Wyoming DEQ Voluntary Remediation Program

Glossary of Terms and Acronyms

ABTU—Aggressive Biological Treatment Unit

Adjacent Property—Property contiguous to a VRP site and any noncontiguous property onto or under which contaminants are known to have migrated from a VRP site.

Administrative Process—The procedures and methods that DEQ uses to document, oversee and approve cleanups under the VRP. DEQ has established two administrative processes under the VRP– the traditional remediation process and the Independent Cleanup Process (ICP).

ADWL: Acceptable Drinking Water Level—Risked-based levels calculated by DEQ for suspected or known carcinogenic contaminants for which MCLs do not exist, and which are based solely on consideration of human exposure and health effects.

ASR—Aquifer Storage and Recovery

AST—Aboveground Storage Tank

ASTM—American Society of Testing and Materials

ATSDR—Agency for Toxic Substances and Disease Registry

Background Concentration—Refers to substances or locations that are not influenced by releases from a site. Once identified and quantified, background concentrations can be used to distinguish site-related soil and groundwater contamination from naturally-occurring or pre-existing concentrations of a contaminant.

BA—Brownfields Assistance

bgs—Below Ground Surface

Biased Site Characterization—Type of site characterization in which volunteers are encouraged to determine sampling locations, analytes, and other characterization activities by using information already known about a site to identify the most likely locations and sources of contamination and the most likely contaminants.

BNI—Bimetallic Nanoscale Iron

BTEX—Benzene, Toluene, Ethylbenzene, Xylenes

CAHs—Chlorinated Aliphatic Hydrocarbons

CAM—Compliance Assurance Monitoring

CAMU: Corrective Action Management Unit—A permitted area where wastes derived from cleanups of hazardous waste sites can be treated, stored, or disposed during cleanup.

CAS: Chemical Abstracts Number—A unique chemical-specific identification number.

CEMS—Continuous Emission Monitoring System

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act—More commonly known as Superfund, CERCLA is EPA's program for carrying out solid waste emergency and long-term removal and remedial activities. These activities include establishing the National Priorities List, investigating sites for inclusion on the list, determining their priority, apportioning liability, and conducting and/or supervising cleanup and other remedial actions.

CERCLA Memorandum of Agreement—Document which defines and clarifies the roles and responsibilities of DEQ and EPA when contaminated sites that are subject to CERCLA are addressed in the VRP.

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Act Information System—The federal computerized inventory of potential hazardous substance release sites—sites that may need to be addressed under CERCLA.

Certificate of Completion—A liability assurance that documents DEQ's opinion that all cleanup requirements for a site (or a portion of a site) have been successfully implemented or satisfied.

Cleanup Levels—Generally numeric, they are the concentration of a contaminant in air, soil, water, or sediment that is determined to be protective of human health and the environment under specific exposure conditions. They specify the concentrations of contaminants that must be achieved for a remedy to be considered successful.

COC—Constituent of Concern

COI: Contaminant of Interest—Contaminants identified on a site-specific basis during ecological risk assessment for further evaluation and screening.

COMS—Continuous Opacity Monitoring System

Contiguous Property—Property that is touching, or in contact with, a VRP site.

COPC: Contaminant of Potential Concern—Contaminants which are determined on a site-specific basis to be of potential concern to human health.

Covenant Not to Sue—A liability assurance that DEQ will not issue a unilateral cleanup order as long as a volunteer is implementing a remedy consistent with the terms of a valid remedy agreement.

CPT: Cone Penetration Testing—Method for rapidly evaluating physical characteristics of unconsolidated soils. It is based on the resistance to penetration of an electronically-instrumented cone which is continuously advanced into the subsurface.

DAF: Dilution Attenuation Factor—The ratio of soil leachate concentration to receptor point concentration at the top of the aquifer or water table directly below the leachate source. The DAF is used to measure the rate at which contamination is diluted or attenuated as it moves through soil to an aquifer or water table.

DEA: Diethanol Amine—used in natural gas "sweetening"

DEG—Diethylene glycol

DEQ: Wyoming Department of Environmental Quality—The mission of the Wyoming DEQ is to protect, conserve, and enhance the quality of Wyoming's environment for the benefit of current and future generations.

