton, and PEVAL (SilverShield®).
- 5.2.2 **Body:** If contact of the body with contaminated surfaces is anticipated, a disposable suit should be used. Acceptable CPC materials include: Tyvek®, KleenGuard®, and cotton. Disposable garments must be discarded as waste if contact with contamination has occurred. If personal clothing items become contaminated, they must be surrendered for BNL cleaning or disposal.
- 5.2.3 **Foot:** If contact of the feet with contaminated surfaces is anticipated, disposable shoe coverings, boots or booties should be used. Acceptable CPC material include: Tyvek®, KleenGuard®, and vinyl, and rubber. If personal shoes become contaminated, they must be surrendered for BNL cleaning or disposal.
- 5.2.4 **Respiratory:** If airborne levels of hazards exceed the OSHA PEL or ACGIH TLV, respirators are required. A respirator complying with BNL's Respiratory Protection Selection and Issuance SOPs must be used.
- 5.2.5 **Eye:** Safety Glasses with side shields are required in laboratories, general industry areas, and construction areas.

5.3 Instrument protection: The Sentinel 44 is intended for vapor use only. DO NOT allow the probe or the meter to come in contact with liquids, dust or other foreign material.

6.0 Procedure

6.1 **Equipment:**

- 6.1.1 Meter Body
- 6.1.2 Pump and sensor cover plate
- 6.1.3 Sample Probe (aluminum probe with felt filter)
- 6.1.4 Optional: Remote sampling tubing. Up to 25 feet of Teflon® or Tygon® tubing (0/25"O.D.) may be inserted into the probe fitting. Perform the Zero and Operational Check of the meter with the tubing in-line to determine the time delay due to the transit of the sample vapor in the tubing.



- 6.2 Sign out the equipment at the IH Laboratory completing all step in IH75180.

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- 6.3 **Set-up:** For pump sampling: screw the metal probe into the pump handle, attach the pump plate over the sensor opening, and attach the pump power cord to the fitting in the back of the meter.

The meter can act as a passive sampler if the pump is not attached.

- 6.4 **Power On:** Press the *Power* Key. The Sentinel 44 will sequence through the following messages:

6.4.1 Serial number and software version.

6.4.3 Battery voltage and its capacity. Recharge or replace the battery pack if less than 60% Capacity is displayed.

6.4.4 Dosimeter recording segments and hours for TWA and STEL calculations (Displayed only if dosimeter functions are turned on.)

6.4.5 Last Cal Date: Month, day, and year the instrument was last calibrated.

6.4.6 Real Time Gas Display. The current measurement of the four-gas display.



20.9	0	0	0
O2	LEL	CO	H2S

- 6.5 **Initial Warm Up:** Allow the instrument's electronics and sensors to stabilize by allowing 15 minutes for the unit to warm up.

Note: Normal operating conditions:

- 32 to 104 F (0-40C) (will operate within temperature -4 to 122 F but performance specifications are not guaranteed);
- 5 to 95% relative humidity.

- 6.6 **Zero:** After warm-up, zero the meter in one of the following ways:

- Zeroed in an area known to have ambient atmospheric oxygen content and known to be free of CO, H2S, combustible gas (CG) or
- Zero by exposure to a zero gas standard.



- 6.7 If the readings are not Oxygen: 20.9%, CG: 0.0% LEL, CO: 0 ppm & H2S: 0 ppm press *ZERO/Reset* then *ZERO/Reset* to set new zero levels. If one or more gas readings exceed the limits listed below while sampling fresh air, the sensors should be software zeroed:

Oxygen 20.9±5%

Combustibles ±5 LEL

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Carbon Monoxide \pm 10 ppm
 Hydrogen Sulfide \pm 5 ppm

NOTE: If a sensor fails to zero a message will appear briefly before the instrument returns to the gas-display mode. The codes *w,x,y* or *z* denotes the sensor that needs re-calibrating. When a single sensor will not zero, none of the sensors are zeroed.

<i>Cal Required</i>			
<i>w</i>	<i>x</i>	<i>y</i>	<i>z</i>

6.8 **Bump Check:** Verify that the Sentinel 44 is operating properly by checking the sensors response to a small portion of calibration gas. (Accuracy must be within \pm 20% of actual.) Do not use the meter if the instrument fails to detect each hazard to be monitored. Perform the bump test at the start of each day of use.

