



## APPENDIX A: PHOTOGRAPHS OF TEST SITES



**Figure 54: G-106 Wilshire/Arden.**

View looking west. Accelerometers placed along the row of small traffic cones, directly in-line with the borehole.



**Figure 55: G-124 Wilshire/Fairfax**

View looking west. Accelerometers along the edge of the median.



**Figure 56: G-134 Wilshire/Hamel**

View looking east. Accelerometers placed near small traffic cones.



**Figure 57: G-152 Santa Monica/Wilshire.**

View looking east towards Wilshire Boulevard. Accelerometers placed approximately one lane from traffic. Borehole is only a few feet from accelerometer line.



**Figure 58: G-164 Moreno/Young.**

View looking northwest, education center bldg is to the right. Accelerometers were in a line extending to the southeast between the trucks.



**Figure 59: G-165 Beverly Hills High School.**

View looking toward the north.





**Figure 60: G-166 Beverly Hills High School.**

View looking south, along the west edge of the school's Lacrosse field.



**Figure 61: G-173 Fox Hills/Missouri.**

View of Missouri Ave looking east (left photo). Accelerometer line runs parallel to white stop line, south along Fox Hills sidewalk.





**Figure 62: G-178 Wilshire/Manning.**  
View looking west along Wilshire Blvd.



**APPENDIX B  
SUBSURFACE GAS INVESTIGATION**

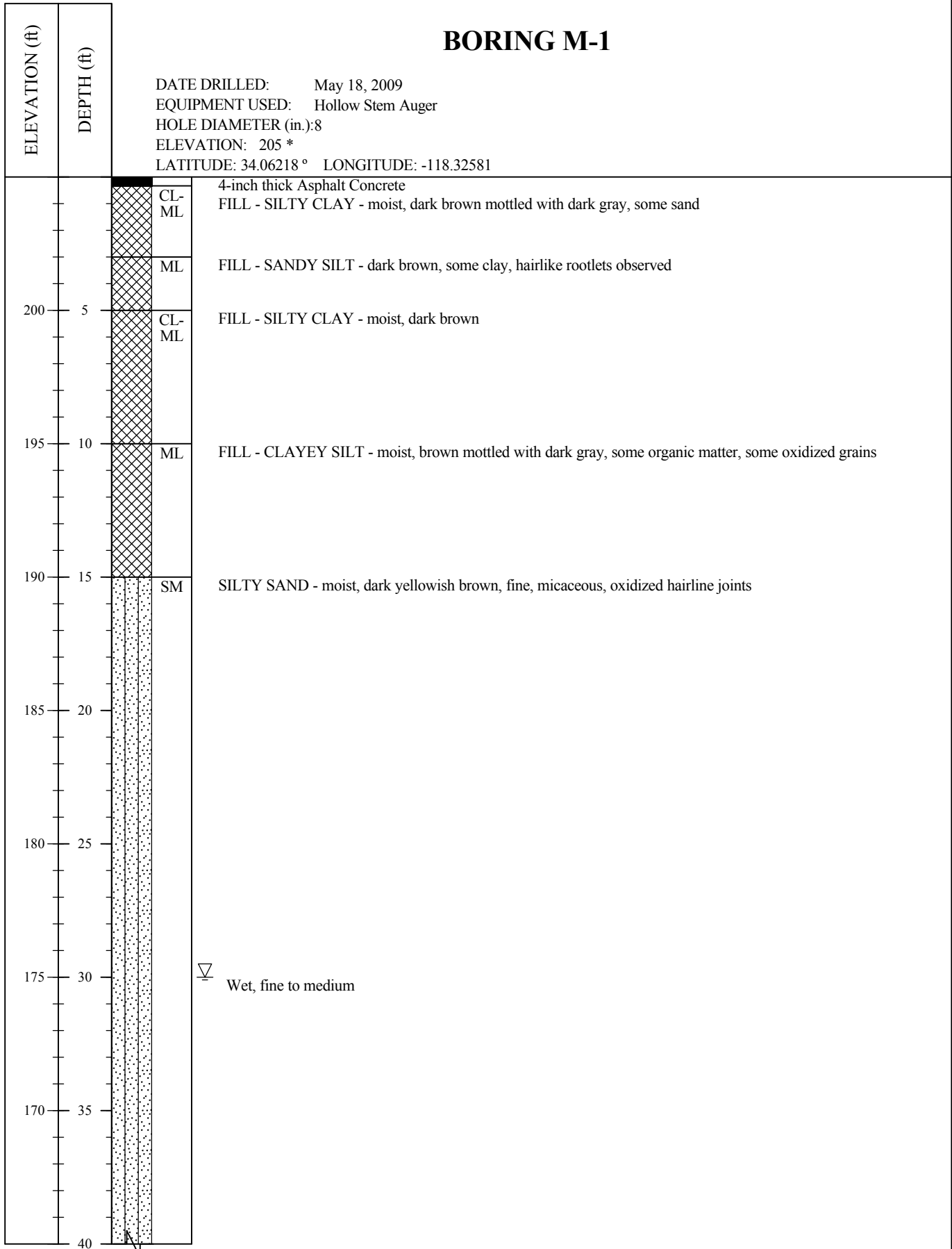
**FIGURES B-1.1A THROUGH B-1.20B  
LOGS OF HOLLOW-STEM AUGER BORINGS (ACE PHASE)**



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 THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS  
 AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

# BORING M-1

DATE DRILLED: May 18, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 205 \*  
 LATITUDE: 34.06218 ° LONGITUDE: -118.32581

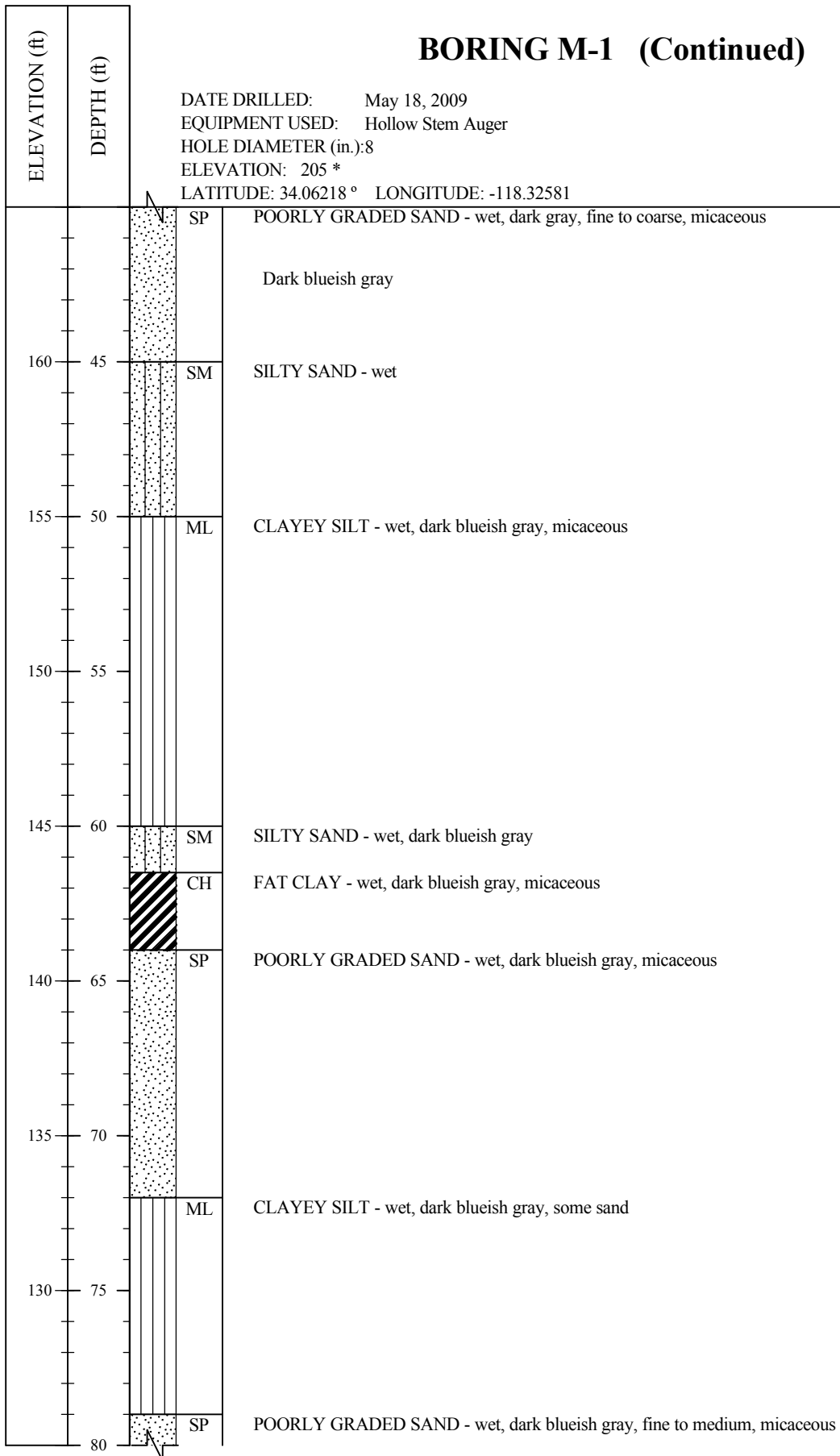


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: RM  
 Prepared By: NH  
 Checked By:

# BORING M-1 (Continued)

DATE DRILLED: May 18, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 205 \*  
 LATITUDE: 34.06218 ° LONGITUDE: -118.32581



Field Tech: RM  
 Prepared By: NH  
 Checked By:

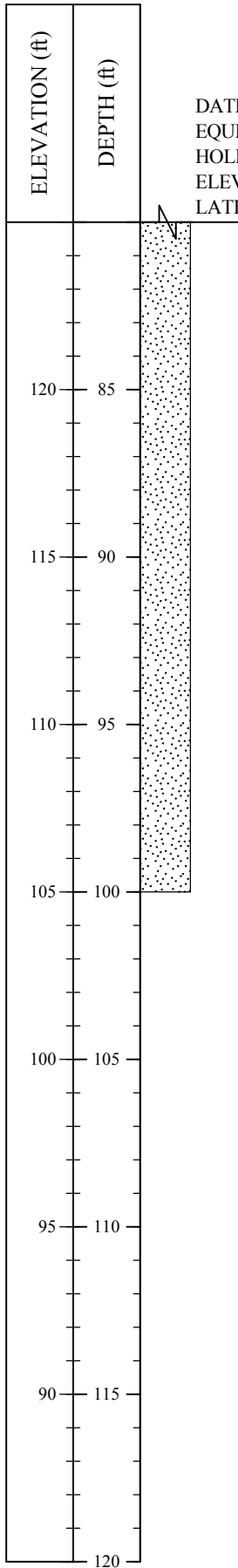
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# BORING M-1 (Continued)

DATE DRILLED: May 18, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 205 \*  
 LATITUDE: 34.06218 ° LONGITUDE: -118.32581



Greenish black

END OF BORING AT 100 FEET

NOTES:

Soil logged from cuttings only.  
 Hand augered top 5 feet due to utilities.  
 Ground water encountered at 30 feet.  
 Photoionization detector measurements recorded for carbon monoxide, volatile organic compounds, hydrogen sulfide, and lower explosive limit.  
 Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 100 feet (yellow). See well construction diagram for M-1.

Field Tech: RM  
 Prepared By: NH  
 Checked By:

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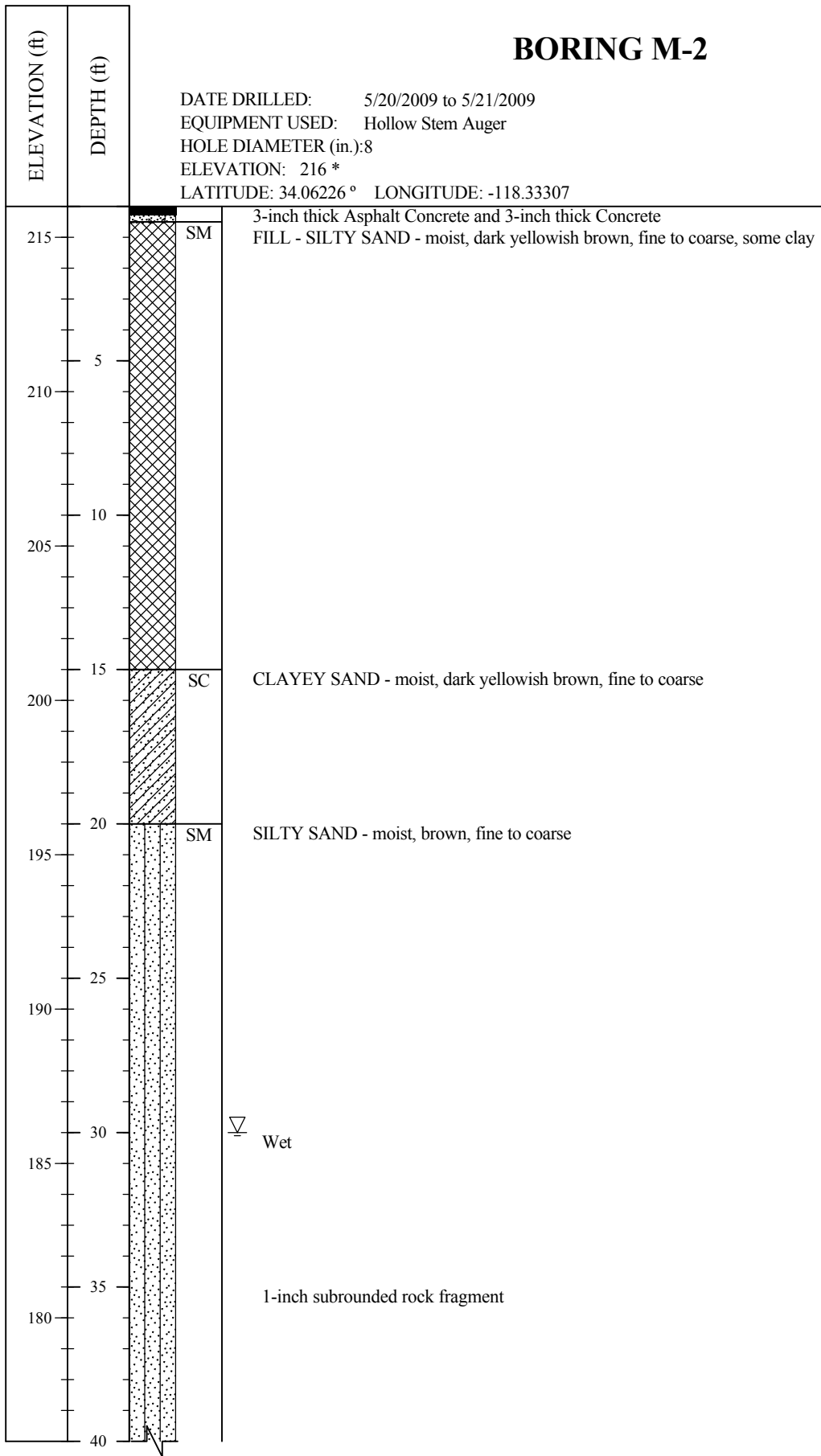


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# BORING M-2

DATE DRILLED: 5/20/2009 to 5/21/2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 216 \*  
 LATITUDE: 34.06226 ° LONGITUDE: -118.33307

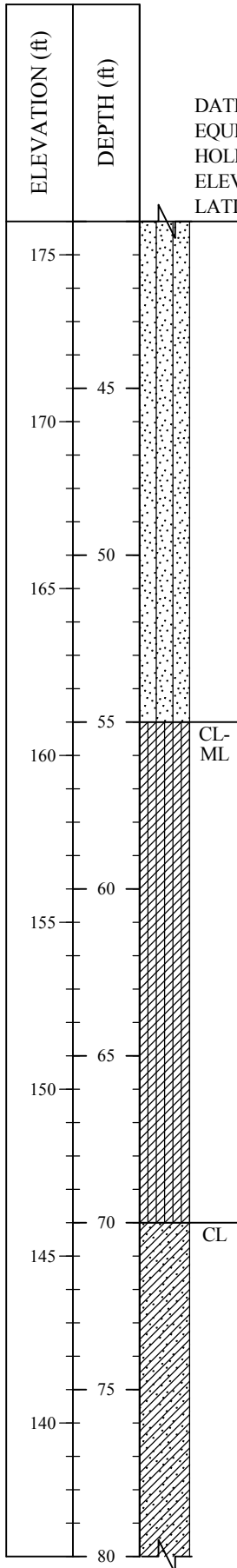


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: RM  
 Prepared By: NH  
 Checked By:

# BORING M-2 (Continued)

DATE DRILLED: 5/20/2009 to 5/21/2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 216 \*  
 LATITUDE: 34.06226 ° LONGITUDE: -118.33307



CL-ML SILTY CLAY - wet, blueish gray, some sand

Olive gray

Greenish gray

CL SANDY CLAY - wet, greenish gray

Field Tech: RM  
 Prepared By: NH  
 Checked By:

(CONTINUED ON FOLLOWING FIGURE)

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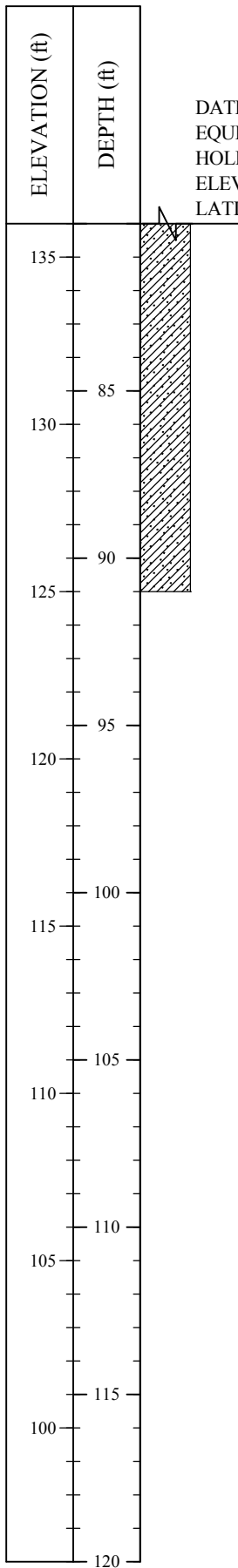
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# BORING M-2 (Continued)

DATE DRILLED: 5/20/2009 to 5/21/2009  
EQUIPMENT USED: Hollow Stem Auger  
HOLE DIAMETER (in.): 8  
ELEVATION: 216 \*  
LATITUDE: 34.06226 ° LONGITUDE: -118.33307



END OF BORING AT 91 FEET

NOTES:

- Soil logged from cuttings only.
- Hand augered top 5 feet due to utilities.
- Ground water encountered at 30 feet.
- Photoionization detector measurements recorded for carbon monoxide, volatile organic compounds, hydrogen sulfide, and lower explosive limit.
- Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 90 feet (yellow). See well construction diagram for M-2.

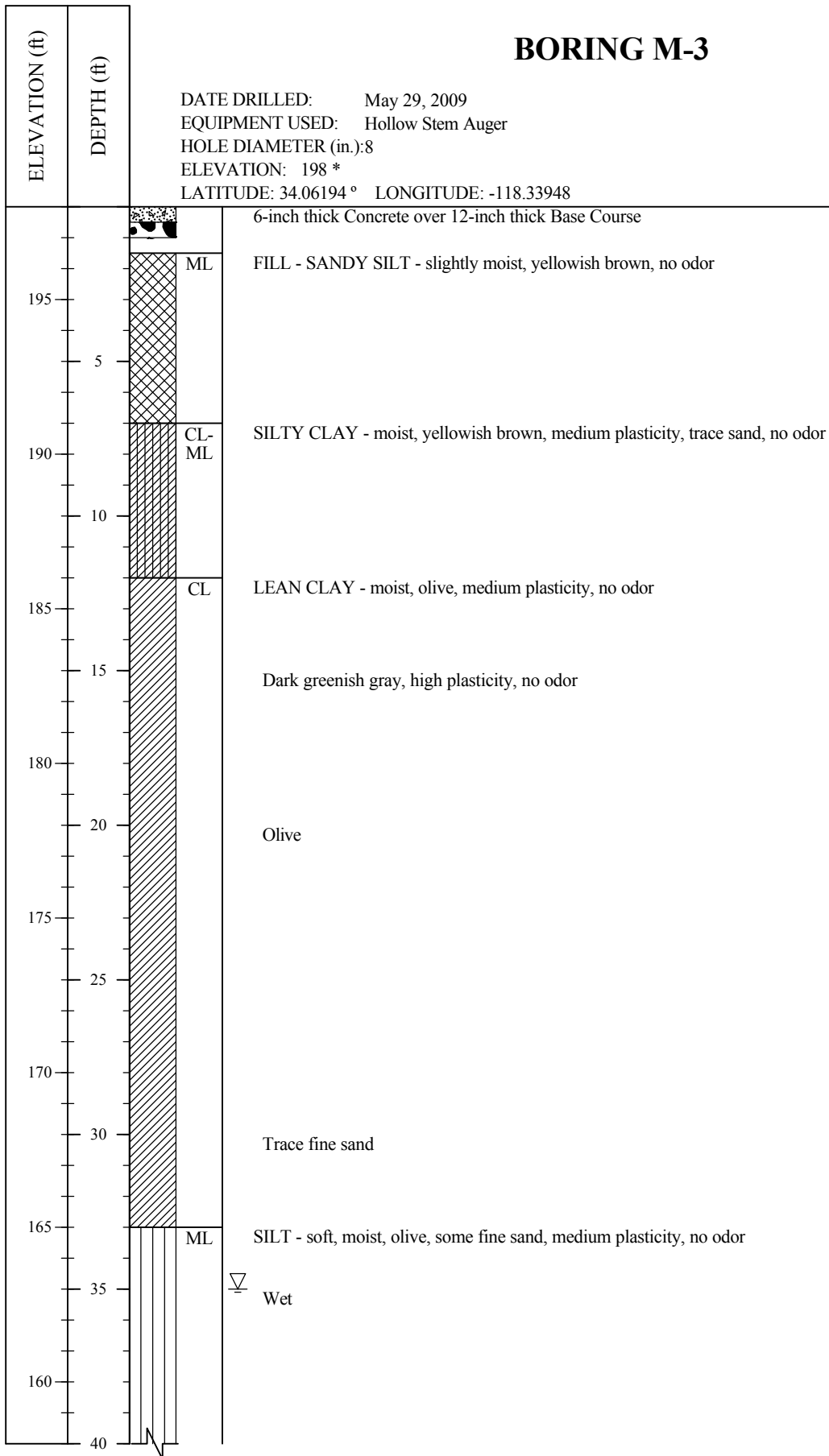
Field Tech: RM  
Prepared By: NH  
Checked By:



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# BORING M-3

DATE DRILLED: May 29, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 198 \*  
 LATITUDE: 34.06194 ° LONGITUDE: -118.33948

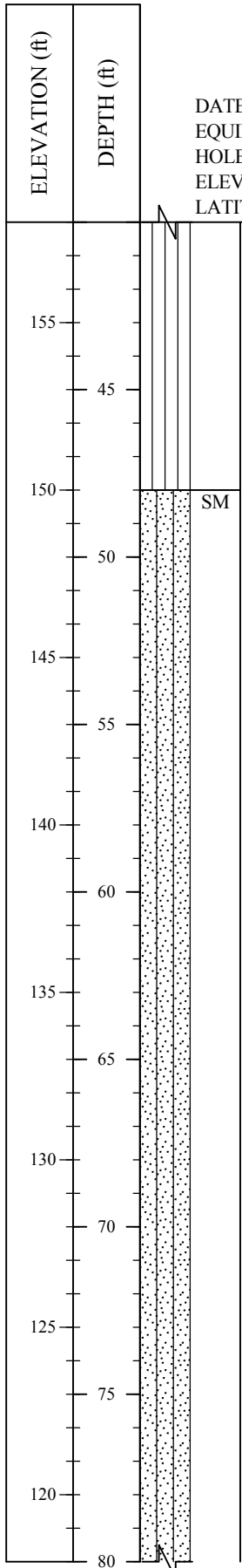


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

# BORING M-3 (Continued)

DATE DRILLED: May 29, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 198 \*  
 LATITUDE: 34.06194 ° LONGITUDE: -118.33948



Sandier

SM  
 SILTY SAND - wet, olive

Dark greenish gray

Field Tech: PK  
 Prepared By: NH  
 Checked By:

(CONTINUED ON FOLLOWING FIGURE)

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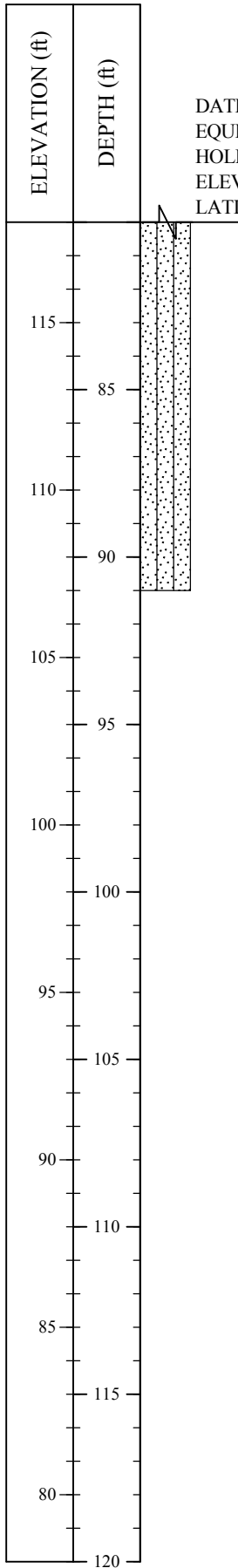
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# BORING M-3 (Continued)

DATE DRILLED: May 29, 2009  
EQUIPMENT USED: Hollow Stem Auger  
HOLE DIAMETER (in.): 8  
ELEVATION: 198 \*  
LATITUDE: 34.06194 ° LONGITUDE: -118.33948



END OF BORING AT 91 FEET

NOTES:

- Soil logged from cuttings only.
- Hand augered top 5 feet due to utilities.
- Ground water encountered at 35 feet.
- Photoionization detector measurements recorded for volatile organic compounds and hydrogen sulfide.
- Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 90 feet (yellow). See well construction diagram for M-3.

