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Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process¹

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1. Scope

1.1 This guide² covers a framework for employing good commercial and customary practices in conducting a Phase II environmental site assessment (ESA) of a parcel of commercial property with respect to the potential presence of a range of contaminants which are within the scope of CERCLA as well as petroleum products.

1.1.1 This guide is intended to provide practical procedural guidance for the continuation of an assessment conducted in accordance with the most recent edition of Practice E 1527 or E 1528, or both. Practice E 1527 is the practice for conducting Phase I ESAs for a parcel of commercial property and Practice E 1528 is the transaction screen practice. Both practices define a process that is intended to constitute “all appropriate inquiry into the previous ownership and uses of a property” to determine whether hazardous substances or petroleum products have been disposed or released there in order to satisfy one element of the innocent purchaser defense to CERCLA liability.

1.1.2 Because this guide for conducting Phase II ESAs describes a process for further evaluating a parcel of commercial property with recognized environmental conditions, as defined in Practices E 1527 and E 1528, users of this guide should understand the requirements and limitations of those practices. It is strongly recommended that the user refer to and apply the guide in concert with Practices E 1527 and E 1528.

1.1.3 This guide has multiple purposes. It is intended to provide assistance to users in satisfying the appropriate inquiry element of CERCLA’s innocent purchaser defense, as defined in 42 U.S.C. § 9601(35)(B), where a previous assessment satisfying that element identified recognized environmental conditions. This guide also is intended to assist a user in

gathering reliable information about a property’s environmental conditions to guide the user’s business decisions. However, this guide does not purport to include the level of specificity required of technical standards that govern full characterization of a site’s environmental conditions.

1.2 *Objectives*—The primary objectives of conducting a Phase II ESA are to evaluate the recognized environmental conditions identified in the Phase I ESA or transaction screen process for the purpose of providing sufficient information regarding the nature and extent of contamination to assist in making informed business decisions about the property; and where applicable, providing the level of knowledge necessary to satisfy the innocent purchaser defense under CERCLA.

1.2.1 To achieve these objectives, it may be appropriate to perform more than a single iteration of assessment. The guide fosters an iterative approach to Phase II assessments and allows the user to terminate the Phase II ESA at the point where sufficient data have been generated to meet the user’s objectives.

1.2.2 At the completion of a Phase II ESA, the environmental professional should be able to conclude, at a minimum, that either (a) the ESA has provided sufficient information to render a professional opinion that there is no reasonable basis to suspect the presence of hazardous substances or petroleum products at the property associated with the recognized environmental conditions under assessment, or (b) the ESA has confirmed the presence of hazardous substances or petroleum products at the property under conditions that indicate disposal or release. If the information developed in the ESA is insufficient for the environmental professional to reach either of these conclusions, the environmental professional may recommend additional iterations of assessment if warranted to meet the objectives of the user. If the environmental professional reasonably suspects that unconfirmed hazardous substance or petroleum releases remain but concludes that further reasonable assessment is not expected to provide additional information of significant value, he may recommend that further assessment is not warranted. In such circumstances, the recommendation for no further assessment should be accompanied by an explanation why a reasonable suspicion of releases remains and why further reasonable assessment is not warranted. Depending upon the work scope, the environmental professional may also be able to provide guidance on the nature

¹ This guide is under the jurisdiction of ASTM Committee E-50 on Environmental Assessment and is the direct responsibility of Subcommittee E50.02 on Commercial Real Estate Transactions.

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² As used herein, a “Standard” is a document that has been developed and established within the consensus principles of the Society and that meets the approval requirements of ASTM procedures and regulations. A “Guide” is a compendium of information or a series of options that does not recommend a specific course of action. A guide increases the awareness of information and approaches in a given subject area. A “Practice,” in contrast, is a definitive set of instructions for performing one or more specific operations that does not produce a test result. See Form and Style for ASTM Standards, 10th ed., 1996.



and extent of contamination in order to assist the user in making business decisions regarding the property.

1.2.3 This guide is intended to provide guidance for assessing recognized environmental conditions and developing technically sound data. It is not intended to satisfy the level of inquiry that may be necessary to support remedial solutions for a site. For further discussion of the use of this guide, refer to Section 4 on Significance and Use.

1.3 *Needs of the User*—Establishing the innocent purchaser defense may not be a realistic objective in some instances. Accordingly, the extent of assessment is based on the business objectives of the user as well as the degree of uncertainty acceptable to the user. In either case, the primary purpose of a Phase II ESA conducted in accordance with this guide is to assess and evaluate the recognized environmental conditions identified in the Phase I ESA or Transaction Screen Process.

