

SUBCHAPTER 2. QUALITY ASSURANCE FOR SAMPLING AND LABORATORY ANALYSIS

7:26E-2.1 Quality assurance requirements

(a) The person responsible for conducting the remediation shall ensure that the following quality assurance procedures be followed for all sampling and laboratory analysis activities.

1. Laboratories performing analyses shall conform to the following:

i. For the analysis of any aqueous samples for a parameter or category of parameters for which laboratory certification exists pursuant to N.J.A.C. 7:18, the laboratory shall be certified for that specific parameter or category of parameters pursuant to N.J.A.C. 7:18;

ii. For the analysis of non-aqueous samples using specific analytical methods contained in the EPA Publication SW-846, "Test Methods for Evaluating Solid Waste", third edition, update IIB, January 1995, as amended and supplemented, for a parameter or category of parameters for which certification exists pursuant to N.J.A.C. 7:18, the laboratory shall be certified for that specific parameter or category of parameters pursuant to N.J.A.C. 7:18 or, at a minimum, have obtained temporary approval to analyze regulatory samples pursuant to N.J.A.C. 7:18-2.5(c);

iii. For the analysis of samples using USEPA Contract Laboratory Program (CLP) analytical methods for a parameter or category or parameters for which certification exists pursuant to N.J.A.C. 7:18, the laboratory shall be certified for that specific parameter or category of parameters pursuant to N.J.A.C. 7:18 or, at a minimum, have obtained temporary approval to analyze regulatory samples pursuant to N.J.A.C. 7:18-2.5(c); or

iv. For the analysis of aqueous and non-aqueous samples for parameters or categories of parameters not contained in (a)1i through iii above, the person responsible for conducting the remediation is also responsible for ensuring that the selected laboratory is capable of performing the analysis. At such time as N.J.A.C. 7:18 incorporates procedures for parameters or categories of parameters not contained in (a)1i through iii above, the procedures in N.J.A.C. 7:18 shall be followed.

2. The Department shall reject analytical data as follows:

i. For laboratories performing analyses pursuant to (a)1i above, decertification or suspension of a laboratory pursuant to N.J.A.C. 7:18 for any given parameter or category of parameters shall result in the rejection of all analytical data for that given parameter or category of parameters generated after the date of decertification or suspension.

ii. For laboratories performing analyses pursuant to (a)1ii above, decertification or suspension of a laboratory pursuant to N.J.A.C. 7:18 for any given parameter or category of parameters shall result in the rejection of all analytical data for that given parameter or category of parameters generated after the date of decertification or suspension.

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iii. For laboratories performing analyses pursuant to (a)1iii above, decertification or suspension of a laboratory pursuant to N.J.A.C. 7:18 for any given parameter or category of parameters shall result in the rejection of all analytical data for that given parameter or category of parameters generated after the date of decertification or suspension.

3. Except as provided in (a) 5 below, analytical methods used shall have been published or approved by organizations with recognized expertise in the development of standardized analytical methods. These organizations include, without limitation:

- i. The EPA;
- ii. The American Society for Testing and Materials (ASTM);
- iii. The American Public Health Association (APHA);
- iv. The National Institute for Occupational Safety and Health (NIOSH);
- v. The Association of Official Analytical Chemists (AOAC);
- vi. The U.S. Army Toxic and Hazardous Materials Agency (USATHAMA);
- vii. The American Water Works Association (AWWA);
- viii. The Department;
- ix. The United States Department of Defense;
- x. The United States Department of Energy; and
- xi. The United States Department of Interior.