DIPE—Disopropyl Ether

DNAPL: Dense Non-Aqueous Phase Liquid—NAPL that is denser than water. DNAPLs sink through the water column until they reach a confining layer.

DQO: Data Quality Objective—Qualitative and quantitative statements that clarify the objectives of a site investigation, define the appropriate type of data to be collected, 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 site remediation decisions.

DRO—Diesel Range Organics

DSMOA—Defense and State Memorandum of Agreement

DWEL: Drinking Water Equivalent Level—Risked-based levels calculated by DEQ for non-carcinogenic contaminants for which MCLs do not exist, and which are based solely on consideration of human exposure and health effects.

EC: Engineering Control—Engineering controls are measures, such as capping, containment, slurry walls, extraction wells, or treatment methods, that are capable of managing environmental and health risks by reducing contamination levels or limiting exposure pathways.

ECD: Electron Capture Detector—Used to detect almost all volatile or semi-volatile compounds

ECGO—ElectroChemicalGeoOxidation

ECRTs—Electrochemical Remediation Technologies

ECLD: Electrolytic Conductivity Detector—Uses high temperatures to flush out halogen ions

Ecological Exclusion Assessment—The first step of the VRP ecological risk assessment, it is designed to screen out VRP sites which do not have quality habitat and at which, therefore, significant ecological risk is not likely a concern.

Ecological Risk Assessment—A process to determine whether plants, invertebrates, fish, or wildlife (ecological receptors) are likely to be affected by chemical, physical, or biological stresses, such as the presence of contamination in habitat.

EOR—Enhanced Oil Recovery technology (e.g., hot water, steam flooding, cosolvents, surfactants, polymers to aid removal of residual LNAPL)

EPA, USEPA—United States Environmental Protection Agency.

ERBSC: Ecological Risk-Based Screening Concentration—Chemical-specific concentrations that represent a threshold above which some measure of ecological effects may occur.

ETBE: ethyl tert-butyl ether

Exposure Assessment—A practice during site-specific human health risk assessment that serves to estimate the type and magnitude of exposures to the COPCs that are present at or migrating from a site.

Fate and Transport Model—An analytical or numerical method for predicting and quantifying constituent migration within the environment.

FID: Flame Ionization Detector—Best suited for combustible compounds such as gasoline and methane.

FPH—Free Phase Hydrocarbon

FUDS—Formerly Utilized Defense Sites

GAC—Granular Activated Carbon

GPC—Groundwater Pollution Control

GPR—Ground Penetrating Radar

GPS: Global Positioning System—A satellite-based navigation system made up of a network of approximately 24 satellites placed into orbit by the U.S. Department of Defense. GPS was originally intended for military applications, but in the 1980s, the government made the system available for civilian use.

Grid Soil Sampling—A technique used to gather the information needed to determine with statistical significance whether soil contamination is present or absent in a defined area. It involves overlaying a sampling grid onto the areas identified for characterization and collection of soil samples within each grid.

GRO—Gasoline Range Organics

Human Health Risk Assessment—A written document in which site-specific information from the site conceptual model and pertinent scientific information on toxicology, chemical environmental fate and transport, and exposure are assembled, critiqued, and interpreted. The risk assessment evaluates existing and future potential risks to human health from hazardous substances detected in soil, groundwater, sediments, surface waters, and (in some cases) air and biota that are at the site, and provides a basis for risk managers to determine whether, and to what extent, remediation of impacted media is warranted.

HWL—Hazardous Waste Landfill

IC: Institutional Control—Institutional controls are legal or administrative measures that limit human exposure to contaminants. Examples include use control areas, easements, zoning restrictions, and deed notices. They are intended to bolster the integrity of remedies and minimize the potential exposure to contamination by limiting land or resource use.

ICP: Independent Cleanup Process—The ICP applies to sites that are not technically complex and where volunteers use a pre-defined conservative remedial approach. In the ICP, contamination must be limited to soil, and volunteers must agree to remove all soil contaminated above unrestricted site use cleanup levels. Volunteers who qualify for the ICP carry out cleanup with reduced DEQ oversight and generally do not negotiate PRAs or RAs.

