

APPENDIX N QUALITY ASSURANCE ENFORCEMENT PROCEDURES

1.0 INTRODUCTION

Quality assurance (QA) is defined as a system for integrating the quality planning, quality assessment, and quality improvement efforts of various groups in an organization. In pollution measurement, quality assurance is concerned with all activities affecting the quality of the measurements, as well as the establishment of methods and techniques to assure the quality of the measurements. The objective of an I/M quality assurance program is to assure that 1) accurate inspections are being performed, and 2) repairs are effective in reducing emissions.

This manual describes procedures for quality assurance of Delaware's Low enhanced I/M program. The objective of this manual is to document specific QA procedures to be followed by auditors from the Delaware Department of Natural Resources and Environmental Control (DNREC).

1.1 Elements of Quality Assurance

Quality assurance is composed of the following elements:

- Audits;
- Undercover surveillance; and
- Data collection and analysis.

Audits of inspection stations are needed to assure equipment accuracy and proper inspection performance. Different types of audits can be performed in an low enhanced I/M

program. The most common type of audit is an overt performance audit. In these audits, inspection equipment is checked and inspector performance is observed. In addition, covert audits also are performed. In these audits, vehicles with known emission defects and characteristics are submitted to inspection stations for an inspection. The inspection results provide an indication of the accuracy of the equipment and the ability of the inspector to follow procedures. In some cases, covert audits include remote observation of inspection performance, either through video cameras or surveillance vehicles. Other types of audits include record audits whereby records are periodically checked for proper completion. In addition, management of the I/M program usually conducts an annual and monthly systems audit to evaluate the overall effectiveness of the program.

Data collection and analysis play a critical role in the quality assurance of an I/M program. As data collection and analysis procedures advance, the emphasis of QA shifts from quality control checks to statistical analysis of inspection data. Data analysis can evaluate several aspects of an I/M program. To assure that emission reduction targets are achieved, the failure rate must be calculated along with the average emissions before and after repairs. Data analysis can identify the stations that are performing inadequate inspections or are not complying to Delaware's procedures. Data analysis can evaluate the program cut points and determine if they should be made more stringent. Other functions of data analysis include identifying vehicles that appear to be difficult to repair.

Proper QA requires establishing the following:

- Formal inspection procedures;
- Use of evaluated and approved emission test equipment;
- Quality control for emission test equipment; and
- Training.

Formal inspection procedures provide the foundation for good quality assurance in an I/M program. Emission analyzers and related equipment approved for use in Delaware's low enhanced I/M program have provisions to assure that the emission test is performed accurately, in addition to incorporating quality control procedures. However, additional provisions are necessary to assure accurate emission tests and thorough performance of the tampering and evaporative system inspection.

Quality control procedures for the emission test equipment are essential. Delaware's emission analyzers have several quality control provisions built into the equipment. However, external quality control functions are still necessary to assure accurate inspections and reliable emissions analyzer performance.

Training is a very important part of quality assurance. Inspectors must be trained to adequately perform the inspection. Auditors must be trained in the objectives of the auditing process and different auditing procedures. Mechanics must be trained in how to repair vehicles for maximum emission reduction at minimum cost. Management of the I/M program also must keep up with emerging vehicle technologies, I/M techniques, and results of other I/M programs, in order to be aware of quality assurance problems that may arise in a program and techniques to alleviate these problems.

2.0 QUALITY ASSURANCE AUDITS

See Appendix 9 (a) (1)