4. Non-aqueous samples to be analyzed for volatile organics shall be sampled using the procedures specified in either USEPA SW846 Method 5035 (USEPA Publication "Test Methods for Evaluating Solid Waste", third edition, final update III, December 1996, as amended and supplemented) or the USEPA Contract Laboratory Program Statement of Work for Organic Analysis, Multi-Media, Multi-Concentration, Revision OLMO4.2 as amended and supplemented. All samples are to be preserved in the field with the appropriate preservation solution except for the following:

- i. Samples that contain high levels of carbonates which would result in rapid or vigorous reaction when the sample is added to the vial containing sodium bisulfate may be shipped in vials without preservative;
- ii. Oily waste samples when the solubility of the waste is unknown may be shipped in vials without preservative; or

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iii. Samples collected using a field core sampling/storage device (i.e., En Core[®] or equivalent; En Core[®] is a product of En Novative Technologies Inc. of Green Bay Wisconsin) and the samples are shipped to and analyzed by the laboratory within 48 hours of sampling or the samples are shipped to the laboratory and transferred to vials containing the appropriate preservation solution within 48 hours of sampling need not be preserved in the field.

5. If an analytical method as described in (a)3 above does not exist for a specific contaminant or parameter within a specific matrix, or if an analytical method as described in (a)3 above for a given contaminant or parameter is demonstrated to be inappropriate for the matrix analyzed, then the person responsible for conducting the remediation shall:

i. Select an appropriate method from another source;

ii. Document the rationale for selecting the method pursuant to N.J.A.C. 7:26E-1.6(c); and

iii. Develop a standard operating procedure for the method, including a quality control section.

6. If analytical methods are not available for a contaminant, analysis of indicator parameters (for example, pH may be used as an indicator parameter for acid or base discharges) may be acceptable, subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E-1.6(c).

7. Laboratories shall follow all quality assurance/quality control procedures specified in the analytical methods.

8. For solid sample analysis, including without limitations, soils and sediments, all results shall be reported on a dry weight basis, except for those results required by the method to be otherwise reported.

9. Sample matrix cleanup methods shall be performed if:

i. Petroleum contaminated soils, sediments, or other solids are analyzed for semivolatile organics, and the method detection limits are elevated above the applicable remediation standard because of matrix interference;

ii. Gas chromatographic peaks are not adequately separated due to matrix interference. A peak shall be considered inadequately separated when a rise in baseline or extraneous peaks interfere with:

(1) The instrumental ability to correctly identify compounds present (including internal standards and surrogates); and/or

(2) The integration of peak area and subsequent quantification;

iii. So specified by the analytical method; or

iv. Matrix interferences prevent accurate quantification and/or identification of target compounds.

10. Acceptable matrix cleanup methods include, without limitation, those methods contained in the EPA Publication SW846 or the EPA "Contract Laboratory Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration" in effect as of the date of sample analysis.

11. Methods acceptable to the Department shall be utilized for the determination of the presence of free and/or residual product in soil or water. Such methods include, without limitation, visual identification of sheens or other visible product, measurable thickness of product on the water table, the use of field instruments, ultraviolet fluorescence, soil-water agitation, centrifuging, and hydrophobic dye testing.

i. For contaminants that in their pure phase and at standard state conditions (20 degrees Celsius to 25 degrees Celsius and one atmosphere pressure) have densities greater than water, free and/or residual product shall be considered to be present if the contaminant is detected in ground water at concentrations equal to or greater than one percent of the water solubility of the contaminant if ground water contains only that organic contaminant. If a mixture of such contaminants is present, then the effective water solubility of the contaminant shall be estimated for this determination.

12. Gas chromatography methods with a mass spectrometer detector system shall be used for analysis of volatile/semi-volatile contaminants (exclusive of herbicides, pesticides, and PCBs). Chromatography methods with a mass spectrometer detector system shall be used for the analysis of organic analytes amenable only to non-gas chromatographic methods. A mass spectrometer detector system is not required if:

i. Contaminant identity is known;

ii. The contaminant chromatographic peak is adequately resolved from any other peak. A peak is considered adequately resolved when:

(1) Adjacent or coeluting chromatographic peaks do not result in retention time shifts causing misidentification;

(2) Coeluting chromatographic peaks do not interfere with quantification of the contaminant's chromatographic peak; and

(3) Matrix interferences as described in (a)9ii above are not present; and

iii. At least 10 percent of the sample analyses are confirmed using the appropriate chromatograph/mass spectrometer detection system.

