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Environmental Programs
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ENTERED

National Nuclear Security Administration
Los Alamos Site Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
(505) 667-4255/FAX (505) 606-2132

Date: NOV 0 3 2011
Refer To: EP2011-0368

RECEIVED
NOV 2011
NMED Hazardous Waste Bureau

John Kieling, Acting Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

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 ft^3 of annular backfill was needed to complete the well. The actual volume of material used to backfill the well was 733.7 ft^3, 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

34891

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,

B-G Schappell for MJ G

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

Sincerely,

Cheryl D Rodgers for

George J. Rael, Assistant Manager
Environmental Projects Office
Los Alamos Site Office

MG/GR/CD/TB:sm

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)

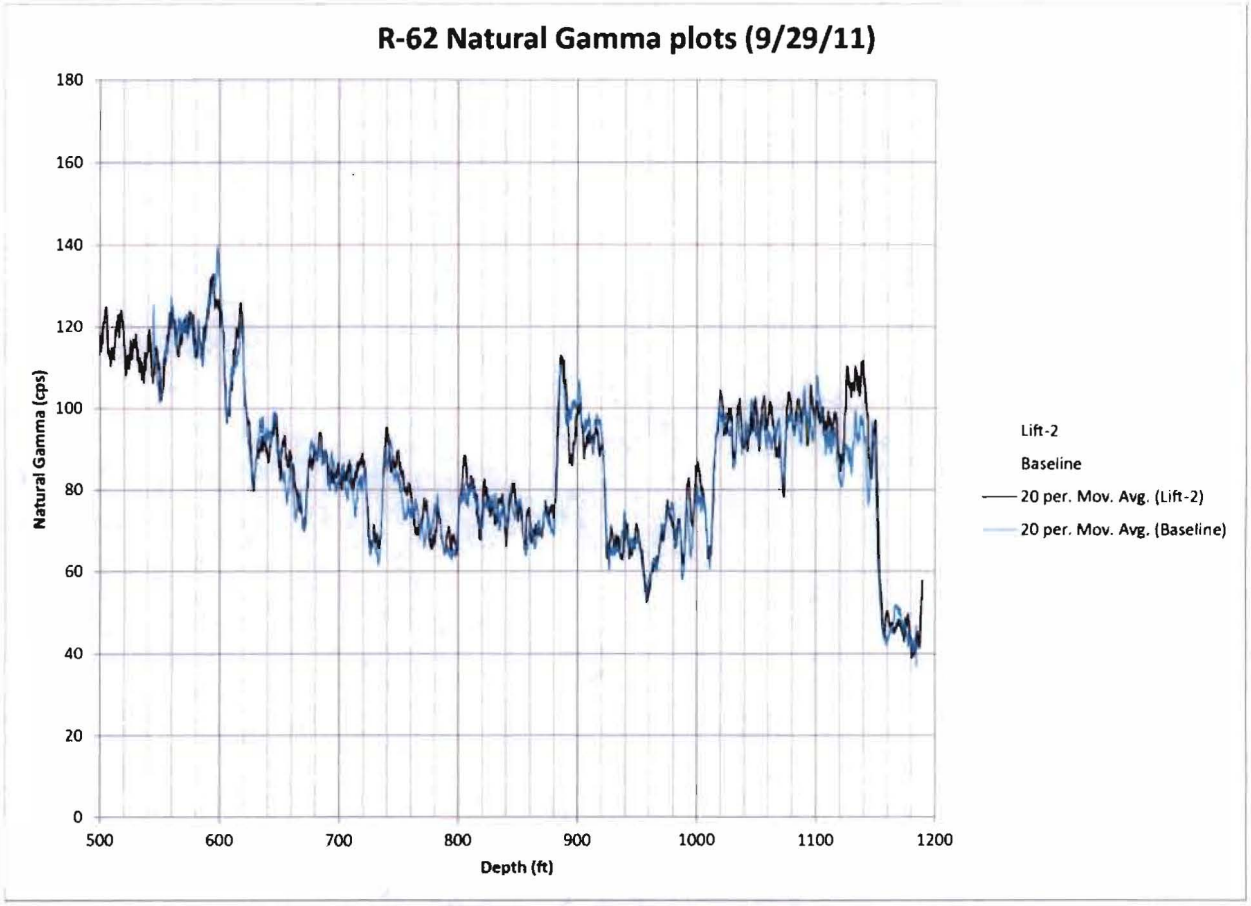


Figure 1 Gamma log collected after the second lift of bentonite was added

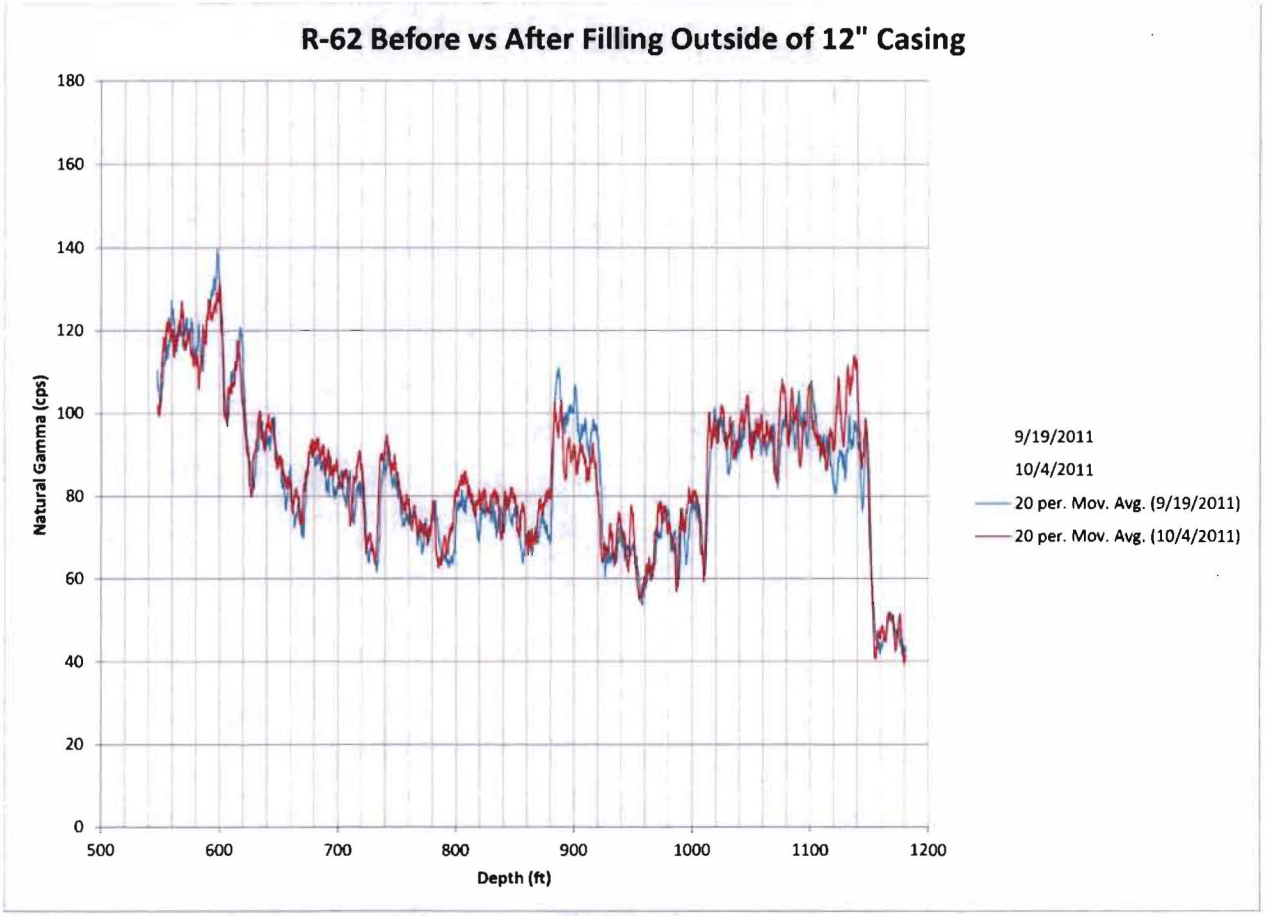
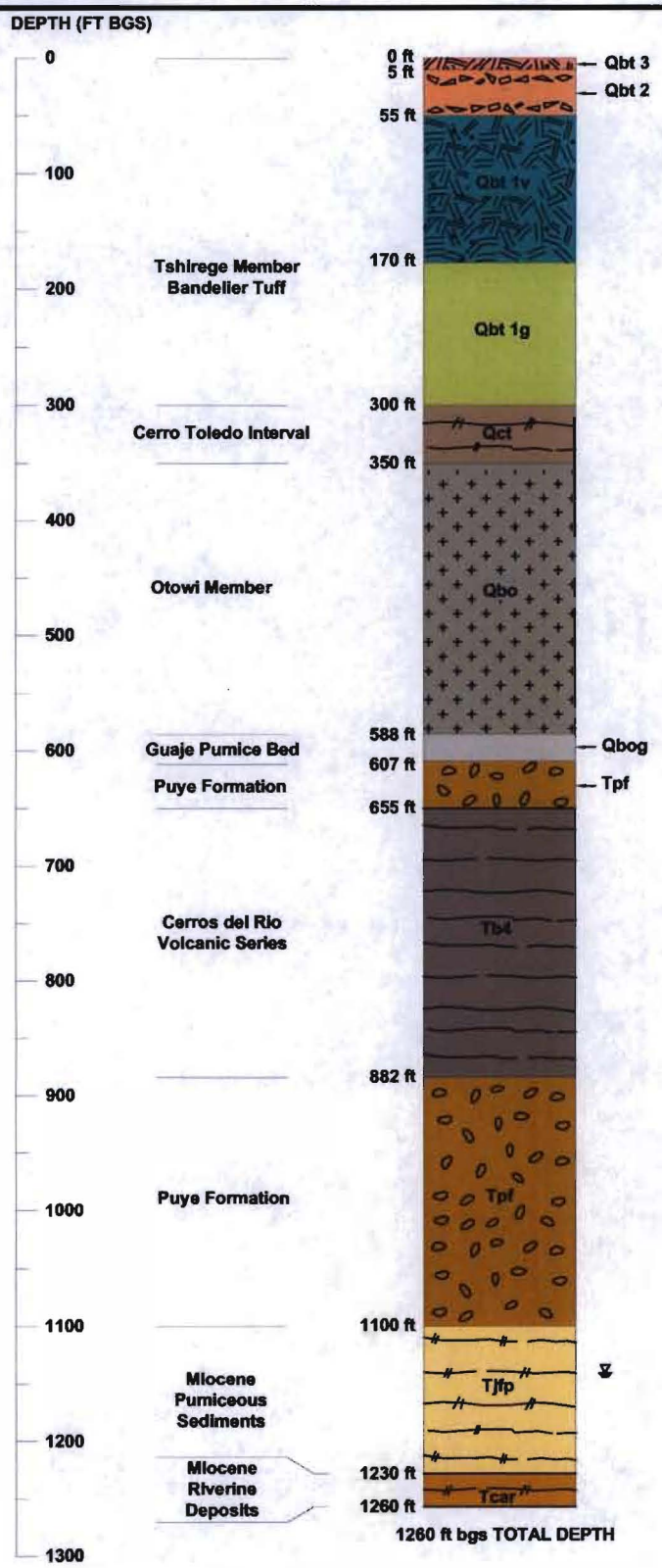