1.3.1 The mere confirmation of contamination or the preliminary indication of the extent and magnitude of contamination may be sufficient for the purposes of many users. If a user desires a more complete characterization of the environmental condition of the property, further assessment may be undertaken. However, this guide should not be construed to require multiple iterations of assessments in all cases, either to establish the innocent purchaser defense or to meet other objectives. Many Phase II ESAs may in fact be restricted to only a single round of assessment, whatever the extent of contamination, if any, that might be revealed.

1.4 *Limitations*—The use of this guide is related to the scope as set forth in Section 1. For information purposes, Section 12 of this guide contains a non-exhaustive list of certain environmental conditions that are beyond the scope of this guide but that may warrant consideration by parties to a commercial property transaction. This guide provides an approach that may be employed to assess the environmental conditions listed in Section 12. Reference also should be made to 4.1.

1.5 *Organization of This Guide*—This guide has twelve sections and one appendix. Section 1 is the Scope section. Section 2 is Referenced Documents. Section 3, Terminology, contains definitions of terms and acronyms used in this guide. Section 4 is Significance and Use of this guide. Section 5 is Contracting Considerations. Sections 6-11 constitute the main body of the Phase II Environmental Site Assessment guide and include objectives (see Section 6), developing the scope of work (see Section 7), assessment activities (see Section 8), evaluation of data (see Section 9), interpretation of results (see Section 10) and recommended report preparation (see Section 11). Section 12 provides additional information regarding non-scope considerations. Appendix X1 provides a sample table of contents and report format for a written Phase II Environmental Site Assessment Report.

2. Referenced Documents

2.1 The references in this Section are for informational purposes. Although Phase II ESAs should utilize government- and industry-accepted practices and methods, this guide does not recommend the use of specific practices in the implementation of a Phase II ESA.

2.2 *ASTM Standards*:

D 5730 Guide to Site Characteristics for Environmental Purposes With Emphasis on Soil, Rock, The Vadose Zone and Ground Water^{3,4}

D 653 Terminology Relating to Soil, Rock and Contained Fluids³

D 4750 Test Method for Determining Subsurface Liquid Levels in a Borehole or Monitoring Well. (Observation Well)³

E 1527 Practice for Environmental Site Assessments: Phase I⁵

E 1528 Practice for Environmental Site Assessments: Transaction Screen Process³

3. Terminology

3.1 Definitions:

3.1.1 *aquifer*—as defined in Terminology D 653, a geologic formation that is capable of providing a significant quantity of water.

3.1.2 *ARARs*—an acronym for “applicable or relevant and appropriate requirements,” a term used in CERCLA and interpreted by EPA regulations. Applicable requirements means “those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site”, 40 C.F.R. § 300.5. Relevant and appropriate requirements means “those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not ‘applicable’ to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site” 40 C.F.R. § 300.5.

3.1.3 *business decision*—a decision based on various business risk management considerations relating to a specific property, such as a transfer of title or change in financing. Such considerations may also include the potential financial exposure associated with environmental risks, the value of the property compared with the cost of environmental assessment, and the participation and motivations of specific parties to the transaction (that is, owner, seller, buyer, lender, etc.).

3.1.4 *CERCLA*—the acronym for the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9601, *et seq.*, the primary federal statute that governs the imposition of liability for environmental cleanups.

3.1.5 *C.F.R.*—Code of Federal Regulations.

3.1.6 *chain of custody*—a written or printed form which is used to document sample possession, condition and responsibility. This custody can include the time from sample container acquisition through transportation, sample collection and laboratory analysis.

³ *Annual Book of ASTM Standards*, Vol 04.08.

⁴ Guide D 5730 covers the selection of the various ASTM Standards that are available for the investigation of soil, rock, the vadose zone, ground water, and other media where investigations have an environmental purpose.

⁵ *Annual Book of ASTM Standards*, Vol 11.04.



Documents

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3.1.7 *chemical phases*—the physical state of the chemical, (that is; solid, liquid, vapor/gaseous). A chemical's physical state can change from the one phase to another based on its physical environment.

3.1.8 *common law*—as distinguished from law created by the enactment of legislatures, the common law comprises the body of those principles and rules of action, relating to the government and security of persons and property, which derive their authority solely from usages and customs of immemorial antiquity, or from the judgments and decrees of the courts recognizing, affirming and enforcing such usages and customs; and, in this sense, particularly the ancient unwritten law of England.⁶

3.1.9 *cuttings*—soil, rock chips, fragments or other material that is brought to the surface by drilling or sampling, or both.

