

1R – 1554

# GW IMPACT REPORT

06 / 18 / 2007



## *Highlander Environmental Corp.*

*Midland, Texas*

**CERTIFIED MAIL**

**RETURN RECIEPT NO. 7005 1160 0005 3780 6023**

June 18, 2007

Mr. Glenn von Gonten  
New Mexico Energy, Minerals, & Natural Resources  
Oil Conservation Division, Environmental Bureau  
1220 S. St. Francis Drive  
Santa Fe, New Mexico 87504

**RE: NOTIFICATION OF GROUNDWATER IMPACT  
CELERO ENERGY II, LP, ROCK QUEEN UNIT  
SECTIONS 25, 26 AND 36, T-13-S, R-31-E  
CHAVES COUNTY, TEXAS**

Mr. von Gonten:

Celero Energy II, LP (Celero) notifies the Director of the New Mexico Oil Conservation Division (OCD), Environmental Bureau of groundwater impact at the above-referenced site in accordance with NM Rule 116. Celero retained Highlander Environmental (Highlander) of Midland, Texas to investigate this site as part of a due diligence in an acquisition of property operated by Palisades Asset Holding Company, LLC (Palisades). This production was originally developed in the mid-1950's. The primary surface owner in this Unit is the State of New Mexico, with the exception of one section of fee ownership. Highlander installed four monitoring wells and one background well at pit locations at the following locations:

Rock Queen Unit Tract 1 Tank Battery, MW-1  
Rock Queen Unit Tract 1 Tank Battery, MW-2 (Background)  
Rock Queen Unit Tract 11 Tank Battery  
Rock Queen Unit Tract 13 Tank Battery  
Rock Queen Unit Salt Water Plant #1

The four monitoring wells exhibited elevated chloride concentrations. These sites will be further investigated as discussed below.

### **Topography**

The properties are located above Mescalero Ridge, a major topographic feature which marks the edge of the Caprock. Mescalero Ridge is at an approximate elevation of 4400 feet above mean sea level (MSL). Most of the drainage east of Mescalero Ridge, on the Caprock, is

towards the east-southeast, with numerous intermittent playas shown interspersed in the production.

## **Hydrology**

Chaves County is located in the southeastern corner of New Mexico. The area is located in the High Plains Valley section of the Great Plains physiographic province. Rocks of Quaternary, Tertiary, and Triassic age are exposed and contain the principal aquifers. The most prominent aquifer is the Ogallala formation, which underlies the Llano Estacado and forms outliers south of it. Below the Cenozoic rocks are sandstones and shales of the Dockum group of Late Triassic age, from which small quantities of water are obtained. No usable groundwater is obtained from rocks older than the Triassic.

The Ogallala formation consists chiefly of sediments deposited by streams that had their headwaters in the mountainous regions to the west and northwest. The Ogallala formation rests unconformably upon an erosional surface of the underlying Triassic and Cretaceous rocks. The Ogallala is made of beds and lenses of clay, silt, sand, and gravel. Caliche occurs as a secondary deposit in many places in the formation.

Uncontaminated water from the Ogallala formation is high in silica (49 to 73 ppm), and contains moderate concentrations of calcium and magnesium. The dissolved solids content is relatively low, being typically less than 1,100 ppm. Water wells east of Mescalero Ridge derive their water from the Ogallala. The reported depth to groundwater in this area ranges from 100' to 200'. Water wells west of Mescalero Ridge derive water from the Triassic Dockum or Quaternary alluvium. No reported depths to groundwater were found for this area.

## **Monitor Well Installation**

As part of the due diligence in the acquisition of this property, four pit locations were selected for evaluation of potential groundwater impact. On May 24-25, 2007, one monitor well each was installed at each of the four locations listed above. Additionally, an additional background monitor well was installed northeast of the Rock Queen Unit Tract 1 tank battery. The monitor wells were completed to EPA and industry standards. The wells were developed and evaluated.

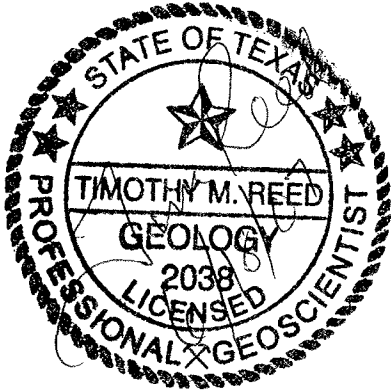
Based upon the drilling logs and development data, the saturated thickness in this area is highly variable, and the potential yield from each of the monitor wells is minimal. Several of the wells, which were fully penetrating wells, bailed off and recovered slowly. The hydraulic gradient is suspected to be towards the southwest, towards Mescalero Ridge, which marks the edge of the Ogallala. The hydraulic gradient will be confirmed once the top of casing elevations have been surveyed. Based upon field observations, Mr. Chris Williams with the OCD Hobbs District office was notified verbally of potential groundwater impact.

