CHAPTER 26E

TECHNICAL REQUIREMENTS FOR SITE REMEDIATION

Authority

N.J.S.A. 13:1D–1 et seq., 13:1E–1 et seq., 13:1K–6 et seq., 58:10–23.11a et seq., 58:10A–1 et seq., 58:10A–21 et seq., and 58:10B–1 et seq.

Source and Effective Date

R.1997 d.124, effective February 18, 1997.
See: 28 N.J.R. 1098(a), 28 N.J.R. 2298(a), 29 N.J.R. 2278(b).

Executive Order No. 66(1978) Expiration Date

Chapter 26E, Technical Requirements for Site Remediation, expires on February 18, 2002.

Chapter Historical Note

Chapter 26E, Technical Requirements for Site Remediation, was adopted as R.1993 d.245, effective June 7, 1993 (operative July 1, 1993). See: 24 N.J.R. 1695(a), 25 N.J.R. 2281(b).

Pursuant to Executive Order No. 66(1978), Chapter 26E was readopted as R.1997 d.124, effective February 18, 1997. See: Source and Effective Date.

Law Review and Journal Commentaries

ISRA: What You Need to Know. Richard J. Conway, Jr., 160 N.J.Law. 16 (Mag.) (April 1994).

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SUBCHAPTER 1. GENERAL INFORMATION

7:26E–1.1 Scope

(a) This chapter constitutes the minimum technical requirements to investigate and remediate contamination at any site.

(b) Any remediation performed pursuant to this chapter shall not relieve any person from:

1. Complying with more stringent requirements or provisions imposed by any other Federal, State or local applicable statutes or regulations; or

2. Obtaining any and all permits required by State, Federal or local statute or regulation, except as expressly provided herein.

(c) No provision of this chapter shall be construed to limit the Department's authority to require additional remediation based upon site-specific conditions in order to protect human health and the environment.

7:26E–1.2 Liberal construction

These rules, being necessary to promote the public health and welfare, shall be liberally construed in order to permit the Commissioner and the Department to effectuate the purposes of N.J.S.A. 13:1D–1 et seq., 13:1E–1 et seq., 13:1K–6 et seq., 58:10–23.11a et seq., 58:10A–1 et seq., and 58:10A–21 et seq.

7:26E–1.3 Applicability

(a) This chapter establishes the minimum technical requirements which form the basis of the Department's review of the remediation of any contaminated site in New Jersey, including, without limitation, those sites and activities subject to:

1. The Environmental Cleanup and Responsibility Act (ECRA);
2. The New Jersey Underground Storage of Hazardous Substances Act (UST);
3. The Spill Compensation and Control Act;
4. The Solid Waste Management Act; and
5. The Water Pollution Control Act.

(b) Any person seeking Department review of work undertaken pursuant to this chapter shall:

1. Execute an oversight document with the Department pursuant to N.J.A.C. 7:26C;
2. Comply with the requirements of N.J.A.C. 7:26B; or
3. Comply with the requirements of N.J.A.C. 7:14B.

(c) For any site at which a particular phase of remediation was commenced prior to July 1, 1993, the Department may evaluate such work to determine whether the work is in substantial compliance with this chapter, and therefore acceptable to the Department.

7:26E–1.4 Notification

(a) The person responsible for conducting the remediation shall notify the Department in writing as follows:

1. Prior to the initiation of any sampling activities at a site which is not already known to the Department pursuant to either a Department regulatory reporting requirement or Department oversight of the remediation; and
2. Prior to the implementation of a remedy described at N.J.A.C. 7:26E–5.1(c), unless the Department has been otherwise notified of the remedy selected pursuant to Department oversight of the remedial action.

(b) If the remediation is being conducted in response to an emergency situation, the notifications to the Department required pursuant to (a) above will be satisfied through compliance with N.J.A.C. 7:1E.

(c) The notification to the Department pursuant to (a) above shall be in writing and shall include the following information:

1. The name and address of the person responsible for implementing the remedial action;
2. The name of the site;
3. The street address of the site;
4. The lot and block of the site;
5. A brief description of the current use and occupancy of the site;
6. The nature of the sampling activities or remedial action to be performed; and
7. The anticipated start date of the sampling activities or remedial action.

(d) The information required pursuant to (a) above shall be submitted to:

Division of Responsible Party Site Remediation
Bureau of Field Operations
CN 407
Trenton, NJ 08625–0407
Attention: Site Assessment

7:26E–1.5 Certifications

(a) If a document prepared pursuant to this chapter is to be submitted to the Department, it shall be signed and certified pursuant to N.J.A.C. 7:26C, 7:26B or 7:14B.

7:26E–1.6 Documenting compliance with the technical requirements

(a) All work being conducted at a site pursuant to this chapter, whether or not being done with Department oversight, shall be documented and included in reports which follow the format and contain the information required pursuant to the reporting sections of N.J.A.C. 7:26E–2 through 7. If a report has already been submitted to the Department pursuant to another Department regulatory program, including but not limited to, N.J.A.C. 7:14B, 7:26B or 7:26C, then a summary of what was included in the previously submitted report may be submitted. The summary shall include a reference to the Department program to which the report was submitted and the date that it was submitted. Any reports prepared pursuant to this chapter may be combined into a single report.

(b) When the remediation is conducted with Department oversight (see N.J.A.C. 7:26E–1.3 above), the person responsible for conducting the remediation shall submit workplans (if applicable) and reports pursuant to the schedule contained in the oversight document which the person executed with the Department pursuant to N.J.A.C. 7:26C, or as the Department requires pursuant to ECRA or UST. The workplan and/or report shall comply with the format and contain the information required pursuant to N.J.A.C. 7:26E–2 through 7.

(c) In order to provide flexibility in the technical requirements for site remediation described in this chapter, the Department has identified certain limited situations, as specified through this chapter, when alternate sampling, analytical, or investigatory methods may be used without Department pre-approval.

1. Such alternate methods may be used if the person responsible for conducting the remediation documents in the applicable remedial phase report (that is, preliminary assessment, site investigation, remedial investigation, remedial action) rationale acceptable to the Department for using the alternate method.

2. The Department will review the documentation, either as part of the Department's oversight during the remediation or at a later time when the site becomes a Department priority for site remediation.

3. The Department will evaluate the alternate method in terms of its site-specific application, based upon the documentation provided and other appropriate information available to the Department, in terms of the extent to which the alternate method:

i. Has previously been either used successfully or approved by the Department in writing in other similar situations; or

ii. Reflects current technology as documented in peer-reviewed professional journals; and

iii. Provides results which are verifiable and reproducible;

iv. Can be expected to achieve the same results or objectives as the method which it proposes to replace;

v. Furthers the attainment of the goals of the specific remedial phase for which it is used; and

vi. Is consistent with the overall scheme of this chapter to ensure the remediation of contaminated sites in a manner which is protective of human health and the environment.

(d) Any person responsible for conducting the remediation may petition the Department for a variance from any of the requirements in N.J.A.C. 7:26E–2 through 6 inclusive pursuant to the procedural criteria in (d)1 below and the substantive criteria in (d)2 below. The petition shall include a request for use of an alternate approach to be utilized in place of the requirement for which the variance has been requested. The variance is not effective until it has been approved by the Department. The decision as to whether or not to grant the variance rests solely with the Department. The Department will review a petition for a variance pursuant to an oversight document executed in accordance with N.J.A.C. 7:26C, or pursuant to the program requirements of N.J.A.C. 7:26B or 7:14B.

1. To petition for a variance from a requirement in N.J.A.C. 7:26E–2 through 6, the petitioner shall submit the following information to the Department at the address in the applicable oversight document or in accordance with the program requirements of N.J.A.C. 7:26B or 7:14B prior to the utilization of the alternate approach:

i. The name and address of the person submitting the petition;

ii. The name and address of the person conducting the remediation;

iii. The names and addresses of the owner(s) and occupant(s) of the site which is the subject of the variance;

iv. The street address and all tax block and lot numbers of the site which is the subject of the variance;

v. A description of the proposed alternate approach;

vi. A description of site specific conditions applicable to the variance;

vii. The technical basis for the variance pursuant to (c) above; and

viii. Any other information or data the Department requests to thoroughly evaluate the petition.

2. The Department will evaluate the petition for a variance from the requirements of N.J.A.C. 7:26E–2 through 6 according to the same criteria as those listed in (c) above for approval of alternate methods.

7:26E–1.7 Criteria for going beyond the minimum technical requirements

(a) The Department may require additional work beyond the minimum technical requirements set forth in this chapter for whenever necessary for the Department to ensure adequate protection of human health and the environment based upon a review of the following areas:

1. The number or magnitude of the discharge(s) being investigated;

2. The nature of the substances discharged;

3. A change in the certification or other authorization of the laboratory performing analyses previously submitted for the site in question or any other site;

4. The identification of additional exposure pathways not otherwise fully investigated pursuant to the minimum requirements;

5. The identification of additional receptors not otherwise fully investigated pursuant to the minimum requirements;

6. Distance to and sensitivity of receptors;

7. When the Department determines that additional data or information is needed to fully evaluate the site; and

8. Any other site-specific conditions the Department identifies which necessitate the need for additional work.

7:26E–1.8 Definitions

The following words and terms, when used in this chapter, shall have the following meanings unless the context clearly indicates otherwise:

"Acid extractable organic compounds" means semivolatile compounds amenable to analysis by extraction of the sample with a pH acidic organic solvent. For the purposes of this chapter, analysis of acid extractable organic compounds means the analysis of a sample for either:

1. Those priority pollutants listed as acid compounds in Appendix B, Table II of N.J.A.C. 7:14A; or

2. Those target compound list compounds which are phenol and phenolic compounds under the listing of semivolatile compounds in the version of the EPA Contract Laboratory Program Statement of Work for Organic Analysis, Multi–Media, Multi–Concentration in effect as of the date on which the laboratory is performing the analysis.

"Applicable remediation standard" means the numeric standard to which contaminants must be remediated for soil, ground water or surface water, or other environmental media, as provided by the Department pursuant to rule, including without limitation the Ground Water Quality Standards, N.J.A.C. 7:9–6, and Surface Water Quality Standards, N.J.A.C. 7:9–4, or as determined by the Department on a case-by-case basis.

"Area of concern" means any existing or former location where hazardous substances, hazardous wastes, hazardous constituents or pollutants are or were known or suspected to have been discharged, generated, manufactured, refined, transported, stored, handled, treated, disposed, or where hazardous substances, hazardous wastes, hazardous constituents or pollutants have or may have migrated, including, but not limited to, all current and former:

1. Bulk storage tanks and appurtenances, including, without limitation:

i. Tanks and silos;

ii. Rail cars;

iii. Piping, above and below ground pumping stations, sumps and pits; and

iv. Loading and unloading areas;

2. Storage and staging areas, including:

i. Storage pads and areas;

ii. Surface impoundments and lagoons;

iii. Dumpsters; and

iv. Chemical storage cabinets or closets;

3. Drainage systems and areas, including, without limitation:

i. Building floor drains and piping, including trenches and piping from sinks that potentially receive process waste;

ii. Roof leaders (when process operations vent to roof);

iii. Drainage swales and culverts;

iv. Storm sewer collection systems;

v. Storm water detention ponds and fire ponds;

vi. Surface water bodies;

vii. Leach fields; and

viii. Dry wells and sumps;

4. Discharge and disposal areas, including, without limitation:

i. Areas of discharges pursuant to N.J.A.C. 7:1E;

ii. Waste piles as defined by N.J.A.C. 7:26;

iii. Waste water treatment, collection and disposal systems, including, without limitation, septic systems, seepage pits and dry wells;

iv. Landfills;

v. Landfarms;

vi. Sprayfields; and

vii. Incinerators;

5. Other areas of concern, including, without limitation:

i. Electrical transformers and capacitors;

ii. Building material and insulation with asbestos;

iii. Building interiors including, without limitation:

(1) Floor drains;

(2) Trenches;

(3) Pits or sumps;

(4) Hazardous materials storage or handling areas;

(5) Equipment;

(6) Loading or transfer areas;

(7) Air vents and ducts;

(8) Areas around boilers/mechanical device areas;

(9) Transformers;

(10) Laboratory;

(11) Waste treatment areas; and

(12) Discolored areas or spill areas;

iv. Open areas away from production operations;

v. Areas with stressed vegetation;

vi. Other discharge areas;

vii. Underground piping including industrial process sewers;

viii. Compressor vent discharges;

ix. Non contact cooling water discharges;

x. Areas that may have received floodwater or stormwater runoff from potentially contaminated areas; and

xi. Any other area suspected of containing contaminants;

6. Ground water areas of concern, including, without limitation, present or past regulated activities under the New Jersey Pollutant Discharge Elimination System (NJPDES) Discharge to Ground Water regulations, N.J.A.C. 7:14A, including: seepage pits; dry wells; lagoons; and septic systems which received industrial waste; and

7. Surface water areas of concern, including, without limitation, all surface water areas and associated sediment which receive or may have received any point or non-point source discharge from the site.

"Base neutral organic compound" means semivolatile compounds amenable to analysis by extraction of the sample with a pH neutral and a pH basic organic solvent. For the purposes of this chapter, analysis of base neutral organic compounds means the analysis of a sample for either:

1. Those priority pollutants listed as base neutral compounds in Appendix B, Table II of N.J.A.C. 7:14A; or

2. Those target compound list compounds identified as semivolatiles except phenol and phenolic compounds in the version of the EPA Contract Laboratory Program Statement of Work for Organic Analysis, Multi–Media, Multi–Concentration in effect as of the date on which the laboratory is performing the analysis.

"CERCLA" means the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. 9601 et seq.).

"Commissioner" means the Commissioner of the Department of Environmental Protection and Energy or his or her authorized representative.

"Containment" or "containment activities" means actions to limit or prevent discharges or the spread of contamination.

"Contaminant" means any hazardous substance, hazardous constituent, hazardous waste or pollutant discharged by a person.

"Contaminated site" means all portions of environmental media at a site that contain one or more contaminants at a concentration which fails to satisfy any applicable remediation standard, and includes all contamination at an individual establishment, facility or other site, and all contamination which is emanating, or has emanated, therefrom.

"Contract laboratory program" or "CLP" means a program of chemical analytical services developed by the EPA to support CERCLA.

"Department" means the New Jersey Department of Environmental Protection and Energy.

"Department certified laboratory" means a laboratory that is currently certified pursuant to N.J.A.C. 7:18, the Regulations Governing Laboratory Certification and Standards of Performance, to perform laboratory analyses for a specific certification category and a specific parameter within the certification categories.

"Diligent inquiry" means:

1. Conducting a diligent search of all documents which are reasonably likely to contain information related to the object of the inquiry, which documents are in such person's possession, custody or control, or in the possession, custody or control of any other person from whom the person conducting the search has a legal right to obtain such documents; and

2. Making reasonable inquiries of current and former employees and agents whose duties include or included any responsibility for hazardous substances, hazardous wastes, hazardous constituents, or pollutants, and any other current and former employees or agents who may have knowledge or documents relevant to the inquiry.

"Discharge" means any intentional or unintentional act or omission resulting in the releasing, spilling, leaking, pumping, pouring, emitting, emptying or dumping of a hazardous substance, hazardous constituent, hazardous waste or pollutant into the waters or onto the lands of the State, or into waters outside the jurisdiction of the State when damage may result to the lands, waters, or natural resources within the jurisdiction of the State.

"ECRA" means the Environmental Cleanup Responsibility Act, N.J.S.A. 13:1K–6 et seq.

"Environmental medium" means any component such as soil, air, sediment, structures, ground water or surface water.

"EPA" means the United States Environmental Protection Agency.

"Fill material" means any material not indigenous to the site or area of concern including, but not limited to, non-homogeneous, unconsolidated material such as demolition debris, dredge spoils, or ash by-products of fossil fuels, which has been used as fill or as cover.

"Free product" means a separate phase material present in concentrations greater than a contaminant's residual saturation point.

"Full laboratory data deliverables" means those deliverables identified as follows:

1. For non-EPA/Contract Laboratory Program analyses, the regulatory format data deliverables listed in the version of the Professional Laboratory Analytical Services contract issued by the New Jersey Department of Treasury, Division of Purchase and Property in effect as of the date on which the laboratory is performing the analysis; and

2. For EPA/Contract Laboratory Program analyses, the deliverables listed in the EPA Contract Laboratory Program "Statement of Work" documents in effect as of the date on which the laboratory is performing the analysis as modified by specific requirements listed in Appendix A, incorporated herein by reference.

"Ground water" means the portion of the water beneath the land surface that is within the zone of saturation where all pore spaces of the geologic formation are filled with water.

"Hazardous constituent" means any substance defined as such pursuant to the Hazardous Waste Regulations, N.J.A.C. 7:26–8.16.

"Hazardous substance" means any substance defined as such pursuant to the Discharges of Petroleum and Other Hazardous Substances Regulations, N.J.A.C. 7:1E.

"Hazardous waste" means any solid waste as defined in the Solid Waste Regulations, N.J.A.C. 7:26–1.4, that is further defined as a hazardous waste pursuant to the Hazardous Waste Regulations, N.J.A.C. 7:26–8.

"Highly permeable soils" means soils having less than 15 percent silts and/or clays. Soils may be classified in the field using a standard system texture analysis.

"Impermeable" means a layer of natural and/or man-made material of sufficient thickness, density and composition so as to have a maximum permeability for water of 10^{-7} cm/sec at the maximum anticipated hydrostatic pressure.

"Innovative and emerging treatment technologies" means any developed technology for which performance information is limited or incomplete (innovative) or a technology in an early stage of development for which there is sufficient data to validate its basic concepts (emerging). An innovative treatment technology may have been successfully used at a limited number of contaminated sites but generally requires more extensive field testing and evaluation before it is considered a proven and readily available technology. An emerging treatment technology may have been successfully applied at a bench top or pilot scale level but has not yet been demonstrated to be effective at a full scale level.

"Landfill" means a sanitary landfill as defined pursuant to N.J.S.A. 13:1E–1 et seq.

"Method detection limit" or "MDL" means the minimum concentration of a substance that can be measured and reported with a 99 percent confidence that the analyte concentration is greater than zero and is determined from the analysis of a sample in a given matrix containing the analyte.

"Natural resources" means all land, biota, fish, shellfish, and other wildlife, air, waters and other such resources.

"Non-targeted compound" means a compound detected in a sample using a specific analytical method that is not a targeted compound, a surrogate compound, a system monitoring compound or an internal standard compound.

"Oversight document" means any document defined as an oversight document pursuant to N.J.A.C. 7:26C.

"Permanent remedy" means a remedy resulting in chemical or biochemical transformation of the contaminant from a concentration that is above the then-applicable residential remediation standard to a concentration that is below the then-applicable residential remediation standard, such that no further action is required to ensure the contaminant remains at a concentration that is below the then-applicable residential remediation standard, or a remedy that allows the contaminant to be reused as a product. Permanent remedies for organic contaminants include, without limitation, thermal destruction, biotransformation, chemical oxidation, or vitrification. Permanent remedies are currently considered unavailable for metallic contaminants except where metal-contaminated media can be reprocessed or reused. If the applicable remediation standards are amended, however, additional remediation may be necessary in order for a previously implemented "permanent remedy" to meet the amended remediation standard.

"Person" means any individual or entity, including without limitation, a public or private corporation, company, estate, association, society, firm, partnership, joint stock company, foreign individual, or entity, interstate agency or authority, the United States, and any of its political subdivisions, the State of New Jersey, or any of the political subdivisions of or found within the State of New Jersey, or any of the other meanings which apply to the common understanding of the term.

