APPENDIX A
WELL CONSTRUCTION DATA
Key to Exploration Logs

Sample Description
Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency
Soil density/consistency in borings is related primarily to the Standard Penetration Resistance.
Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

<table>
<thead>
<tr>
<th>SAND or GRAVEL</th>
<th>Penetration Resistance (N) in Blows/foot</th>
<th>SILT or CLAY</th>
<th>Penetration Resistance (N) in Blows/foot</th>
<th>Approximate Shear Strength in TSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td></td>
<td>Consistency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very loose</td>
<td>0 – 4</td>
<td>Very soft</td>
<td>0 – 2</td>
<td>&lt;0.125</td>
</tr>
<tr>
<td>Loose</td>
<td>4 – 10</td>
<td>Soft</td>
<td>2 – 4</td>
<td>0.125 – 0.25</td>
</tr>
<tr>
<td>Medium dense</td>
<td>10 – 30</td>
<td>Medium stiff</td>
<td>4 – 8</td>
<td>0.5 – 1.0</td>
</tr>
<tr>
<td>Dense</td>
<td>30 – 50</td>
<td>Stiff</td>
<td>8 – 15</td>
<td>1.0 – 2.0</td>
</tr>
<tr>
<td>Very dense</td>
<td>&gt;50</td>
<td>Very stiff</td>
<td>15 – 30</td>
<td>&gt;2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hard</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Moisture
Dry    Little perceptible moisture
Damp   Some perceptible moisture, probably below optimum
Moist  Probably near optimum moisture content
Wet    Much perceptible moisture, probably above optimum

Minor Constituents
Not identified in description 0 – 5
Slightly (clayey, silty, etc.) 5 – 12
Clayey, silty, sandy, gravelly 12 – 30
Very (clayey, silty, etc.) 30 – 50

Legends

Sampling Test Symbols

BORING SAMPLES
- Split Spoon
- Shelby Tube
- Cuttings
- Core Run

TEST PIT SAMPLES
- Grab (Jar)
- Shelby Tube
- Bag
- Bucket Sample

* No Sample Recovery
P Tube Pushed, Not Driven

Test Symbols

GS  Grain Size Classification
CN  Consolidation
TU Unconfined Unconsolidated Undrained
TCU Triaxial Consolidated Undrained
TCD Triaxial Consolidated Drained
QU Unconfined Compression
DS  Direct Shear
K  Permeability
PP  Pocket Penetrometer
    Approximate Compressive Strength in TSF
TV  Torvane
    Approximate Shear Strength in TSF
CBR  California Bearing Ratio
MD  Moisture Density Relationship
AL  Atterberg Limits

Groundwater Observations

- Monument
- Concrete Surface Seal
- Borehole
- Riser Pipe
- Cement/Bentonite Grout
- Bentonite Chips
- Water Level at Time of Drilling
- 10/20 Sand Pack
- Screen Section
- Native Material
- Pea Gravel

Water Content In Percent
Liquid Limit
Natural Plastic Limit
Plastic Limit

CA  Chemical Analysis

HARTCROWER
J-2844-73 5/01
Figure A-1
## Boring Log and Construction Data for Monitoring Well CL-MW-1

### Geologic Log

<table>
<thead>
<tr>
<th>Sample</th>
<th>N</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>73</td>
<td>0</td>
</tr>
<tr>
<td>S-2</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>S-3</td>
<td>73/8</td>
<td>0</td>
</tr>
<tr>
<td>S-4</td>
<td>50/3</td>
<td>NA</td>
</tr>
<tr>
<td>S-5</td>
<td>41</td>
<td>0</td>
</tr>
<tr>
<td>S-6</td>
<td>73/9</td>
<td>0</td>
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<tr>
<td>S-7</td>
<td>57</td>
<td>1</td>
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<tr>
<td>S-8</td>
<td>68/9</td>
<td>0</td>
</tr>
<tr>
<td>S-9</td>
<td>79</td>
<td>0</td>
</tr>
<tr>
<td>S-10</td>
<td>53/9</td>
<td></td>
</tr>
<tr>
<td>S-11</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>S-12</td>
<td>87/10</td>
<td></td>
</tr>
</tbody>
</table>

Approx. Floor Surface
Elevation in Feet: 2004.8

Very dense to dense, damp, brown to gray-black, slightly silty to silty, sandy GRAVELS and COBBLES.

Bottom of Boring at 92.0 Feet. Completed 11/27/91.

### Monitoring Well Design

Casing Stickup in Feet: 0
Top of PVC in Feet: 2004.78

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1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well DW-MW-1

Geologic Log

Approx. Ground Surface
Elevation in Feet 2000

Sample N PID

<table>
<thead>
<tr>
<th>Sample</th>
<th>N</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>41</td>
<td>32</td>
</tr>
<tr>
<td>S-2</td>
<td>11</td>
<td>26</td>
</tr>
<tr>
<td>S-3</td>
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<td>70</td>
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<tr>
<td>S-4</td>
<td>19</td>
<td>350</td>
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<tr>
<td>S-5</td>
<td>76</td>
<td>3</td>
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<td>S-6</td>
<td>49</td>
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<td>S-7</td>
<td>39</td>
<td>0</td>
</tr>
<tr>
<td>S-8</td>
<td>26</td>
<td>0</td>
</tr>
</tbody>
</table>

Medium dense to dense, moist to wet, slightly clayey, sandy GRAVEL.

Dense to very dense, damp to wet, brown, sandy GRAVEL.

Medium dense to dense, moist to wet, brown, slightly clayey, sandy GRAVEL.

Bottom of Boring at 74.0 Feet.
Completed 2/29/91.

Monitoring Well Design
Casing Stickup in Feet = 0.38
Top of PVC in Feet 1999.62

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well HL-MW-1

Geologic Log

Approx. Ground Surface
Elevation in Feet 2002.7

0

Depth in Feet

Sample N PID

Damp to dry, dark brown to light brown, very sandy GRAVEL.

Dry, brown, very gravelly SAND with traces of silt.

Dry, light brown, sandy to very sandy GRAVEL.

Very dense, damp to wet, brown and black with orange mottling, very gravelly SAND.

Dense, wet, gray-black, sandy GRAVEL.

Bottom of Boring at 84.0 Feet.
Completed 12/14/90.

S-1  70  <1
S-2  <1
S-3  46  70
BS-1  8

Casing Stickup in Feet 1.70
Top of PVC in Feet 2004.38

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well HL-MW-2

Geologic Log

Approx. Ground Surface
Elevation in Feet: 2003.3

Sample N PID

Damp to dry, brown to light brown, very sandy GRAVEL.

Dry, brown to light brown, sandy GRAVEL.

Very dense to dense, damp to wet, brown to black, sandy GRAVEL.

Bottom of Boring at 86.0 Feet.
Completed 12/16/90.

Monitoring Well Design
Casing Stickup in Feet: 1.6
Top of PVC in Feet: 2004.94

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well HL-MW-3

Geologic Log

Approx. Ground Surface
Elevation in Feet 2003.2

Depth in Feet

- Damp, brown, slightly silty, sandy GRAVEL.
- Damp, dark brown, silty, gravelly SAND.
- Dry, light brown, slightly sandy to sandy GRAVEL.
- Dense, dry to wet, brown with orange stains, slightly silty, sandy GRAVEL.
- Bottom of Boring at 84.0 Feet. Completed 6/9/91.

Sample | PID |
-------|-----|
S-1    | 50/5| 1.5 |
S-2    | 50  | 1.5 |
S-3    | NR  | 1.5 |
S-4    | 46  | ≤ 1 |

Monitoring Well Design
Casing Stickup in Feet 3.0
Top of PVC in Feet 2006.18

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATO) or for date specified. Level may vary with time.
   NR: Not recorded due to repositioning of sampler.
Boring Log and Construction Data for Monitoring Well HL-MW-4

Geologic Log

Approx. Ground Surface
Elevation in Feet 2003.4

Sample N
PID

0
10
20
30
40
50
60
70
80
90
100

Depth
Feet

Damp, brown, gravelly, silty SAND. (FILL)

Damp to dry, silty, sandy GRAVEL becoming sandier with depth.

(Dense) dry, gray, silty, gravelly SAND.

Dense to very dense, moist to wet, brown with orange stains, very sandy to sandy GRAVEL.

Bottom of Boring at 84.0 Feet. Completed 6/7/91.

S-1 50/5 ≤ 1
S-2 76 ≤ 1
S-3 50/5 ≤ 1
S-4 47 ≤ 1

Monitoring Well Design
Casing Stickup in Feet 2.6
Top of PVC in Feet 2006.00

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well HL-MW-5

Geologic Log

Approximate Ground Surface
Elevation in Feet: 2003.5

Depth in Feet

<table>
<thead>
<tr>
<th>Sample</th>
<th>N</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
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</tr>
<tr>
<td>S-2</td>
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<td>S-5</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>S-6</td>
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<tr>
<td>S-7</td>
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<td>S-8</td>
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<td>0</td>
</tr>
<tr>
<td>S-9</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

Dry, brown, sandy GRAVEL.

Dry, brown, slightly silty, sandy GRAVEL.

Dry, brown, slightly silty, gravelly SAND.

Dry, brown, slightly silty, sandy GRAVEL.

Grades coarser.

Monitoring
Well Design

Casing Stickup in Feet: 2.4
Top of PVC in Feet 2005.89

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well HL-MW-5

Geologic Log

Approximate Ground Surface
Elevation in Feet: 2003.5

Dry, brown, slightly silty, sandy GRAVEL.

Becomes damp.

Dense to very dense, wet, brown, slightly sandy GRAVEL.

Bottom of Boring at 96.0 Feet.
Completed 8/23/95.

2-inch-diameter, 0.020-inch machine-slotted PVC screen from 93 to 95 feet.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well HL-MW-6

Geologic Log

Approximate Ground Surface
Elevation in Feet: 1999.4

Medium dense to dense, damp, slightly silty, sandy GRAVEL.

Sample N
S-1  41
S-2  52
S-3  52
S-4
S-5  37
S-6  10/12
S-7  37
S-8  65
S-9  82
S-10 29
S-11
S-12  45

Bottom of Boring at 78.0 Feet.
Completed 11/28/98.
Abandoned 2/26/99.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

Monitoring
Well Design
Casing Stickup in Feet: -0.16
Top of Casing in Feet 1999.24

HARTCROWSER
J-2644-80-OR 10/98
Figure A-9
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
### Monitoring Well Log HL-MW-7S

**Soil Descriptions**

- Brown, silty GRAVEL.
- GRAVEL and SAND with some silt.
- Dark brown, silty GRAVEL.
- Light brown, silty GRAVEL.
- Bottom of Boring at 85.0 Feet. Completed 07/19/01.

**Approximate Ground Surface Elevation in Feet**: 2001.3

**Depth in Feet**

<table>
<thead>
<tr>
<th>Depth in Feet</th>
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<tbody>
<tr>
<td>0</td>
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<td>115</td>
</tr>
<tr>
<td>120</td>
</tr>
<tr>
<td>125</td>
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</tbody>
</table>

**Top of Casing in Feet**: 2003.52

**Stick up in Feet**: 2.22

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
Top of Casing in Feet: 2001.0
Stick up in Feet: 1.9

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
Sample

LAB TESTS

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 1994.9

Brown, silty GRAVEL.
Dark brown, silty GRAVEL.

Light brown, silty GRAVEL.

Dark brown, silty GRAVEL.

Light brown, silty GRAVEL.

GRAVEL and SAND.

Bottom of Boring at 78.0 Feet.
Completed 07/20/01.

Top of Casing in Feet: 1996.75
Stick up in Feet: 1.85

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
Soil Descriptions

Approximate Ground Surface Elevation in Feet: 1994.9

- Brown, silty GRAVEL.
  - Dark brown, silty GRAVEL.
- Light brown, silty GRAVEL.
- Dark brown, silty GRAVEL.
- Light brown, silty GRAVEL.
- GRAVEL and SAND.

Bottom of Boring at 98.0 Feet.
Completed 07/20/01.

Top of Casing in Feet: 1996.69
Stick up in Feet: 1.79

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
Boring Log and Construction Data for Monitoring Well MW-1

Geologic Log

Monitoring
Well Design
Casing Stickup in Feet: 0.88
Top of Carbon Steel in Feet 197.48

Depth
in Feet
0
5
10
15
20
25
30
35
40
45
50
55
60
65

Approximate Ground Surface
Elevation in Feet: 1974

Gravel and boulders

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Geologic Log

Approximate Ground Surface
Elevation in Feet: 1974

Depth in Feet

Gravel and boulders

70

75

Sandy GRAVEL.

80

85

Gravel with clay seams.

90

95

100

105

110

115

Bottom of Boring at 115.0 Feet.
Completed 9/20/79.

110

120

125

130

Monitoring
Well Design

Casing Stickup in Feet: 0.88
Top of Carbon Steel in Feet 1974.88

1. Refer to Figure A-1 for explanation of descriptions
and symbols.

2. Soil descriptions and stratum lines are interpretive
and actual changes may be gradual.

3. Ground water level, if indicated, is at time of drilling
(A TD) or for date specified. Level may vary with time.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Geologic Log

Approximate Ground Surface
Elevation in Feet: 1961

Clayey GRAVEL.

Coarse, sandy GRAVEL.

Bottom of Boring at 90.0 Feet.
Completed 9/28/79.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well MW-3

Geologic Log

Approximate Ground Surface
Elevation in Feet: 1991

Gravel.

Monitoring
Well Design
Casing Stickup in Feet: 2.16
Top of Carbon Steel in Feet 1993.16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well MW-3

Geologic Log

Approximate Ground Surface
Elevation in Feet: 1991

65
70
75
80
85
90
95
100
105
110
115
120
125
130

GRAVEL.

Clayey GRAVEL.

Sandy GRAVEL.

Bottom of Boring at 120.0 Feet.
Completed 10/5/79.

Monitoring
Well Design

Casing Stickup in Feet: 218
Top of Carbon Steel in Feet 193.16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (AHD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well MW-4

Geologic Log

Approximate Ground Surface
Elevation in Feet: 2014

GRAVEL.