13. Laboratory data deliverables, as listed in Appendix A, shall be as follows unless otherwise specifically required pursuant to a NJPDES permit:

i. Full laboratory data deliverables shall be submitted for all potable water and polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans sample results, and for all hexavalent chromium soil sample results;

ii. Reduced laboratory data deliverables shall be submitted for all other analyses; and

iii. Analytical results without all quality control and raw data as required in full and reduced laboratory data deliverables, may be provided for all delineation samples which necessitate additional delineation sampling, and for all long-term ground water monitoring samples where the site has Department oversight, provided the following information is submitted:

(1) A cover page, including facility name and address, laboratory name and address, laboratory certification number, if applicable, date of analytical report preparation and signature of laboratory director;

(2) A listing of all field sample identification numbers and corresponding laboratory sample identification numbers;

(3) A listing of all analytical methods used;

(4) The method detection limit and practical quantitation level for each analyte for each sample analysis;

(5) All sample results including date of analysis;

(6) All method blank results; and

(7) All chain of custody documentation.

iv. Upon written request, the Department may require that a "reduced" data deliverables package shall be upgraded to a "full" data deliverables package for any sample analysis pursuant to N.J.A.C. 7:26E-1.7.

14. Sampling methods, sample preservation requirements, sample handling times, decontamination procedure for field equipment, and frequency for field blanks, field duplicates and trip blanks shall conform to applicable industry methods such as those specified in the NJDEP "Field Sampling Procedures Manual" in effect as of the date on which sampling is performed. The person responsible for conducting the remediation shall document the rationale for any deviations from the methods in the "Field Sampling Procedures Manual" pursuant to N.J.A.C. 7:26E-1.6(c).

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15. Samples shall be preserved in the field immediately after collection and submitted to the laboratory as soon as possible and no later than 48 hours after sample collection.

(b) Field screening methods are limited as follows:

1. Field screening methods for all sampling matrices (soil, water, air, interior surfaces) can only be used under the following conditions:

i. For contaminant delineation if contaminant identity is known or if there is reasonable certainty that a specific contaminant may be present (for example, benzene, toluene, ethylbenzene, xylene in the case of sampling for a gasoline release); or

ii. To bias sample location to the location of greatest suspected contamination.

2. Field screening methods shall not be used to verify contaminant identity or clean zones. However, where 10 or more samples are required for initial characterization sampling at an area of concern, field screening methods listed in (b)3 and 4 below may be used to document that up to 50 percent of sampling points within the area of concern are not contaminated.

3. The field screening methods described in the version of the following references in effect as of the date of the field screening activities may be used:

i. The NJDEP "Field Sampling Procedures Manual";

ii. The NJDEP Site Remediation Program "Field Analysis Manual";

iii. "Field Measurements," EPA/530/UST-90-003; or

iv. The "Field Screening Methods Catalog," EPA/540/2-88/005.

4. Other field screening methods may be acceptable, subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E-1.6(c).

(c) The following requirements apply for selection of analytical parameters:

1. Samples from each area of concern shall be analyzed for contaminants which may be present.

2. Analysis of Target Compound List plus 30/Target Analyte List (TCL + 30/TAL) or Priority Pollutant plus 40 (PP + 40) scans, petroleum hydrocarbons, and pH shall be conducted when contaminants in an area are unknown or not well documented, although a limited contaminant list may be used subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E-1.6(c).

