Subject: Submittal of the Fact Sheets for Regional Well R-62

Dear Mr. Kieling:

Enclosed please find two hard copies with electronic files of the Fact Sheets for R-62. Because several challenges were encountered during completion of this well, Los Alamos National Laboratory (the Laboratory) is including a brief narrative of the backfilling operations in this letter. Additional detail will be provided in the well completion report that will be submitted by March 1, 2012.

An annular seal was set at the base of the 16-in. casing at 672 to 708 ft below ground surface (bgs), before the 12-in. casing was advanced. Drilling continued with the 12-in. casing to a total depth of 1260 ft after which the borehole collapsed to 1239 ft. A single-screen, 5-in.-diameter well was built and properly completed, as depicted in the attached R-62 fact sheet. A calculated volume of 745.3 ft³ of annular backfill was needed to complete the well. The actual volume of material used to backfill the well was 733.7 ft³, which was 98.4% of the calculated volume (from the point when the 16-in. casing was stuck).

The borehole had been backfilled to 952 ft bgs with bentonite chips/pellets, when a 954-ft section of 12-in. casing was dropped down hole and lodged in the bentonite at 1004 ft bgs. The annular space between the outside of the 5-in. well casing and the inside of the 12-in. drill casing was then filled with bentonite chips and hydrated.

After lifting the 16-in. casing several inches, it became apparent that it was stuck in the borehole and 666 ft was left in place. A modified completion plan was submitted to and approved by the New Mexico Environment Department. In the plan, the Laboratory proposed to fill the annulus with a combination of Barotherm Gold bentonite grout (28% solids) and a cement mix.

To ensure optimal cure time and proper placement, the bentonite grout was tremied down hole in multiple lifts (from 952 to 600 ft bgs) to seal off the annular space between the 12-in. casing and the 16-in. casing and between the borehole wall and the 12-in. casing below the 16-in. casing. The
Laboratory ran gamma logs after each lift to evaluate the grout placement. After the grout was emplaced between the 12-in. and 16-in. casing, the 16-in. casing was sealed and pressurized to 40 pounds per square inch to force the grout between the casing and the borehole wall to form a tight seal. After the pressure test was determined to have been successful, bentonite grout was placed between the borehole wall and the outside of the 16-in. casing from 952 to 50 ft bgs.

A 20-ft lift of neat cement was pumped into the interval above the bentonite and allowed to cure for 12-plus hours. Then, a cement mix was placed in the annular space between the 12-in. and 16-in. casing, between the 5-in. and the 16-in. casing, and between the borehole wall and the 16-in. casing (see as-built diagram included with the R-62 fact sheets). Upon completion of backfilling activities, the Laboratory ran another gamma log to further evaluate the grout and cement placement. Examples of the gamma logs are attached. Figure 1 is the gamma log collected after the second lift of bentonite was added up to a target depth of 800 ft bgs, and Figure 2 is the gamma log collected after backfilling was completed.

If you have any questions, please contact Ted Ball at (505) 665-3996 (tedball@lanl.gov) or Woody Woodworth at (505) 665-5820 (lance.woodworth@doe.nnsa.gov).

Sincerely,

Michael J. Graham, Associate Director
Environmental Programs
Los Alamos National Laboratory

Sincerely,

George J. Rael, Assistant Manager
Environmental Projects Office
Los Alamos Site Office
Enclosures: Two hard copies with electronic files – Fact Sheets for Regional Well R-62 
(LA-UR-11-6229)

Cy: (w/enc.)
Neil Weber, San Ildefonso Pueblo
Woody Woodworth, DOE-LASO, MS A316
Ted Ball, EP-CAP, MS M996
RPF, MS M707 (electronic)
Public Reading Room, MS M992 (hard copy)

Cy: (Letter and CD and/or DVD only)
Laurie King, EPA Region 6, Dallas, TX
Steve Yanicak, NMED-DOE-OB, MS M894
Hai Shen, DOE-LASO, MS A316
Richard Knapp, Eberline, Los Alamos, NM (w/ MS Word files on CD)
William Alexander, EP-BPS, MS M992