Sandy GRAVEL.

Bottom of Boring at 120.0 Feet.
Completed 10/10/79.

Monitoring
Well Design
Casing Stickup in Feet: 192
Top of Carbon Steel in Feet: 2015.92

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well MW-5

Geologic Log

Approximate Ground Surface
Elevation in Feet: 2008

0
5
10
15
20
25
30
35
40
45
50
55
60
65

Sandy GRAVEL.

Monitoring
Well Design
Casing Stickup in Feet: 1.55
Top of Cargon Steel in Feet 2009.55

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (AHD) or at date specified. Level may vary with time.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
**Boring Log and Construction Data for Monitoring Well MW-6**

Geologic Log

Approximate Ground Surface
Elevation in Feet: 2016

Casing Stickup in Feet: 186
Top of Carbon Steel in Feet: 2019.66

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well MW-6

Geologic Log

Approximate Ground Surface
Elevation in Feet: 2018

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>Sandy GRAVEL.</td>
</tr>
<tr>
<td>70</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td></td>
</tr>
<tr>
<td>85</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td></td>
</tr>
<tr>
<td>95</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>Gravelly CLAY</td>
</tr>
<tr>
<td>105</td>
<td>Sandy GRAVEL.</td>
</tr>
<tr>
<td>110</td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>Bottom of Boring at 112.0 Feet.</td>
</tr>
<tr>
<td></td>
<td>Completed 2/2/81.</td>
</tr>
<tr>
<td>120</td>
<td></td>
</tr>
<tr>
<td>125</td>
<td></td>
</tr>
<tr>
<td>130</td>
<td></td>
</tr>
</tbody>
</table>

Monitoring
Well Design
Casing Stickup in Feet: 166
Top of Carbon Steel in Feet: 2019.66

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (AFT) or for date specified. Level may vary with time.
Boring Log and Construction Data for
Monitoring Well MW-8

Geologic Log

Approx. Ground Surface
Elevation in Feet 1973.9

Damp, brown, sandy GRAVEL and very gravelly SAND.

Bottom of Boring at 64.0 Feet.
Completed 6/21/90.

Casing Stickup in Feet 2.3
Top of PVC in Feet 1976.15

Sample N

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well MW-9

Geologic Log

Approx. Ground Surface
Elevation in Feet 1975.2

Dry to damp, brown, sandy to very sandy GRAVEL

Sample N

BS-1
BS-2
BS-3
BS-4

Bottom of Boring at 64.0 Feet.
Completed 6/21/90.

Monitoring Well Design
Casing Stickup in Feet 2.0
Top of PVC in Feet 1977.18

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring and Construction Data for
Monitoring Well MW-10

Geologic Log

Approx. Ground Surface
Elevation in Feet 2009.7

Depth

Very dense, dry, brown, very sandy GRAVEL.

Very dense, damp, brown, silty GRAVEL.

Dense, damp to moist, slightly sandy to sandy GRAVEL.

Bottom of Boring at 84.0 Feet.
Completed 6/14/90.
Converted to Flush Monument 7/96.

Sample N
S-1 72/11
S-2 72/11
S-3 49
S-4 49
S-5 25

Before 7/96:
Casing Stickup in Feet: 2.1
Top of PVC in Feet: 2011.8

After 7/96:
Casing Stickup in Feet: -0.23
Top of PVC in Feet: 2009.47

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well MW-11

Geologic Log

Approx. Ground Surface
Elevation in Feet 2001.5

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Sample N PID</td>
</tr>
<tr>
<td></td>
<td>S-1 64 ≤1</td>
</tr>
<tr>
<td></td>
<td>S-2 50/5 ≤1</td>
</tr>
<tr>
<td></td>
<td>S-3 64 ≤1</td>
</tr>
<tr>
<td></td>
<td>S-4 87 ≤1</td>
</tr>
</tbody>
</table>

Damp, brown, gravelly, silty SAND.
(TOPSOIL)

Dry, light brown, silty, sandy GRAVEL.

Dry, light brown, slightly silty, sandy to very sandy GRAVEL.

Dense to very dense, damp to moist, brown, slightly sandy to sandy GRAVEL with occasional moist silty layers.

Very dense, wet, gray-brown with orange stains, sandy GRAVEL to very gravelly SAND.

Boulder.

Bottom of Boring at 80.5 Feet. Completed 6/6/91.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well MW-12

Geologic Log

Approximate Ground Surface
Elevation in Feet: 1965.6

Sandy GRAVEL to gravelly SAND.

Bottom of Boring at 52.0 Feet.
Completed 8/25/95.

2-inch-diameter, 0.020-inch machine-slotted PVC screen from 32 to 52 feet.
Abandoned 2/25/99.

Monitoring
Well Design

Casing Stickup in Feet: 2.88
Top of PVC in Feet: 1968.48

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well MW-12A

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>LAB TESTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td></td>
</tr>
</tbody>
</table>

Soil Descriptions
Approx. Ground Surface Elevation in Feet: 1964.5

- SAND and GRAVEL.

Bottom of Boring at 60.5 Feet.
Completed 02/25/99.

Replace MW-12.
Casing Stickup in Feet: 2.33
Top of Casing in Feet: 1966.83

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
# Geologic Log

Approximate Ground Surface
Elevation in Feet: 1966.7

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>(Medium dense), moist, brown, silty, sandy GRAVEL with cobbles.</td>
</tr>
<tr>
<td>25</td>
<td>(Medium dense), damp, dark brown, silty, sandy GRAVEL.</td>
</tr>
<tr>
<td>30</td>
<td>(Medium stiff), moist, dark brown, clayey SILT.</td>
</tr>
<tr>
<td>35</td>
<td>(Dense), moist, dark brown, silty, very sandy GRAVEL.</td>
</tr>
<tr>
<td>40</td>
<td>Becomes wet.</td>
</tr>
<tr>
<td>45</td>
<td>S-1</td>
</tr>
<tr>
<td>50</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Bottom of Boring at 56.5 Feet. Completed 1/24/98.</td>
</tr>
<tr>
<td>65</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td></td>
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<tr>
<td>85</td>
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<td></td>
</tr>
<tr>
<td>95</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

### Monitoring Well Design
Casing Stickup in Feet: 2.8
Top of Casing in Feet: 1968.5

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well MW-14

Geologic Log

Approximate Ground Surface
Elevation in Feet: 1949.7

Sample

<table>
<thead>
<tr>
<th>Depth (in Feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>(Medium dense), moist, dark brown, slightly silty, sandy GRAVEL.</td>
</tr>
<tr>
<td>10</td>
<td>(Medium dense), damp, gray, sandy GRAVEL.</td>
</tr>
<tr>
<td>25</td>
<td>(Dense), damp, gray, silty, very sandy GRAVEL to very gravelly SAND.</td>
</tr>
<tr>
<td>35</td>
<td>(Dense), wet, dark brown, sandy GRAVEL with cobbles to very gravelly SAND.</td>
</tr>
<tr>
<td>50</td>
<td>Bottom of Boring at 49.0 Feet. Completed 1/24/98.</td>
</tr>
</tbody>
</table>

Monitoring Well Design
Casing Stickup in Feet: 2.6
Top of Casing in Feet: 1952.34

Lab Tests

S-1 GS
S-2 GS

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well MW-15

Geologic Log

Approximate Ground Surface
Elevation in Feet: 1958.8

Sample

Depth in Feet

(Loose), moist, dark brown, silty, sandy GRAVEL.

(Dense), damp, gray, sandy GRAVEL with cobbles to very gravelly SAND.

(Dense), wet, dark brown, silty, very sandy GRAVEL.

Bottom of Boring at 51.5 Feet. Completed 1/28/96.

Sample

Lab Tests

Monitoring Well Design
Casing Stickup in Feet: 2.1
Top of Casing in Feet: 1958.95

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well MW-16

Geologic Log

Approximate Ground Surface
Elevation in Feet: 1991.6

(Medium to dense), damp, gray, sandy to very sandy GRAVEL.

Silty GRAVEL zone.

Silty, sandy GRAVEL.

Becomes wet.

Bottom of Boring at 83.0 Feet.
Completed 1/28/98.

Monitoring Well Design
Casing Stickup in Feet: 2.4
Top of Casing in Feet: 1994.03

Sample

Lab Tests

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
**Soil Descriptions**

Approximate Ground Surface Elevation in Feet: 1990.8

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
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<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td></td>
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<tr>
<td>50</td>
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<td>55</td>
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<td>75</td>
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</tr>
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<td>85</td>
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</tr>
<tr>
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<tr>
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<tr>
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<td>110</td>
<td></td>
</tr>
<tr>
<td>115</td>
<td></td>
</tr>
<tr>
<td>120</td>
<td></td>
</tr>
<tr>
<td>125</td>
<td></td>
</tr>
</tbody>
</table>

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
Soil Descriptions
Approximate Ground Surface Elevation in Feet: 1954.3

Brown, silty GRAVEL and SAND.

Light brown, silty GRAVEL and SAND.

Silty GRAVEL and SAND.

GRAVEL and SAND.

Bottom of Boring at 63.4 Feet.
Completed 07/09/01.

Top of Casing in Feet: 1956.35
Stick up in Feet: 2.05

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
Brown, silty GRAVEL.

Light brown, silty GRAVEL.

Gray, silty GRAVEL and SAND.

Bottom of Boring at 47.0 Feet.
Completed 07/13/01.

Top of Casing in Feet: 1959.66
Stick up in Feet: 1.76

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
### Monitoring Well Log MW-25S

**Soil Descriptions**

**Approximate Ground Surface Elevation in Feet: 1982.0**

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom of Boring at 70.0 Feet.</td>
<td></td>
</tr>
<tr>
<td>Top of Casing in Feet: 1984.10</td>
<td></td>
</tr>
<tr>
<td>Stick up in Feet: 2.1</td>
<td></td>
</tr>
</tbody>
</table>

### LAB TESTS

Approximate Ground Surface Elevation in Feet: 1982.0

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and measured stick up. Actual TOC elevation will be surveyed at a later date.
Boring Log and Construction Data for North Supply Well

Geologic Log

Approx. Ground Surface Elevation in ???

Depth in Feet

Grain Size Samples

Brown SAND with some silts and gravels.

Water-bearing SAND and GRAVEL

Red-Brown SILT and SAND with angular gravels. (Weathered Bedrock?)

Bottom of Boring at 222.0 Feet. Completed 11/21/95.

S-1
S-2
S-3
S-4
S-5
S-6
S-7

Monitoring Well Design

Cement/Bentonite Surface Seal

8-inch Ø Steel Pipe

Neoprene "K" Packer

10 Feet of 100-Slot Wire-Wrap Stainless Steel Screen

5 feet of 50-Slot Wire-Wrap Stainless Steel Screen

Tail Pipe

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction for
Extraction Well OH-EW-1

Geologic Log

Depth in Feet

Approx. Ground Surface
Elevation in Feet: 2004.8

Sample N

Very dense, moist to wet, gray, slightly
silty, sandy GRAVEL occasionally
becoming very sandy GRAVEL with
some boulders.

S-3 75/6
S-4 50/6
S-5 75/5
S-6 50/6
S-7 50/6
S-8 50/3
S-9 75/6
S-10
S-11
S-12
S-13
S-14
S-15
S-16
S-17
S-18

Well Design

Native Soil
20-inch @
Well Screen
Assembly
3 Feet of
250-Slot

15 Feet of
100-Slot

7½ Feet of
60-Slot

5 Feet of
150-Slot

20-inch @
End Pipe
24-inch @
Casing with
Cutting Shoe

Bottom of Boring at 133.0 Feet.
Completed 11/14/93.

1. Refer to Figure A-1 for explanation of descriptions
   and symbols.
2. Soil descriptions and stratum lines are interpretive
   and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling
   (ATD) or for date specified. Level may vary with time.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ADB) or for date specified. Level may vary with time.
Boring Log and Construction Data for Recirculation Well OH-EW-2-US

Geologic Log

Approx. Ground Surface
Elevation in Feet: 2004.2

Sample
Lab Tests

Extraction Well Design
Casing Stickup in the Feet: 2.88
Top of Casing in Feet: 2007.08

Depth in Feet

10-inch Diameter Well Casing

7-inch Diameter 100 Slot Screen

Bottom of Exploration at 80.0 Feet. Completed 4/18/00.

1. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
2. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
**Boring Log and Construction Data for Monitoring Well OH-MW-1**

### Geologic Log

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
<th>Blows per Foot</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Surface</td>
<td>S-1</td>
<td>59</td>
<td>0.6</td>
</tr>
<tr>
<td>Elevation in Feet 2004.7</td>
<td>S-2</td>
<td>23</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>S-3</td>
<td>17</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>S-4</td>
<td>94</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>S-5</td>
<td>38</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>BS-1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>S-6</td>
<td>42</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>BS-2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>S-7</td>
<td>70</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>BS-3</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Bottom of Boring at 82.5 Feet.**
Completed 10/28/89.
Abandoned

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-2

Geologic Log

Sample | PID |
---|---|
S-1 | 52 | 0.4 |
S-2 | 30 | 0.4 |
S-3 | 22 | |
S-4 | 41 | 0.4 |
S-5 | 44 | 0.4 |
BS-1 | |

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
# Boring Log and Construction Data for Monitoring Well OH-MW-3

## Geologic Log

<table>
<thead>
<tr>
<th>Sample</th>
<th>Depth (ft)</th>
<th>H-Nu</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS-1</td>
<td>17</td>
<td>0.9</td>
</tr>
<tr>
<td>BS-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-2</td>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td>BS-6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 2-inches Asphalt over medium dense to dense, damp to moist, brown and gray, slightly silty to silty, sandy to very sandy GRAVEL.

- Bottom of Boring at 83.5 Feet. Completed 11/1/89.