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(d) For all petroleum storage and discharge areas, sample analysis shall be conducted pursuant to the requirements in Table 2-1. Samples taken in non-petroleum storage and discharge areas shall be analyzed for the stored material. Analysis of soil and sediment samples for petroleum hydrocarbons may be in accordance with the revision of NJDEP Method OQA QAM 025 10/91: "Quantitation of Semi-volatile Petroleum Products in Water, Soil, Sediment and Sludge" in effect as of the date on which sampling is performed. Analysis shall be conducted by a laboratory that is certified for any gas chromatography method pursuant to N.J.A.C. 7:18. Laboratory deliverables shall be as specified in the NJDEP method listed above.

(e) If tentatively identified compounds or unknown compounds are detected at concentrations in excess of the applicable remediation standard, they shall be addressed in either of two ways:

1. If the area will be remediated and it is likely that the concentration of the tentatively identified compounds/unknown compounds will be reduced by the remediation, the tentatively identified compounds/unknown compounds shall be analyzed in post remediation samples to document that it is no longer present in excess of the applicable remediation standard; or

2. An attempt shall be made to positively identify and accurately quantify the tentatively identified compounds/unknown compounds using an analytical method consistent with this section so that a remediation standard can be developed.

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**TABLE 2-1
ANALYTICAL REQUIREMENTS FOR
PETROLEUM STORAGE AND DISCHARGE AREAS¹¹**

<u>Sampling Objective</u>	<u>Soil Initial Screening/ Post-Remediation¹</u>	<u>Water Initial Screening</u>
Gasoline, Mineral Spirits	VO+10 ² , Lead ⁷	VO+10 ² , MTBE ³ TBA ³ , Lead ⁷
Kerosene, Jet Fuel	VO+10 ² Naphthalenes ⁵	B/N+15 ² , VO+10 ²
Fuel Oil No. 2, Diesel Fuel	TPHC ⁹	B/N+15 ¹⁰ , VO+10 ²
Fuel Oil Nos. 4 & 6, Hydraulic Oils, Cutting Oil, Crude Oil, Lubricating Oil Waste Oil	TPHC, PAH ⁸ TPHC ⁶ , VO+10 ² , B/N+15 ¹⁰ PCBs, Priority Pollutant Metals or EPA Target Analyte List	B/N+15 ¹⁰ , VO+10 ² PP+40 or TCL/TAL ⁴
Waste Vehicular Crankcase Oil Waste Mineral Oil	TPHC ⁶ , VO+10 ² B/N+15 ¹⁰ , PCBs, lead TPHC	VO+10 ² , B/N+15 ¹⁰

Footnotes

1. Analytical parameters may be limited based on previous analytical results.
2. EPA target compound list volatile organic or priority pollutant volatile organic scans including xylene with a library search.
3. Methyl-tertiary-butyl-ether (MTBE), tertiary-butyl alcohol (TBA) analysis required if gasoline tanks were in service after 1979 and 1969 respectively.
4. Priority Pollutant plus forty (PP+40) including xylene, excluding PCB/pesticide analysis, or EPA Target Compound List plus 30 and EPA Target Analyte List, excluding PCB/pesticide analysis.
5. Naphthalene, including Naphthalene, Methyl Naphthalenes, Dimethyl Naphthalenes; may be analyzed in B/N + 15 fraction or in VO fractions; if analyzed in VO fraction, instrument must be calibrated for these analytes. Quantitation of all isomers found shall be performed against at least one Methyl Naphthalene standard and at least one Di-Methyl Naphthalene standard.
6. Total Petroleum Hydrocarbon (TPHC) analysis required on all samples. Other parameters required on 25 percent of samples where TPHC was detected (minimum of one sample); other parameters shall be analyzed for in the sample with the highest TPHC.
7. Lead Analysis required if source was or is leaded gasoline.
8. TPHC analysis required on all samples. Polynuclear aromatic hydrocarbons (per EPA Priority Pollutant List) analysis required on 25 percent of samples where TPHC exceeds 100

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ppm (minimum of one sample); samples for PAH analysis shall be those with the highest TPHC concentration.