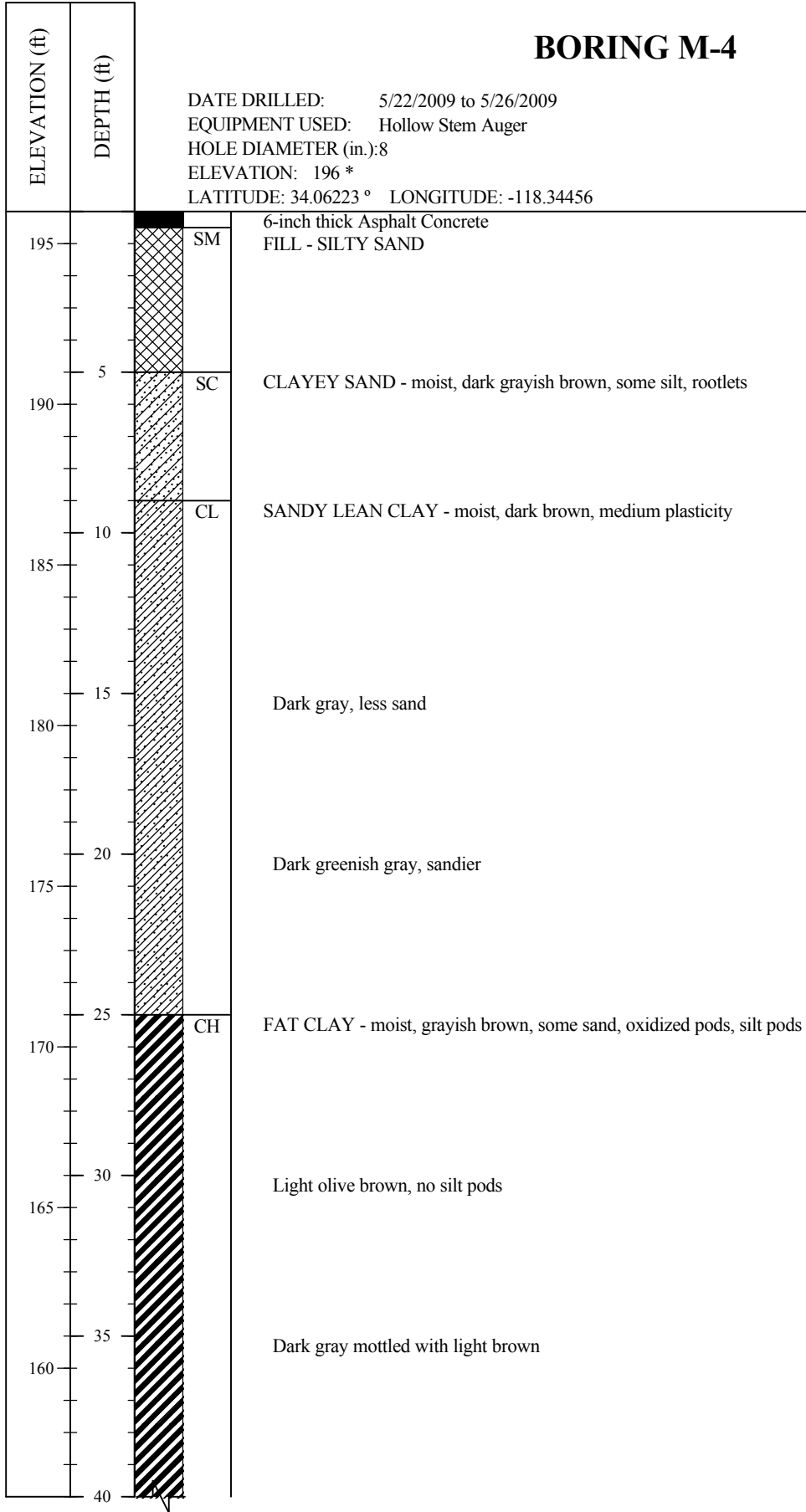
Field Tech: PK  
Prepared By: NH  
Checked By:

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# BORING M-4

DATE DRILLED: 5/22/2009 to 5/26/2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 196 \*  
 LATITUDE: 34.06223 ° LONGITUDE: -118.34456

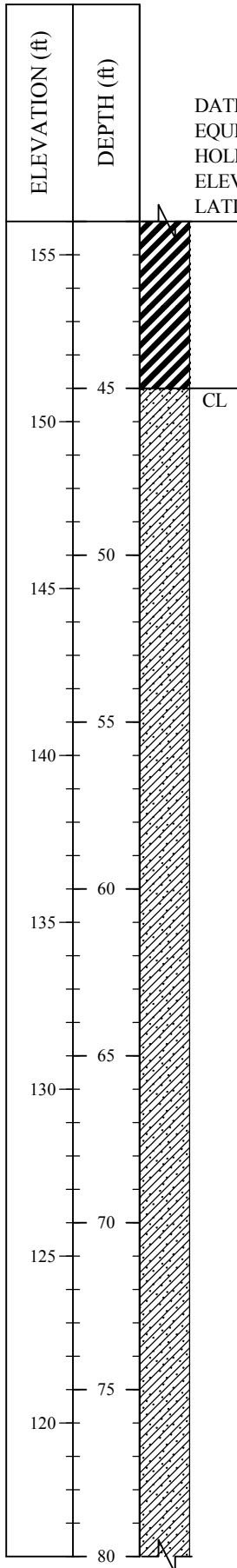


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: RM  
 Prepared By: NH  
 Checked By:

# BORING M-4 (Continued)

DATE DRILLED: 5/22/2009 to 5/26/2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 196 \*  
 LATITUDE: 34.06223 ° LONGITUDE: -118.34456



CL  $\nabla$  SANDY LEAN CLAY - wet, greenish gray

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(CONTINUED ON FOLLOWING FIGURE)

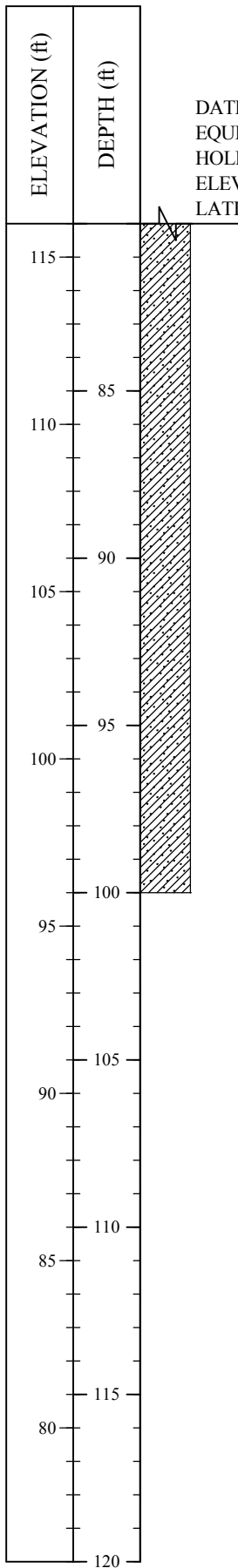
Field Tech: RM  
 Prepared By: NH  
 Checked By:

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# BORING M-4 (Continued)

DATE DRILLED: 5/22/2009 to 5/26/2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.):8  
 ELEVATION: 196 \*  
 LATITUDE: 34.06223 ° LONGITUDE: -118.34456



Sample not recovered

Sample not recovered

Sample not recovered  
 END OF BORING AT 100 FEET

**NOTES:**

Soil logged from cuttings only.  
 Hand augered top 5 feet due to utilities.  
 Ground water encountered at 45 feet.  
 Photoionization detector measurements recorded for carbon monoxide, volatile organic compounds, hydrogen sulfide, and lower explosive limit.  
 Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 100 feet (yellow). See well construction diagram for M-4.

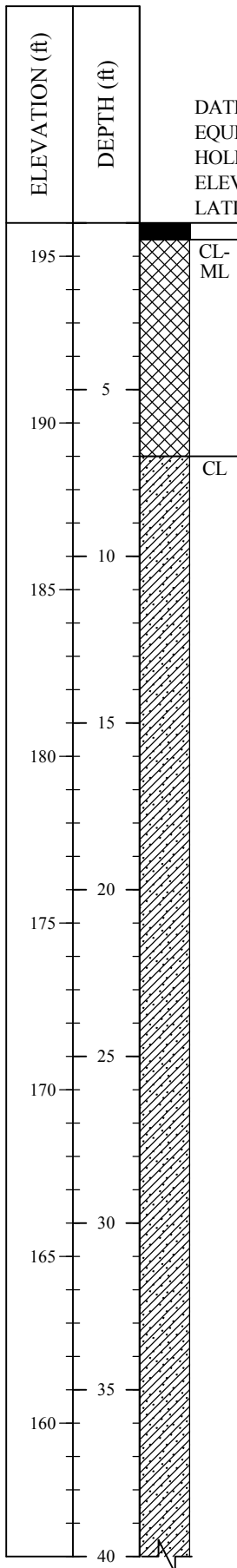
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 Prepared By: NH  
 Checked By:

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# BORING M-5

DATE DRILLED: May 27, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 196 \*  
 LATITUDE: 34.06232 ° LONGITUDE: -118.34594



6-inch thick Asphalt Concrete  
 FILL - SILTY CLAY - moist, black, some coarse sand

CL-  
ML

SANDY CLAY - moist, brown, medium plasticity

CL

Grayish brown

Dark greenish gray

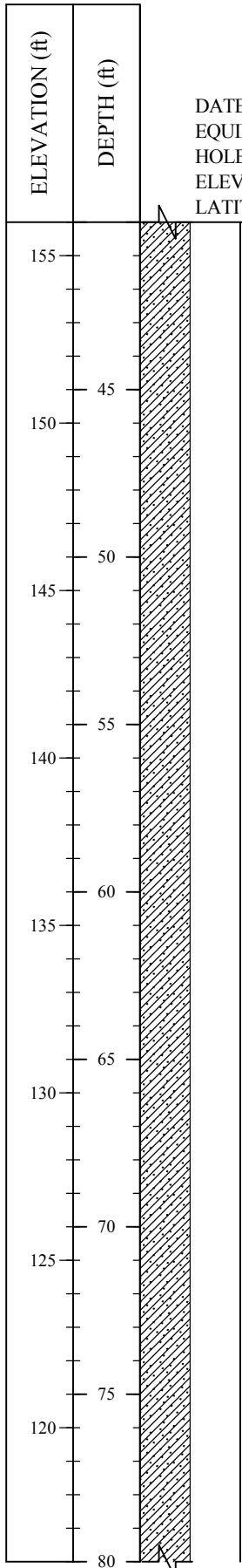
(CONTINUED ON FOLLOWING FIGURE)

Field Tech: RM  
 Prepared By: NH  
 Checked By:



# BORING M-5 (Continued)

DATE DRILLED: May 27, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 196 \*  
 LATITUDE: 34.06232 ° LONGITUDE: -118.34594



▽ Wet

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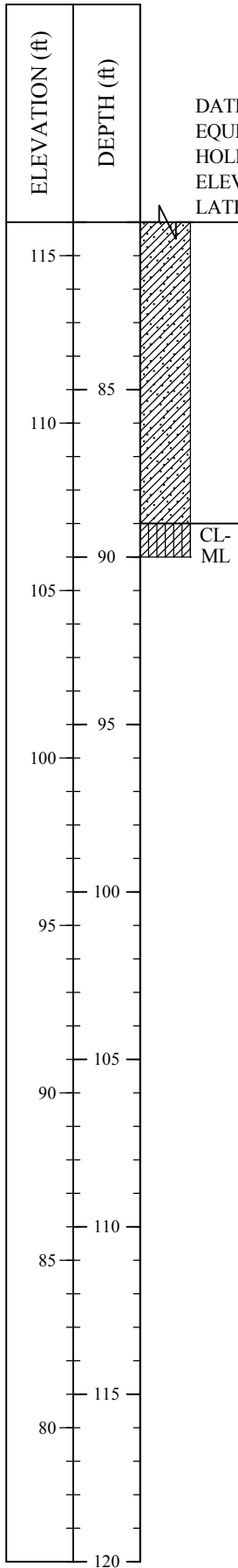
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(CONTINUED ON FOLLOWING FIGURE)

Field Tech: RM  
 Prepared By: NH  
 Checked By:

# BORING M-5 (Continued)

DATE DRILLED: May 27, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 196 \*  
 LATITUDE: 34.06232 ° LONGITUDE: -118.34594



SILTY CLAY - wet, dark greenish gray, micaceous, medium to high plasticity

END OF BORING AT 90 FEET

NOTES:

- Soil logged from cuttings only.
- Hand augered top 5 feet due to utilities.
- Ground water encountered at 50 feet.
- Photoionization detector measurements recorded for carbon monoxide, volatile organic compounds, hydrogen sulfide, lower explosive limit, and oxygen.
- Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 100 feet (yellow). See well construction diagram for M-4.

Field Tech: RM  
 Prepared By: NH  
 Checked By:

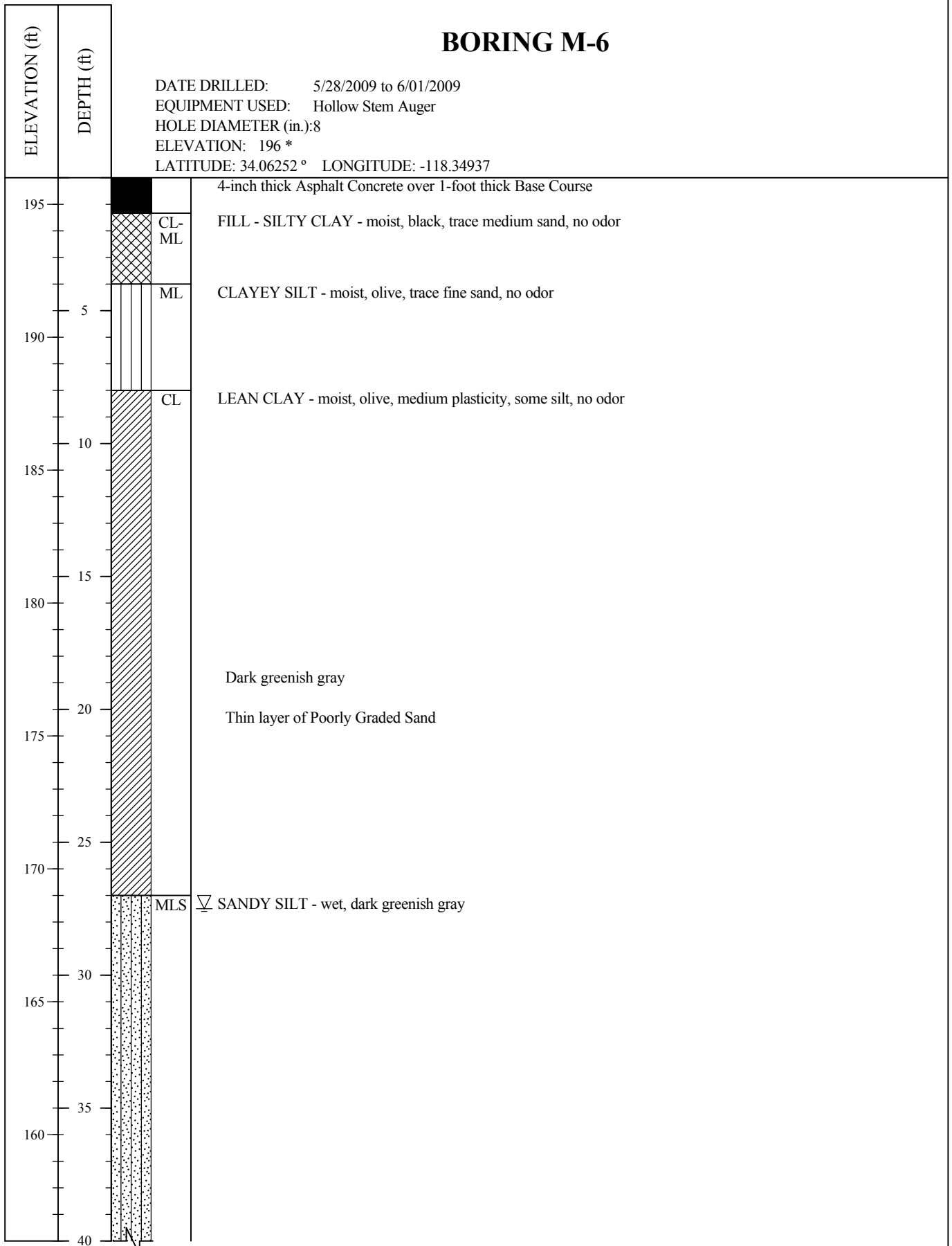
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# BORING M-6

DATE DRILLED: 5/28/2009 to 6/01/2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 196 \*  
 LATITUDE: 34.06252 ° LONGITUDE: -118.34937

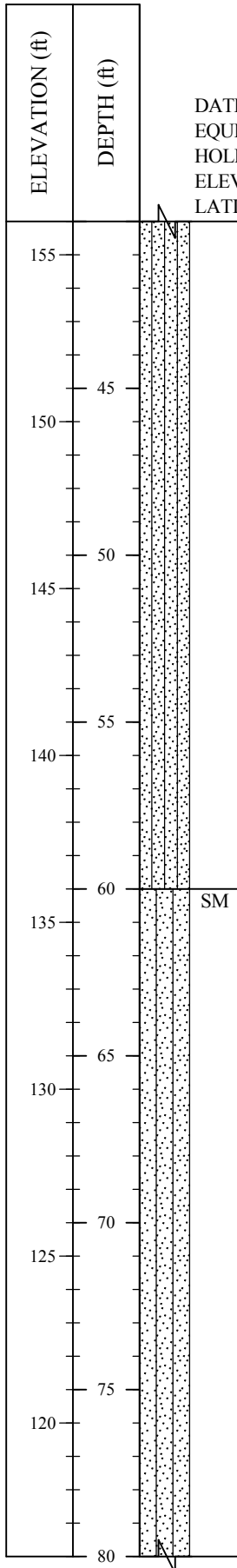


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

# BORING M-6 (Continued)

DATE DRILLED: 5/28/2009 to 6/01/2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 196 \*  
 LATITUDE: 34.06252 ° LONGITUDE: -118.34937



SILTY SAND - wet, black, fine, strong hydrocarbon odor, top of tar sands

Field Tech: PK  
 Prepared By: NH  
 Checked By:

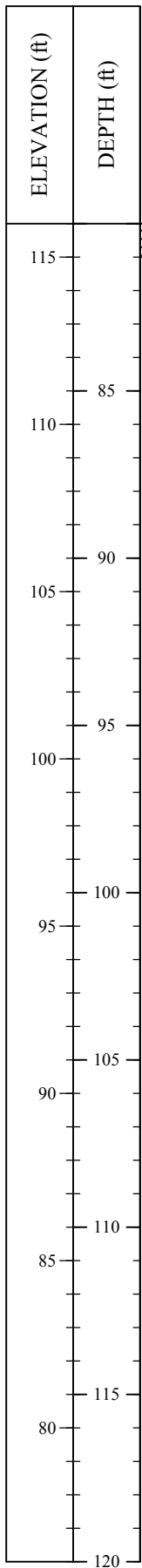
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THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

# BORING M-6 (Continued)

DATE DRILLED: 5/28/2009 to 6/01/2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 196 \*  
 LATITUDE: 34.06252 ° LONGITUDE: -118.34937



CL-  
ML

SILTY CLAY  
 END OF BORING AT 81 FEET

**NOTES:**

Soil logged from cuttings only.  
 Hand augered top 5 feet due to utilities.  
 Ground water encountered at 27½ feet.  
 Caving observed at 40 feet.  
 Hit pocket of hydrogen sulfide and methane at 80 feet. Elevated levels of hydrogen sulfide from augers. Area evacuated and rig shut down.  
 Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 80 feet (yellow). See well construction diagram for M-6.

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 AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

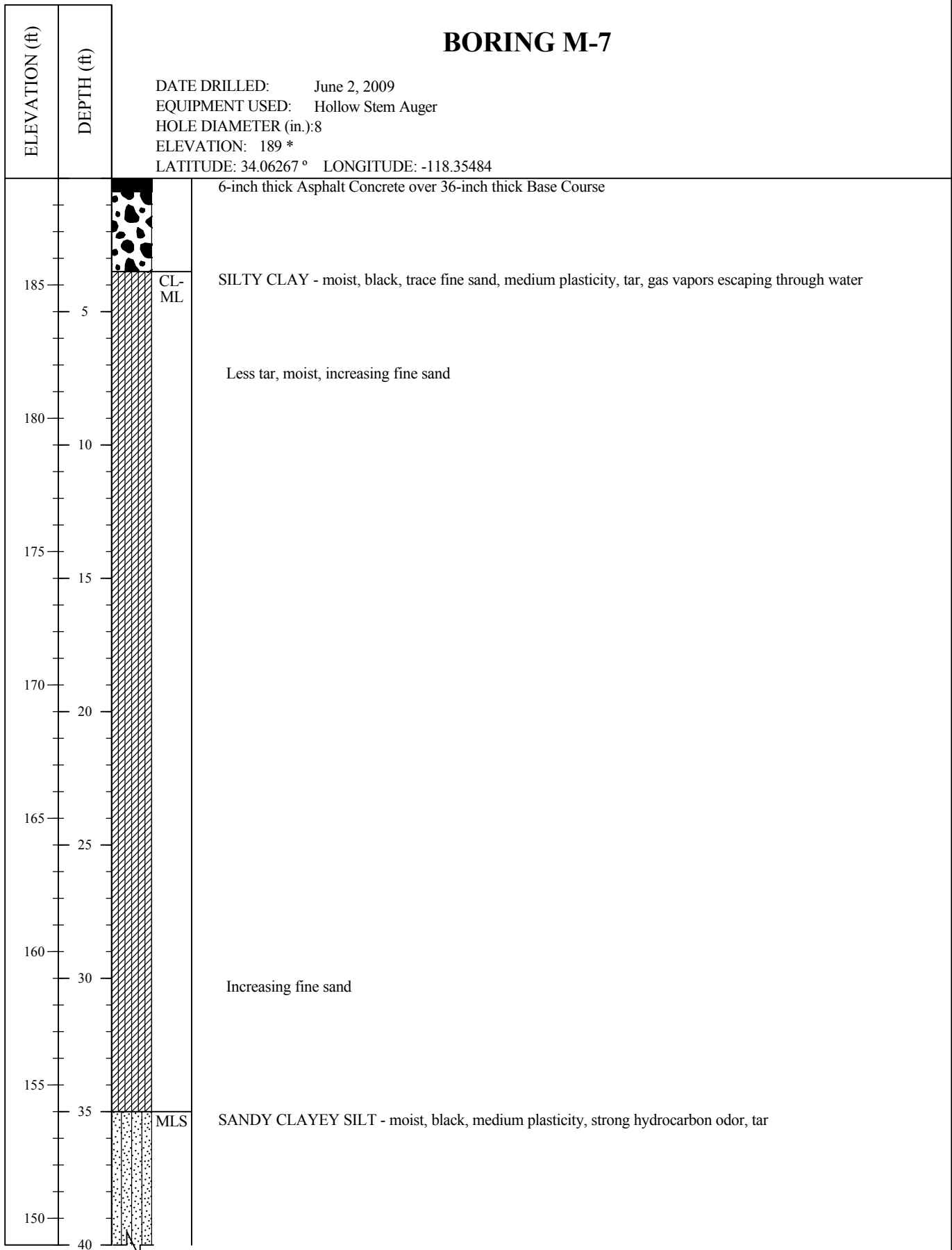
Field Tech: PK  
 Prepared By: NH  
 Checked By:

ENVIRONMENTAL (EMPTY W/USCS), S:\70131\GEO\GINT\LIBRARY MACTEC JUNE2011.GLB  
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# BORING M-7

DATE DRILLED: June 2, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 189 \*  
 LATITUDE: 34.06267 ° LONGITUDE: -118.35484

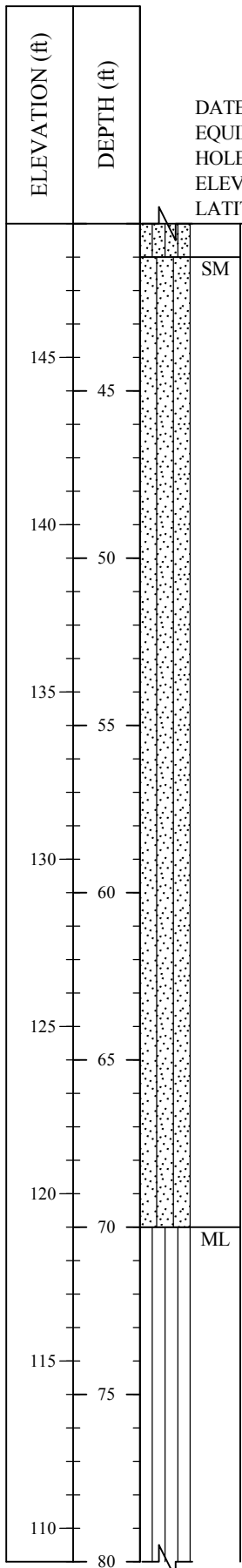


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

# BORING M-7 (Continued)

DATE DRILLED: June 2, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 189 \*  
 LATITUDE: 34.06267 ° LONGITUDE: -118.35484



SM SILTY SAND - wet, black, fine, trace clay, strong hydrocarbon odor, tar

ML SILT - wet, black, some fine sand, strong hydrocarbon odor, tar

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(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

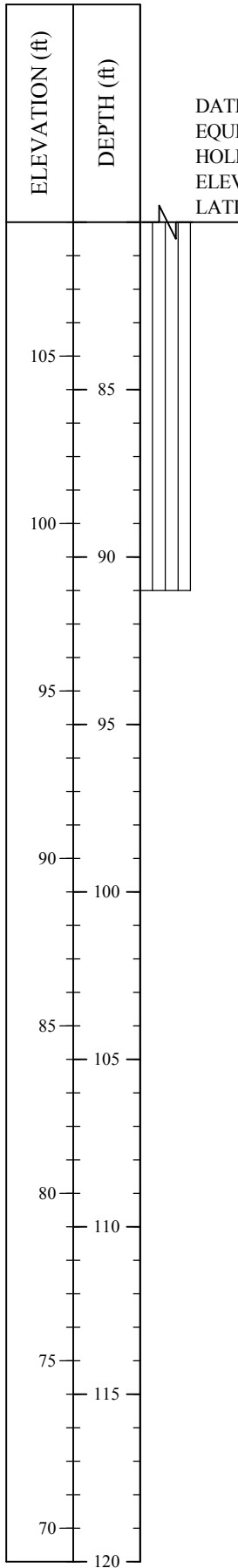


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## BORING M-7 (Continued)

DATE DRILLED: June 2, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 189 \*  
 LATITUDE: 34.06267 ° LONGITUDE: -118.35484



END OF BORING AT 91 FEET

**NOTES:**

Soil logged from cuttings only.  
 Hand augered top 6 feet due to utilities.  
 Ground water encountered at 42 feet.  
 Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 90 feet (yellow). See well construction diagram for M-7.

