Glossary of Technical Terms

Note: Terms specific to radioactive materials are listed under the heading "Radioactive Terms" below.

Accelerated Site Characterization (ASC) – A process for characterizing vadose zone and ground water contaminated sites using primarily professional judgement-base sampling and measurements by an integrated, multidisciplinary core technical team. The team operates within the framework of a dynamic work plan that gives flexibility and responsibility to select the type and location of measurements to optimize data collection activities during a limited number of field mobilizations.

Accuracy – The ability of a technique to detect the true concentration of the analyte.

Administrative Consent Order (ACO) – An enforcement document that compels a responsible party to initiate cleanup efforts.

Analytical Method - The techniques used for the detection, identification, and quantification of chemical compounds in environmental samples.

Anisotropic – To exhibiting properties with different values when measured in different directions.

Background Samples – Samples that are collected and used to compare site conditions to the surrounding environment. Background samples are collected and handled in the same manner as all other samples.

Biased Sample – Samples which are collected at locations based on historical information, behavior of contaminants, or knowledge about the physical system's matrix (the physical system's effect on fate of transport).

Blind Samples – A quality assurance sample in which the laboratory performing the analysis is unaware of the sample's true location this sample is collected a duplicate.

Calibration – Process of adjusting an instrument's read out so that it corresponds to actual concentrations. It involves checking the instrument with a known concentration of a surrogate to insure that the instrument provides a proper response.

Caliper – A mechanical device that is used to measure the diameter of a borehole.

Certified Laboratory – 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 analysis for a specific certification category and a specific parameter within the certification categories.

Cleanup Standard – The combination of numeric and narrative standards established pursuant to this chapter for a contaminant or group of contaminants.

Clean Zone – A series of contiguous samples collected at a frequency consistent with the requirements of the Technical Requirements for Site Remediation, N.J.A.C. 7:26E, which are analyzed and deter- mined to be below the cleanup criteria (a single sample may constitute a clean zone for small contaminated areas).

Colorimetric Tube – Device used to estimate the concentration of a specific gas in air. A known volume of contaminant is pulled through the tube and reacts with the indicator chemical producing a colored stain whose length is proportional to the contaminant's concentration.

Combustible Gas Indicator (CGI) – Instrument used to determine the potential for combustion or explosion in an unknown atmosphere.

Composite Sample – A non-discrete sample composed of more than one specific aliquot collected at various sampling points or times.

Compression/Expansion Well Plug – Plugs are designed to seal the well and protect the groundwater from any impacts from the surface. The plug works by turning the top handle clockwise, so the screwing action squeezes the rubber sleeve tight against the inside of the monitoring well pipe. The seals should be checked at each sampling event and well plugs replaced as needed to maintain a tight seal.

Contaminant – As defined in N.J.A.C. 7:26E, currently: any hazardous substance, hazardous constituent, hazardous waste, or pollutant discharged by any individual or entity.

Contaminant Delineation – The systematic collection and analysis of samples from a point of known contamination to determine the vertical and horizontal extent of contamination.

Contaminant Screening – The analysis of environmental media by non-selective instrumentation or methods to gain a preliminary estimate of contaminant extent.

Contamination Reduction Zone – Transition zone between contaminated area (exclusion zone) and clean area. The zone is where all personnel decontamination of hazardous waste is conducted.

Corrected Results – The results obtained when instrumental results are adjusted to account for laboratory confirmation values and/or other quality control criteria.

Data quality objectives (DQO) – Qualitative and quantitative statements derived from the DQO process that clarify study technical and quality objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions.

Data Quality Objectives Process – A systematic strategic planning tool based on the scientific method that identifies and defines the type, quality, and quantity of data needed to satisfy a specified use.

Department – The New Jersey Department of Environmental Protection.

Dielectric Constant – The relationship between two charges, that is their distance of separation in relation to the force of attraction.

Diffusion Sampler – Type of sampling device which functions by the passive movement of contaminant molecules through a concentration gradient created within a stagnant layer of air between the contaminated atmosphere and the indicator material.

Distilled Water – Prepared by thermal distillation using a still of all-borosilicate glass, fused quartz, tin, or titanium with the distillate meeting the following characteristics of Type I (Type II) water:

- Resistivity (megohm-cm @ 25øC) greater than 10 (greater than 1)
- Conductivity (umho/cm @ 25øC) less than 0.1 (equal to 1)
- Total oxidizable organic carbon (mg/L) less than 0.05 (less than 0.2)
- Total solids (mg/L) less than or equal to 0.1 (equal to 1)
- SiO2 (mg/L) less than 0.05 (less than 0.1)

Deionized Water – Prepared by passing feedwater through a mixed-bed ion exchanger, consisting of strong anion and strong cation resins mixed together. The resultant water shall have the same characteristics as those for distilled water noted above.

