

Work Plan to Plug and Abandon Well TW-2B

Primary Purpose	This work plan summarizes the methods Los Alamos National Laboratory (the Laboratory) proposes to use to plug and abandon groundwater monitoring test well 2B (TW-2B), located in Pueblo Canyon, Los Alamos, New Mexico. Well abandonment of TW-2B will be consistent with the requirements and guidelines of Sections IV.B.1.b.v and X.D (Well Abandonment) of the Compliance Order on Consent (the Consent Order). The construction of TW-2B and the methods used to abandon the well are detailed below.
Conceptual Model of TW-2B	<p>Groundwater monitoring well TW-2B was installed in 1949 in an attempt to isolate a zone of perched water above the regional aquifer identified during the drilling of Test Well 2 in Pueblo Canyon. When TW-2B was drilled, the perched aquifer was either not present or was of such limited extent that it could not be located. Construction details are as follows:</p> <ul style="list-style-type: none"> • 0–112 ft: 12-in.-inside diameter (I.D.) steel casing • 0–130 ft: 6-in.-I.D. steel casing • 130–225 ft: (potential) open hole
Abandonment Methods	<p>There are no reported aboveground or belowground appurtenances to be removed. The well will be inspected with a downhole video camera, and a natural gamma log will be collected to document the existing conditions.</p> <p>Based on the available well-completion notes (Purtymun and Swanton 1998, 099096), TW-2B does not have an annular seal or a screened interval. Completion notes are not in agreement on the location of the 6-in. casing at TW-2B. One source places the bottom of the 6-in. casing at 223 ft below ground surface (bgs) and another at 130 ft bgs, with the total depth of 225 ft bgs having been achieved in an open hole.</p> <p>Plugging and abandonment at TW-2B will generally take the approach of removing as many of the internal casing strings as possible in order to gain access to outer casing strings for the purpose of perforating and sealing via grouting. Work will take place within the well from inside to outside, working on the smallest diameter casing first. Grouting will take place in one stage at TW-2B because it is not a particularly deep well, and the hydrostatic pressure associated with a single lift of grout will not be substantial enough to “blow out” the formations within the perforated intervals. Casing cutters and perforators will be pneumatic tools run in the hole on drill rods. This approach will require the use of a rotary drilling rig.</p> <p>TW-2B will be abandoned by first determining the status of the 6-in. casing. An attempt will be made to remove the entire 130-ft string of 6-in. casing. If the 6-in. casing cannot be removed, it will be cut off at approximately 110 ft bgs near the bottom of the 12-in. casing string. After the 6-in. casing is removed, the 12-in. casing will be perforated in two intervals: 10 to 30 ft bgs and 80 to 100 ft bgs. The entire well will be pressure-grouted in one continuous lift with a mixture of Portland Type I/II cement and Baroid IDP-381 from the bottom to approximately 2 ft bgs using a tremie pipe to force cement through the perforated intervals and into the formation and to seal the open-hole portion.</p>
Surface Completion	The hole will be cement-grouted to within 2.0 ft of ground surface. A 2-ft × 2-ft concrete surface pad will be installed at ground surface with a brass survey marker and will be surveyed in accordance with the Section IX.B.2.f of the Consent Order, which states that pertinent structures may be horizontally located with a global positioning system within 0.5 ft.
Waste Disposal	No sampling will take place during plugging and abandonment of this well. The intent is to reuse and recycle all materials. If some materials cannot be recycled, they will be sampled, characterized, and disposed of in accordance with the waste characterization strategy form that applies to this activity.

Summary Report	A brief report will be prepared detailing the methods used, presenting borehole logs (video and natural gamma), quantities of materials used, and providing the final abandonment details. Figures depicting the location of the abandoned well and backfill completion will also be included in the report.	
Schedule	Activity	Completion Date
	Plug and abandon TW-2B	No later than January 31, 2010
	Submit report to the New Mexico Environment Department	No later than March 15, 2010

REFERENCE

The following list includes all documents cited in this plan. Parenthetical information following each reference provides the author(s), publication date, and ER ID. This information is also included in text citations. ER IDs are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

Purtymun, W.D., and A.S. Swanton, February 5, 1998. "Engineering, Geology, and Construction Data of Twenty-Five Test Holes and Test Wells on and Adjacent to the Pajarito Plateau," draft, Los Alamos National Laboratory, Los Alamos, New Mexico. (Purtymun and Swanton 1998, 099096)