## **Agreed Compliance Order**

Celero, Highlander and the OCD are currently involved in the drafting of an Agreed Compliance Order to assess and close open pits. Once the pit closures are underway and the source areas eliminated, additional groundwater delineation will be performed and Corrective Action Plans will be presented for remediation of the groundwater in this area.



Please accept this notification for the above-referenced site. Should you have any questions or concerns regarding this site, please do not hesitate to contact me at (432) 682-4559.



Highlander Environmental Corp.

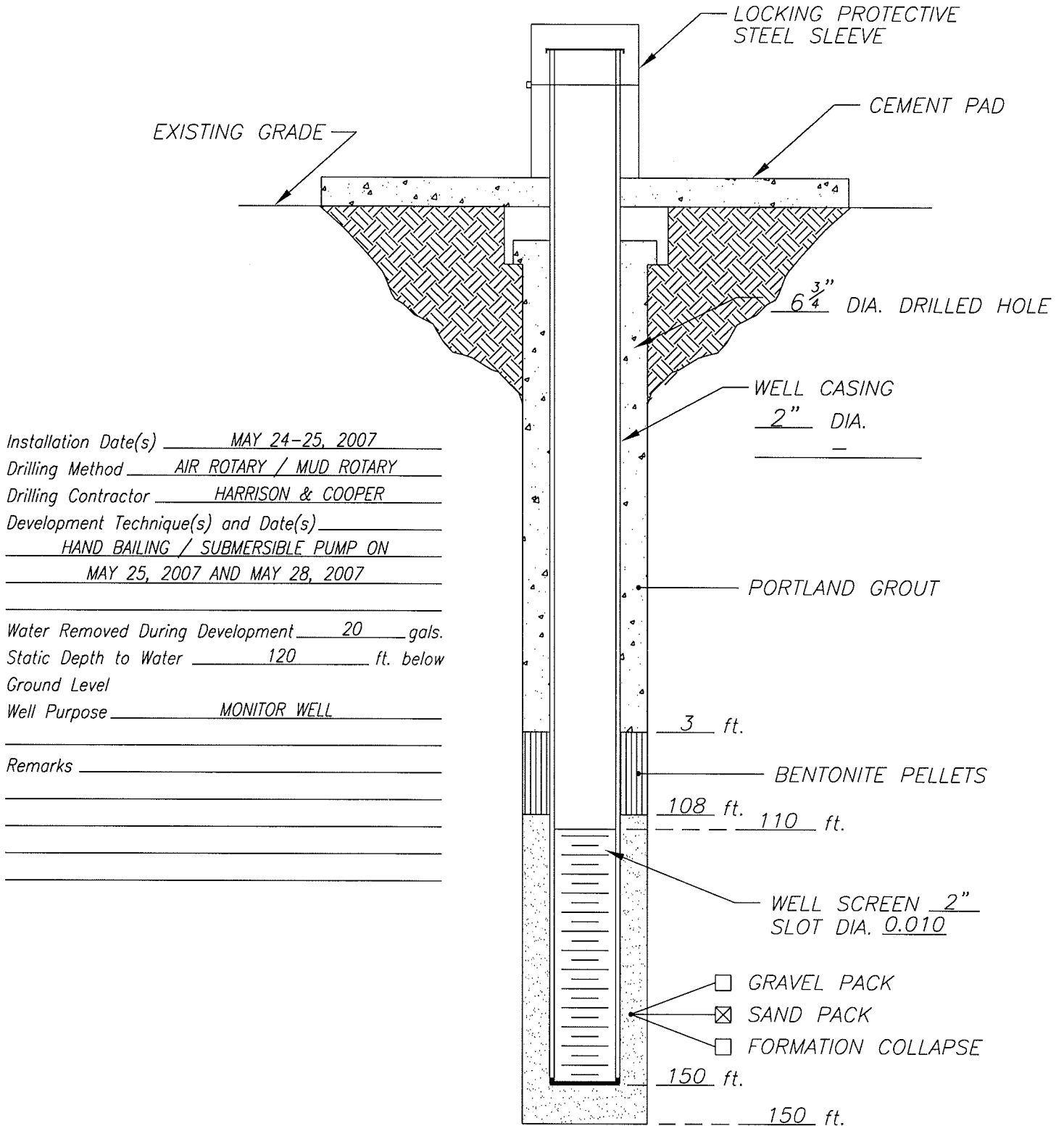
A handwritten signature in cursive script that reads "Tim Reed".