Figure 2 Gamma log collected after backfilling was completed



DRILLING INFORMATION

DRILLING COMPANY/PERSONNEL:
YELLOW JACKET DRILLING
S. EDWARDS
Q. STEVENS
L. McCAULEY
A. LAMON
M. PHILLIPS

DRILL RIG:
FOREMOST DR-24 HD

DRILLING METHOD:
☒ FLUID ASSISTED AIR ROTARY
☒ FLUID ASSISTED DUAL ROTARY

DRILLING FLUID TYPE:
☒ WATER
☒ AIR
0 ft bgs 1260 ft bgs
☒ AQF-2 FOAM
308 ft bgs 975 ft bgs

DRILLING START / FINISH:
DATE: 7/30/11 TIME: 07:00
DATE: 8/30/11 TIME: 08:18

GEOLOGISTS:
EBERLINE
J. MARIN

KLEINFELDER
C. VALLEJO
D. KRUPICKA
D. NEIDIGH
E. SHANNON

Depth: 1142 ft Date: 8/29/2011

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

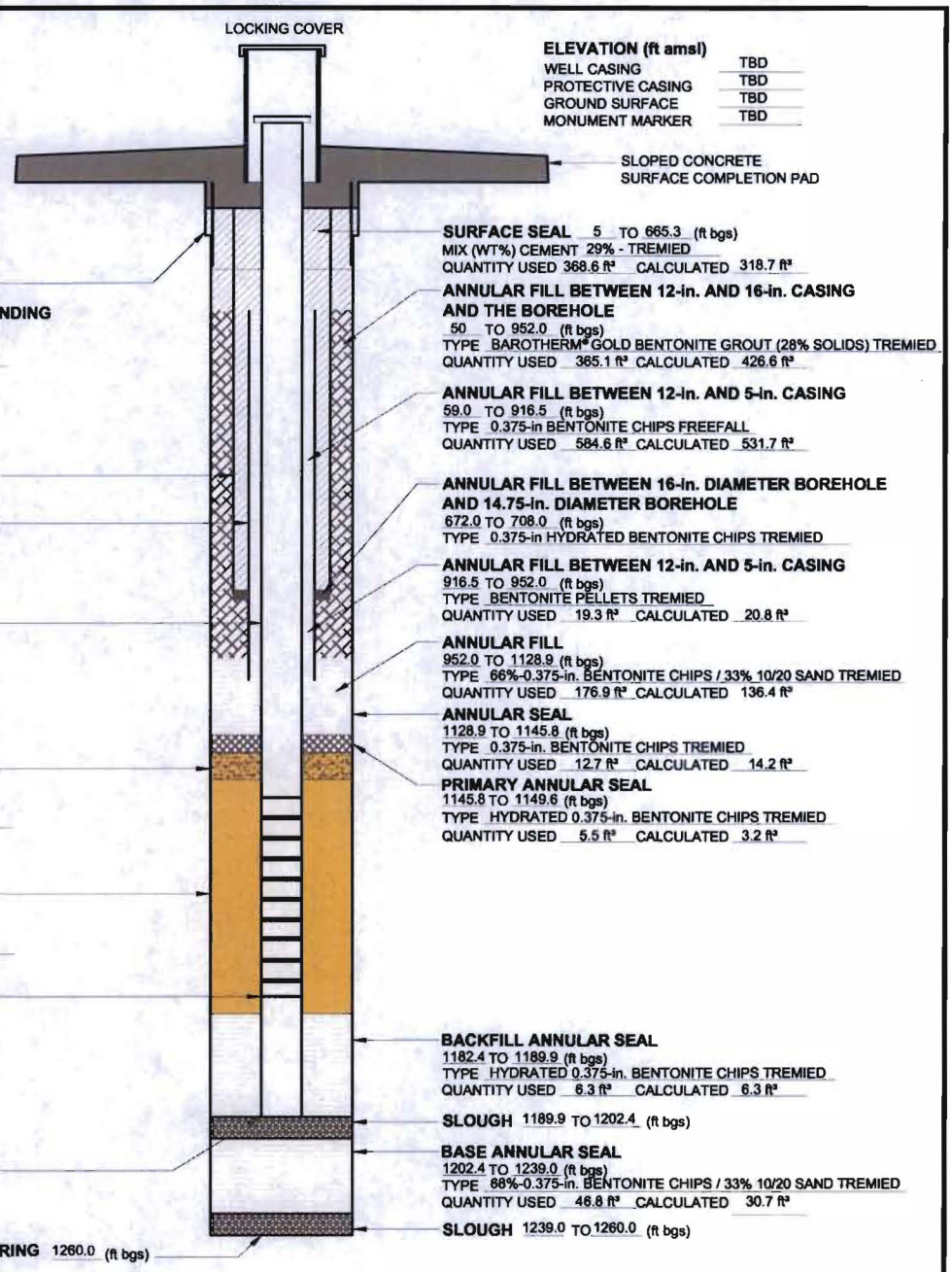
R-62 WELL SUMMARY DATA SHEET
BOREHOLE STRATIGRAPHY

TA-05
LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

ORIGINATOR: B. EVERETT
APPROVED BY:
DRAWING CATEGORY: 2

FIGURE
FACT SHEET

CAD FILE: G:\Environ\120764-Eberline-LANL Wells\2.0 Tech Info\2.8 - Technical-CADD Figures\ LAYOUT: Lithology PLOTTED: 31 Oct 2011, 3:41pm, JStoken
ATTACHED XREFS: ALBUQUERQUE, NM



TOTAL LENGTH
CASING AND SCREEN (ft) 1189.7

DEPTH TO WATER
AFTER WELL DEVELOPEMENT & AQUIFER TESTING (ft bgs) 1142.5 10/26/2011