3.1.10 *disposal*—as defined by CERCLA and interpreted by EPA regulations, the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters. By judicial construction, the term also may include hazardous substances in repose in the environment, with the result that hazardous substances that have migrated to a site from an off-site source may nonetheless be considered to have been disposed at the site. See, for example, *United States v. Waste Industries*, 734 F.2d 159 (4th Cir. 1984). This construction is not universally accepted. See, for example, *United States v. Petersen Sand and Gravel, Inc.*, 806 F. Supp. 1346 (D.Ill. 1992).

3.1.11 *downgradient*—with respect to a given reference point, it is all points through which ground water originating at the reference point flows until reaching a surface discharge point or a distance or depth that ceases to be a matter of potential environmental concern; the direction of decreasing hydrostatic head.

3.1.12 *environmental media*—soil, rock, water, air, sediment.

3.1.13 *environmental professional*—a person or group of persons possessing sufficient training and experience necessary to prepare and implement a Phase II environmental site assessment in accordance with this guide, and from the information generated by such activities, having the ability to develop sound opinions and conclusions regarding recognized environmental conditions in connection with the property in question. An individual's status as an environmental professional may be limited to the type of assessment to be performed or to specific segments of the assessment for which the professional is responsible. The person may be an independent contractor or an employee of the user.

3.1.13.1 *Discussion*—Some jurisdictions may have licensing requirements for individuals who perform certain activities included in a Phase II ESA.

3.1.14 *EPA*—the United States Environmental Protection Agency.

3.1.15 *ESA*—environmental site assessment.

3.1.16 *fate and transport characteristics*—natural consequences that can be predicted based on the distinguishing characteristics of a substance and the media which carry the substance.

3.1.17 *ground water*—as defined by Terminology D 653, the part of the subsurface that is in the saturated zone. Loosely, all subsurface water as distinct from surface water.

3.1.18 *ground water flow*—as defined by Terminology D 653, the movement of water in the zone of saturation.

3.1.19 *ground water flow direction*—the compass bearing of the movement of water in the zone of saturation (vertical and horizontal components of ground water flow).

3.1.20 *hazardous substance*—a substance defined as a hazardous substance pursuant to CERCLA, 42 U.S.C. § 9601(14), as interpreted by EPA regulations and the courts. The term includes any substance designated pursuant to section 311(b)(2)(A) of the Clean Water Act, 33 U.S.C. § 1321(b)(2)(A); any element, compound, mixture, solution or substance designated pursuant to section 102 of CERCLA, 42 U.S.C. § 9602; any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act, 42 U.S.C. § 6921, (but not including any waste the regulation of which under the Solid Waste Disposal Act, 42 U.S.C. § 6901 *et seq.*, has been suspended by Act of Congress); any toxic pollutant listed under section 307(a) of the Clean Water Act, 33 U.S.C. § 1317(a); any hazardous air pollutant listed under section 112 of the Clean Air Act, 42 U.S.C. § 7412; and any imminently hazardous chemical substance or mixture with respect to which the EPA administrator has taken action pursuant to section 7 of the Toxic Substances Control Act, 15 U.S.C. § 2606. The term does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance by EPA and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas). Hazardous substances designated by EPA are listed in 40 C.F.R. § 302.4.

3.1.21 *petroleum products*—those substances included within the petroleum exclusion to CERCLA, 42 U.S.C. § 9601(14), as interpreted by the courts and EPA; that is, petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under Subparagraphs (A) through (F) of 42 U.S.C. § 9601(14), natural gas, natural gas liquids, liquefied natural gas, and synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas). (The word fraction refers to certain distillates of crude oil, including gasoline, kerosene, diesel oil, jet fuels, and fuel oil, pursuant to Standard Definitions of Petroleum Statistics).⁷

3.1.22 *Phase I environmental site assessments (ESAs)*—the process described in Practice E 1527.

3.1.23 *Phase II environmental site assessments (ESAs)*—the process described in this guide.

3.1.24 *property*—the property that is the subject of the ESA described in this guide. The term includes buildings and other

⁶ Black's Law Dictionary 250-251, 5th ed., 1979.

⁷ Standard Definitions of Petroleum Statistics, American Petroleum Institute, Fourth Edition 1988.



fixtures and improvements located on the property and affixed to the land.

3.1.25 *purged ground water*—water that is removed from a monitoring well prior to collecting a representative sample of the aquifer, including water generated during well installation and well development.

3.1.26 *quality assurance/quality control (QA/QC)*—the use of standards and procedures to provide reasonable assurance that samples collected and data generated are reliable, reproducible and verifiable.