## Monitoring Well Design

- Casing Stickup in Feet: -0.6
- Top of PVC in Feet: 2004.09

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-4

Geologic Log

Casing Stickup in Feet 2.35
Top of PVC in Feet 2007.01

Sample | PID
--- | ---
S-1 | 11 0.6
S-2 | 13 2
BS-2 | -
S-3 | 35/6 0.6
BS-3 | -
S-4 | 39 110

Ground Surface
Elevation in Feet 2004.7

Medium dense, damp, brown, very sandy GRAVEL.

Medium dense, dry, gray GRAVEL.

Medium dense to dense, damp to wet, brown and gray, slightly silty, sandy to very sandy GRAVEL with boulders.

Bottom of Boring at 88.0 Feet.
Completed 11/10/89.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-5

Geologic Log

Depth in feet

Sample N  PD

Ground Surface
Elevation in Feet 2005.0

2-inches Asphalt over very dense, dry, brown, silty, very sandy GRAVEL

10

Medium dense, moist, brown-gray, slightly sandy GRAVEL

20

Medium dense to very dense, damp to moist, brown and gray, slightly silty, sandy to very sandy GRAVEL

30

Bottom of Boring at 88.5 Feet. Completed 11/17/89.

40

50

60

70

80

90

100

Casing Stickup in Feet = 0.45
Top of PVC in Feet 2004.51

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-6

Geologic Log

Ground Surface
Elevation in Feet 2004.8

Casing Stickup in Feet: -2.16
Top of PVC in Feet: 2007.03

Sample | N | PID
--- | --- | ---
S-1 | 13 | 0.5
S-2 | 29 | 0.5
S-3 | 17 | 0.5
BS-1 | - | -
S-4 | 37 | 0.5
BS-2 | - | -
S-5 | 119 | 50

Bottom of Boring at 83.5 Feet.
Completed 11/19/89

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
**Boring Log and Construction Data for Monitoring Well OH-MW-7**

**Geologic Log**

Approx. Ground Surface
Elevation in Feet 2004.5

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Dry, brown, sandy GRAVEL.</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Dry to damp, light brown, sandy GRAVEL.</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Moist, light brown, sandy GRAVEL with cobbles.</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Very dense, damp to moist, brown with orange stains, sandy GRAVEL.</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Dense, wet, gray-brown, very sandy GRAVEL.</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>Medium dense, wet, gray, very sandy GRAVEL to very gravelly SAND. Boulder.</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Bottom of Boring at 83.5 Feet. Completed 12/5/90.</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Monitoring Well Design**

Casing Stickup in Feet 2.65
Top of PVC in Feet 2007.13

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-8

Geologic Log

Approx. Ground Surface Elevation in Feet 2003.5

- 0
  - 0
  - 10
  - 20
  - 30
  - 40
  - 50
  - 60
  - 70
  - 80
  - 90
  - 100

Dry, light brown to brown, very sandy to sandy GRAVEL.

- 60
  - 60
  - 70
  - 70
  - 80
  - 80
  - 90
  - 90
  - 100

Dry, brown, very gravelly, coarse SAND.

- 70
  - 70
  - 80
  - 80
  - 90
  - 90
  - 100

Damp to moist, brown, very gravelly SAND.

- 70
  - 70
  - 80
  - 80
  - 90
  - 90
  - 100

Medium dense, wet, brown, very sandy to sandy GRAVEL.

- 70
  - 70
  - 80
  - 80
  - 90
  - 90
  - 100

- 70
  - 70
  - 80
  - 80
  - 90
  - 90
  - 100

Sample

- 70
  - 70
  - 80
  - 80
  - 90
  - 90

N

- 70
  - 70
  - 80
  - 80
  - 90
  - 90

PID

- 70
  - 70
  - 80
  - 80
  - 90
  - 90

Casing Stickup in Feet 2.5
Top of PVC in Feet 2005.95

Monitoring Well Design

Bottom of Boring at 83.0 Feet. Completed 12/8/90.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-9

Geologic Log

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
<th>N</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approx. Ground Surface</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevation in Feet 2004.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphalt and fill.</td>
<td>Damp, brown, very sandy GRAVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry to damp, brown, sandy GRAVEL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damp to moist, brown, very sandy GRAVEL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dense, moist to wet, grayish-brown with orange motting, sandy to very sandy GRAVEL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottom of Boring at 84.0 Feet. Completed 12/10/90.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Monitoring Well Design

Casing Stickup in Feet -0.3
Top of PVC in Feet 2004.05

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-10

Geologic Log

Approx. Ground Surface Elevation in Feet: 2004.8

Sample N PID

S-1 49 <1
S-2 26 1.5
S-3 26 200
S-4 15

Asphalt:
Dry to damp, light brown, very sandy to sandy GRAVEL.

Dense, damp to moist, brown, sandy GRAVEL.

Medium dense, moist, brown, very gravelly SAND.

Medium dense, wet, gray, sandy GRAVEL.

Bottom of Boring at 84.0 Feet. Completed 12/6/90.

Monitoring Well Design
Casing Stickup in Feet 1.8
Top of PVC in Feet 2006.56

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-11

Geologic Log

Depth measurements in feet, elevation of ground surface is 2004.6

- Concrete
- Fill: Damp, brown, slightly silty, very gravelly SAND.
- Dry, light brown, sandy to very sandy GRAVEL.
- Damp, brown, very sandy GRAVEL with trace of silt.
- Dry, light brown, very sandy GRAVEL.
- Very dense to dense, moist to wet, sandy GRAVEL.
- Medium dense to dense, wet, brown, very sandy GRAVEL.
- Bottom of Boring at 86.0 Feet. Completed 12/9/90.

Monitoring Well Design

Casing Stickup in Feet = 0.3
Top of PVC in Feet = 2004.34

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-12

Geologic Log

Approx. Ground Surface
Elevation in Feet 2004.0

Sample N PID

Depth in Feet

- Asphalt
- Damp, brown, very sandy GRAVEL with trace of silt.
- Dry, light brown to brown, very sandy GRAVEL
- Dry, brown, sandy GRAVEL
- Dense to medium dense, moist to wet, brown, slightly sandy to sandy GRAVEL
- Medium dense, wet, brown-black, very sandy GRAVEL

Bottom of Boring at 83.0 Feet.
Completed 12/16/90.

Monitoring Well Design
Casing Stickup in Feet = 0.25
Top of PVC in Feet 2003.76

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-13

Geologic Log

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approx. Ground Surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevation in Feet 2004.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>N</td>
<td>PID</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S-1</td>
<td>48</td>
</tr>
<tr>
<td>20</td>
<td>S-2</td>
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<tr>
<td>30</td>
<td>S-3</td>
<td>21</td>
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<tr>
<td>40</td>
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<td></td>
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<tr>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Dense, moist, gray-brown, very gravelly SAND.</td>
<td>S-1</td>
</tr>
<tr>
<td>80</td>
<td>Dense, wet, gray-brown, very sandy to slightly sandy GRAVEL</td>
<td>S-2</td>
</tr>
<tr>
<td>90</td>
<td>Bottom of Boring at 84.0 Feet. Completed 12/15/90.</td>
<td>S-3</td>
</tr>
</tbody>
</table>

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-14

Geologic Log

Approx. Ground Surface Elevation in Feet 2006.2

Depth in Feet

Dry to damp, brown, very sandy GRAVEL

Damp, brown, very gravelly SAND with trace of silt

Very dense to dense, wet, gray, very sandy GRAVEL with trace of silt

Wet, gray, sandy GRAVEL

Monitoring Well Design

Casing Stickup in Feet 0.9
Top of PVC in Feet 2007.09

Sample N PID

S-1 200
S-2 45
S-3 8
S-4 8
S-5 <1

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-14

Geologic Log

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

Bottom of Boring at 130.0 Feet.
Completed 1/4/91.
Abandoned.

Wet, gray, sandy GRAVEL.
Boring Log and Construction Data for Monitoring Well OH-MW-15

Geologic Log

Approx. Ground Surface
Elevation in Feet 2004.6

- Sample: N
- PID

Damp, brown, gravelly, silty SAND. (TOPSOIL)

Damp to dry, gray to brown, slightly silty, slightly sandy GRAVEL with abundant large cobbles.

60

Dense, moist, brown and gray with abundant orange stains, slightly silty, slightly sandy to sandy GRAVEL

Very dense, wet, brown and gray with orange stains, sandy GRAVEL

80

Bottom of Boring at 80.0 feet.
Completed 6/8/91

S-1 50/5 1.5
S-2 30 1.5
S-3 44 ≤ 1
S-4 6 NA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
NA: Not analyzed due to poor sample recovery.
Boring Log and Construction Data for Monitoring Well OH-MW-16

Geologic Log

Approx. Ground Surface Elevation in Feet: 2003.6

Dense, dry, gray, sandy GRAVEL with slightly silty zones.

Dense to very dense, moist to wet, gray and brown, slightly silty, sandy GRAVEL with cobbles and boulders.


Sample N

Before 6/25/95
Casing Stickup in Feet: -0.05
Top of PVC in Feet: 2003.65

After 6/25/95
Casing Stickup in Feet: -0.03
Top of PVC in Feet: 2003.57

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-17

Geologic Log

Approx. Ground Surface
Elevation in Feet 2004.2

Sample N PID

Dense, moist, brown and gray, slightly silty to silty, sandy GRAVEL with cobbles.

S-1  40  12
S-2  35  0
S-3  40  5
S-4  17  3
S-5  23  NA

Medium dense, wet, gray, sandy GRAVEL with cobbles.

Bottom of Boring at 86.0 Feet. Completed 11/7/91.

Casing Stickup in Feet = 0.08
Top of PVC in Feet 2004.16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER
J-2644-58  11/91
Figure A-63
Boring Log and Construction Data for Monitoring Well OH-MW-18

Geologic Log

Approx. Ground Surface Elevation in Feet: 2004.8

Sample N PID

Dense to very dense, moist to dry, gray and brown, slightly silty, sandy GRAVEL with cobbles.

Very dense to medium dense, moist to wet, gray and brown with black stains, slightly silty, sandy GRAVEL with cobbles.

Petroleum odor.

Bottom of Boring at 90.0 Feet. Completed 11/8/91.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
# Boring Log Construction Data for Monitoring Well OH-MW-19

## Geologic Log

<table>
<thead>
<tr>
<th>Sample</th>
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<th>PID</th>
</tr>
</thead>
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<tr>
<td>S-1</td>
<td>70</td>
<td>5</td>
</tr>
<tr>
<td>S-2</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>S-3</td>
<td>60</td>
<td>784</td>
</tr>
<tr>
<td>S-4</td>
<td>30</td>
<td>228</td>
</tr>
<tr>
<td>S-5</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

Approx. Ground Surface
Elevation in Feet 2004.6

Dense to very dense, moist, brown and gray, slightly silty, sandy GRAVEL with cobbles.

Dense to very dense, moist to wet, gray, slightly silty, sandy GRAVEL with cobbles and strong petroleum odor.

Bottom of Boring at 86.0 Feet. Completed 11/4/91.

Monitoring Well Design
Casing Stickup in Feet -0.3
Top of PVC in Feet 2004.33

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

---

**HARTCROWSER**

J-2644-58

11/91

Figure A-65
Boring Log and Construction Data for Monitoring Well OH-MW-20

Geologic Log

Approx. Ground Surface Elev. in Feet 2004.6

Depth in Feet

Dense to very dense, moist, brown, slightly silty, sandy GRAVEL with cobbles.

Sample N PID

S-1 X 90 4
S-2 X 40 426
S-3 X 50 844
S-4 X 75 100
S-5 X 45 11
S-6 X 25

Bottom of Boring at 89.0 Feet. Completed 11/5/91.

Monitoring Well Design

Casing Stickup in Feet = 0.41
Top of PVC in Feet 2004.21

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-21

Geologic Log

Approx. Ground Surface
Elevation in Feet 2004.2

Medium dense to dense, damp to dry, brown, slightly silty, sandy GRAVEL with cobbles.

Cobbly layer.

Cobbly layer.

Medium dense to dense, grayish brown, silty, very sandy GRAVEL grading to a very gravelly SAND.

Loose to dense, wet, brown, silty, sandy GRAVEL with very slight hydrocarbon odor.

Bottom of Boring at 85.4 Feet.
Completed 11/20/91.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-22

Geologic Log

Approx. Ground Surface
Elevation in Feet 2005.1

- Dense, damp, brown, slightly silty, sandy GRAVEL with cobbles.
- Cobbles and boulders.
- Solvent odor.
- Boulder
- Dense to very dense, moist to wet, slightly silty, sandy GRAVEL with hydrocarbon odor and staining.
- End of smear zone.

Bottom of Boring at 90.0 Feet.
Completed 11/21/91.

Sample N PID
S-1 X 42 1
S-2 X 86 47
S-3 X 49 89
S-4 X 40 11
S-5 X 16 0
S-6 X 7 0

Casing Stickup in Feet -0.53
Top of PVC in Feet 2004.57

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-23

Geologic Log

Approx. Ground Surface
Elevation in Feet 2004.7

0
10
20
30
40
50
60
70
80
90
100

Depth in Feet

3 inches of asphalt over 6 inches of asphalt subgrade over dense to very dense, dry to moist, brown and gray, slightly silty, sandy GRAVEL with cobbles.

Top of smear zone with hydrocarbon staining and odor.

Loose to dense, wet, gray, slightly silty, sandy to very sandy GRAVEL.

Bottom of smear zone.

Bottom of Boring at 90.0 Feet. Completed 11/24/91.