9. TPHC analysis required on all samples; VO + 10 analysis required on 25 percent of samples in which TPHC level in soil exceeds 1000 PPM (minimum of one sample); samples for VO analyses shall be those with the highest TPHC concentration.

10. EPA Target Compound List Base Neutral or Priority Pollutant Base Neutral scan with a library search.

11. Analyses are required on all samples unless otherwise noted.

7:26E-2.2 Quality assurance project plan

(a) If the Department requires a Quality Assurance Project Plan (QAPP) pursuant to an oversight document or the ISRA, UST, or any other regulatory program, the person responsible for conducting the remediation shall submit the Quality Assurance Project Plan in accordance with the schedule contained in the oversight document or applicable regulation, and in a format that corresponds directly to the outline of this section.

1. For each remedial phase at a site involving less than 10 areas of concern, the following shall be included in the Quality Assurance Project Plan:

i. The project's scope and complexity and how the project relates to the overall site remediation strategy;

ii. The data quality objectives specific to the site and sampling event (for example, initial site characterization, delineation of contamination, selection of a remedial action);

iii. The names, addresses and Department laboratory certification number (if applicable) of the laboratories to be used for sample analysis. This shall be updated if changes occur during the project;

iv. The name and telephone number of each of the individuals responsible for the following functions. (This shall be updated if changes occur during the project):

(1) Overall project coordination;

(2) Sampling activities, including quality assurance and quality control; and

(3) Laboratory activities, including quality assurance and quality control;

v. An "Analytical Methods/Quality Assurance Summary Table" which shall include the following information for all environmental, performance evaluation, and quality control samples:

(1) Matrix type;

(2) Number or frequency of samples to be collected per matrix;

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- (3) Number of field and trip blanks per matrix;
- (4) Analytical parameters to be measured per matrix;
- (5) Analytical methods to be used per matrix pursuant to N.J.A.C. 7:26E-2.1;
- (6) If proposed, the number and type of matrix spike and matrix spike duplicate samples to be collected;
- (7) If proposed, the number and type of duplicate samples to be collected;
- (8) If proposed, the number and type of split samples to be collected;
- (9) If proposed, the number and type of performance evaluation samples to be analyzed;
- (10) Sample preservation to be used per analytical method and sample matrix;
- (11) Sample container volume and type to be used per analytical method and sample matrix; and
- (12) Sample holding time to be used per analytical method and sample matrix;

vi. A detailed description of site specific sampling methods to be used pursuant to N.J.A.C. 7:26E-2.1(a) 14, sample storage in the field and sampling handling time requirements;

vii. A detailed description of all calibration and preventative maintenance procedures for all field analytical instrumentation;

viii. A detailed description of procedures used to obtain duplicate and split samples, if applicable;

ix. A detailed description of the chain of custody procedures to be utilized in the field and in the laboratory;

x. A detailed description of sample storage procedures to be utilized by the laboratory; and

xi. Laboratory data deliverable formats to be used.

2. For any remedial phase at a site involving 10 or more areas of concern, the following shall be included in the Quality Assurance Project Plan:

i. The requirements contained in (a) 1i through x above;

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ii. A detailed description of field quality control audit procedures to be used, including without limitation, corrective action procedures;

iii. The procedures to be followed to ensure the complete documentation of all field sampling activities; and

iv. A detailed description of the data reporting procedures and format for all analytical data generated by the laboratory, including without limitation, the following:

(1) Laboratory data deliverable format(s);

(2) The laboratory's review and cross-check procedures for the elimination of errors during routine data transfer, in calculations, preparation of data deliverable packages and off-line storage; and

(3) If required by the Department, a description of the laboratory's capability to provide EPA Contract Laboratory Program analytical methodology data on diskette in standard EPA Contract Laboratory Program format utilizing the requirements in the versions of the applicable EPA Contract Laboratory Program Statements of Work documents in effect as of the date on which the laboratory is performing the analysis.