Timothy M. Reed, P.G.  
Vice President

cc: Mr. Larry Johnson-NMOCD-Hobbs  
Mr. Bruce Woodard – Celero Energy II,LP



# WELL CONSTRUCTION LOG



DATE: 5/24-25/07

**Highlander  
Environmental**

CLIENT: CELERO

PROJECT: ROCK QUEEN UNIT TRACT 1 TB

LOCATION: CHAVES COUNTY, NM

WELL NO.

MW-1

## SAMPLE LOG

**Boring/Well:** MW-1  
**Project Number:** 2972  
**Client:** Celero Energy  
**Site Location:** Rock Queen Tract 1 Tank Battery  
**Location:** Chaves County, New Mexico  
**Total Depth** 153  
**Date Installed:** 05/24/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Buff limestone
5-10	--	Tan/buff calcareous fine grain sand.
10-15	--	Tan/buff calcareous fine grain sand.
15-20	--	Tan/buff calcareous fine grain sand.
20-25	--	Tan/buff calcareous fine grain sand.
25-30	--	Tan/buff calcareous fine grain sand.
30-35	--	Tan/buff calcareous fine grain sand.
35-40	--	Tan/buff calcareous fine grain sand.
40-45	--	Tan fine grain sand - v.f.sand
45-50	--	Tan fine grain sand - v.f.sand
50-55	--	Tan fine grain sand - v.f.sand
55-60	--	Tan fine grain sand - v.f.sand
63-65	--	Tan fine grain sand - v.f.sand
68-70	--	Tan fine grain sand - v.f.sand
73-75	--	Tan fine grain sand - v.f.sand
78-80	--	Tan fine grain sand - v.f.sand
83-85	--	Tan fine grain sand - v.f.sand
88-90	--	Tan fine grain sand - v.f.sand
93-95	--	Tan fine grain sand - v.f.sand
98-100	--	Tan fine grain sand - v.f.sand
103-105	--	Tan fine grain sand - v.f.sand
108-110	--	Tan fine grain sand - v.f.sand
113-115	--	Tan fine grain sand - v.f.sand
118-120	--	Tan fine grain sand - v.f.sand
123-125	--	Dark brown well sorted sand
128-130	--	Dark brown well sorted sand