Sample  N  PID
S-1  80/10  1
S-2  66   10
S-3  41   14
S-4  11   43
S-5  27   2
S-6  30   0

Monitoring Well Design
Casing Stickup in Feet -0.34
Top of PVC in Feet 2004.38

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-24

Geologic Log

Approx. Ground Surface in Elevation in Feet 2004.9

Depth

<table>
<thead>
<tr>
<th>Sample</th>
<th>N</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>50/S</td>
<td>0</td>
</tr>
<tr>
<td>S-2</td>
<td>P</td>
<td>1</td>
</tr>
<tr>
<td>S-3</td>
<td>42</td>
<td>0</td>
</tr>
<tr>
<td>S-4</td>
<td>P</td>
<td>4</td>
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<td>S-5</td>
<td>X 20</td>
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<tr>
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<td>X 33</td>
<td>4</td>
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<tr>
<td>S-8</td>
<td>X 32</td>
<td>3</td>
</tr>
<tr>
<td>S-9</td>
<td>X 14</td>
<td>6</td>
</tr>
<tr>
<td>S-10</td>
<td>X 20</td>
<td>1</td>
</tr>
<tr>
<td>S-11</td>
<td>X 15</td>
<td>2</td>
</tr>
<tr>
<td>S-12</td>
<td>X 52</td>
<td>3</td>
</tr>
<tr>
<td>S-13</td>
<td>X 40</td>
<td>128</td>
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<td>S-14</td>
<td>X 41</td>
<td>457</td>
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<td>S-15</td>
<td>X 15</td>
<td>471</td>
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<tr>
<td>S-16</td>
<td>X 65</td>
<td>3</td>
</tr>
<tr>
<td>S-17</td>
<td>X 38</td>
<td>0</td>
</tr>
</tbody>
</table>

Loose to dense, damp to wet, brown and gray, very gravelly SAND.

Loose to medium dense, wet, brown, slightly silty, slightly sandy GRAVELS with cobbles, some gravels, oxidized, slight to moderate solvent odor.

Dense to very dense, dry to damp, gray and brown, slightly silty, sandy to very sandy GRAVEL with cobbles.

(Smear zone with hydrocarbon odor and staining.)

Dense to very dense, wet, brown, slightly silty, sandy GRAVEL

Bottom of Boring at 90.0 Feet. Completed 11/25/91.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

Monitoring Well Design

Casing Stickup in Feet = 0.38
Top of PVC in Feet 2004.52

HARTCROWSER
J-2644-58 11/91
Figure A-70
Boring Log and Construction Data for Monitoring Well OH-MW-25

Geologic Log

Approx. Ground Surface
Elevation in Feet 2004.9

1 inch of asphalt over 3.5 inches of concrete over dense, damp, brown, slightly silty, sandy to very sandy GRAVEL with cobbles.

Slight solvent odor.

Dense, wet, tan and brown, slightly silty, gravelly SAND with traces of green staining and solvent odor.

Medium dense to dense, dry, gray, slightly sandy GRAVEL

Medium dense to loose, moist to wet, gray, slightly silty, very sandy GRAVEL with strong solvent odor and extensive staining.

Bottom of Boring at 90.0 Feet. Completed 12/3/91.

Sample | N | PID |
--- | --- | --- |
S-1 | P | 4 |
S-2 | 35 | 3 |
S-3 | P | 3 |
S-4 | 36 | NA |
S-5 | P | 2 |
S-6 | 21 | 0 |
S-7 | 39 | 3 |
S-8 | 37 | 2 |
S-9 | 31 | 2 |
S-10 | 39 | 3 |
S-11 | 16 | 2 |
S-12 | 19 | 0 |
S-13 | 50/2 | 0 |
S-14 | 39 | 1 |
S-15 | 31 | 387 |
S-16 | 30 | 894 |
S-17 | 25 | 18 |
S-18 | 9 | 0 |

Casing Stickup in Feet =0.29
Top of PVC in Feet 2004.57

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Geologic Log

Depth in Feet

Approx. Ground Surface
Elevation in Feet: 2004.8

Topsoil over (medium dense), damp, light brown, silty SAND to sandy, silty GRAVEL.

(Dense), damp, brown, slightly silty, slightly sandy to sandy GRAVEL with boulders.

(Dense), damp to moist, brownish gray, slightly silty to silty, sandy GRAVEL.

Very dense, damp, brownish gray, gravelly silty SAND.

Very dense, moist to wet, gray, slightly silty, sandy GRAVEL occasionally becoming very sandy GRAVEL with some boulders.

Well Design

Casing Stickup in Feet: -0.3
Top of Casing in Feet: 2004.5

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
# Boring Log and Construction Data for Monitoring Well OH-MW-26

## Geologic Log

<table>
<thead>
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<th>Sample</th>
<th>N</th>
</tr>
</thead>
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<td></td>
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<tr>
<td>80</td>
<td></td>
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<tr>
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<td>90</td>
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<td>95</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>105</td>
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<tr>
<td>110</td>
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<td>145</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approx. Ground Surface
Elevation in Feet: 2004.8

Very dense, moist to wet, gray, slightly silty, sandy GRAVEL occasionally becoming very sandy GRAVEL with some boulders.

Bottom of Boring at 98.0 Feet.
Completed 11/5/93.

Boring drilled unsampled to install well.
Soil descriptions from OH-EW-1 log.

## Well Design

2-inch 20-Slot PVC
8-inch Borehole

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-27

Geologic Log

Approximate Ground Surface
Elevation in Feet: 2000.7

Depth in Feet

<table>
<thead>
<tr>
<th>Depth</th>
<th>Sample</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S-1</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>S-2</td>
<td>0</td>
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<tr>
<td>10</td>
<td>S-3</td>
<td>0</td>
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<tr>
<td>15</td>
<td>S-4</td>
<td>0</td>
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<tr>
<td>20</td>
<td>S-5</td>
<td>0</td>
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<tr>
<td>25</td>
<td>S-6</td>
<td>0</td>
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<td>30</td>
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<td>40</td>
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<tr>
<td>45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dry, brown, slightly gravelly SAND.

Boulder.

Becomes slightly silty.

Gray to brown, sandy GRAVEL.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-27

Geologic Log

Approximate Ground Surface
Elevation in Feet: 2000.7

Gray to brown, sandy GRAVEL.

<table>
<thead>
<tr>
<th>Sample</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-10</td>
<td>0</td>
</tr>
<tr>
<td>S-11</td>
<td>0</td>
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<tr>
<td>S-12</td>
<td>5</td>
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<tr>
<td>S-13</td>
<td>0.8</td>
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<td>S-14</td>
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<td>S-16</td>
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<td>S-17</td>
<td>0</td>
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<tr>
<td>S-18</td>
<td>1.3</td>
</tr>
<tr>
<td>S-19</td>
<td>6.8</td>
</tr>
</tbody>
</table>

Bottom of Boring at 97.5 Feet.
Completed 8/23/95.

4-inch-diameter, 0.080-inch wire wrap slot, stainless steel screen from 74.7 to 94.7 feet.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-28

Geologic Log

Approximate Ground Surface
Elevation in Feet: 2004.6

Sandy GRAVEL with cobbles.

Monitoring Well Design
Casing Stickup in Feet: -0.5
Top of PVC in Feet: 2004.11

Bottom of Boring at 97.0 Feet.
Completed 9/10/95.

4-inch-diameter stainless steel,
0.080-inch slot wire wrap screen
from 75 to 95 feet.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-29

Geologic Log

Approx. Ground Surface
Elevation in Feet: 2004

Depth in Feet:

<table>
<thead>
<tr>
<th>Depth (Feet)</th>
<th>Grain Size Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
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<tr>
<td>20</td>
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<tr>
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<tr>
<td>180</td>
<td></td>
</tr>
<tr>
<td>200</td>
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</tr>
</tbody>
</table>

SAND and GRAVEL

Oil smear zone.

Bottom of Exploration at 105.0 Feet.
Completed 11/3/95.
Abandoned 2/27/99.
Boring drilled unsampled to install well. Soil description from OH-EW-2 log.

Well Design

Casing Stickup in Feet: -0.95
Top of Casing in Feet: 2004.95

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (AHD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well OH-MW-29

Geologic Log

- Approx. Ground Surface Elevation in Feet: 2004
- Grain Size Samples

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Grain Size Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SAND and GRAVEL</td>
</tr>
<tr>
<td>20</td>
<td></td>
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<tr>
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<td>60</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>Oil smear zone.</td>
</tr>
<tr>
<td>140</td>
<td></td>
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<td>160</td>
<td></td>
</tr>
<tr>
<td>180</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
</tr>
</tbody>
</table>

Well Design

- Casing Stickup in Feet: -0.95
- Top of Casing in Feet: 2004.95

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Skimming Well OH-SK-1 (formerly OH-SK-A)

Geologic Log

Approx. Ground Surface
Elevation in Feet: 204.8

- Topsoil over (dense), damp, light brown, silty, gravelly SAND to dry silty, sandy GRAVEL

- (Dense), dry to damp, brown to tan-gray, slightly silty to silty, sandy to very sandy GRAVEL with cobbles and boulders.

- (Dense), moist, gray, silty to very silty, sandy GRAVEL

- (Dense), moist to wet, slightly silty to silty, sandy to very sandy GRAVEL with cobbles.

Well Design
Casing Stickup in Feet: -1.79
Top of Steel in Feet: 2003.01

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
**Boring Log and Construction Data for Skimming Well OH-SK-1 (Formerly OH-SK-A)**

**Geologic Log**

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>(Dense), moist to wet, slightly silty to silty, sandy to very sandy GRAVEL with cobbles.</td>
</tr>
<tr>
<td>90-98.0</td>
<td>Bottom of Boring at 88.0 Feet. Completed 11/3/93. Boring drilled unsampled to install well. Soil description from OH-EW-1 log.</td>
</tr>
</tbody>
</table>

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Skimming Well OH-SK-2 (Formerly OH-SK-B)

Geologic Log

Approx. Ground Surface
Elevation in Feet: 2004.7

- Topsoil over (medium dense), damp, light brown, silty SAND to sandy, silty GRAVEL

- (Dense), damp, brown, slightly silty, slightly sandy to sandy GRAVEL with boulders

- (Dense), damp to moist, brownish gray, slightly silty to silty, sandy GRAVEL

- Very dense, damp, brownish gray, gravelly silty SAND

- Very dense, moist to wet, gray, slightly silty, sandy GRAVEL occasionally becoming very sandy GRAVEL with some boulders

Well Design

Casing Stickup in Feet: 2.02
Top of Casing in Feet: 2006.72
Top of PVC Casing in Feet: 2007.94

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for
Skimming Well OH-SK-2 (Formerly OH-SK-B)

Geologic Log

Approx. Ground Surface
Elevation in Feet: 2004.7

Depth in Feet

Sample | N

Very dense, moist to wet, gray, slightly silty, sandy GRAVEL occasionally becoming very sandy GRAVEL with some boulders.

Bottom of Boring at 95.0 Feet.
Completed 1/5/95.
Boring drilled unsampled to install well.
Soil description from OH-EW-1 log.

Well Design

12-inch Well Completion
18-inch Borehole
80-Stal Stainless Steel

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or as date specified. Level may vary with time.
Boring Log and Construction Data for Skimming Well OH-SK-3

Geologic Log

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Grain Size Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approx. Ground Surface Elevation in Feet: 2002.8</td>
<td>SAND and GRAVEL</td>
</tr>
<tr>
<td>Completed 11/3/95.</td>
<td></td>
</tr>
<tr>
<td>Boring drilled unsampled to install well.</td>
<td>Oil smear zone.</td>
</tr>
<tr>
<td>Soil description from OH-EW-2 log.</td>
<td>Bottom of Exploration at 95.0 Feet.</td>
</tr>
</tbody>
</table>

Well Design

Casing Stickup in Feet: 2.72
Top of Casing in Feet: 2005.52

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (A.D.) or for date specified. Level may vary with time.
Well Log OH-SK-4

Geologic Log

Approx. Ground Surface
Elevation in Feet: 2004.9

Depth in Feet

0

Brown, silty GRAVEL

10

SAND and GRAVEL with some Silt

20

Gray SAND and GRAVEL

30

Gray SAND and GRAVEL with some Silt

40

Bottom of Exploration at 91.0 Feet.
Completed 6/30/01.

Extraction
Well Design

Casing Stickup in Feet: 2.48
Top of Casing in Feet: 2007.38

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and stick up reported by Holt Drilling. Actual TOC elevation will be surveyed at a later date.
Boring Log and Construction Data for Extraction Well TF-EW-1

Geologic Log

Well Design

Casing Stickup in Feet: 1.73
Top of Steel Casing in Feet: 2006.33

Approx. Ground Surface
Elevation in Feet: 2004.6

SAND and GRAVEL with cobbles.

SAND and GRAVEL with boulder and cobbles.

SAND and GRAVEL.

Bottom of Boring at 98.0 Feet.
Completed 4/29/91.

16-inch Stainless Steel 70-Slot Screen

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for
Extraction Well TF-EW-1
Deepened April 29, 2000

Geologic Log

Approx. Ground Surface
Elevation in Feet: 2004.6

SAND and GRAVEL with cobbles.

SAND and GRAVEL with boulder and cobbles.

SAND and GRAVEL.

Well Design
Casing Depth in Feet: 1.05
Top of Steel Casing in Feet: 2003.55
Vault Base in Feet: 2001.9

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Extraction Well TF-EW-1
Deepened April 29, 2000

Geologic Log

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Approx. Ground Surface Elevation in Feet: 2004.6</th>
</tr>
</thead>
<tbody>
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<td>SAND and GRAVEL</td>
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<tr>
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<td>195</td>
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<tr>
<td>200</td>
<td>Bottom of Boring at 178.0 Feet.</td>
</tr>
<tr>
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<td>Completed 4/29/91.</td>
</tr>
<tr>
<td></td>
<td>Deepened 4/29/00.</td>
</tr>
</tbody>
</table>

Well Design

Casing Stickup in Feet: -1.05
Top of Steel Casing in Feet: 2006.55

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or date specified. Level may vary with time.
Boring Log and Construction Data for Recirculation Well TF-EW-1-US

Geologic Log

Approx. Ground Surface Elevation in Feet: 2004.1

Depth in Feet

0

Asphalt over brown, silty GRAVEL.

10

SAND and GRAVEL.

20

Bottom of Exploration at 50.0 Feet. Completed 4/19/00.