3.1.27 *recognized environmental condition (REC)*—the presence or likely presence of any hazardous substances or petroleum products on property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

3.1.28 *release*—as defined by § 101(22) of CERCLA, 42 U.S.C. § 9601(22), “any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance or pollutant or contaminant), but exclud[ing] (A) any release which results in exposure to persons solely within a workplace, with respect to a claim which such persons may assert against the employer of such persons, (B) emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station engine, (C) release of source, byproduct, or special nuclear material from a nuclear incident, as those terms are defined in the Atomic Energy Act of 1954 [42 U.S.C. § 2011 *et seq.*], if such release is subject to requirements with respect to financial protection established by the Nuclear Regulatory Commission under section 170 of such Act [42 U.S.C. § 2210], or, for the purposes of section 104 of CERCLA or any other response action, any release of source, byproduct, or special nuclear material from any processing site designated under section 102(a)(1) or 302(a) of the Uranium Mill Tailings Radiation Control Act of 1978; [42 U.S.C. § 7912(a)(1) or 7942(a)], and (D) the normal application of fertilizer.”

3.1.29 *sample medium*—the particular matrix that is sampled for laboratory analysis. Examples of commonly encountered matrices include: soil, rock, sludge, sediment, air, wastes, pure or mixtures of chemicals, ground water, drinking water, surface water, etc.

3.1.30 *self-evaluation privilege*—a privilege invoked to protect from disclosure confidential information resulting from a critical self-analysis undertaken by the party seeking to invoke the privilege.

3.1.31 *Superfund*—the common name for the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9601, *et seq.*, as amended by the Superfund

Amendments and Reauthorization Act of 1986 (“SARA”), the primary federal statute that governs the imposition of liability for environmental cleanups.

3.1.32 *surface water*—water above the surface of the ground, including but not limited to lakes, ponds, reservoirs, artificial impoundments, streams, rivers, springs, seeps and wetlands.

3.1.33 *target analyte*—a chemical substance or class of chemicals that is selected for laboratory analysis or field analysis.

3.1.34 *Transaction Screen Process*—the process described in Practice E 1528.

3.1.35 *U.S.C.*—United States Code.

3.1.36 *user*—the party seeking to use this guide to guide performance of an ESA of the property. A user may include, without limitation, a purchaser of property, a potential tenant of property, an owner of property, a lender, or a property manager.

3.1.37 *water table*—as defined in Test Method D 4750, the surface of a ground water body at which the water pressure equals atmospheric pressure. Earth material below the ground water table is saturated with water.

4. Significance and Use

4.1 Uses:

4.1.1 This guide is intended for use on a voluntary basis by parties who wish to assess the recognized environmental conditions (“RECs”) identified in a Phase I ESA or transaction screen process for the purpose of establishing the innocent purchaser defense, where applicable, or to support business decisions about the property. The level of assessment can, and most likely will, vary depending on the needs of the user and the business situation driving the assessment, as described in 1.3. No implication is intended that a person must use this guide in order to be deemed to have conducted inquiry in a commercially prudent or reasonable manner in any particular transaction. Nevertheless, this guide is intended to reflect good commercial and customary practice for appropriate inquiry sufficient to satisfy the innocent purchaser defense.

4.1.1.1 CERCLA provides that a purchaser of real property qualifies for the innocent purchaser defense if the purchaser acquires a contaminated site after the disposal or placement of hazardous substances at the site, and the purchaser neither knew nor had reason to know that any hazardous substance which is the subject of the release was disposed at the site. 42 U.S.C. § 9601(35)(A)(i). To establish that a purchaser had no reason to know of the disposal or release of any hazardous substance at the site, CERCLA requires the purchaser to show that at the time of acquisition the purchaser undertook all appropriate inquiry into the previous ownership and uses of a property consistent with “good commercial or customary practice”. 42 U.S.C. § 9601(35)(B). To determine whether a purchaser made “all appropriate inquiry”, the courts are directed by statute to consider any specialized knowledge or experience on the part of the purchaser, the relationship of the purchase price to the value of the property, if uncontaminated, commonly known or ascertainable information about the property, the obviousness of the presence or likely presence of contamination at the property, and the ability to detect such contamination by appropriate inspection.



4.1.1.2 This guide is intended to meet the business community's need for a written, practical reference describing procedures that constitute "all appropriate inquiry" once recognized environmental conditions are identified. This guide is intended to be a practical reference document which can be used to assess whether good commercial or customary practice (that is, appropriate procedure) has been followed in a particular environmental assessment.

4.1.1.3 This guide does not address the business judgments that follow from the interpretation of data collected through the Phase II process. Assessment of the business risks reflected by such data is dependent upon numerous site- and transaction-specific variables which cannot be adequately anticipated in this guide. Proper analysis of the legal, business and environmental risks associated with a particular site and business transaction is best conducted on a case-by-case basis by legal, business and environmental professionals assessing the known data relating to the particular site and transaction.

