Attachment 7c (1)

II Scope of Work

TASK 1: Performance Audits

Both sites shall be audited twice per year. This can be done by alternating sites each quarter for the year. Each analyzer at the site will be challenged with either a known mixture of pollutant gas and air, in the case of carbon monoxide, or an assayed sample of test gas, in the case of ozone. The pollutant gas cylinder, ozone analyzer and dilution system used to create or analyze the test atmospheres are completely independent of the Nevada DEP operation. The technical approach and standards protocol are discussed in Section III.

Each audit shall also serve as a working means of training the state personnel responsible for performing the audits after this contract expires. The training will consist of a general transfer of information concerning the peculiarities of the analyzer and/or audit system and the development of audit procedures, including forms.

Task 2: Repair Dasibi Calibration System and Monitoring Instruments

An assessment will be made concerning the maintenance requirements for the Dasibi calibrator and clean air system. Depending on the extensiveness of repairs a decision will be made to perform the maintenance at the DRI facilities or return the calibrator to Dasibi. After the repairs are made a full calibration and verification process will be performed using DRI primary standards.

Repair of monitoring instrumentation will be as needed through the year. After an initial investigation DRI personnel will decide whether it is more cost effective and efficient to perform the maintenance or return the analyzer to the manufacturer. In either case a complete check out will be made upon completion of the maintenance.

TASK 3: Quality Assurance / Control Procedures

The objective of this task is to help the State personnel develop a QA plan that would make the entire monitoring and reporting operation efficient from instrument procurement to data validation. Three phases are recommended for this task: 1) perform a systems audit and review of present documentation, 2) recommend what procedures are needed and prioritize them and 3) assist in writing the procedures based on the recommended priority list. This task includes implementing the procedures after they are accepted.

TASK 4: Program Management

III Technical Approach (Performance Audits)

Performance Audits for continuous gas analyzers (CO and O_3) are accomplished by testing the range of each analyzer at four or five evenly spaced concentrations. The technique for determining the actual concentration of the test atmosphere varies according to the type of pollutant being measured. In the case of CO a known concentration will be created by accurately metering flows from a CO (in a balance of Air or N_2) compressed gas cylinder and the zero air. The gas cylinder is analyzed for its contents of CO by both the gas ~~manufact~~ manufacturer and the DRI Standards Lab; in both cases the results are traceable to NBS standards. Zero air is dried ambient air from which CO has been removed. The DRI system utilizes a heated catalyst to oxidize CO to CO_2.

The dilution system, which mixes the span gas and zero air, basically consists of two mass flow controllers. The span gas controller is low flow, usually on the order of 0 to 30 sccm or 0 to 100 sccm, and the air flow controller is high flow, either 0 to 5 SLPM or 0 to 10 SLPM. Both mass flow controllers are tested before each audit by comparing their flow indications to NBS traceable Vol-u-mets, laminar flow elements and bubblemeter.

The system, zero air and dilution, are again tested for contaminants and correct operation by challenging analyzers that are kept in the ~~CO~~ ~~DBT~~ Standards Lab.

For auditing O_3 analyzers a test atmosphere is created and analyzed at the same time as the monitor being challenged - Ozone is created by exposing clean dry air to ultra-violet light (185 nm wavelength). The concentration can be varied by adjusting the power to the lamp. This sample is drawn by both the site ~~and~~ analyzer and audit standard. The audit standard is a Dasibi 1003-PC which is compared to a primary standard (Dasibi 1008-PC) before each audit. Once each year the 1008PC is sent to the California Air Resource Board for certification against a long path photometer.

Appropriate corrections are made for temperature and pressure for both the checkout and audit.

Statistical calculations for both types of continuous analyzers are the same and, at a minimum, will be the per cent deviation, average deviation and standard deviation as defined by 40 CFR PART 50 Appendix A.

After completing the basic 4 or 5 point audit and determining that the analyzer is operational, linear and operating in a predictable manner, one or two concentrations are repeated to test the analyzer's repeatability. If the analyzer indication is with 2% of the initial test then an assay of the site cylinder (CO only) can be performed. An onsite O_3 source can be tested directly against the audit standard for verification of consistency. The span gas cylinder concentration is considered valid if the assay is with 4% of the presently used value. If the deviation is greater than 4% then a laboratory assay is recommended.

The final planned check will be to compare site calibration system tests with the audit results. If the audit reveals possible problems (flow or contamination) with the calibration system then comparative tests can be done at the time of the audit, however, if the monitoring system has been stable, according to the last few zero/span checks then these last checks will be used for comparison.

After this point the auditor and site technician will do as much system trouble-shooting as is needed and time allows. By the end of the audit enough information should be gathered to determine what, if any, maintenance, changes or additions in the monitoring program