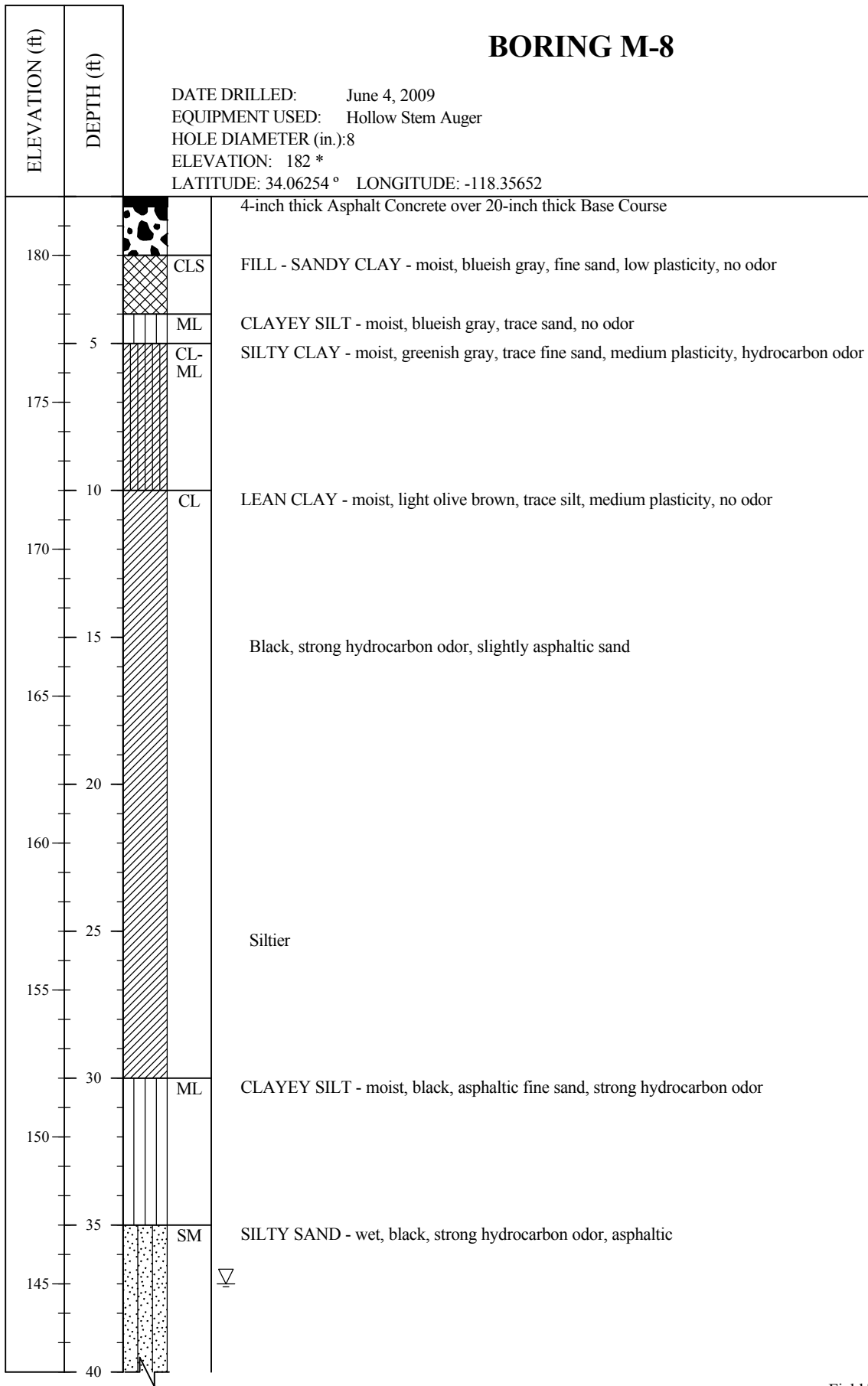
Field Tech: PK  
 Prepared By: NH  
 Checked By:

ENVIRONMENTAL (EMPTY W/USCS), S:\70131\GEO\GINT\LIBRARY\MACTEC\JUNE2011\_GLB  
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THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

# BORING M-8

DATE DRILLED: June 4, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 182 \*  
 LATITUDE: 34.06254 ° LONGITUDE: -118.35652

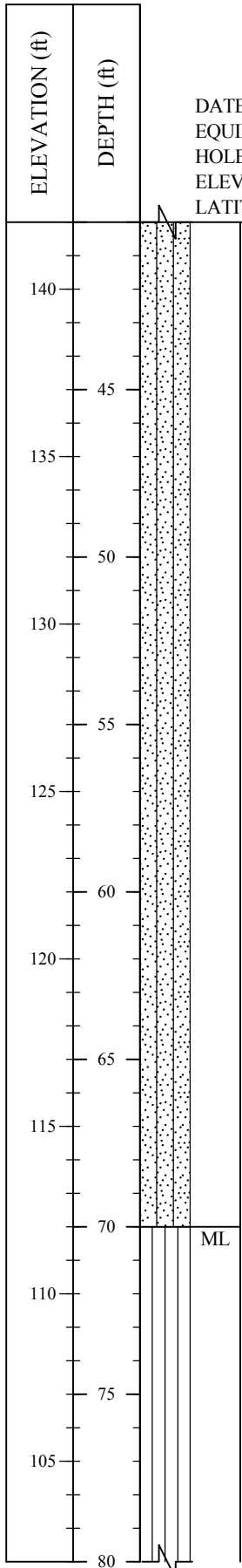


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

# BORING M-8 (Continued)

DATE DRILLED: June 4, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 182 \*  
 LATITUDE: 34.06254 ° LONGITUDE: -118.35652



ML SILT - wet, black, some fine asphaltic sand

(CONTINUED ON FOLLOWING FIGURE)

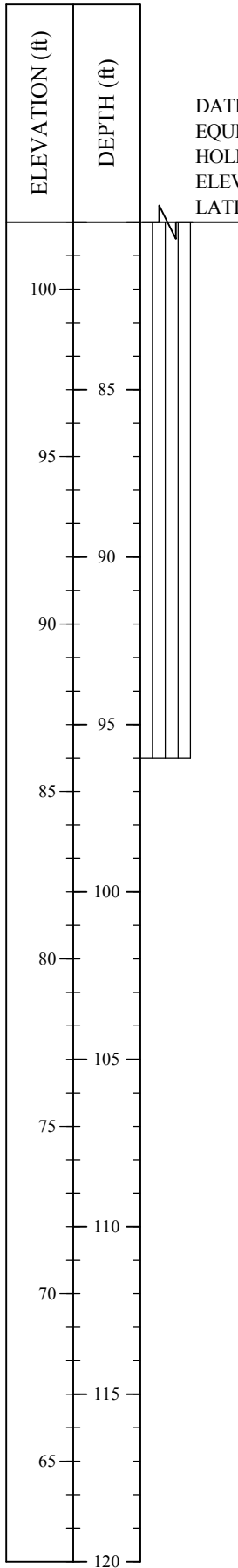
Field Tech: PK  
 Prepared By: NH  
 Checked By:

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# BORING M-8 (Continued)

DATE DRILLED: June 4, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 182 \*  
 LATITUDE: 34.06254 ° LONGITUDE: -118.35652



END OF BORING AT 96 FEET

NOTES:

Soil logged from cuttings only.  
 Hand augered top 5 feet due to utilities.  
 Ground water encountered at 37 feet.  
 Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 95 feet (yellow). See well construction diagram for M-8.

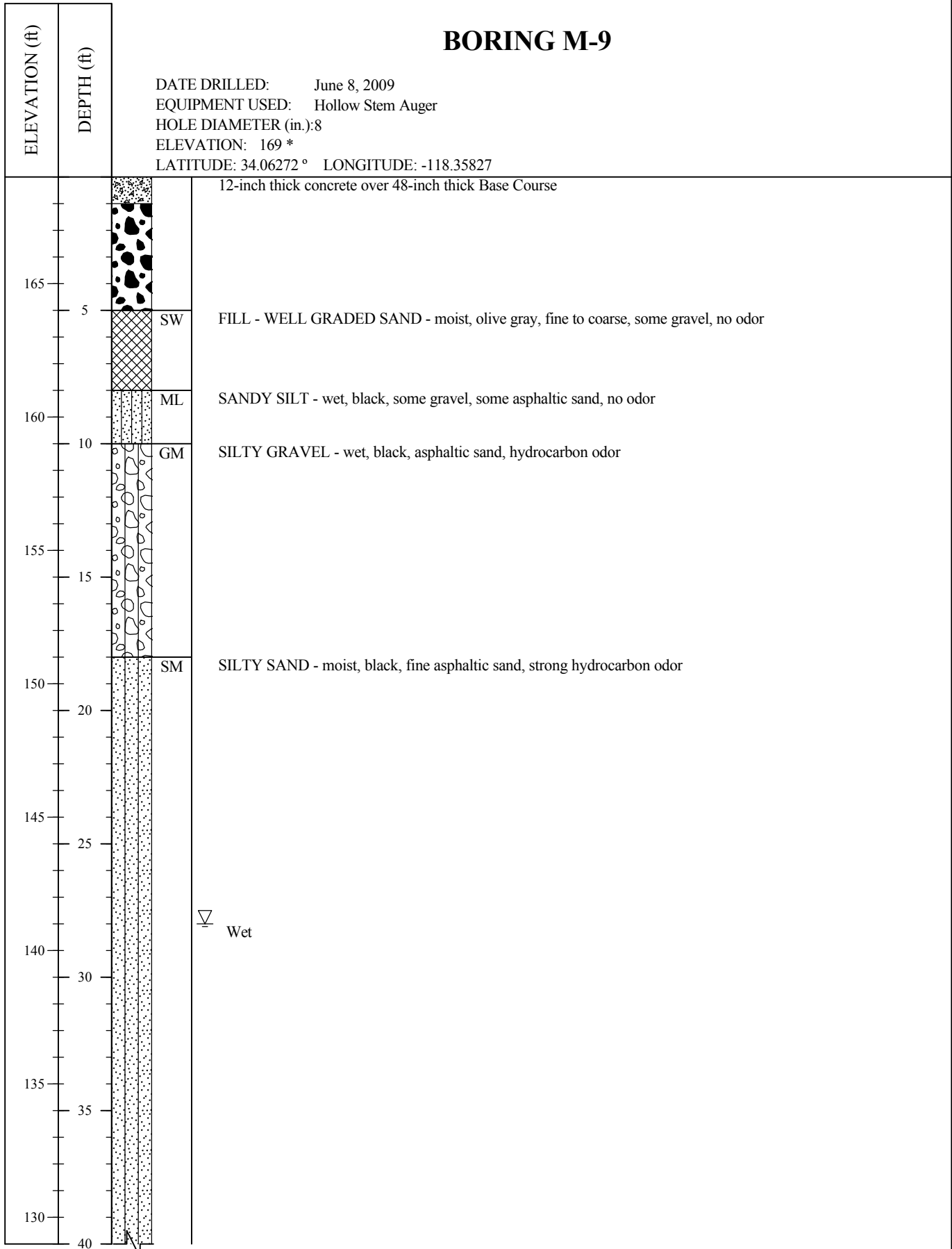
Field Tech: PK  
 Prepared By: NH  
 Checked By:

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# BORING M-9

DATE DRILLED: June 8, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 169 \*  
 LATITUDE: 34.06272 ° LONGITUDE: -118.35827

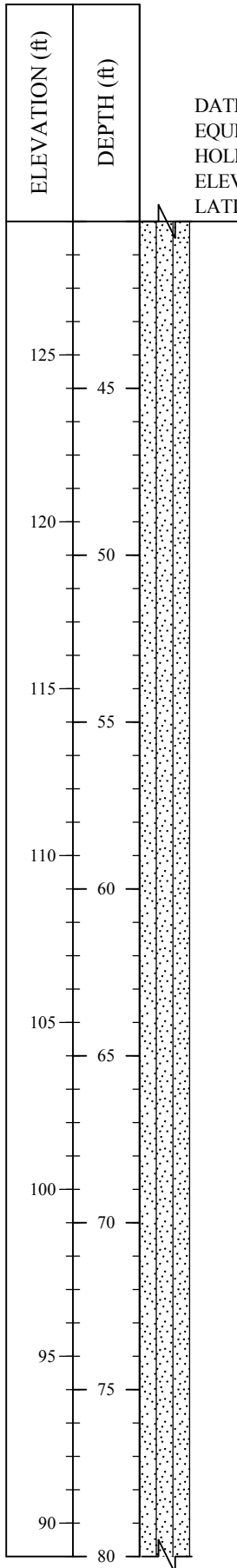


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

# BORING M-9 (Continued)

DATE DRILLED: June 8, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 169 \*  
 LATITUDE: 34.06272 ° LONGITUDE: -118.35827



Some gravel

Shell fragments to 78 feet, trace gravel

Field Tech: PK  
 Prepared By: NH  
 Checked By:

(CONTINUED ON FOLLOWING FIGURE)

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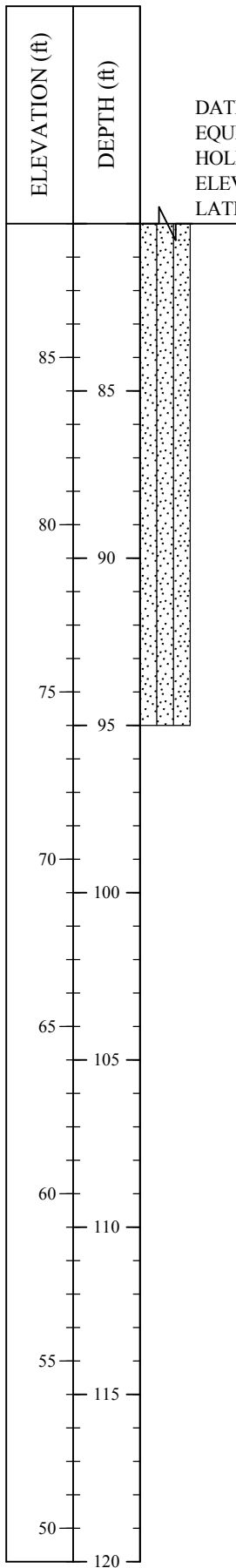
THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

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## BORING M-9 (Continued)

DATE DRILLED: June 8, 2009  
EQUIPMENT USED: Hollow Stem Auger  
HOLE DIAMETER (in.): 8  
ELEVATION: 169 \*  
LATITUDE: 34.06272 ° LONGITUDE: -118.35827



END OF BORING AT 95 FEET

NOTES:

Soil logged from cuttings only.  
Hand augered top 5 feet due to utilities.  
Ground water encountered at 28 feet.  
Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 95 feet (yellow). See well construction diagram for M-9.

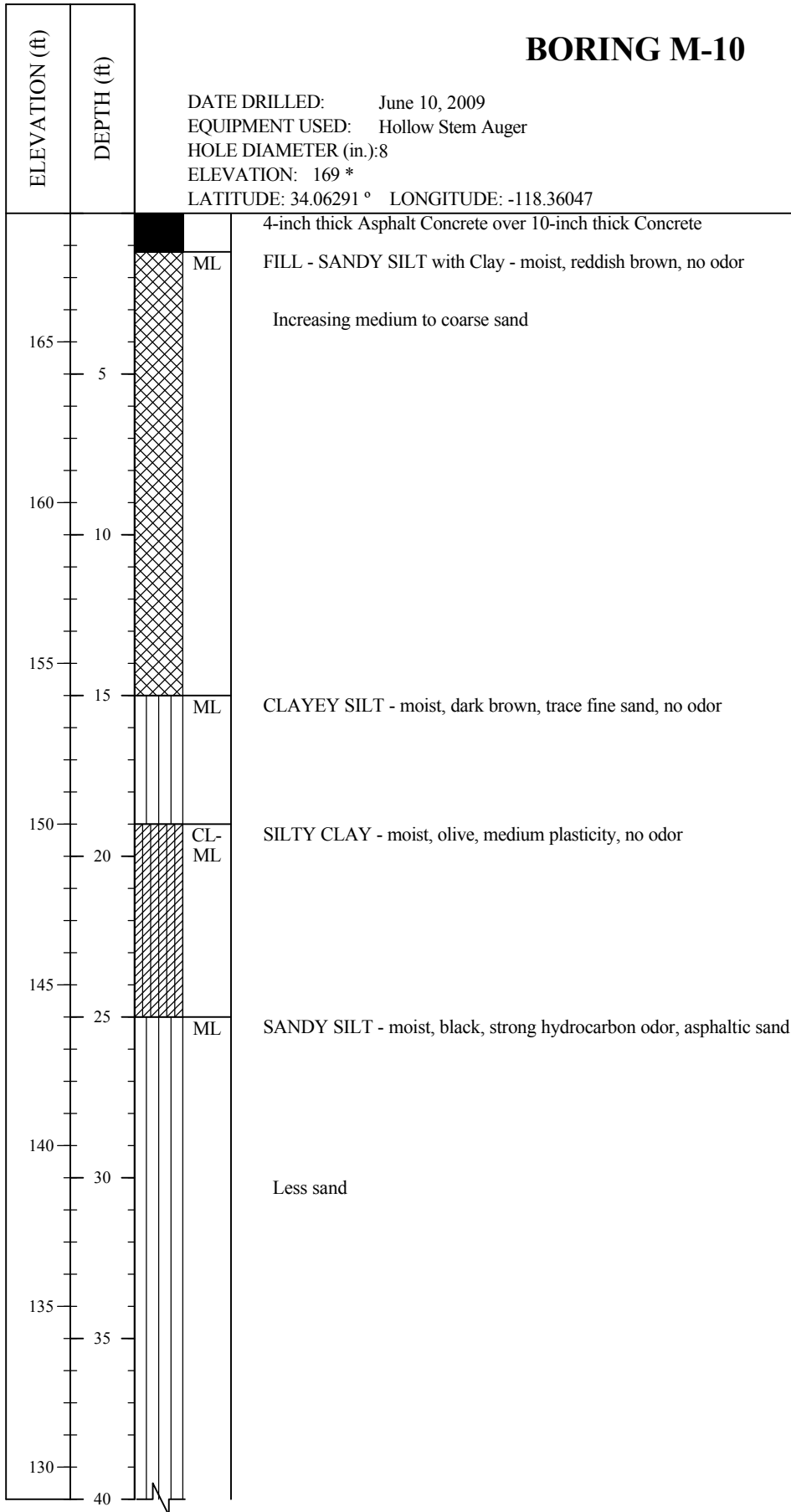
Field Tech: PK  
Prepared By: NH  
Checked By:



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# BORING M-10

DATE DRILLED: June 10, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 169 \*  
 LATITUDE: 34.06291 ° LONGITUDE: -118.36047

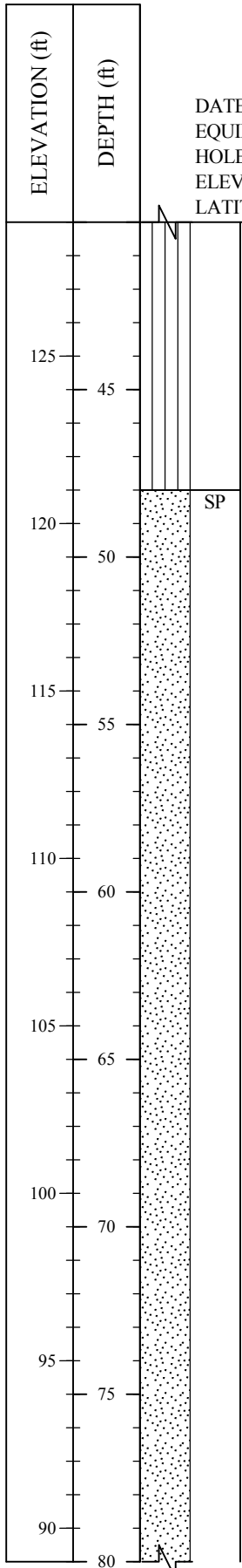


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

# BORING M-10 (Continued)

DATE DRILLED: June 10, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 169 \*  
 LATITUDE: 34.06291 ° LONGITUDE: -118.36047



Increasing fine sand

SP POORLY GRADED SAND - moist, black, fine, strong hydrocarbon odor, asphaltic

Wet

Some medium sand

Oily

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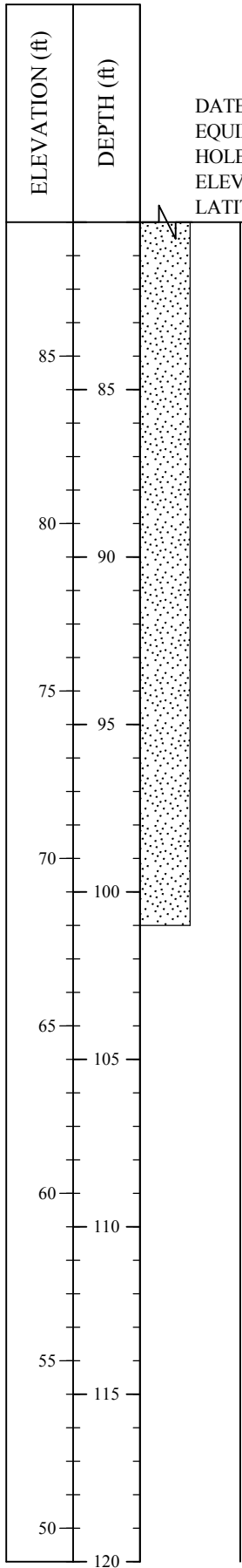
(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

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## BORING M-10 (Continued)

DATE DRILLED: June 10, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 169 \*  
 LATITUDE: 34.06291 ° LONGITUDE: -118.36047



END OF BORING AT 101 FEET

**NOTES:**

Soil logged from cuttings only.  
 Hand augered top 5 feet due to utilities.  
 Ground water encountered at 52 feet.  
 Installed nested soil vapor probes at 15 feet (green), 30 feet (red), 65 feet (blue), and 100 feet (yellow). See well construction diagram for M-10.

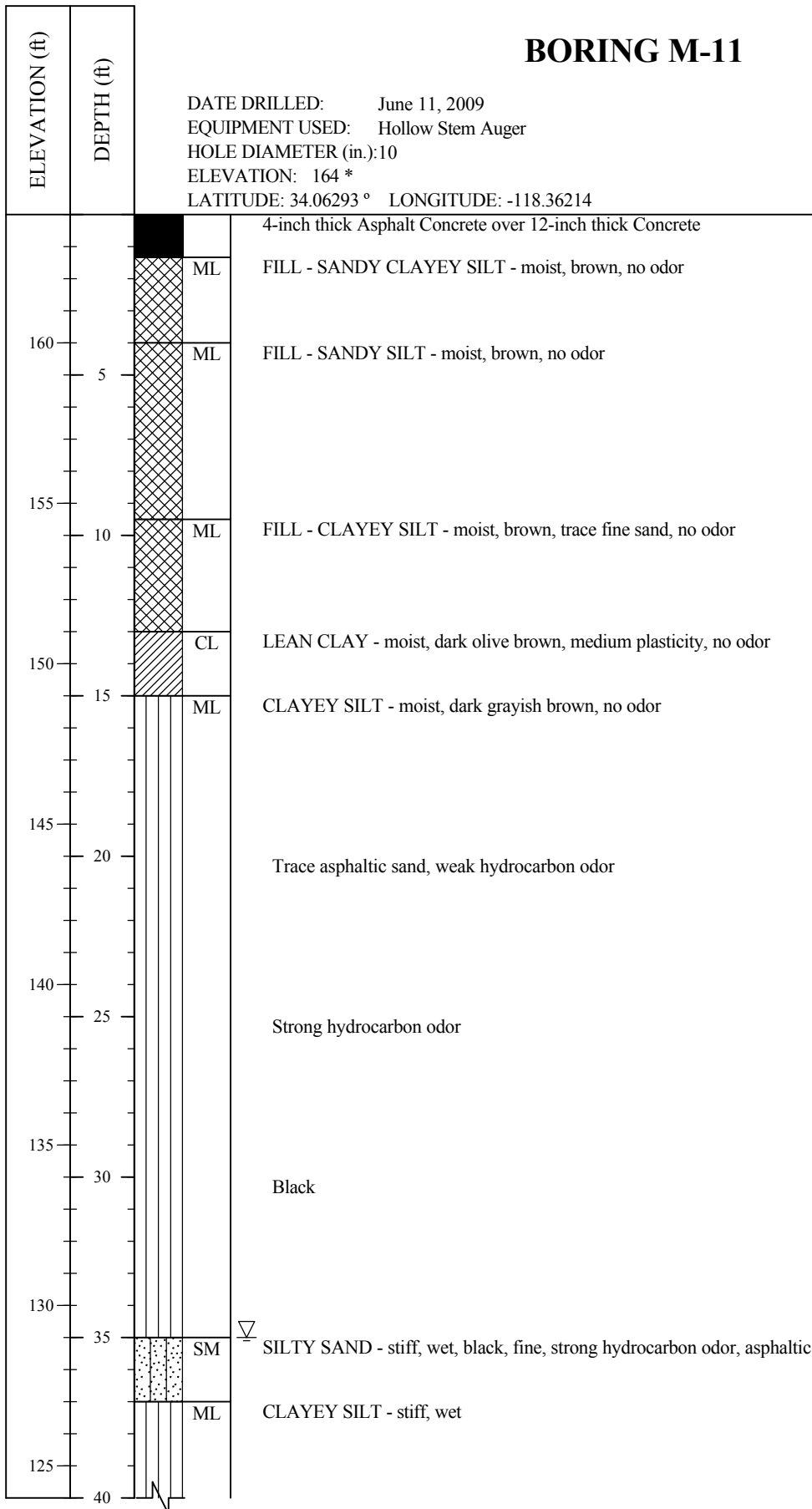
Field Tech: PK  
 Prepared By: NH  
 Checked By:

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# BORING M-11

DATE DRILLED: June 11, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 10  
 ELEVATION: 164 \*  
 LATITUDE: 34.06293 ° LONGITUDE: -118.36214

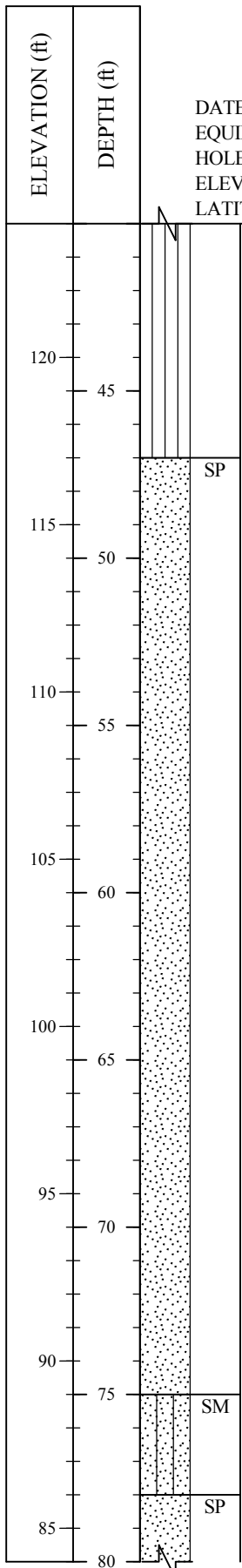


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

# BORING M-11 (Continued)

DATE DRILLED: June 11, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 10  
 ELEVATION: 164 \*  
 LATITUDE: 34.06293 ° LONGITUDE: -118.36214



SP POORLY GRADED SAND - wet, black, fine, strong hydrocarbon odor, asphaltic

Oily

SM SILTY SAND - wet

SP POORLY GRADED SAND - wet, fine to medium, asphaltic

Field Tech: PK  
 Prepared By: NH  
 Checked By:

(CONTINUED ON FOLLOWING FIGURE)

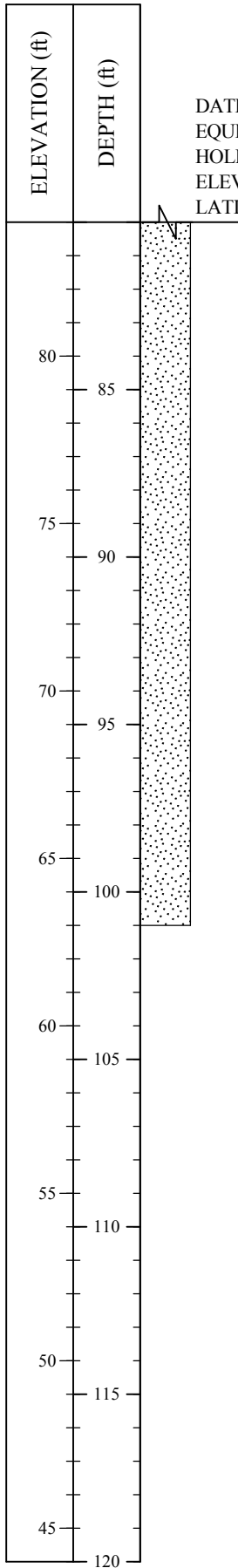
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## BORING M-11 (Continued)

DATE DRILLED: June 11, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 10  
 ELEVATION: 164 \*  
 LATITUDE: 34.06293 ° LONGITUDE: -118.36214



END OF BORING AT 101 FEET

**NOTES:**

Soil logged from cuttings only.  
 Hand augered top 5 feet due to utilities.  
 Ground water encountered at 35 feet.  
 Installed 2 2-inch diameter groundwater monitoring wells extending to 65 feet and 100 feet, respectively. See well construction diagram for M-11.

