
Standard Practice for

Decommissioning Geotechnical Exploratory Boreholes

AASHTO Designation: R 22-97 (2023)

Technically Revised: 1997

Reviewed but Not Updated: 2023

Tech Subcommittee: 5c, Quality Assurance and Environmental



American Association of State Highway and Transportation Officials
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INTRODUCTION

The preservation of groundwater resources is a very important issue in the design, construction, and maintenance of the highway infrastructure system. Most projects require some type of on-site subsurface geotechnical investigation to properly design the facilities. These investigations typically involve progressing smaller-diameter (<200 mm) exploratory boreholes up to depths of approximately 60 m. In some instances, cone penetrometers or instrumentation devices such as piezometers, monitoring wells, and vane shear tests are used to obtain subsurface information. By progressing exploratory boreholes that may penetrate the water table, a conduit for surface and subsurface aquifer cross-contamination may be introduced. In situations in which the investigation may lead to the contamination of groundwater resources, it would be prudent to properly abandon the borehole.

Construction of a borehole seal during decommissioning can add significantly to the time, material, and labor costs of geotechnical exploratory boreholes. Some states have regulations that mandate that all geotechnical exploratory boreholes must be sealed. When that is the case, this standard practice is of limited use, and the reader should consult references pertaining to borehole sealing. If borehole sealing mandates are not in effect, this standard practice may provide some guidelines regarding which boreholes should be sealed, as well as the procedures involved in this determination.

1. SCOPE

- 1.1. *Types of Boreholes*—This standard practice addresses the permanent decommissioning (closure) of the following types of geotechnical exploratory boreholes. It is specifically intended to address the closure in situations in which hazardous material or solid wastes are determined not to be present.¹ Included in the list of geotechnical exploratory boreholes are:
 - 1.1.1. Boreholes progressed with temporary casing for obtaining soil, rock, and groundwater information;
 - 1.1.2. Uncased boreholes progressed for obtaining soil, rock, and groundwater information using drilling mud or open-hole techniques;
 - 1.1.3. Hollow-stem flight auger boreholes;
 - 1.1.4. Observation wells for monitoring groundwater conditions;
 - 1.1.5. Instrumentation boreholes (i.e., piezometers, Borros points, etc.);

- 1.1.6. Cone penetrometer boreholes; and
- 1.1.7. Soil characterization tests (vane shear, dilatometer, etc.).
- 1.2. *Intent of Practice*—This practice describes the overall process of decommissioning the holes and, as such, includes a systematic approach to completing the process. The typical steps entail an evaluation of the specific site characteristics and potential problems, a review of available decommissioning options including the null option if applicable, selection of an appropriate sealant, and a method of sealing. Specific requirements for the quality control and performance of the sealed borehole are addressed. Record-keeping requirements are noted.
- 1.3. *Safety*—This standard practice does not propose to address all safety concerns associated with its usage. It is the duty and responsibility of the user of this practice to establish appropriate safety and health practices and determine the applicability of other state regulatory limitations prior to use.

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standard:*
 - < R 13, Conducting Geotechnical Subsurface Investigations
- 2.2. *ASTM Standard:*
 - < D5299/D5299M, Standard Guide for Decommissioning of Groundwater Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities
- 2.3. *National Cooperative Highway Research Program Reports:*
 - < *National Cooperative Highway Research Report 378: Recommended Guidelines for Sealing Geotechnical Exploratory Holes*
 - < NCHRP Project 21-4, *Sealing Geotechnical Exploratory Holes to Protect the Subsurface Environment*

3. SUMMARY OF GUIDE

- 3.1. Currently, there are numerous state agencies and private contractors who install geotechnical exploratory boreholes for the state transportation programs. Within these agencies, various state regulations and decommissioning procedures are in place. No national or international standards exist for abandoning geotechnical boreholes. This standard practice attempts to provide members of the transportation industry with guidelines and references to follow in evaluating the need for sealing, different sealant materials, methods for sealing, and the associated record keeping for the process.

4. SIGNIFICANCE AND USE

- 4.1. This standard practice is intended to provide technical information and is not intended to supplant any federal, state, or municipal regulations that may be in effect in a particular area. For a summary of practices of state transportation departments, see National Cooperative Highway Research Program Project 21-4, *Sealing Geotechnical Exploratory Holes to Protect the Subsurface Environment*, August 1995.