

STANDARD OPERATING PROCEDURE

ONE

FIELD SCREENING

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1.0 FIELD SCREENING OF SOILS

The South Dakota Department of Environment and Natural Resources has developed a field soil sampling and screening method patterned after the Minnesota Pollution Control Agency and research performed by John J. Fitzgerald. This methodology was developed for field soil screening to generate consistency and reliability of results when using PID/FID instruments.

Soil samples collected for field soil screening may not be used for laboratory analysis. Separate soil samples must be collected according to the soil sampling protocols outlined in this handbook. The field soil sampling and screening procedures shall include the following:

1. Samples collected during drilling procedures must be taken in advance of the drill bit or auger.
2. No samples shall be collected from the auger flights.
3. When using PID/FID instrument the following procedure must be used:
 - A. Half-fill **either** a glass jar, or a plastic whirl pack bag or Ziploc® baggie.
 - 1) When using glass jars:
 - a. Fill jars with a total capacity of 8 oz. or 16 oz. Preferably 16 oz.
 - b. Seal each jar with one (1) or two (2) sheets of aluminum foil with the screw cap applied to secure the aluminum foil.
 - 2) When using whirl pack bags or Ziploc® baggies:
 - a. Half fill whirl pack bags from the split spoon or the excavation.
 - b. Whirl and tie or zip to close.
 - B. Vigorously shake the sample jars or bags for at least thirty (30) seconds once or twice in a 10-15 minute period to allow for headspace development.
 - C. If ambient temperatures are below 32^o Fahrenheit (0^o Celsius) headspace development is to be within a heated vehicle or building.
 - D. Quickly insert the PID/FID sampling probe through the aluminum foil. If plastic bags are used, unzip the corner of the bag approximately one to two inches and insert the probe or insert the probe through the plastic. Record the maximum meter response (should be within the first 2-5 seconds). Erratic responses should be discounted as a result of high organic vapor concentrations or conditions of elevated headspace moisture.
 - E. Record headspace screening data from both jars or bags for comparison.
 - F. PID/FID instruments shall be operated and calibrated to yield "total organic vapors" in parts per million as benzene. PID instruments should be operated with a 10.2 eV

lamp source. Calibration must be checked/adjusted daily. In addition, all manufacturers' requirements for instrument calibration must be followed.

- G. If sample jars are to be re-used in the field, jars must be cleaned according to field decontamination procedures for cleaning of bailers. In addition, headspace readings must be taken to ensure no residual organic vapors exist in the cleaned sample jars. Plastic bags may not be re-used.
- H. Any deviation(s) from these procedures must be noted and a basis stated for the deviation(s), with consideration of acceptance by the Department.

2.0 DETERMINATION OF ANALYTICAL RESULTS USING A MOBILE GAS CHROMATOGRAPH

Mobile Gas Chromatographs (GCs) may be used in the field to determine analytical contaminant levels of soil and groundwater. The Department will accept analytical results generated in this manner with the following conditions:

1. At least 20% of the samples analyzed by field GC are split and sent to a fixed laboratory for confirmation using an equivalent analytical method.
2. Acceptable analytical methods are used:

For Soil Samples -

	<u>Method No.</u>
Diesel Fuel Constituents (PAH Screen)	EPA 8100 or Equivalent
Gasoline Constituents (BTEX)	EPA 8020, 8015 or Equivalent
Waste Oil Constituents	SEE NOTE ^(A)
Total Petroleum Hydrocarbons (for hydrocarbon of concern)	California/USGS Method or Equivalent

For Water Samples -

Diesel Fuel Constituents (PAH Screen)	EPA 8100, 610
Gasoline Constituents (BTEX)	EPA 8020, 8015, 602 or Equivalent
Waste Oil Constituents	SEE NOTE
Total Petroleum Hydrocarbons (for hydrocarbons of concern)	California/USGS Method or Equivalent

3. The integrity of the samples is protected using all Department recommended sampling, containment, shipping, etc., procedures outlined in this handbook.

(A) NOTE: Should be based on contents of waste oil spill (i.e. solvents, metals, etc).

3.0 OTHER FIELD SCREENING METHODS

Other field screening methods will be considered by the Department for use at sites. All other field screening methods must follow the manufacture's instructions.