"Person responsible for conducting the remediation" includes any person who executes or is otherwise subject to an oversight document, and any person who is performing the remediation or has control over the person (for example, contractor or consultant) who is performing the remediation, including, without limitation, an owner or operator who is subject to either ECRA or UST.

"Pollutant" means any substance defined as such pursuant to the Water Pollution Control Act, N.J.S.A. 58:10A–1 et seq.

"Practical quantitation level" or "PQL" means the lowest quantitation level of a given analyte that can be reliably achieved among laboratories within the specified limits of precision and accuracy of a given analytical method during routine laboratory operating conditions.

"Preliminary assessment" means the initial search and evaluation of existing site specific operational and environmental information to determine if further investigation concerning the documented, alleged, suspected or potential discharge of any contaminant is required by the Department. The preliminary assessment is the first phase in the process of determining whether contaminants are present at a site.

"Priority pollutant plus 40" or "PP + 40" means the priority pollutant list of 126 compounds and elements developed by the EPA pursuant to Section 307(a)(1) of the Clean Water Act and 40 non-targeted organic compounds detected by gas chromatography/mass spectroscopy (GC/MS) analysis. For the purposes of this chapter, a PP + 40 scan means the analysis of a sample for all priority pollutants except asbestos and 2,3,7,8–tetra–chloro–dibenzo–p–dioxin, and up to 15 non-targeted volatile organic compounds and up to 25 non-targeted semivolatile organic compounds as analyzed using GC/MS analytical methods. Non-targeted compound criteria shall be used pursuant to the version of the EPA "Contract Laboratory Program Statement of Work for Organic Analysis, Multi-media, Multi-concentration" in effect as of the date which the laboratory is performing the analysis.

"Quality assurance" means the total integrated program for assuring the reliability of monitoring and measurement data which includes a system for integrating the quality planning, quality assessment and quality improvement efforts to meet data end-use requirements.

"Quality assurance project plan" means a document which presents in specific terms the policies, organization, objectives, functional activities and specific quality assurance/quality control activities designed to achieve the data quality goals or objectives of a specific project or operation.

"Quality control" means the routine application of procedures for attaining prescribed standards of performance in the monitoring and measurement process.

"Receptor" means any human or other ecological component which is or may be affected by a contaminant from a contaminated site.

"Reduced laboratory data deliverables" means, for both EPA/Contract Laboratory Program and non-EPA/Contract Laboratory Program analyses, the laboratory data deliverables listed in Appendix A, Sections III and IV.

"Remedial action" means those actions taken at a contaminated site as may be specified in a decision document, record of decision or other document the Department determines appropriate. The term includes, but is not limited to, such actions at the location of a contaminated site as compliance with the applicable remediation standards, storage, confinement, perimeter protection using dikes, trenches, or ditches, clay or other covers, neutralization, cleanup of discharged contaminants and associated contaminated materials, ground water pumping and treatment, recycling or reuse, diversion, destruction, segregation of wastes, dredging or excavations, repair or replacement of leaking containers, collection of leachate and runoff, treatment, off-site transport and off-site storage, treatment, destruction, or secure disposition of contaminants and associated contaminated materials, or any monitoring required to assure that such actions protect human health or the environment. The term includes the temporary or permanent relocation of residents and businesses and community facilities where the Department determines that, alone or in combination with other measures, such relocation is more cost-effective than, and environmentally preferable to, the transportation, storage, treatment, destruction, or secure disposition off-site of such contaminants, or may otherwise be necessary to protect the human health and the environment. The term includes the restoration of natural resources.

"Remedial alternative analysis" means a study to develop and evaluate options for remedial action. The remedial alternative analysis emphasizes data analysis and is generally performed concurrently and in an interactive fashion with the remedial investigation. The remedial alternative analysis process uses data gathered during the remedial investigation to develop conceptual remedial action alternatives based on the characterization of the nature and extent of contamination. The remedial investigation data are used to define the objectives of the remedial action and to develop remedial action alternatives. Next, an initial screening of these alternatives is conducted to reduce the number of alternatives to a workable number. Finally, the remedial alternative analysis involves an analysis for engineering, scientific, institutional, human health, environmental and cost factors of a limited number of alternatives which remain after the initial screening stage.

"Remedial investigation" means actions to investigate contamination and the problems presented by a discharge. The remedial investigation emphasizes data collection and site characterization, and is generally performed concurrently and in an interactive fashion with the remedial alternative analysis. The remedial investigation includes sampling and monitoring, as necessary, and includes the gathering of sufficient information, to determine the necessity for remedial action and to support the evaluation of remediation alternatives.

"Remedial phase" means a distinct component of the remediation process. Such components may include preliminary assessment, site investigation, remedial investigation, remedial alternative analysis, and remedial action.

"Remediation" means all necessary actions to investigate and clean up any known or suspected discharge or threatened discharge of contaminants, including, without limitation, preliminary assessment, site investigations, remedial investigations, remedial alternative analyses, and remedial actions.

"Semivolatile organic compounds" means compounds amenable to analysis by extraction of the sample with an organic solvent. For the purposes of this chapter, analysis of semivolatile organic compounds means the analysis of a sample for either:

1. Those priority pollutants listed as base neutral and acid compounds in Appendix B, Table II of N.J.A.C. 7:14A; or

2. Those target compound list compounds identified as semivolatiles in the version of the EPA Contract Laboratory Program Statement of Work for Organic Analysis, Multi–Media, Multi–Concentration in effect as of the date on which the laboratory is performing the analysis.

"Site investigation" means the collection and evaluation of data necessary to determine whether or not contaminants exist at the site which fails to satisfy the applicable remediation standard.

"Soil" means the unconsolidated mineral and organic matter on the surface of the earth that has been subjected to and influenced by geologic and other environmental factors.

"Spill Act" means the Spill Compensation and Control Act, N.J.S.A. 58:10–23.11a et seq.

"Surface water" means water defined as surface water pursuant to the Surface Water Quality Regulations, N.J.A.C. 7:9–4.

"SWMA" means the Solid Waste Management Act, N.J.S.A. 13:1E–1 et seq.

"Tank" means a stationary device designed to contain an accumulation of hazardous substances, hazardous constituents, hazardous wastes, or pollutants which is constructed of non-earthen materials (for example, concrete, steel, plastic) that provide structural support.

"Target analyte list" or "TAL" means the list of inorganic compounds/elements designated for analysis as contained in the version of the EPA Contract Laboratory Program Statement of Work for Inorganics Analysis, Multi–Media, Multi–Concentration in effect as of the date on which the laboratory is performing the analysis. For the purpose of this chapter, a Target Analyte List scan means the analysis of a sample for Target Analyte List compounds/elements.

"Targeted compounds" means a hazardous substance, hazardous waste, hazardous constituent or pollutant for which a specific analytical method is designed to detect that potential contaminant both qualitatively and quantitatively.

"Target compound list plus 30" or "TCL + 30" means the list of organic compounds designated for analysis (TCL) as contained in the version of the EPA "Contract Laboratory Program Statement of Work for Organics Analysis, Multi–Media, Multi–Concentration" in effect as of the date on which the laboratory is performing the analysis, and up to 30 non-targeted organic compounds (plus 30) as detected by gas chromatography/mass spectroscopy (GC/MS) analysis. For the purposes of this chapter, a Target Compound List + 30 scan means the analysis of a sample for Target Compound List compounds and up to 10 non-targeted volatile organic compounds and up to 20 non-targeted semivolatile organic compounds using GC/MS analytical methods. Non-targeted compound criteria shall be pursuant to the version of the EPA "Contract Laboratory Program Statement of Work for Organics Analysis, Multi–Media, Multi–Concentration" in effect as of the date on which the laboratory is performing the analysis.

"Tentatively identified compound" or "TIC" means a non-targeted compound detected in a sample using a GC/MS analytical method which has been tentatively identified using a mass spectral library search. An estimated concentration of the TIC is also determined.

"Underground storage tank" means any one or combination of tanks, including appurtenant pipes, lines, fixtures, and other related equipment, used to contain an accumulation of hazardous substances, hazardous constituents, hazardous wastes or pollutants, the volume of which, including the volume of the appurtenant pipes, lines, fixtures and other related equipment, is ten percent or more beneath the surface of the ground.

"Unknown compound" means a non-targeted compound which cannot be tentatively identified. Based on the analytical method used, the estimated concentration of the unknown compound may or may not be determined.

"UST" means the New Jersey Underground Storage of Hazardous Substances Act, N.J.S.A. 58:10A–21 et seq.

"Volatile organics" means organic compounds amenable to analysis by the purge and trap technique. For the purposes of this chapter, analysis of volatile organics means the analysis of a sample for either those priority pollutants listed as amenable for analysis using EPA method 624 or those target compounds identified as volatiles in the version of the EPA "Contract Laboratory Program Statement of Work for Organics Analysis, Multi–Media, Multi–Concentration" in effect as of the date on which the laboratory is performing the analysis.

"Waters" means the ocean and its estuaries to the seaward limit of the State's jurisdiction, all springs, streams and bodies of surface or ground water, whether natural or artificial, within the boundaries of this State.

"Wetland" means any freshwater or coastal wetland.

"WPCA" means the Water Pollution Control Act, N.J.S.A. 58:10A–1 et seq.

7:26E–1.9 Health and safety plan

Any person conducting remediation activities shall prepare a site-specific health and safety plan which shall be adhered to by all personnel involved in the remediation. The plan shall be in accordance with the most recently adopted and applicable general industry (29 CFR 1910) and construction (29 CFR 1926) standards of the Federal Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, as well as any other Federal, State or local applicable statutes or regulations.

7:26E–1.10 Severability

If any section, subsection, provision, clause or portion of these regulations is adjudged invalid or unconstitutional by a court of competent jurisdiction, the remainder of these regulations shall not be affected thereby.

7:26E–1.11 Bias for action

As a first priority during remediation, contaminants in all media should be contained and/or stabilized to prevent contaminant exposure to receptors and to prevent further movements of contaminants through any pathway.

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 shall 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 except for that provided in 2(a)1iii below, or use of an analytical method for which laboratory certification exists pursuant to N.J.A.C. 7:18, the laboratory shall be certified for that specific parameter, category of parameters or analytical method pursuant to N.J.A.C. 7:18;

ii. For the analysis of non-aqueous samples using specific analytical methods contained in the third edition or most recent edition of EPA Publication SW–846, "Test Methods for Evaluating Solid Waste", the laboratory shall be a New Jersey Certified Laboratory as described in Table 2–1; or

iii. For the analysis of samples using USEPA Contract Laboratory Program (CLP) analytical methods, the laboratory shall be:

(1) A New Jersey Certified Laboratory as described in Table 2–2; or

(2) A participant in good standing in the USEPA CLP for the applicable Statement of Work protocol as described in the contract the laboratory has with the USEPA as of the date on which the laboratory is performing the analysis; or

(3) A contract awardee for the applicable methods under Task IV of the version of the Professional Laboratory Analytical Services contract issued by the New Jersey Department of Treasury, Division of Purchase and Property, in effect as of the date on which the laboratory is performing the analysis;

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.

TABLE 2–1

Laboratory Requirements for Sample Analysis Using Selected USEPA SW–846 Analytical Methods

USEPA SW–846 Analytical Method	Required NJDEPE Drinking Water or Water Pollution method/category certification
8240—Volatile Organics by GC/MS	624 or 524.1 or 524.2
8250, 8270—Semivolatile Organics by GC/MS	625 or 525
8080—Organochlorine Pesticides and PCBs by GC	608 or 508 or 505 or "Organochlorine Pesticides—Drinking Water" or "Pesticides—Water Pollution"
8010—Halogenated Volatile Organics by GC	601 or 502.1 or 502.2 or "Trihalomethanes—Drinking Water"
8020—Aromatic Volatile Organics by GC	602 or 502.2 or 503.1
8120—Chlorinated Hydrocarbons by GC	612
8150—Chlorinated Herbicides by GC	515.1 or "Chlorophenoxy Acid Herbicides"
6010—Metals by ICP	Specific Metal by ICP
Various Methods—Metals by AA Furnace	Specific Metal by Graphite Furnace
Various Methods—Metals by Flame AA	Specific Metal by AA

USEPA SW–846 Analytical Method	Required NJDEPE Drinking Water or Water Pollution method/category certification
7471—Mercury by Cold Vapor	Mercury—Cold Vapor
Various Methods—Cyanide	Cyanide*

TABLE 2–2
Laboratory Requirements for Sample Analysis
Using USEPA Contract Laboratory
Program Analytical Methods

	USEPA CLP Statement of Work	Required NJDEPE Drinking Water or Water Pollution Method/Category Certification
1.	Organics Analysis, Multi–Media, Multi–Concentration	624[1] or 524.1[1] or 524.2[1] and 625[2] or 525[2] and 608[3] or 508[3] or 505[3] or "Organochlorine Pesticides—Drinking Water"[3] or "Pesticides—Water Pollution"[3]
2.	Organics Analysis, Multi–Media, High Concentration	624[1] or 524.1[1] or 524.2[1] and 625[2] or 525[2] and 608[3] or 508[3] or 505[3] or "Organochlorine Pesticides—Drinking Water"[3] or "Pesticides—Water Pollution"[3]
3.	Low Concentration Water for Organic Analysis	524.1[1] or 524.2[1] and 625[2] or 525[2] and 608[3] or 508[3] or 505[3] or "Organochlorine Pesticides—Drinking Water"[3] or "Pesticides—Water Pollution"[3]
4.	Low Concentration Water for Volatile Organic Analysis	524.1[1] or 524.2[1]
5.	Inorganics Analysis, Multi–Media, Multi–Concentration	Al, Sb, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Mg, Mn, Ni, K, Ag, Na, V, Zn by ICP and As, Pb, Se, Tl by Graphite Furnace and Hg by Cold Vapor and CN
6.	Inorganics Analysis, Multi–Media, High–Concentration	Al, Sb, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Mg, Mn, Ni, K, Ag, Na, V, Zn by ICP and As, Pb, Se, Tl by Graphite Furnace and Hg by Cold Vapor and CN
7.	Low Concentration Water for Inorganic Analysis	Al, Sb, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Mg, Mn, Ni, K, Ag, Na, V, Zn by ICP and As, Pb, Se, Tl by Graphite Furnace and Hg by Cold Vapor and CN

1 Required for the analysis of volatile organics
2 Required for the analysis of semi-volatile organics
3 Required for the analysis of pesticides and PCBs

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, category of parameters or analytical method shall result in the rejection of all analytical data for that given parameter, category of parameters or analytical method 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, category of parameters or analytical method contained in Table 2–1 shall result in the rejection of all analytical data from the comparable USEPA Publication SW–846 analytical method generated after the date of decertification or suspension.

iii. For laboratories performing analyses pursuant to (a)1iii(1) above, decertification or suspension of a laboratory pursuant to N.J.A.C. 7:18 for any given parameter, category of parameters or analytical method contained in Table 2–2 shall result in the rejection of all analytical data from the comparable USEPA Contract Laboratory Program (CLP) analytical method generated after the date of decertification or suspension.

iv. For laboratories performing analyses pursuant to (a)1iii(2) above, suspension of a laboratory by the USEPA from the Contract Laboratory Program for a given Statement of Work protocol or loss of a given USEPA Contract Laboratory Program Contract shall result in the rejection of all data from the given USEPA Contract Laboratory Program Statement of Work protocol generated after the date of suspension or loss of contract.

v. For laboratories performing analyses pursuant to (a)1iii(3) above, placement of a laboratory on non-engagable status by the New Jersey Department of Treasury for a given method under Task IV of the Professional Laboratory Analytical Services Contract or loss of a Professional Laboratory Analytical Services Contract shall result in the rejection of all data from the given method under Task IV of the Professional Laboratory Analytical Services Contract generated after the date of non-engagable status or loss of contract.

3. Except as provided in (a)4 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; and

x. The United States Department of Energy.

4. 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.

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

6. 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 NJDEPE "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).

7. 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.

8. For solid sample analysis, including without limitation, 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 interferes 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. Laboratory data deliverables 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;

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, 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.

(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, ethyl benzene, 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 analytical 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 NJDEPE "Field Sampling Procedures Manual";

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

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

iv. The "Field Screening Methods Catalog," EPA/540/2–8 8/005.

4. Other field analytical 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 provided:

i. That gas chromatography methods with a mass spectrometer detector system are used for analysis of volatile/semi-volatile contaminants (exclusive of herbicides, pesticides, and PCBs); and

ii. Chromatography methods with a mass spectrometer detector system are used for the analysis of organic analytes amenable only to non-gas chromatographic techniques.

2. A mass spectrometer detector system pursuant to (c)1 above 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.

3. 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).

4. 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).

5. Analysis of soil and sediment samples for petroleum hydrocarbons may be in accordance with the "Interim Petroleum Hydrocarbon Guideline" prepared by the Department.

(d) For all petroleum storage and discharge areas, sample analysis shall be conducted pursuant to the requirements in Table 2–3. Samples taken in non-petroleum storage and discharge areas shall be analyzed for the stored material.

TABLE 2–3

ANALYTICAL REQUIREMENTS FOR PETROLEUM STORAGE AND DISCHARGE AREAS [11]

Sampling Objective	Soil Initial Screening/Post–Remediation[1]	Water Initial Screening
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[10], 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	TPHC, PAH[8]	B/N + 15[10], VO + 10[2]
Waste Oil	TPHC[6], VO + 10[2], B/N + 15[10], PCBs, Priority Pollutant Metals or EPA Target Analyte List	PP + 40 or TCL/TAL[4]

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 or EPA Target Compound List plus 30 and EPA Target Analyte List.

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 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.

(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.

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 ECRA, 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;

(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)6, 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;

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.

SUBCHAPTER 3. PRELIMINARY ASSESSMENT AND SITE INVESTIGATION

7:26E–3.1 Preliminary assessments

(a) The purpose of a preliminary assessment is to identify the presence of any potentially contaminated areas of concern. If any potentially contaminated areas of concern are identified, then there is a need for a site investigation pursuant to N.J.A.C. 7:26E–3.3. If no potentially contaminated areas of concern are identified, then no further action is required at the site.

(b) A preliminary assessment is the first step in the process to determine whether or not a site is contaminated.