30

100

Top of Casing in Feet: 2006.54

Casing Stickup in Feet: 2.41

Extraction Well Design

12-inch Diameter Borehole

10-inch Diameter Well Casing

K-Packer

10-inch Telescoping 100-Slot Screen

Lab Tests

1. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
2. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well TF-MW-1

Geologic Log

Approx. Ground Surface
Elevation in Feet: 2003.5

18 inches of moist, brown, slightly clayey, sandy GRAVEL (Road Base) over medium dense to very dense, damp to moist, brown, sandy GRAVEL.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Depth (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>10</td>
</tr>
<tr>
<td>S-2</td>
<td>65/10</td>
</tr>
<tr>
<td>S-3</td>
<td>52</td>
</tr>
<tr>
<td>S-4</td>
<td>37</td>
</tr>
<tr>
<td>S-5</td>
<td>64/9</td>
</tr>
<tr>
<td>S-6</td>
<td>9</td>
</tr>
<tr>
<td>S-7</td>
<td>26</td>
</tr>
<tr>
<td>S-8</td>
<td>27</td>
</tr>
<tr>
<td>S-9</td>
<td>30</td>
</tr>
<tr>
<td>S-10</td>
<td>54</td>
</tr>
<tr>
<td>S-11</td>
<td>42</td>
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<tr>
<td>S-12</td>
<td>79/9</td>
</tr>
<tr>
<td>S-13</td>
<td>18</td>
</tr>
</tbody>
</table>

Grading medium dense and slightly clayey.

Dense to very dense, moist to wet, brown, clayey, sandy GRAVEL.

Bottom of Boring at 81.0 Feet. Completed 2/22/91.

Casing Stickup in Feet: 1.9
Top of PVC in Feet: 2005.41

Monitoring Well Design

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
**Boring Log and Construction Data for Monitoring Well TF-MW-2**

**Geologic Log**

- Approx. Ground Surface
- Elevation in Feet: 2003.7

<table>
<thead>
<tr>
<th>Sample</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
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<tr>
<td>S-2</td>
<td>61</td>
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<tr>
<td>S-5</td>
<td>21</td>
</tr>
<tr>
<td>S-6</td>
<td>45/8</td>
</tr>
<tr>
<td>S-7</td>
<td>45</td>
</tr>
<tr>
<td>S-8</td>
<td>50/3</td>
</tr>
</tbody>
</table>

- 18 inches of damp, brown, sandy GRAVEL (Road Base) over very dense, damp to moist, brown, slightly clayey to clayey, very sandy GRAVEL.
- Medium dense to very dense, moist to wet, brown, slightly clayey, very sandy GRAVEL.
- Bottom of Boring at 79.5 Feet. Completed 2/23/91.

**Monitoring Well Design**

- Casing Stickup in Feet: 1.9
- Top of PVC in Feet: 2005.60

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well TF-MW-3

Geologic Log

Approx. Ground Surface
Elevation in Feet 2004.5

Moist, brown, sandy GRAVEL over very dense, damp to moist, brown, slightly clayey to clayey, sandy to very sandy GRAVEL.

Medium dense to dense, damp to wet, brown, very sandy GRAVEL grading clayey with depth.

Bottom of Boring at 79.5 Feet. Completed 2/25/91.

Sample | N | PID
--- | --- | ---
S-1 | 59 | 0
S-2 | 75 | 0
S-3 | 49 | 0
S-4 | 27 | 
S-5 | 27 | 
S-6 | 39 | 
S-7 | 36 | 0
S-8 | 40 | 4

Casing Stickup in Feet 0.9
Top of PVC in Feet 2005.40

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
**Boring Log and Construction Data for Monitoring Well TF-MW-4**

**Geologic Log**

Approx. Ground Surface
Elevation in Feet 2004.5

6 inches of asphalt over 12 inches of crushed rock (Base Course), over dense
to very dense, damp to moist, brown,
very sandy GRAVEL.

Grading slightly clayey to clayey with
depth.

Bottom of Boring at 79.5 Feet.
Completed 2/26/91.

<table>
<thead>
<tr>
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<th>PID</th>
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</thead>
<tbody>
<tr>
<td>S-1</td>
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<td>S-2</td>
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<tr>
<td>S-3</td>
<td>55</td>
<td>5</td>
</tr>
<tr>
<td>S-4</td>
<td>55</td>
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<td>4.5</td>
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<td>25</td>
<td>12</td>
</tr>
<tr>
<td>S-7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Monitoring
Well Design

Casing Stickup in Feet 1.8
Top of PVC in Feet 2006.27

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well TF-MW-5

Geologic Log

Sample N PID

S-1 19 0
S-2 35 0
S-3 67 0
S-4 12
S-5
S-6 53 6

Casing Stickup in Feet 1.2
Top of PVC in Feet 2004.79

Approx. Ground Surface
Elevation in Feet 2003.6

0 Depth in feet

Moist, brown, sandy GRAVEL over medium dense to very dense, moist to wet, brown, slightly clayey, sandy to very sandy GRAVEL.

Very dense, damp, brown, very gravelly SAND.

Medium dense to very dense, moist to wet, brown, very sandy GRAVEL grading clayey with depth.

Bottom of Boring at 79.5 Feet. Completed 2/27/91.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well TL-MW-1

Geologic Log

Approx. Ground Surface
Elevation in Feet 2004.1

Depth in Feet

Loose, damp, brown, slightly silty, sandy GRAVEL.

Medium to very dense, damp, gray and brown GRAVEL.

Medium to very dense, damp, sandy to very sandy GRAVEL.

Sample N

<table>
<thead>
<tr>
<th>Sample</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>9</td>
</tr>
<tr>
<td>S-2</td>
<td>15</td>
</tr>
<tr>
<td>S-3</td>
<td>50/4</td>
</tr>
<tr>
<td>S-4</td>
<td>7</td>
</tr>
<tr>
<td>S-5</td>
<td>22</td>
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<td>S-6</td>
<td>15</td>
</tr>
<tr>
<td>S-7</td>
<td>59</td>
</tr>
<tr>
<td>S-8</td>
<td>55</td>
</tr>
</tbody>
</table>

Bottom of Boring at 79.0 Feet.
Completed 6/18/90.
Replace 9/27/95 with TL-MW-1A.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Observation Well TL-MW-1A

Geologic Log

Approximate Ground Surface
Elevation in Feet: 2004.4

Sandy GRAVEL to gravelly SAND.

Monitoring
Well Design

Casing Stickup in Feet: 2
Top of PVC in Feet: 2008.41

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Observation Well TL-MW-1A

Geologic Log

Approximate Ground Surface
Elevation in Feet: 2004.4

Sandy GRAVEL to gravelly SAND.

Bottom of Boring at 83.0 Feet.
Completed 9/27/95.
2-inch-diameter, 0.020-inch machine-slotted PVC screen from 83 to 83 feet.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well TL-MW-2

Geologic Log

Approx. Ground Surface
Elevation in Feet 2003.9

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>S-1</td>
<td>8</td>
</tr>
<tr>
<td>20</td>
<td>S-2</td>
<td>11</td>
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<tr>
<td>30</td>
<td>S-3</td>
<td>74</td>
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<td>40</td>
<td>S-4</td>
<td>40</td>
</tr>
<tr>
<td>50</td>
<td>S-5</td>
<td>108/4</td>
</tr>
<tr>
<td>60</td>
<td>S-6</td>
<td>23</td>
</tr>
<tr>
<td>70</td>
<td>S-7</td>
<td>55/6.5</td>
</tr>
<tr>
<td>80</td>
<td>S-8</td>
<td>34</td>
</tr>
</tbody>
</table>

Bottom of Boring at 79.5 Feet,
Completed 6/19/90.

Monitoring Well Design
Casing Stickup in Feet 2.0
Top of PVC in Feet 2005.94

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well TL-MW-3

Geologic Log

Approx. Ground Surface
Elevation in Feet 2001.9

Depth in feet

Medium dense, damp to moist, brown, sandy to very sandy GRAVEL.

Very dense, dry, gray, slightly sandy GRAVEL

Medium to very dense, damp to moist, brown, slightly silty to silty, slightly sandy to sandy GRAVEL

Sample N
S-1 18
S-2 15
S-3 85/11
S-4 26
S-5 29
S-6 8

S-7 32

* 60/2

Bottom of Boring at 84.0 Feet. Completed 6/22/90.

Monitoring Well Design
Casing Stickup in Feet 1.7
Top of PVC in Feet 2003.59

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well TL-MW-4

Geologic Log

Approx. Ground Surface Elevation in Feet 2000.3

Damp to moist, brown and gray, sandy to very sandy GRAVEL.

Sample

Casing Stickup in Feet 1.95
Top of PVC in Feet 2002.24

Bottom of Boring at 88.0 Feet. Completed 6/20/90.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Extraction Well WW-EW-1

Geologic Log

Approximate Ground Surface
Elevation in Feet: 1971.7

- Silty, sandy GRAVEL
- Sandy GRAVEL with cobbles and boulders.
- Silty, sandy GRAVEL
- Sandy GRAVEL
- Slightly gravelly SAND.

Bottom of Boring at 190.0 Feet
Computed 12/19/94

Well Design
Casing Stickup in Feet: 0.43
Top of Casing in Feet: 1972.13

- 30-inch Ø Borehole
- 24-inch Ø Steel Casing
- ATD
- Bentonite Slurry
- Sand
- 24 Feet of 125-Slot Screen
- 10 Feet of 100-Slot Screen
- 12 Feet of 85-Slot Screen
- 12 Feet of 50-Slot Screen
- 7 Feet of 40-Slot Screen

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWS ER
J-2644-58 12/94
Figure A-93
Boring Log and Construction Data for Extraction Well WW-EW-2

Geologic Log

Approx. Ground Surface
Elevation in Feet: 1980.4

Moist to wet, dark gray, trace silty, sandy GRAVEL with cobbles.

Petroleum smear zone.

Wet, brown, slightly silty, very gravelly SAND.

Wet, brown, slightly silty, slightly gravelly SAND with cemented sandy layers.

Bottom of Exploration at 198.0 Feet. Completed 12/3/96

Sample

1. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
2. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Extraction Well WW-EW-3

Geologic Log

Approx. Ground Surface
Elevation in Feet: 1972.2

Depth in Feet

0

Moist to wet, gray to brown, slightly silty, sandy GRAVEL to slightly silty, gravelly SAND.

20

Wet, gray to brown, slightly gravelly to gravelly SAND.

Petroleum smear zone.

40

Silty layers to 120 feet.

60

120

140

Wet, brown, non-gravelly to slightly gravelly SAND.

Top SILT layer.

160

180

200

Bottom of Exploration at 196.0 Feet. Completed 11/25/98.

Sample

Lab Tests

S-1 GS
S-2
S-3
S-4
S-5
S-6 GS
S-7
S-8
S-9 GS
S-10
S-11 GS
S-12
S-13
S-14
S-15
S-16 GS
S-17
S-18
S-19

Extraction
Well Design

Casing Stickup in Feet: 2.05
Top of Casing in Feet: 1974.25

24-inch Diameter Borehole

20-inch Diameter Well Casing

1/14/99

21 Feet of 80 Slot Screen

22 Feet of 50 Slot Screen

23 Feet of 40 Slot Screen

11 Feet of 60 Slot Screen

5 Feet of Tail Pipe

1. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.

2. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Extraction Well WW-EW-3
Modified April 2000

Geologic Log

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
<th>Lab Tests</th>
</tr>
</thead>
</table>
| Approx. Ground Surface
  Elevation in Feet: 1972.2 |
| 0              |        |           |
| 20             |        |           |
| 40             |        |           |
| 60             |        |           |
| Wet, gray to brown, slightly gravelly to gravelly SAND. Petroleum smear zone. |
| 80             |        |           |
| 100            |        |           |
| Silty layers to 120 feet. |
| S-1            | GS     |
| S-2            |        |
| S-3            |        |
| S-4            |        |
| S-5            |        |
| S-6            |        |
| S-7            |        |
| S-8            | GS     |
| S-9            |        |
| S-10           |        |
| 140            |        |           |
| Wet, brown, non-gravelly to slightly gravelly SAND. Top SILT layer. |
| S-11           | GS     |
| S-12           |        |
| S-13           |        |
| S-14           |        |
| S-15           |        |
| S-16           |        |
| S-17           |        |
| S-18           |        |
| S-19           |        |
| 160            |        |           |
| 180            |        |           |
| 200            |        |           |

Extraction Well Design

Casing Pickup in Feet: 2.35
Top of Casing in Feet: 1966.75
Vault Base in Feet: 1964.4

1. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
2. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well WW-MW-1

Geologic Log

Ground Surface  Elevation in Feet  1970.9

Depth in Feet

Medium dense to very dense, damp to moist, brown, slightly silty to silty, slightly sandy to sandy GRAVEL.

S-1  60/4
S-2  52  1.0
S-4  15  0.4
S-5  67  0.6
S-6  45  0.8
BS-1 - -

Dense, wet, gray, slightly sandy GRAVEL.

Bottom of Boring at 58.0 Feet. Completed 11/13/89. Abandoned 9/25/95.

Casing Stickup in Feet -0.4
Top of PVC in Feet 1970.47

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
**Boring Log and Construction Data for Monitoring Well WW-MW-2**

**Geologic Log**

<table>
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<th>Sample</th>
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<tbody>
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<tr>
<td>0</td>
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<tr>
<td>0</td>
<td>S-3</td>
<td>33</td>
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<tr>
<td>0</td>
<td>BS-1</td>
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<td>0</td>
<td>S-4</td>
<td>37</td>
</tr>
<tr>
<td>0</td>
<td>BS-2</td>
<td></td>
</tr>
</tbody>
</table>

**Casing Stickup in Feet:** -0.65

**Top of PVC in Feet:** 1970.01

Bottom of Boring at 57.5 Feet.
Completed 11/9/89.
Abandoned

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well WW-MW-3

Geologic Log

Ground Surface
Elevation in Feet 1976.8

Depth in Feet

<table>
<thead>
<tr>
<th>Sample</th>
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<th>PID</th>
</tr>
</thead>
<tbody>
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<tr>
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<tr>
<td>S-3</td>
<td>40</td>
<td>0.5</td>
</tr>
<tr>
<td>S-4</td>
<td>70/11</td>
<td>0.5</td>
</tr>
<tr>
<td>BS-1</td>
<td>48/11</td>
<td></td>
</tr>
<tr>
<td>S-5</td>
<td>70/10</td>
<td>0.5</td>
</tr>
<tr>
<td>S-6</td>
<td>88</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Bottom of Boring at 63.0 Feet. Completed 11/6/89.