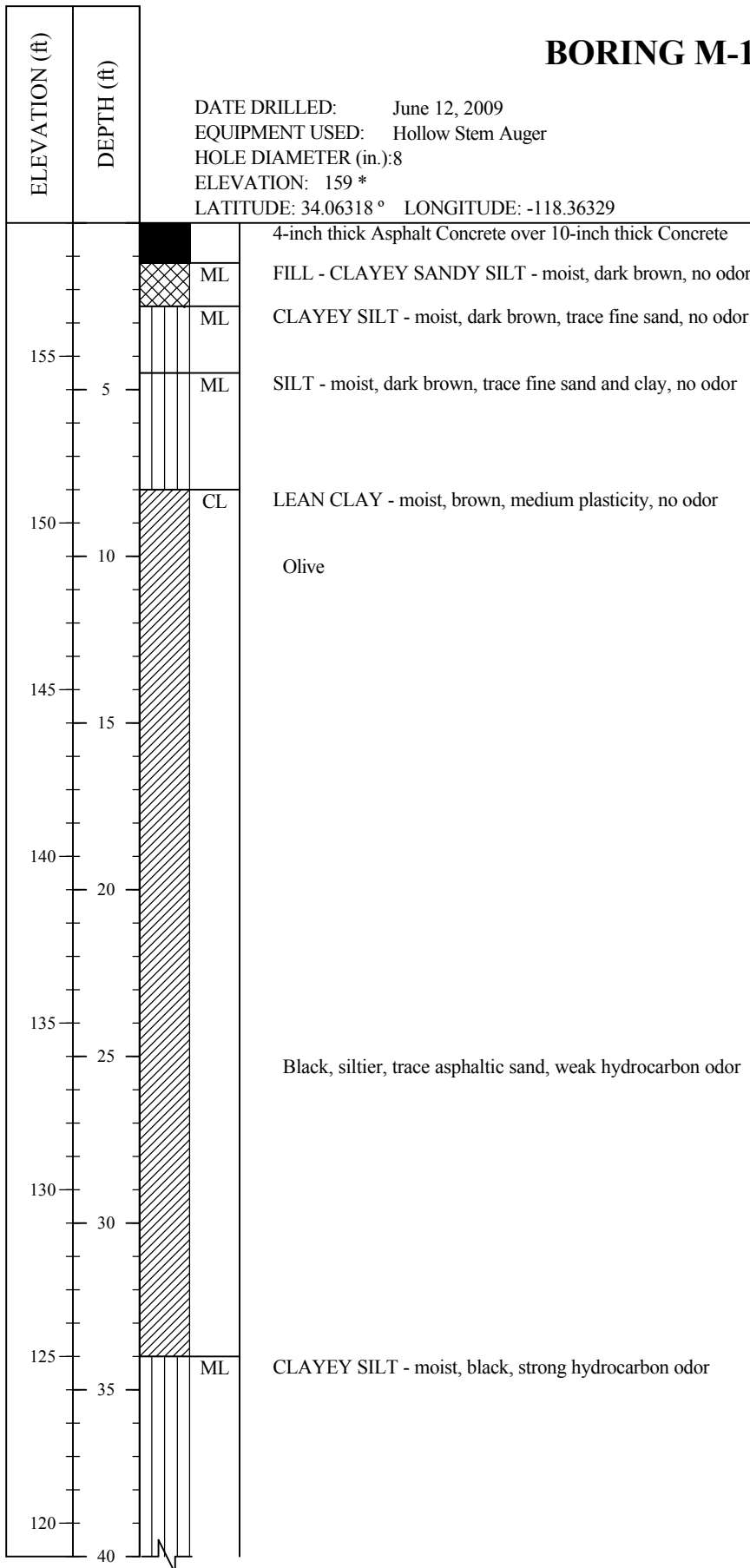
Field Tech: PK  
 Prepared By: NH  
 Checked By:

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# BORING M-12

DATE DRILLED: June 12, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 159 \*  
 LATITUDE: 34.06318 ° LONGITUDE: -118.36329



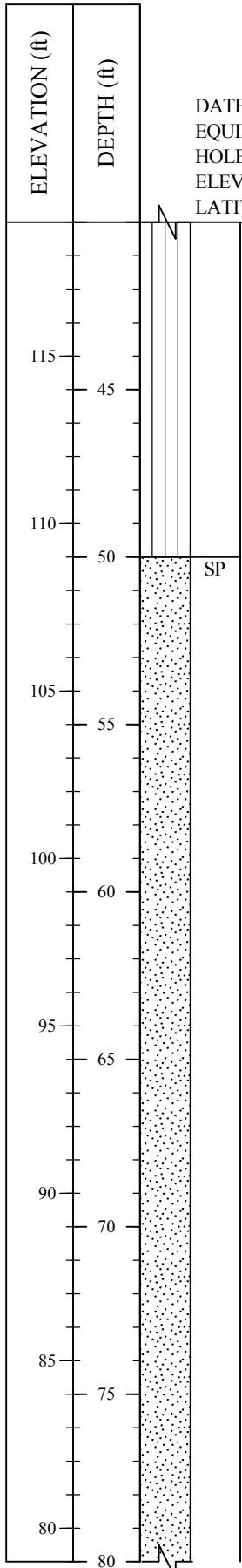
(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:



# BORING M-12 (Continued)

DATE DRILLED: June 12, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 159 \*  
 LATITUDE: 34.06318 ° LONGITUDE: -118.36329



SP  $\nabla$  POORLY GRADED SAND - wet, black, fine, oily, strong hydrocarbon odor, asphaltic

Increasing medium sand

Field Tech: PK  
 Prepared By: NH  
 Checked By:

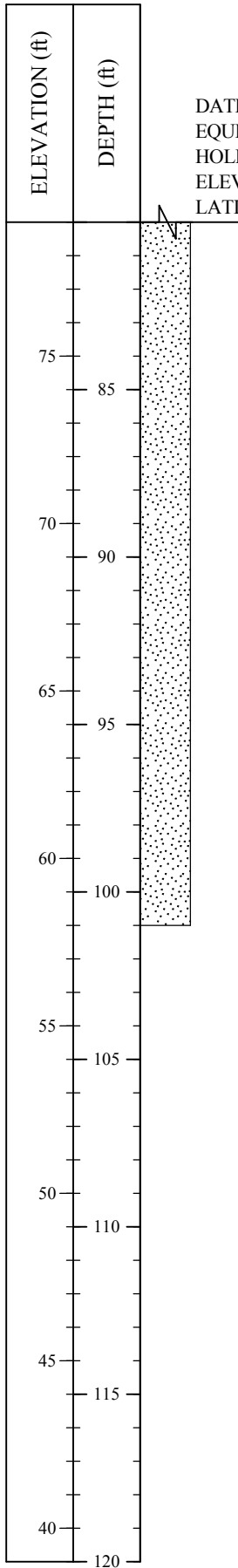
(CONTINUED ON FOLLOWING FIGURE)

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 THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

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## BORING M-12 (Continued)

DATE DRILLED: June 12, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 159 \*  
 LATITUDE: 34.06318 ° LONGITUDE: -118.36329



END OF BORING AT 101 FEET

**NOTES:**

Soil logged from cuttings only.  
 Hand augered top 5 feet due to utilities.  
 Ground water encountered at 50 feet.  
 Installed nested soil vapor probes at 15 feet (green), 35 feet (red), 65 feet (blue), and 100 feet (yellow). See well construction diagram for M-12.

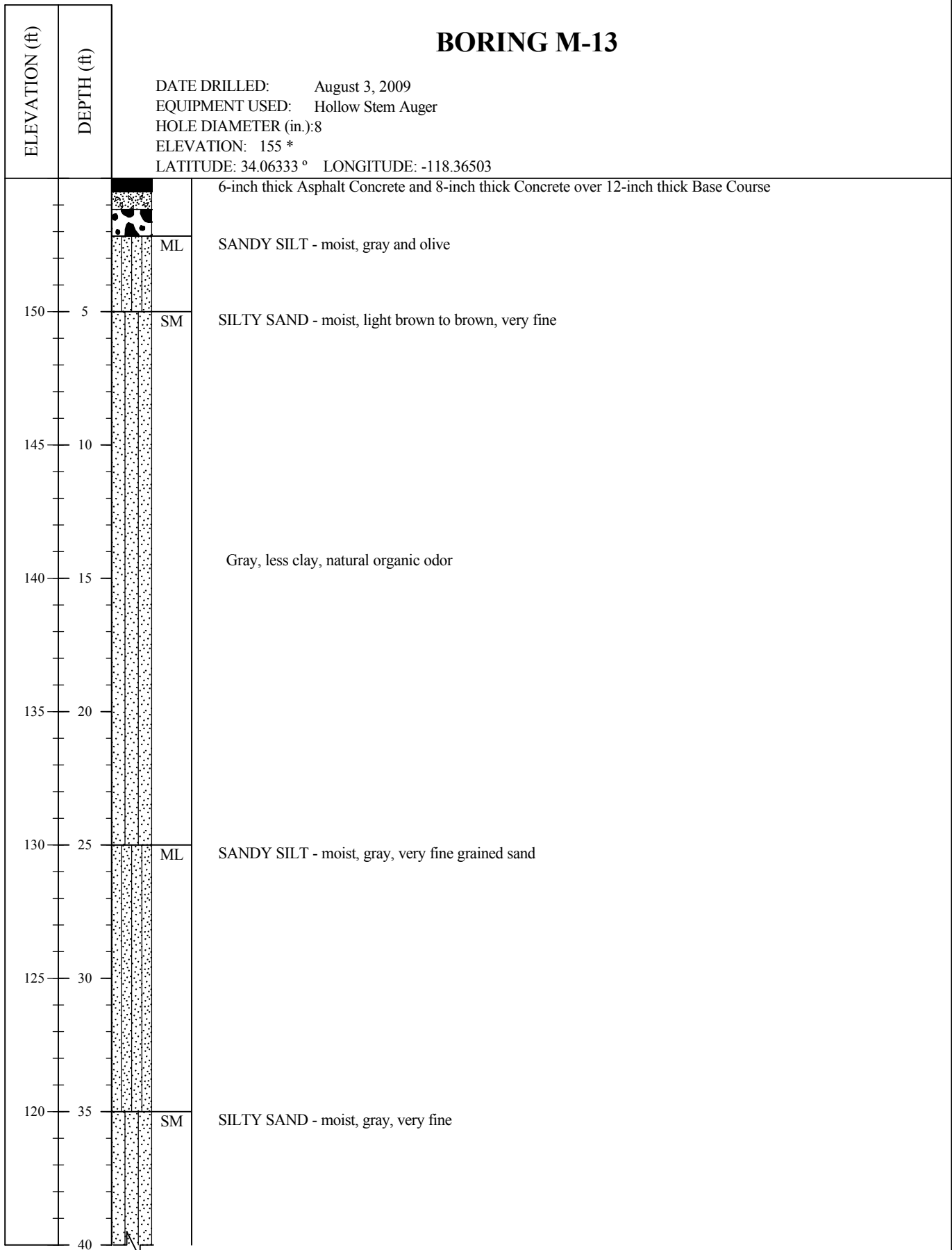
Field Tech: PK  
 Prepared By: NH  
 Checked By:

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# BORING M-13

DATE DRILLED: August 3, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 155 \*  
 LATITUDE: 34.06333 ° LONGITUDE: -118.36503

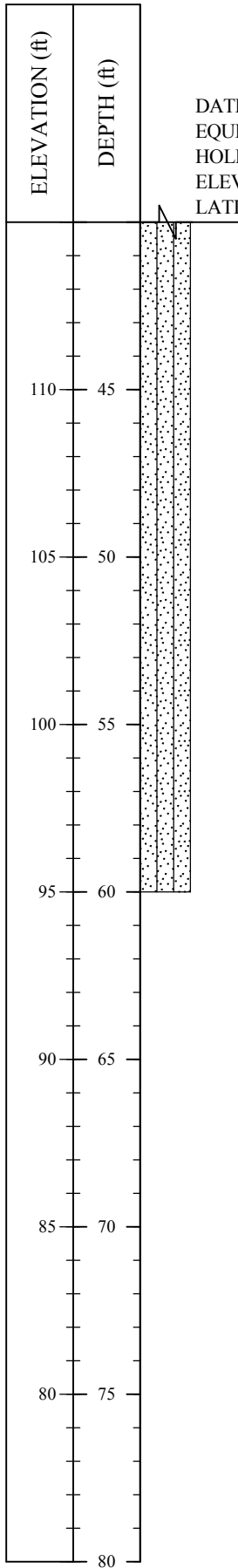


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: CW  
 Prepared By: NH  
 Checked By:

# BORING M-13 (Continued)

DATE DRILLED: August 3, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 155 \*  
 LATITUDE: 34.06333 ° LONGITUDE: -118.36503



END OF BORING AT 60 FEET

NOTES:

Soil logged from cuttings only.  
 Hand augered top 6 feet due to utilities.  
 Encountered high levels (>160 ppm) of hydrogen sulfide at 60 feet. Drilled stopped, called fire department. Left augers in hole and placed concrete patch on top of hole. Returned on August 13, 2009. Tip of augers had dark, fine Poorly Graded Sand.

Field Tech: CW  
 Prepared By: NH  
 Checked By:

ENVIRONMENTAL (EMPTY W/USCS), S:\70131\GEO\TECH\GINT\LIBRARY\MACTEC\JUNE2011\_GLB  
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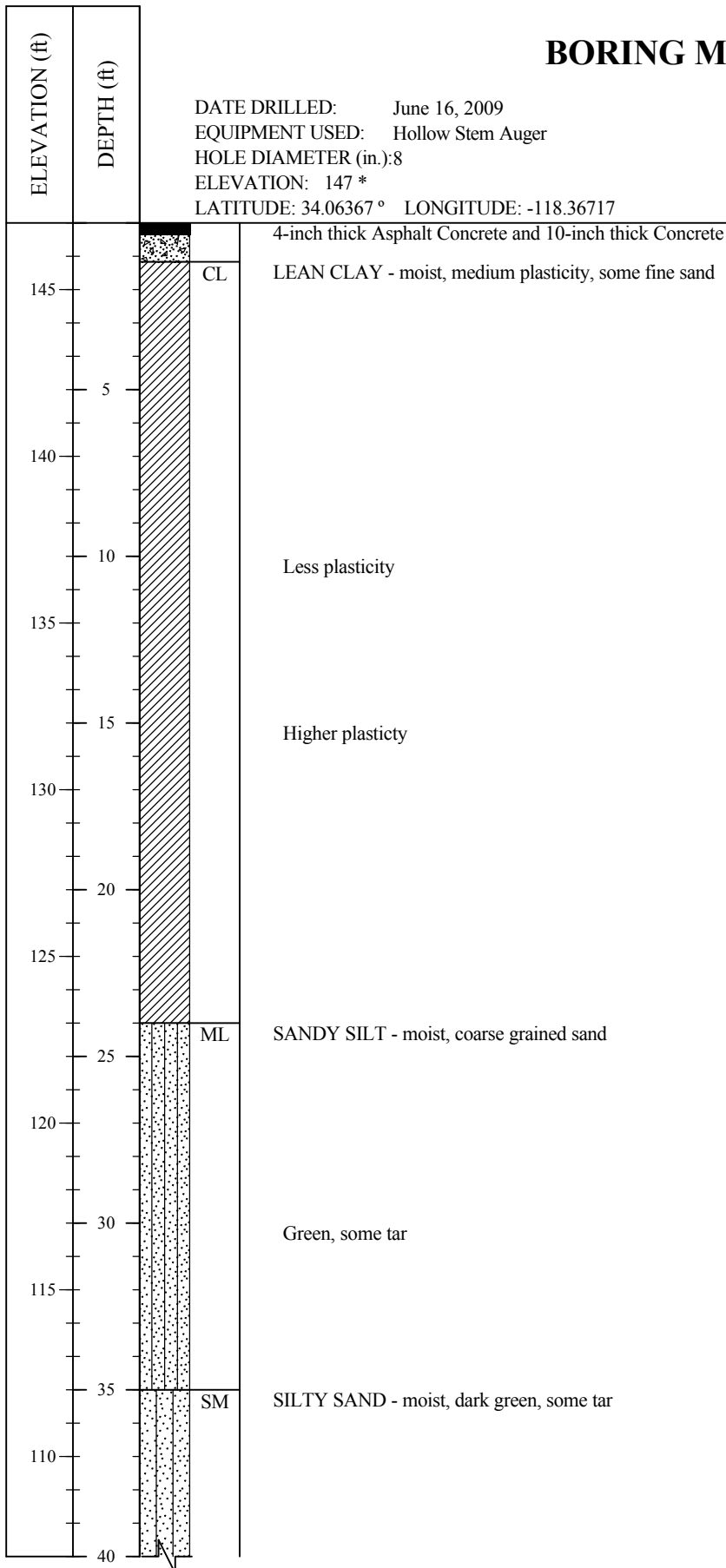
THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

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# BORING M-14

DATE DRILLED: June 16, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 147 \*  
 LATITUDE: 34.06367 ° LONGITUDE: -118.36717

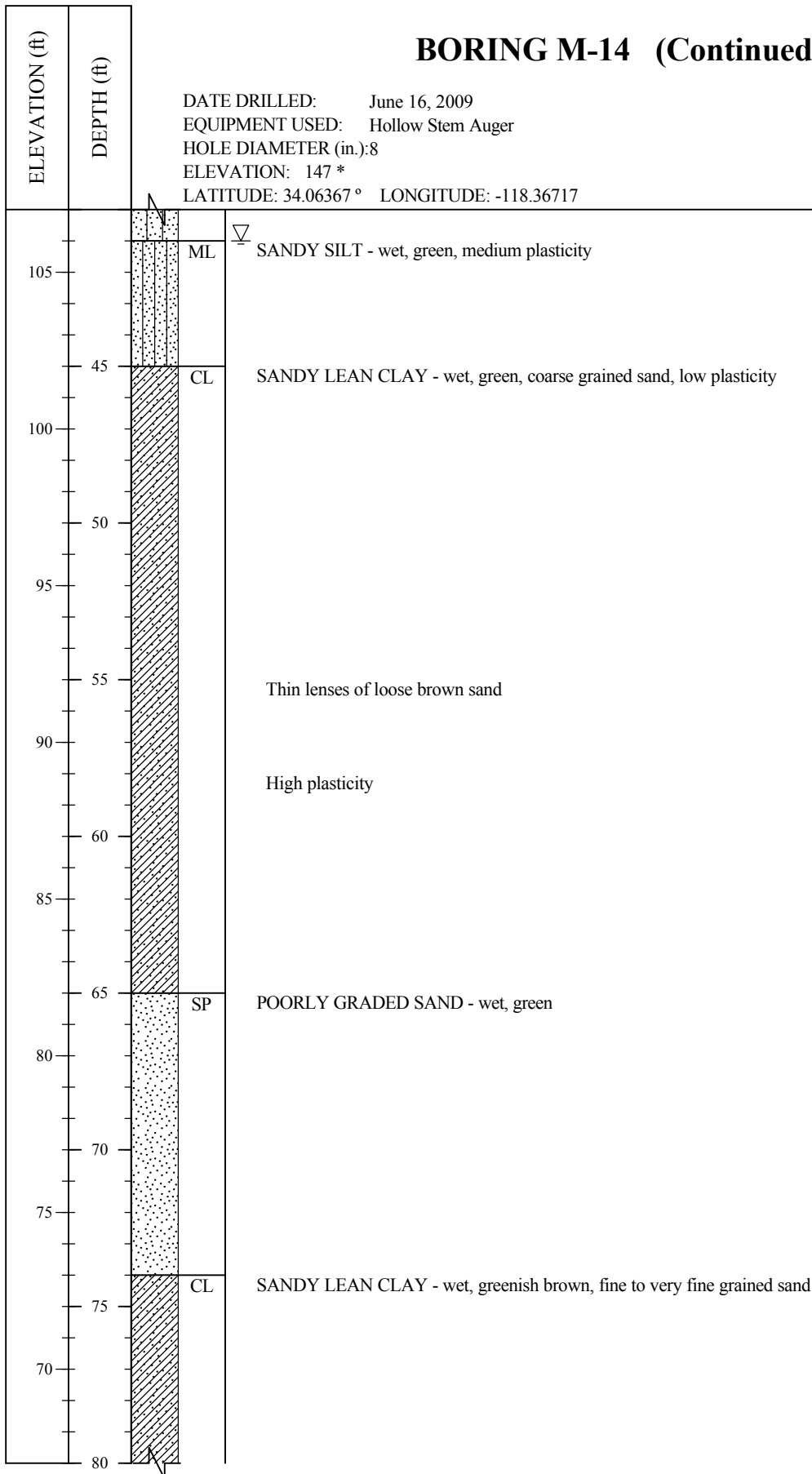


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: EMR  
 Prepared By: NH  
 Checked By:

# BORING M-14 (Continued)

DATE DRILLED: June 16, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 147 \*  
 LATITUDE: 34.06367 ° LONGITUDE: -118.36717



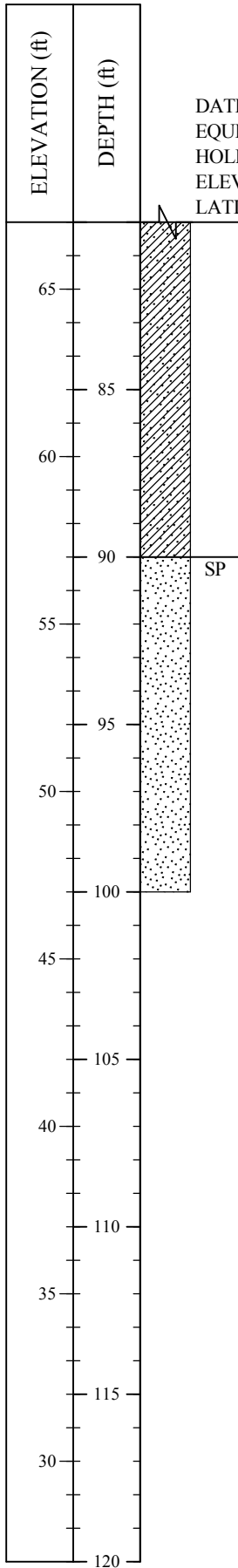
Field Tech: EMR  
 Prepared By: NH  
 Checked By:

(CONTINUED ON FOLLOWING FIGURE)

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# BORING M-14 (Continued)

DATE DRILLED: June 16, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 147 \*  
 LATITUDE: 34.06367 ° LONGITUDE: -118.36717



SP POORLY GRADED SAND - wet, green

END OF BORING AT 100 FEET

NOTES:

Soil logged from cuttings only.  
 Hand augered top 5 feet due to utilities.  
 Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 100 feet (yellow). See well construction diagram for M-14.