DIAMETER OF BOREHOLE
20.0 (in.) FROM 0 TO 29.1 (ft bgs)
17.5 (in.) FROM 29.1 TO 490.0 (ft bgs)
16.0 (in.) FROM 490.0 TO 678.0 (ft bgs)
14.8 (in.) FROM 678.0 TO 923.0 (ft bgs)
12.5 (in.) FROM 923.0 TO 1015.0 (ft bgs)
13.4 (in.) FROM 1015.0 TO 1260.0 (ft bgs)

OUTER CEMENT SEAL ____ TO ____ (ft bgs)

SURFACE COMPLETION INFORMATION - PENDING
PROTECTIVE CASING
TYPE ____ SIZE ____ (in) OD
PAD AND PROTECTIVE POSTS INSTALLED
CHECK FOR SETTLEMENT
PAD MATERIAL
REINFORCED WITH
PAD DIMENSIONS (ft) (L) (W) (H)

16-in. CARBON STEEL CASING
0 TO 666 (ft bgs)

12-in. CARBON STEEL CASING
50 TO 1004 (ft bgs)

STAINLESS STEEL CENTRALIZERS USED
☒ YES AT 1157.2 (ft bgs) AND 1180.2 (ft bgs)

TYPE OF CASING
MATERIAL PASSIVATED A304 STAINLESS STEEL
ID (in.) 5.0 OD (in.) 5.6
JOINT TYPE THREADED / COUPLED

FINE SAND COLLAR
1149.6 TO 1152.6 (ft bgs)
SIZE/TYPE 20/40 SILICA SAND
QUANTITY USED 3.0 ft³ CALCULATED 2.5 ft³

PRIMARY FILTER PACK
1152.6 TO 1182.4 (ft bgs)
SIZE/TYPE 10/20 SILICA SAND
QUANTITY USED 46.5 ft³ CALCULATED 24.7 ft³

SCREENED INTERVAL 1158.4 TO 1179.1 (ft bgs)
SCREEN TYPE A304 STAINLESS STEEL
ID (in.) 5.0 OD (in.) 5.6
SLOT SIZE 0.20
JOINT TYPE THREADED / COUPLED