6.9 **Clear previous logged data:** To remove the existing data from the memory of the meter:



6.9.1 While the display is in the Real Time Gas Display screen. Then press *Mode* then *ZERO/Reset*, then *ZERO/Reset*. The meter responds with *All Sensors Zeroed* then reverts to the Real Time Gas Display.

20.9	0	0	0
O2	LEL	CO	H2S

6.9.2 Press *Mode* so that the Logged Data Display screen is shown. Then press *ZERO/Reset*, then *ZERO/Reset*. This clears the stored data. Meter responds with *Data Cleared* then reverts to the Logged Data Display screen.

20.9	0	0	0
20.9	LEL	CO	H2S

6.9.3 Press *Mode* so that the TWA Data Display screen is shown. Then press *ZERO/Reset*, then *ZERO/Reset*. This clears the TWA data. Meter responds with *Data Cleared* then reverts to the TWA Display.

TWA	M	0	0
:00	CO		

6.9.4 Press *Mode* so that the STEL Data Display screen is shown. Then *ZERO/Reset*, then *ZERO/Reset*. This clears the STEL data. Meter responds with *Data Cleared* then reverts to the STEL Display.

STEL	M	0	0
:00	CO	H2S	

6.10 **Taking airborne readings:**

6.10.1 Press *Mode*. The time/battery status screen appears.

10:48	43%
01/01/01	RATT

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6.10.2 Press *Mode*. The meter now displays the real-time concentration of the four hazards and begins recording data. A confidence beep sounds once every minute to assure the user that the unit is on and monitoring the gas channels.

20.9	0	0	0
O2	LEL	CO	H2S

Response time in Seconds: to achieve 90% of actual value

	<i>Diffusion</i>	<i>Motor Pump With 10" probe</i>	
<i>Oxygen</i>	<30	<12	<i>Add an additional 5 to 10 seconds when using a 30" probe.</i>
<i>Combustibles</i>	<60	<50	
<i>Carbon Monoxide</i>	<70	<80	
<i>Hydrogen Sulfide</i>	<50	<70	

6.9. **Turning off the meter:** Turn off the instrument by holding *POWER* for 5 seconds. Logged Data is not lost when the power is turned off. Instrument will give warning if data-logging feature is full.

6.10. Documenting Sampling Results

- 6.10.1. Record readings on a BNL *Direct Reading Instrument* Form (or Confined Space Permit, if applicable). Return meter and original copy of the *Direct Reading Instrument* sampling form to the SHSD IH Laboratory. Note and mention any problems with the meter.
- 6.10.2. This meter can log data. Whenever possible, use this feature and print a hardcopy of the data and supply it to the IH Laboratory. An additional program is available for downloading. See SHSD IH laboratory.

6.11. Results interpretation:

- 6.11.1. A competent person should write a hazard evaluation report evaluating the monitoring if it evaluated the potential for occupational exposure and indicates the status of compliance with OSHA and ACGIH Occupational Exposure Limits.
 - 6.11.1.1. Ensure that a copy of the hazard evaluation report is sent to the:
 - IH Laboratory and is included in the ESHQ Directorate Recordkeeping system.
 - Occupational Medicine Clinic with the worker(s) BNL Life

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Number(s) noted.

- 6.11.1.2. The hazard evaluation report and/or an *Employee Notification Form* (IH75140 Attachment 8.3) must be used to inform all employees monitored or represented by the monitoring of the results of the air sampling and the implication to compliance with OELs.
- 6.11.1.3. Acceptable Readings are listed in the Table below. The readings need to be evaluated with professional judgment including consideration of the configuration of the area being tested (such as confined space versus a large room):

Hazard	Alarm Setting*	Passing Reading	Indicator of Need for Further Investigation in a Confined space
Oxygen	<19.5% and >22%	Within the range of 19.5 %- 22.0%	<19.5 % or >22%
LEL	10% of LEL	<10% of LEL	Any detection greater than 5% LEL, verify source of combustible gas
CO	25 ppm	<TLV & PEL 25 ppm	Any detection greater than 5 ppm, verify source
H2S	10 ppm	<TLV & PEL 10 ppm (TLV 5 ppm notice of purposed change for 2002)**	Any detection greater than 3 ppm, verify source

* Alarm settings can be set for custom applications.

