

Populations, Activity and Emissions of Diesel Nonroad Equipment in EPA Region 7

Populations, Usage and Emissions of Diesel Nonroad Equipment in EPA Region 7 - Statement of Work - On-Site Equipment Inventory Appendix B

Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

Prepared for EPA by
Eastern Research Group, Inc. (ERG)
EPA Contract No. EP-C-06-080

Populations, Usage and Emissions of Diesel Nonroad Equipment in EPA Region 7

Statement of Work

Statement of Work APPENDIX B1-2

On-Site Equipment Inventory

A.2 On-Site Equipment Inventory

For respondents in the equipment sample, the step following the initial ownership interview is to obtain a listing of equipment that is eligible for instrumentation. This listing serves as a third-stage sample frame, and also will serve to describe the age and size distribution of equipment used by the respondent. The interviewer will continue with additional questions regarding the respondent's operation and use of equipment. For respondents who use equipment at multiple sites or on a continuous shift basis, additional sampling steps will be employed as appropriate to access equipment while retaining control of selection probabilities for individual pieces. We describe specific items below:

- Item 1: *Respondent's work sites.* This question is intended to determine if a respondent has equipment stored or in operation at sites other than the home site listed in the establishment sample frame.
- Item 2: *No. work sites with equipment.* This question determines the number of work sites at which the respondent stores or uses equipment. If the number is greater than 1, the technicians will select one site, using SRS, to reduce the number of sites to be visited. This step simplifies field operations and reduces respondent burden, as it may be impractical to schedule multiple appointments at different sites and times to inventory all pieces used by the respondent. Also for practical purposes, technicians may consider remote sites ineligible if they are beyond a pre-determined maximum distance from the respondent's home site.
- Item 3: *Contact at remote site.* If a remote site is selected, the interviewer will ask whether an additional person, such as a site manager, should be contacted to obtain permission to visit the site. Responses to this item will be binary.
- Item 4: *Additional Contact Information.* If the answer to Item 3 is 'YES,' the interviewer will request a name(s) and contact information for one or more contacts at the remote site.
- Item 5: *Contact's Schedule.* The interviewer will request information on the contacts' work schedule(s), and good times to reach the contact(s).
- Item 6: *Respondent's Shift Schedule.* This item determines whether the respondent operates equipment on a continuous shift basis, i.e., whether some portion of the respondent's equipment is in operation at any given time. Equipment in operation at the time of a site visit is unavailable for sampling or instrumentation. The response to this question is binary.
- Item 7: *No. Shifts per 24-hour Period.* This binary item determines whether the respondent operates equipment over more than one shift in a 24-hour period. The object is to determine whether a site visit can be scheduled at any time when all equipment would be idle. If the number is greater than one, the technicians will select one shift, using SRS, and schedule a time to inventory the equipment when it is off-shift.

After selection of the home site or a remote site for piece selection, the technicians will complete an inventory of all equipment pieces on the site. They will obtain five items needed to uniquely identify individual pieces and their specifications. These items

include:

- equipment type,
- equipment manufacturer,
- equipment model,
- equipment model year, and
- equipment serial number.

In addition, acquisition of these items allows the technicians to determine other equipment specifications directly without burdening the respondent with additional highly specific questions. For example, the equipment serial number allows determination of the equipment model year through commercially available serial number guides (EquipmentWatch, 2001a). Determination of manufacturer and model also allows determination of other specifications such as power and speed ratings from commercially available specification references or manufacturers' specifications (EquipmentWatch, 2001b). Again, the goal is to avoid the need to trouble respondents with detailed questions that are difficult to remember or that may require consultation of records.

Equipment Piece Selection (Third-stage sampling). To select equipment pieces, interviewers will apply simple random sampling (SRS) through the use of random number tables (Cochran, 1977). After selection of an eligible equipment piece for either emissions or activity measurement, interviewers will continue with item 8.

Item 8: *Confirmation following Selection:* Following selection of a single piece for instrumentation, the technician(s) will confirm with the respondent that they have permission to instrument the selected piece. After receiving confirmation, they will proceed to instrument the piece.

Item 9: *Annual vs. Periodic Usage:* Regarding the piece selected for instrumentation, this item is designed to solicit information concerning whether the piece is used throughout the year, or periodically or seasonally during the year. This information may be particularly relevant to equipment in construction or agriculture where equipment use may follow consistent seasonal patterns.

Item 10: *Usage by Month:* In cases when the respondent indicates that the equipment piece is not used all through the year, this item asks the respondent to indicate during which months of the year they use the piece. This item gives a rough profile of the equipment piece's annual usage pattern, broadly indicating when during the year the selected piece or similar pieces might be available for instrumentation.

Item 11: *Use During Measurement Period.* This item attempts to determine whether the selected piece is likely to be used during the proposed measurement period, i.e., during the "next week" for emissions measurement, or during the "next 2-3 months" for activity measurement. If the answer is "NO," the selected piece will be considered ineligible for instrumentation. At that point, the technicians will select another equipment piece, and repeat items 8-11.