BOTTOM OF WELL CASING 1189.7 (ft bgs)

BOTTOM OF BORING 1260.0 (ft bgs)

ELEVATION (ft amsl)
WELL CASING TBD
PROTECTIVE CASING TBD
GROUND SURFACE TBD
MONUMENT MARKER TBD

SURFACE SEAL 5 TO 665.3 (ft bgs)
MIX (WT%) CEMENT 29% - TREMIED
QUANTITY USED 368.6 ft³ CALCULATED 318.7 ft³

ANNULAR FILL BETWEEN 12-in. AND 16-in. CASING AND THE BOREHOLE
50 TO 952.0 (ft bgs)
TYPE BAROTHERM® GOLD BENTONITE GROUT (28% SOLIDS) TREMIED
QUANTITY USED 365.1 ft³ CALCULATED 426.6 ft³

ANNULAR FILL BETWEEN 12-in. AND 5-in. CASING
59.0 TO 916.5 (ft bgs)
TYPE 0.375-in BENTONITE CHIPS FREEFALL
QUANTITY USED 584.6 ft³ CALCULATED 531.7 ft³

ANNULAR FILL BETWEEN 16-in. DIAMETER BOREHOLE AND 14.75-in. DIAMETER BOREHOLE
672.0 TO 708.0 (ft bgs)
TYPE 0.375-in HYDRATED BENTONITE CHIPS TREMIED

ANNULAR FILL BETWEEN 12-in. AND 5-in. CASING
916.5 TO 952.0 (ft bgs)
TYPE BENTONITE PELLETS TREMIED
QUANTITY USED 19.3 ft³ CALCULATED 20.8 ft³

ANNULAR FILL
952.0 TO 1128.9 (ft bgs)
TYPE 66%-0.375-in. BENTONITE CHIPS / 33% 10/20 SAND TREMIED
QUANTITY USED 176.9 ft³ CALCULATED 136.4 ft³

ANNULAR SEAL
1128.9 TO 1145.8 (ft bgs)
TYPE 0.375-in. BENTONITE CHIPS TREMIED
QUANTITY USED 12.7 ft³ CALCULATED 14.2 ft³

PRIMARY ANNULAR SEAL
1145.8 TO 1149.6 (ft bgs)
TYPE HYDRATED 0.375-in. BENTONITE CHIPS TREMIED
QUANTITY USED 5.5 ft³ CALCULATED 3.2 ft³

BACKFILL ANNULAR SEAL
1182.4 TO 1189.9 (ft bgs)
TYPE HYDRATED 0.375-in. BENTONITE CHIPS TREMIED
QUANTITY USED 6.3 ft³ CALCULATED 6.3 ft³

SLOUGH 1189.9 TO 1202.4 (ft bgs)

BASE ANNULAR SEAL
1202.4 TO 1239.0 (ft bgs)
TYPE 68%-0.375-in. BENTONITE CHIPS / 33% 10/20 SAND TREMIED
QUANTITY USED 46.8 ft³ CALCULATED 30.7 ft³

SLOUGH 1239.0 TO 1260.0 (ft bgs)

WELL DEVELOPMENT BEGAN
DATE 10/4/2011
TIME 13:40

WELL DEVELOPMENT FINISHED
DATE IN PROGRESS
TIME

DEVELOPMENT METHOD
☒ SWABBING ☒ BAILING
☒ PUMPING
TOTAL PURGE VOLUME ____ gal.

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

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

R-62 WELL CONSTRUCTION DIAGRAM (AS BUILT)

TA-05
LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

ORIGINATOR: C. VALLEJO
APPROVED BY: B. EVERETT
DRAWING CATEGORY: 2

FIGURE
FACT SHEET