Cy: (w/o enc.)
Tom Skibitski, NMED-OB, Santa Fe, NM (date-stamped letter emailed)
Annette Russell, DOE-LASO (date-stamped letter emailed)
Craig Douglass, EP-CAP, MS M992 (date-stamped letter emailed)
Michael J. Graham, ADEP, MS M991 (date-stamped letter emailed)
Figure 1  Gamma log collected after the second lift of bentonite was added
Figure 2  Gamma log collected after backfilling was completed
TOTAL LENGTH CASING AND SCREEN (ft) 1189.7
DEPTO TO WATER AFTER WELL DEVELOPMENT & AQUIFER TESTING (ft bgs) 1142.5 10/20/2011
DIAMETER OF BOREHOLE 20.3 (in) FROM 0.0 TO 25.1 (ft bgs)
17.5 (in) FROM 25.1 TO 96.0 (ft bgs)
10.0 (in) FROM 96.0 TO 166.0 (ft bgs)
14.8 (in) FROM 166.0 TO 233.0 (ft bgs)
12.5 (in) FROM 233.0 TO 301.0 (ft bgs)
13.4 (in) FROM 301.0 TO 1280.0 (ft bgs)
OUTER CEMENT SEAL TO (ft bgs)
SURFACE COMPLETION INFORMATION - PENDING
PROJECT NO. 120764 R-62 WELL CONSTRUCTION FIGURE
FROM 490.0 TO 678.0 (ft bgs) 14.8 (in) FROM 678.0 TO 1280.0 (ft bgs)
BOTTOM OF BORING 1280.0 (ft bgs)

WELL DEVELOPMENT BEGAN
DATE 10/4/2011
TIME 12:40
WELL DEVELOPMENT FINISHED
DATE IN PROGRESS
TIME

DEVELOPMENT METHOD
X SWABBING X BAILING
X PUMPING

TOTAL PURGE VOLUME

FINAL PARAMETERS
pH
TEMPERATURE (°C)
SPECIFIC CONDUCTANCE (μS/cm)
TURBIDITY (NTU)

WELL COMPLETION BEGAN
DATE 9/22/2011 TIME 18:40
WELL COMPLETION FINISHED
DATE 10/3/2011 TIME 14:20

DATA AS OF 10/18/2011

R-62 WELL CONSTRUCTION DIAGRAM (AS BUILT)
TA-05
LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO
ORIGINATOR: C. VALLEJO
DRAWING CATEGORY: 2
APPROVED BY: B. EVERETT

FIGURE

PROJECT NO. 120764
DRAWN: 10/5/2011
DRAWN BY: PD
CHECKED BY: BB
FILE NAME: 120764 R-62.dwg

ORIGINATOR: C. VALLEJO
DRAWING

LOCKING COVER

SLOPED CONCRETE SURFACE COMPLETION PAD

SURFACE SEAL 5 TO 665.3 (ft bgs)
MIX (WT%) CEMENT 25% - Tremied
QUANTITY USED 3.66 ft³ - CALCUlATED 6.6 ft³

ANNULAR FILL BETWEEN 12-In. AND 16-In. CASING AND THE BOREHOLE
50.0 TO 952.0 (ft bgs)
TYPE BAROTHERM PHOTOGRAPHS TREMIED
QUANTITY USED 363.1 ft³ - CALCUlATED 426.6 ft³

ANNULAR FILL BETWEEN 12-In. AND 5-In. CASING
50.0 TO 915.0 (ft bgs)
TYPE 0.375-In. BENTONITE CHIPS FREEFALL
QUANTITY USED 364.8 ft³ - Calculated 331.7 ft³

ANNULAR FILL BETWEEN 16-In. DIAMETER BOREHOLE AND 14.75-In. DIAMETER BOREHOLE
672.0 TO 706.0 (ft bgs)
TYPE 0.375-In. HYDRATED BENTONITE CHIPS TREMIED

ANNULAR FILL BETWEEN 12-In. AND 5-In. CASING
915.0 TO 952.0 (ft bgs)
TYPE BENTONITE CHIPS TREMIED
QUANTITY USED 19.3 ft³ - CALCUlATED 20.8 ft³

ANNULAR FILL 952.0 TO 1128.0 (ft bgs)
TYPE 6% 0.375-In. BENTONITE CHIPS/33% 10/20 SAND TREMIED
QUANTITY USED 126.9 ft³ - CALCUlATED 336.4 ft³

ANNULAR SEAL 1128.0 TO 1145.8 (ft bgs)
TYPE HYDRATED 0.375-In. BENTONITE CHIPS TREMIED
QUANTITY USED 5.7 ft³ - CALCUlATED 3.2 ft³

BACKFILL ANNULAR SEAL 1145.8 TO 1189.9 (ft bgs)
TYPE HYDRATED 0.375-In. BENTONITE CHIPS TREMIED
QUANTITY USED 8.3 ft³ - CALCUlATED 6.3 ft³

SLOUGH 1189.9 TO 1202.4 (ft bgs)

BASE ANNULAR SEAL 1202.4 TO 1239.0 (ft bgs)
TYPE 39% 0.375-In. BENTONITE CHIPS/33% 10/20 SAND TREMIED
QUANTITY USED 48.8 ft³ - CALCUlATED 30.7 ft³

SLOUGH 1239.0 TO 1260.0 (ft bgs)

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