Field Tech: EMR  
 Prepared By: NH  
 Checked By:

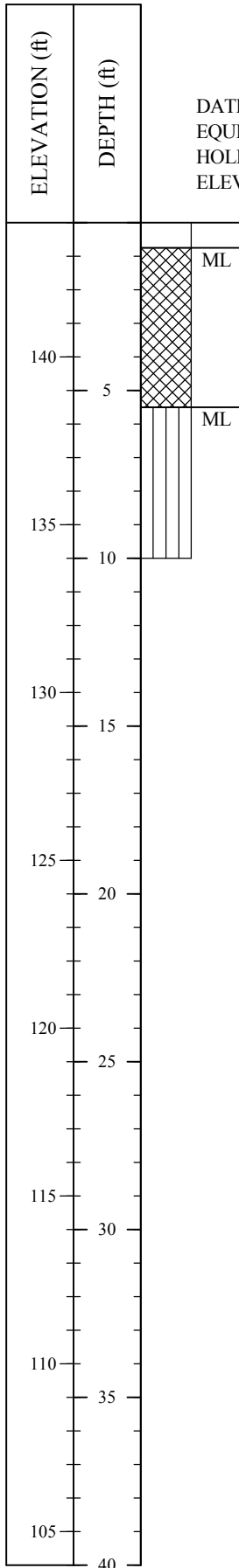
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# BORING M-15

DATE DRILLED: June 17, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 144 \*



9-inch thick Asphalt Concrete  
 FILL - SANDY SILT - moist, brown, trace clay, no odor

CLAYEY SILT - moist, dark yellowish brown, some fine sand, low plasticity, no odor

END OF BORING AT 10 FEET

NOTES:

Soil logged from cuttings only.  
 Boring terminated at 10 feet due to sewer break.

Field Tech: PK  
 Prepared By: NH  
 Checked By:

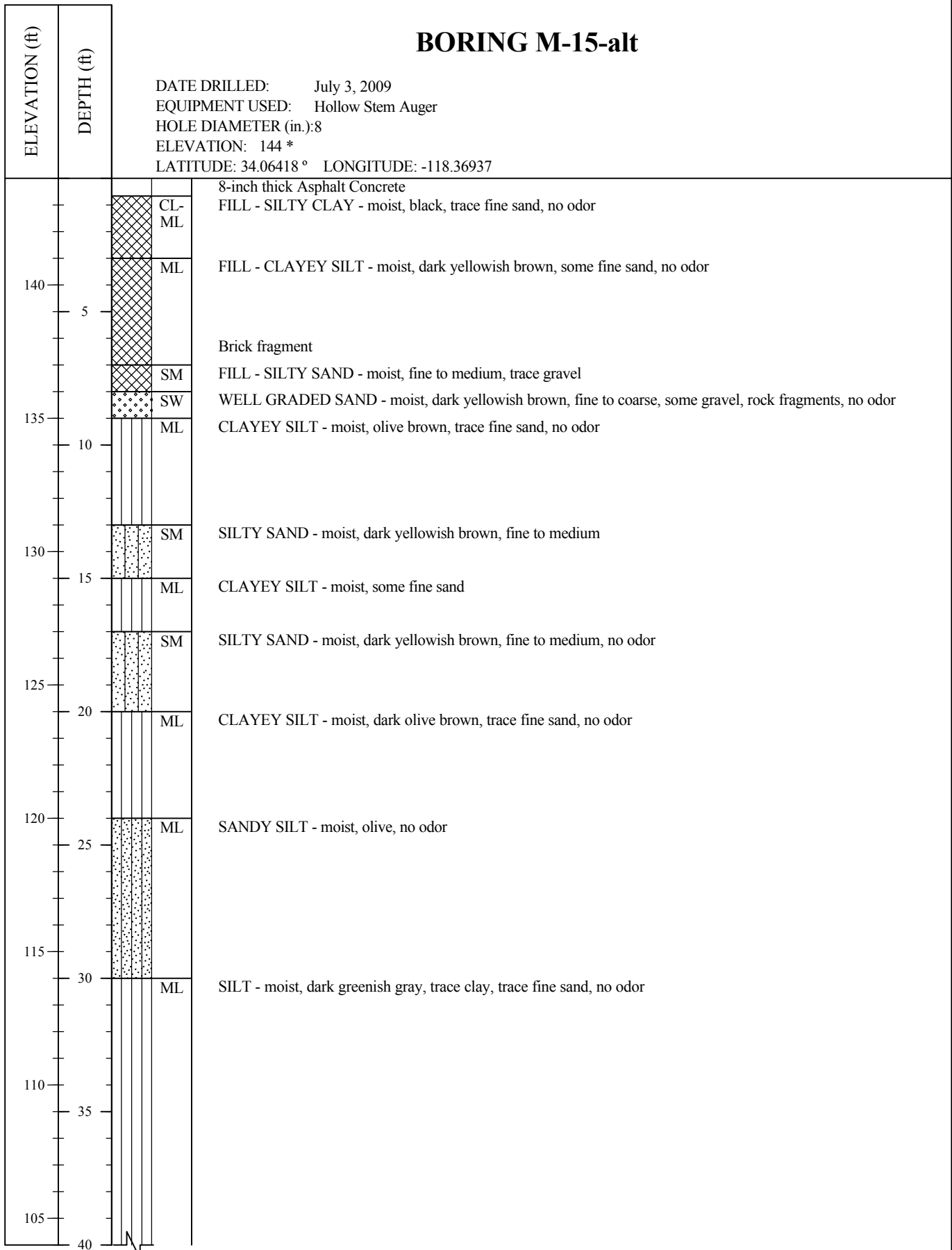


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## BORING M-15-alt

DATE DRILLED: July 3, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 144 \*  
 LATITUDE: 34.06418 ° LONGITUDE: -118.36937

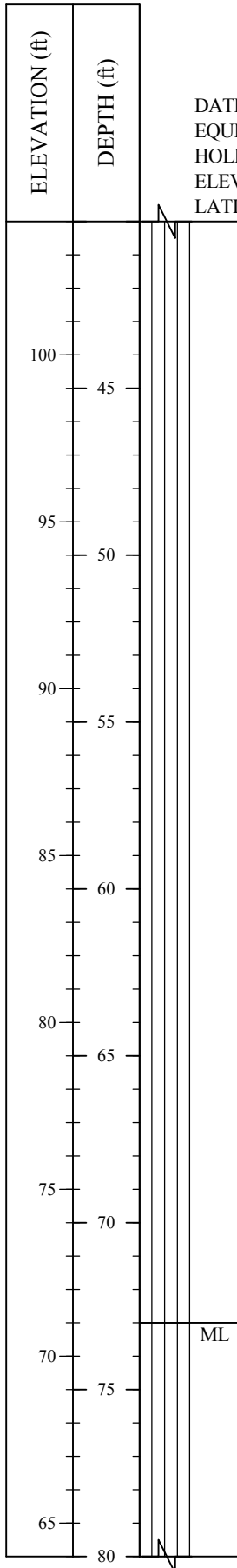


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

# BORING M-15-alt (Continued)

DATE DRILLED: July 3, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 144 \*  
 LATITUDE: 34.06418 ° LONGITUDE: -118.36937



Sandier

Wet

ML

CLAYEY SILT - wet, dark olive gray, trace fine sand, no odor

Field Tech: PK  
 Prepared By: NH  
 Checked By:

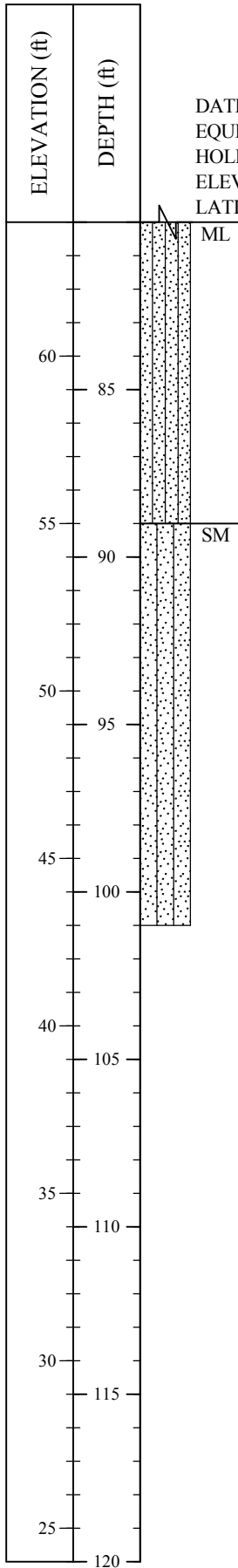
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# BORING M-15-alt (Continued)

DATE DRILLED: July 3, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 144 \*  
 LATITUDE: 34.06418 ° LONGITUDE: -118.36937



ML SANDY SILT - wet, dark greenish gray

SM SILTY SAND - wet, dark greenish gray, no odor

END OF BORING AT 101 FEET

Soil logged from cuttings only.  
 Ground water encountered at 45 feet.  
 Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 100 feet (yellow).

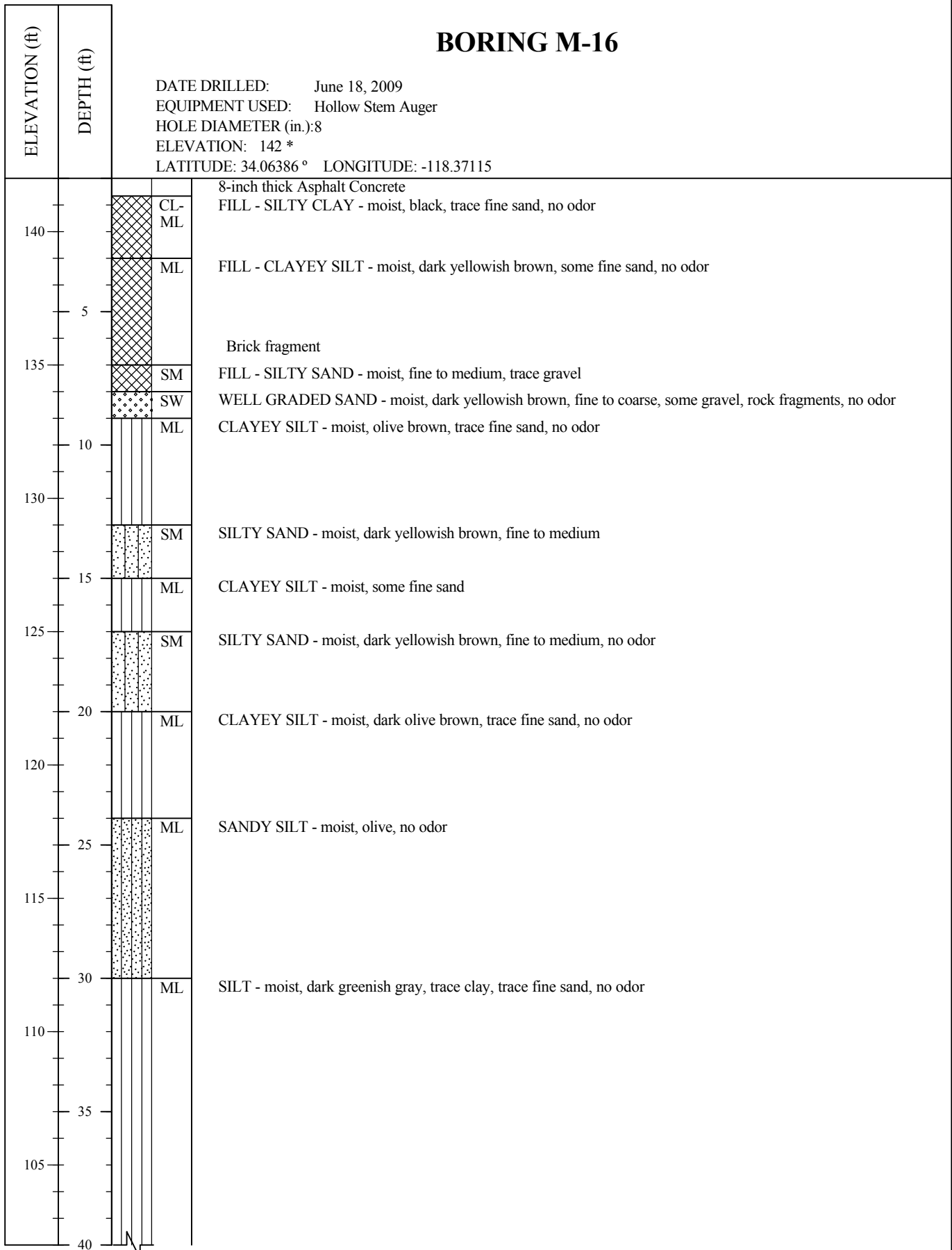
Field Tech: PK  
 Prepared By: NH  
 Checked By:

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# BORING M-16

DATE DRILLED: June 18, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 142 \*  
 LATITUDE: 34.06386 ° LONGITUDE: -118.37115

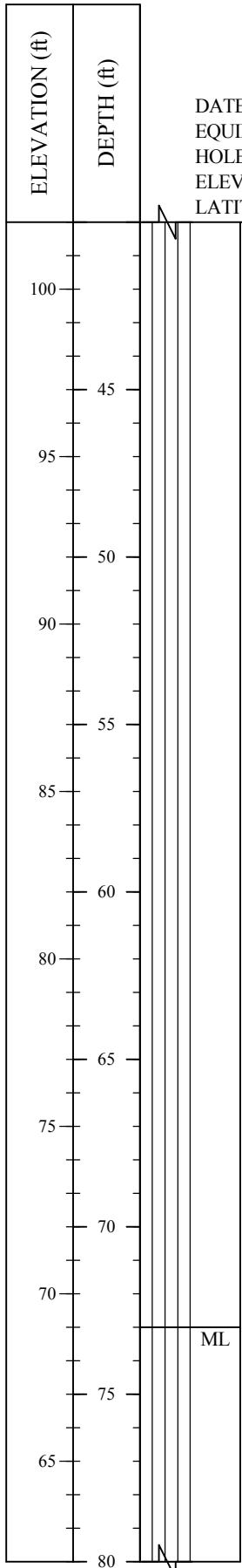


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

# BORING M-16 (Continued)

DATE DRILLED: June 18, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 142 \*  
 LATITUDE: 34.06386 ° LONGITUDE: -118.37115



Sandier

Wet

ML CLAYEY SILT - wet, dark olive gray, trace fine sand, no odor

Field Tech: PK  
 Prepared By: NH  
 Checked By:

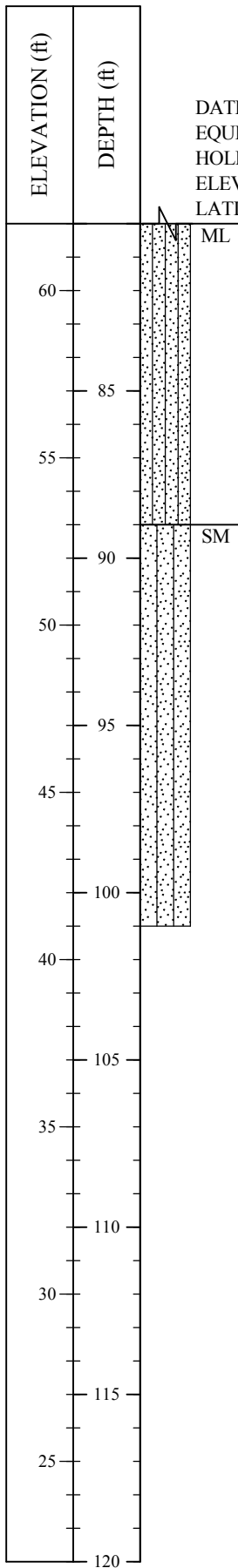
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# BORING M-16 (Continued)

DATE DRILLED: June 18, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 142 \*  
 LATITUDE: 34.06386 ° LONGITUDE: -118.37115



ML SANDY SILT - wet, dark greenish gray

SM SILTY SAND - wet, dark greenish gray, no odor

END OF BORING AT 101 FEET

NOTES:

Soil logged from cuttings only.  
 Ground water encountered at 45 feet.  
 Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 100 feet (yellow). See well construction diagram for M-16.

Field Tech: PK  
 Prepared By: NH  
 Checked By:

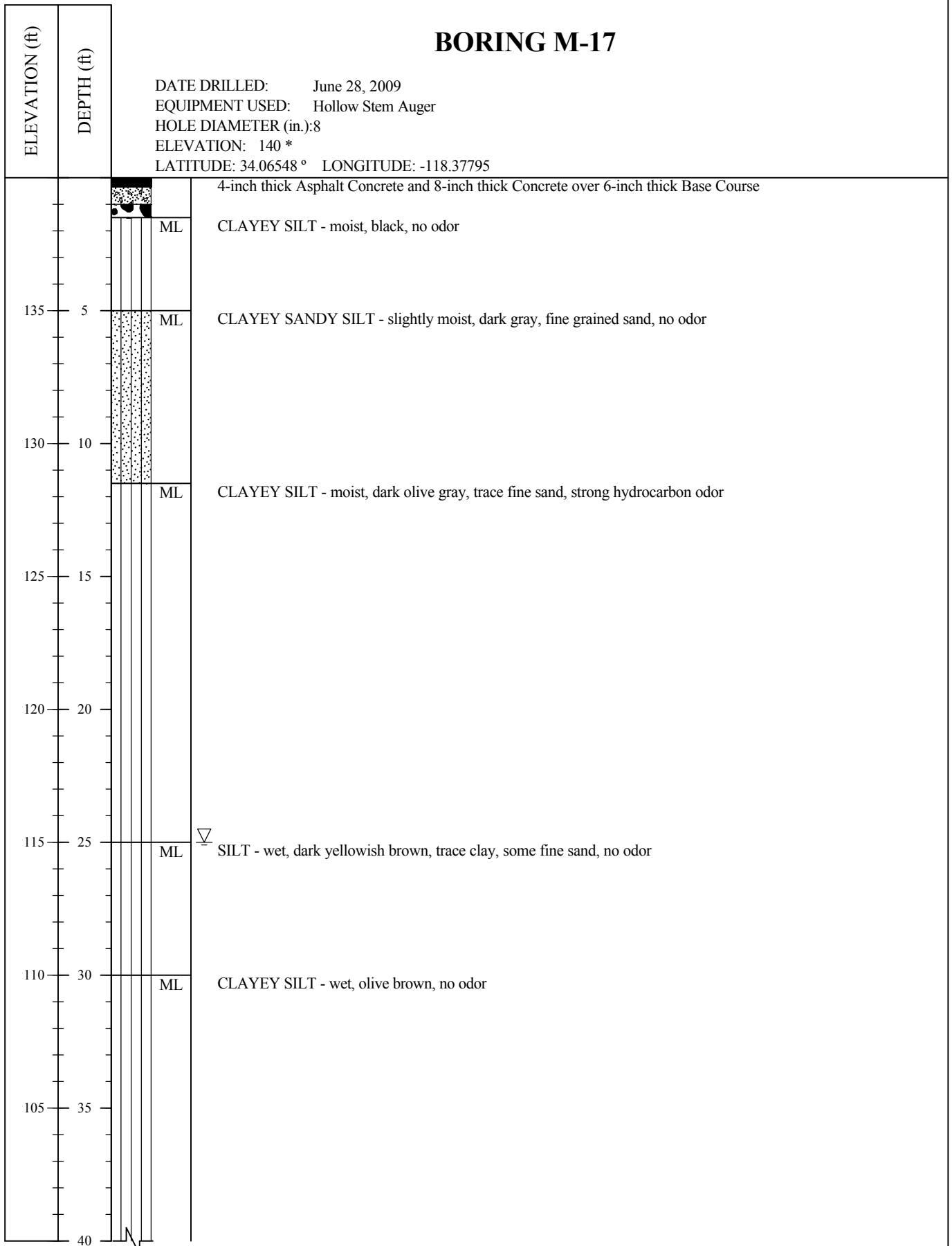
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# BORING M-17

DATE DRILLED: June 28, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 140 \*  
 LATITUDE: 34.06548 ° LONGITUDE: -118.37795

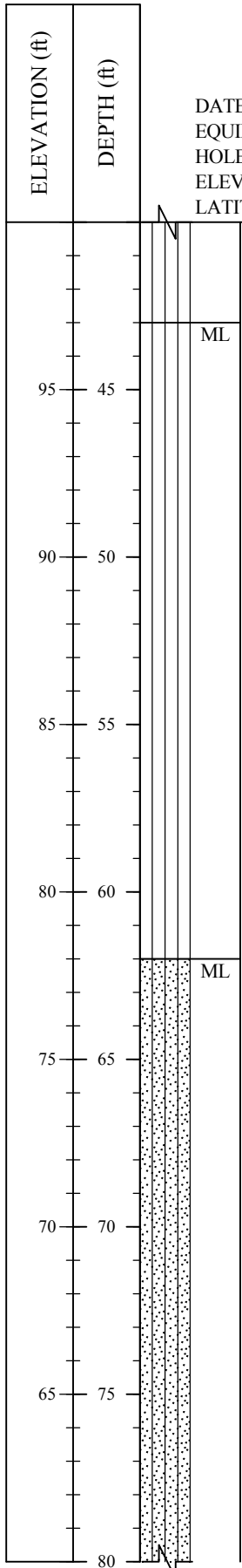


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

# BORING M-17 (Continued)

DATE DRILLED: June 28, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 140 \*  
 LATITUDE: 34.06548 ° LONGITUDE: -118.37795



SILT - wet, olive, some clay, weak hydrocarbon odor

Dark greenish gray

SANDY SILT - wet, dark greenish gray, fine grained sand, no odor

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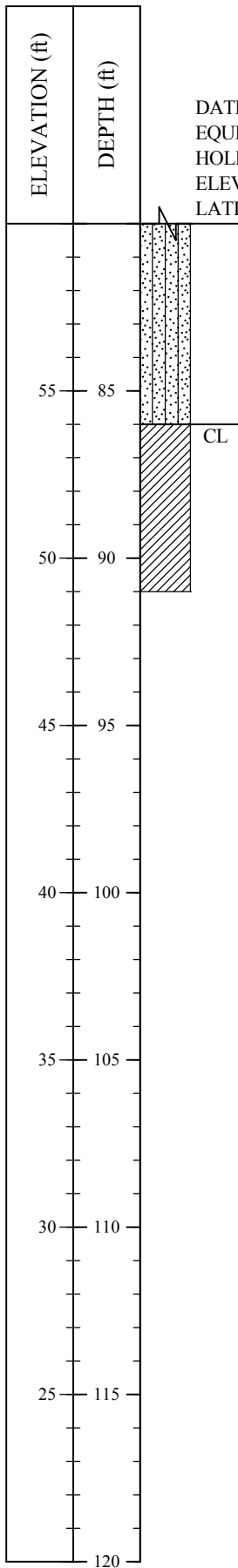
(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:



# BORING M-17 (Continued)

DATE DRILLED: June 28, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 140 \*  
 LATITUDE: 34.06548 ° LONGITUDE: -118.37795



LEAN CLAY - wet, dark greenish gray

END OF BORING AT 91 FEET

NOTES:

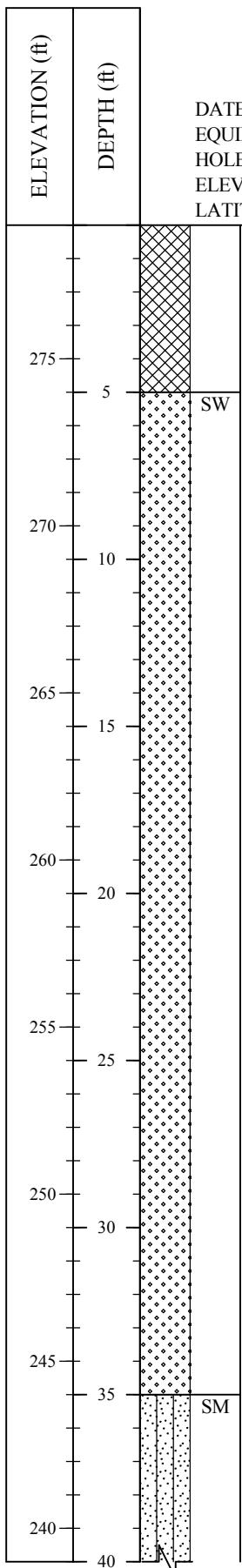
Soil logged from cuttings only.  
 Ground water encountered at 25 feet.  
 Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 90 feet (yellow). See well construction diagram for M-17.

Field Tech: PK  
 Prepared By: NH  
 Checked By:

ENVIRONMENTAL (EMPTY W/USCS), S:\70131\GEO\GINT\LIBRARY\MACTEC\JUNE2011\_GLB  
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# BORING M-18

DATE DRILLED: June 19, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 279 \*  
 LATITUDE: 34.06265 ° LONGITUDE: -118.41658



FILL

WELL GRADED SAND - moist, fine to coarse

SILTY SAND - moist, fine

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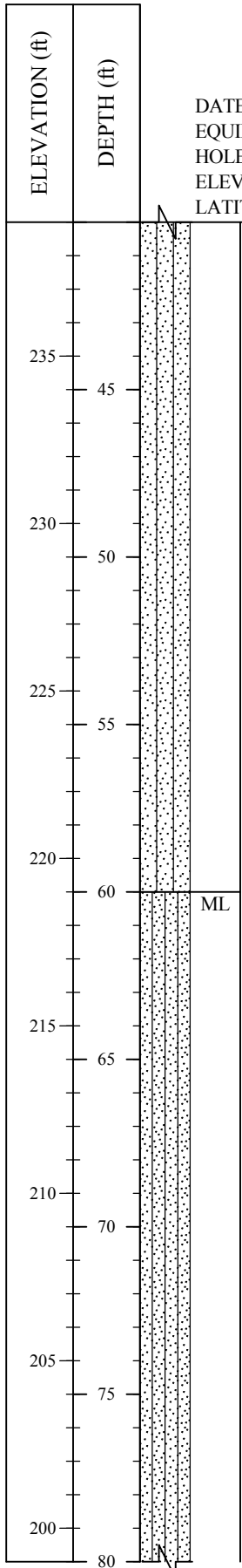
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(CONTINUED ON FOLLOWING FIGURE)

Field Tech: EMR  
 Prepared By: NH  
 Checked By:

# BORING M-18 (Continued)

DATE DRILLED: June 19, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 279 \*  
 LATITUDE: 34.06265 ° LONGITUDE: -118.41658



ML  $\nabla$  SANDY SILT - wet, yellowish brown, fine

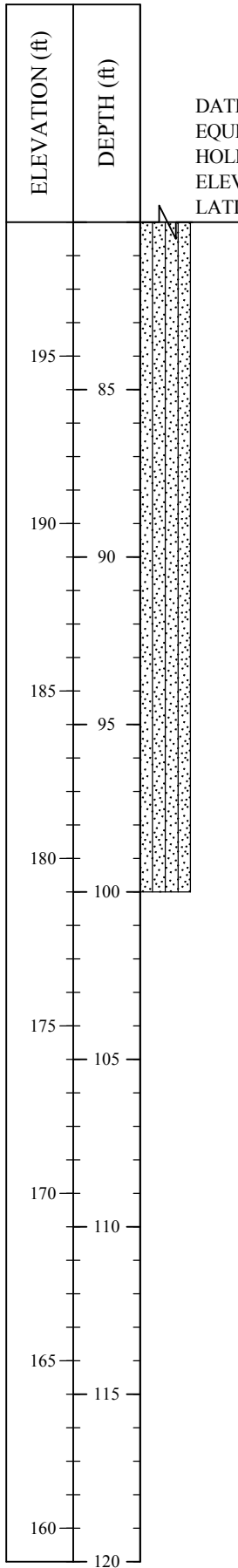
Field Tech: EMR  
 Prepared By: NH  
 Checked By:

(CONTINUED ON FOLLOWING FIGURE)

ENVIRONMENTAL (EMPTY W/USCS) S:\70131\GEO\GINT\LIBRARY\MACTEC\JUNE2011\GLB  
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 THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS  
 AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

# BORING M-18 (Continued)

DATE DRILLED: June 19, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 279 \*  
 LATITUDE: 34.06265 ° LONGITUDE: -118.41658



END OF BORING AT 100 FEET

NOTES:

Soil logged from cuttings only.  
 Hand augered top 5 feet due to utilities.  
 Installed nested soil vapor probes at 15 feet (green), 25 feet (red), 65 feet (blue), and 100 feet (yellow). See well construction diagram for M-18.

