

## SUBSTANTIVE POLICY STATEMENT

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## STATE STATION BIENNIAL AMBIENT SENSORS AUDITS PROCEDURE

Contact for information: Contract Oversight Unit

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### PURPOSE AND GENERAL DESCRIPTION

This procedure outlines the process for the **THE BIENNIAL AMBIENT SENSORS AUDITS**. THE PASS/FAIL DETERMINATION OF THE AMBIENT SENSORS IS MADE BY COMPARING THE VALUE READ TO THE AMBIENT READINGS OF THE THERMO-HYGROMETER.

### AUDIT GUIDELINES AND RESTRICTIONS

#### Audit Frequency, Station Assignments, and Station Traffic

Pursuant to Arizona Administrative Code ' R18-2-1025, the sensors used to obtain the ambient conditions shall be audited **biennially**. The **biennial** ambient sensor performance audits are to be **completed during the propane injection audits**. The Contract Oversight (CO) supervisor shall be responsible for the audit schedule and coordination with Gordon-Darby Arizona Testing (GDAT).

#### Audit Reporting

At the conclusion of the audit cycle, the State Inspector assigned shall be responsible for recapping the audits. Opacity meter audits are reported by the type of opacity meter audited, the number of test lanes audited, and the number of initial failing audits. Opacity meter re-audit results, AFTER REPAIRS have been completed are IDENTIFIED as re-audits AND reported SEPERATLEY. The CO Supervisor shall report the audit results in the **biennial** ambient sensor audit cycle is completed

#### Pass/Fail Limits

The allowable deviation is different for each ambient sensor. The allowable deviation for barometric pressure is  $\pm 0.2$ . The allowable deviation for temperature is  $\pm 5^{\circ}\text{F}$ . The allowable deviation for relative humidity is  $\pm 10\%$ .

#### Audit Failures, Re-Audits, and Disputed Failures

In the event of a failing audit due to high or low readings or equipment malfunction, a follow-

up audit must be immediately performed. If a second failure is recorded, the State Inspector shall complete ALL SECTIONS OF THE Notice of State Station Equipment Failure form. The reason for the failure should be clearly noted on the failure form. Comments other than that directly related to observations made during the audit are not authorized. **IN THE EVENT OF A FAILURE, COMPLIANCE OFFICERS MUST CEASE AUDITING THAT TYPE OF OPACITY METER AT THE STATION IF THE STATION WILL NO LONGER BE ABLE TO PERFORM INSPECTIONS.**

After a failure, GDAT technical repair personnel or station managers may be allowed to perform repairs to the sensors and request a re-audit of the failed equipment. State Inspectors may perform the re-audit, only after GDAT personnel have completed their portion of the equipment failure form. When performing a re-audit, in case of failure, perform a follow-up audit and if necessary complete a Notice of State Station Equipment Failure form. Under no circumstances shall more than one re-audit be performed. **NOTE: Management may clean the optics after a failure notice is issued. (Continue to the next station and/or lane) Re-audits, pass or fail are identified on the audit form and re-cap form separate from the regular audits and a separate total.**

Audit results that are disputed will be mediated by performing the audit in front of the CO Supervisor and GDAT Technical Services Manager.

## Ambient Sensor Audit

### Ambient Sensor Audits

Prior to performing the first audit of the snap-acceleration barometric pressure sensor, the field barometer must be calibrated with the master barometer located in ICU. Follow the procedure attached to master barometer, which can also be found at: **J:\VEI\Contract Compliance\Night Audits\Master Night Audit Forms\State Station Ambient Sensor audit.doc**

### EQUIPMENT REQUIRED

#### Ambient Sensor Performance Audits:

THERMO-HYGROMETER IS USED IN PLACE OF PSYCHROMETER

Psychrometer, Distilled Water, and Wet-Bulb/Dry-Bulb Temperature/Relative Humidity Conversion Table

Thermometer

Field Barometer

Master Barometer

Ambient Sensor Audit Report

Notice of State Station Equipment Failure Report

The snap-acceleration opacity meters use ambient conditions (temperature, barometric pressure, relative humidity) to correct the final opacity value used to determine a vehicle's pass/fail status. The ambient conditions are an important part of the pass/fail opacity calculation, and the ICU has determined that audits the ambient sensors biannually. A scientific grade thermometer is used to audit the temperature sensor. A scientific grade master barometer is used to calibrate the field barometer to audit the barometric pressure

sensor. A scientific grade THERMO-HYGROMETER is used to audit the relative humidity sensor. Use the following procedure to audit the ambient sensors. Prior to leaving Vehicle Emissions calibrate the field barometer with the master barometer each day of the audit cycle.1

**Warning: Do not leave the thermometer or THERMO-HYGROMETER in the state vehicle. Temperatures over 120°F will cause the cause the Mercury in the thermometer to expand to the point of breaking the glass. If at any time a thermometer has been broken and Mercury has been spilled, do not touch it. Mercury can cause severe damage to your kidneys and central nervous system. Contact the Contract Oversight supervisor immediately.**

**NOTE:** All snap-acceleration opacity meters are incorporated into the system and no warm up time is necessary. The ambient sensors are mounted on a pillar near the middle of the station test lanes. The temperature, barometric pressure, and relative humidity are read from the bottom of the LCD screen.

1. Place the thermometer, barometer, and THERMO-HYGROMETER on top of the cabinet nearest the sensors.
2. Allow the thermometer, barometer, and THERMO-HYGROMETER to stabilize for a minimum of ten minutes.
3. Use the THERMO-HYGROMETER to determine the relative humidity and record the value on the audit form.
4. Read the thermometer and record the temperature on the form.
5. Read the barometer and record the barometric pressure on the form.
6. Obtain the relative humidity, temperature, and barometric pressure from the bottom of the LCD screen.
7. Determine and record the deltas between the ADEQ and GDAT relative humidity, temperature and barometric pressure.
8. Determine the pass/fail status of each ambient sensor and mark the audit form appropriately.
9. If any of the sensors failed, complete a Notice of State Station Equipment Failure form.
10. After all lanes have been audited and prior to leaving the station, discuss audit results with the station manager and obtain their signature in the “Received by” space of all forms.

Equipment Failure Re-Audits - Pursuant to Arizona Administrative Code R18-2-1025, the State Inspector shall provide a copy of the test equipment’s failing results to the station manager. Additionally, the contractor’s calibration audit of the failing equipment shall be provided to the Department within three calendar days after the equipment is return to service.

Upon receipt of the contractor’s calibration audit a State Inspector shall schedule a visit to the station and perform an audit of the equipment. All audit procedures will be followed, including completion of an audit form and if necessary a failure notice. The Contract Oversight Supervisor will be notified when state station equipment fails a re-audit. The Contract Oversight Supervisor will maintain the data of all re-audits for future reference. The audit shall be identified as a performance re-audit and reported in the State Inspector’s monthly report. The Contract Oversight supervisor shall report the audit(s) in the Contract Oversight monthly report.