Deviation – A variation from NJDEP guidance documents.

Dynamic work plan – A site characterization work plan including a technical program that identifies the suite of field investigation methods and measurements that may be necessary to characterize a specific site, with the actual methods used and the locations of measurements and sampling points based on on-site technical decision making.

Electrical Resistivity – Geophysical sensing technique used to determine the structure and physical properties of subsurface geologic materials which can be used to detect anomalies which may indicate the presence of

hazardous materials (e.g., drums, containers).

Electromagnetics – Geophysical method which induces and detects electrical current flow within geologic strata.

Environmental Samples – Samples of naturally occurring matrices such as soil, sediment, ground water, surface water and air.

Exclusion Zone – Designated zone of a hazardous waste site where contamination is known to or may occur and can only be entered with appropriate personnel protection.

Expedited site characterization (ESC) – A process for characterizing vadose zone and groundwater contaminated sites using primarily professional judgement, base sampling, and measurements by an integrated, multidisciplinary core technical team. The team operates within the framework of a dynamic work plan that gives flexibility and responsibility to select the type and location of measurements to optimize data collection activities during a limited number of field mobilizations.

Field Blank – A QA/QC sample used to indicate potential contamination from ambient air and sampling instruments.

Field Portable – An instrument that is durable and relatively simple to move between facilities for on- site analysis.

Flame Ionization Detector (FID) – An air monitoring instrument that utilizes the principle of hydrogen flame ionization for detection and measurement of organic vapors.

Flowmeter – Measures the vertical movement of fluid in a borehole.

Full Laboratory Data Deliverables – The data deliverables as required in N.J.A.C. 7:26E section 1.8 and Appendix A.

Gas Chromatography – Analytical technique for separating compounds of a sample and qualitatively and quantitatively identifying them.

Geostatistics – Statistical methodology that incorporates contaminant relationships between sample locations to derive conclusions about concentrations at locations lying between those points.

Grab Sample – A discrete aliquot that is representative of one specific sample site location at a specific point in time.

Ground Water – The portion of the water beneath the land surface that is within the zone of saturation (below the seasonally high water table) where all pore spaces of the geologic formation are filled with water.

Handling Time – All trip blanks, field blanks, and environmental sample containers must be received in the field within one day of preparation in the lab. They may be held on site for a maximum of two calendar days. They must then be shipped back to the lab at the end of the second calendar day. All samples and blanks must be maintained at 4øC while on site and during shipment.

Henry's Law Constant – Expressed as a ratio between the partial pressure of the vapor and the concentration in the liquid.

Holding Time – The analytical time clock for all samples and blanks measured between the time of sample collection and analytical extraction. Typically determined by matrix and specific analytical method requirements.

Homogenization – Process whereby a sample is mixed in a stainless steel bowl or in-situ until a consistent physical appearance is achieved. This is performed for all parameters except volatiles.

Instrument Log – A manual that documents all instruments outputs, calibration, and maintenance.

Isoconcentration – More than one sample point exhibiting the same analyte concentration.

Isopleth – The line or area represented by an isoconcentration.

Koc – A coefficient that relates the partitioning of the organic compound between the adsorbed phase and the soil solution relative to the organic carbon fraction.

Kriging – A geostatistical technique, which interpolates concentration values for locations between sampling points.

Laboratory Decontaminated – The decontamination of sampling equipment and bottles in a controlled setting.

Limited Laboratory Data Deliverables – Data deliverables with less QA/QC documentation than those required under Appendix A of N.J.A.C. 7:26E.

Lower Explosive Limit (LEL) – Minimum concentration of a combustible gas measured as a percent- age of the total constituents present in the atmosphere that will combust when ignited.

Magnetometer – Instrument which is used to measure magnetic field strength in units of gamma.

Matrix Spike – A laboratory Q/A sample comprised of the same matrix of the samples being analyzed. The sample is injected with a known concentration of a specific analyte.

Method Blank – A laboratory Q/A blank comprised of demonstrated analyte free water that is analyzed simultaneously with the environmental sample.

Method Detection Limit (MDL) – The minimum concentration of a contaminant that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

Microsiemens – µS

Nylon Screen Passive Diffusion Samplers - Diffusion samplers (also called equilibrium samplers) are devices that rely on the analytes to reach equilibrium between the sampler and the groundwater via diffusion. Samples are time-weighted toward conditions at the sampling point during the latter portion of the deployment period. The degree of weighting depends on analyte and device-specific diffusion rates.

