

# **STANDARD OPERATING PROCEDURES**

## **Ohio Lumex Mercury Analyzer (Lumex RA 915)**

### **AMBIENT AIR MONITORING PROGRAM for the 130 LIBERTY STREET DECONSTRUCTION PROJECT**



**LOWER MANHATTAN DEVELOPMENT CORPORATION**  
1 Liberty Plaza  
New York, New York

Prepared by:  
TRC Corporation  
Boott Mills South  
116 John Street  
Lowell, MA 01852  
(978) 970-5600



# Standard Operating Procedures

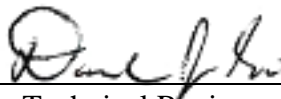
## Ohio Lumex Mercury Analyzer (Lumex RA 915)

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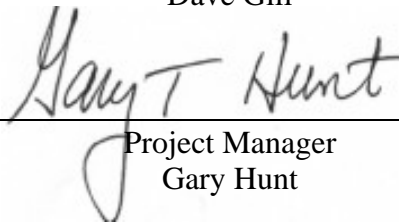
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Author  
Kelly Holland



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Technical Reviewer  
Dave Gill



---

Project Manager  
Gary Hunt



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QA Officer  
Liz Denly

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## **1.0 PURPOSE OF SOP**

This SOP was designed to describe the procedures used to sample mercury vapor in ambient air using the Ohio Lumex RA-915 monitor.

## **2.0 EQUIPMENT DESCRIPTION**

The RA-915 Mercury Analyzer is a continuous ambient air monitor direct-read instrument based upon the principle of differential Zeeman atomic absorption spectrometry using high frequency modulation of light polarization. The operator will refer to the manufacturer's operation manual for pictorials and additional information to aid in performing operation and maintenance.

## **3.0 EQUIPMENT OPERATION**

In order to operate the RA-915 Mercury Analyzer, it is necessary to attach a hose with a pre-filter at the intake location and attach a muffler at the exhaust port. (Note: Refer to manufacturer's operation manual for pictorials on where to attach intake hose and muffler.)

### **3.1 Instrument Start Up**

1. Turn on instrument. The manufacturer's trademark will appear on the screen of the display and control unit.
2. Press the ENT key on the display and control unit. The MAIN MENU will be displayed and the "\*" will appear in the upper left corner.
3. Press and hold for several seconds the LAMP IGNITION button on the front panel. When the spectral lamp turns on the "\*" will go out. Allow lamp to warm up for 5 minutes before collecting data.

## **4.0 CALIBRATION**

A serviceability test must be done prior to and after each sampling period to verify that the analyzer is functioning properly, as defined by the project specific QAPP.

1. Set the TEST handle to the off position.
2. Select the TEST command on the display unit and press the ENT button.
3. The SET OPTICAL BRIDGE TO POSITION III message will be displayed.
4. Set the optical bridge to position III and press the ENT button. A baseline test occurs for 20 seconds (turbo pump will turn on).
5. The Display will show "ENTER TEST CELL". Rotate Test Cell to "ON".
6. Press the ENT button. Air will be drawn through Zero Mercury Filter, as a countdown occurs for 10 seconds.
7. Allow to run several minutes, noting the relative deviation "R%" value.
8. If the "R%" value is less than 25%, the instrument is operating correctly.
9. Press the ESC button. The REMOVE THE TEST CELL message will appear.
10. Set the TEST handle of the test cell to the OFF position and press the ENT button. The MAIN MENU will be displayed.

## 5.0 SAMPLING

The ON STREAM command is used for measuring the mercury vapor concentration in the air.

1. Set the TEST handle to the OFF position.
2. Select the ON STREAM mode from the MAIN MENU and press the ENT button.
3. The SET OPTICAL BRIDGE TO POSITION III message will be displayed.
4. Set the optical bridge handle to position III and press the ENT button.
5. A baseline test occurs for 20 seconds and the intake valve assembly will switch from Zero Mercury Filter to Intake Hose. Readings will commence with an update every second.
  - a. "S" = Every second
  - b. "Si" = Every 10 seconds
6. Press the ENT button again. Readings will continue every second, but with various functions:
  - a. Three 10 second averages
  - b. After 30 seconds, a 30 second average will display (Say)
  - c. Relative Standard Deviation will display (R%)
7. Select DATA LOGGER and press ENT to begin logging 10 minute averages.

NOTE: The detection limit of the analyzer is  $2 \text{ ng/m}^3$  for gaseous mercury. Readings below this value will be reported as " $< 2 \text{ ng/m}^3$ ."

## 6.0 MAINTENANCE

Maintenance of the analyzer includes:

- Daily visual inspection
- Battery charging
- Changing the dust filters (inlet port, pre-filter)
- Changing the zero mercury absorption filter
- Preventative maintenance

During the daily visual inspection make sure that there is no physical damage of the analyzer housing and of its parts. Ensure that all the cables are undamaged and securely fastened.

During preventative maintenance, check the housing covers and if necessary, change the dust and absorption filters. It is recommended to carry out annual pre-verification maintenance of the analyzer at the manufacturer's center.

## 7.0 ADDITIONAL INFORMATION

A more detailed equipment manual available from Ohio Lumex is located in the site office for any other questions about the Mercury Analyzer.