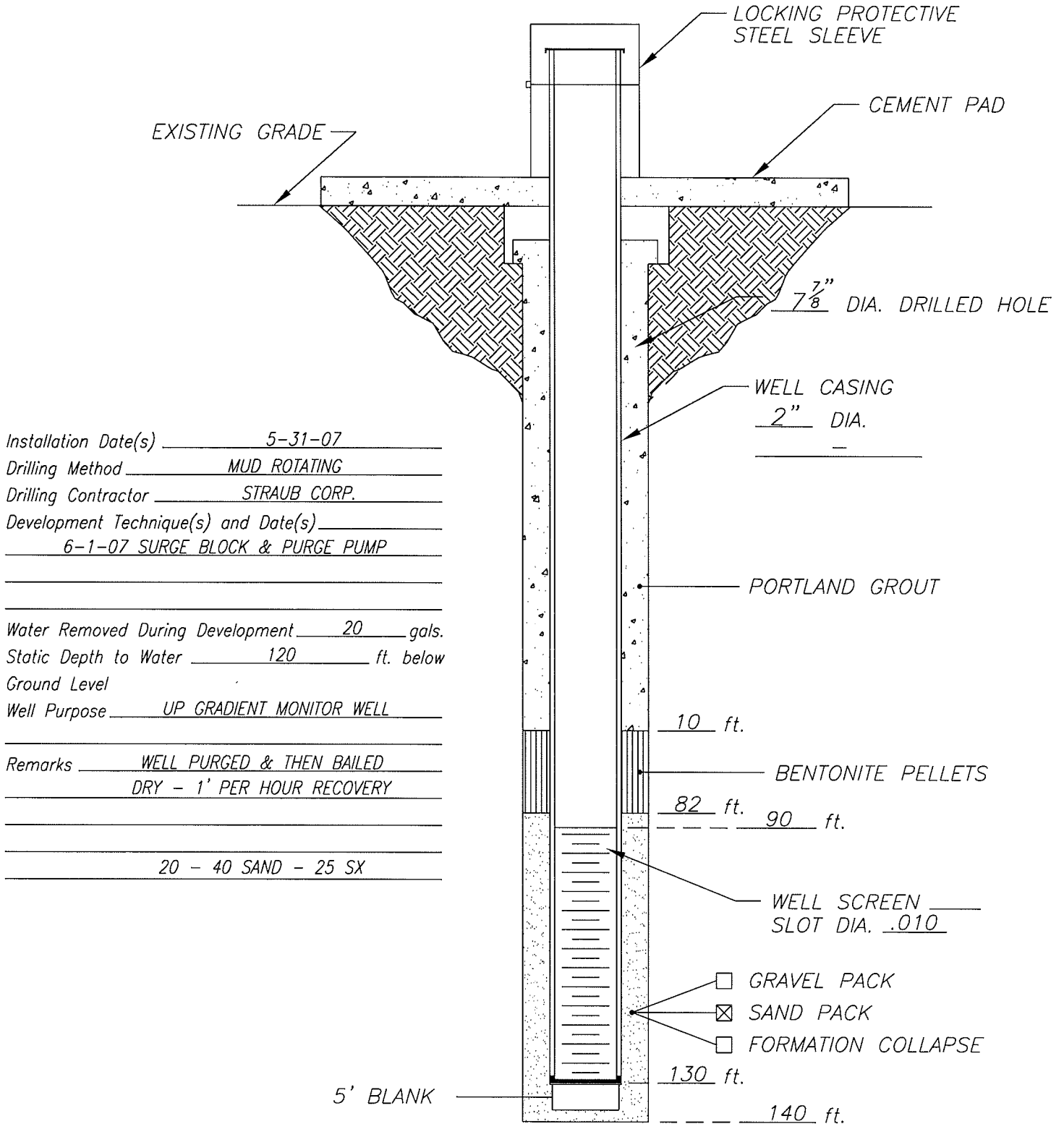
## SAMPLE LOG

Boring/Well: MW-1  
Project Number: 2972  
Client: Celero Energy  
Site Location: Rock Queen Tract 1 Tank Battery  
Location: Chaves County, New Mexico  
Total Depth: 153  
Date Installed: 05/24/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
133-135	--	Red clayey sand
138-140	--	Red clayey sand
143-145	--	Red clayey sand
148-150	--	Red/tan clayey sand

Total Depth is 153 feet      Groundwater encountered at 119 feet

# WELL CONSTRUCTION LOG



DATE: 6/1/07

**Highlander  
Environmental**

CLIENT: CELERO ENERGY

PROJECT: ROCK QUEEN UNIT TRACT 1 TB

LOCATION: CHAVES COUNTY, NEW MEXICO

WELL NO.