Field Tech: EMR  
 Prepared By: NH  
 Checked By:

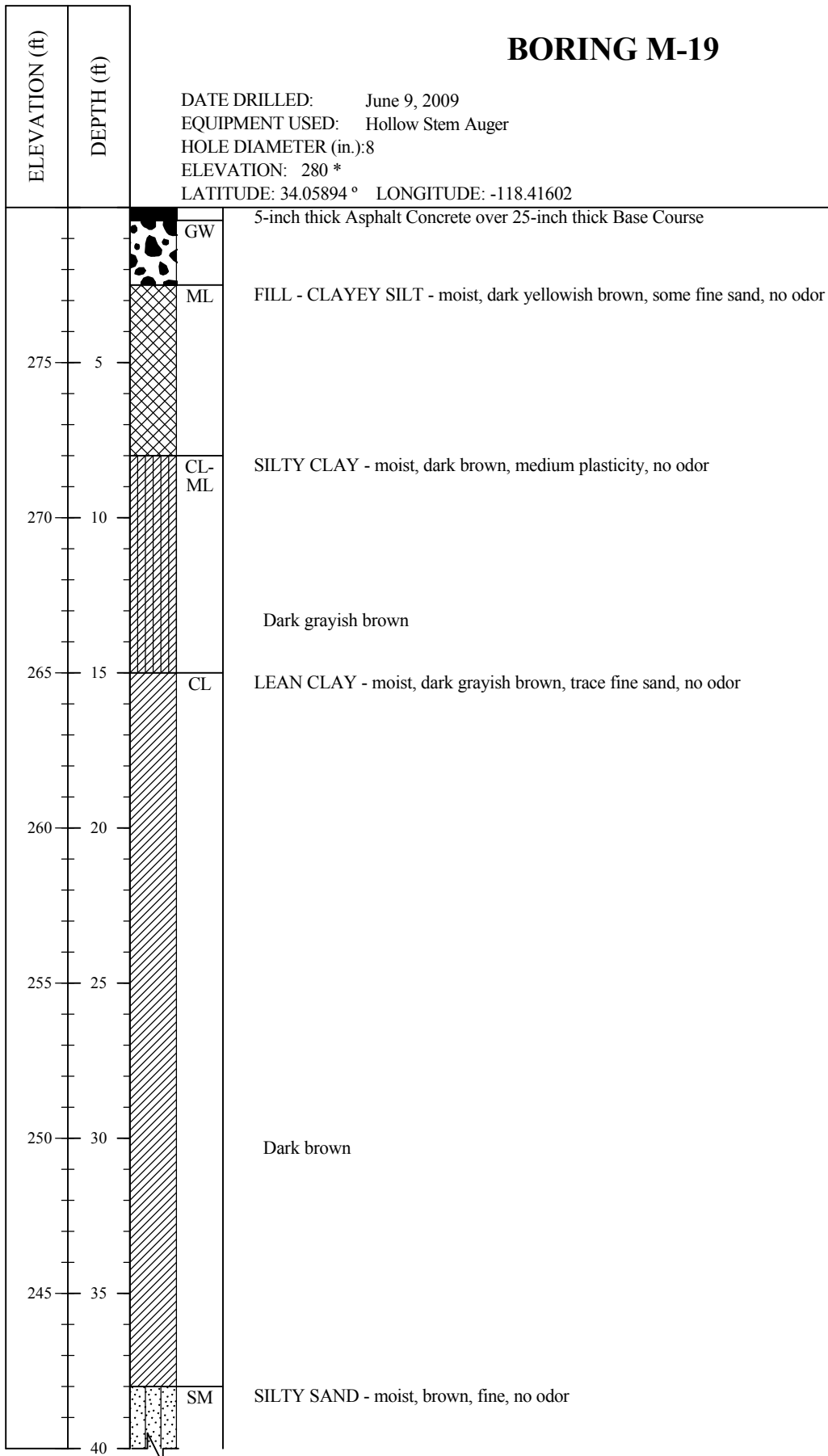
ENVIRONMENTAL (EMPTY W/USCS) S:\70131\GEO\GINT\LIBRARY\MACTEC\JUNE2011\GLB  
 C:\PROJECT\_DIRECTORY\4953\2010\10\1561\METRO\_WESTSIDE\_EXTENSION\6.2.3\GEO\TECHNICAL\DESIGN\3.2\ALL-FIELD NOTES\GINT LOG\FACE PHASE ENVIRONMENTAL BORINGS\GP1\_11/29/11  
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 AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

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THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

# BORING M-19

DATE DRILLED: June 9, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 280 \*  
 LATITUDE: 34.05894 ° LONGITUDE: -118.41602

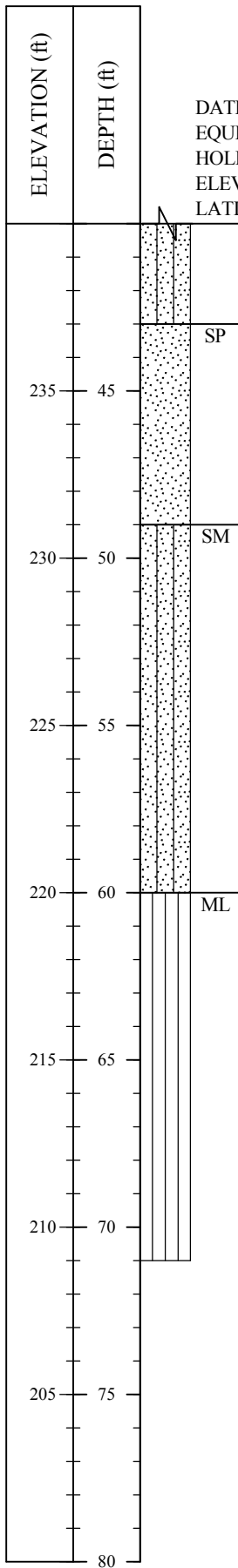


(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PK  
 Prepared By: NH  
 Checked By:

# BORING M-19 (Continued)

DATE DRILLED: June 9, 2009  
 EQUIPMENT USED: Hollow Stem Auger  
 HOLE DIAMETER (in.): 8  
 ELEVATION: 280 \*  
 LATITUDE: 34.05894 ° LONGITUDE: -118.41602



SP POORLY GRADED SAND - moist, reddish brown, fine, trace silt, no odor

SM SILTY SAND - moist, dark reddish brown, no odor

Interbedded clay lenses

ML SANDY SILT - moist, dark brown, no odor

Shell fragments

END OF BORING AT 71 FEET

NOTES:

Soil logged from cuttings only.  
 Hand augered top 5 feet due to utilities.  
 Ground water not encountered at time of drilling.  
 Installed nested soil vapor probes at 15 feet (red), 40 feet (blue), and 70 feet (yellow). See well construction diagram for M-19.

Field Tech: PK  
 Prepared By: NH  
 Checked By:

ENVIRONMENTAL (EMPTY W/USCS) S:\70131\GEO\TECH\GINT\LIBRARY MACTEC JUNE2011.GLB  
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 THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.



**FIGURES B-2.1A THROUGH B-2.24C  
LOGS OF HOLLOW-STEM AUGER BORINGS (PE PHASE)**

# BORING M-101

DATE DRILLED: 6/29/2011 - 6/30/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

B2SOIL AMEC PID G:\PROJECT\_DIRECTORIES\4953\2010\101561 METRO WESTSIDE EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\LIBRARY MACTEC OCT11.GLB  
 G:\PROJECT\_DIRECTORIES\4953\2010\101561 METRO WESTSIDE EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\NEHAUS OCT 21 2011 GPT 1129711  
 THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.5 feet of Asphalt 0.67 feet of Concrete <u>FILL</u>
	5					CL-ML	CLAYEY SILT (cl-ml) - (10YR, 2/2) very dark brown, slightly moist, some tan colored caliche nodules present
						CL	<u>NATIVE</u>
	10			0.0	14	ML	SILTY CLAY (cl) - (10YR, 6/2) light brownish gray, slightly moist, abundant caliche nodules
	15			0.0	9	ML	SILT (ml) - (10YR, 4/3) brown, slightly moist, some oxidation staining, micaceous, crumbles easily
	20			0.0	13	CL	SILTY CLAY (cl) - (10YR, 4/4) dark yellowish brown, slightly moist, oxidation staining, caliche nodules present, micaceous
	25			0.0	10	CL	SILTY CLAY (cl) - (10YR, 3/3) dark brown, slightly moist, caliche nodules present, micaceous
	30			0.0	16	CL-ML	CLAYEY SILT (cl-ml) - (GLE Y1, 3/10GY) very dark greenish gray, slightly moist, some caliche nodules present, micaceous
	35			0.0	7	CL	SILTY CLAY (cl) - (GLE Y1, 3/10GY) very dark greenish gray, slightly moist, caliche nodules present, micaceous
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP



B2SOIL AMEC PID G:\PROJECT\_DIRECTORIES\4953\2010\101561\_METRO WESTSIDE\_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\LIBRARY MACTEC OCT11.GLB  
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## BORING M-101 (Continued)

DATE DRILLED: 6/29/2011 - 6/30/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
				0.0	11		
	45			0.0	25	SC	<p>CLAYEY SAND (sc) - (GLE Y1, 3/5GY) very dark greenish gray, wet, fine to medium grained, micaceous</p>
	50			0.0	10	CL-ML	<p>CLAYEY SILT to SILTY CLAY (cl-ml) - (GLE Y1, 3/10Y) very dark greenish gray, moist to wet, one/single caliche nodule present, micaceous</p>
	55			0.0	10	ML-SM	<p>SILT with SAND (ml-sm) - (GLE Y1, 3/5GY) very dark greenish gray, wet, fine grained, micaceous, sulfuric odor (not registering on meter)</p>
	60			0.0	1/6"	SP	<p>FINE to MEDIUM SAND (sp) - (GLE Y1, 3/5GY) very dark greenish gray, wet, slightly micaceous, sulfuric odor (not registering on meter)</p>
	65			2.0	18		<p>Same as above</p>
	70			0.0	57		<p>Same as above</p>
	75			0.0	42		<p>Same as above</p>
	80						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

B2SOIL\_AMEC\_PID\_G:\PROJECT\_DIRECTORIES\4953\2010\101561\_METRO\_WESTSIDE\_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\LIBRARY\_MACTEC\_OCT11.GLB  
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## BORING M-101 (Continued)

DATE DRILLED: 6/29/2011 - 6/30/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
						□
	85					
	90					
	95					
	100					
	105					
	110					
	115					
	120					

Same as above

**NOTES:**

Total depth = 81 feet bgs  
 Groundwater encountered at approximately 41 feet bgs  
 Hand augered to 6 feet bgs  
 The boring was initially drilled with 8-inch O.D. augers and later reamed with 11.25-inch O.D. augers.  
 Soil samples collected using an SPT sampler.  
 After reaming, a well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP

# BORING M-102

DATE DRILLED: 3/30/2011 - 3/31/2011  
 EQUIPMENT USED: CME-75, Jet Drilling  
 HOLE DIAMETER (in.): 10.5  
 ELEVATION: \*\*

B2SOIL AMEC PID G:\PROJECT\_DIRECTORIES\4953\2010\101561\_METRO\_WESTSIDE\_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\LIBRARY MACTEC OCT11.GLB  
 G:\PROJECT\_DIRECTORIES\4953\2010\101561\_METRO\_WESTSIDE\_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\NEHAUS OCT 21 2011 GPT 1129711  
 THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.83 feet of Asphalt
						SM	CLAYEY SILTY SAND (sm) - (10YR, 5/3) brown, slightly moist
	5			0.0	25	X	CLAYEY SILTY SAND (sm) - (10YR, 5/3) brown, slightly moist, fine to medium grained, mottled with beige caliche stringers
	10			0.0	23	X	Same as above, also mottled with beige caliche nodules
	15			0.0	25	X	FINE SAND (sp) - (10YR, 4/2) dark grayish brown, saturated, micaceous SILTY CLAY (cl-ml) - (10YR, 5/3) brown, slightly moist, caliche nodules present, some oxidation staining, rootlets present at 16.5 feet
	20			0.0	19	X	Becomes mottled with beige caliche stringers and nodules, no rootlets present
	25			0.0	18	X	▽ Becomes very moist at 25.5 feet, possible water zone
	30				16	X	Becomes saturated from the addition of water
	35			0.0	9	X	Same as above
	40					CL	

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

B2SOIL AMEC PID G:\PROJECT\_DIRECTORIES\4953\2010\101561\_METRO\_WESTSIDE\_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\LIBRARY MACTEC OCT11.GLB  
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## BORING M-102 (Continued)

DATE DRILLED: 3/30/2011 - 3/31/2011  
 EQUIPMENT USED: CME-75, Jet Drilling  
 HOLE DIAMETER (in.): 10.5  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
				0.0	50		CLAY (cl) - (GLE Y 2, 4/10) dark greenish gray, wet from the addition of water, jelly-bean sized caliche nodules present SILT to FINE SAND (ml/sm) - (GLE Y 2, 4/10) dark greenish gray, wet
	45				50		SILT (ml) - (GLE Y 2, 4/10G) dark greenish gray, wet, fine grained, caliche nodules present
	50				51		CLAY (cl) - dark greenish gray, hard, wet, trace of silt
	55				83/11"		SILTY CLAY with SAND (cl) - black tar, very hard
	60				55		CLAYEY SILT (ml) - dark greenish gray, very hard, wet, black tar lense in shoe consists of moist sandy silt with clay
	65				55		SANDY SILT with CLAY (ml) - black tar, moist, hard
	70						
	75						
	80						

NOTES:  
 Total depth = 66 feet bgs  
 Groundwater encountered at approximately 25 feet bgs  
 Hand augered to 5 feet bgs  
 The boring was initially drilled with 8-inch O.D. augers and later reamed with 11.25-inch O.D. augers.  
 Soil samples collected using an SPT sampler.  
 After reaming, a nested well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP

# BORING M-103

DATE DRILLED: 4/4/2011 - 4/7/2011  
 EQUIPMENT USED: CME-75, Jet Drilling  
 HOLE DIAMETER (in.): 10.5  
 ELEVATION: \*\*

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 G:\PROJECT\_DIRECTORIES\4953\2010\101561 METRO WESTSIDE EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\NEHAUS OCT 21 2011 GPT 11/29/11  
 THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS  
 AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.5 feet of Asphalt
	5			0.0	32	ML	CLAYEY SILT (ml) - (10YR, 7/3) very pale brown, slightly moist, some oxidation staining, micaceous, only 0.5 foot recovered
	10			0.0	10	SP	Becomes (10YR, 4/3) brown FINE SAND (sp) - (10YR, 4/4) dark yellowish brown, slightly moist, oxidation staining, micaceous
	15			0.0	27	CL	<u>SAN PEDRO FORMATION (Qsp)</u> SANDY CLAY to SILTY CLAY (cl) - (GLE2, 4/5BG) dark greenish gray, mottled with light gray caliche nodules and clayey zones, 0.5 feet of clayey sand at 15 feet
	20			0.0	14	SC	Increased moisture
	25			0.0	41	SP	CLAYEY SAND (sc) - (GLE2, 4/5BG) dark greenish gray, moist, caliche nodules present Groundwater encountered at 25-30 feet
	30				34	SP	FINE to MEDIUM SAND (sp) - (GLE1, 3/10GY) very dark greenish gray, wet, some clay
	35			0.0	34	CL/ML	SILTY CLAY to CLAYEY SILT (cl-ml) - (GLE1, 4/5GY) dark greenish gray, wet, mottled with caliche nodules
	40					ML	

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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## BORING M-103 (Continued)

DATE DRILLED: 4/4/2011 - 4/7/2011  
 EQUIPMENT USED: CME-75, Jet Drilling  
 HOLE DIAMETER (in.): 10.5  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
				0.0	31	X
45				0.0	41	X
50				0.0	50/6"	X
55				0.0	50/6"	X
60				140	50/6"	X
65						O
70				0.0	50/6"	X
75						
80						

CLAYEY SILT (ml) - (GLEYS, 4/5GY) dark greenish gray, very moist, some caliche stringers and nodules present  
 0.5 feet of sandy clay mottled with dark brown silt and caliche nodules at 41 feet

TAR IMPACTED SOILS  
 CLAYEY TAR SAND (sp) - (10YR, 2/1) black to brownish black, wet, fine grained, strong tar odor, sticky, tar pods present

TAR SAND - black, odor, super saturated with tar

Becomes very sticky

Same as above, H2S release/odor

No recovery

Same as above

Same as above

NOTES:  
 Total depth = 75 feet bgs  
 Groundwater at 25-30 feet bgs  
 Hand augered to 5 feet bgs  
 The boring was initially drilled with 8-inch O.D. augers and later reamed with 10.5-inch O.D. augers.

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

B2SOIL\_AMEC\_PID\_G:\PROJECT\_DIRECTORIES\4953\2010\101561\_METRO\_WESTSIDE\_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\LIBRARY MACTEC OCT11.GLB  
 G:\PROJECT\_DIRECTORIES\4953\2010\101561\_METRO\_WESTSIDE\_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\NEUHAUS\_OCT\_21\_2011.GPT 11/29/11

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## BORING M-103 (Continued)

DATE DRILLED: 4/4/2011 - 4/7/2011  
 EQUIPMENT USED: CME-75, Jet Drilling  
 HOLE DIAMETER (in.): 10.5  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
85						
90						
95						
100						
105						
110						
115						
120						

Soil samples collected using an SPT sampler.  
 After reaming, a well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP

# BORING M-104

DATE DRILLED: 4/7/2011 - 4/27/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

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 G:\PROJECT\_DIRECTORIES\4953\2010\101561 METRO WESTSIDE EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\NEHAUS OCT 21 2011 GPT 1129711  
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ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							1.5 feet of Asphalt
						SM	SILTY SAND (sm)
	5			0.0			FINE SAND (sp) - (10YR, 6/4) light yellowish brown
	10			0.0	31	ML	FINE SAND to SILTY SAND (sm) - (10YR, 5/3) brown <u>SAN FERNANDO FORMATION (Tf)</u> SILT (ml) - (10YR, 4/3) brown, slightly moist, some oxidation staining, micaceous, trace of hairline rootlets
	15			0.0	25	ML	CLAYEY SILT (ml) - (10YR, 5/6) yellowish brown, slightly moist, oxidation staining, mottled with beige and dark brown silt, caliche nodules present Becomes (GLE Y1, 4/5G) dark greenish gray at 15.5 feet, lightly mottled with caliche nodules and lighter gray silt
	20			0.0	18	SM	▽ Groundwater encountered at 19.3 feet SANDY SILT with CLAY (ml) - (GLE Y1, 4/5G) dark greenish gray to (GLE Y1, 2.5/10GY) greenish black, slightly moist, sulfuric odor, mottled with green silt and caliche nodules, some dark brown tar staining
	25			0.0	27	ML	CLAYEY SILT (ml) - (10YR, 2/1) black, slightly moist Becomes sandier, gravel fragments present
	30			0.0	50/5"	SP	<u>TAR IMPACTED SOILS</u> FINE to MEDIUM TAR SAND (sp) - (10YR, 2.5/1) black, dry, cemented, micaceous, trace of coarse grained, tar infused
	35				45	ML	CLAYEY SILT (ml) - (GLE Y1, 3/5G) very dark greenish gray, dry to slightly moist, mottled with tar pod, caliche nodules present
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP



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## BORING M-104 (Continued)

DATE DRILLED: 4/7/2011 - 4/27/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
				0.0	79	X	CLAYEY PETROLIFEROUS SILT (ml) - black, slightly moist, tar odor, some mottling with beige colored silt
	45			0.0	75	X	TAR SAND to CLAYEY TAR SAND (sp-sm) - black, odor, sticky, pure tar in sampler
	50			0.0	50/6"	X	TAR SAND (sp-sm) - black, odor, sticky, almost pure tar
	55			0.0	50/6"	X	Same as above
	60			0.0	50/5"	X	Same as above, 2-inch zone of possible shale and/or granite fragments present
	65			0.0	50/6"	X	Same as above, very thin bone fragments present
	70						
	75						
	80						

NOTES:  
 Total depth = 66 feet bgs  
 Groundwater not encountered at time of drilling  
 Groundwater measured at 19.3 feet bgs on 4/27/2011  
 Hand augered to 6 feet bgs  
 The boring was initially drilled with 8-inch O.D. augers and later reamed with 10.5-inch O.D. augers.  
 Soil samples collected using an SPT sampler.  
 After reaming, a well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP



# BORING M-105

DATE DRILLED: 4/25/2011 - 4/26/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

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 THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.5 feet of Asphalt 0.67 feet of Concrete CLAYEY SILT to SILTY CLAY with SAND (cl-ml) - greenish black
	5			0.0	1/6"		SANDY CLAY (cl) - (10YR, 2/1) black, slightly moist
							▽ Groundwater encountered at 7.85 feet
	10			0.0	1/6"		CLAYEY SILT to SILTY CLAY with SAND (cl-ml) - (10YR, 4/3) brown, slightly moist, some mottling present
	15			0.0	12		CLAYEY SILT with SAND (ml) - (10YR, 5/4) yellowish brown, slightly moist, some oxidation staining, some mottling present
	20			0.0	19		<u>TAR IMPACTED SOIL</u> TAR SAND (sp) - black, saturated in tar, odor, sticky
	25			0.0	56		Same as above
	30			2.4	21		CLAYEY PETROLIFEROUS SILT (ml) - black, tar pods present
	35			0.0	22		SILT (ml) - greenish black, mottled, tar pods present Becomes black
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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## BORING M-105 (Continued)

DATE DRILLED: 4/25/2011 - 4/26/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
				1.0	12		SILTY CLAY to CLAYEY SILT (cl-ml) - black, saturated with tar, odor
	45			1.3	36		TAR SAND (sp) - black, liquid tar saturated, 50-80 percent tar
	50				66		Same as above
	55			30.2	61		Same as above
	60			30.6	84		Same as above
	65				55		Same as above
	70						Same as above
							According to driller, not as tight at 72.5 feet
	75				25		PETROLIFEROUS SILT (ml) - black, saturated in tar, tar odor
	80						NOTES: Total depth = 76.5 feet bgs Groundwater not encountered at time of drilling Groundwater measured at 7.85 feet bgs Hand augered to 6 feet bgs The boring was initially drilled with 8-inch O.D. augers and later reamed with 10.5-inch O.D. augers.

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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## BORING M-105 (Continued)

DATE DRILLED: 4/25/2011 - 4/26/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
85						
90						
95						
100						
105						
110						
115						
120						

Soil samples collected using an SPT sampler.  
 After reaming, a well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP

# BORING M-106

DATE DRILLED: 4/28/2011 - 4/29/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

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ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	DESCRIPTION
							0.5 feet of Asphalt 0.58 feet of Concrete
	5					CL	SILTY CLAY (cl) - (GLEY1, 2.5/N) black, stiff, moist, medium plasticity, no odor
	10				30	ML	SILT (ml) - (GLEY1, 5/2) grayish green, medium stiff, moist, trace of clay, sulfuric odor
	15				25	CL/ML	Same as above CLAYEY SILT (cl-ml) - (5Y, 3/2) dark olive gray, very stiff, slightly moist, hydrocarbon odor
	20				15	ML	<u>TAR IMPACTED SOIL</u> SILT (ml) - (5Y, 3/2) dark olive gray, very stiff, slightly moist, some clay, strong odor
	25				17		Same as above
	30				17		Becomes more clayey
	35				29	SP	Groundwater encountered at 34 feet TAR SAND (sp-sm) - (5Y, 2.5/1) fine grained, black, medium dense, damp to wet, some silt, strong odor, liquid tar
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: PK  
 Prepared By: KP

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## BORING M-106 (Continued)

DATE DRILLED: 4/28/2011 - 4/29/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
					62	☒	Becomes very dense
	45				65	☒	Becomes saturated
	50				46	☒	Becomes less dense, finer grained sand
	55				69	☒	Becomes very dense, fine grained, some medium grained sand
	60				54	☒	ML  <u>SAN FERNANDO FORMATION (T1)</u> SILT (ml) - (5Y, 2.5/1) black, hard, wet, some fine sand, strong hydrocarbon/tar odor
	65				26	☒	Becomes very stiff, less tar present
	70				24	☒	CL/ML CLAYEY SILT (cl-ml) - (5Y, 2.5/1) black, stiff, moist, strong odor, tar infused (moderate streaks)
	75				26	☒	Same as above
	80						NOTES: Total depth = 75 feet bgs Groundwater measured at 34 feet bgs Static water level measured at 18 feet bgs Hand augered to 5 feet bgs The boring was initially drilled with 8-inch O.D. augers and later reamed with 10.5-inch O.D. augers.

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: PK  
 Prepared By: KP

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## BORING M-106 (Continued)

DATE DRILLED: 4/28/2011 - 4/29/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
85						
90						
95						
100						
105						
110						
115						
120						

Soil samples collected using an SPT sampler.  
 After reaming, a well was installed. See well construction diagram for details.