(c) A preliminary assessment shall be based on diligent inquiry and include an evaluation of the following:

1. Historical information concerning the site history shall be part of the preliminary assessment unless the remediation is directed at either a specific discharge event, rather than a particular area of concern or any underground tank or underground tank system. The site history shall include an evaluation of the following to the extent available from diligent inquiry:

i. Site history information from sources including, but not limited to the following:

(1) Sanborn Fire Insurance Maps;

(2) MacRae's Industrial Directory;

(3) Title and Deed;

(4) Site plans and facility as-built drawings; and

(5) Federal, State, county and local government files;

ii. The industrial/commercial site history from the time the site was naturally vegetated or utilized as farmland, including without limitation:

(1) Names of all owners and operators;

(2) Dates of ownership of each owner;

(3) Dates of operation of each operator; and

(4) Brief descriptions of the past industrial/commercial usage of the site by each owner and operator;

iii. All raw materials, finished products, formulations and hazardous substances, hazardous wastes, hazardous constituents and pollutants which are or were present on the site, including intermediates and by-products;

iv. Present and past production processes, including dates, and their respective water use and shall be identified and evaluated, including ultimate and potential discharge and disposal points and how and where materials are or were received onsite (for example, rail, truck);

v. All former and current containers, container or bulk storage areas, above and below ground tanks, above and below ground waste and product delivery lines, surface impoundments, landfills, septic systems and other structures, vessels, conveyances or units that contain or previously contained hazardous substances, hazardous waste, hazardous constituents and pollutants, including:

(1) Type;

(2) Age;

(3) Dimension of each container;

(4) Location;

(5) Chemical content;

(6) Integrity (for example, tank test reports);

(7) Volume;

(8) Construction materials; and

(9) Inventory control records unless a Department-approved leak detection system pursuant to N.J.A.C. 7:1E or 7:14B has always been in place and there is no discharge history;

vi. If the site area exceeds two acres, an interpretation of the aerial photographical history of the site, based on available current and historical color, black and white and infrared aerial photographs (scale 1:18,000 or less) of the site and surrounding area at a frequency which provides the evaluator with a historical perspective of site activities. The photographic history shall date back to 1932 or to the earliest photograph available. Aerial photographic coverage is available for review at the New Jersey Department of Environmental Protection and Energy, Tidelands Management Program, Aerial Photo Library, 9 Ewing Street, Trenton, New Jersey;

vii. Any data or information concerning known discharges that have occurred on the site;

viii. Remediation activities previously conducted or currently underway at the site including dates of previous discharges, remedial actions, and all existing sampling data concerning contaminants at the site. If a government agency was involved, the name of the lead government agency, case identification number, and current case status;

ix. All existing environmental sampling data concerning contaminants at the site;

x. Any known changes in site conditions or new information developed since completion of previous sampling or remediation;

xi. All Federal, State and local environmental permits including permits for all previous and current owners or operators, applied for or received, or both, for the site including:

(1) The name and address of permitting agency;

(2) The reason for the permit;

(3) The permit identification number;

(4) The application date;

(5) The date of approval, denial, or status of application;

(6) The name and current address of all permittees;

(7) The reason for denial, revocation or suspension if applicable; and

(8) The permit expiration date; and

xii. All administrative, civil and criminal enforcement actions for alleged violations of environmental laws concerning the site, including:

(1) The name and address of agency that initiated the enforcement action;

(2) Date of the enforcement action;

(3) The section of statute, rule or permit allegedly violated;

(4) The type of enforcement action;

(5) A description of alleged violations;

(6) The resolution or status of violation and enforcement action; and

(7) A description of any potential environmental impact which may have resulted from the alleged violation.

2. The person conducting the preliminary assessment shall conduct a site visit to verify the findings in (c)1 above.

7:26E–3.2 Preliminary assessment report

(a) The person responsible for conducting the remediation shall prepare a preliminary assessment report which:

1. Presents and discusses all of the information identified, evaluated or collected pursuant to N.J.A.C. 7:26E–3.1;

2. Is presented in a format that corresponds to the outline of N.J.A.C. 7:26E–3.1(c);

3. Shall also include:

i. Scaled site plans detailing lot and block numbers, property and leasehold boundaries, construction or destruction of buildings, areas where fill or cover material has been brought onsite, paved and unpaved areas, vegetated and unvegetated areas, all areas of concern and active and inactive wells; and

ii. Scaled historical site plans and facility as-built construction drawings, if available;

iii. A copy of the United States Geologic Survey (USGS) 7.5 minute topographic quadrangle that includes the site and an area of at least a one mile radius around the site. This map shall be the most recent USGS revision and shall clearly note the facility location and property boundaries. When a portion of the USGS quadrangle is used, the scale, north arrow, contour interval, longitude and latitude, along with the name and date of the USGS quadrangle shall be noted on the map; and

iv. A summary of the data and information evaluated pursuant to N.J.A.C. 7:26E–3.1(c)1vii, viii and ix shall be presented by area of concern and all phases of work for a particular area of concern shall be integrated into a single discussion of that area;

4. For each area of concern identified at the site, the report shall contain a recommendation that either:

i. The area of concern is potentially contaminated, and thus additional investigation or remediation is required; or

ii. The area of concern is not believed to contain contaminants above the applicable remediation standards, in which case the preliminary assessment report shall include documentation for this belief.

(b) The Department will determine the extent to which prior submissions or completions may satisfy the specific items required for the preliminary assessment. If the Department approves any such prior work in writing, then that work may be included as part of the preliminary assessment.

7:26E–3.3 Site investigations

(a) The purpose of a site investigation is to determine if any contaminants are present at the site above any of the applicable remediation standards or if no further action is required. If such contaminants are present at the site, then additional remediation is necessary prior to a Department determination that no further action is necessary.

(b) A site investigation shall be conducted based upon the information collected pursuant to the preliminary assessment requirements in N.J.A.C. 7:26E–3.1 and shall satisfy all of the following requirements:

1. The general sampling requirements in N.J.A.C. 7:26E–3.4;

2. The building interior sampling requirements in N.J.A.C. 7:26E–3.5, if applicable;

3. The soil sampling requirements in N.J.A.C. 7:26E–3.6;

4. The ground water sampling requirements in N.J.A.C. 7:26E–3.7, if applicable;

5. The surface water and sediment sampling requirements in N.J.A.C. 7:26E–3.8, if applicable; and

6. The area specific sampling requirements in N.J.A.C. 7:26E–3.9.

(c) If required pursuant to an oversight document or other applicable rule, the person responsible for conducting the remediation shall submit reports pursuant to N.J.A.C. 7:26E–3.10 in accordance with the schedules contained in the oversight document or other applicable rule.

(d) It is often appropriate to phase the site investigation so that the areas of concern most likely to be contaminated above the applicable remediation standards are sampled first. If at any time during the site investigation, any contamination is found above the applicable remediation standards, then the site investigation may be discontinued and the remediation continued at either the remedial investigation or remedial action phase.

7:26E–3.4 Site investigation—general sampling requirements

(a) Sampling shall be conducted in all potentially contaminated areas of concern, whether relating to current or former uses of the site to determine whether or not any contaminants are present above the applicable remediation standard.

1. Sampling shall be biased to the suspected location of greatest contamination.

2. Samples shall be biased based on professional judgment, area history, discolored soil, stressed vegetation, drainage patterns, field instrument measurements, odor, or other field indicators.

3. Sampling locations shall comply with requirements listed in N.J.A.C. 7:26E–3.5 through 3.9.

(b) All sampling methods and laboratory analyses shall be conducted pursuant to N.J.A.C. 7:26E–2.1.

(c) Composite sampling shall not be conducted, except as necessary for waste classification pursuant to N.J.A.C. 7:26–8.

7:26E–3.5 Site investigation—building interiors

(a) The site investigation of building interiors may be conducted for the purposes of a site investigation pursuant to N.J.A.C. 7:26E–3.3(c) according to the following:

1. The quality assurance and quality control requirements pursuant to N.J.A.C. 7:26E–2.1;

2. If there is reason to believe interior building surfaces are contaminated, wipe or chip sampling shall be conducted;

3. Sampling frequency shall be as follows:

i. One sample for every 900 square feet for each area of concern of 9,000 square feet or less;

ii. For areas of concern greater than 9,000 square feet, one additional sample shall be taken for every additional 9,000 square feet. For example, an area of concern of 9,001 to 18,000 square feet would require a minimum of 11 samples;

4. If the person responsible for the site investigation can provide documentation acceptable to the Department in the site investigation report that the contaminant in a wipe or chip sample present above the applicable remediation standard in the building materials is not the result of a discharge, remediation is not required. This documentation shall include, without limitation, data from at least two samples collected from each building material type being evaluated. Samples shall be collected from a non-production area that has not received any discharges and analyzed for any contaminants present above the applicable remediation standard; and

5. The presence and extent of asbestos containing material (ACM) in buildings shall be determined. ACM may be present as surfacing material, thermal system insulation, or in miscellaneous material such as ceiling tiles and vinyl asbestos tiles. Asbestos surveys shall be conducted in accordance with 40 CFR 763, Subpart E (The Asbestos Hazard Emergency Response Act Statute and Regulations, "AHERA", 10–30–87).

7:26E–3.6 Site investigation—soil

(a) The site investigation shall satisfy the following requirements for all soil investigations:

1. A survey for buried drums, tanks or waste using test pits, ground penetrating radar, magnetometry electromagnetics, or other techniques capable of detecting metal containers and other waste to an average depth of 20 feet or deeper shall be conducted if:

i. There have been any reports of buried drums, tanks or waste;

ii. Ground water contamination is detected and no source has been identified; or

iii. Aerial photographic history of the site indicates the presence of drums, tanks or waste in or adjacent to regraded and/or filled areas.

2. Soil borings shall be extended to a depth appropriate for collection of soil samples, and to provide a profile of subsurface conditions. The profile shall meet the following:

i. Logs shall be prepared for all borings to document subsurface conditions including, without limitation, soil types and description of nonsoil materials, depth to ground water, if ground water is encountered, soil mottling, field instrument measurements, presence of odor, vapors, soil discoloration, and free product;

ii. Soil shall be classified according to one of the standard systems (for example, Burmeister, Unified, or United States Department of Agriculture);

iii. All borings shall be performed in accordance with the Subsurface and Percolating Waters Act, N.J.S.A. 58:4A–4.1 et seq., which requires, among other things, that a permit be obtained prior to drilling a boring greater than 25 feet below grade; and

iv. Soil sample locations may be photo-documented.

3. Initial characterization soil samples (except samples being analyzed for volatile organics) shall be collected at zero to six inches below grade except as required pursuant to N.J.A.C. 7:26E–3.9 (Area Specific).

4. All soil samples collected for volatile organics analysis shall comply with the following:

i. When field screening is conducted for volatile organics and soil consists of more than 15 percent silt/clay, a soil core shall be collected beginning at the ground surface and ending at approximately 24 inches.

(1) The core shall be field-screened with a properly calibrated photoionization detector or flame ionization detector (PID/FID) or other suitable instrument pursuant to N.J.A.C. 7:26E–2.1(b).

(2) An undisturbed sample from the six inch interval registering the highest field measurement shall be sub-sampled from the core and lab-analyzed for volatile organics. If all intervals register the same measurement, the sample interval shall be selected based on soil type pursuant to (a)4ii below.

ii. If field screening is not conducted or if soil consists of less than 15 percent silt/clay, volatile organics sample depth shall be based on soil type (soil type may be field-determined). The following guidelines shall apply:

(1) Sample at six to 12 inches if soil consists of 50 percent or more silt/clay.

(2) Sample at 18 to 24 inches if soil consists of 15 to 50 percent silt/clay.

(3) If surface soil consists of less than 15 percent silt/clay, sample the six inch interval above the saturated zone or a six inch interval within the next lower soil horizon consisting of 15 percent or more silt/clay, or at 9.5 to 10 feet, whichever is encountered first.

iii. Soil sampling for volatile organics shall be performed using a coring device, if practicable, to minimize contaminant loss during sampling.

5. In all cases, samples shall be collected in discrete six inch increments. If more or less than a six inch increment is sampled because of poor sample recovery or other field logistical problems, an explanation shall be provided in the soil log.

6. Additional sampling of increments below those specified in (a)3 and 4 above shall be completed in cases where the surface has been regraded or if physical evidence in borings indicate the possible presence of contamination.

7. If the designated soil sampling point is within the saturated zone, a sample of the saturated soil shall be collected, when sample recovery is possible, and analyzed.

(b) Soil gas detection methods may be used to bias soil or ground water sample locations.

(c) The site investigation of soil shall be conducted:

1. For the purposes of a site investigation pursuant to N.J.A.C. 7:26E–3.3(a); and

2. According to the quality assurance and quality control requirements pursuant to N.J.A.C. 7:26E–2.1.

7:26E–3.7 Site investigation—ground water

(a) Except as provided in (b) below, the site investigation of each area of concern shall include at least one ground water sample if:

1. Any contaminant in the area of concern has a water solubility greater than 100 milligrams per liter as documented by a peer-reviewed reference; and

2. All of the soil between the contaminant and the saturated zone is less than 15 percent silt and clay.

(b) Ground water sampling may not be necessary during a site investigation for a particular area of concern if the person responsible for conducting the remediation documents that ground water contamination from the discharge is unlikely based on the following criteria:

1. The date and duration of the discharge is known;

2. The identity and the volume of the contaminants are known;

3. The date the remediation in response to the single discharge was completed;

4. Post remediation soil sampling data establish that the remediation meets all applicable remediation standards at the time of the remedial action workplan approval; and

5. Any other data or information that is relevant to the determination of the likelihood of ground water contamination.

(c) The site investigation of ground water shall be conducted for the purposes of a site investigation pursuant to N.J.A.C. 7:26E–3.3(a) according to the following:

1. The quality assurance and quality control requirements pursuant to N.J.A.C. 7:26E–2;

2. Ground water samples may be taken pursuant to any generally acceptable sampling method pursuant to N.J.A.C. 7:26E–1.6(c); any method-specific requirements pursuant to N.J.A.C. 7:26E–4.4(f) shall be conducted, if ground water monitoring wells or piezometers are used; and

3. The ground water sampling points shall be located in:

i. The excavation of an underground storage tank which is the source of contaminants, if possible; or

ii. The expected downgradient flow direction of the area of concern and within 10 feet of the area of concern; ground water flow direction shall be predicted based on topographic controls in the bedrock or soils, location of pumping wells and subsurface conduits at or below the water table.

(d) The minimum number of ground water samples collected shall be as follows:

1. At least one ground water sample for each area of concern which is classified as an Underground Injection Control (UIC) unit including, without limitation, seepage pits, septic systems, dry wells or other injection wells regulated under N.J.A.C. 7:14A–5 sampled pursuant to N.J.A.C. 7:26E–3.9(e)3;

2. At least one ground water sample for sites with leaking underground storage tanks and tank fields containing up to three tanks with a maximum capacity of 10,000 gallons per tank. If a leaking tank is excavated, the ground water sampling point shall be located within the excavation, if possible;

3. Pump islands and associated piping greater than 25 feet from the tank field shall be considered separate areas of concern and shall require a separate ground water sample location; and

4. At least one ground water sample for all other areas of concern unless the area of concern is within 10 feet hydraulically upgradient of a ground water sampling location.

(e) The results of any ground water site investigation analysis shall be evaluated as follows:

1. If the contaminant concentrations found in all ground water samples are below the applicable remediation standards, no further remediation is necessary for ground water;

2. If the contaminant concentrations found in any ground water samples exceed the applicable remediation standards, the ground water may be resampled to confirm the presence of contamination; this confirmation sampling shall include at least two additional samples taken over a 30 day period, the results of which may be averaged with the original result to determine compliance with the applicable remediation standards; and

3. If ground water contamination is confirmed, a ground water remedial investigation shall be conducted.

7:26E–3.8 Site investigation—surface water and sediment

(a) If contamination is found in any area of concern at a site, then surface water and sediment may be investigated as part of the remedial investigation.

(b) The investigation of surface water and sediment shall be conducted for the purposes of a site investigation pursuant to N.J.A.C. 7:26E–3.3(a) according to the following:

1. The quality assurance and quality control requirements pursuant to N.J.A.C. 7:26E–2;

2. Surface water samples are required to evaluate standing water bodies, or, for flowing water, upgradient, downgradient, and discharge point water samples are required when there is reason to believe surface water may have been impacted by contamination emanating from the site. Sampling shall be designed to account for seasonal or short-term flow and water quality fluctuations due to dry versus wet weather flow, system hydraulics (obtaining flow-proportioned samples where applicable) and potential contaminant characteristics (for example, density, solubility); and

3. Sediments in surface water bodies shall be analyzed when there is reason to believe sediments may have been impacted by contamination emanating from the site.

i. Sediment sampling for streams and similar water bodies shall be completed in accordance with N.J.A.C. 7:26E–3.9(d)3 (Swales/Culverts).

ii. Sediment sampling for ponded bodies of water shall be completed in accordance with N.J.A.C. 7:26E–3.9(c) (Surface Impoundments).

iii. In addition to other required analyses, surface water sediments shall also be analyzed for total organic carbon, pH, and particle size. These data are required to develop appropriate remediation standards.

7:26E–3.9 Site investigation—area specific requirements

(a) The site investigation shall also satisfy the following sampling requirements for bulk storage tanks and appurtenances, including, without limitation, all in-use and out of service storage tanks with a storage capacity greater than 55 gallons, and associated piping and fill points.

1. For above ground tanks over unpaved soil:

i. Sampling around tanks with shell or bottom in direct contact with soil now or in the past shall meet all the following criteria:

(1) Sampling to detect surface contamination shall be conducted around the base of the tank with at least one sample per 100 linear feet, and shall include expected areas of contamination based on soil discoloration/odors, history of repairs/replacement, soil beneath valves, or low areas where spills or leaks from valves may accumulate.

(2) Unless the tank has always been in compliance with N.J.A.C. 7:1E–2 and has no discharge history, at least one boring shall be located adjacent to or within two feet of the tank and continuous two foot split spoon sampling performed to the water table (if water table is less than 10 feet). The sample in each boring evidencing the highest apparent contamination based on soil discoloration, odor, field screening result or other field indicator shall be laboratory analyzed. If there is no evidence of contamination, samples shall be collected from the zero to six inch interval above the saturated zone. At least one boring shall be located in the expected downgradient ground water flow direction from the tank. For tanks in excess of 100 feet in circumference, at least three borings, spaced equidistantly, are required.

(3) In cases where the depth to ground water is greater than 10 feet, sampling shall be conducted to 10 feet as in (a)1i(2) above. If there is no evidence of contamination, samples shall be collected at 9.5 to 10 feet.

ii. Elevated tanks (that is, shell or bottom not in contact with ground) require soil sampling when there is any physical or documentary evidence of discharges, when soil discoloration is observed or when field monitoring or other evidence indicates that a discharge has occurred.

1. At least one soil sample shall be taken below tanks which store or may have stored hazardous substances, hazardous wastes, hazardous constituents or pollutants that do not cause obvious soil discoloration (such as volatile organics), in the area most likely to be contaminated, including without limitation, valve or former leak or rupture areas. If samples cannot be obtained from below the tank because soils are not accessible to sampling equipment, the sample may be located within two feet of the tank.

2. Soil around above ground tanks on paved surfaces shall be sampled pursuant to (b)1 below (Pads) if there are stained soils adjacent to pad or if the potential contaminant would not cause discoloration (volatile organics), or if there is a history of spillage or other evidence that a discharge has occurred.

i. Tanks within a paved containment area shall be sampled at the drainage discharge point, if one exists, pursuant to (d) below (Drainage Areas).

ii. Soil sampling below the pavement shall be conducted only when the pavement has deteriorated so as to allow potential contaminant contact with the soil, or if pavement was not present over the life of the tank or former tanks.

iii. Instead of sampling soil beneath pavement, samples around the pad may be taken pursuant to (b)1 below subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E–1.6(c) specifying why boring through pavement was not considered practical (for example, concrete slabs with berms, synthetic liners).

3. For underground storage tanks:

i. Underground storage tanks and distribution systems containing potential contaminants shall be evaluated to identify any past or present discharges. No sampling is required for tanks and distribution systems which have always had leak detection per N.J.A.C. 7:14B and no discharge history. At least four soil borings or test pits around each tank shall be used. If tanks will be removed, refer to N.J.A.C. 7:26E–6.3(b) for requirements.