MW-2



## SAMPLE LOG

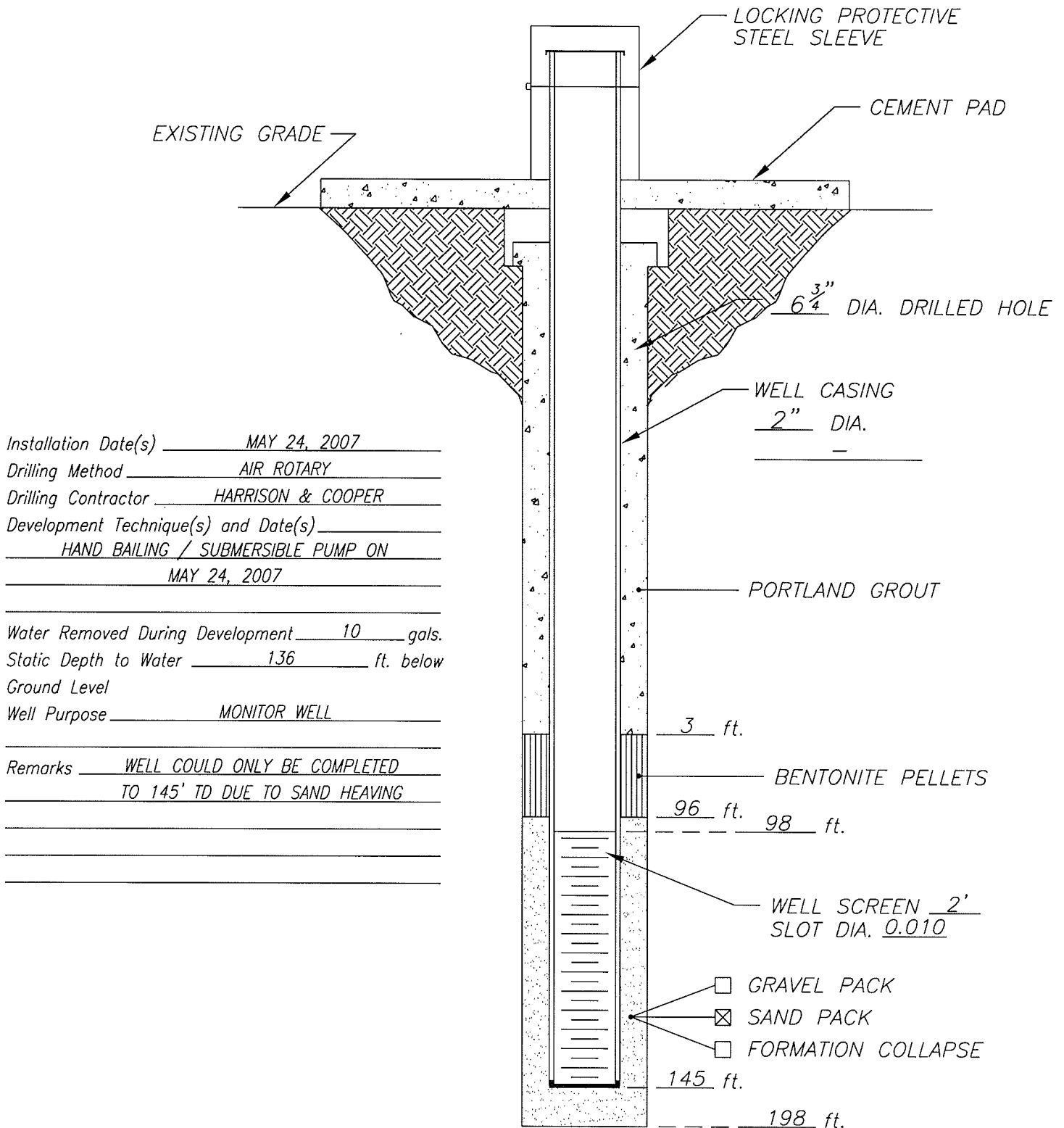
**Boring/Well:** MW-2  
**Project Number:** 2972  
**Client:** Celero Energy  
**Site Location:** Rock Queen Tract 1 Tank Battery  
**Location:** Chaves County, New Mexico  
**Total Depth:** 140  
**Date Installed:** 06/01/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Buff limestone
5-10	--	Tan/buff calcareous fine grain sand.
10-15	--	Tan/buff calcareous fine grain sand.
15-20	--	Tan/buff calcareous fine grain sand.
20-25	--	Tan/buff calcareous fine grain sand.
25-30	--	Tan/buff calcareous fine grain sand.
30-35	--	Tan/buff calcareous fine grain sand.
35-38	--	Tan/buff calcareous fine grain sand.
38-45	--	Tan fine grain sand - v.f. sand
45-50	--	Tan fine grain sand - v.f. sand
50-55	--	Tan fine grain sand - v.f. sand
55-60	--	Tan fine grain sand - v.f. sand
63-65	--	Tan fine grain sand - v.f. sand
68-70	--	Tan fine grain sand - v.f. sand
73-75	--	Tan fine grain sand - v.f. sand
78-80	--	Tan fine grain sand - v.f. sand
83-85	--	Tan fine grain sand - v.f. sand
88-90	--	Tan fine grain sand - v.f. sand
93-95	--	Tan fine grain sand - v.f. sand
98-100	--	Tan fine grain sand - v.f. sand
100-106	--	Tan fine grain sand - v.f. sand
106-124	--	Tan fine grain sand and light brown clay
124-130	--	Tan sand and shale
130-131	--	Gray and red clay
130-140	--	Red Clay

Total Depth is 140 feet

Groundwater encountered at 110 feet

# WELL CONSTRUCTION LOG



DATE: 5/24/07

CLIENT: CELERO

PROJECT: INJECTION PLANT #1

LOCATION: CHAVES COUNTY, NM

WELL NO.

MW-1

**Highlander  
Environmental**

## SAMPLE LOG

**Boring/Well:** MW-1  
**Project Number:** 2972  
**Client:** Celero Energy  
**Site Location:** Injection Plant #1  
**Location:** Chaves County, New Mexico  
**Total Depth:** 198  
**Date Installed:** 05/24/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Buff limestone with chert intermixed with tan sand.
5-10	--	Buff limestone with chert intermixed with tan sand.
10-15	--	Buff/tan sandy limestone intermixed with chert.
15-20	--	Tan calcareous fine grain sand.
20-25	--	Tan calcareous fine grain sand.
25-30	--	Tan well sorted calcareous sand.
30-35	--	Tan well sorted calcareous sand.
35-40	--	Tan well sorted calcareous sand.
40-45	--	Tan well sorted calcareous sand.
45-50	--	Tan well sorted calcareous sand.
50-55	--	Tan fine grain sand (moist)
55-60	--	Tan fine grain sand (moist)
63-65	--	Tan fine grain sand (moist)
68-70	--	Tan fine grain sand (moist)
73-75	--	Tan fine grain sand (very moist)
78-80	--	Tan fine grain sand
83-85	--	Tan fine grain sand
88-90	--	Tan fine grain sand
93-95	--	Tan fine grain sand
98-100	--	Tan fine grain sand
103-105	--	Tan fine grain sand
108-110	--	Tan fine grain sand
113-115	--	Tan fine grain sand
118-120	--	Tan fine grain sand
123-125	--	Tan fine grain sand
128-130	--	Tan fine grain sand

