Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: April 20, 1999
In Reply Refer To: ESH-18/WQ&H:99-0147
Mail Stop: K497
Telephone: (505) 665-4681

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Mr. John Kieling
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2044 Galisteo St., Building A
P.O. Box 26110
Santa Fe, New Mexico 87505

SUBJECT: R-25 CHARACTERIZATION WELL

Dear Mr. Kieling:

The purpose of this letter is to inform you that the R-25 well construction is being temporarily delayed as a result of equipment failure which has affected the integrity of the backfill materials outside of the well casing. No one was injured as a result of the equipment failure and safety of the site personnel was not compromised. Los Alamos National Laboratory and its contractors are currently working to understand the cause for the equipment failure and to identify measures that would prevent similar incidents from happening in the future. The Laboratory is committed to completing R-25 as a Resource Conservation and Recovery Act (RCRA) compliant well, so every effort will be made to rehabilitate the affected backfill materials.

On Friday, April 9th, Dynatec (formerly Tonto) Drilling, Inc. employees installed dual tremie rods into the well to remove an excess amount of grout/sand pack from around Screen No.4 (Figure 1). The top of the sand was measured to be at a depth of 1142 feet below ground surface whereas the target depth for the sand was to be 1178.5 feet below ground surface. The drillers installed dual tremie rods of two diameters (A-rods: 1.19 inch O.D. and BQ-rods: 2.19 inch O.D.) in the annulus between the 5.56-inch O.D. permanent stainless steel casing and the 11.75-inch O.D. temporary drill casing. The A-rods were installed inside the BQ-rods, each with a total length of 1180 feet. The purpose of the dual system of tremie rods was to air-lift or water-lift the surplus sand out of the borehole. Removing the surplus sand would be done by injecting air and water down the 1.19 inch A-rods to create a high pressure which would lift the sand out of the borehole by passage up the annulus between the A-rods ands BQ-rods. A water swivel was attached to the top of the A-rods for the purpose of injecting air and water down the 1.19 inch rods. A lifting bail was attached to the top of the BQ-rods with a threaded connector (Figure 2). The A-rods were attached to the lifting bail by a collar located above the threaded housing for the BQ-rods.

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The lifting bail which carried the tremie rods was attached to the vertical hydraulic drive in the mast of the drill rig by a double cable sling which was fabricated by the drillers with cable clamps and shielded thimbles to protect the 1/2 inch cable (Figure 2). Three cable clamps were attached to each loop of the sling for a total of six cable clamps. One of the six cable clamps broke while the driller was raising the tremies. The broken clamp caused the upper loop to come unfastened which resulted in both 1180 foot long strings of tremie rods to drop a distance of approximately 20 feet to a landing plate which was located on the top of the drill table. The impact of striking the landing plate caused a failure of the threaded connectors on both tremies. Both tremies then traveled down the borehole and probably penetrated the filter pack and borehole grout for Screen Nos. 4, 5, 6, 7, and 8. The available information indicates that the top of the 1.19 inch A-rods is at a depth of 348 feet below ground surface and the bottom of the 2.19 inch BQ-rods is at a depth of 1854 feet below ground surface, midway between Screen No. 8 and Screen No. 9. The two tremies possibly extend over a total distance of 1506 feet in the annulus of the borehole (Figure 1). This interpretation assumes that the tremies are still intact and relatively straight and that the 1.19 inch A-rod tremie is still nested inside the 2.19 inch BQ-rod tremie.

The Laboratory is taking the following steps as a result of the equipment failure and damage to the R-25 backfill materials:

- An investigation of the circumstances surrounding the equipment failure is being conducted by the Laboratory and its on-site contractors. The purpose of the investigation is to document the sequence of events that occurred, to assess the nature and extent of the damage caused, to identify the root cause for the incident, and to identify steps that will prevent similar incidents from happening in the future.

- Technical, procurement and legal representatives from the Laboratory met with senior representatives from Dynatec Drilling Inc. on Monday, April 19th to discuss options for removal of the tremie rods and rehabilitation of the damaged backfill materials so that the well will meet RCRA construction standards. Dynatec will provide a technical/cost proposal to the Laboratory for the rehabilitation of the well on April 21, 1999, and the Laboratory will involve your staff in the review of their proposal.

- The Laboratory is in contact with Schlumberger Geophysical Services to conduct downhole geophysics inside the 5.56-in well casing in order to determine the location of the BQ rod, assess the current condition of backfill materials relative to the well screens, and determine the integrity of the 5.56-inch well casing. The geophysical logging is scheduled to be performed on April 21, 1999.

- The Laboratory notified NMED on Tuesday morning, April 10th and met with NMED that afternoon to discuss the condition of the R-25 well, to present preliminary findings about the circumstances leading to the equipment failure, to outline our assessment of damage to the backfill materials, and to identify options to assure the integrity of the backfile materials. Options to assure the integrity of the backfill material and well are still being developed and will evolve as additional information becomes available. The Laboratory will continue to coordinate the discussions of options with the NMED and include NMED recommendations in the decision-making process.