Field Geol: PK  
 Prepared By: KP

# BORING M-107

DATE DRILLED: 5/4/2011 - 5/9/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

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 THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.58 feet of Asphalt 0.67 feet of Concrete
	5					ML	
	10			0.0	31	X	<u>TAR IMPACTED SOILS</u> PETROLIFEROUS SILT with CLAY (ml) - greenish brownish black, slightly moist, mottled with tar pods/blebs
	15			0.0	23	X	SP TAR SAND (sp) - (10YR, 2/2) very dark brown, slightly moist, fine to medium grained, goeey
	20			0.0	16	X	ML PETROLIFEROUS SILT with CLAY (ml) - (10YR, 2/2) very dark brown, slightly moist, hydrocarbon odor
	25				14	X	Same as above
	30				16	X	Same as above
	35			0.0	18	X	Slightly PETROLIFEROUS SILT (ml) - lighter green, dry, mottled
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP



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## BORING M-107 (Continued)

DATE DRILLED: 5/4/2011 - 5/9/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
					11	⊗	PETROLIFEROUS SILT (ml) - (10YR, 2/2) very dark brown, slightly moist
							TAR SAND (sp) - (San Pedro Formation?)
	45			0.0	76	⊗	TAR SAND (sp-sm) - (10YR, 2/2) very dark brown, fine to medium grained, trace of coarse grained
	50			0.0	49	⊗	Same as above
	55			0.0	63	⊗	Same as above
	60				89/11"	⊗	Becomes fine to coarse grained with gravel layer at 60.5 feet, gooey, clay layers present
	65			0.0	50/6"	⊗	Becomes fine to coarse grained with gravel, gooey
	70						ML
	70				50	⊗	PETROLIFEROUS SILT with CLAY (ml) - (10YR, 2/2) very dark brown, slightly moist, slightly greenish tint, some fissile, possible San Fernando Formation?
	75			0.0	37	⊗	PETROLIFEROUS SILT (ml) - (10YR, 2/2) very dark brown, slightly moist, hydrocarbon odor
	80						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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## BORING M-107 (Continued)

DATE DRILLED: 5/4/2011 - 5/9/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
				0.0	57	☒
85					46	☒
90				0.0	36	☒
95					25	☒
100				0.0	24	☒
105					31	☒
110						
115						
120						

Same as above

Same as above

Same as above

Same as above

Becomes moist, looks more black, hydrocarbon odor

Becomes clayey, possible transition to Repetto Formation

NOTES:  
 Total depth = 106.5 feet bgs  
 Groundwater apparently not encountered  
 Hand augered to 6 feet bgs  
 The boring was initially drilled with 8-inch O.D. augers and later reamed with 10.5-inch O.D. augers.  
 Soil samples collected using an SPT sampler.  
 After reaming, a well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP

# BORING M-108

DATE DRILLED: 5/2/2011 - 5/3/2011  
 EQUIPMENT USED: CME-75, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

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 AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.58 feet of Asphalt 0.75 feet of Base, fine to coarse grained 0.58 feet of Base, coarse gravel up to 2" in diameter, some cobble sized
	5						CLAYEY SILT (cl-ml) - (GLE Y1 2.5/N) black, stiff, moist, no odor  Becomes more clayey
	10				10		CLAYEY SILT (cl-ml) - (GLE Y1, 3/2) very dark greenish gray, stiff, moist, weak sulfuric odor  Becomes (2.5/1) black, strong hydrocarbon odor
	15				22		CLAYEY SILT (cl-ml) - (5Y, 2.5/1) black, very stiff, moist, some asphaltic sand, strong odor <u>TAR IMPACTED SOILS, SAN PEDRO FORMATION (Qsp)</u> SILTY SAND (sm) - (5Y, 2.5/1) black, damp, fine grained, asphaltic tar sand
	20				20		SILT (ml) - (GLE Y1, 3/N) very dark gray, very stiff, moist, strong odor
	25				15		CLAYEY SILT (cl-ml) - (5Y, 2.5/1) black, stiff, moist, strong odor
	30				9		Becomes (GLE Y1, 3/N) very dark greenish gray
	35				22		▽ FINE TAR SAND (sp) - (5Y, 2.5/1) black, medium dense, damp to wet, some silt, fine grained, strong odor
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: PK & RM  
 Prepared By: KP

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## BORING M-108 (Continued)

DATE DRILLED: 5/2/2011 - 5/3/2011  
 EQUIPMENT USED: CME-75, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	DESCRIPTION
					44	☒	Same as above
	45				45	☒	Same as above
	50				45	☒	PETROLIFEROUS SILT (ml) - (5Y, 2.5/1) black, hard, damp, strong odor
	55				69	☒	Same as above
	60				61	☒	Same as above
	65				31	☒	CLAYEY SILT (cl-ml) - (5Y, 2.5/1) black, hard, moist, some tar, strong odor
	70				50/2"	☒	SILTSTONE (ml) - dark greenish gray, strongly indurated
	75						
	80						

NOTES:  
 Total depth = 71 feet bgs, refusal  
 Groundwater measured at 35 feet bgs  
 Hand augered to 5 feet bgs  
 The boring was initially drilled with 8-inch O.D. augers and later reamed with 11.25-inch O.D. augers.  
 Soil samples collected using an SPT sampler.  
 After reaming, a nested well was installed. See well construction diagram for details.

Field Geol: PK & RM  
 Prepared By: KP

# BORING M-109

DATE DRILLED: 5/10/2011 - 5/12/2011  
 EQUIPMENT USED: CME-75, Martini Drilling  
 HOLE DIAMETER (in.): 8.5  
 ELEVATION: \*\*

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 AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.58 feet of Asphalt 0.75 feet of Base
	5					SM	
	10			0.0	21	X	SILTY SAND (sm) - (10YR, 3/3) dark brown, medium grained, tar odor
	15			0.0	17	X	ML CLAYEY PETROLIFEROUS SILT (ml) - (10YR, 2/2) very dark brown, slightly moist, hydrocarbon odor Driller notes perched water zone at approximately 15 feet due to wet sample rod.
	20			0.0	23	X	<u>TAR IMPACTED SOILS</u> Same as above, oil stringers
	25			0.0	20	X	Same as above
	30			0.0	50/6"	X	SP TAR SAND (sp) - (10YR, 2/2) very dark brown, sticky, saturated with tar, fine to medium grained
	35			0.0	29	X	Same as above
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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# BORING M-109 (Continued)

DATE DRILLED: 5/10/2011 - 5/12/2011  
 EQUIPMENT USED: CME-75, Martini Drilling  
 HOLE DIAMETER (in.): 8.5  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
				0.0	34	X	Same as above
	45			0.0	41	X	Same as above
	50			0.0	68	X	Same as above Broken shale fragments present at 51 feet
	55			0.0	87/10.5"	X	Same as above, no shale fragments present
	60			0.0	64	X	SM/ ML PETROLIFEROUS SILT (ml) to SILTY SAND (sm) - (10YR, 2/2) very dark brown, fine grained sand
	65			0.0	55	X	SP TAR SAND (sp) - (10YR, 2/2) very dark brown, fine to medium grained
	70			0.0	27	X	ML PETROLIFEROUS SILT (ml) - (10YR, 2/2) very dark brown, slightly moist, wood chip/fragment at 66 feet  Same as above, tar pods present
	75			0.0	38	X	CL SILTY PETROLIFEROUS CLAY (cl) - (10YR, 2/2) very dark brown, slightly moist, tar pods present, shale fragments at bottom of sampler
	80						

(CONTINUED ON FOLLOWING FIGURE)






Field Geol: RM  
 Prepared By: KP

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THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

## BORING M-109 (Continued)

DATE DRILLED: 5/10/2011 - 5/12/2011  
 EQUIPMENT USED: CME-75, Martini Drilling  
 HOLE DIAMETER (in.): 8.5  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
				0.0	31	
	85			0.0	32	
	90			0.0	27	
	95			0.0	29	
	100			0.0	25	
	105					
	110					
	115					
	120					

Same as above, no shale fragments present

CLAYEY PETROLIFEROUS SILT (ml) - (10YR, 2/2) very dark brown, slightly moist, tar pods present

Same as above

Same as above, no tar pods present (not noted)

Same as above

NOTES:  
 Total depth = 101.5 feet bgs  
 Groundwater apparently not encountered  
 Hand augered to 6 feet bgs  
 Backfilled with hydrated bentonite chips  
 Groundwater sample taken using disposable PVC casing and bailer.

Field Geol: RM  
 Prepared By: KP

# BORING M-110

DATE DRILLED: 5/16/2011 - 5/17/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

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ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.42 feet of Asphalt 0.5 feet of Concrete
	5						SILTY SAND (sm) - (10YR, 3/3) dark brown, moist, fine to coarse grained, gravel size fragments present
	10			0.0	5		SILTY SAND (sm) - (10YR, 3/3) dark brown, moist, fine grained, some coarse grained, some oxidation staining Becomes SANDY SILT to SILT (ml) at 10.75 feet
	15			0.0	10		SILT with SAND (ml) - (10YR, 4/3) brown, slightly moist, black organic pods present
	20			0.0	21		SANDY SILT with CLAY (ml) - (10YR, 3/2) very dark grayish brown mottled with greenish silt and dark brown silt, moist, fine to coarse sand, caliche nodules present
	25			0.0	14		CLAYEY SILT with SAND (ml) - (10YR, 3/2) very dark grayish brown and (GLEY, 4/5G) dark greenish gray, moist, mottled, caliche nodules present, tar pods present
	30			0.0	36		CLAYEY SILT with SAND (ml) - (10YR, 2/2) very dark brown, moist, fine to medium sand, some coarse sand, tar color, tar odor, tar pods present, sticky, some mottled with greenish silt, rock fragments present <u>SAN PEDRO FORMATION (Qsp)</u>
	35			0.0	29		CLAYEY SILT (ml) - (GLEY1, 2.5/10GY) greenish black, slightly moist, strong tar odor, mottled with greenish silt
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP



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## BORING M-110 (Continued)

DATE DRILLED: 5/16/2011 - 5/17/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
				0.0	38	X	Same as above
	45			0.0	42	X	Same as above
	50			0.0	48	X	<p><u>TAR IMPACTED SOILS</u></p> <p>TAR SAND (sp) - (10YR, 2/1) black, saturated in tar, fine to medium grained, tar odor, sticky</p> <p>Driller noted gravel layer at 52 feet</p>
	55			0.8	78	X	Increased strong odor, gravel fragments present
	60			0.7	52	X	Same as above, no gravel fragments present
	65			3.2	47	X	Same as above
	70			0.0	20	X	<p>CLAYEY SILT with SAND (ml) - (10YR, 3/1) very dark gray, moist, mottled with greenish silt, strong odor, tar pods present</p>
	75			0.0	90/9"	X	TAR SAND (sp) - (10YR, 2/1) black, fine to medium grained
	80						

(CONTINUED ON FOLLOWING FIGURE)


Field Geol: RM  
 Prepared By: KP

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## BORING M-110 (Continued)

DATE DRILLED: 5/16/2011 - 5/17/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
					50/5"	
	85					
	90					
	95					
	100					
	105					
	110					
	115					
	120					

Same as above

NOTES:  
 Total depth = 81 feet bgs  
 Hand augered to 6 feet bgs  
 The boring was initially drilled with 8-inch O.D. augers and later reamed with 11.25-inch O.D. augers.  
 Soil samples collected using an SPT sampler.  
 After reaming, a nested well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP

# BORING M-111

DATE DRILLED: 5/18/2011 - 5/19/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

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 AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.67 feet of Concrete
	5					ML/SM	
	10			0.0	12	X	SILT with SAND (ml/sm) - (10YR, 4/6) dark yellowish brown, moist, fine to medium sand, some oxidation staining
	15				7	X	CLAYEY SILT (ml) - (10YR, 3/3) dark brown, very moist, oxidation staining, mottled, black organic pods present
	20				6	X	▼ <u>SAN PEDRO FORMATION (Osp)</u> SILT with SAND (ml/sm) - (10YR, 3/3) dark brown, wet (saturated at 20 to 21 feet), fine to medium sand, some black organic pods present
	25				17	X	<u>TAR IMPACTED SOILS</u> TAR SAND (sp) - (10YR, 2/1) black, fine to coarse grained, mottled with greenish silt, white gravel sized grains, very sticky, very tary SILT (ml) - (10YR, 3/1) very dark gray mottled with (GLEY1, 4/5G) dark greenish gray, some gravel sized fragments, tar odor
	30				18	X	SILT (ml) - (GLEY1, 2.5/N) black, very moist, slightly mottled with greenish silt, tar odor, micaceous (muscovite) 2" fine sand layer at 30.5 feet
	35			0.0	14	X	CLAYEY SILT (ml) - (GLEY1, 2.5/10Y) greenish black, moist, micaceous (muscovite)
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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## BORING M-111 (Continued)

DATE DRILLED: 5/18/2011 - 5/19/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
				0.0	56/9"	X	CLAYEY PETROLIFEROUS SILT (ml) - (GLE Y1, 2.5/10Y) greenish black, moist, tar pods present, micaceous (muscovite) 2" layer of cemented sand with pebbles at 40.5 feet
	45			0.0	16	X	CLAYEY SILT (ml) - (GLE Y1, 2.5/10Y) greenish black, moist, micaceous (muscovite)
	50			0.0	12	X	CLAYEY SILT (ml) - (GLE Y1, 2.5/10Y) greenish black, moist, some black organic pods present, micaceous (muscovite)
	55			0.0	39	X	PETROLIFEROUS SILT (ml) to SANDY SILT (ml/sm) with pebble layer ML/SM SP TAR SAND (sp) - (10YR, 2/1) black, moist to saturated, sticky
	60			3.1	43	X	TAR SAND (sp) - (10YR, 2/1) black, saturated, fine to medium grained, some coarse grained, odor, sticky
	65			0.5	7	X	Same as above, no coarse sand present
	70			1.5	13	X	TAR SAND (sp) - (10YR, 2/1) black, fine to medium grained, gravel sized fragments present, odor, sticky, very heavy tar
	75			2.1	19	X	TAR SAND (sp) - (10YR, 2/1) black, fine to medium grained, odor, sticky, heavy tar
	80						

(CONTINUED ON FOLLOWING FIGURE)


Field Geol: RM  
 Prepared By: KP

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## BORING M-111 (Continued)

DATE DRILLED: 5/18/2011 - 5/19/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
				0.0	87/11"	
	85					
	90					
	95					
	100					
	105					
	110					
	115					
	120					

Same as above

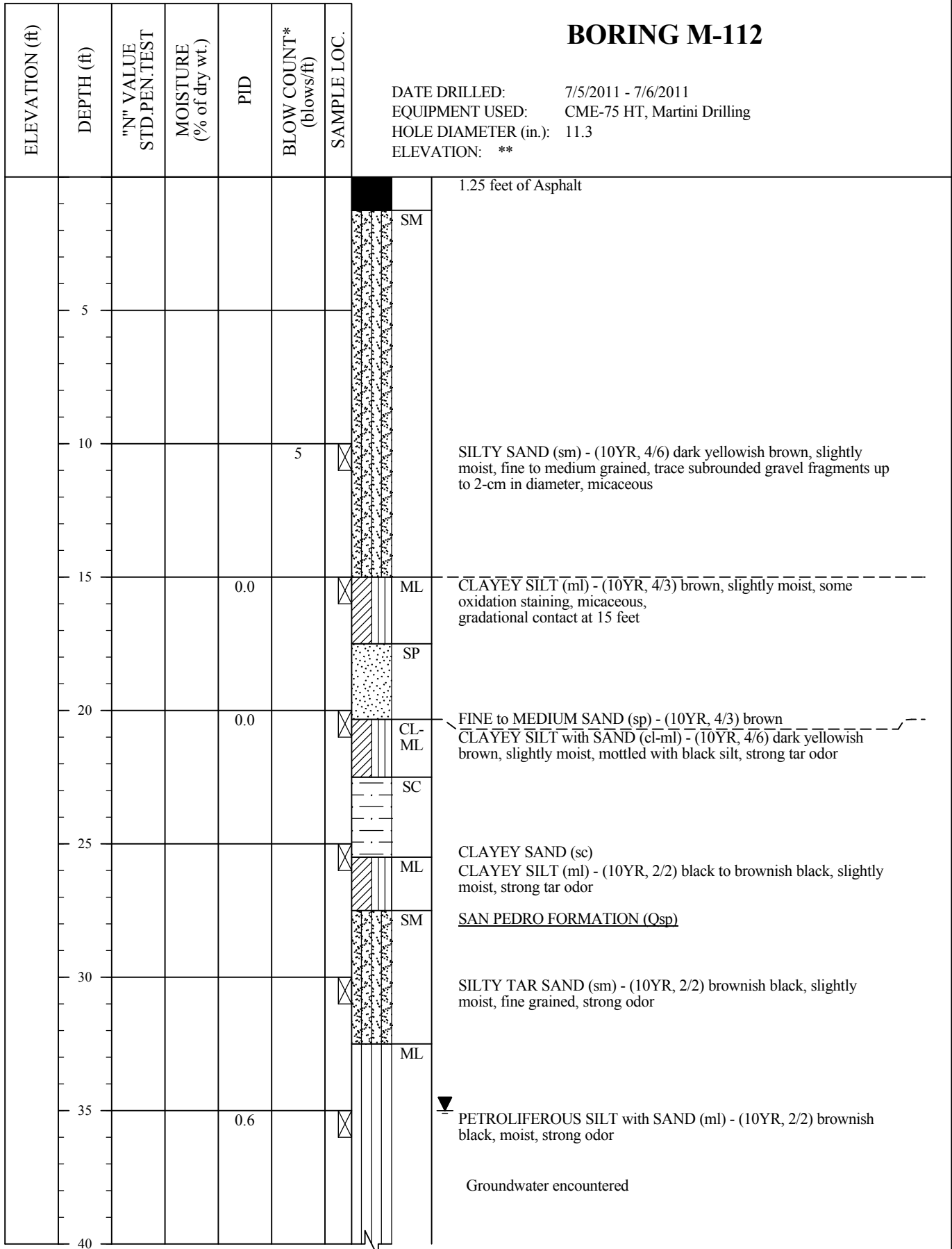
NOTES:  
 Total depth = 81.5 feet bgs  
 Groundwater encountered at 20-21.5 feet bgs  
 Hand augered to 6 feet bgs  
 The boring was initially drilled with 6-inch O.D. augers and later reamed with 11.25-inch O.D. augers.  
 Soil samples collected using an SPT sampler.  
 After reaming, a nested well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP

# BORING M-112

DATE DRILLED: 7/5/2011 - 7/6/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

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(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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## BORING M-112 (Continued)

DATE DRILLED: 7/5/2011 - 7/6/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	DESCRIPTION
						X	PETROLIFEROUS SILT (ml) - (10YR, 2/2) brownish black, moist to wet, some greenish silt mottled with petroliferous silt, strong tar odor, sticky
						X	SP <u>TAR IMPACTED SOILS</u>
	45			0.0		X	TAR SAND (sp) - (10YR, 2/2) black, slightly moist, fine to medium grained, strong odor, sticky
	50					X	Same as above
	55			0.7		X	Becomes very moist to wet, very strong tar odor, some broken gravel fragments present
	60			0.5		X	Becomes slightly moist
	65			0.3		X	Same as above
	70			1.2		X	Becomes moist
	75			7.0		X	TAR SAND (sp) - (10YR, 2/2) black, heavy tar, strong sulfuric odor, sticky
	80					X	

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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## BORING M-112 (Continued)

DATE DRILLED: 7/5/2011 - 7/6/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
				79+		⊗
	85					
	90					
	95					
	100					
	105					
	110					
	115					
	120					

No recovery due to high levels of methane escaping through the boring hole

NOTES:  
 Total depth = 80 feet bgs  
 Groundwater encountered at 35 feet bgs  
 Hand augered to 8 feet bgs  
 The boring was initially drilled with 6-inch O.D. augers and later reamed with 11.25-inch O.D. augers.  
 Soil samples collected using an SPT sampler.  
 After reaming, a nested well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP



# BORING M-113

DATE DRILLED: 5/23/2011 - 5/24/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

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 AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.42 feet of Asphalt 0.54 feet of Concrete SILTY SAND with CLAY (sm)
	5						
	10			0.0			SILTY SAND with CLAY (sm) - (10YR, 4/3) brown, slightly moist, fine to medium grained, gravel fragments present, some oxidation staining
	15			0.0			<u>SAN PEDRO FORMATION (Qsp)</u> CLAYEY SILT (ml) - (2.5Y, 4/2) dark grayish brown, slightly moist, trace coarse sand, some oxidation staining
	20			0.0			CLAYEY SILT (ml) - (GLE Y1, 3/10GY) very dark greenish gray, moist, trace sand, some black organic material present
	25			0.0			CLAYEY SILT (ml) - (GLE Y1, 3/10GY) very dark greenish gray, slightly moist
	30			0.0			Becomes mottled with greenish silt
	35			0.0			CLAYEY SILT with SAND (ml) - (GLE Y1, 2.5/5GY) greenish black, slightly moist, tar pods present, very strong odor, sticky
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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## BORING M-113 (Continued)

DATE DRILLED: 5/23/2011 - 5/24/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	Description
				0.0		X	CLAYEY SILT (ml) - (GLEYS, 2.5/5GY) greenish black, slightly moist, tar pods present
	45			0.0		X	SP  <u>TAR IMPACTED SOILS</u> TAR SAND (sp) - (10YR, 2/2) black, saturated in tar, fine to medium grained, strong odor, sticky
	50			0.0		X	Same as above
	55			0.0		X	Same as above, gravel fragments present
	60			0.0		X	TAR SAND (sp) - (10YR, 2/2) black, saturated in tar, fine to medium grained, strong odor, heavy tar
	65			0.0		X	TAR SAND (sp) - (10YR, 2/2) black, saturated in tar, fine to medium grained
	70			0.0		X	Same as above
						ML	SILT (ml) - (GLEYS) tar pods present
	75			0.0		X	SP TAR SAND (sp) - (10YR, 2/2) black, saturated, fine to medium grained, heavy tar
	80						

(CONTINUED ON FOLLOWING FIGURE)


Field Geol: RM  
 Prepared By: KP

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## BORING M-113 (Continued)

DATE DRILLED: 5/23/2011 - 5/24/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
						
	85					
	90					
	95					
	100					
	105					
	110					
	115					
	120					

TAR SAND (sp) - (10YR, 2/2) black, saturated, fine to medium grained

NOTES:  
 Total depth = 81.5 feet bgs  
 Hand augered to 6 feet bgs  
 The boring was initially drilled with 6-inch O.D. augers and later reamed with 11.25-inch O.D. augers.  
 Soil samples collected using an SPT sampler.  
 After reaming, a nested well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP

# BORING M-114

DATE DRILLED: 6/20/2011 - 6/21/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

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 THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS  
 AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.5 feet of Asphalt 0.67 feet of Concrete
	5						CLAYEY SILT with SAND (ml) - (10YR, 3/3) dark brown, slightly moist
	10			0.0	3		CLAYEY SILT (ml) - (10YR, 4/3) brown, slightly moist, slight oxidation staining, micaceous
	15			0.0	16		SILTY SAND (sm) - (10YR, 4/2) dark grayish brown, slightly moist, fine grained, oxidation staining, micaceous, crumbles easily
	20			0.0	17		CLAYEY SILT (ml) - (10YR, 4/2) dark grayish brown, slightly moist, oxidation staining, some caliche nodules present, micaceous
	25			0.0	16		Same as above
	30			0.0	9		Same as above, no caliche nodules noted
	35			0.0	18		<u>SAN PEDRO FORMATION (Qsp)</u> CLAYEY SILT with SAND (ml) - (10YR, 4/2) dark grayish brown, slightly moist, fine sand, some oxidation staining, some caliche nodules present, micaceous
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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## BORING M-114 (Continued)

DATE DRILLED: 6/20/2011 - 6/21/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	Description
				33.1	12	X	CLAYEY SILT (ml) - (GLEYS, 3/10GY) very dark greenish gray, slightly moist, micaceous
	45			7.0	11	X	Same as above
	50			0.0	13	X	SP  <u>TAR IMPACTED SOILS</u> FINE to MEDIUM SAND (sp) - (10YR, 2/2) very dark brown, slightly moist, sticky with tar, strong tar odor
	55			0.4	37	X	TAR SAND (sp) - (10YR, 2/1) black to dark brownish black, slightly moist, fine to medium grained, strong tar odor, strong sulfuric odor
	60			4.3	42	X	Becomes sticky, no sulfuric odor noted, some green silt fragments at 61 feet
	65			2.1	38	X	Same as above  Becomes wet at 66.5 feet
	70			2.3	49	X	Becomes dry
	75			1.8	31	X	TAR SAND (sp) - (10YR, 2/1) black, dry to wet, fine grained, strong tar odor, sticky Becomes wet (again) at 76.5 feet, strong sulfuric odor
	80					X	ML

(CONTINUED ON FOLLOWING FIGURE)


Field Geol: RM  
 Prepared By: KP

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## BORING M-114 (Continued)

DATE DRILLED: 6/20/2011 - 6/21/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
	85			0.0	22	
	90					
	95					
	100					
	105					
	110					
	115					
	120					

CLAYEY SILT (ml) - (GLEY1, 4/10GY) dark greenish gray, slightly moist (pen is dry), micaceous, strong sulfuric odor'

NOTES:  
 Total depth = 81.5 feet bgs  
 Hand augered to 6 feet bgs  
 The boring was initially drilled with 6-inch O.D. augers and later reamed with 11.25-inch O.D. augers.  
 Soil samples collected using an SPT sampler.  
 After reaming, a nested well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP

# BORING M-115

DATE DRILLED: 6/13/2011 - 6/14/2011  
 EQUIPMENT USED: Marl M-12, Gregg Drilling  
 HOLE DIAMETER (in.): 10.5  
 ELEVATION: \*\*

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 AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.5 feet of Asphalt 0.67 feet of Concrete
	5						SILTY SAND (sm) - (10YR, 3/4) dark yellowish brown, slightly moist
	10				10		Same as above
	15				23		SILTY CLAY (cl) - (10YR, 4/3) brown, slightly moist, mottled with caliche nodules up to 0.5-inches long
	20				22		FINE SAND with SILT (sp) - (10YR, 4/2) dark grayish brown, slightly moist, micaceous
	25				23		FINE SAND (sp) - (10YR, 4/2) dark grayish brown, slightly moist, micaceous
	30				12		<u>SAN PEDRO FORMATION (Qsp)</u> CLAYEY SILT (cl-ml) - (10YR, 4/1) dark gray, slightly moist, micaceous
	35				28		SILTY CLAY (cl) - (GLEY1, 3/10Y) very dark greenish gray, slightly moist FINE SAND (sp) - (GLEY1, 3/10Y) very dark greenish gray, slightly moist
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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## BORING M-115 (Continued)

DATE DRILLED: 6/13/2011 - 6/14/2011  
 EQUIPMENT USED: Marl M-12, Gregg Drilling  
 HOLE DIAMETER (in.): 10.5  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
					28		CLAYEY SILT (cl-ml) - (GLEY1, 3/5GY) very dark greenish gray, slightly moist, caliche nodules present
	45				33		Same as above
	50				28		Becomes dry, mottled with caliche
	55				18		CLAYEY SILT (cl-ml) - (GLEY1, 2.5/10Y) greenish black, very moist, micaceous FINE to COARSE SAND (sp) - (GLEY1, 2.5/10Y) greenish black, wet, micaceous, subrounded rock fragments up to 1-inch long present Groundwater at 55.5 feet
	60				29		CLAYEY SILT (cl-ml) - (GLEY1, 2.5/10Y) greenish black, wet FINE to COARSE SAND (sp) - (GLEY1, 2.5/10Y) greenish black, wet, micaceous
	65				36		CLAYEY SILT (cl-ml) - (GLEY1, 3/10Y) very dark greenish gray, dry, caliche nodules present
	70				20		SILTY SAND (sm) to FINE SAND (sp) - (GLEY1, 4/10Y) dark greenish gray, very moist, fine grained
	75				34		FINE to MEDIUM SAND (sp) - (GLEY1, 4/10Y) dark greenish gray, wet, strong sulfuric odor Same as above
	80						NOTES: Total depth = 75 feet bgs Groundwater encountered at 55.5 feet bgs Hand augered to 6 feet bgs The boring was initially drilled with 6-inch O.D. augers and later reamed with 10.5-inch O.D. augers.