Monitoring Well Design
Casing Stickup in Feet 2.5
Top of PVC in Feet 1979.34

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well WW-MW-4

Geologic Log

<table>
<thead>
<tr>
<th>Depth (Feet)</th>
<th>Sample</th>
<th>Blows per Foot</th>
<th>PID</th>
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<td></td>
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<tr>
<td>100</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Ground Surface
Elevation in Feet 2004.9

Loose to dense, moist, brown to gray, slightly silty to silty, slightly to very sandy GRAVEL (FILL)

Very dense, damp, brown, very sandy GRAVEL

(Dense), damp, brown-gray, silty, very gravelly SAND

Very dense, damp, brown and gray, slightly silty to silty, sandy to very sandy GRAVEL

Bottom of Boring at 93.5 Feet. Completed 11/14/89. Abandoned

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

Casing Stickup in Feet
Top of PVC in Feet 2007.22

Monitoring Well Design
# Boring Log and Construction Data for Monitoring Well WW-MW-5

## Geologic Log

<table>
<thead>
<tr>
<th>Sample</th>
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</tr>
</thead>
<tbody>
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<td>0.4</td>
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<tr>
<td>S-2</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>S-3</td>
<td>49</td>
<td>0.4</td>
</tr>
<tr>
<td>S-4</td>
<td>55</td>
<td>0.4</td>
</tr>
<tr>
<td>S-5</td>
<td>20</td>
<td>0.4</td>
</tr>
<tr>
<td>BS-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-6</td>
<td>40</td>
<td>30</td>
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<tr>
<td>S-7 (Dup)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Ground Surface**
  - Elevation in Feet 1984.4
- **Depth in Feet**
  - 0
  - 10
  - 20
  - 30
  - 40
  - 50
  - 60
  - 70
  - 80
  - 90
  - 100

**Notes:**
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well WW-MW-6

Geologic Log

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
<th>Blows per Foot</th>
<th>PID</th>
</tr>
</thead>
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<tr>
<td>10</td>
<td>S-1</td>
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<td>0.4</td>
</tr>
<tr>
<td>10</td>
<td>S-2</td>
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<td>40</td>
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<td>70</td>
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</tr>
<tr>
<td>70</td>
<td>S-6</td>
<td>37</td>
<td>22</td>
</tr>
</tbody>
</table>

Bottom of Boring at 73.5 Feet.
Completed 11/7/89.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
**Boring Log and Construction Data for Monitoring Well WW-MW-7**

**Geologic Log**

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
<th>Blows per Foot</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Surface</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevation in Feet 1997.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S-1</td>
<td>22</td>
<td>0.6</td>
</tr>
<tr>
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<td>S-2</td>
<td>43</td>
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<td>S-3</td>
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<td>0.5</td>
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<td>40</td>
<td>S-4</td>
<td>63</td>
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<tr>
<td>60</td>
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<td>100</td>
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</tr>
</tbody>
</table>

Bottom of Boring at 84.0 Feet. Completed 11/3/89.

**Monitoring Well Design**

Casing Stuckup in Feet 1.85
Top of PVC in Feet 1999.35

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
**Boring Log and Construction Data for Monitoring Well WW-MW-8**

**Geologic Log**

- Approx. Ground Surface
  - Elevation in Feet 1998.7
- Depth in Feet

<table>
<thead>
<tr>
<th>Layer Description</th>
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</thead>
<tbody>
<tr>
<td>Damp, dark brown to brown, slightly silty, sandy to very sandy GRAVEL.</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>Dry, light brown, sandy to very sandy GRAVEL.</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>Damp, brown, very gravelly SAND.</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>Dry to damp, light brown to brown, very sandy GRAVEL with trace of silt.</td>
</tr>
<tr>
<td>40</td>
</tr>
<tr>
<td>Medium dense to dense, moist to wet, brown and gray with orange motting, sandy GRAVEL.</td>
</tr>
<tr>
<td>70</td>
</tr>
<tr>
<td>Bottom of Boring at 84.0 Feet. Completed 12/11/90.</td>
</tr>
<tr>
<td>90</td>
</tr>
<tr>
<td>100</td>
</tr>
</tbody>
</table>

**Monitoring Well Design**

- Casing Stickup in Feet 2.15
- Top of PVC in Feet 2000.83

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
# Boring Log and Construction Data for Monitoring Well WW-MW-9

## Geologic Log

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<th>Depth in Feet</th>
<th>Description</th>
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<tbody>
<tr>
<td>0</td>
<td>Approx. Ground Surface</td>
</tr>
<tr>
<td></td>
<td>Elevation in Feet 1990.4</td>
</tr>
<tr>
<td>10</td>
<td>Dry to damp, brown, slightly silty, gravelly SAND to very sandy GRAVEL</td>
</tr>
<tr>
<td>20</td>
<td>Dry, light brown, very sandy GRAVEL</td>
</tr>
<tr>
<td>30</td>
<td>Dry to damp, brown, slightly silty, very sandy GRAVEL</td>
</tr>
<tr>
<td>50</td>
<td>Damp, brown, sandy GRAVEL</td>
</tr>
<tr>
<td>60</td>
<td>Very dense to medium dense, damp to wet, brown and gray with orange motting sandy to very sandy GRAVEL</td>
</tr>
<tr>
<td>70</td>
<td>Bottom of Boring at 74.0 Feet. Completed 12/12/90</td>
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<tr>
<td>80</td>
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</tr>
<tr>
<td>90</td>
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<table>
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<tr>
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<tr>
<td>S-1</td>
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<tr>
<td>S-2</td>
<td>48</td>
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<tr>
<td>S-3</td>
<td>25</td>
</tr>
</tbody>
</table>

## Monitoring Well Design

- Casing Stickup in Feet 2.2
- Top of PVC in Feet 1992.64

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well WW-MW-9

Geologic Log

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Description</th>
<th>Sample N</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approx. Ground Surface</td>
<td>Dry to damp, brown, slightly silty, gravelly SAND to very sandy GRAVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevation in Feet 1990.4</td>
<td>Dry, light brown, very sandy GRAVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Dry to damp, brown, slightly silty, very sandy GRAVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Damp, brown, sandy GRAVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Very dense to medium dense, damp to wet, brown and gray with orange mottling sandy to very sandy GRAVEL</td>
<td>S-1 61</td>
<td>NA</td>
</tr>
<tr>
<td>70</td>
<td></td>
<td>S-2 48</td>
<td>NA</td>
</tr>
<tr>
<td>80</td>
<td></td>
<td>S-3 25</td>
<td>NA</td>
</tr>
</tbody>
</table>

Bottom of Boring at 74.0 Feet. Completed 12/12/90.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well WW-MW-10

Geologic Log

Depth in Feet

Approx. Ground Surface Elevation in Feet 2002.7

Dry, light brown, very sandy GRAVEL.

Dry to damp, brown, very gravelly SAND with trace of silt.

Dry, brown, sandy GRAVEL.

Very dense, damp to wet, brown with orange mottling, slightly sandy GRAVEL.

Dense, wet, gray-brown, very sandy GRAVEL.

Bottom of Boring at 84.0 Feet. Completed 12/13/90.

Sample N PID

S-1 50 <1
S-2 49 <1
S-3 35 18

Casing Stickup in Feet 1.35
Top of PVC in Feet 2004.03

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well WW-MW-11

Geologic Log

Approx. Ground Surface Elevation in Feet 1971.3

Depth in Feet

Dense, moist, brown, slightly silty, sandy GRAVEL with cobbles.

Very dense, moist, brown, slightly sandy GRAVEL with cobbles.

Medium dense, moist to wet, slightly silty, sandy GRAVEL with petroleum odor and staining.

Bottom of Boring at 66.0 Feet.
Completed 10/31/91.

Sample N PID
S-1 50/4 2
S-2 50/6 5
S-3 100/10 1
S-4 20 31
S-5 16 10
S-6 18 0

Monitoring Well Design
Casing Stickup in Feet 2.5
Top of PVC in Feet 1973.79

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well WW-MW-12

Geologic Log

- Approx. Ground Surface
  Elevation in Feet 1981.0

- Dense, moist, brown, slightly silty, sandy GRAVEL with cobbles and occasional silty layers.

- Medium dense to very dense, moist to wet, gray, slightly silty, sandy GRAVEL.

- Slight to strong petroleum odor and staining.

- Bottom of Boring at 73.5 Feet. Completed 11/2/91.

- Sample N PID
  S-1 50/4 0
  S-2 41 0
  S-3 39 1
  S-4 55 2
  S-5 22 10
  S-6 40 2
  S-7 75 30
  S-8 45 129
  S-9 22 19
  S-10 50/6 12
  S-11 30 12
  S-12 35 0

Monitoring Well Design

Casing Stickup in Feet 2.5
Top of PVC in Feet 1983.49

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well WW-MW-14

Geologic Log

Approx. Ground Surface
in Elevation in Feet 1970.0

- Very dense, moist, brown, slightly silty, sandy GRAVEL with cobbles.

- Dense, damp, tan, gravelly SAND.

- Dense, wet, brown, very sandy GRAVEL with boulders.

- Medium dense, moist to wet, brown, slightly sandy to very sandy GRAVEL.

Bottom of Boring at 70.0 Feet.
Completed 11/19/91.
Abandoned 9/25/95.

Sample | N | PID
--- | --- | ---
S-1 | 79 | 2
S-2 | 35 | 0
S-3 | 33 | 1
S-4 | 43 | 0
S-5 | 33 | 1
S-6 | 24 | 0
S-7 | 25 | 1
S-8 | 13 | 0
S-9 | 15 | 0

Monitoring Well Design
Casing Stickup in Feet -0.42
Top of PVC in Feet 1969.53

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well WW-MW-15

Geologic Log

Approx. Ground Surface
Elevation in Feet: 1974.0

Depth in Feet

Dense, dry and damp, brown and gray, slightly silty, sandy GRAVEL with some cobbles.

Dense to very dense, damp to wet, gray and brown, sandy to very sandy GRAVEL.

Loose to dense, wet, brown and gray, slightly sandy GRAVEL.

Bottom of Boring at 70.0 Feet.
Completed 11/13/91.

Sample | N | PID
--- | --- | ---
S-1 | 40 | 45
S-2 | 54 | 5
S-3 | 34 | 1
S-4 | 12 | 1
S-5 | 7 | 1
S-6 | 12 | 1

Monitoring Well Design
Casing Stickup in Feet: 1.47
Top of PVC in Feet: 1975.43

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well WW-MW-16

Geologic Log

Approximate Ground Surface
Elevation in Feet: 1970.5

Sandy GRAVEL, (FILL)

Sandy GRAVEL with cobbles.

Sandy GRAVEL.

Sandy GRAVEL with boulders and cobbles.

Monitoring Well Design
Casing Stickup in Feet: 2.62
Top of PVC in Feet: 1973.12

1. Refer to Figure A-11 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Monitoring Well WW-MW-17

Geologic Log

Depth in Feet

Approximate Ground Surface
Elevation in Feet: 1971.5

10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200

Silty, sandy GRAVEL

Sandy GRAVEL with cobbles and boulders.

Bottom of Boring at 104.0 Feet.
Completed 1/4/95.

Boring drilled unsampled to install well. Soil description from WW-EW-1 log.

Well Design

Casing Stickup in Feet: -2.87
Top of Casing in Feet: 1974.37

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (AHD) or for date specified. Level may vary with time.
# Geologic Log

Approximate Ground Surface  
Elevation in Feet: 1971.9

<table>
<thead>
<tr>
<th>Depth (in Feet)</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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</tr>
<tr>
<td>5</td>
<td>S-1</td>
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<tr>
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<tr>
<td>95</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

- Dry, brown to dark brown, slightly silty, sandy GRAVEL.
- Dry, gray, slightly sandy GRAVEL.
- Dry, brown, slightly sandy GRAVEL.

Becomes damp.

Dry, brown, slightly sandy GRAVEL.

Bottom of Boring at 62.5 Feet.  
Completed 8/17/95.  
2-inch-diameter 0.020-inch machine-slotted PVC screen from 42 to 57 feet.

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
### Geologic Log

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<tr>
<th>Depth in Feet</th>
<th>Description</th>
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<tbody>
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<td>Approximate Ground Surface</td>
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<tr>
<td>10</td>
<td>Elevation in Feet: 1982.9</td>
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<tr>
<td>10-20</td>
<td>Sandy GRAVEL to gravelly SAND with cobbles.</td>
</tr>
<tr>
<td>75</td>
<td>Bottom of Boring at 75.0 Feet. Completed 9/20/95.</td>
</tr>
<tr>
<td>80-90</td>
<td>4-inch-diameter, 0.080-inch wirewrap slot steel screen from 54 to 74 feet.</td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

Monitoring Well Design

Casing Stickup in Feet: -0.45
Top of PVC in Feet: 1382.45
Boring Log and Construction Data for Skimming Well WW-SK-1

Geologic Log

Approximate Ground Surface
Elevation in Feet: 1971.4

Silty, sandy GRAVEL

Sandy GRAVEL with cobbles and boulders.

Bottom of Boring at 70.0 Feet.
Completed 10/14/94.
Boring drilled unsampled to install well. Soil descriptions from WW-EW-1 log.

Well Design
Casing Stuckup in Feet: -2.97
Top of Casing in Feet: 1974.37

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Geologic Log

Approx. Ground Surface Elevation in Feet: 1977.2

0
Brown, silty SAND and GRAVEL

10
Gray SAND and GRAVEL

20
Moist to wet SAND and GRAVEL

30

Bottom of Exploration at 68.0 Feet. Completed 6/26/01.

40

Extraction Well Design

Casing Stickup in Feet: 2.47
Top of Casing in Feet: 1979.67

8-inch-Diameter Well Casing

K-Packer

8-inch-Telescoping 80-Slot Screen

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may gradually.
3. Groundwater level, if indicated, is at time of drilling (ATO) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and stick up reported by Holt Drilling. Actual TOC elevation will be surveyed at a later date.