(1) The soil boring or test pit shall be within two feet of the tank with one sampling location located at each end, and additional sampling locations located along the length of the entire tank system, including distribution and fill pipelines;

(2) The total number of required sampling locations, by tank capacity, are as follows:

Total Capacity (Gallons)	Approximate Length (Feet)	Minimum Number of Sampling Locations
56–2,000	to 10′	4
2,001–10,000	to 30′	6
10,001–25,000	to 40′	8
25,000+	to 40′+	10

(3) Detailed soil logs shall be completed for each sampling location pursuant to N.J.A.C. 7:26E–3.6 (Soil);

(4) Soil samples collected for analysis shall be taken at zero to six inches below the tank bottom unless the tank is within the saturated zone (see (a)3ii(6) below);

(5) In case of any soils or bedding material that is less than 15 percent silt/clay, samples for volatile organics shall be collected at the first less permeable soil horizon encountered below the bottom of the tank, or at zero to six inches above the saturated zone, or at 9.5 to 10 feet below the tank bottom, whichever is encountered first;

(6) If the tank is within the saturated zone, sample zero to six inches above the saturated zone if the potential contaminant's density is less than water, and zero to six inches below tank bottom if the potential contaminant's density is greater than water;

ii. Precision tests pursuant to N.J.A.C. 7:14B–4.3(i) may be used in lieu of soil borings if tanks are beneath buildings or otherwise inaccessible.

iii. To verify tank contents for out of service tanks, one sample shall be taken of any product or residue remaining in the tank and analyzed using ASTM fingerprint method D3328 or other appropriate method.

4. For all above grade piping:

i. Sampling is necessary if there is evidence of a discharge (for example, discolored soil, etc.) or reports of past discharges.

ii. Any sampling conducted shall be pursuant to (e) below (Discharge/Disposal Areas).

5. For all below grade piping:

i. Below grade piping shall be evaluated to identify any past or present discharges along with the storage tank using soil borings unless the system has always had double-walled containment with leak detection and no discharge history. Precision tests pursuant to N.J.A.C. 7:26B–4.3(j) may be used if the piping is original and there is no history of discharges or repairs.

ii. For total piping length up to 50 feet, one soil sample shall be collected for each 15 linear feet of piping, including joints and other potential discharge areas. For total piping length in excess of 50 feet, sampling frequency may be reduced subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E–1.6(c) specifying why the reduced number was considered adequate.

6. For all loading and unloading areas:

i. Exposed soils at loading or unloading areas associated with tanks shall be sampled at a minimum rate of one sample per fill connection or valved discharge point;

ii. For loading or unloading points located over impervious cover, sampling shall be conducted pursuant to N.J.A.C. (b)1 below (Pads).

(b) The site investigation shall also satisfy the following requirements for all storage and staging areas, dumpsters and transformers, whether temporary or permanent, including exposed soil areas adjacent to above ground vessels on pads; tank loading/unloading areas on pads; dumpster staging areas; electrical transformers, heat exchanger and other outdoor equipment and drum storage pads.

1. For all pads:

i. Pads shall have a minimum of one sampling location per side adjacent to exposed soil for sides up to 30 feet long; for sides greater than 30 feet long, one additional sample location is required for each additional 30 feet of length;

ii. Each sampling point shall be located immediately adjacent to the pad and biased toward the expected location of greatest contamination;

iii. If a pad shows evidence of deterioration that may allow contaminant contact with the soil, or its surface has been modified (repaved), or aerial photographs or site history indicate potential for previous discharges to the soil, soil samples beneath the pad shall be collected pursuant to N.J.A.C. (b)2ii below; and

iv. Bermed pads and pads surrounded by impermeable cover shall be sampled at any drainage discharge point pursuant to (d) below (Drainage Areas).

2. For all storage and staging areas over permeable cover:

i. Storage and staging areas with evidence of discharges which are or were used for storage of hazardous substances, hazardous wastes, hazardous constituents or pollutants shall be sampled pursuant to (e) below (Spills/Disposal Areas).

ii. Sample frequency shall be one per 900 square feet of surface area to characterize soils below a storage or staging area up to 300 feet in perimeter with a minimum of one sample. Sample frequency may be reduced for larger areas subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E–1.6(c) specifying why sample frequency was considered adequate. Sampling locations shall be biased toward the suspected location of greatest contamination based on low points, drainage patterns, discoloration, stressed vegetation, field instrument measurements or other field indicators.

(c) The site investigation shall satisfy the following requirements for all surface impoundments, including without limitation, lagoons, fire ponds, waste ponds or waste pits, storm water detention basins, excavations, natural depressions or diked areas, which are designed to hold an accumulation of liquid substances or substances containing free liquids. Active surface impoundments with impermeable liners which may be damaged as a result of sample collection shall have liner integrity verified by physical inspection and/or evaluation of monitoring well water quality data associated with the surface impoundment, if available.

1. Sediments within all unlined surface impoundments shall be sampled if the impoundment receives runoff from areas of potential contaminant sources;

2. Sediment sample locations shall be biased towards inflow/outflow areas, and areas where sediments may be expected to accumulate;

3. Core samples shall be taken for contaminant analysis and to fully characterize sediment type, thickness of sediment layers, and vertical extent of sediment.

4. Distinct layers of sediments thicker than six inches, as evidenced by color, particle size, or other physical characteristics, shall be sampled individually.

5. Sediment quantity within the surface impoundment shall be estimated.

(d) The site investigation shall also satisfy the following requirements for all drainage systems.

1. For all building floor drains and collection systems, if there is reason to believe contaminants were discharged into the floor drain or collection system:

i. The point of discharge for any floor drain or collection system shall be sampled if the system discharges onsite to soil, ground water or surface water;

ii. If the point of discharge is unknown, tracer tests (for example, dye or smoke) shall be conducted to determine the discharge point(s);

iii. Collection system integrity shall be documented by representative soil sampling at potential leak areas, video inspection, hydrostatic test or pressure test. Other methods may be acceptable, subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E–1.6(c) specifying why the methods were considered effective; and

iv. Sampling soil below floor drains, or collection system laterals, shall be conducted when corrosives (as defined in N.J.A.C. 7:26 or, if plastic piping is or was used, organic solvents are considered corrosive) are or were discharged to floor drains or the collection system or there has been a history of collection system discharges, rupture or repairs. In such cases, representative soil sampling at known or suspected leak areas is required for potential contaminants.

2. Soil at each roof leader discharge point shall be sampled if storage units or process operations using hazardous substances, hazardous wastes, hazardous constituents, or pollutants vent or have vented to the roof;

3. For all swales and culverts:

i. Sampling shall be conducted when the swale/culvert receives or received runoff from other contaminated areas of concern;

ii. Sediment and soil sampling shall be conducted at the points where contamination from runoff/spills enter or have entered the drainage system; and

iii. If flow could have scoured sediments from the receiving structure, sampling shall be conducted at onsite downgradient structures laden with sediments;

4. For all storm sewer and spill containment collection systems:

i. Sampling shall be conducted when the collection system is or was the runoff/spill discharge point from other contaminated areas of concern;

ii. Sediment sampling shall be conducted at the manhole, catchbasin, sump, or other structure where contaminated runoff or discharges enter the drainage system;

iii. Sampling shall be conducted in the soils around catchbasins, manholes, sumps or other structures which contain or may have contained hazardous substances, hazardous wastes, hazardous constituents or pollutants, and are not hydraulically sound (that is, water percolates through the floor and walls), through the use of adjacent soil borings. A single boring located within two feet of the downstream side of the structure shall be sampled at a depth corresponding to the bottom of the structure. If highly permeable soils are encountered and volatile organics sampling is required, sample at the next lower permeability soil horizon or zero to six inches above the saturated zone, or at 9.5 to 10 feet, whichever is encountered first; and

iv. Ground water discharging from storm sewer systems which contain dry weather flow (that is, five days following the most recent rainfall) shall be sampled at the discharge point and analyzed for potential contaminants discharged or potentially discharged into the system; and

5. For all boiler and compressor discharges, if there is reason to believe a potential contaminant discharge has occurred, sampling shall be conducted pursuant to (e) below (Discharge/Waste Disposal Areas).

(e) The site investigation shall also satisfy the following requirements for all discharge and waste disposal systems and areas.

1. For any discharge areas and areas of discolored soil or stressed vegetation where specific requirements are not otherwise provided in this section:

i. Each distinct area shall be evaluated independently as an area of concern; and

ii. Initial characterization samples shall be biased based on field indicators such as soil discoloration, stressed vegetation, or field instrument measurements toward those areas of greatest suspected contamination. Sample frequency shall be at least one sample for every 900 square feet for areas up to 300 feet in perimeter. Sample frequency may be reduced for larger areas, subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E–1.6(c) specifying why the reduced sample frequency was considered adequate.

2. Above ground treatment systems shall be sampled pursuant to the requirements for the functional portions of the system pursuant to (a) above (Tanks). For example, any above ground waste treatment tanks over unpaved soil shall be sampled pursuant to (a)1 above.

3. For below grade wastewater treatment systems:

i. For tanks, septic tanks, separators, and neutralization pits, two samples shall be collected from within the tank, one aqueous and one sludge sample, for analysis unless documentation acceptable to the Department pursuant to N.J.A.C. 7:26E–1.6(c) is provided in the site investigation report (N.J.A.C. 7:26E–3.10) specifying why such sampling was not considered necessary to confirm that only sanitary waste was discharged to the system during the entire life of the system. Documentation shall include, without limitation, an affidavit certifying that only sanitary waste was ever discharged to the system and that no present or former floor drains, sinks, or other units in process areas were ever connected to the system.

ii. For septic disposal fields:

(1) Soil borings shall be completed as specified below for onsite disposal fields unless documentation acceptable to the Department is provided in the site investigation report (N.J.A.C. 7:26E–3.10) specifying why soil borings were not considered necessary to confirm that only sanitary waste was discharged to the system pursuant to (e)3i above.

(2) At least one boring per 500 square feet of field area shall be completed, with a minimum of four borings per disposal field.

(3) Borings shall be located within two feet of the edge of the bed area in active disposal fields, but shall be angled so that samples are taken below the infiltrative surface as defined in N.J.A.C. 7:9A–2.1, and directly below laterals within abandoned fields.

(4) Borings shall be located to include the first five feet of the infiltrative surface as defined in N.J.A.C. 7:9A–2.1 and shall be spaced so that samples are representative of the entire disposal field.

(5) Soil samples shall be taken at a depth corresponding to 0.6 inches below the bottom of the infiltrative surface as defined in N.J.A.C. 7:9A–2.1.

(6) If material to be sampled has less than 15 percent silt/clay and volatile organics samples are required, volatile organics soil samples shall be taken at the first lower permeability soil horizon or at zero to six inches above the saturated zone, or at 9.5 to 10 feet, whichever is encountered first.

iii. For cesspools and seepage pits, as defined in N.J.A.C. 7:9A–2.1 and dry wells:

(1) One representative sample of sludge/sediments in each pit shall be obtained for analysis at zero to six inches below the pit bottom; and

(2) If material to be sampled has less than 15 percent silt/clay and volatile organics samples are required, samples for volatile organics shall be collected at the first less permeable soil horizon below the pit or at zero to six inches above the saturated zone or at 9.5 to 10 feet, whichever is encountered first.

iv. Collection lines shall be sampled pursuant to (d)1 above (Floor Drains).

(f) The site investigation shall also satisfy the following requirements for any other potentially contaminated areas away from process areas not otherwise addressed pursuant to (a) through (e) above:

1. The sample locations shall be biased toward suspected areas of the greatest contamination. If there is no basis for biasing, then random sampling of these areas is required as follows, except as provided in (f)2 below:

i. The area to be sampled shall be gridded and each grid node given an identification number;

ii. The grid nodes chosen for sampling shall be based on the numbers selected from a random number chart;

iii. Areas of less than 10 acres shall be sampled at a rate of at least one sample for every two acres; and

iv. Areas greater than 10 acres may be sampled at a reduced frequency subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E–1.6(c) specifying why a reduced frequency was considered appropriate, but a minimum of five locations shall be sampled.

2. If the person responsible for conducting the remediation documents, pursuant to N.J.A.C. 7:26E–1.6(c), that the area is not and has not been used for any purpose which may have included hazardous substances, hazardous wastes, hazardous constituents, or pollutants, including, without limitation, the activities described in (a) through (e) above, then no samples are required. Such documentation shall be based upon the following:

i. An aerial photographic history pursuant to N.J.A.C. 7:26E–3.1(c)1vi (Preliminary Assessment); and

ii. An affidavit signed by the person certifying the site investigation attesting that, based on diligent inquiry, no potential contaminants were discharged in the area.

7:26E–3.10 Site investigation report

(a) The site investigation report shall present and discuss all of the information identified or collected pursuant to N.J.A.C. 7:26E–3.3 through 3.9.

(b) The site investigation report shall include the following:

1. Historical information pursuant to N.J.A.C. 7:26E–3.2 (preliminary assessment report) unless the remediation is directed at either a specific discharge event, rather than a particular area of a site, or any underground tank or underground tank system;

2. A physical setting section which shall include descriptions of the following unless the remediation is directed at either a specific discharge event, rather than a particular area of concern, or any underground tank or underground tank system:

i. The physical conditions of the site and surroundings, including a general description of soils, geology, hydrogeology, and topography; and

ii. Use of, distance to, flow direction, and names of surface water bodies within one-half mile of the site with emphasis upon water bodies topographically or hydraulically downgradient of the site that may receive site discharges or runoff.

3. A technical overview which shall present a general profile of the site investigation execution and results. The following items shall be discussed in the technical overview:

i. Reliability of laboratory analytical data as indicated by compliance with sample holding times, ability to achieve method detection limits and precision and accuracy criteria for the analytical method, and other indicators of data quality;

ii. A summary of the overall nature of contamination on the site, including, without limitation, the numbers of areas of concern requiring further remediation; and

iii. Any significant events or seasonal variation which may have influenced sampling procedures or analytical results; and

4. Findings/recommendations which shall include;

i. A discussion, by area of concern, of the site investigation execution and analytical results. The discussion shall consist of specific findings at the areas of concern;

ii. A discussion of the following items, for each area of concern:

(1) A detailed description of each area of concern including dimensions, suspected and actual contamination, and suspected source of discharge;

(2) Results and implications of field measurements or area-specific changes in sampling protocol due to field conditions;

(3) Significance of information generated in the library search of tentatively identified compounds/unknown compounds; and

(4) Recommendations for either additional remediation or no further action for each area of concern.

(c) The site investigation report shall also include the following data and information:

1. Results of all analyses, copies of all laboratory data sheets and the required laboratory data deliverables pursuant to N.J.A.C. 7:26E–2.1 (Quality Assurance Requirements). Laboratory data deliverables may be submitted as a separate attachment;

2. A summary table of analytical methods and quality assurance indicators pursuant to N.J.A.C. 7:26E–2.2(a)1v;

3. A table summarizing all sampling results, including sample location, media, sample depth, and field and laboratory identification numbers, analytical results, and comparison to applicable remediation standards:

i. All contaminant concentrations exceeding the applicable remediation standards shall be identified;

ii. Samples with method detection limits (MDLs) (or practical quantitation levels (PQLs) if available) exceeding the applicable remediation standard shall be identified and an explanation provided in the table key; and

iii. Soils/solids sample results shall be reported in milligrams per kilogram on a dry weight basis, and aqueous sample results shall be reported in micrograms per liter;

4. Stratigraphic logs, which include soil/rock physical characteristics and field instrument readings detected during drilling for each soil boring, test pit and monitoring well;

5. Stratigraphic cross sections of the site using information from monitoring wells, test pits and borings, if available;

6. All soil boring, piezometer, and monitoring well records, including the State permit numbers and as-built specifications, if applicable; and

7. Any other data and information obtained pursuant to N.J.A.C. 7:26E–3.3 through 3.9.

(d) The site investigation report shall also include the following legible maps and diagrams:

1. Site and area of concern base maps pursuant to N.J.A.C. 7:26E–3.2(a)3i;

2. Sample location map(s), including:

i. All sample locations, sample depths and contaminant concentrations shall also be plotted on the map. Where an entire contaminant class is not detected or is less than the applicable remediation standard, contaminants need not be listed individually;

ii. Map scale and orientation;

iii. Field identification numbers for all samples; and

iv. If more than one map is submitted, maps shall be presented as overlays, keyed to the base map in (d)1 above; sample locations may be superimposed on the site or area of concern map in (d)1 above. Alternatively, individual maps may be submitted which have a common coordinate system and common scale, provided each map details the features of the base map in (d)1, above;

3. If applicable, a map of the distribution of surface water, structure and airborne contaminants, including sample location numbers and contaminant concentrations; and

4. Photos may be submitted to document the location of all soil and sediment sample locations.

SUBCHAPTER 4. REMEDIAL INVESTIGATIONS

7:26E–4.1 Remedial investigation requirements

(a) A remedial investigation is necessary at each area of concern with contaminants which exceed the applicable remediation standards. The purposes of a remedial investigation are to:

1. Delineate the horizontal and vertical extent of contaminants in all media at the site pursuant to (b) below;

2. Determine the general surface and subsurface characteristics of the site, including, without limitation, the depth to ground water;

3. Identify the migration paths and actual or potential receptors of contaminants on or through air, soil, bedrock, sediment, ground water, surface water, and structures at a contaminated site;

4. Collect and evaluate all data necessary to evaluate remedial action alternatives. This data may be gathered through studies including, without limitation, treatability studies, bench scale studies and pilot scale studies (these studies may be conducted pursuant to EPA 540/2–89/058 "Guide for Conducting Treatability Studies Under CERCLA").

i. Any such data collection, shall be initiated as soon as the general extent of contamination is known, usually after the first delineation phase and, at a minimum, these studies shall be initiated by the end of the second delineation phase; and

ii. A remedial alternative analysis if required pursuant to N.J.A.C. 7:26E–5.1;

5. Collect and evaluate all data necessary to evaluate the ecological impacts of the contaminants;

6. Collect all data necessary to develop permit limitations for any discharge to an environmental medium which may be required for any remedial action alternative under consideration;

7. Characterize all natural resource damages, including the nature and extent of injury or damage to flora and fauna, caused by the potential contaminants at the site; and

8. Identify containment and/or stabilization activities to prevent contaminant exposure to onsite receptors and to prevent the offsite migration of contaminants while remedial alternatives are being evaluated.

(b) The delineation of the horizontal and vertical limits of contamination for all media shall be conducted as part of the remedial investigation. Delineation samples shall be biased to identify any migration paths of the contaminant. Samples shall be biased based on professional judgment, area history, discolored soil, stressed vegetation, drainage patterns, field instrument measurements, odor and other field indicators. If soil samples within the saturated zone are required to identify the vertical limit of contamination, a sample of the saturated soil shall be collected, if sample recovery is possible, and analyzed. Delineation shall be accomplished by either:

1. Presentation of sample data that indicates contamination is below the applicable remediation standard. This may be accomplished after a remedial action has been implemented; or

2. By establishment of a contaminant gradient as follows:

i. Contaminant levels decrease by:

(1) Ten percent or more between the initial characterization sample and each of two sequential delineation samples; or

(2) A factor of five or more between the initial characterization sample and a single delineation sample; and

ii. Once a contaminant gradient has been established, the approximate limits of contamination may be reasonably estimated by extrapolation.

7:26E–4.2 Remedial investigation of building interiors

(a) If applicable, the remedial investigation may include an investigation of all building interiors which may contain contaminants above the applicable building interior remediation standards.