Independent Cleanup Report—Prepared by a volunteer for DEQ when an ICP cleanup is finished to document the source and extent of a site's contamination, as well as cleanup levels and remediation activities.

Initial Public Notice—Allows the public to find out about VRP sites and participate in decisions about cleanups. As soon as DEQ determines that a site is eligible for the VRP, the volunteer must notify the public about the site and give people an opportunity to participate in cleanup decisions. During the initial public notice, notification must be published as a display advertisement in a newspaper of general circulation in the county in which the site is located once per week for a minimum of four weeks. In addition, notice must be given in writing to all surface land owners of record for land that is contiguous to the site and to all known surface land owners of record for land that is adjacent to the site.

IRIS: EPA's Integrated Risk Information System—A database of human health effects that may result from exposure to various substances found in the environment.

ISBS—In Situ Biogeochemical Stabilization

ISCO—In Situ Chemical Oxidation

ISTD—In Situ Thermal Desorption

ISTR—In Situ Thermal Remediation

LAUST—Leaking, Aboveground, and Underground Storage Tank Program

LDR—Land Disposal Restrictions

LEL—Lower Explosive Limit

Liability Assurances—Written documents, issued by DEQ, that establish the amount of remediation required for a given piece of property (a "site") or a portion of a site. Liability assurances affect DEQ's ability to require additional cleanup at a site, and give site owners, operators, prospective purchasers, and land developers certainty about the extent of their responsibility for cleanup.

LNAPL: Light Non-Aqueous Phase Liquid—NAPL that is lighter than water, and thus tends to float on top of the water table.

LPG—Liquid Petroleum Gas

LQD—Land Quality Division, Wyoming DEQ

LTX: Low-Temperature Separator—Used to separate oil and gas

LUST—Leaking Underground Storage Tank

MCL: Maximum Contaminant Level—Serves as the default cleanup level for hazardous substances in ground water under the VRP.

MDL: Method Detection Limit—The minimum concentration of a substance being analyzed that has a 99 percent probability of being identified (i.e., concentration is greater than zero).

MEA: Monoethanolamine—Used in natural gas "sweetening"

MNA: Monitored Natural Attenuation—A remedial approach that involves monitoring of contaminant concentration and natural attenuation parameters that provide an indication of the effectiveness of natural attenuation and progress being made to achieve remedy goals. In general, MNA does not include remediation methods that require human intervention beyond monitoring. However, institutional controls, such as use restrictions, may be needed in conjunction with MNA to ensure protection of human health and the environment.

MS: Mass Spectrometer—Uses electron energy to fragment the compound

MTBE—Methyl tert-butyl ether

NAPL: Non-Aqueous Phase Liquid—Contaminants that remain undiluted as the original bulk liquid in the subsurface, e.g. spilled oil.

NGLs: Natural Gas Liquids—usually ethane, propane, butane, iso-butane, and natural gasoline

NIR—Near Infra-Red

No Further Action Letter—A liability assurance that documents that a site has been completely cleaned up to levels that support unrestricted site uses, generally residential cleanup levels, or that a site will be completely cleaned up to these levels through monitored natural attenuation.

NPL: National Priorities List—The NPL is the list of federal national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. Sites are listed on the NPL by EPA after a public comment period. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation and work under CERCLA.

OGCC—Oil and Gas Conservation Commission

OSWER—EPA Office of Solid Waste and Emergency Response

PAH: Polycyclic Aromatic Hydrocarbon—A mixture of organic compounds released into the atmosphere as gases or particles during the incomplete combustion of organic material.

PCB: Polychlorinated Biphenyl—Mixtures of synthetic organic chemicals with the same basic chemical structure and similar physical properties ranging from oily liquids to waxy solids.

PCE—Perchloroethylene

PCS—Petroleum Contaminated Soil

PCOC—Potential Contaminant of Concern

PEMS—Predictive Emission Monitoring Systems

Phase I ESA: Preliminary Environmental Site Assessment—During a Phase I ESA, information on potential contaminant sources is gathered through records review, conducting interviews, and physical inspections of the property in question.

Phase II ESA: Confirmatory Environmental Site Assessment—If contamination is suspected as a result of the Phase I ESA, a Phase II ESA is generally recommended. A Phase II or confirmatory ESA involves collecting and analyzing samples of environmental media at the property (such as soil, water, or air) to confirm the presence or absence of environmental contamination.

