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Standard Guide for Management of Investigation-Derived Waste Associated with PFAS¹

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1. Scope

1.1 Existing guidance on the management of *investigation-derived waste* is focused upon cuttings, purge water, personal protective equipment, and other miscellaneous solid waste generated at property that may be impacted by the release of hazardous materials and hazardous substances. These hazardous substances include, but are not limited to, heavy metals, petroleum, petroleum byproducts, solvents, polycyclic aromatic hydrocarbons, organic and inorganic corrosives, radioactive material, and explosives. Guidance on the management of *investigation derived waste* generated at sites that may be impacted by releases of perfluoroalkyl and polyfluoroalkyl substances (PFAS) is limited. This standard guide addresses this deficiency

1.2 This guide describes best practices for managing *investigation-derived waste* associated with PFAS that are consistent with federal and state policies and regulations at the date of issuance. The user is advised to determine if new regulations or rules have been promulgated by the state, federal, or tribal regulatory agency having jurisdiction over the property.

1.3 This guide describes considerations to prevent the unintended and unauthorized disposal of liquid *investigation-derived waste* that may contain PFAS into wastewater treatment plants or systems that are not permitted to receive these waste streams.

1.4 This guide describes considerations to prevent the unintended and unauthorized disposal of solid *investigation-derived waste* that may contain PFAS into landfills or other solid waste disposal facilities that are not permitted to receive these waste streams.

1.5 This guide describes several stormwater pollution prevention best management practices applicable to *investigation-derived waste*.

1.6 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

1.7 This international standard was developed in accordance with internationally recognized principles on standardization established in the *Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee*.

2. Referenced Documents

2.1 ASTM Standards:²

D5088 Practice for Decontamination of Field Equipment Used at Waste Sites

2.2 Other Standards:

49 CFR 172 Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans³

49 CFR 262 Standards Applicable to Generators of Hazardous Waste³

Method 537 : Determination of Selected Perfluorinated Alkyl Acids in Drinking Water⁴

3. Terminology

3.1 Definitions:

3.1.1 *investigation-derived wastes, n*—discarded materials resulting from field activities such as sampling, surveying, drilling, excavation, and decontamination processes that, in present form, possess no inherent value or additional usefulness without treatment.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ Available from United States Environmental Protection Agency (EPA), William Jefferson Clinton Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, http://www.epa.gov.

¹ This test method is under the jurisdiction of ASTM Committee E50 on Environmental Assessment, Risk Management and Corrective Action and is the direct responsibility of Subcommittee E50.04 on Corrective Action.

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3.1.1.1 *Discussion*—Well development and well purge waters are considered *investigation-derived waste*. Soil cuttings, excess sample spoils, and excavated soil that are returned to the borehole or excavation are not considered *investigation-derived waste*. The user must determine if the regulatory authority having jurisdiction over the site, the responsible party, and property owner, permit the return of soil cuttings and spoils to the borehole or excavation. Soil cuttings, excess sample spoils, and excavated soil that cannot be returned to the borehole or excavation are considered *investigation-derived wastes*.

3.1.2 *other regulated wastes, n*—personal protective equipment, (for example, nitrile gloves, paper towels, polyethylene sheeting) and decontamination fluids that may be classified as hazardous or nonhazardous wastes.

3.1.3 *PFAS, n*—perfluoroalkyl and polyfluoroalkyl substances are a group of man-made chemicals consisting of polymeric chains of carbon bonded to fluorine atoms, usually with a polar functional group at the head.

3.1.4 *PFAS-impacted waste, n*—discarded material that contains perfluoroalkyl and polyfluoroalkyl substances and their breakdown constituents.

3.2 *Acronyms:*

3.2.1 *CFR*—Code of Federal Regulations

3.2.2 *DOT*—U.S. Department of Transportation

3.2.3 *EPA*—U.S. Environmental Protection Agency

3.2.4 *IDW*—Investigation-derived waste

3.2.5 *OSHA*—U.S. Occupational Safety and Health Administration

3.2.6 *PFAS*—perfluoroalkyl and polyfluoroalkyl substances and their breakdown constituents.

3.2.7 *PFOS/PFOA*—Perfluorooctane Sulfonate (PFOS) / Perfluorooctanoic Acid (PFOA)

4. Significance and Use

4.1 Perfluoroalkyl and polyfluoroalkyl substances (*PFAS*) are a family of more than 4700 synthetic organic chemicals. *PFAS* can withstand high temperatures and survive highly corrosive environments. They are used in the manufacture of coatings, surface treatments, and specialty chemicals in cookware, carpets, food packaging, clothing, cosmetics, and other common consumer products. *PFAS* also have many industrial applications and are an active ingredient in certain types of fire-fighting foams (aqueous film-forming foams, or AFFF). *PFAS* coatings resist oil, grease, and water. *PFAS* are persistent compounds. Therefore, *PFAS* should be considered for purposes of managing *investigation-derived waste* where *PFAS* is known or suspected to be present in environmental media.

4.1.1 *PFAS* are emerging contaminants for which environmental regulations and guidance are dynamic and are being developed simultaneously at federal, state, local, and international levels as more is learned about their characteristics, environmental fate, and management/treatment. Therefore, site-specific rules, regulations, and guidance should be evaluated for options and restrictions on management of *PFAS*

investigation-derived waste. For example, the Massachusetts Department of Environmental Protection has determined that *PFAS* wastes are “hazardous materials” subject to the Massachusetts Oil and Hazardous Material Release Prevention and Response Act (*M.G.L. Chapter 21E*) and the Massachusetts Contingency Plan. Other states and jurisdictions may have or will develop and implement similar determinations that affect the on-site management, storage, and labeling and off-site transportation requirements for *PFAS investigation-derived waste*.

4.1.2 Given the characteristics and persistence of *PFAS* compounds, *PFAS investigation-derived waste* presents special handling and treatment/disposal considerations. EPA recently issued Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances (2020) **(1)**⁵. This interim guidance focuses on technologies for treatment and disposal that have the potential to destroy *PFAS* by breaking the carbon-fluorine bonds or controlling migration of *PFAS* in the environment (for example, secure landfilling). Although the interim guidance focuses on the destruction and disposal of residuals and wastes/waste byproducts from manufacturing activities, the guidance should be considered when evaluating treatment or disposal options for *PFAS investigation-derived waste*.

4.1.3 *PFAS investigation-derived waste* may also contain other nonhazardous or hazardous substances or materials that may impact the options and requirements for management. The associated substances should be considered for proper characterization of the *investigation-derived waste* and in selecting containerization, labeling, handling, transportation, and disposal options. **(2)**

4.2 Field investigation activities result in the generation of waste materials that may include *PFAS*. *Investigation-derived waste* may include monitoring well development water, purge water, soil cuttings from boreholes, sediments, soil or fill from excavation activities, solutions from decontaminating sampling equipment, personal protective equipment, and other sampling wastes (for example, paper towels, plastic sheeting).

4.2.1 Soil cuttings, excess sample spoils, and excavated soil that are returned to the borehole/excavation may not be considered *investigation-derived waste* on sites in jurisdictions where regulations and guidance allow for this management option.

4.2.1.1 The user must determine the disposal options for these materials in conjunction with the property owner, responsible party, and the regulatory agency.

4.3 The primary objectives for managing *investigation-derived waste* during field activities include:

4.3.1 Leaving the site in no worse condition than existed before field activities,

4.3.2 Removing wastes that pose an immediate threat to human health or the environment,

4.3.3 Segregating wastes above background or threshold concentrations,

⁵ The boldface numbers in parentheses refer to a list of references at the end of this standard.