(b) The remedial investigation of each building shall be conducted pursuant to N.J.A.C. 7:26E–4.1 and according to:

1. The quality assurance and quality control requirements pursuant to N.J.A.C. 7:26E–2; and

2. The technical requirements for a building investigation pursuant to N.J.A.C. 7:26E–3.5.

7:26E–4.3 Remedial investigation of soil

(a) The remedial investigation shall include an investigation of all soil which may contain contaminants above the applicable soil remediation standards.

(b) The remedial investigation of the soil shall be conducted for the purposes of a remedial investigation pursuant to N.J.A.C. 7:26E–4.1 according to:

1. The quality assurance and quality control requirements pursuant to N.J.A.C. 7:26E–2; and

2. The technical requirements for soil investigation pursuant to N.J.A.C. 7:26E–3.6.

7:26E–4.4 Remedial investigation of ground water

(a) A remedial investigation of ground water for an area of concern shall be conducted if:

1. A ground water sample previously collected from that area of concern contains a contaminant above the applicable ground water remediation standard;

2. A soil sample collected from that area of concern within two feet of the saturated zone or bedrock contains a contaminant above the applicable soil remediation standard;

3. A soil sample collected in the area of concern anywhere in the soil column contains a contaminant above the applicable soil remediation standard and the contaminant is not going to be actively remediated or removed;

4. Any contaminant in an area of concern has a water solubility greater than 100 milligrams per liter as listed in a peer reviewed reference; and all of the soil between the contaminant and the saturated zone is less than 15 percent silt and clay.

5. A ground water sample may not be necessary in a remedial investigation for a particular area of concern if the person responsible for conducting the remediation documents that ground water contamination from the discharge is unlikely based on the following criteria:

i. The date and duration of the discharge is known;

ii. The identity and the volume of the contaminants are known;

iii. The date the remediation in response to the single discharge was completed;

iv. Post remediation soil sampling data establish that the remediation meets all applicable remediation standards in the approved remedial action workplan or remedial action report; and

v. Any other data or information that is relevant to the determination of the likelihood of ground water contamination.

(b) The remedial investigation of ground water shall be conducted for the purposes of a remedial investigation pursuant to N.J.A.C. 7:26E–4.1 according to:

1. The quality assurance and quality control requirements pursuant to N.J.A.C. 7:26E–2; and

2. The requirements in (c) through (i) below.

(c) Ground water samples shall be taken pursuant to acceptable professional methods, such as those described in the NJDEPE Field Sampling Procedures Manual in effect as of the date the samples were taken. The person responsible for conducting the investigation may implement an alternate sampling method not described in the Manual, subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E–1.6(c).

(d) All ground water sampling points shall be located in:

1. The excavation of a tank which is the source of the contaminants, if possible; or

2. The expected downgradient flow direction of the area of concern and within 10 feet of the area of concern; ground water flow direction shall be predicted based on topographic relief, the location of surface water bodies, structural controls in the bedrock or soils, location of pumping wells and subsurface conduits at or below the water table.

(e) The minimum number of ground water samples collected shall be as follows:

1. At least one ground water sample for each area of concern which is classified as an Underground Injection Control (UIC) unit including, without limitation, seepage pits, septic systems, dry wells or other injection wells regulated under N.J.A.C. 7:14A–5;

2. At least one ground water sample for sites with leaking underground storage tanks and tank fields containing up to three tanks with a maximum capacity of 10,000 gallons per tank. If a leaking tank is excavated, the ground water sampling point shall be located within the excavation, if possible;

3. Pump islands and associated piping greater than 25 feet from the tank field shall be considered separate areas of concern and shall require a separate ground water sample location; and

4. At least one ground water sample for all other areas of concern unless the area of concern is within 10 feet hydraulically upgradient of a ground water sampling location.

(f) All ground water monitoring wells and piezometers shall:

1. Be constructed pursuant to generally accepted methods, such as those described in the NJDEPE Field Sampling Procedures Manual in effect as of the date the wells or piezometers were constructed. The person responsible for conducting the investigation may implement an alternate sampling method not described in the Manual, subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E–1.6(c). Variations on the well design shall be approved by the Department prior to installation;

2. Be installed after the required well drilling permits are obtained pursuant to N.J.S.A. 58:4A et seq.;

3. Be installed by a licensed New Jersey well driller pursuant to N.J.S.A. 58:4A–4.1 et seq.;

4. Have split spoon samples collected during drilling through unconsolidated or overburden material using American Society of Testing Materials (ASTM) Method D1586–84, incorporated herein by reference, if appropriate. Split spoon samples shall be collected every five feet and at any change in soil lithology and at all zones that show obvious signs of contamination. At least one drilling location per area of concern shall include continuous split spoon samples to define the subsurface stratigraphy. Drilling logs shall include all data pursuant to N.J.A.C. 7:26E–3.6 (Soil Investigations);

5. Have a sufficient number of rock cores collected during the drilling of bedrock monitoring wells, piezometers and other borings, if appropriate, to obtain a general understanding of the fracture patterns beneath the site. The corings shall be conducted using the ASTM 2113 Diamond Drilling Method, as amended and supplemented, incorporated herein by reference. Other methods may be used if documentation acceptable to the Department is provided indicating that the methods were appropriate. The core logs shall include:

i. Lithology;

ii. Fracture frequency;

iii. Degree of weathering;

iv. Fracture fit;

v. Fracture spacing;

vi. Orientation of fractures;

vii. Odors and discoloration in the rock core;

viii. Percent recovery; and

ix. Any other information appropriate for the investigation.

6. If appropriate, an evaluation of the bedrock structure at the site including strike and dip of the bedding planes, orientation of faults, joints and fractures; plunges and trends of folds, must be completed through a field evaluation. Published geologic literature may be used if appropriate.

7. Be surveyed by a New Jersey licensed surveyor as follows:

i. The inner well casing must be surveyed to the nearest hundredth (0.01) foot in relation to the permanent, on-site datum and horizontally to an accuracy of one-tenth of a second latitude and longitude; and

ii. A permanent water level measurement mark shall be etched onto the top of the inner well casing to allow for accurate, consistent and comparable water level measurements over time.

8. Be developed to yield a non-turbid discharge, where possible; and

9. Be sealed upon completion of the investigation in accordance with N.J.A.C. 7:9–9 unless otherwise approved by the Department.

(g) The results of initial ground water analyses shall be evaluated as follows:

1. If the contaminant concentrations found in all ground water samples are below the applicable remediation standards, no further remediation is necessary for ground water;

2. If the contaminant concentrations found in any ground water samples exceed the applicable remediation standard, the ground water may be resampled to confirm the presence of contamination. This confirmation sampling shall include at least two additional samples taken over a 30 day period, the results of which may be averaged with the original result to determine compliance with the applicable remediation standard; and

3. Upon confirmation of ground water contamination, the remedial investigation shall include the collection of ground water samples to:

i. Delineate the vertical and horizontal extent of ground water contamination;

ii. Determine the direction of ground water flow as follows:

(1) A minimum of three ground water monitoring wells or piezometers in each affected aquifer or water bearing zone to determine the ground water flow direction in that zone;

(2) A minimum of two rounds of static water levels shall be obtained at a minimum of 30 days apart to provide a more accurate indication of the ground water flow direction. The water levels may be taken to evaluate seasonal variations in flow direction;

(3) If the site is located in an area that is tidally influenced, synotic ground and surface water levels shall be collected during two fair weather sampling events separated by a minimum 30 day period where each event entails collecting hourly water levels from all applicable wells and the surface water for a minimum 71 hour period; and

(4) Water level measurements and ground water flow determinations shall take into account activities in the area which affect flow direction, such as pumping wells or seasonably used pumping wells; and

iii. If ground water contamination above the applicable remediation standards has been confirmed, the person responsible for the remediation shall:

(1) Conduct aquifer tests (pump tests, packer tests, slug tests) or other appropriate analysis to adequately characterize the impacted aquifer at the site. At a minimum, this shall include the site water table gradient, hydraulic conductivity (K), and an estimate of the rate of ground water and contaminant flow in the aquifer. If pumping the aquifer is determined to be a feasible option for possible remediation, then additional aquifer characteristics such as transmissivity (T) and storativity (S) must be determined through the use of a pump test; and

(2) If a model to further define characteristics of the ground water flow system is used, documentation acceptable to the Department shall be provided in the remedial investigation report (N.J.A.C. 7:26E–4.9) indicating that the model was appropriate. Specific details on the type of model, input parameters used and referenced, boundaries and limitations of the model shall be submitted to the Department upon request along with a justification as to why the model was selected.

(h) When ground water contamination above the appropriate remediation standards has been confirmed pursuant to (g)2 above, the person responsible for conducting the remediation shall perform the following tasks:

1. A well search of all wells, including:

i. A file search using all available Department, county or local records must be conducted for all irrigation, monitoring, and domestic wells within one-half mile of the site and all industrial, public supply wells, and wells with water allocation permits within one mile of the site. If the contaminated site is located in a ground water use area and contaminated ground water may be emanating from the site, further evaluation, including a door-to-door survey, shall be conducted;

ii. If applicable, the type of well, the status of the well (active, inactive, properly abandoned pursuant to N.J.A.C. 7:9–9.1). If possible, total depth, casing length, open bore hole or screened interval, copies of well records and/or well logs on file with the Department's Bureau of Water Allocation, and any additional records available in county or municipal records shall be included; and

iii. A listing of all sources referenced in performing the well search; if a referenced agency was unable to provide the information requested, written documentation as to whom was contacted and when, and that the request for information was either denied or that the information was unavailable.

2. Any existing supply wells identified pursuant to the well search which are suspected to be contaminated by the site in question shall be sampled;

3. An evaluation of any surface water body that may be impacted by the contaminated ground water pursuant to N.J.A.C. 7:26E–4.5 (Surface Water Investigations);

4. An evaluation of any subsurface utilities, basements or other structures that may be impacted from a vapor hazard as a result of the ground water contamination; and

5. An evaluation of the current and potential ground water uses based on a 25–year planning horizon utilizing municipality and water purveyor planning data.

(i) Soil gas studies shall be conducted to locate sources of ground water contamination when ground water contamination by volatile organic compounds is identified but no apparent source is identified.

7:26E–4.5 Remedial investigation of surface water, wetlands and sediment

(a) The remedial investigation shall include an investigation of any surface water, wetlands and sediments which may have been impacted by contamination emanating from the site.

(b) The remedial investigation of surface water, wetlands and sediment shall be conducted for the purposes of a remedial investigation pursuant to the requirements for the appropriate media in N.J.A.C. 7:26E–3.4 and 4.1 according to the quality assurance and quality control requirements pursuant to N.J.A.C. 7:26E–2.

(c) The surface water investigation shall be conducted pursuant to (d) below to evaluate the relationship between contaminated ground water, sediments and surface waters, unless:

1. Documentation acceptable to the Department pursuant to N.J.A.C. 7:26E–1.6(c) is provided with the remedial investigation report (N.J.A.C. 7:26E–4.9) specifying why this migration pathway was not considered significant; or

2. The Department approves a less stringent water quality analysis:

i. Based on site-specific conditions; and

ii. Supported by appropriate supporting documentation.

(d) The surface water investigation shall include:

1. Sampling designed to account for seasonal or short-term flow and water quality fluctuations (dry vs. wet weather), system hydraulics (obtaining flow proportioned samples) and potential contaminant characteristics (density, solubility).

2. A receiving water body analysis on any surface water body to which contaminated ground water is discharging, including the following:

i. A water quality analysis program with sampling stations upstream and downstream of the contaminated site, any existing point source discharges at that site, and any proposed discharge locations;

(1) Procedures in accordance with the methods identified in (d)2i(2) below, including, without limitation:

(A) Water quality sampling for each constituent of concern potentially emanating from a site;

(B) At least two sample sets must be taken during critical, low flow conditions; and

(C) At least one sediment sample shall be taken and analyzed for the appropriate parameters identified in (d)2i(1)(A) above, during one of the sampling events;

(D) For non-tidal water bodies, samples shall be taken at the area of discharge, and at least one location downstream;

(E) For tidal water bodies, samples shall be taken at the area of discharge at high, low, and slack tides; and

(F) Depending upon site-specific conditions, additional samples may be necessary to define loads from other point sources, tributaries, and other non-point sources; and

(2) All methods shall be consistent with generally accepted professional methods, such as those described in the NJDEPE "Field Procedures Manual For Water Data Acquisition," or the EPA Handbook "Instream Sampling for Waste Load Allocation Applications;" any deviations from these two documents shall be documented pursuant to N.J.A.C. 7:26E–1.6.

ii. A determination of the critical instream waste concentration (IWC), consistent with N.J.A.C. 7:9–4.6, shall also be conducted if a point source discharge to surface water is a potential part of a remedial action at the site. For tidal water bodies, a determination of the critical instream waste concentration may include, but is not limited to, computer plume modelling and dye studies.

7:26E–4.6 Remedial investigation of landfills

(a) The remedial investigation shall include, unless the remedial investigation is being conducted pursuant to ECRA, an investigation of all landfills which may contain contaminants above the applicable remediation standards.

(b) The remedial investigation of landfills shall be conducted pursuant to N.J.A.C. 7:26E–4.1 according to the quality assurance and quality control requirements pursuant to N.J.A.C. 7:26E–2.

(c) Landfill investigations shall characterize the contents of the landfill through a complete file review. In addition, the horizontal and vertical extent of fill material and impact on the soil, ground water, air and surface waters shall be evaluated.

(d) The boundaries of the landfill shall be identified through geophysical sensing techniques, or subsurface exploration techniques including test pits or borings, or an aerial photographic history, or local government records. Other methods may be used if documentation acceptable to the Department pursuant to N.J.A.C. 7:26E–1.6(c) is provided in the remedial investigation report (N.J.A.C. 7:26E–4.9) specifying why the methods were considered appropriate.

(e) The person responsible for the investigation shall review all records pertaining to the landfill to determine if any hazardous waste pursuant to N.J.A.C. 7:26 was ever disposed in the landfill.

7:26E–4.7 Remedial investigation of ecological receptors (Reserved)

7:26E–4.8 Remedial investigation workplan

(a) If a remedial investigation workplan is required by the Department in an oversight document or by the ECRA or UST programs, the workplan shall include proposals to complete all requirements pursuant to N.J.A.C. 7:26E–4.1 through 4.7. The remedial investigation workplan shall be presented in a format that corresponds to the outline of this subsection.

(b) The remedial investigation workplan shall include:

1. A detailed schedule for all remedial investigation activities, including timelines and target dates for:

i. Start and completion of all field activities;

ii. Receipt of analytical results required in N.J.A.C. 7:26E–4.1 through 4.7; and

iii. Submission of all reports to the Department;

2. A description of the role of principal personnel who will participate in the remedial investigation:

i. The following information about project personnel including the project manager and, if applicable, a facility contact, legal contact, and contractor and subcontractor contacts shall be provided:

(1) Responsibilities;

(2) Authority on the project; and

(3) The telephone number of the project manager.

ii. If the principal personnel designated on the project change, information for the new personnel shall be submitted to the Department within 10 calendar days of such change;

3. The following historical information unless the remediation is directed at either a specific discharge event, rather than a particular area of a site, or any underground tank or underground tank system:

i. Historical site plans, if available after completion of a due diligence search, and facility as-built construction drawing detailing, at a minimum, all information pursuant to N.J.A.C. 7:26E–3.2(a) and in addition, topography using two foot contours, potential contaminant conduits including all subsurface utilities. Maps depicting the entire site shall be scaled at one inch to 200 feet or less and individual area of concern maps shall be scaled at one inch to 40 feet or less. If more than one map is submitted, maps shall be presented as overlays, keyed to a base map; and

ii. An interpretive aerial history pursuant to N.J.A.C. 7:26E–3.1(c)1vi including all photos. Photos shall be enlarged to an appropriate scale. Matched pairs shall be provided, if available, to allow for stereo viewing. Photos shall include a north arrow, date and source of photo, and site boundaries. Matte finish reproductions are preferred;

4. Descriptions of the following unless the remediation is directed at either a specific discharge event, rather than a particular area of a site, or any underground tank or underground tank system:

i. The physical conditions of the site and surroundings, including a general description of soils, geology, hydrogeology, and topography.

ii. Usage, distance to, flow direction, and names of surface water bodies within one half mile of the site with emphasis upon water bodies topographically or hydraulically downgradient of the site that may receive site discharges or runoff;

iii. A copy of the United States Geologic Survey (USGS) 7.5 minute topographic quadrangle that includes the site and an area of at least a one mile radius around the site shall be required. This map shall be the most recent USGS revision and shall clearly note the facility location and property boundaries. When a portion of the USGS quadrangle is used, the scale, north arrow, contour interval, longitude and latitude, along with the name and date of the USGS quadrangle shall be noted on the map;

iv. In addition, a wetlands map from the "National Wetlands Inventory" which provides a wetlands map superimposed on a USGS 7.5 minute topographic quadrangle shall be included;

v. Copies of boring logs from on-site construction;

vi. Land use within a 1,000 foot radius of the site including proximity of the site to sensitive human and/or environmental receptors (for example, residences, endangered species habitats, wetlands, hospitals, nursing homes, schools, parks) and

vii. An estimate of the percentage of total land area within a 1,000–foot radius of site covered by structures and other impermeable surface covers shall be required to evaluate ground water recharge potential;

5. A description of each area of concern including dimensions, suspected contaminants, and suspected source of discharge;

6. An area of concern sampling summary table of proposed sampling and analysis shall be presented in the remedial investigation workplan text or on the sample location map specified in (b)7 below, according to the following headings (A suggested format is included in Table 4–1):

i. Location: use the same alpha or numeric designation as shown on the scaled sampling location map;

ii. Matrix: building interior, waste, soil, surface water, ground water, or sediment;

iii. Sample depth:

(1) Soil/sediment—depth of sample increment which will be analyzed;

(2) Ground water—indicate water bearing zone to be sampled (water table, confined, and semi-confined) and sample depth;

(3) Surface water—indicate depth of water sample.

iv. Analytical parameters for each sample (for example, priority pollutant metals, full priority pollutant scan); and

v. Sampling method;

7. Sample location map: proposed sample locations shall be indicated on a sample location map, scaled as in (b)3i above. Sample locations may be superimposed on maps presented pursuant to (b)3i above;

8. Other sampling proposals including any proposals to conduct the following studies:

i. Treatability, bench scale, pilot studies pursuant to N.J.A.C. 7:26E–4.1(a)4i;

ii. Data necessary to develop discharge permit effluent limitations; and

iii. Characterization of natural resource damages pursuant to N.J.A.C. 7:26D–5;

9. Quality assurance project plan including proposed sampling/analytical methods pursuant to N.J.A.C. 7:26E–2.2; and

10. Health and safety plan pursuant to N.J.A.C. 7:26E–1.9.

TABLE 4–1

SUGGESTED FORMAT
SAMPLING SUMMARY TABLE

Location	Medium	Sample Depth	Analytical Parameters	Sampling Method
Area T:	Seepage Pit			
MWT–1	Ground Water	Water Table (20′)	Priority Pollutants	Bailer
MWT–2	Ground Water	Water Table (20′)	Priority Pollutants	Bailer
MWT–3	Ground Water	Water Table (20′)	Priority Pollutants	Bailer
MWT–4	Ground Water	Confined (50′)	Priority Pollutants	Bailer
Area S:	Drum Storage Pad			
S–1	Soil	0–6″	Priority Pollutant Metals and Cyanide	Trowel
S–2	Soil	0–6″	Priority Pollutant Metals and Cyanide	Trowel
		18–24″	Priority Pollutant Volatile Organics	Coring Device
S–3	Soil	0–6″	Priority Pollutant Metals and Cyanide	Trowel

7:26E–4.9 Remedial investigation report

(a) The remedial investigation report shall comply with all requirements in N.J.A.C. 7:26E–3.10 (site investigation report) and in addition shall present and discuss any additional information collected pursuant to N.J.A.C. 7:26E–4.1 through 4.7 and the approved remedial investigation workplan as outlined in N.J.A.C. 7:26E–4.8, if applicable. The remedial investigation report shall be presented in a format that corresponds to the outline of this subchapter.

