

# REPORT DOCUMENTATION PAGE

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ROCKY MOUNTAIN ARSENAL

INSTALLATION RESTORATION PROGRAM

PILOT CONTAINMENT -- RECHARGE SYSTEM

TEST PLAN

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ROCKY MOUNTAIN ARSENAL  
RECHARGE SYSTEM TEST PLAN

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1. Objectives - The objectives of the proposed test are to provide preliminary data for the design-construction of recharge pits along the north boundary containment line (bentonite barrier). This evaluation will guide in determining the size, spacing, flow rate, and number of recharge pits needed so as to approximate as closely as possible existing groundwater flow conditions prior to installation and operation of the pilot containment system.

2. Location - The recharge evaluation test will take place along the line proposed for the recharge system under actual operating conditions (which is 250 feet north of the bentonite barrier). Three sites along that line will be evaluated. Site A will be positioned 250 feet east of the west end of the proposed barrier. Site B will be 400 feet west of the east end, and Site C will be 100 feet west of B. Site A is located in the area in which the sand and gravel aquifer is relatively thin -- less than four feet thick. Sites B and C are located in an area in which this sand and gravel aquifer reaches its maximum thickness, varying between approximately 10 and 18 feet.

3. Field Design

a. These recharge shafts will consist of 36-inch diameter bore holes drilled approximately two feet into the aquifer material. The bore holes will be cased, utilizing corrugated steel pipe in a manner consistent with drilling practices normally used in industry in which cased bore holes are required. The casing will be driven to the bottom of the shaft, and the hole will be inspected and cleaned out to ensure that no nonaquifer material remains inside the casing. Gravel material, one-half or three-fourth inch size, will be placed at the bottom of this shaft to cover the bottom to a depth of three feet. The casing will then be backed off the bottom to a height equivalent to the top of the sand and gravel aquifer.

b. In addition to the recharge shafts, two observation wells will be installed on the down-gradient side at each shaft. The spacing of these wells will be 5 feet and 25 feet from the recharge points.

RMA, RECHARGE SYSTEM TEST PLAN -- Cont

4. Test Phase - The recharge test will consist of two phases: (1) A slug test and (2) A dynamic test. The source of water for both of these wells will be water from the bog.

a. Slug Test - The slug test consists primarily of filling the recharge pit with water and measuring the rate of all of the hydraulic head. This will provide data on the volume of water uptake per square foot of aquifer per unit time and will be used to determine the range of constant-Q tests to be performed in phase 2. The observation wells on the down-gradient side will be monitored during this first phase. The monitoring schedule will be at 1 minute intervals for the first 10 minutes, 10 minute intervals between 10 and 100 minutes, and 100 minute intervals for any determinations after 100 minutes. Measurements will be made on this schedule until no changes are detected in water levels in the observation wells for 3 consecutive time intervals beyond the 100 minute threshold. Approximately 600 gallons will be required for each bore during the slug test.

b. Dynamic Test

(1) Based on the results of the slug test described above, a constant-Q test will be performed at each of the three sites. It is anticipated that three constant-Q tests will be performed at each site. The anticipated discharge rates will be 10, 20, and 40 gpm. The recharge will be maintained at these constant discharge rates until a constant head conditions results, and that constant head will be maintained for at least eight hours.

(2) The observation wells will be monitored according to the scheduled intervals described in the slug test to the end of the eight hour constant head time interval.