

# COAL MINE HEALTH INSPECTION PROCEDURES HANDBOOK

## TABLE OF CONTENTS

### Chapter 5 DIESEL EXHAUST GAS MONITORING

I. Introduction.....	5.1
II. Sample Frequency.....	5.1
III. Sample Location and Duration.....	5.1
IV. Sampling Equipment.....	5.2
V. Prior to Sampling/During Sampling Shift.....	5.2
VI. Compliance/Noncompliance Determinations.....	5.3
VII. Data Collection.....	5.3
VIII. Diesel Equipment Inventory.....	5.3

Diesel Survey Summary Form

## Chapter 5 DIESEL EXHAUST GAS MONITORING

### I. Introduction

The purpose of monitoring diesel exhaust gas emissions is to evaluate miners' exposure to carbon monoxide (CO) and nitrogen dioxide (NO<sub>2</sub>) and to determine the effectiveness of the approved mine ventilation plan controls as they relate to diesel exhaust emissions. Samples may be collected concurrently with any inspection event.

### II. Sample Frequency

Samples shall be collected at the following times:

1. On at least one shift during each longwall move where diesel equipment is utilized either on the teardown section, transportation, or set-up section.
2. At least once each quarter on sections utilizing diesel face haulage equipment.
3. Twice each fiscal year on a representative number of diesel powered pieces of equipment operated in the outby areas of each mine utilizing such equipment (two-three different types of diesel equipment if available).

### III. Sample Location and Duration

- A. Longwall Moves - Samples shall be collected in the breathing zone (as described in 30 CFR 70/71.208 for respirable dust sampling) of each operator of diesel powered equipment for the full shift or at least 8 hours. An area sample shall also be collected at a point in the split of air ventilating diesel equipment immediately downwind of the most inby miner.
- B. Sections utilizing diesel face haulage equipment - Samples shall be collected in the breathing zone of each operator of diesel powered equipment, including scoops, operated on such sections for at least four 15-minute periods representing the entire normal production shift. Full shift or 8-hour samples may be collected on each operator. An area full shift or 8-hour sample shall also be collected at a point in the split of air ventilating diesel equipment immediately downwind of the most inby miner.
- C. Outby diesel powered equipment - Samples shall be collected from a number (two-three) of outby occupations that operate different types of diesel powered equipment

for the duration of one full shift or for at least 8 hours. Samples shall be collected in the breathing zone of the subject equipment operators.

#### **IV. Sampling Equipment**

- A. All samples collected during longwall moves and on sections with diesel face haulage shall be collected utilizing direct-reading instruments capable of determining the 8-hour time-weighted-average, maximum concentration, and short-term exposure limit (15-minute intervals) for exposure to CO and NO<sub>2</sub>.
- B. Samples collected on outby equipment may be collected utilizing long-duration detector tubes for both CO and NO<sub>2</sub> or by using direct-reading instruments. However, if any detector tube sample indicates a level greater than or equal to 50% of the current exposure limit for the applicable gas, a full shift exposure assessment shall be conducted within 7 days utilizing a direct-reading instrument. The equipment operator's activities should be included in this assessment.

#### **V. Prior to Sampling/During Sampling Shift**

- A. Inspection personnel should review the mine ventilation plan for any requirements necessitated by the use of diesel powered equipment and the diesel equipment inventory for the number and type of diesel units at the mine. This information will aid in determining the number of samples to be collected.
- B. Sampling equipment shall be properly prepared prior to use. Direct-reading instruments shall be calibrated according to the manufacturer's instructions. The calibration date shall be recorded in the inspection notes. Long-duration detector tubes shall be within the useable shelf life.
- C. Inspectors shall discuss the diesel monitoring with the miner's representative if available, and miners working in the area at the beginning of the shift or, as appropriate, during the shift being monitored. The inspector shall determine and document in his/her notes, if there are situations different than those specified in this procedure where miners may be exposed and that should be monitored.
- D. Inspectors shall discuss the results of this evaluation with the mine operator, the miners working with the equipment sampled, and the representative of the miners.
- E. All data listed on the attached Diesel Survey Summary sheet shall be recorded during

the inspection/evaluation. This data sheet permits up to six different sampling periods to be recorded for any one piece of diesel powered equipment.

**VI. Compliance/Noncompliance Determinations**

A. Compliance/noncompliance determinations will be made by comparing the monitoring results (after taking into account the applicable instrument accuracy) to the appropriate standard. The appropriate citation/order shall be issued under 30 CFR 75.322 when any miner's exposure exceeds the Threshold Limit Value (TLV ) listed for the contaminant in question.

B. The current TLVs for CO and NO<sub>2</sub> are listed in the 1972 American Conference of Governmental Industrial Hygienists (ACGIH) TLV book. Those limits are as follows:

CO	8-hour time-weighted average	50 ppm
	Short-term exposure (15 min.)*	400 ppm
NO <sub>2</sub>	Ceiling limit (Never to be exceeded)	5 ppm

\* The 75 ppm excursion limit cannot be defended; the scientifically-accepted short term exposure limit for CO is 400 ppm.

**VII. Data Collection**

All data points as listed on the attached Diesel Monitoring Survey Summary shall be collected during each survey. A copy of the diesel monitoring database will be provided to each district for tracking this data. Survey sheets/data shall be submitted to the Chief, Division of Health, by the fifteenth of the month following the end of each quarter.

**VIII. Diesel Equipment Inventory**

It is important to maintain an accurate inventory of all diesel equipment that is taken underground, whether approved or unapproved. Each district shall make corrections and/or additions to the inventory quarterly. The MSHA Form 2000-198, Diesel Equipment Inventory (see Page 6.51, Chapter 6), may be duplicated locally and used for initial and updating actions. Upon completion, forms are to be submitted to:

Mr. Gary L. Clark  
MSHA Approval and Certification Center  
R.R. 1, Box 251, Industrial Park Road  
Triadelphia, WV 26059

Any District Manager requiring additional or nonstandard reports should make arrangements with the Chief, Mechanical Safety Division, Approval and Certification Center.

# Diesel Survey Summary

## District

---

<i>Mine ID:</i>	<i>MMU:</i>	<i>Survey Type:</i>	<i>Survey Date:</i>	<i>Survey Start Time:</i>
<i>Equipment Type:</i>		<i>Company Equipment ID</i>		<i>Catalytic Converter Used:</i>
<i>Model:</i>		<i>Air Qty (CFM):</i>		<i>Exhaust Filter Used:</i>
<i>Engine Size (HP):</i>		<i>Gas Smp Loc:</i>		<i>Production:</i>
<i>Nameplate Qty (CFM):</i>		<i>Fuel Type:</i>		

---

*Start Time (24 hr clock)*      *Sample Period 1*   *Sample Period 2*   *Sample Period 3*   *Sample Period 4*   *Sample Period 5*   *Sample Period 6*

*Time (hrs)*

*NO2 Max (ppm\*)*

*NO2 Avg (ppm\*)*

*NO2 STEL (ppm\*)*

*CO Max (ppm\*)*

*CO Avg (ppm\*)*

*CO STEL (ppm\*)*

*\* Parts Per Million*

---

*Notes:*

*Observations:*