* ACGIH Purposed Change of TLV to 5 ppm published in 2001 Booklet.

- 6.11.2. Complete an *IH Database Entry* form (IH75140 Attachment 8.4) and return to the IH Laboratory (except for Confined Space Entry monitoring).

The only official copy is on-line at the SHSD IH Group website.
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7.0 References

- 7.1 Bacharach Sentinel 44 Personal Gas Monitor Installation/Operation/Maintenance Instruction 51-9649 Rev 1. April 1993.

8.0 Attachments

- 8.1 Function of the meter's Keys
- 8.2 Alarm Messages
- 8.3 Photo of the meter
- 8.4 Short Operating Instructions for the Sentinel 44
- 8.5 Qualification Criteria Record for SHSD personnel

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9.0 Documentation

Document Review Tracking Sheet		
REVISED BY: <i>(Signature and date on file)</i> N. Bernholc SHSD IH Group Date 05/02/00	REVIEWED BY: <i>(Signature and date on file)</i> R. Selvey SHSD IH Group Leader Date 03/20/01	APPROVED BY: <i>(Signature and date on file)</i> R. Selvey SHSD IH Group Leader Date 03/20/01
PREPARED BY: <i>(Signature and date on file)</i> G. Rawn OTQGroup Date 09/30/96	RCD Facility Support Procedure Committee Review Date	APPROVED BY: RCD Procedure Coordinator Date
Filing Code: IH51QR.02	DQAR Date	Effective Date: 09/30/96

Periodic Review Record		
Date of Review	Reviewer Signature and Date	Comments Attached
01/15/02	<i>(Signature and date on file)</i> R. Selvey 01/17/02	Interferences (chemicals that can cause the meter to give a false response) added to section 5.1.5. also minor changes to qualification form. Add pass criteria in section 6.11.

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Attachment 8.1 Functions of Meter Keys

Key	Meter Response
Power	Press to turn instrument ON. Press and hold until LCD goes blank (approximately 2 seconds) to turn instrument OFF. Momentarily press to turn back light on for 30 seconds.
Mode	The mode key steps the instrument through the following display modes.
Gas-Display Mode	Displays the concentration of all gases being monitored.
Peak-Display Mode	Displays the maximum and minimum recorded readings for oxygen and the peak readings recorded for combustibles and the toxic gases.
Info-Display Mode	Displays the time, date, and remaining battery capacity.
Special Functions	Cancels a command or entry when the following message is displayed "MODE TO CANCEL"
Zero/Reset	Performs specific functions in each of the following modes.
Gas-Display Mode	Sets software zero point of all sensors
Peak Display Mode	Clears all recorded peak gas readings
Special functions	Turns off the audible alarm and any LCDs when they are triggered on by an alarm condition.

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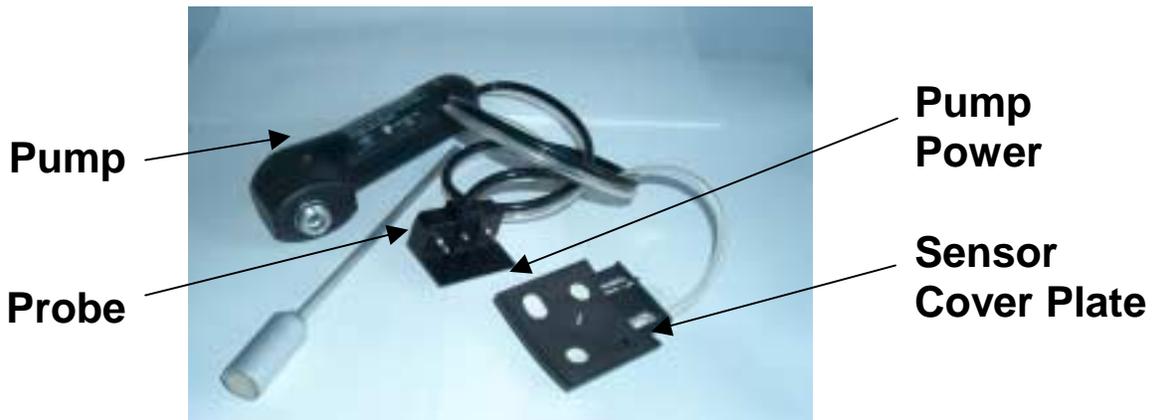
Attachment 8.2 Alarm Messages