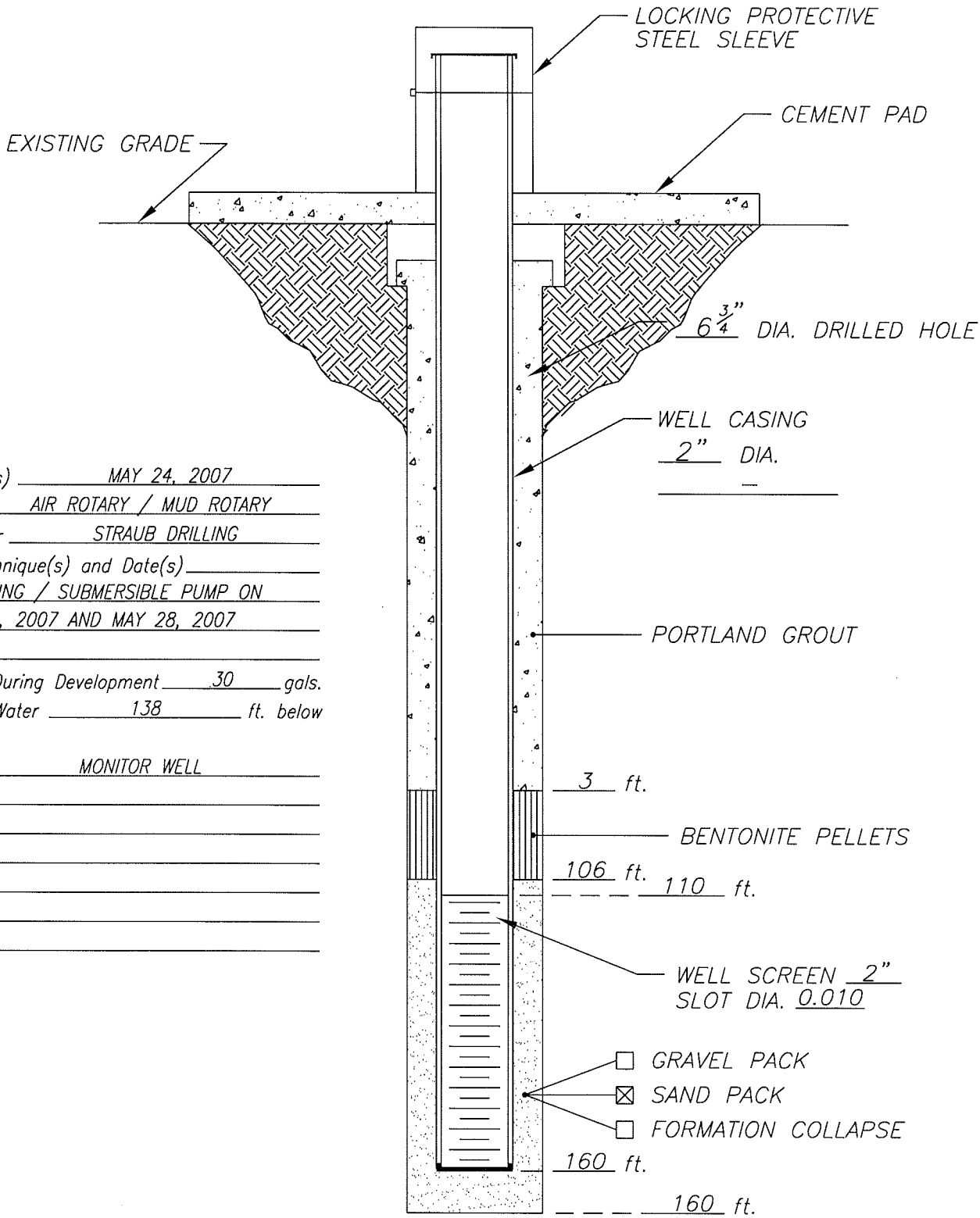
## SAMPLE LOG

**Boring/Well:** MW-1  
**Project Number:** 2972  
**Client:** Celero Energy  
**Site Location:** Injection Plant #1  
**Location:** Chaves County, New Mexico  
**Total Depth** 198  
**Date Installed:** 05/24/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
133-135	--	Tan fine grain sand
138-140	--	Tan fine grain sand
143-145	--	Dark brown sand
148-150	--	Red well sorted sand
153-155	--	Red clayey sand
158-160	--	Tan fine grain sand
163-165	--	Dark brown clayey sand
168-170	--	Dark brown clayey sand
173-175	--	Light red sandy clay
178-180	--	No sample
183-185	--	Red sandy clay
188-190	--	Red sandy clay
193-198	--	Red sandy clay