Figure A-116
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATB) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and stickup reported by Holt Drilling. Actual TOC elevation will be surveyed at a later date.
Well Log WW-SK-4

Geologic Log

Depth in Feet

Approx. Ground Surface Elevation in Feet: 1978.9

0

Dark brown, silty GRAVEL.

10

Silty SAND and GRAVEL.

20

Gray SAND and GRAVEL.

30

SAND and GRAVEL.

40

Bottom of Exploration at 69.0 Feet. Completed 6/27/01.

50

60

70

80

90

100

Extraction Well Design

Casing Stickup in Feet: 2.39
Top of Casing in Feet: 1981.29

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATO) or for date specified. Level may vary with time.
4. Top of casing (TOC) elevation was calculated based on surveyed ground surface elevation and stickup reported by Holt Drilling. Actual TOC elevation will be surveyed at a later date.
**Boring Log and Construction Data for Monitoring Well WW-TL-MW-01**

### Geologic Log

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<tr>
<td>90</td>
<td>S-14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>95</td>
<td>S-15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>S-17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Monitoring Well Design**

- Casing Stickup in Feet: 2.0
- Top of Casing in Feet: 2005

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log and Construction Data for Recirculation Well WW-UVB-1

Geologic Log

Approx. Ground Surface
Elevation in Feet: 1970

Sample
Depth in Feet

0

Moist, gray to gray-brown, gravelly SAND and sandy GRAVEL with silty layers.

20

Moist to wet, gray to brown, sandy GRAVEL and gravelly SAND with cobbles.

Iron staining.

40

60

Wet, brown, slightly gravelly, silty SAND.

Brown, slightly gravelly SILT with cobble-size chunks of weathered bedrock.

Bottom of Exploration at 151.0 Feet. Completed 11/4/98.

140

160

180

200

Recirculation Well Design

Casing Stickup in Feet: -1.88
Top of Casing in Feet: 1971.98

16-inch Diameter Borehole

6 Feet of 100 Slot Screen

7 Feet of 30 Slot Screen

12/7/98

8 Feet of 100 Slot Screen

5 Feet of 60 Slot Screen

9 Feet of 100 Slot Screen

14-inch Diameter Well Casing

35 Feet of 80 Slot Screen

5 Feet of Tail Pipe

Backfill

1. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
2. Ground water level, if indicated, is at time of drilling (4/10) or for date specified. Level may vary with time.
Soil core boxes are oriented from upper right to lower left unless noted.

Photograph A-1 - HL-MW-28DD 0 to 4 feet below ground surface.

Photograph A-2 - HL-MW-28DD 4 to 8 feet below ground surface.
Photograph A-3 - HL-MW-28DD 8 to 18 feet below ground surface.

Photograph A-4 - HL-MW-28DD 18 to 26 feet below ground surface.
Photograph A-5 - HL-MW-28DD 26 to 33 feet below ground surface.

Photograph A-6 - HL-MW-28DD 33 to 42 feet below ground surface.
Photograph A-7 - HL-MW-28DD 42 to 46 feet below ground surface.

Photograph A-8 - HL-MW-28DD 46 to 50 feet below ground surface.
Photograph A-9 - HL-MW-28DD 50 to 54 feet below ground surface.

Photograph A-10 - HL-MW-28DD 54 to 57 feet below ground surface.
Photograph A-11 - HL-MW-28DD 57 to 61 feet below ground surface.

Photograph A-12 - HL-MW-28DD 65 to 70 feet below ground surface.
Photograph A-13 - HL-MW-28DD 70 to 74 feet below ground surface.

Photograph A-14 - HL-MW-28DD 74 to 78 feet below ground surface.
Photograph A-15 - HL-MW-28DD 78 to 82 feet below ground surface.

Photograph A-16 - HL-MW-28DD 82 to 98 feet below ground surface.
Photograph A-17 - HL-MW-28DD 98 to 108 feet below ground surface.

Photograph A-18 - HL-MW-28DD 108 to 109 feet below ground surface.
Photograph A-19 - HL-MW-28DD 109 to 118 feet below ground surface.

Photograph A-20 - HL-MW-28DD 118 to 133 feet below ground surface.
Photograph A-21 - HL-MW-28DD 133 to 140 feet below ground surface.

Photograph A-22 - HL-MW-28DD 140 to 144 feet below ground surface.
Photograph A-23 - HL-MW-28DD 144 to 148 feet below ground surface.

Box is oriented backwards

Bottom of boring

Top of core interval

Photograph A-24 - HL-MW-28DD 148 to 150 feet below ground surface.
<table>
<thead>
<tr>
<th>Course gravel &amp; boulders</th>
<th>0</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course gravel</td>
<td>16</td>
<td>70</td>
</tr>
<tr>
<td>Gravel with hardpan &amp; clay</td>
<td>70</td>
<td>85</td>
</tr>
<tr>
<td>Course gravel</td>
<td>86</td>
<td>96</td>
</tr>
<tr>
<td>Hardpan &amp; gravel</td>
<td>96</td>
<td>101</td>
</tr>
<tr>
<td>Gravel and sand</td>
<td>101</td>
<td>103</td>
</tr>
<tr>
<td>Fine gravel and clay</td>
<td>103</td>
<td>110</td>
</tr>
<tr>
<td>Fine gravel</td>
<td>110</td>
<td>112</td>
</tr>
<tr>
<td>Course gravel</td>
<td>112</td>
<td>132</td>
</tr>
<tr>
<td>Fine gravel</td>
<td>132</td>
<td>134</td>
</tr>
<tr>
<td>Course gravel</td>
<td>134</td>
<td>138</td>
</tr>
<tr>
<td>Sand mixed with small gravel</td>
<td>136</td>
<td>138</td>
</tr>
<tr>
<td>Casing: 20°F from 0 to 110°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perforated from 112 to 138</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No screens</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, no state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)
<table>
<thead>
<tr>
<th>Consol Lation</th>
<th>Material</th>
<th>Thickness (foot)</th>
<th>Depth (foot)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SWt: 98' on March 5, 1963

No well test made.
**WELL LOG**

**Record by:** Driller

**Source:** Driller's record

**Location:** State of WASHINGTON

**County:** Spokane

**Area:**

**Map:** S. B4 SE 1/4 sec 4 T25 N R 44 E

**Diagram of Section:**

Drilling Co.: Holman Drilling Company

**Method of Drilling:**

**Date:** 18

**Owner:** Irvin Water District # 6

**Address:** N. 3120 Bulture, Spokane, Washington

**Land surface, datum:** 1989 ft above

**SWL:** 78 ft below

**Durs:** 19

<table>
<thead>
<tr>
<th>Correlation</th>
<th>Material</th>
<th>From (ft)</th>
<th>To (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Municipal supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>boulders and gravel</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>gravel</td>
<td>22</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>hardpan</td>
<td>100</td>
<td>117</td>
</tr>
<tr>
<td></td>
<td>Casing: 16&quot; from 0' to 117'</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perforations: 3/8&quot; by 3&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>540 perf. from 83' to 115'</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pump: Peerless turbine 100 HP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Turn up
The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 10</td>
<td>Gravel</td>
<td>Cements</td>
</tr>
<tr>
<td>10 - 20</td>
<td>Gravel</td>
<td>1-1&quot; loose</td>
</tr>
<tr>
<td>20 - 30</td>
<td>Gravel</td>
<td>1-1&quot; light</td>
</tr>
<tr>
<td>30 - 40</td>
<td>Gravel</td>
<td>2-4&quot;</td>
</tr>
<tr>
<td>40 - 50</td>
<td>Gravel</td>
<td>2-4&quot;</td>
</tr>
<tr>
<td>50 - 60</td>
<td>Gravel</td>
<td>2-4&quot;</td>
</tr>
<tr>
<td>60 - 70</td>
<td>Gravel</td>
<td>2-4&quot;</td>
</tr>
<tr>
<td>70 - 80</td>
<td>Gravel</td>
<td>2-4&quot;</td>
</tr>
<tr>
<td>80 - 90</td>
<td>Gravel</td>
<td>2-4&quot;</td>
</tr>
<tr>
<td>90 - 100</td>
<td>Gravel</td>
<td>2-4&quot;</td>
</tr>
<tr>
<td>100 - 110</td>
<td>Gravel</td>
<td>2-4&quot;</td>
</tr>
<tr>
<td>110 - 120</td>
<td>Gravel</td>
<td>2-4&quot;</td>
</tr>
</tbody>
</table>

Pump: 200 hp, deep well turbine
Surface sealed with bentonite slurry to 10'

State: Washington
County: Spokane
Area: T.41 N., E.9 W.
Section 15
Drilling Co: Human Drilling Co., Inc.
Owner: Trentwood Irrigation Dist. #3
Address: 3410 E. 9th Spokane, Wash.

Date: Sept. 15, 1966
Method of Drilling: Cable
SWL: 771
The Department of Ecology does NOT Warranty the Data and/or the information on this Well Report.

<table>
<thead>
<tr>
<th>WELL LOG—Continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovery too rapid to measure</td>
</tr>
<tr>
<td>Temp: 65, 1964</td>
</tr>
<tr>
<td>Pump: turbine - surface motor (not purchased)</td>
</tr>
<tr>
<td>Date (Use... (Use...</td>
</tr>
<tr>
<td>No. (Use... (Use...</td>
</tr>
</tbody>
</table>

[Table continues with columns for various data entries, but details are unclear due to the quality of the photo.]
**WATER WELL REPORT**

**STATE OF WASHINGTON**

**Application No:** 63-26592

**Permit No:**

---

**1)** **OWNER:**
Name: TREATWELL

**2)** **LOCATION OF WELL:**
County: Spokane

---

**PROPOSED USE:**
- Domestic [ ]
- Industrial [ ]
- Municipal [ ]
- Irrigation [ ]
- Test Well [ ]
- Other [ ]

**TYPE OF WORK:**
- New well [ ]
- Deepened [ ]
- Reconditioned [ ]
- Method: Drift [ ]
- Bored [ ]
- Rotary [ ]
- Jetted [ ]

**DIMENSIONS:**
- Diameter of well: 2 3/4 inches
- Depth of completed well: 174 ft.

---

**CONSTRUCTION DETAILS:**
- Casing installed: 2 3/4 ft. from top to 129 ft.
- Threaded [ ]
- Welded [ ]

**Perforations:**
- Yes [X] No [ ]
- Type of perforator used: JOHNSON
- Size of perforation: in. by in.
- Perforations from ft. to ft.

**Screen:**
- Yes [X] No [ ]
- Manufacturer's Name: JOHNSON
- Type: JOHNSON
- Model No.: 1/2" D.O."
- Diameter: 2 3/4 ft.
- Slot size: 1/8 in. from 129 ft. to 133 ft.
- Diameter: 2 3/4 ft.
- Slot size: 1/8 in. from 133 ft. to 140 ft.

**Travel packed:**
- Yes [X] No [ ]
- Size of gravel:
- Gravel placed from ft. to ft.

**Surface seal:**
- Yes [X] No [ ]
- To what depth: 20 ft.
- Material used in seal: CEMENT GROUT
- Did any strata contain unusable water? Yes [X] No [ ]
- Type of water: Depth of strata:

---

**PUMP:**
- Manufacturer's Name:
- Type: H.P.

---

**WATER LEVELS:**
- Land-surface elevation above mean sea level: 2020 ft.
- Static level: 102.6 ft. below top of well Date: 7/20/81
- Artesian pressure: Date: 7/20/81
- Artesian water is controlled by: (Cap, valve, etc.)

---

**WELL TESTS:**
- Drawdown is amount water level is lowered below static level
- Was a pump test made? Yes [X] No [ ]
- If so, by whom: DRILLER
- Yield: 2 gpd, drawdown after 1 hr.
- 2 gpd
- 4 gpd
- 6 gpd
- Recovery data (time taken or water when pump turned off) (water level measured from well top to water level)
- Time Water Level Time Water Level Time Water Level
- 0 102.6
- 10 102.6
- 21/5/81

---

**WELL DRILLER'S STATEMENT:**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

---

**NAME:** Holman Drilling Corp.
(Person, firm, or corporation) Type or print)

**Address:** E 1010 9th Ave
Spokane WA 99202

[Signed] Arnold E. Holman
(Well Driller)

**License No.:** 0189 Date: 8/19, 1981
Trentwood Irrigation District #3
N. 4402 Sullivan Rd.
Spokane, Washington 99216
922-7532

Well Log: Well #5
Record by: Driller
Source: Engineer's record

Location: N1/2, NW1/4, Sec. 1, T. 25 N., R. 44 E.W.M.
Spokane County, Washington

Drilling Co: E. A. Holman Drilling Co.,
S. 601 Pines Rd.
Spokane, Washington 99206

Method of Drilling: Cable
Date: Feb. 15, 1968

Owner: Trentwood Irrigation District #3
N. 4402 Sullivan Rd.
Spokane, Washington 99216

SWL: 104'
Date: Feb. 15, 1968
Diams: 16' x 159'

<table>
<thead>
<tr>
<th>Material</th>
<th>From (feet)</th>
<th>To (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand &amp; gravel</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Sand, silt &amp; pea gravel</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Sand &amp; gravel</td>
<td>18</td>
<td>59</td>
</tr>
<tr>
<td>Sand, silt &amp; pea gravel</td>
<td>59</td>
<td>81</td>
</tr>
<tr>
<td>Cemented sand &amp; gravel</td>
<td>81</td>
<td>84</td>
</tr>
<tr>
<td>Sand &amp; gravel</td>
<td>84</td>
<td>102</td>
</tr>
<tr>
<td>Very hard packed gravel</td>
<td>102</td>
<td>104</td>
</tr>
<tr>
<td>Good clean washed gravel up to 1 1/4&quot;</td>
<td>104</td>
<td>110</td>
</tr>
<tr>
<td>Gravel, to 2&quot;</td>
<td>110</td>
<td>112</td>
</tr>
<tr>
<td>Gravel, to 1 1/4&quot;</td>
<td>112</td>
<td>117</td>
</tr>
<tr>
<td>Gravel, to 3&quot;</td>
<td>117</td>
<td>122</td>
</tr>
<tr>
<td>Gravel, to 3 1/2&quot;</td>
<td>122</td>
<td>130</td>
</tr>
<tr>
<td>Gravel, to 2 1/4&quot;</td>
<td>130</td>
<td>140</td>
</tr>
<tr>
<td>Gravel, to 3&quot;</td>
<td>140</td>
<td>150</td>
</tr>
</tbody>
</table>