- Once the schedule for completion of R-25 is re-established, the need for additional drilling rigs and/or for drilling crews for 24 hour per day work will be determined to minimize delays in completion of R-9, R-15, and R-31 during the remainder of FY99.

Please contact me at 665-4681 if additional information would be helpful at this time.

Sincerely,

Charles L. Nylander

Charles Nylander
Water Quality and Hydrology Group

CN:DB/py

Enclosures: a/s

Cy: B. Garcia, NMED/HRMB, Santa Fe, New Mexico, w/enc.
J. Young, NMED, HRMB, Santa Fe, New Mexico, w/enc.
J. Davis, NMED/SWQB, Santa Fe, New Mexico, w/enc.
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S. Yanicek, NMED/DOE/OB, w/enc., MS J993
J. Ordaz, DOE Headquarters, Germantown, MD, w/enc.
J. Vozella, DOE/LAAO, w/enc., MS A316
G. Turner, DOE/LAAO, w/enc., MS A316
B. Enz, DOE/LAAO, w/enc., MS A316
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T. Gunderson, DIR, w/enc., MS A100
J. Holt, NW-IFC, w/enc., MS F629
T. Baca, EM-DO, w/enc., MS J591
J. Canepa, EM-ER, w/enc., MS M992
T. George, EM/ER, w/enc., MS M992
A. Pratt, EES-13, w/enc., MS M992
D. Broxton, EES-1, w/enc., MS D462
S. Bolivar, EES-13, w/enc., MS H865
L. Brown, BUS-8, w/enc., MS M991
S. Freund, LC-BPL, w/enc., MS D412
D. Erickson, ESH-DO, w/enc., MS K491
S. Rae, ESH-18, w/enc., MS K497
K. Mullen, ESH-18, w/enc., MS K497
D. Rogers, ESH-18, w/enc., MS K497
D. Woitte, LC-GEN, w/enc., MS A187
WQ&H File, w/enc., MS K497
CIC-10, w/enc., MS A150