Total Depth is 198 feet      Groundwater encountered at 134 feet

# WELL CONSTRUCTION LOG



Installation Date(s) MAY 24, 2007  
 Drilling Method AIR ROTARY / MUD ROTARY  
 Drilling Contractor STRAUB DRILLING  
 Development Technique(s) and Date(s) HAND BAILING / SUBMERSIBLE PUMP ON  
MAY 24, 2007 AND MAY 28, 2007

Water Removed During Development 30 gals.  
Static Depth to Water 138 ft. below  
Ground Level  
Well Purpose MONITOR WELL

Remarks \_\_\_\_\_

DATE: 5/24/07

CLIENT: *CELERO*

PROJECT: *ROCK QUEEN UNIT TRACT 11 TB*

LOCATION: CHAVES COUNTY, NM

WELL NO.

MW-1

*Highlander  
Environmental*

## SAMPLE LOG

**Boring/Well:** MW-1  
**Project Number:** 2972  
**Client:** Celero Energy  
**Site Location:** Rock Queen Tract 11 Tank Battery  
**Location:** Chaves County, New Mexico  
**Total Depth** 160  
**Date Installed:** 05/24/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Buff limestone
5-10	--	Tan/buff calcareous fine grain sand.
10-15	--	Tan/buff calcareous fine grain sand.
15-20	--	Tan/buff calcareous fine grain sand.
20-25	--	Tan/buff calcareous fine grain sand.
25-30	--	Tan/buff calcareous fine grain sand.
30-35	--	Tan/buff calcareous fine grain sand.
35-40	--	Tan/buff calcareous fine grain sand.
40-45	--	Tan fine grain sand - v.f. sand
45-50	--	Tan fine grain sand - v.f. sand
50-55	--	Tan fine grain sand - v.f. sand
55-60	--	Tan fine grain sand - v.f. sand
63-65	--	Tan fine grain sand - v.f. sand
68-70	--	Tan fine grain sand - v.f. sand
73-75	--	Tan fine grain sand - v.f. sand
78-80	--	Tan fine grain sand - v.f. sand
83-85	--	Tan fine grain sand - v.f. sand
88-90	--	Tan fine grain sand - v.f. sand
93-95	--	Tan fine grain sand - v.f. sand
98-100	--	Tan fine grain sand - v.f. sand
103-105	--	Tan fine grain sand - v.f. sand
108-110	--	Tan fine grain sand - v.f. sand
113-115	--	Tan fine grain sand - v.f. sand
118-120	--	Tan fine grain sand - v.f. sand
123-125	--	Dark brown well sorted sand
128-130	--	Dark brown well sorted sand