Passive Dosimeter – Device which utilizes the processes of diffusion and permeation to move a contaminant through a collection medium.

Performance Evaluation Sample (PE) – Pre-measured, pre-determined samples of known concentration that are submitted by the NJDEP as a QA/QC check on laboratory performance.

Photo Ionization Detector (PID) – An air monitoring instrument that utilizes the principle of photoionization for the detection and measurement of organic and inorganic vapors.

Piezometer – A cased boring used to determine the level of ground water.

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

Precision – The ability of a method to provide reproducible results from sample to sample.

ppb – Parts per billion, micrograms per liter (ug/L), or micrograms per kilogram (ug/Kg).

ppm – Parts per million, milligrams per liter (mg/L), or milligrams per kilogram (mg/Kg).

Practical Quantitation Level (PQL) – 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 operating conditions.

Quality Assurance (QA) – Documentation designed to assure that proper sampling and/or analysis protocol are being followed. Measures taken to independently check and verify that the quality control procedures specified in the QA/QC plan are being carried out.

Quality Assurance Project Plan – 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 (QC) – The implementation of protocols designed to assure that the final sampling or analytical results are reliable. QC is the process of ensuring the quality of data during their collection, measurement, integration, interpretation, and archiving, through the application of defined procedures.

Radioactive Terms

Byproduct material –

(1) Any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or using special nuclear material;

(2) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition;

(3)(i) Any discrete source of radium-226 that is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity; or (ii) Any material that—(A) Has been made radioactive by use of a particle accelerator; and (B) Is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity; and

(4) Any discrete source of naturally occurring radioactive material, other than source material, that— (i) The Commission, in consultation with the Administrator of the Environmental Protection Agency, the Secretary of Energy, the Secretary of Homeland Security, and the head of any other appropriate Federal agency, determines would pose a threat similar to the threat posed by a discrete source of radium-226 to the public health and safety or the common defense and security; and (ii) Before, on, or after August 8, 2005, is extracted or converted after extraction for use in a commercial, medical, or research activity.

Derived concentration guideline level (DCGL) – A derived, radionuclide-specific activity concentration within a survey unit corresponding to the release criterion (regulatory limit expressed in dose or risk). The DCGL is derived from the activity/dose relationship through various exposure pathway scenarios and is established in N.J.A.C. 7:28-12.

Diffuse NARM – A naturally occurring or accelerator-produces radionuclide that has become concentrated, but not for the purpose of use in commercial, medical, or research activities.

Final status survey – A survey or analysis, performed after remediation, which provides data that demonstrates that all radiological parameters satisfy the remediation standards.

Impacted area – Any area with a possibility of containing residual radioactivity in excess of natural background levels.

Natural background radionuclide concentration – The average value of a particular radionuclide concentration in soils measured in areas in the vicinity of the site, in an area that has not been influenced by localized human activities, including the site's prior or current operations.

Non-impacted area – Any area with no potential for contamination or residual radioactivity in excess of natural background levels. When contaminants are present in background, concentrations meeting the USS definition may be considered as a screening level for bounding radiological impacts.

Radioactive contamination or radioactive contaminant - The collective amount of radiation emitted from one or more radionuclides in the soil and in/on building materials and/or equipment at concentrations above natural background levels.

Residual radioactivity - Radioactivity in structures, materials, soils, groundwater, and other media at a site resulting from activities under the licensee's control. This includes radioactivity from all licensed and unlicensed sources used by the licensee, but excludes background radiation. It also includes radioactive

materials remaining at the site as a result of routine or accidental releases of radioactive material at the site and previous burials at the site, even if those burials were made in accordance with the provisions of 10 CFR Part 20 or N.J.A.C 7:28-12.15.

Source Material - (1) Uranium or thorium, or any combination thereof, in any physical or chemical form or (2) ores which contain by weight one-twentieth of one percent (0.05%) or more of: (i) Uranium, (ii) thorium or (iii) any combination thereof. Source material does not include special nuclear material. This radioactive material is regulated by N.J.A.C 7:28-58 (incorporation by reference of 10 CFR 40).

Special Nuclear Material - (1) Plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Department determines to be special nuclear material. This radioactive material is regulated by N.J.A.C 7:28-60 (incorporation by reference of 10 CFR 70).