(b) The remedial investigation report shall include the following:

1. Historical information pursuant to N.J.A.C. 7:26E–4.8(b)3;

2. Physical setting pursuant to N.J.A.C. 7:26E–4.8(b)4. In addition, if a well search was conducted, it shall be presented pursuant to Appendix B, incorporated herein by reference;

3. Technical overview pursuant to N.J.A.C. 7:26E–3.10(b)3 and, in addition, the following items shall be discussed:

i. A summary of the results of any treatability, bench scale, or pilot studies conducted to support remedy selection;

ii. A summary of the results of any data collected to develop permit limitations for any permits which may be required during potential remedial actions; and

iii. A summary of the results of any ecological assessments conducted; and

4. Findings/recommendations pursuant to N.J.A.C. 7:26E–3.10(b)4.

(c) The remedial investigation report shall include the following data and information:

1. Results of all analyses, copies of all laboratory data sheets and the required laboratory data deliverables pursuant to N.J.A.C. 7:26E–2.1 (Quality Assurance Requirements). Laboratory data deliverables may be submitted as a separate attachment;

2. A summary table of analytical methods and quality assurance indicators pursuant to N.J.A.C. 7:26E–2.2 (Quality Assurance Workplan);

3. Sampling Results Summary Table(s) of all analyses, including sample location, media, sample depth, and field and lab identification numbers pursuant to N.J.A.C. 7:26E–3.13(c)3 and, in addition:

i. All summary tables shall be organized by area of concern, and for each area of concern, average concentrations for each contaminant shall be presented along with individual sample results. The average shall be the arithmetic average and the following shall apply:

(1) All contaminant concentrations exceeding the applicable remediation standard shall be identified; and

(2) Samples with MDLs (or PQLs if available) exceeding the applicable remediation standard shall be identified and an explanation provided in the table key; and

(3) If some contaminants are detected and quantified and some contaminants are "estimated" or non-detectable, for purposes of calculating the average, the person submitting the site investigation report shall substitute one half the reported method detection limit for all contaminants reported as non-detectable, and "estimated" values shall be included in the contaminant average "as is."

(4) "Non-detectable" values for contaminants in samples which have been diluted shall not be included in the area of concern average for those contaminants. "Detectable" values for contaminants in diluted samples shall be included in the area of concern average for those contaminants.

(5) The average shall be calculated for the contaminated area only, and shall not include clean zone data (data from outside the boundaries of the contaminated area as defined by samples contaminated greater than the applicable remediation standard). For example, if data points within a 50 foot "clean" buffer zone around an area of concern were identified during pre-remedial sampling, this clean zone shall not be included in the average. Samples from different depth intervals shall not be averaged together to determine compliance with applicable remediation standards.

ii. The data in the summary table pursuant to (c)3i. above may be presented using the database format outlined in detail in Tables 4.2 and 4.3.

(1) The Site Sampling Results Database defines the parameters of each site/subsite, sample location, and result of chemical and/or physical analysis of samples collected within a site or subsite. These results are then spatially related to an absolute coordinate system. The database structure shall not be duplicated as a hard copy deliverable. This database shall conform to the following structure and contain, at a minimum, the specified data fields:

(A) The database will consist of three files: Site Definition, Sample, and Analytical Results.

(I) The Site Definition file contains information specific to the site (Table 4–2). This database shall consist of a single form per site/subsite and is used to locate the site in relation to other sites in the area. This number shall be the permanent number assigned to the site). An absolute (latitude-longitude coordinated system shall be used to locate the site). The key field in this file is the SITEID.

(II) The Sample Database file contains information specific to each sample collected (Table 4–3). This file includes the spatial and physical parameters of each sample collected within a site or subsite. These samples can be defined in an absolute or relative plane (Cartesian) coordinate system. Sample depth shall be included to allow for development of a three dimensional diagram of the site subsurface. This location system (CO SYS), whether absolute or relative, shall be defined in the Site Description data file and a reference sample point (REFNCE) will be equated with the absolute latitude and longitude of the site. In the case of sites/subsites less than five acres, the site absolute coordinators shall be measured from the approximate center of the site and any centrally located sample used as a reference point. The key fields are SITEID and FIELDID.

(III) The Analytical Results Database file contains information specific to each sample collected (Table 4–3a). The key fields are SITEID and FIELDID.

(2) Databases shall be constructed and delivered in any commonly available commercial database compatible with the IBM type PC running under a DOS operating system and that can be converted into line, or comma quote-delimited ASCII format. The .DBF format, common to dBase, Foxpro, First Choice, Clipper, Alpha 4 and other commercial software, is the required format. The databases shall be delivered to the Department on a DOS 3.0 or more recent formatted removable media. These are 360k and 1200k 5 1/4 inch disks and 720k and 1440k 3.5 inch floppy disks.

(3) Shareware and commercial compression programs are available and can be used to efficiently compress the data. The Department currently uses PKZIP version 1.1 and PCTOOLS CPBACKUP version 7.1 software. (PKZIP is shareware and is available from any public bulletin board.) Other compression routines can be used but the contractor must be able to supply the Department with the ability to uncompress the database. Distribution of commercial software will present a licensing problem but most shareware products (for example, ARJ, ZIP and LZH) can be distributed for uncompressing files without incurring a fee.

TABLE 4–2

SITE DEFINITION DATABASE

Field	Field Name	Variable Type	Field Width	Description
1	SITEID	Character	12	Unique Identification Number (Same as SITEID found in Sample Results Database and may be assigned by the Department)
2	LATITUDE	Numeric	10	Absolute Latitude (decimal degrees)
3	LONGITUDE	Numeric	10	Absolute Longitude (decimal degrees)
4	SITENAME	Character	40	Official Site Name
5	ALIASNAME	Character	48	Other Common Names (separate by semicolons)
6	SITESTREET	Character	40	Street Address of Site
7	SITECITY	Character	15	City
8	SITESTATE	Character	2	New Jersey (NJ)
9	SITEZIP	Character	10	Zip Code
10	MUNICIPALI	Character	30	Municipality
11	COUNTY	Character	10	County
12	BLOCKS	Character	12	Block Number
13	LOTS	Character	12	Lot Number
14	ACTIVE	Logical	1	(Y)es or (N)o
15	LAND_USE	Character	60	Industrial, residential, recreational
16	SITESIZE	Numeric	15	Area in Acres
17	CO_SYS	Character	15	Coordinate system used to locate samples
18	COORUNIT	Character	8	Units of coordinate system (ft, meters, yards, etc.)
19	XDIRECT	Character	9	Compass direction of X coordinate
20	REFNCE	Character	9	Field ID of sample location that corresponds to absolute reference point (Lat., Log.) if absolute reference system is not used
21	SIC_CODE	Character	10	Industrial SIC code for industrial sites

TABLE 4–3
SAMPLE DATABASE

Field	Field Name	Variable Type	Field Width	Description
1	SITEID	Character	12	Unique Site Identification Number (Same as SITEID in Site Definition Database)
2	LABID	Character	10	Identification Number Assigned to Sample by Lab
3	FIELDID	Character	10	Identification Number Assigned or Code Assigned by Sampler
4	MATRIX	Character	4	([wat]er, [air], [sed]iment, building [wall]s or [f]loors, or [soil])
5	XCOOR	Numeric	12	Relative or Absolute X–Coordinate
6	YCOOR	Numeric	12	Relative or Absolute Y–Coordinate
7	DEPTH	Numeric	4	Sample Depth (ft)
8	SAMPDATE	Date	10	Date of Sample Collection (mm/dd/yyyy)
9	DATELAB	Date	10	Date Sample was Received at Lab (mm/dd/yyyy)
10	SAMPNOTE	Character	256	Specific or Non–Standard Information for Sample

TABLE 4–3a
SAMPLE RESULTS DATABASE

Field	Field Name	Variable Type	Field Width	Description
1	SITEID	Character	12	Unique Site Identification Number (Same as SITEID in Site Definition Database)
2	FIELD ID	Character	10	Unique Sample ID, same as FIELDID in Sample Database
3	ANALYTE	Character	60	Chemical or property analyzed
4	CAS	Character	10	CAS Number of analyte, if available
5	CONC	Numeric	7	Value or concentration of measured analyte or property
6	CONCUNIT	Character	12	Unit of measurement or concentration
7	QAQUAL	Character	6	Quality Assurance Qualifier(s) Separate by Semicolons
8	MDL(3)	Numeric	7	Minimum Detection Level in CONCUNIT
9	FTNOTE	Character	256	Specific or Non–Standard Information for Analytical Results
10	DANALYZ	Date	10	Date Analysis was Commenced at Lab (mm/dd/yyyy)

4. Stratigraphic logs, which include soil/rock physical descriptions and field instrument readings detected during drilling for each soil boring, test pit and monitoring well, if applicable;

5. Stratigraphic cross sections of the site using information from monitoring wells, test pits and borings;

6. All soil boring, piezometer, and monitoring well records, including the State permit numbers and as-built specifications, if applicable;

7. If applicable, well casing elevations to the nearest hundredth (0.01) foot relative to a permanent, on-site datum taken at the top of casing with locking cap removed;

8. If applicable, ground water elevation, for each monitoring well, to the nearest hundredth (0.01) foot relative to a permanent, on-site datum taken prior to evacuation, from the top of well casing with locking cap removed;

9. A summary of the review of inventory control records to identify product loss and any actions taken to investigate potential discharge areas;

10. Results of any treatability, bench scale, or pilot studies or other data collected to support remedy selection;

11. Any data collected to develop permit limitations;

12. The results of any ecological assessments conducted;

13. For landfills, a summary of any records pertaining to the nature of waste disposed at the landfill. Copies of the records shall be submitted as a separate attachment to the report; and

14. Any other data and information obtained pursuant to N.J.A.C. 7:26E–4.1 through 4.8.

(d) The remedial investigation report shall include the following legible maps and diagrams:

1. Site and area of concern base maps pursuant to N.J.A.C. 7:26E–4.8(b)3i. If more than one map is submitted pursuant to (d)2 below, maps shall be presented as overlays, keyed to the base maps. Sample locations may be superimposed on the base maps;

2. Sample location map(s), including:

i. All ground water, soil, sediments and other sample locations; sample depth and contaminant concentration shall also be plotted on the map;

ii. Map scale and orientation;

iii. Field identification numbers for all samples;

iv. Ground water elevation contour maps with flow direction specified for each set of static water level measurements for each aquifer if monitoring wells were installed for flow direction;

v. Top of bedrock contour map if bedrock was encountered in a sufficient number of borings to prepare a map;

vi. Isopleth maps for ground water contaminant concentrations, including horizontal/vertical extent of any free product zones, for each round of sampling; isopleth maps for soil sample results may also be provided; and

vii. If data for more than 25 samples are presented for an area of concern, soil, ground water and sediment contaminant isopleth maps and cross section diagram(s) showing concentrations of potential contaminants shall be submitted, including:

(1) Horizontal and vertical distribution of contaminants in the soil and sediment, with sample point location numbers and contaminant concentrations; and

(2) Horizontal and vertical distribution of contaminants in the ground water, with sample point location numbers and contaminant concentrations; and

viii. All monitoring well, piezometer, or other ground water sampling point locations including depth of the open borehole interval and/or screened interval;

3. If applicable, map of the distribution of surface water, structure and airborne contaminants, including sample location numbers and contaminant concentrations;

4. The same alpha or numeric labels, if assigned in the remedial investigation workplan, shall be used in the remedial investigation report; and

5. Photos may be submitted to document the location of all soil and sediment sample locations.

SUBCHAPTER 5. REMEDIAL ALTERNATIVE ANALYSIS

7:26E–5.1 Remedial alternative analysis trigger

(a) The purpose of a remedial alternative analysis is to identify and evaluate remedial action alternatives that are appropriate to the particular characteristics of the area of concern which is undergoing remediation.

(b) The person remediating the site shall select a permanent remedy for the site or area of concern unless otherwise approved by the Department. The Department's preference for remedy selection is, in order of decreasing preference:

1. Onsite permanent remedies;
2. Offsite permanent remedies;
3. Onsite disposal; and
4. Offsite disposal.

(c) The person responsible for conducting the remediation shall conduct a remedial alternative analysis pursuant to this subchapter unless one of the following remedies is implemented:

1. An onsite permanent remedy; or

2. An offsite permanent remedy when the total volume of contaminated material taken offsite from the entire site, not just the individual area of concern undergoing remediation, is less than 100 cubic yards.

7:26E–5.2 Remedial alternative analysis requirements

(a) A remedial alternative analysis is a multi-step process including:

1. The initial identification of remedial action alternatives which may be appropriate for the site or the area of concern;

2. An initial screening of the remedial action alternatives identified;

3. A detailed analysis of each of the remedial action alternatives which remain after the initial screening; and

4. A comparative analysis of the potential performance of each of the remedial action alternatives which remain after the initial screening.

(b) The identification of potential remedial action alternatives, including innovative and emerging treatment technologies, shall be assembled for each area of concern.

(c) The remedial action alternatives which are identified pursuant to (b) above shall undergo an initial screening based on the following:

1. The effectiveness of each remedial action alternative in protecting human health and the environment, including:

i. Its effectiveness in meeting the applicable remediation standards. Alternatives that do not meet the applicable remediation standards shall be eliminated from further consideration; and

ii. The degree to which each alternative reduces toxicity, mobility, or volume of contaminants through treatment, minimizes residual risks and affords long-term protection and minimizes short-term impacts.

2. The implementability of each alternative, including:

i. The technical feasibility and availability of the technologies that each alternative would employ; alternatives that are technically infeasible or that would require equipment, specialists, or facilities that are not available within a reasonable period of time may be eliminated from further consideration; and

ii. If treatability, bench scale, or pilot studies have been conducted pursuant to N.J.A.C. 7:26E–4.1(a)4, these results shall be utilized to determine whether or not an alternative is technically feasible;

3. The timeliness of each alternative including:

i. How quickly each alternative achieves the applicable remediation standard; and

ii. Alternatives where the time needed to achieve the applicable remediation standard is grossly excessive compared to the timeliness of other alternatives may be eliminated from further consideration, however, timeliness shall not be used to select non-treatment over treatment alternatives; and

4. The cost of each alternative including those costs listed below; alternatives where the cost of achieving the applicable remediation standard is grossly excessive compared to the cost of other alternatives may be eliminated from further consideration, however, cost shall not be used to select non-treatment over treatment alternatives:

i. Capital costs (both direct and indirect);

ii. Annual operation, maintenance and monitoring costs; and

iii. Net present value of capital and operation, maintenance and monitoring costs.

(d) Each of the remedial action alternatives which remain after the initial screening shall be analyzed in detail and evaluated according to the following criteria:

1. The ability of the alternative to:

i. Reduce the toxicity, mobility or volume of contaminants through treatment;

ii. Employ reuse, recycling or treatment that reduces toxicity, mobility or volume of contaminants, or results in the reuse or recycling of the contaminants or contaminated media; and

iii. Address the threats to human health and the environment posed by the site;

2. The implementability of the alternative including:

i. The degree of difficulty of implementing the alternatives by considering the technical feasibility, including technical difficulties associated with construction and operation of the alternative;

ii. The reliability of the technology;

iii. The degree to which the alternative may interfere with or restrict other remedial actions taken or to be taken at the site;

iv. The ability to monitor the effectiveness of the alternative;

v. The administrative feasibility including:

(1) The activities needed to coordinate with appropriate offices and agencies; and

(2) The ability and time needed to obtain any necessary approvals and permits from appropriate agencies; and

vi. The availability of services and materials necessary to implement the alternative;

3. The long-term effectiveness and permanence of the alternative, and the degree of certainty that the remedial action will prove successful;

4. The short-term effectiveness of the alternative including:

i. The short-term impacts of alternatives including the risks that might be posed to the community and workers during implementation of the alternative;

ii. The potential environmental impacts of the alternatives and the effectiveness and reliability of measures to mitigate the negative human health or environmental impacts of the alternative during implementation; and

iii. The time required for all applicable remediation standards to be achieved for the area of concern;

5. The cost of the alternative including:

i. The capital costs, both direct and indirect;

ii. The annual operation, maintenance and monitoring costs; and

iii. The net present value of capital, operation, maintenance, and monitoring costs; and

6. Community concerns, including which alternatives interested persons in the community support, have reservations about or oppose.

(e) The final step in a remedial alternative analysis is a comparative analysis of the alternatives which remain after the initial screening to evaluate the relative performance of the alternatives in relation to each criteria specified in (d) above, including identifying the advantages and disadvantages of each alternative.

1. A narrative discussion shall be included describing the strengths and weaknesses of the alternatives relative to one another with respect to each criterion, and how reasonable variations or uncertainties could change the expectations of their relative performance.

2. The alternative that performs the best overall for each criterion, with other alternatives discussed in the relative order in which they perform, shall be identified.

3. If innovative technologies are being considered, their potential advantages with respect to cost or performance and the degree of uncertainty with respect to expected performance (as compared with more demonstrated technologies) shall also be discussed.

4. The presentation of differences among alternatives shall be measured both qualitatively and quantitatively, and shall identify substantive differences between alternatives (for example, greater short-term effectiveness concerns, greater cost, etc.).

5. Quantitative information that was used to assess the alternatives (for example, specific cost estimates, time until all applicable remediation standards would be achieved, and levels of residual contamination) shall be included in these discussions.

7:26E–5.3 Remedial alternative analysis report

(a) The remedial alternative analysis report shall contain the information included in this section and shall be presented in a format that corresponds directly to the outline of this section and shall provide:

1. A list of the remediation standards applicable to the contamination in the area of concern;

2. A discussion of the initial screening process including a presentation of all remedial action alternatives considered for the site pursuant to N.J.A.C. 7:26E–5.2(c);

3. A list of the remedial action alternatives that remain after initial screening;

4. The evaluation and assessment of each remedial action alternative against the criteria specified in N.J.A.C. 7:26E–5.2(d); and

5. A comparative analysis of the alternatives to evaluate the relative performance of each remedial action alternative in relation to each specific evaluation criterion in N.J.A.C. 7:26E–5.2(d).

(b) The remedial alternative analysis report shall be based on all data and information obtained pursuant to N.J.A.C. 7:26E–4.1(a)4i including treatability, bench or pilot scale studies.

SUBCHAPTER 6. REMEDIAL ACTION

7:26E–6.1 Remedial action requirements

(a) The person responsible for implementing any remedial action at a contaminated site shall notify the Department pursuant to N.J.A.C. 7:26E–1.4.