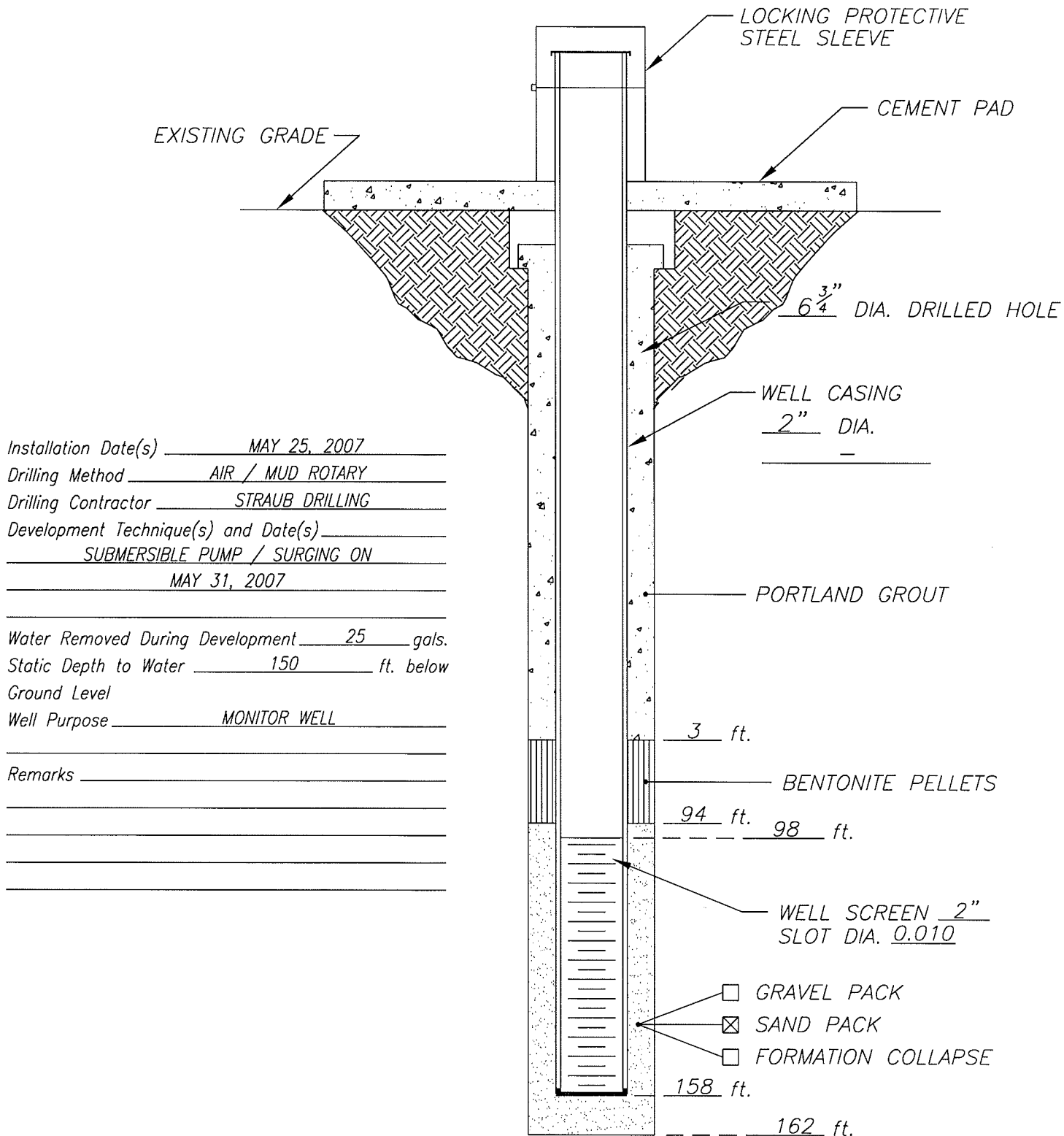
## SAMPLE LOG

Boring/Well: MW-1  
Project Number: 2972  
Client: Celero Energy  
Site Location: Rock Queen Tract 11 Tank Battery  
Location: Chaves County, New Mexico  
Total Depth: 160  
Date Installed: 05/24/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
133-135	--	Red clayey sand
138-140	--	Red clayey sand
143-145	--	Red clayey sand
148-150	--	Red sandy clay

Total Depth is 150 feet      Groundwater encountered at 138 feet

# WELL CONSTRUCTION LOG



DATE: 5/25/07

CLIENT: *CELERO*

PROJECT: *ROCK QUEEN UNIT TRACT 13 TB*

LOCATION: CHAVES COUNTY, NM

WELL NO.

MW-1

*Highlander  
Environmental*



## SAMPLE LOG

**Boring/Well:** MW-1  
**Project Number:** 2972  
**Client:** Celero Energy  
**Site Location:** Rock Queen Tract 13 Tank Battery  
**Location:** Chaves County, New Mexico  
**Total Depth** 160  
**Date Installed:** 05/25/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Buff to tan sandy limestone
5-10	--	Buff to tan sandy limestone
10-15	--	Buff to tan sandy limestone with chert
15-20	--	Buff sandy limestone with chert
20-25	--	Buff to tan calcareous sand
25-30	--	Buff to tan calcareous sand
30-35	--	Buff to tan calcareous sand
35-40	--	Buff to tan calcareous sand
40-45	--	Buff to tan calcareous sand
45-50	--	Tan fine sand - v.f. sand
50-55	--	Tan fine sand - v.f. sand
55-60	--	Tan fine sand - v.f. sand
63-65	--	Tan fine sand - v.f. sand
68-70	--	Tan fine sand - v.f. sand
73-75	--	Tan fine sand - v.f. sand
78-80	--	Tan fine sand - v.f. sand
83-85	--	Tan fine sand - v.f. sand
88-90	--	Tan fine sand - v.f. sand
93-95	--	Tan fine sand - v.f. sand
98-100	--	Tan fine sand - v.f. sand
103-105	--	Tan fine sand - v.f. sand
108-110	--	Tan fine sand - v.f. sand
113-115	--	Tan fine sand - v.f. sand
118-120	--	Tan fine sand - v.f. sand
123-125	--	Tan fine sand - v.f. sand
128-130	--	Tan fine sand - v.f. sand

## SAMPLE LOG

**Boring/Well:** MW-1  
**Project Number:** 2972  
**Client:** Celero Energy  
**Site Location:** Rock Queen Tract 13 Tank Battery  
**Location:** Chaves County, New Mexico  
**Total Depth** 160  
**Date Installed:** 05/25/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
133-135	--	Tan fine sand - v.f. sand
138-140	--	Tan fine sand - v.f. sand
143-145	--	Tan fine sand - v.f. sand
148-150	--	Chert layer intermixed with red sand
153-155	--	Chert layer intermixed with red sand
158-160	--	Red sand

Total Depth is 160 feet

Groundwater encountered at 117 feet