Number	Alarm	Wording	Meter or User action
1	Low Battery	10% Capacity Low Battery	Display will disappear
2	Power shutdown	00% Capacity Power shutdown	The instrument automatically shuts off
3	Low Oxygen or High	% ALARM Oxygen OXYGEN DEPLETED	User Leave Area
		% ALARM OXYGEN RISING	User Leave Area
4	Oxygen sensor failure	% DANGER OXY SENSOR FAIL	Leave area & replace sensor
5	High combustibles	% LEL ALARM COMBUSTIBLE GAS	User Leave Area
6	Combustibles flood	99 % COMBUSTIBLE FLOOD COMBUSTIBLE GAS	User Leave Area
7	Combustibles sensor failure	0% DANGER LEL SENSOR FAIL	Leave area & replace sensor
8	High toxic gas 1	PPM ALARM CARBON MONOXIDE	Reset and leave area if appropriate or sensor failure

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Attachment 8.3 Photo of the Meter



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Attachment 8.4 Short Operating Instructions for the Sentinel 44

	Step	User Action	Meter Display
1	Power ON	Press <i>POWER</i> . Allow 15 minute for the unit to warm up.	<i>Serial #, Battery status, Data capacity, Cal date, then:</i> 20.9 0 0 0 02 LEL CO H2S
3	Zero	Press <i>ZERO</i> then <i>ZERO</i> .	All sensors Zeroed
4	Bump Check	Sample small amount of calibration gas. Shaded area values should change appropriately to the gas concentration.	20.9 0 0 0 02 LEL CO H2S
6	Clear Data	Press <i>MODE</i> , then <i>ZERO</i> then <i>ZERO</i> .	Data Cleared
	Survey Mode	Bring meter into area to be sampled. If hazardous gases are present, shaded area values should change appropriately to the gas concentration.	20.9 0 0 0 02 LEL CO H2S
7	Power OFF	Press <i>POWER</i> . and hold for 5 seconds. Note: Logged data is not lost.	Screen blank.

ESHQ Directorate - Industrial Hygiene Services

**Bacharach Sentinel 44 Gas Monitor
Qualification**

Candidate's Name	BNL Life Number	Expires (3 years)
Qualified By:	Date of Qualification	Qualification Number: GE - IHQ- 75501

Topic	Criteria	Qual. Status
Hazard Analysis	Can show how to perform (or who to request to perform) the hazard analysis of the sampling area and potential exposure to the sampler.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified
Personal Protective Equipment	Understands the need to be aware of the potential surface contamination and airborne levels of contaminants and knows how to determine the need for PPE and how to obtain the correct PPE for the hazard.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified
Sampling Equipment	Can show where equipment needed for the procedure is located and how to properly sign it out.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified
Sampling Protocol	Understands the exposure monitoring logic necessary to appropriately select sampling locations to accurately measure worker, public and environmental exposure potential.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified
Meter Operation	Can show how to correctly turn on/off, bump check, operate, and log data with the meter. See Performance Checklist on page 2 and 3 of this attachment.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified
Record forms	Can show how to correctly and completely fill out all forms associated with this SOP.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified
Analysis of data	Can show how to perform (or who to request to perform) the data analysis on the sampling data to access potential exposure to the sampler, worker, public and environment.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified

Performance Standards for Meter Operation

No.	DESCRIPTION of PERFORMANCE ITEM	ACCEPTANCE CRITERIA
1	Locate and obtain the Sentinel 44 meter	Location identified and instrument properly signed out to user
	<ul style="list-style-type: none"> ▪ Identify storage location of instrument 	
	<ul style="list-style-type: none"> ▪ Complete appropriate documentation for signing out the unit from S&H Services 	
2	Perform warm-up of the unit	Obtain copy of the Bacharach Sentinel 44 Personal Gas Monitor operating instructions
	<ul style="list-style-type: none"> ▪ Energize the unit 	Depress Power button
	<ul style="list-style-type: none"> ▪ Obtain data and verify instrument calibration 	Record: <ul style="list-style-type: none"> ▪ Instrument Serial Number ▪ Calibration Date
	<ul style="list-style-type: none"> ▪ Check backlight display function 	After automatic backlight function de-energizes, demonstrate how to re-energize function by momentarily press power button
	<ul style="list-style-type: none"> ▪ Zero all instrument sensors 	Depress MODE for Peak-Display values
		<ul style="list-style-type: none"> ▪ Depress ZERO/RESET twice to zero out
		Depress MODE for TWA values
		<ul style="list-style-type: none"> ▪ Depress ZERO/RESET twice to zero out
		Depress MODE for STEL values
		<ul style="list-style-type: none"> ▪ Depress ZERO/RESET twice to zero out
		Depress MODE until in Real Time Gas Display
3	Operate unit in PASSIVE Mode	Breathe into the sensor intake port
	<ul style="list-style-type: none"> ▪ Observe oxygen level indication 	Indication should decrease from exhaled breath and alarm should sound
		<ul style="list-style-type: none"> ▪ Explain PASSIVE mode is operation without sample assembly
		<ul style="list-style-type: none"> ▪ This mode is used primarily for continuous real-time personal monitoring
4	Assemble sample pump (ACTIVE Mode)	Obtain accessories from storage case
	<ul style="list-style-type: none"> ▪ Locate and attach sampling cup 	<ul style="list-style-type: none"> ▪ Screw sampling cup to the top of the unit
	<ul style="list-style-type: none"> ▪ Locate and attach probe assembly 	Attach hose from assembly to sample cup gas inlet
		Attach sample tube to the probe
		<ul style="list-style-type: none"> ▪ Verify sensor pre-filter is in place
		<ul style="list-style-type: none"> ▪ Use standard 10 inch rigid probe
		<ul style="list-style-type: none"> ▪ Use optional plastic extension tubing
	<ul style="list-style-type: none"> ▪ Operate probe On-Off switch 	Use probe On-Off slide switch
		Explain that battery power must be conserved
	<ul style="list-style-type: none"> ▪ Locate and attach power supply 	Clip power supply to unit
		Plug power cord into 120v receptacle
5	Bump check the unit sensors	Breathe into sample hose
		<ul style="list-style-type: none"> ▪ Observe decrease in oxygen and wait for alarm to sound.
		<ul style="list-style-type: none"> ▪ Explain expected response time of 1 second per foot of sample line
	<ul style="list-style-type: none"> ▪ Locate check gas 	Introduce check gas into sample line
		<ul style="list-style-type: none"> ▪ Observe appropriate sensor indication
6	Monitor atmosphere and determine acceptable atmospheric condition	Obtain atmospheric samples from various areas of space
		<ul style="list-style-type: none"> ▪ Determine acceptable atmospheric conditions <ul style="list-style-type: none"> ➢ O₂ must be >19.5% and <23.5% ➢ LEL <10% ➢ CO <25% ➢ H₂S <5 ppm
7	Document results of survey	Use FORM "Direct Reading Instrument" Data Sheet for the Bacharach Sentinel 44 or Confined Space Entry documentation as appropriate.

	▪ Complete all applicable sections of the form	▪ Original copy of form goes to the IH Laboratory (Building 120)
		▪ Copy maintained by the facility surveyed
8	Secure and return atmospheric sampling equipment	
	▪ De-energize sample pump	Depress and hold until LCD display goes blank
	▪ Disassemble and return all components to storage case	Return unit the IH Laboratory
	▪ Complete appropriate documentation for signing out the unit from S&H Services	Sign instrument back into the IH system

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TASK PERFORMANCE EVALUATION

Using the list below, a designated OJT Evaluator must document satisfactory performance of each step of this task prior to the candidate receiving authorization to perform this task unsupervised.

No.	STEP to be EVALUATED	SAT / UNSAT
1	LOCATED AND OBTAINED THE BACHARACH SENTNEL 44	
2	PERFORMED ADEQUATE WARM-UP OF THE UNIT	
3	OPERATED THE UNIT IN PASSIVE MODE	
4	ASSEMBLED THE SAMPLE PUMP	
5	BUMP CHECKED THE UNIT SENSORS	
6	MONITORED ATMOSPHERE AND DETERMINED ACCEPTABLE ATMOSPHERIC CONDITIONS	
7	DOCUMENTED RESULTS OF THE SURVEY	
8	SECURED AND RETURNED THE ATMOSPHERIC SAMPLING EQUIPMENT	

OTJ Trainer Name	Signature	Date
Candidate's Name	Signature	Date