Technologically enhanced naturally occurring radioactive materials (TENORM) - Any naturally occurring radioactive materials whose radionuclide concentrations or potential for human exposure have been increased by any human activities. This radioactive material is regulated under N.J.A.C. 7:28-4.

Uncontaminated surface soil (USS) - Soil whose average natural background radionuclide total concentrations are less than the remediation standards for radionuclides, and cannot exceed the background established for the site by more than two standard deviations.

Reduced Laboratory Data Deliverables – The data deliverables as required in N.J.A.C. 7:26E section 1.8 and Appendix A.

Regenerated Cellulose Dialysis Membrane - The dialysis sampler consists of a deionized water-filled tube of high-grade regenerated-cellulose dialysis membrane inside an outer protective layer of low-density polyethylene (LDPE) mesh.

Response Factor (Relative Response Factor) – A measure of the relative response of the instrument detector to an analyte compared to an internal or external standard. Relative Response Factors are determined by the analysis of standards and are used to calculate the concentrations of analytes in samples.

Retention Time – Period of time from the injection of the sample into the gas chromatography system until the point of maximum detector response for each substance.

Sample Network – Statistical method used to describe the frequency and location of samples to be collected.

Semi-Qualitative – Identification of a compound by class rather than identification of the specific compound (i.e., semi-qualitative would identify aromatic hydrocarbons whereas qualitative would identify benzene).

Semi-Quantitative – Numeric values which only approximate the true concentration of the analytes.

Semivariogram – Tool that shows the relationships between observations at sampling points based on the distance from each sample to the other samples.

Site Screening – Rapidly surveying a site, possibly employing some chemical analysis instrumentation or methods, in an effort to estimate worst case environmental conditions.

Site-similar material – Material containing the same chemical and physical characteristics of native material found on-site and shall include actual site material used for the prescribed purpose.

Snap Sampler - The Snap Sampler is a patented (US Pat. 7,178,415) groundwater sampling device that employs a unique double-end-opening bottle with “Snap” sealing end caps. This dedicated, in-well equipment is deployed at the desired position in the screen interval. The design allows for the collection of groundwater samples which are in dynamic equilibrium with the aquifer through a simple, no purge/passive technique.

Soft-Dig - Excavation using tools or equipment that utilize air or water pressure as the direct means to break up soil or earth for removal by vacuum excavation.

Soil – 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.

Soil Gas – Subsurface gas that may be generated by biological, chemical, and physical decomposition of spilled, stored or illegally disposed waste.

Soil Texture – A measure of the percentages of various particles size groups in a volume of soil, typically sand, silt, and clay.

Sorbent Samples – Consist of air samples, which are collected utilizing special adsorbents such as activated carbon and silica gel.

Subsurface Soil – The soil more than two feet below grade and extending downward to the top of the seasonally high water table.

Support Zone – Uncontaminated area where administrative functions needed to keep site operations running smoothly are conducted.

Surface Soil – The top two feet of soil below grade.

Survey Instrument – An instrument which detects compounds with little or no selectivity.

Tap Water – Water obtained directly from a faucet or tap, that has not been purified, distilled, or otherwise treated.

Total Recoverable – The amount of a contaminant that is extracted from the sample.

Traditional Site Evaluation – The initial characterization, delineation, and clean zone confirmation of a site by collection and analysis of samples by certified methods with appropriate data deliverables.

Trip Blank – A QA/QC sample whose purpose is to place a mechanism of control on sample bottle preparation, blank water quality and sample handling.

Upper Explosive Limit (UEL) – Maximum concentration of a gas in percent that will combust in the atmosphere.

Variance – A variation from New Jersey Regulations.

Vapor Pressure – The pressure of a confined liquid such that the vapor collects above it.

Volatilization – Process whereby certain compounds evaporate rapidly and easily into air at ordinary temperatures.

Volumetric Water Content – The ratio of the volume of water in a porous volume to the total volume.

Vuggy Porosity – A type of pore space in rocks that is not interparticle, but rather small cavities in a rock or vein. Vuggy porosity is visible to the naked eye and can form major conduits for ground water flow, especially in carbonate rocks.

Waste Samples – Samples that are comprised of process waste or other man-made materials.

Water Solubility – The extent to which a compound dissolves in water.

Water Table – The seasonally high level in the saturated zone at which the hydraulic pressure is equal to atmospheric pressure.

Well Purging – Process in which the standing water in a well column is evacuated.

Well Intake Interval – The depth interval where vapor, water, or other fluids can enter a well. Also known as the screen or open borehole interval.

Weir – A device built to back up water.