PFLA—Phospholipid Fatty Acid Analysis

PIANO: Paraffins, Isoparaffins, Aromatics, Napthenes, and Olefins—Near IR spectra analysis of weight %, volume %, or mole % of each component.

PID: Photoionization Detector—Uses UV radiation to ionize compounds, good for detecting compounds with double bonds such as aromatic compounds and ethylene

Points of Compliance—The physical locations where air, soil, water, or other environmental media (e.g., sediments or plants) are monitored for constituents of concern within a remediation site to determine if remedies are working as expected and whether cleanup levels are achieved.

PPRTV: Provisional Peer Reviewed Toxicity Value—Represents the second tier of human health toxicity values for the EPA Superfund and Resource Conservation and Recovery Act (RCRA) hazardous waste programs. Both the Superfund and RCRA programs accept the primacy of human health toxicity values contained in EPA's Integrated Risk Information System (IRIS). Values placed on IRIS have undergone external peer review and Agency consensus review. The toxicity values in this database (PPRTVs) have been developed specifically for EPA's Superfund program and have not undergone the multi-program review and consensus required for toxicity values to be placed in IRIS.

PRA: Preliminary Remediation Agreement—Establishes the specific activities needed to investigate and characterize contamination at a VRP site and, if necessary, to evaluate potential remediation alternatives.

PRG: Preliminary Remediation Goal—Conservative, risk-based contaminant concentrations that are intended to assist risk assessors and others in initial screening-level evaluations of environmental measurements.

Public Participation Plan—A plan describing how a volunteer will carry out enhanced public involvement for a VRP site in which there is significant public interest. If DEQ determines that there is significant public interest in a VRP site, the volunteer must prepare and implement a site-specific public participation plan, which should identify the activities the volunteer will carry out to give the public an opportunity to participate in his or her cleanup.

QA/QC: Quality Assurance/Quality Control—Procedures which ensure methodology and data collection and analysis are conducted in a way that achieves accurate and repeatable results.

RA: Remedy Agreement—RAs establish remedial activities and site-specific cleanup levels, points of compliance, and remediation timeframes for a cleanup site. They are generally negotiated after a site has been investigated to document the remedial action selected and establish requirements for remedy implementation. Once an RA is established, the requirements of the agreement are permanent except for specific circumstances under which an agreement can be reopened or terminated.

RATA—Relative Accuracy Testing Audits

RCRA: Resource Conservation and Recovery Act—RCRA gives EPA the authority to control hazardous waste from the "cradle-to-grave." This includes regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous wastes. Finally, the 1986 amendments to RCRA require EPA to require cleanup of environmental contamination, as necessary to protect humans and the environment, at sites where hazardous waste is, or has been, treated, stored, or disposed.

RCRA Memorandum of Understanding—Agreement between Wyoming DEQ and EPA that ensures that VRP cleanup activities are consistent with RCRA cleanup requirements and policies.

Remediation—Another term for cleanup.

Remediation Time Frame—The time period over which remedy implementation will occur.

Remedy Public Notice—Allows the public to find out about remedy proposals and gives people an opportunity to participate in decision about cleanups. During the remedy public notice, notification of the proposed remedy must be published as a display advertisement in a newspaper of general circulation in the county in which the site is located once per week for a minimum of four weeks. In addition, notice must be given in writing to all surface land owners of record for land that is contiguous to the site and to all known surface land owners of record for land that is adjacent to the site. Remedy public notices are also needed if a remedy is modified after its initial selection.

RfC: Reference Concentration—An estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

Risk Assessment Work Plan—Describes the methodologies for completing a human health risk assessment for a site.

ROST: Rapid Optical Screening Technology—Laser-Induced Fluorescence system to screen soils for petroleum hydrocarbon materials containing aromatic hydrocarbon constituents.

SAP: Sampling and Analysis Plan—Identifies soil sample locations, the soil depth intervals to be collected for laboratory analysis and for physical observation, the sample type (environmental vs. geotechnical, disturbed vs. undisturbed), the sampling method(s), sampling devices, and sample collection procedures.