Figure 1
View of Lifting Bail and Cable Screen

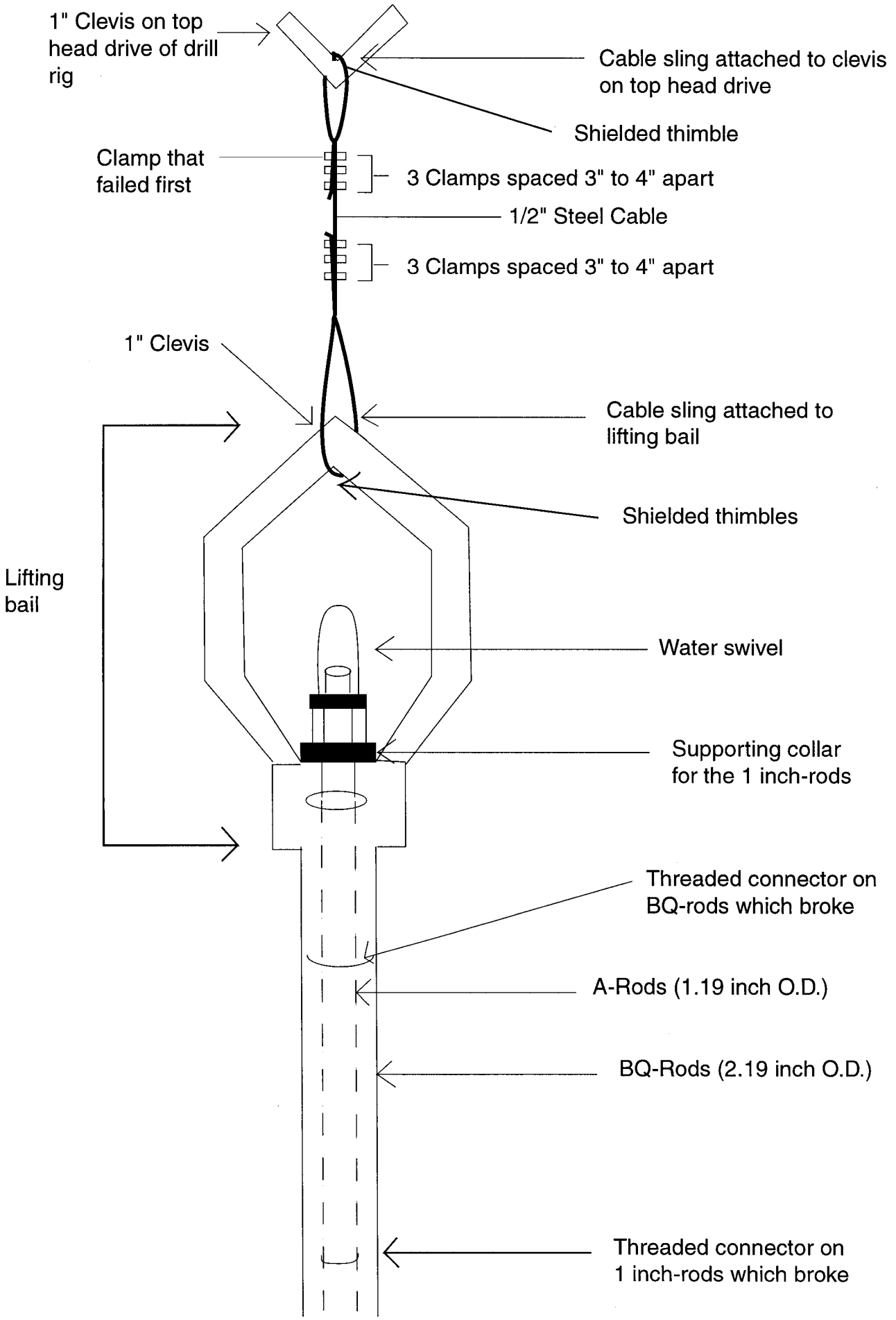
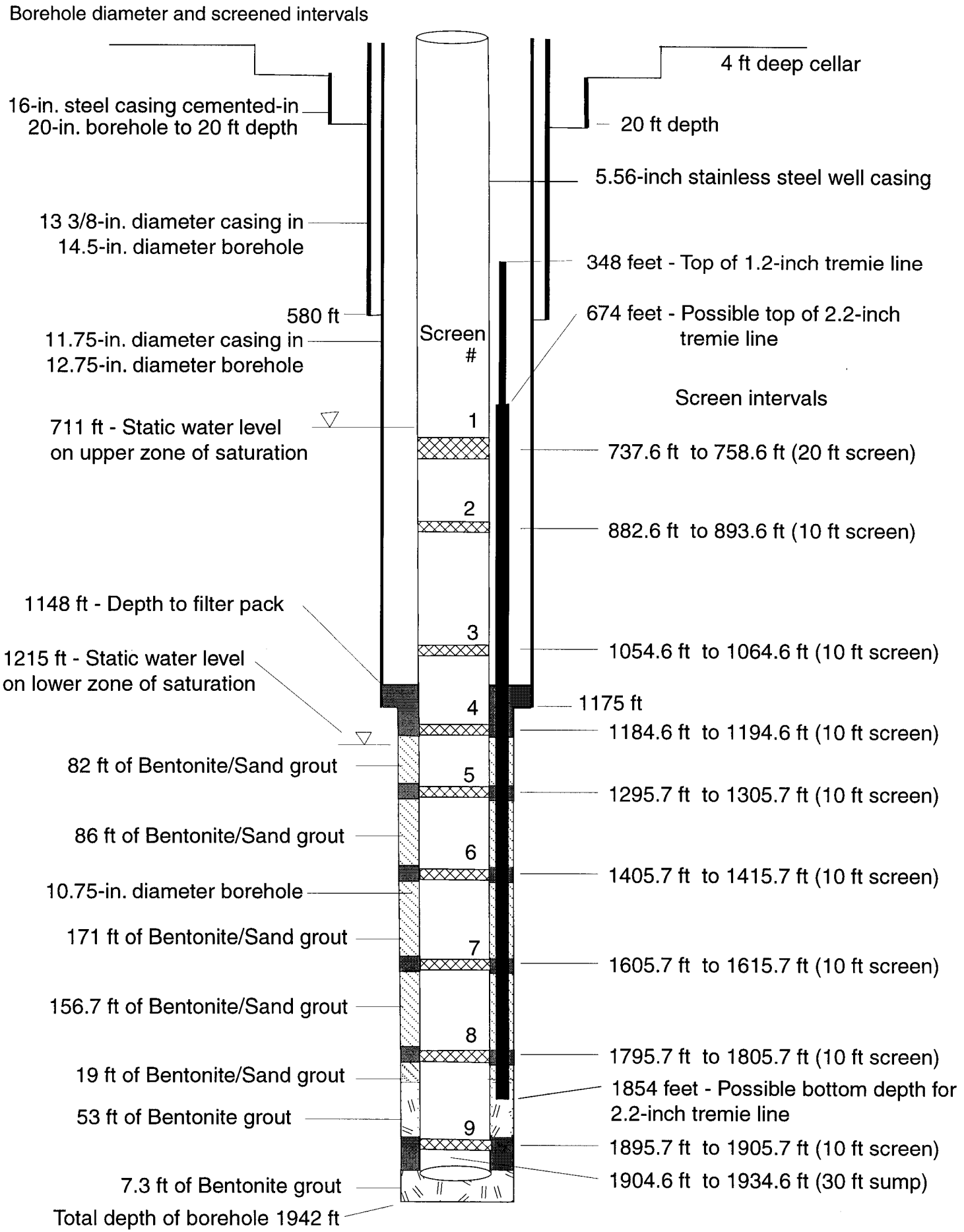


Figure 2

Characterization Well R-25 showing possible postion of dropped tremies

Not to Scale