(b) Each remedial action implemented at a contaminated site shall:

1. Be approved by the Department prior to implementation, unless the remedial action is a permanent remedy pursuant to N.J.A.C. 7:26E–5.1(c);

2. Comply with all applicable remediation standards;

3. Comply with all applicable Federal, State, and local laws, regulations, and requirements;

4. Not in itself cause an uncontrolled or unpermitted discharge or transfer of contaminants from one media to another; and

5. Be reevaluated, as determined as necessary by the Department, if contaminants remain onsite after the remediation in excess of the applicable remediation standards. The reevaluation shall be conducted, at a frequency to be determined by the Department, by the person responsible for the remediation. The reevaluation shall determine, at a minimum, the continued adequacy of the chosen remedy, including the implemented institutional controls.

(c) Single phase remediations, where the remedial action is conducted concurrently with sampling to delineate the contamination and to confirm contaminant removal, are acceptable.

7:26E–6.2 Remedial action workplan

(a) If a remedial action workplan is required by the Department in an oversight document or pursuant to the ECRA or UST programs, the workplan shall be submitted in accordance with the schedule contained in that document and shall be presented in a format that corresponds directly to the outline of this section. The workplan shall include:

1. The remedial investigation report, pursuant to N.J.A.C. 7:26E–4.9, shall be presented as the first section of the remedial action workplan. If the remedial investigation report was previously submitted to the Department, a summary of the report may be submitted;

2. A sampling summary table pursuant to N.J.A.C. 7:26E–4.8 (remedial investigation workplan);

3. A proposal to complete all requirements in N.J.A.C. 7:26E–6;

4. The identification of all applicable remediation standards;

5. A detailed description of the remedial action and the remedial technology to be conducted for each area of concern;

6. The identification of all areas where remedial action will be conducted on a scaled site map pursuant to N.J.A.C. 7:26E–4.9 (remedial investigation report). In addition, the map shall specify:

i. The location of remedial treatment units;

ii. The volume of each environmental medium to be remediated;

iii. The vertical and horizontal extent of area to be remediated;

iv. The location, depth and concentration of all contaminants in excess of the remediation standard; and

v. Sample locations, depths and parameters for all post-construction samples;

7. A quality assurance project plan including proposed sampling and analytical methods pursuant to N.J.A.C. 7:26E–2.2;

8. A list of all required permits;

9. If any construction activity is planned, the following items shall be provided in the workplan:

i. The location of any such construction facilities with additional details describing construction design;

ii. All applicable requirements and standards relating to construction for onsite remedial units including inspection and professional engineer certification.

10. A description of soil and sediment erosion control and monitoring, and dust and odor control and monitoring procedures to be implemented during remedial activities, if applicable;

11. A health and safety plan pursuant to N.J.A.C. 7:26E–1.9;

12. A detailed description of site restoration plans to comply with N.J.A.C. 7:26E–6.4 (post-remediation action requirements);

13. A description of procedures for dismantling and removal of remedial structures and equipment from the site, if applicable;

14. A cost estimate of the remedial action pursuant to N.J.A.C. 7:26E–5.2; and

15. If remedial actions will exceed three months in duration, refer to N.J.A.C. 7:26E–6.5 (remedial action schedule and progress reports) for specific schedule and progress report requirements. A schedule is not required if the remedial action will not exceed three months from the proposed start date and the proposed completion date of the remedial action shall be provided.

7:26E–6.3 Specific remedial action requirements

(a) As a first priority during remedial action, contaminants in all media shall be contained and/or stabilized to prevent contaminant exposure to receptors and to prevent further movement of contaminants through any pathway.

(b) The following requirements shall be followed for the removal of an underground storage tank:

1. The associated piping shall be drained and the tanks pumped out and cleaned thoroughly using the American Petroleum Institute's recommended Practice for the Abandonment or Removal of Used Underground Service Tanks, as amended and supplemented. Copies can be obtained from the American Petroleum Institute, 1220 L Street Northwest, Washington, DC 20005;

2. All of the openings in the tank shall be plugged except for one vent hole;

3. The soil around the tank shall be excavated and the tank shall be removed and secured;

4. After the tank is secured, it shall be examined for holes and the NJDEPE HOTLINE, (609) 292–7172, shall be called if any holes are found unless a discharge from the tank was previously reported to the Department;

5. The tank shall then be prepared for disposal by labeling the tank regarding its site of origin, ultimate destination site and the substance(s) that were stored in it during its use as a storage tank; and

6. The tank shall be removed from the site according to all applicable laws and regulations.

i. During tank removal, the following observations shall be made and documented:

(1) A description of tank condition (with photographic documentation);

(2) The excavation floor and sidewalls shall be examined for any physical evidence of soil contamination;

(A) When tanks that contained volatile organics, including No. 2 fuel oil, diesel fuel, gasoline, kerosene, jet fuel, waste oil, are removed, the excavation floor and sidewalls shall be field screened with a properly calibrated flame ionization detector (FID), or photoionization detector (PID) along transects spaced no more than five feet apart.

(B) If the tank did not contain volatile organics (for example, No. 4, No. 6 fuel oil), the excavation shall be examined visually for evidence of a discharge.

(3) If there is no evidence of a discharge, soil samples for laboratory analysis shall be taken immediately after tank removal at a frequency of one per five linear feet along the center line of each tank, and two of the excavation sidewalls shall be sampled at the bottom of the sidewalls. If there is evidence of a discharge and remediation will occur, see N.J.A.C. 7:26E–6.4;

(4) The presence and physical description (for example, odor, sheen) of the quality of ground water (including any perched water); and

(5) A description of product type and quantity spilled from tank or tank system during excavation.

ii. If documentation acceptable to the Department is provided in the remedial action report, the owner or operator of an underground storage tank system may abandon the system in place only if:

(1) The underground storage tank is located under a permanent structure; or

(2) The owner or operator submits a certification, signed and sealed by a New Jersey professional engi-

neer, stating that removal of the underground storage tank will cause damage to the other structure, or that the tank is difficult to remove from the ground because of inaccessibility or type of tank construction.

iii. If tank systems are abandoned in place, the following requirements shall be met:

(1) The tank system and associated piping shall be drained and the system pumped out and cleaned thoroughly using current American Petroleum Institute guidance;

(2) Decommissioning of the tanks shall then be completed by introducing sand, cement or other material with similar physical/chemical properties into the system through existing openings in the tank or through holes cut in the top of the tank. Because vapors in the tank atmosphere will be displaced during the tank filling operation, particular emphasis shall be placed on health and safety concerns; and

(3) Procedures shall comply with any local ordinances.

7:26E–6.4 Post-remedial action requirements

(a) The following sampling shall document the effectiveness of the remedial action:

1. All sampling shall be conducted pursuant to N.J.A.C. 7:26E–3.3 through 3.9 and 4.1 through 4.7.

2. For soils, if excavation is conducted, the minimum post remediation sampling frequency shall be:

i. For excavations less than 20 feet in perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.

ii. For excavations 20 to 300 feet in perimeter:

(1) For surface spills, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.

(2) For subsurface spills, one sample from the bottom of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.

iii. For larger excavations, sampling frequency may be reduced if documentation acceptable to the Department is provided in the remedial action report (N.J.A.C. 7:26E–6.6) specifying why the sample frequency was considered adequate.

iv. For volatile organics bottom samples taken within 24 hours of excavation, samples shall be taken from the zero to six inch interval at the excavation floor. Samples taken after 24 hours shall be taken at six to 12 inches. For excavations open longer than two weeks, volatile organics sample depth for bottom samples shall be in accordance with N.J.A.C. 7:26E–3.9 (site investigation requirements).

v. Each excavation within a larger excavation shall be considered a separate excavation and shall comply with (a)2i through iv above.

vi. For tanks, if contaminated soil is removed, post remediation soil samples for laboratory analysis shall be taken immediately after contaminated soil removal at a frequency of one per five linear feet along the centerline of each tank and at least two of the excavation sidewalls shall be sampled at the bottom of the sidewalls. If the excavation is enlarged horizontally beyond the immediate tank removal area, additional soil samples shall be taken pursuant to (a)2i through iv above.

3. For soils, if in situ remediation is conducted, the minimum post-remediation sampling frequency shall be one sample per 900 square feet of contaminated area. Where the contaminated zone exceeds two feet in depth, one additional sample per 900 square feet of contaminated area shall be taken for each two feet of depth.

4. For building interiors, post-remediation sample frequency shall be as follows:

i. One sample for every 900 square feet for each area of concern of 9,000 square feet or less.

ii. For areas of concern greater than 9,000 square feet, one additional sample shall be taken for every additional 9,000 square feet. For example, an area of concern of 9,001 to 18,000 square feet would require a minimum of 11 samples.

5. Post-remediation sample locations and depth shall be biased towards the areas and depths of highest contamination identified during previous sampling episodes unless field indicators such as field instrument measurements or visual contamination identified during the remedial action indicate that other locations and depths may be more heavily contaminated. In this case, post-remediation samples shall be biased towards locations and depths of the highest expected contamination.

(b) All areas subject to remediation shall be restored, to the extent practicable, to pre-remediation conditions with respect to topography, hydrology and vegetation, unless alternate restoration is approved by the Department.

1. Sites located adjacent to or in wetlands or in or near other critical habitat areas as defined in N.J.A.C. 7:26D–5, may have further requirements under N.J.A.C. 7:7E (Coastal Zone Management) or N.J.A.C. 7:7A (Wetlands Act).

2. Fill material used to restore a site after the remediation has been completed shall be similar in physical properties to the material removed unless otherwise approved in advance by the Department. Fill used for new building foundations or other construction in remediated areas are exempt from this requirement.

i. If the excavated material is native soil, the fill shall be of equal or less permeability than the soil removed.

ii. If the excavated material is not native soil, the fill material shall be of equal or less permeability than the native soil in or adjacent to the area of concern or, at a minimum, have a permeability equal to or less than that of loam.

iii. Fill shall be uncontaminated pursuant to any applicable remediation standard and free of extraneous debris or solid waste.

iv. Documentation of the quality of the fill shall be provided by a certification stating that it is virgin material from a commercial or noncommercial source or decontaminated recycled soil.

v. Uncontaminated soil from the site pursuant to any applicable remediation standard may be returned to excavations or may be used elsewhere on the site.

vi. The bills of lading shall be provided to the Department to document the source(s) of fill. The documentation shall include:

(1) The name of the affiant and relationship to the source of the fill;

(2) The location where the fill was obtained, including the street, town, lot and block, county, and state, and a brief history of the site which is the source of the fill; and

3. A statement that to the best of the affiant's knowledge and belief the fill being provided is not contaminated pursuant to any applicable remediation standards and a description of the steps taken to confirm such.

(c) After completion of remediation all monitoring and extraction wells shall be sealed in accordance with N.J.A.C. 7:9–9 unless otherwise approved by the Department.

7:26E–6.5 Remedial action schedule and progress reports

(a) If the Remedial Action activities at a site are being performed pursuant to N.J.A.C. 7:26C or the ECRA or UST programs, and require more than three months for completion, a schedule for completion of the remedial action by task and final completion schedule is required in addition to progress reports at a frequency which shall be specified by the Department in the oversight document or by the ECRA or UST program. The remedial action schedule shall contain the following elements:

1. Schedules shall utilize monthly timeframes, when possible, for the initiation or completion of tasks;

2. The remedial action workplan shall not list specific dates as these will be contingent upon Department approval of the remedial action workplan;

3. After remedial action workplan approval is obtained, the schedule shall be revised to identify the projected month/year for each task;

4. All tasks for all areas of concern shall be identified in the schedule;

5. Contractor bidding/review/acceptance process timeframe shall be included in the schedule;

6. The schedule shall consider timeframes for permit applications (municipal, NJDEPE, etc.) and final permit approvals. A critical path schedule shall be included when any permits are involved because certain tasks cannot proceed without permit approval;

7. When projecting dates for submission of reports to the Department, the schedule shall consider review time of not only the person preparing the report but all other persons who are deemed necessary to finalize the report;

8. The schedule shall identify all anticipated report submittals (month/year) to the Department including, without limitation, progress reports, ground water monitoring reports, post-remediation data reports for individual areas of concern, construction design reports and final remedial action reports. Laboratory analysis time shall be accounted for in projecting report submittal dates;

9. The schedule shall allow for Department review time of submitted reports;

10. The schedule shall include time for obtaining waste classification from the Department for disposal or treatment of waste material generated during remediation;

11. The schedule shall include a timeframe for site restoration (backfill, regrade, pave, etc.) and Department final inspection; and

12. The schedule shall include projected date for full compliance with the Department program overseeing the remediation.

(b) A progress report shall include, at a minimum, the following information:

1. Specification/reporting of all remedial actions accomplished during the reporting period;

2. Proposal of any deviations from and/or modifications to the approved remedial action workplan. All modifications shall be approved by the Department prior to enactment;

3. Reporting of problems or delays in the implementation of the remedial action workplan. Proposed corrections shall be presented with changes to the approved project schedule and shall be approved by the Department. A revised schedule shall be submitted as part of the progress report. The status of all permit applications shall be included in this schedule;

4. Identification of the remedial actions for the next reporting period;

5. Presentation annually of the actual costs of remediation incurred to date;

6. If required in an oversight document pursuant to N.J.A.C. 7:26C or by ECRA or UST, the following shall be provided:

i. Tabulation of all sample results received during this period with sample date, sample location, laboratory identification, matrix sampled, depth, analyses performed, analytes detected, and concentrations detected and submission of a report summarizing the data and presenting conclusions; and

ii. Tabulation of waste classification and/or characterization samples collected including the physical state of the material (solid, liquid, sludge), the volume of material, number of samples collected, analyses performed and results;

7. A listing of all types and quantities of waste generated by the remedial action during the reporting period and to date. Include the name of the disposal facilities, and transporters' dates of disposal, and if appropriate, the manifest numbers of each waste load; and

8. Any additional support documentation that is available (e.g. photographs) shall be submitted.

(c) If the Department determines in writing that oversight of some of the remedial activities will occur pursuant to Federal, State or local permits, then the requirements of this subchapter may be waived for those activities. The Department may request a summary of permitted activities.

7:26E–6.6 Remedial action report

(a) Any remedial action report submitted to the Department for approval shall present and discuss all data and information collected in compliance with N.J.A.C. 7:26E–6.3 (specific remedial action requirements) and N.J.A.C. 7:26E–6.4 (specific post-remedial action requirements), if applicable. The report shall be presented in a format that corresponds directly to the outline of this section.

(b) Any remedial action report submitted to the Department for approval shall include the following:

1. All information contained in the remedial investigation report pursuant to N.J.A.C. 7:26E–4.9 or a summary of the report;

2. The remedial investigation report section entitled "Findings/Recommendations," shall be renamed "Findings/Remedial Action Report" and shall include a description of how each area of concern was addressed;

(c) The Findings/Remedial Action report section shall state for each area of concern either "no remediation was conducted for this area of concern" or "remedial actions were completed for this area of concern." Where remedial actions were completed, the following shall be included:

1. A summary by area of concern of all remedial actions completed;

2. A list of the remediation standards applied to the remedial actions;

3. Tables and figures pursuant to N.J.A.C. 7:26E–4.9 (remedial investigation report) containing all pre and post remedial data keyed appropriately so that completion of the remedial action is documented. The figures shall clearly indicate the volume of contaminated media which was remediated;

4. A detailed description of site restoration activities pursuant to N.J.A.C. 7:26E–6.4 (Post–Remedial Action Requirements);

5. A detailed description of source and quality of fill pursuant to N.J.A.C. 7:26E–6.4;

6. A detailed report of actual costs pursuant to N.J.A.C. 7:26E–5.2;

7. "As-built" diagrams for any permanent structures including, without limitation, caps, slurry walls, treatment units, or other remedial structures which will remain in place after completion of the remedial action;

8. Fully executed manifests documenting any offsite transport of waste material; and

9. A filed copy of Department approved use restrictions.

SUBCHAPTER 7. PERMIT IDENTIFICATION AND APPLICATION SCHEDULE

7:26E–7.1 Permit identification

(a) Any person conducting a remedial action shall identify all relevant Federal, State and local permits or permit modifications or certifications needed to implement the selected remedial action including, but not limited to:

1. Soil Erosion and Sediment Control Plan Certification for Land Disturbance Control (N.J.A.C. 2:90);

2. Permit to Construct/Install/Alter Air Quality Control Apparatus/Equipment (N.J.A.C. 7:27–8);

3. Certificate to Operate Air Quality Control Apparatus/Equipment (N.J.A.C. 7:27–8);

4. Coastal Area Facility Review Act (CAFRA) Permit (N.J.S.A. 13:19–1 et seq.);

5. Waterfront Development/Upland Waterfront Permit (N.J.S.A. 12:5–3);

6. Wetlands Permit (N.J.S.A. 13:9A–1 et seq.);

7. Freshwater Wetlands/Open Water Fill Permit (N.J.S.A. 13:98–1 et seq.);

8. Stream Encroachment Permit (Construction Within a Flood Plain) (N.J.S.A. 58:16A–50 et seq.; N.J.A.C. 7:8–3.15);

9. State Water Quality Certificate (N.J.S.A. 58:10A–1 to 13; 33 U.S.C. 1251, § 401);

10. Dewatering Permit and/or Water Diversion Permit (N.J.S.A. 23:5–29);

11. U.S. Army Corps of Engineers Dredge and Fill Permit;

12. Delaware River Basin Commission Docket Approval (N.J.S.A. 32:20–1 et seq.);

13. Hackensack Meadowlands Development Commission—Zoning Certificate (N.J.S.A. 13:17–1 et seq.);

14. New Jersey Pinelands—Letter of Approval (N.J.S.A. 13:18A–1 et seq.);

15. Discharge Prevention and Discharge Cleanup and Removal Plans (Pertaining to Storage and Transfer of Petroleum and other Hazardous Substances) (N.J.S.A. 58:10–23.11 et seq.; N.J.A.C. 7:1E);

16. Registration of Underground Storage Tank; UST Installation Permit and Closure Approval (N.J.S.A. 58:10A–21 et seq.);

17. Water Quality Management Plan Consistency Determination (N.J.S.A. 58:11A–1 et seq.; N.J.A.C. 7:15);

18. New Jersey Pollutant Discharge Elimination System (NJPDES) (N.J.S.A. 58:10A–1 et seq.; N.J.A.C. 7:14A);

i. NJPDES—Discharge to Surface Water (DSW)—Industrial (N.J.S.A. 58:10A–1 et seq.; N.J.A.C. 7:14A);

ii. NJPDES—Significant Indirect User (SIU) (N.J.S.A. 58:10A–1 et seq.; N.J.A.C. 7:14A); and

iii. NJPDES—Discharge to Ground Water (DGW) (N.J.S.A. 58:10A–1 et seq.; N.J.A.C. 7:14A);

19. Treatment Works Approval (TWA) (N.J.S.A. 58:12A–1 et seq.; N.J.A.C. 7:10–11);

20. Sewer Connection Permit (N.J.S.A. 58:10A–1 et seq.; N.J.A.C. 7:14A);

21. Employer License (Asbestos) (N.J.A.C. 8:60–4), (N.J.A.C. 12:120–4);

22. Asbestos Worker or Asbestos Supervisor Permit Certification of Training Agencies (Asbestos) Asbestos Work Notification Requirements (N.J.A.C. 8:60–6), (N.J.A.C. 12:120–6);

23. National Emission Standards for Hazardous Air Pollutants (NESHAPs) Written Notification Requirements;

24. Landfill Disruption/Closure Approval (N.J.S.A. 13:1E–1 et seq.; N.J.A.C. 7:26–2.7);

25. Hazardous Waste Facility Registration (N.J.S.A. 13:1E–1 et seq.; N.J.A.C. 7:26);

26. Short Term Water Use Report;

27. Well Drilling Permit, and Well Certification Forms A & B; (N.J.S.A. 58:4A–14; N.J.A.C. 7:8–3.11);

28. Well Abandonment Form;

29. Exemption of Waste Flow Rule (Soil Reuse);

30. Hazardous Waste Generator Identification Number (N.J.A.C. 7:26);

31. RCRA TSD Facility Permit, except that hazardous waste treatment, storage, or disposal facility permits pursuant to the Solid Waste Management Act, N.J.S.A. 13:1E–1 et seq., and the Hazardous Waste Permitting regulations at N.J.A.C. 7:26, shall not be required for any remediation conducted on site pursuant to any of the following:

i. An administrative consent order pursuant to N.J.A.C. 7:26C; or

ii. A memorandum of agreement expressly executed for the implementation of a Department approved remedial action pursuant to a Department approved schedule; provided, however, that if the remedial action is not implemented pursuant to the approved schedule, then this provision does not apply and the otherwise applicable hazardous waste permits shall be required;

iii. Approvals under authority of ECRA and UST; or

iv. Approvals under any State publicly funded projects; and

32. Any other Federal, State or local approvals that may be required.

(b) Any person conducting a remedial action shall apply for and obtain all required permits prior to initiating the remedial action.