4.1.1.4 Likewise, this guide does not assess the legal risks associated with a transaction involving property where hazardous substances or petroleum products are present at levels above those occurring naturally but below those generally considered to be of regulatory concern, that is, *de minimis* levels. What constitutes a *de minimis* level of contamination is an evolving regulatory concept which may vary from jurisdiction to jurisdiction and may turn on site-specific factors.

4.1.1.5 If a Phase II ESA conducted in accordance with this guide provides sufficient information from which the environmental professional can render a professional opinion that there is no reasonable basis for suspecting the disposal or release of hazardous substances at the site, then further assessment is not warranted to establish the innocent purchaser defense. If the Phase II ESA confirms the presence of *de minimis* quantities of hazardous substances on the site under circumstances that suggest these hazardous substances have been released or disposed, the availability of the innocent purchaser defense is not assured as a matter of law. A review of reported case law as of January 1996 revealed no judicial decision concerning the availability of the innocent purchaser defense when *de minimis* quantities of hazardous substances are present on a site. This guide, therefore, does not address the availability of the innocent purchaser defense in those circumstances. Because petroleum products are excluded from the hazardous substances subject to CERCLA, the innocent purchaser defense is inapplicable to petroleum product releases.

4.1.2 *Use Not Limited to CERCLA*—This guide is designed to assist a user in developing information about the environmental condition of the property and has utility for a wide range of users including those who may have no actual or potential CERCLA concerns.

4.1.2.1 Where fewer than all recognized environmental conditions identified in a Phase I ESA or transaction screen are assessed in the Phase II ESA, the conclusion that no further inquiry is warranted applies only to the recognized environmental conditions assessed. However, this guide should not be construed to require Phase II assessment of all recognized environmental conditions identified in a Phase I ESA or a transaction screen. Where the user's objectives may be other-

wise satisfied (for example, establishing the innocent purchaser defense is not the user's objective), a recognized environmental condition identified in a Phase I ESA or transaction screen may be eliminated from further assessment in the Phase II ESA.

4.1.3 *Site- and Transaction-Specific*—A Phase II ESA is site-specific in that it relates to assessing recognized environmental conditions as identified in a Phase I ESA or transaction screen. A Phase II ESA is also transaction-specific. This guide is intended to set forth a level of diligence that will satisfy the innocent purchaser defense where it is sought. The level of diligence set forth in this guide is also intended to generate information of sufficient quality to satisfy different or additional objectives of the user.

4.1.4 *Use by Other Parties*—Transaction-specific assumptions and limitations, based on the user's objectives, will be built into the implementation of this guide for any specific site to the extent the user's objectives go beyond establishing the innocent purchaser defense. Any person who seeks to rely on a Phase II ESA conducted for someone else is cautioned to understand these assumptions and objectives prior to review and use of the findings of the Phase II ESA.

4.2 *Principles*—The following principles are an integral part of this guide and are intended to be referred to in resolving any ambiguity or exercising such discretion as is accorded the user or environmental professional.

4.2.1 *Elimination of Uncertainty*—No ESA can eliminate all uncertainty. Furthermore, any sample, either surface or subsurface, taken for chemical analysis may or may not be representative of a larger population. Professional judgment and interpretation are inherent in the process and uncertainty is inevitable. Additional assessment may be able to reduce the uncertainty.

4.2.1.1 *Failure to Detect*—Even when Phase II work is executed with an appropriate site-specific standard of care, certain conditions present especially difficult detection problems. Such conditions may include, but are not limited to, complex geological settings, the fate and transport characteristics of certain hazardous substances and petroleum products, the distribution of existing contamination, physical limitations imposed by the location of utilities and other man-made objects, and the limitations of assessment technologies.

4.2.1.2 *Inadequate Phase I ESA or Transaction Screen*—If Phase II work is based on an inadequate Phase I ESA or an inadequate transaction screen (for example, one that fails to identify all recognized environmental conditions) there will be an increased risk that the disposal or release of hazardous substances or petroleum products on the property may go undetected and jeopardize the availability of the innocent purchaser defense and the quality of data on which judgments are made. A Phase I ESA or transaction screen, or both, conducted in accordance with the latest edition of Practice E 1527 and Practice E 1528 should provide an adequate basis for a Phase II ESA.

4.2.1.3 *Chemical Analysis Error*—Chemical testing methods have inherent uncertainties and limitations. The environmental professional should build quality control and quality assurance tests into the work description, as an integral part