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP



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## BORING M-115 (Continued)

DATE DRILLED: 6/13/2011 - 6/14/2011  
 EQUIPMENT USED: Marl M-12, Gregg Drilling  
 HOLE DIAMETER (in.): 10.5  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
85						
90						
95						
100						
105						
110						
115						
120						

Soil samples collected using an SPT sampler.  
 After reaming, a nested well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP

# BORING M-116

DATE DRILLED: 6/8/2011 - 6/10/2011  
 EQUIPMENT USED: CME-95, Gregg Drilling  
 HOLE DIAMETER (in.): 10.5  
 ELEVATION: \*\*

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 AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.33 feet of Asphalt 0.67 feet of Concrete CLAYEY SILT (cl-ml) - (2.5/1) black, medium stiff, moist, no odor
	5						
	10			0.0	18		Becomes (7.5YR, 4/3) brown, very stiff
	15			0.0	28		SANDY SILT (ml) - (10YR, 4/6) dark yellowish brown, medium stiff, moist
	20			0.0	31		SILTY CLAY (cl-ml) - (10YR, 3/6) dark yellowish brown, hard, moist (to very moist at 21 feet), medium plasticity
	25			0.0	22		CLAYEY SILT (cl-ml) - (5Y, 6/2) light olive gray, very stiff, moist, some coarse sand
	30			0.0	21		Becomes olive in color, no sand present
	35			0.0	13		<u>SAN PEDRO FORMATION (Qsp)</u> SILTY CLAY (cl) - GLEY1, 4/1) dark greenish gray, stiff, moist, medium plasticity, no odor
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: PK & RM  
 Prepared By: KP

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## BORING M-116 (Continued)

DATE DRILLED: 6/8/2011 - 6/10/2011  
 EQUIPMENT USED: CME-95, Gregg Drilling  
 HOLE DIAMETER (in.): 10.5  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
				0.0	22		Same as above, trace of coarse sand
	45			0.0	50	CL/ ML	CLAYEY SILT (cl-ml) - (GLEY1, 3/1) greenish gray, hard, moist
						ML	SILT (ml) - (GLEY1, 5/1) greenish gray, hard, moist, some fine sand, mottled
	50			0.0	15	CL/ ML	CLAYEY SILT (cl-ml) - (GLEY1, 4/1) dark greenish gray, stiff, damp to very moist, no odor
						SM	∇ Saturated at 52 feet
	55			0.0	52		SILTY SAND (sm) - (GLEY 4) dark greenish gray, very dense, wet, fine grained
						ML	SILT (ml) - (GLEY1, 4/1) dark greenish gray, very dense, wet, some fine sand
	60			0.0	76		Same as above, clay present at bottom of sampler 1.5-inch rock fragment present at 66 feet
	65			0.0	51		
						SP	FINE SAND (sp) - (GLEY1, 4/1) dark greenish gray, very dense, wet
	70			0.0	67		
	75			0.0	42		Same as above
	80					CL/	

(CONTINUED ON FOLLOWING FIGURE)


Field Geol: PK & RM  
 Prepared By: KP

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## BORING M-116 (Continued)

DATE DRILLED: 6/8/2011 - 6/10/2011  
 EQUIPMENT USED: CME-95, Gregg Drilling  
 HOLE DIAMETER (in.): 10.5  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
				0.0	44	 ML
	85					
	90					
	95					
	100					
	105					
	110					
	115					
	120					

CLAYEY SILT (cl-ml) - (GLEYS, 4/1) dark greenish gray, hard, damp to moist, some coarse sand, mottled at 80.5 feet

NOTES:  
 Total depth = 81 feet bgs  
 Groundwater encountered at 52 feet bgs  
 Hand augered to 5 feet bgs  
 The boring was initially drilled with 8-inch O.D. augers and later reamed with 10.5-inch O.D. augers.  
 Soil samples collected using an SPT sampler.  
 After reaming, a nested well was installed. See well construction diagram for details.

Field Geol: PK & RM  
 Prepared By: KP

# BORING M-119

DATE DRILLED: 1/18/2011 - 1/20/2011  
 EQUIPMENT USED: CME-75, Jet Drilling  
 HOLE DIAMETER (in.): 10  
 ELEVATION: \*\*

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 THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							0.5 feet of Asphalt <u>FILL</u> SILTY SAND with Asphalt (sm) - asphalt and gravel fragments present
	5						
	10			0.0	27	X	SILTY SAND with GRAVEL (sm) - (10YR, 3/3) dark brown, slightly moist, some asphalt fragments present, siltier zone at top of sampler
	15			0.0	20	X	<u>NATIVE ALLUVIUM (Qal)</u>  SILT (ml) - (10YR, 3/2) dark brown, slightly moist, mottled, oxidation staining
	20			0.0	16	X	Same as above, with caliche nodules present
	25			0.0	32	X	Becomes more dense
	30			0.0	24	X	SANDY SILT to SILT (sm/ml) - (10YR, 4/4) dark yellowish brown, slightly moist, fine sand, mottled with oxidation staining
	35			0.0	28	X	▽ <u>LAKWOOD FORMATION (Qlw)</u> SILT (ml) - (2.5Y, 4/3) olive brown, wet, trace of sand, mottled with oxidation staining, micaceous
	40						

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

## BORING M-119 (Continued)

DATE DRILLED: 1/18/2011 - 1/20/2011  
 EQUIPMENT USED: CME-75, Jet Drilling  
 HOLE DIAMETER (in.): 10  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
45				0.0	75	SP
50						
55				0.0	50/6"	SP
60						
65				0.0	80	SP
70						
75				0.0	68	SP
80						

FINE SAND to SILTY FINE SAND (sp) - (GLE Y1, 4/5GY) dark greenish gray, wet, micaceous

SILTY SAND with GRAVEL (sp) - greenish gray, mottled with rounded gravel and broken shale fragments, orthoclase, mottled with reddish brown silt, possible Basil scour zone

FINE SAND (sp) - (GLE Y1 4/10GY) dark greenish gray, wet, some gravel fragments, micaceous

FINE SAND (sp) - (GLE Y1, 4/10Y) dark greenish gray, wet

**NOTES:**

Total depth = 76 feet bgs  
 Groundwater encountered at 35 feet bgs  
 Hand augered to 6.5 feet bgs  
 The boring was drilled with 10-inch O.D. augers and later reamed with 11.25-inch O.D. augers.

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

B2SOIL\_AMEC\_PID\_G:\PROJECT\_DIRECTORIES\4953\2010\101561\_METRO\_WESTSIDE\_EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\LIBRARY\_MACTEC\_OCT11.GLB  
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## BORING M-119 (Continued)

DATE DRILLED: 1/18/2011 - 1/20/2011  
 EQUIPMENT USED: CME-75, Jet Drilling  
 HOLE DIAMETER (in.): 10  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.
85						
90						
95						
100						
105						
110						
115						
120						

A nested well was installed. See well construction diagram for details.

Field Geol: RM  
 Prepared By: KP

# BORING M-122

DATE DRILLED: June 22, 2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

B2SOIL AMEC PID G:\PROJECT\_DIRECTORIES\4953\2010\101561 METRO WESTSIDE EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\LIBRARY MACTEC OCT11.GLB  
 G:\PROJECT\_DIRECTORIES\4953\2010\101561 METRO WESTSIDE EXTENSION\6.2.3.5 SUBSURFACE GAS\3.2 ALL FIELD NOTES\NEHAUS OCT 21 2011 GPT 1129711  
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ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							1 foot of Asphalt
						SM	SILTY SAND (sm) with broken gravel fragments and fill
	5					CL	
	10			0.0	3		SILTY CLAY (cl) - (10YR, 3/3) dark brown, slightly moist, soft caliche nodules present, micaceous
	15			0.0	3		SILTY CLAY (cl) - (10YR, 3/4) dark yellowish brown, soft, slightly moist, micaceous
	20			0.0	21	SP	FINE SAND (sp) - (10YR, 3/3) dark brown, slightly moist, 2-inch broken gray shale fragment
	25			0.0	22		FINE TO COARSE SAND with SILT (sm/sp) - (10YR, 3/2) very dark grayish brown, dry, angular to subrounded broken gray shale fragments
	30			0.0	23	SM	SILTY SAND (sm) - (10YR, 3/3) dark brown, dry, fine to coarse grained, angular to subrounded broken gray shale fragments "shale sand"
	35			0.0	15		Same as above
	40					SM/ML	

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP



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## BORING M-122 (Continued)

DATE DRILLED: June 22, 2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
				0.0	11		CLAYEY SILTY SAND (ml/sm) - (10YR, 3/3) dark brown, dry, fine to medium grained, angular to subrounded broken shale fragments
	45			0.0	10		CLAYEY SILT with SAND (ml/sm) - (10YR, 3/3) dark brown, soft, slightly moist, fine to coarse grained, broken shale fragments
							SM
	50			0.0	23		SILTY SAND (sm) - (10YR, 3/2) very dark grayish brown, dry, fine to coarse grained, angular to subrounded broken shale fragments
							ML
	55			0.0	25		SILT (ml) - (10TR, 3/3) dark brown SILTY SAND (sm) - (10YR, 3/3) dark brown, very moist to wet, fine grained, micaceous
							SM
							SP
	60			0.0	33		FINE TO COARSE SAND (sp) - (10YR, 3/2) very dark grayish brown, wet, micaceous
	65			0.0	15		CLAYEY SILT (ml) - (10YR, 3/3) dark brown, wet, micaceous
							ML
							ML
	70			0.0	68		SILT (ml) SILTY SAND (sm) - (10YR, 3/3) dark brown, wet, fine grained, some coarse grained, angular to subrounded fragmented gravel, micaceous
							SM
							ML
	75			0.0	14		CLAYEY SILT (ml) - (10YR, 3/3) dark brown, very moist, some oxidation staining, caliche nodules present, micaceous
							SM
	80						

▽ Groundwater encountered at 58.55 feet

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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# BORING M-122 (Continued)

DATE DRILLED: June 22, 2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
				0.0	48		SILTY SAND to SANDY SILT (sm) - (10YR, 3/3) dark brown, very moist to wet, fine to medium grained, micaceous
	85			0.0	53		Becomes wet, fine grained, some oxidation staining present
	90			0.0	33		CLAYEY SILT with FINE to MEDIUM SAND (sm/ml) - (10YR, 3/3) dark brown, very moist to wet, some oxidation staining, micaceous
	95			0.0	17		CLAYEY SILT (ml) - (10YR, 4/2) dark grayish brown, very moist to wet, micaceous  Substrate becomes hard to drill from 97 to 99 feet
	100			0.0	72		SILT (ml) - (10YR, 3/3) dark brown, wet, FINE to MEDIUM SAND (sp) - (10YR, 3/3) dark brown, wet, micaceous
	105						NOTES: Total depth = 101.5 feet bgs Groundwater encountered at 58.55 feet bgs Hand augered to 6 feet bgs The boring was initially drilled with 6-inch O.D. augers and later reamed with 11.25-inch O.D. augers. Soil samples collected using an SPT sampler. After reaming, a well was installed. See well construction diagram for details.
	110						
	115						
	120						

Field Geol: RM  
 Prepared By: KP

# BORING M-124

DATE DRILLED: 6/27/2011 - 6/28/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

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ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							(approx) 0.5 feet of Asphalt SANDY SILT (ml/sm) - (10YR, 3/4) dark yellowish brown, dry, fine sand
	5						ML
	10			0.0	28	X	CLAYEY SILT with SAND (ml) - (10YR, 3/3) dark brown, dry, trace of coarse sand, trace of angular to subrounded broken gray shale fragments less than 1 cm in diameter
	15			0.0	19	X	FINE SAND (sp) - (10YR, 3/4) dark yellowish brown, dry, micaceous CLAYEY SILT (ml) - (10YR, 3/6) dark yellowish brown, slightly moist, micaceous, some dark brown to black organic pods present
	20			0.0	31	X	CLAYEY SILT with SAND (ml) - (10YR, 3/2) very dark grayish brown, dry to slightly moist, some coarse sand, some angular to subrounded broken shale fragments less than 1 cm in diameter, micaceous
	25			0.0	50	X	SILTY SAND with Shale fragments (sm) - (10YR, 3/2) very dark grayish brown, dry, fine to coarse grained, broken shale fragments up to 1 inch in diameter, micaceous
	30			0.0	44	X	Same as above
	35			0.0	35	X	Same as above
	40						ML

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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## BORING M-124 (Continued)

DATE DRILLED: 6/27/2011 - 6/28/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
				0.0	13		CLAYEY SILT (ml) - (10YR, 4/3) dark yellowish brown, slightly moist, some medium sand, micaceous
	45			0.0	15		FINE SAND (sp) - (10YR, 4/3) brown, slightly moist, micaceous SILT (ml) - (10YR, 4/3) brown, slightly moist, micaceous
	50			0.0	33		FINE SAND to SILTY SAND (sp/sm) - (10YR, 4/2) dark grayish brown, micaceous
	55			0.0	20		FINE SAND (sp) - (10YR, 4/2) dark grayish brown, slightly moist, micaceous 2-inch layer of Silt at 55.5 feet
	60			0.0	25		SANDY SILT to SILTY SAND (sm) - (10YR, 4/4) dark yellowish brown, slightly moist, fine sand, micaceous
	65			0.0	45		▽ SILTY SAND with Shale gravel fragments (sm) - (10YR, 3/4) dark yellowish brown, moist, fine to coarse grained, subangular to subrounded shale fragments up to 1 inch in diameter Groundwater encountered at 65.6 feet
	70			0.0	74		Becomes wet
	75			0.0	57		Same as above
	80						CL

(CONTINUED ON FOLLOWING FIGURE)

Field Geol: RM  
 Prepared By: KP

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## BORING M-124 (Continued)

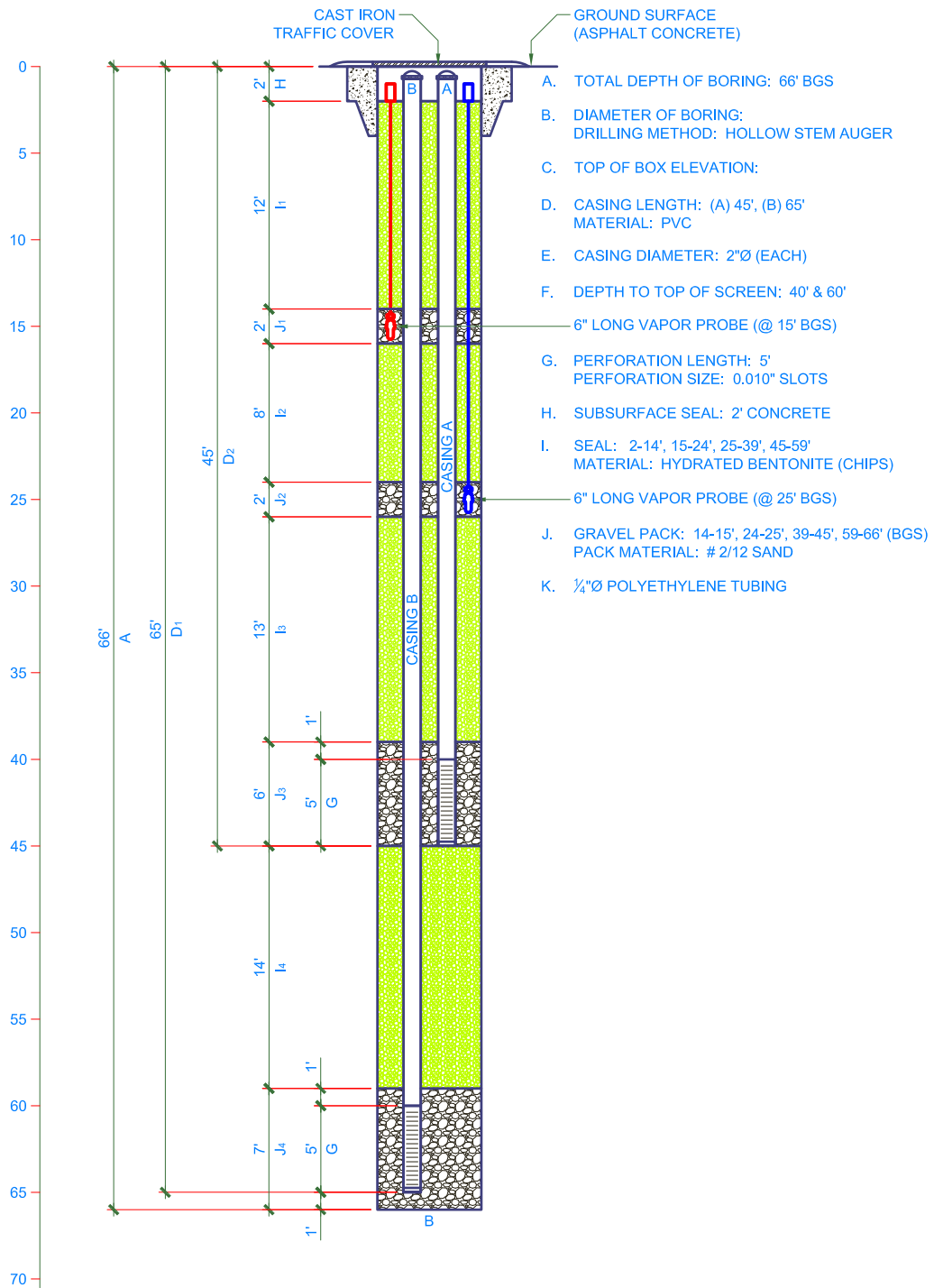
DATE DRILLED: 6/27/2011 - 6/28/2011  
 EQUIPMENT USED: CME-75 HT, Martini Drilling  
 HOLE DIAMETER (in.): 11.3  
 ELEVATION: \*\*

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	PID	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
				0.0	16		SILTY CLAY (cl) - (10YR< 3/6) dark yellowish brown, very moist to wet, micaceous
	85			0.0	50/4"		SILTY SAND with Shale gravel fragments (sm) - (10YR, 3/4) dark yellowish brown, wet, fine to coarse grained, angular to subrounded shale fragments up to 1 inch in diameter
	90			0.0	41		SANDY SILT (ml/sm) - (10YR, 3/4) dark yellowish brown, wet, fine to coarse sand, trace of gravel fragments
	95			0.0	32		SILTY CLAY (cl-ml) - (10YR, 3/6) dark yellowish brown, moist to very moist, micaceous
	100			0.0	46		Same as above
	105						NOTES: Total depth = 101.5 feet bgs Groundwater encountered at 65.6 feet bgs Hand augered to 6 feet bgs The boring was initially drilled with 6-inch O.D. augers and later reamed with 11.25-inch O.D. augers. Soil samples collected using an SPT sampler. After reaming, a well was installed. See well construction diagram for details.
	110						
	115						
	120						

Field Geol: RM  
 Prepared By: KP

**FIGURES B-3.0 THROUGH B-3.24  
GAS MONITORING WELL DIAGRAMS (ACE PHASE)**

# TYPICAL SOIL GAS MONITORING WELL CONSTRUCTION DIAGRAM



Vertical Scale: 1" = 10'-0"  
Horizontal Scale Exaggerated



AMEC Environment & Infrastructure  
5628 E. Slauson Avenue, Los Angeles, California 90040  
Phone (323) 889-5300 Fax (323) 889-5398

WELL NO.:	N/A	DRAWN:	L. Morley
INSTALLED:	N/A	CHKD:	J. Neuhaus
SCALE:	1" = 10' Vertical	DATE:	October, 2011
DRILL CO.:	N/A	TECHNIQUE:	Hollow Stem
FIELD PERSONNEL:	N/A		
PROJECT NAME:	MTA Westside Subway Extension		
WELL LOCATION:	Los Angeles, CA		

MTA WESTSIDE SUBWAY EXTENSION  
Parsons Brinckerhoff Americas, Inc.

WELL CONSTRUCTION  
DETAIL  
Methane Gas Monitoring Well

FIGURE NO.

**B-3.0**

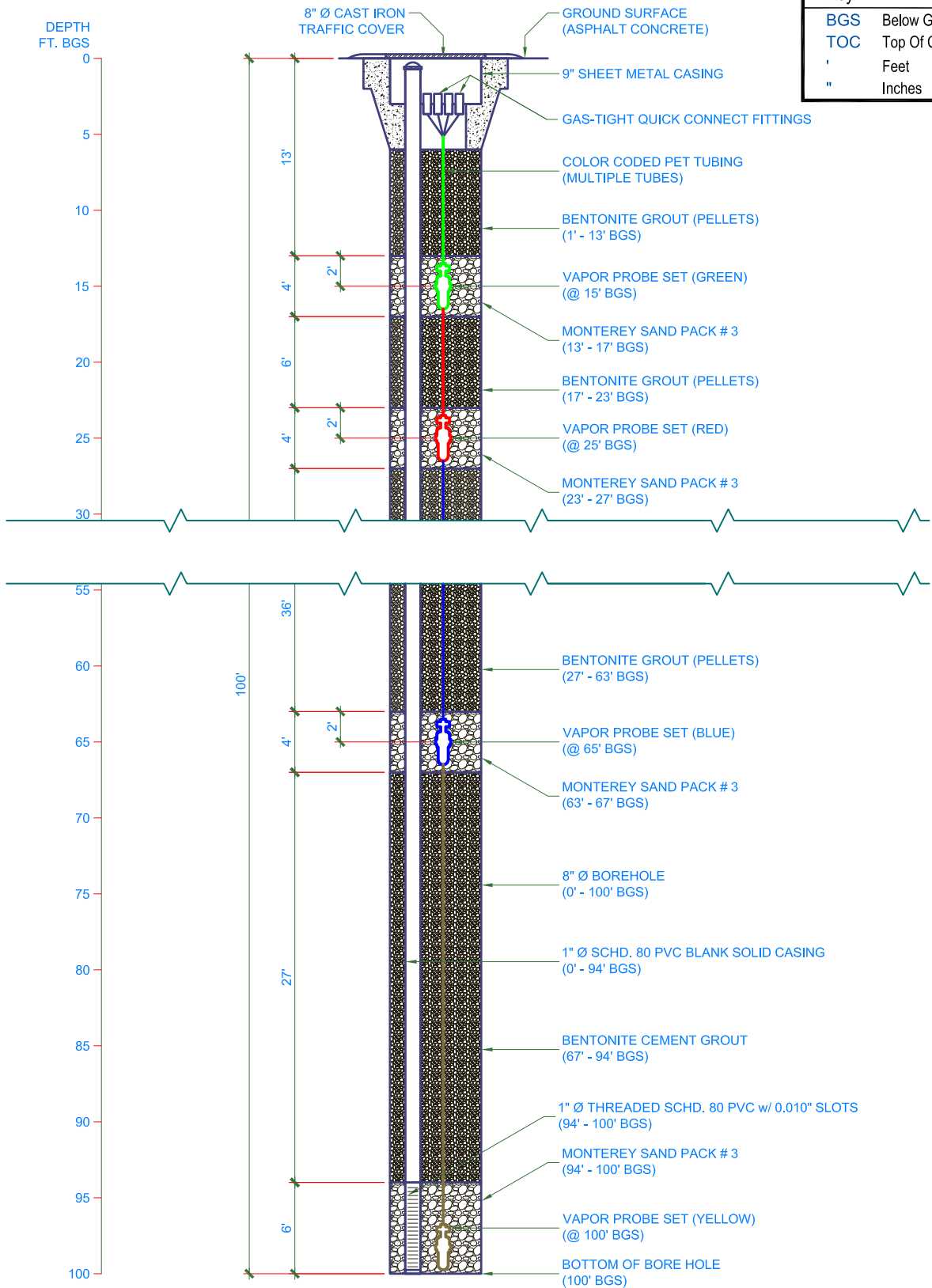
PROJECT NO.  
4953-10-1561

# BORING M-1 MONITORING WELL DETAIL

## METHANE

Vertical Scale: 1" = 10'-0"  
Horizontal Scale Exaggerated

Key	
BGS	Below Ground Surface
TOC	Top Of Casing
'	Feet
"	Inches



AMEC Environment & Infrastructure  
5628 E. Slauson Avenue, Los Angeles, California 90040  
Phone (323) 889-5300 Fax (323) 889-5398

WELL NO.:	M-1	DRAWN:	L. Morley
INSTALLED:	05/19/2009	CHKD:	Jag
SCALE:	1" = 10' Vertical	DATE:	December 2, 2011
DRILL CO.:	Cascade Drilling	TECHNIQUE:	Hollow Stem
FIELD PERSONNEL:	Rachel Mills / Curtis Welty		
PROJECT NAME:	MTA Westside Subway Extension		
WELL LOCATION:	Wilshire & South Arden, Los Angeles, CA		

MTA WESTSIDE SUBWAY EXTENSION  
Parsons Brinckerhoff

WELL CONSTRUCTION  
DETAIL  
Methane Gas Monitoring Well

FIGURE NO.

**B-3.1**

PROJECT NO.

4953-11-1421