SESOIL: Seasonal Soil Compartment Model—A type of fate and transport model originally designed by EPA.

SHWD—Solid and Hazardous Waste Division, Wyoming DEQ

Site—A parcel of real property being addressed under the VRP.

Site Characterization—Assessment of the nature and extent of contamination at a VRP site. During site characterization, volunteers identify and gather information about the site that is necessary to develop a site conceptual model to support selection and implementation of remedial actions. Typical site characterization activities include evaluations of the historical uses of property, site reconnaissance, and collection and analysis of environmental samples.

Site Conceptual Model—A summary that describes all of the known or suspected sources of contamination at a site, considers how and where the contaminants are likely to move, identifies media and receptors that are likely to be affected by them, and identifies potential exposure pathways.

Soil Cleanup Level Look-up Table—A table of pre-calculated, human-health, risk-based soil cleanup levels that are appropriate for unrestricted site uses. The table provides a simple, easy-to-use method to evaluate whether site soil contamination is present at a level that may require further evaluation and/or remediation for protection of human health

Soil Confirmation Sampling—Process in which samples are collected at the completion of excavation beneath or adjacent to areas from which contaminated soil has been removed—that is, at the base and along the side walls of an excavation pit—to determine or verify whether cleanup levels have been achieved.

Superfund—Common name for CERCLA. Also often used to refer to sites that are listed on the National Priorities List (e.g., as in "Superfund site").

SCDM—Superfund Chemical Data Matrix

SVOCs—Semi-Volatile Organic Compounds

SWL—Static Water Level

TAME—Tert-amyl Methyl Ether

TCA—Trichloroethane

TCE—Trichloroethylene

TCH—Thermal conductive heating

TCLP—Toxic Characteristic Leaching Procedure

TEF: Toxicity Equivalency Factor—Numerical factors that express the toxicity of an individual dioxin-like compound relative to the toxicity of 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD).

TEG—Triethylene Glycol

TI: Technical Impracticability—Refers to a situation where achieving cleanup standards is not practical using currently available cleanup methods or technologies.

THM: Trihalomethanes—Chloroform, bromodichloromethane, dibromochloromethane, and bromoform.

TMB—1,3,5-trimethylbenzene

Toxicity Assessment—A practice during site-specific human health risk assessment that establishes the relationship between the dose of a contaminant and its toxic effect.

TPE—Thermoplastic Elastomeric Compounds

TPH—Total Petroleum Hydrocarbons

Traditional Remediation Process—The traditional remediation process is the procedures DEQ will use to document, oversee, and approve cleanup at most VRP sites. In the traditional remediation process, the parameters of site-specific work are established in preliminary remediation agreements (PRAs) and remedy agreements (RAs) negotiated between the volunteer and DEQ. DEQ then

oversees cleanup work on an ongoing basis by reviewing and approving site-specific work plans, field sampling plans, and other documents and activities.

UAO—Unilateral Administrative Order

UCA: Use Control Area—An area designated by a governmental entity or entities for the purposes of controlling current and future property uses. Cleanups within use control areas may be eligible for alternative soil cleanup standards under W.S. 31-11-1605(c).

UEL—Upper Explosive Limit

UIC—Underground Injection Control Program, Wyoming DEQ

UPL: Upper Confidence Limit—Upper bound of a confidence interval around any calculated statistic, most typically an average.

UR: Inhalation Unit Risk—The upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 µg/L in water, or 1 µg/m^3 in air.

USDW—Underground Sources of Drinking Water

UST: Underground Storage Tank—An underground storage tank system (UST) is a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. Under RCRA, EPA has established regulatory programs to prevent, detect, and cleanup releases from USTs containing petroleum or hazardous substances.

VOC: Volatile Organic Compound—Any organic compound that participates in atmospheric photochemical reactions except those designated by EPA as having negligible photochemical reactivity.

VRP: the Voluntary Remediation Program—The VRP is a new set of comprehensive standards and procedures for voluntary remediation (cleanup) of contaminated sites in Wyoming. The Program is focused on voluntary cleanup, but also includes provisions for DEQ to order responsible parties to carry out cleanup actions.

WEQA, EQA—Wyoming Environmental Quality Act

WQD—Water Quality Division, Wyoming DEQ