(c) Any person conducting a remedial action pursuant to an oversight document or the ECRA or UST programs, shall develop a permit application schedule to identify the timeframes for application and issuance/approval pursuant to N.J.A.C. 7:26E–6.5(a)6.

APPENDIX A

Laboratory Data Deliverables Formats

I. Full Laboratory Data Deliverables—USEPA/CLP Methods

Full laboratory data deliverables for USEPA/CLP analyses may be requested when the following Statements of Work are employed:

"USEPA Contract Laboratory Program Statement of Work for:

A) Organics Analysis, Multi–Media, Multi–Concentration"

B) Inorganics Analysis, Multi–Media, Multi–Concentration"

C) Organics Analysis, Multi–Media, High–Concentration"

D) Inorganics Analysis, Multi–Media, High–Concentration"

E) Low Concentration Water for Organic Analysis"

F) Low Concentration Water for Volatile Organic Analysis"

G) Low Concentration Water for Inorganic Analytes"

H) Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans"

The Full laboratory data deliverables required for USEPA/CLP analyses are listed in the versions of the above noted Statements of Work in effect as of the date of sample analysis by the laboratory. Additionally, mass spectral negative proofs[1] are required where applicable, "clean" soil method blanks[2] for nonaqueous samples are not permitted, and laboratory internal chain of custody documentation is required.

[1] A negative proof is a mass spectrum offered as evidence to support an analyst's decision to negate the presence of a contaminant which has been qualitatively identified and reported by the instrument's data system.

[2] Method blanks for nonaqueous samples shall consist of performing the entire analytical procedure without any actual sample being present. The appropriate amount of sodium sulfate as specified in the current Statements of Work for Organics would be substituted as the "sample" for the semivolatile and pesticide/aroclor fractions.

II. Full Laboratory Data Deliverables—Non–USEPA/CLP Methods

These deliverables shall be the "Regulatory Format" data deliverables listed in the version of the Professional Laboratory Analytical Services contract issued by the N.J. Department of Treasury, Division of Purchase and Property in effect as of the date of sample analysis by the laboratory.

III. Reduced Laboratory Data Deliverables—USEPA/CLP Methods

Reduced laboratory data deliverables for USEPA/CLP analyses may be required when the "USEPA Contract Laboratory Program Statement of Work for Organic Analyses, Multi–Media, Multi–Concentration"; the "USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, Multi–Media, Multi–Concentration"; "USEPA Contract Laboratory Program Statement of Work for Organics Analysis, Multi–Media, High Concentration"; and/or the "USEPA Contract Laboratory Program Statement of Work for Inorganics Analysis, Multi–Media, High Concentration are employed. Data generated via the other above noted Statements of Work may NOT be delivered in the reduced format.

A. Organics

All laboratory data deliverables required for USEPA CLP analyses for organics via the appropriate Statement of Work are the same as those listed above in the **Full Laboratory Data Deliverables—USEPA/CLP** requirements and must be submitted with the following exceptions:

1. Chromatograms of standards (calibrations) are not required.

2. Chromatograms and spectra for matrix spikes and matrix spike duplicates are not required.

B. Inorganics

The Reduced laboratory data deliverables required for USEPA/CLP analyses for inorganics are all the Inorganics Data Reporting Forms as specified in the version of the above noted Statement of Work for Inorganics in effect as of the date of sample analysis by the laboratory.

IV. Reduced Laboratory Data Deliverables—Non–USEPA/CLP Methods

This attachment presents reduced laboratory data deliverables requirements for Non–USEPA/CLP Methods. The deliverable package is divided into six (6) sections:

1. General Requirements
2. GC/MS Requirements
3. GC Requirements
4. Metals Requirements
5. General Chemistry Requirements
6. Petroleum Hydrocarbons Requirements

1. General Requirements

A. The data deliverable package shall be bound and paginated with margins, bindings and of reproduction quality such that all pages are legible.

B. Title/Cover Page

The format for QA/QC documentation shall be simplified as much as possible for ease of review and reference. The report shall begin with a cover page that includes the laboratory certification number, if applicable, facility name, address and date of report preparation.

The report shall include a summary table that cross-references the field identification number to the laboratory identification number for each sample. This table is needed to locate laboratory information for specific field samples. Sample numbers used in the field are always different than those used in the laboratory and therefore shall be reconciled before submitting the results to Department.

C. **Chain of Custody**

The Chain of Custody (COC) shall ensure the secure and appropriate handling of samples from the site to the laboratory as well as the movement of the sample within the laboratory until analysis is completed. The COC remains with the samples at all times and bears the name of the person assuming responsibility of the samples and the date. The COC is acceptable when there are no lapses in sample custody.

D. **Methodology Review**

The Methodology Review shall list method numbers, with a detailed discussion of any method modification.

E. **Laboratory Chronicle**

The laboratory chronicle shall detail actual sample holding times and specify the sample condition upon receipt at the laboratory (including sample temperature and pH when pH adjustment is required). Holding time begins at the time of sample collection.

F. **Conformance/Non–Conformance Summary**

A non-conformance summary shall be completed and signed by the laboratory. This summary states that the laboratory has reviewed the quality assurance and quality control measures for sample analysis. It identifies any deviations from the accepted practices or results.

2. **GC/MS Requirements**

A. Analytical Results Summary—An analytical results summary form shall be submitted for each sample and for each GC/MS analytical fraction (i.e., volatiles and semivolatiles). Each form shall contain the following information: date sample received, date sample extracted, date sample analyzed, sample weight/volume, sample moisture content, dilution factor, GC column used, list of analytes, method detection limit, practical quantitation level and detected analyte concentrations. In addition a separate form for tentatively identified compounds (TICs) shall be submitted for each sample and for each GC/MS analytical fraction. Each TIC shall be identified by compound name or class (if it can be determined) and CAS number along with its retention time and estimated concentration.

B. Tuning Results Summary—Tuning results for all initial and continuing calibrations that are associated with all samples shall be submitted for each GC/MS analytical fraction. Each form shall contain the following information: laboratory file ID, instrument ID, injection date and time, the m/e (mass to ion charge) listing for the key ions, the reported ion relative abundance, the ion abundance criteria and a listing of all standards, blanks, QC samples and field samples (including date and time of analysis) associated with the tune.

C. Method Blank Results Summary—An analytical results form shall be submitted for all method blanks associated with all field samples for all analytical fractions. Each form shall contain the information listed in Section 2A above, as well as a listing of all field and QC samples associated with each method blank. In addition, a separate form for TICs shall be submitted which contains the information listed in Section 2A above.

D. Calibration Summary—A summary of all initial and continuing calibrations that are associated with all samples and blanks shall be submitted for each GC/MS analytical fraction. The following information shall be provided for each initial calibration: instrument ID, calibration date and time, listing of standard concentrations used, laboratory file ID for each calibration standard, listing of all associated field samples, QC samples and blanks, retention times for each target analyte and surrogate compound, listing of the relative response factor (RRF) for each target analyte and surrogate compound, the average RRF for each target analyte and surrogate compound, and percent relative standard deviation for each target analyte and surrogate compound. The following information shall be provided for each continuing calibration: instrument ID, calibration date and time, date and time of the associated initial calibration, the standard concentration used, the laboratory file ID for the calibration standard, listing of all associated field samples, QC samples and blanks, retention times for each target analyte and surrogate compound, the average RRF for each target analyte and surrogate compound from the associated initial calibration, the RRF for each target analyte and surrogate compound from the continuing calibration and the percent difference for each target analyte and surrogate compound.

E. Surrogate Compound Recovery Results Summary—If required by the analytical method, a summary form shall be submitted which contains the following information for all field samples, method blanks and QC samples for each GC/MS analytical fraction: sample identification number, sample matrix, surrogate compound names, concentration of surrogate compounds used, surrogate compound recoveries and QC limits for each surrogate compound.

F. Matrix Spike/Matrix Spike Duplicate Results Summary—If required by the analytical method, a summary form shall be submitted for each sample matrix and each GC/MS analytical fraction which contains the following: sample identification number for the sample selected for spiking, list of compounds being spiked, concentration of each spiked compound, matrix spike concentration, matrix spike percent recovery, matrix spike duplicate concentration, matrix spike duplicate percent recovery, relative percent difference and QC limits for percent recovery and relative percent difference.

G. Internal Standard Summary—A summary form shall be submitted which contains the following information for all standards, field samples, method blanks and QC samples for each analytical fraction: sample ID number, ID of laboratory calibration standard, internal standard compound names, concentration of internal standards compounds, retention times of each internal standard, area of each internal standard, and QC criteria (where applicable) for internal standard areas and retention times.

H. Chromatograms—The total ion chromatograms for all field samples and method blanks. All peaks on the chromatograms shall be identified as either an internal standard, surrogate compound, target compound or non-target compound. All peaks on a chromatogram shall also be associated with retention times, either directly on the chromatogram or identified and cross-referenced in tabular form.

3. **GC Requirements**

A. Analytical Results Summary—An analytical results form shall be submitted for each sample. Each form shall contain the information contained in Section 2A above.

B. Method Blank Results Summary—An analytical results form shall be submitted for all method blanks as well as a listing of all field and QC samples associated with each method blank. Each form shall contain the information contained in Section 2A above.

C. Standards Summary—A summary form containing GC standards information for all associated samples shall be submitted for both primary and confirmation (if applicable) analyses. This summary shall contain the following information: instrument ID number, GC column used and notation if primary or confirmation analysis, date and time of standard(s) analysis, listing of all associated field, QC and method blank samples, listing of target compounds, retention time windows of each target compound and calibration factor for each target compound.

D. Surrogate Compound Recovery Results Summary—If required by the analytical method, a summary form shall be submitted which contains the following information for all field samples, method blanks, and QC samples: sample identification number, sample matrix, surrogate compound names, concentration of surrogate compounds used, surrogate compound recoveries and QC limits for each surrogate compound.

E. Matrix Spike/Matrix Spike Duplicate Results Summary—If required by the analytical method, a summary form shall be submitted for each sample matrix which contains the information contained in Section 2F above.

F. Retention Time Shift Summary—If required by the analytical method, a summary form containing retention time shift results shall be submitted for both the primary and confirmation (if applicable) analyses. The form shall contain the following information: instrument ID number, GC column used and notation if primary or confirmation column analysis, name of retention time shift marker compound, list of all field samples, method blanks and QC samples, date and time of analysis of all field samples, method blanks and QC samples, percent difference of the retention time shift and QC limits for the retention time shift.

G. Chromatograms—The primary analysis chromatograms and confirmation analysis chromatogram (when applicable) for all field samples and method blanks shall be submitted. All peaks on the chromatogram attributable to target and surrogate compounds shall be identified as such along with the retention time for each peak. The reference standard chromatogram for all multi-peak target compounds (e.g., toxaphene, PCBs) for both the primary and the confirmation analysis (when applicable) shall also be submitted.

4. **Metals Requirements**

A. Analytical Results Summary—An analytical results form shall be submitted for each sample. Each form shall contain the following information: sample identification number (laboratory and/or field ID), sample matrix, date sample received, date sample analyzed, sample moisture content, dilution factor (if any), list of target analytes and detected analyte concentrations and method detection limits.

B. Blank Results Summary—A blank results form shall be submitted for all instrument calibration blanks and reagent blanks associated with all field and QC samples. Each form shall contain the following information: list of all target analytes, matrix of the reagent blank, concentration units of the reagent blank, reported concentration of all target analytes found in all calibration and reagent blanks and method detection limits.

C. Calibration Summary—A calibration summary shall be submitted for all initial calibration standards and check standards associated with field samples, blanks and QC samples. Each form shall contain the following information: list of all target analytes, the true concentration for the initial calibration standards, the reported (or found) concentrations for the initial calibration standards and check standards, the percent recovery for each initial calibration standard and check standard and the percent recovery QC limits for each target analyte. In addition, this form shall also list the method detection limit and instrument detection limit for each target analyte.

D. ICP Interference Check Sample Results Summary—If metals analysis is being conducted by ICP methodology, results of the interference check samples analysis shall be reported. The following information shall be reported: list of all target analytes in the interference check sample, the true concentration of analytes in the interference check sample, the reported concentrations of analytes found in the interference check sample for both the initial and final check samples analyses, the percent recovery of the target analytes found in the initial and final check samples analyses and the QC control limits for percent recovery values.

E. Spike Sample Results Summary—A summary of the spike sample analysis shall be submitted. The following information shall be reported: ID number of the sample chosen for spiking, sample matrix, the concentration of each spiked target analyte, the results of the unspiked sample analysis, the results of the spiked sample analysis, the percent recovery for each spiked analyte and the QC limit for percent recovery for each spiked analyte.

F. Duplicate Sample Results Summary—A summary of the duplicate sample analysis shall be submitted. The following information shall be reported: ID number of the original sample and the duplicate samples, sample matrix, results of the original sample analysis, results of the duplicate sample analysis, the relative percent difference of each target analyte for the original duplicate sample analyses and the QC limit for relative percent difference for each target analyte.

G. Laboratory Control Sample Results Summary—When specified by the analytical method, the results of the laboratory control (quality control) sample shall be submitted. The following information shall be reported: control sample matrix, list of all target analytes, the true concentration for each analyte in the control sample, the reported concentration for each target analyte in the control sample, the percent recovery for each target analyte and the QC limit for percent recovery for each target analyte.

H. Serial Dilution Summary—If required by the analytical method, a summary of the serial dilution results shall be submitted. The following information shall be reported: ID number of the original sample and the serial dilution samples, sample matrix, results of the original sample analysis, results of the serial dilution sample analysis, the percent difference of each target analyte compared to the original analytes' results and the QC limit for percent difference for each target analyte.

5. **General Chemistry Requirements**

A. Analytical Results Summary—An analytical results form shall be submitted for each sample. Each form shall contain the following information: sample identification number (laboratory and/or field ID), sample matrix, date sample received, date sample analyzed, sample moisture content, dilution factor (if any), list of target analytes and detected analyte concentrations and method detection limits.

B. Blank Results Summary—A blank results form shall be submitted for all method blank samples associated with all field and QC samples. Each form shall contain the following information: list of all target analytes, matrix of the method blank, concentration units of the method blank, reported concentration of all target analytes found in all method blanks.

C. Spike Sample Results Summary—A summary of the spike sample analysis shall be submitted. The following information shall be reported: ID number of the sample chosen for spiking, sample matrix, the concentration of each spiked target analyte, the results of the unspiked sample analysis, the results of the spiked sample analysis, the percent recovery for each spiked analyte and the QC limit for percent recovery for each spiked analyte.

D. Duplicate Sample Results Summary—A summary of the duplicate sample analysis shall be submitted. The following information shall be reported: ID number of the original sample and the duplicate samples, sample matrix, results of the original sample analysis, results of the duplicate sample analysis, the relative percent difference of each target analyte for the original duplicate sample analyses and the QC limit for relative percent difference for each target analyte.

6. **Petroleum Hydrocarbon Requirements**

A. Analytical Results Summary—An analytical results form shall be submitted for each sample. Each form shall contain the following information: sample identification number (laboratory and/or field ID), sample matrix, date sample received, date sample analyzed, sample moisture content, dilution factor (if any), and detected analyte concentrations and method detection limits.

B. Blank Results Summary—A blank results form shall be submitted for all method blank samples associated with all field and QC samples. Each form shall contain the following information: list of all target analytes, matrix of the method blank, concentration units of the method blank, reported concentration of all target analytes found in all method blanks.

C. Spike Sample Results Summary—A summary of the spike sample analysis shall be submitted. The following information shall be reported: ID number of the sample chosen for spiking, sample matrix, the concentration of each spiked target analyte, the results of the unspiked sample analysis, the results of the spiked sample analysis, the percent recovery for each spiked analyte and the QC limit for percent recovery for each spiked analyte.

D. Duplicate Sample Results Summary—A summary of the duplicate sample analysis shall be submitted. The following information shall be reported: ID number of the original sample and the duplicate samples, sample matrix, results of the original sample analysis, results of the duplicate sample analysis, the relative percent difference of each target analyte for the original duplicate sample analyses and the QC limit for relative percent difference for each target analyte.

E. IR spectra for standards, blanks, samples.

F. If GC fingerprinting was conducted, submit chromatograms for standards, blanks, samples.

APPENDIX B

Well Search Format

Preparer

Name of Site

Case Number

Street Address

Township

County

USGS Quadrangle

Latitude

Longitude

Instructions:

1. All sources of well records/information shall be clearly documented.

2. List all wells and State well permit numbers, including active, inactive and abandoned, within ½ mile of the site boundary. Include all wells, active, inactive and abandoned at the site.

3. Locate all listed wells on a site locus map.

4. Sources that shall be used:

a. Well records search of the Bureau of Water Allocation. There is no cost if this search is performed by the individual. Appointments shall be made to examine well records by contacting the Bureau of Water Allocation at (609) 292–2957. Upon written request, the Bureau will provide the well search for a fee.

b. Contact local or county Health Department or equivalent.

5. Submit any available analyses from wells as an attachment.

6. Complete chart on back.

	Well Owner	Address	Total Depth	Length of Casing	Static Water Elev.	Use Code	Source of Information
1.							
2.							
3.							
4.							
5.							
6.							

USE CODES

A =
B = Boring
C =
D = Domestic
E = Recovery/Decontamination Pollution Control/Leachate with Pump Capacity
F = Fire
G = Irrigation
H = Heat Pump/Geothermal
I = Industrial
J = Injection/Waste Discharge
K =
L = Livestock
M = Monitoring
N = Public Non-community
O = Oil/Gas Exploration
P = Public Supply
Q = Recharge
S = Sealed
T = Test
U = Non-public
V = Gas Vent
W = Dewatering
X = Cancelled
Y = Cathodic Protection
Z = Piezometer

NEW REPLACEMENT WELL CODES

1 = Domestic
2 = Public Community
3 = Public Non–Community
4 = Industrial
5 = Irrigation
6 = Monitoring
7 = Piezometer
8 = Heat Pump/Geothermal
9 = Recovery
0 = Gas Vent