9' of casing welded on top and back filled around to raise ground level.
Casing: 16" 0' to 159'
Perforated from 110' to 145'
Pumps: 200 h.p. deep well turbine, Layne & Bowler.
Well No. 1

State of Washington
Department of Conservation
Division of Water Resources

Application No.: 11195
Permit No.: 10027 Certification No.: 7129

Well Log

Record by: Driller
Source: Driller's record

Location: State of Washington
County: Spokane
Area:

Map: NW 1/4 SW 1/4 sec. 1 T 25 N, R 44 E
Diagram of Section

Drilling Co.: A. A. Durand
Address: Walla Walla, WA

Method of Drilling: cable
Date: 19
Owner: Spokane Industrial Park, Inc.
Address: N. 3808 Sullivan Road, Spokane, WA

Land surface, datum above below:

SWL: 76.2' Date: Sept. 10, 1970. Dima:

<table>
<thead>
<tr>
<th>Consolation</th>
<th>Material</th>
<th>From (feet)</th>
<th>To (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial use</td>
<td>gravel</td>
<td>0</td>
<td>160</td>
</tr>
<tr>
<td>Casing: 12&quot; from 0' 60 160'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface Seal: concrete grout to 20'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump: Pomona deep well turbine 50 hp</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Turn up

Sheet of sheets
## Well Log

**State of Washington**

**Department of Conservation**

**Division of Water Resources**

**Appl. 11196, Cert 7130**

**Record by A. A. Durand**

**Driller record**

**Location:** State of WASHINGTON  
**County:** Spokane

**Diagram of Section**

**E & G**

**Drilling Co.:** A. A. Durand  
**Address:**  
**Walla Walla, WA**

**Method of Drilling:** Cable  
**Date:** 19

**Owner:** Spokane Industrial Park, Inc.  
**Address:**  
**N. 3808 Sullivan Road, Spokane, WA**

**Land surface, datum:** Above  
**SWL:** 19.70  
**Dims:** 16" x 120

### Coordinates

<table>
<thead>
<tr>
<th>Material</th>
<th>From (feet)</th>
<th>To (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial gravel</td>
<td>0</td>
<td>120</td>
</tr>
<tr>
<td>Casing: 16&quot; from 0' to 120'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface seal: concrete grout to 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump: Pomona deep well turbine</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

**Turn up**

*The Department of Ecology does NOT warranty the Data and/or the Information on this Well Report.*
<table>
<thead>
<tr>
<th>Coarse Material</th>
<th>From (feet)</th>
<th>To (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>gravel</td>
<td>0</td>
<td>117</td>
</tr>
<tr>
<td>Casing: 10&quot; from 0' to 117'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump: Peerless deep well turbine</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>
WATER WELL REPORT
STATE OF WASHINGTON

(1) OWNER: Spokane Industrial Park, Inc. Address: N. 3808 Sullivan Road, Spokane, Wash.

(2) LOCATION OF WELL: County: Spokane Section: 12, T. 25 N., R. 44 E. W.M.

PROPOSED USE: Domestic ☐ Industrial ☒ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Existing

- New well ☐
- Deepened ☐
- Reconditioned ☐
- Existing treatment ☐
- Drilled ☒
- Cable Driven ☐
- Rotary ☐
- Jetted ☐
- Other ☐

(5) DIMENSIONS:

- Diameter of well: 10 inches
- Depth of complete well: 117 ft

(6) CONSTRUCTION DETAILS:

<table>
<thead>
<tr>
<th>Casing installed:</th>
<th>10 feet</th>
<th>117 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threaded ☐</td>
<td>10 feet</td>
<td>117 feet</td>
</tr>
<tr>
<td>Welded ☑</td>
<td>10 feet</td>
<td>117 feet</td>
</tr>
</tbody>
</table>

Perforations: Yes ☐ No ☐

- Type of perforator used: Unknown
- Size of perforations: 0.25 in.
- Number of perforations: 25
- Depth of strata: 100 ft

Screens: Yes ☐ No ☐

- Manufacturer's Name: Peerless
- Model: Deep well turbine

(7) PUMP: Manufacturer's Name: Peerless

(8) WATER LEVELS:

- Land-surface elevation: 67.10 ft
- Above mean sea level: 2008 ft
- Static level: 67.10 ft
- Below top of well Date: 07/10/70
- Artesian level: 0 ft
- Artesian water is controlled by:...

(9) WELL TESTS:

- Drawdown is amount water level is lowered below static level
- Yield: gal/min with... ft. drawn down after...

- Recovery data (time taken as zero when pump turned off (water level measured from well top to water level)
- Time Water Level Time Water Level Time Water Level
- Unknown...

- Rate of test: gal/min with... ft. drawn down after...
- Artesian flow: g.p.m.
- Temperature of water:...

(10) WELL LOG:

- Formation: Spokane valley gravel
- MATERIAL FROM TO

- Spokane valley gravel

NAME: A. A. Durand
Address: Walla Walla, Washington
[Signature]: Out of business
License No.: Date: 10/19

USE ADDITIONAL SHEETS IF NECESSARY
WATER WELL REPORT
STATE OF WASHINGTON
Application No. 10215
(1) OWNER: John Doe
Address: 123 Main St, Anytown, USA
(2) LOCATION OF WELL: County: King
Township: 32 N
Section: 18
Range: 25 W
Lot: 4
Well: 25 x 44.5
(3) PROPOSED USE: Domestic
(4) TYPE OF WORK: Owner's number of well
New well
Reconditioned
(5) DIMENSIONS:
Diameter of well
Depth of completed well
(6) CONSTRUCTION DETAILS:
Casing installed:
Threaded
Welded:
Perforations:
Yes
Type of perforator used
SIZE of perforations
Perforations from
Perforations from
Screens:
Yes
Manufacturer's Name
Diam.
Slot size
Gravel packed:
Yes
Type of gravel
Gravel placed from
Surface seal:
Yes
Material used in seal
Did any strata contain usable water?
Yes
Type of water
Depth of strata
Method of sealing strata off
(7) PUMP: Manufacturer's Name
Type:
(8) WATER LEVELS:
State lev.
Artesian pressure
Artesian water is controlled by
(9) WELL TESTS:
Was a pump test made?
Yes
No
Yield:
gal./min.
ft. drawdown after hr.
Recovery data (time taken as soon when pump turned off) (water level measured from well top to water level)
Time
Water Level
Time
Water Level
Time
Water Level
(10) WELL LOG:
Formation:
MATERIAL FROM TO
RECEIVED
JAN 16, 1974
DEPARTMENT OF ECOLOGY
SPOKANE REGIONAL OFFICE
Work started
Completed
WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME: John Doe
Address: 123 Main St, Anytown, USA
License No. 123-45-6789
Date: Feb 17, 1977
**STATE OF WASHINGTON**
**DEPARTMENT OF CONSERVATION AND DEVELOPMENT**

**Well Log**

**Date:** April 15, 1965

**Record by:** Driller's Record

**Source:** Driller's Record

**Location:** State of Washington

- **County:** Spokane
- **Area:** N 72° 27' E 309.2' from SW
- **Map Corner Sec. 11

**SW 1/4 SW 1/4 sec. 11 t. 25 s. n. 4/4 E. E.**

**Drilling Co.:** Holman Drilling Corporation

**Address:** 3410 E. 9th Ave., Spokane, Washington

**Method of Drilling:** Cable

**Owner:** U.S. Bureau of Reclamation

**Address:** Box 937, Boise, Idaho

**Land surface, datum above:**

**Land surface, datum below:**

<table>
<thead>
<tr>
<th>Consolation</th>
<th>Material</th>
<th>Thickness (feet)</th>
<th>Depth (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic, irrigation, industrial and municipal well</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gravel 1 1/2&quot; - 2&quot;</td>
<td>0</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Gravel 1 1/2&quot; 2&quot;</td>
<td>25</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Gravel 2&quot; - 3 1/4&quot;</td>
<td>46</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Gravel 1 1/2&quot; 2&quot;</td>
<td>50</td>
<td>58</td>
<td></td>
</tr>
<tr>
<td>Sand and gravel to 3&quot;</td>
<td>58</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>Coarse sand, brown</td>
<td>87</td>
<td>103</td>
<td></td>
</tr>
<tr>
<td>Gravel and sand to 2&quot;</td>
<td>103</td>
<td>117</td>
<td></td>
</tr>
<tr>
<td>Casing: 16&quot; from 0 to 116'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screened from 116 to 141'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface sealed with cement grout</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SMR:** 61' on July 24, 1964

**Yields:**
- 1120 gpm with 0.7' DD after 18 hours
- 1570 gpm with 1.0' DD after 18 hours
- 2500 gpm with 1.8' DD after 18 hours
STATE OF WASHINGTON  
DEPARTMENT OF CONSERVATION  
DIVISION OF WATER RESOURCES

WELL LOG  
Appl. #7886

Record by  Driller's Record
Source  Driller's Record

Location: State of WASHINGTON  
County  Spokane

Area  

Gov't, Lat. 11° 25' N Sec. 4 N R 44 E  
Diagram of Section

Drilling Co.  Zinkgraf Well Drilling
Address  106 East Sharp

Method of Drilling  Cable  
Date  Jan. 12  1966

Owner  The Hillyard Processing Company
Address  Box 6055, Spokane, Washington

Land surface datum  above  

SWL: 60'  
Date  Jan. 12  1966  
Diam. 10" x 125'

<table>
<thead>
<tr>
<th>Material</th>
<th>From (ft)</th>
<th>To (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gravel w/occasional boulders</td>
<td>0</td>
<td>43</td>
</tr>
<tr>
<td>Gravel, 3/4&quot; up to 3&quot;</td>
<td>43</td>
<td>52</td>
</tr>
<tr>
<td>Boulders, large</td>
<td>52</td>
<td>56</td>
</tr>
<tr>
<td>Rocks, large</td>
<td>56</td>
<td>61</td>
</tr>
<tr>
<td>Mixture - pea gravel up to</td>
<td>61</td>
<td>75</td>
</tr>
<tr>
<td>5&quot; round</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sand, coarse</td>
<td>75</td>
<td>82</td>
</tr>
<tr>
<td>Gravel, 3/4&quot;</td>
<td>82</td>
<td>86</td>
</tr>
<tr>
<td>Sand, coarse &amp; gravel</td>
<td>96</td>
<td>103</td>
</tr>
<tr>
<td>Gravel, 3/4&quot; up to 3&quot; round</td>
<td>103</td>
<td>125</td>
</tr>
<tr>
<td>Casing: 10&quot; from 0-125'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perforated from 106-115'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Also from 106-120'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump: 40 h.p. turbine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peerless</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.
STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

WELL LOG
No. Appl. 4209

Date: Sept. 20 1956
Record by: Well driller
Source: Driller's record

Location: State of WASHINGTON
County: Spokane
Area:

Map: NW 1/4 NE 1/4 sec. 11 T. 25 N. R. 44 E.

Drilling Co, Oliver F., Zinkgraf
Address: Spokane, Wash.

Method of Drilling: Date: Sept. 18, 1956
Owner: Cominco Products Inc.
Address: Spokane, Wash.

Land surface, datum: Above

<table>
<thead>
<tr>
<th>Consistency</th>
<th>Material</th>
<th>Thickness (feet)</th>
<th>Depth (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top soil</td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Nigger heads, boulders</td>
<td>gravel</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>Sand, gravel, few boulders</td>
<td></td>
<td>18</td>
<td>40</td>
</tr>
<tr>
<td>Sand, gravel, boulders</td>
<td>Few boulders</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Diam. 115 x 10&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWL:</td>
<td>74 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DD:</td>
<td>1 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yields:</td>
<td>200 g.p.m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Temp:</td>
<td>56° F.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type &amp; size of pump: deep well turbine d&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type &amp; size of engine: vertical shaft</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

25 h.p.

Turn up (over) Sheet of sheets: 1
The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

<table>
<thead>
<tr>
<th>WELL LOGO—Continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASTING: 10&quot; diam. std. blk. pipe</td>
</tr>
<tr>
<td>PERFORATIONS: from 1 to 115 ft. below surface to 20 perforations per ft. 2/&quot;</td>
</tr>
<tr>
<td>from 20 ft. above surface to 85 ft. below surface, 87 ft. to 102 ft.</td>
</tr>
<tr>
<td>108 ft. to 115 ft.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth Forward</th>
</tr>
</thead>
<tbody>
<tr>
<td>85 ft. to 102 ft.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tool Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>108 ft. to 115 ft.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
WATER WELL REPORT
STATE OF WASHINGTON
Application No. 63-21634
Permit No. 63-216348

(1) OWNER: COMINGO AMERICAN INCORPORATED
Address: Building 101, Spokane Ind'l Park, Spokane

(2) LOCATION OF WELL: County: Spokane
Township: NE 1/4 NE 1/4 Sec. 11
Range: R. 25 N, R. 44 W
Proximity and distance from section or subdivision corner: 626 Feet South A 437 Feet West from NE Cor. Sec. 11

(3) PROPOSED USE: Domestic [X] Industrial [X] Municipal [ ]
Irrigation [ ] Test Well [ ] Other [ ]

(4) TYPE OF WORK: Owner's number of well
New well [X] Method: Dug [X] Bored [ ]
Deepened [ ] Cable [ ] Driven [ ]
Reconditioned [ ] Rotary [ ] Jetted [ ]

(5) DIMENSIONS:
Diameter of well: 18 inches
Drilled: 150 ft. Depth of completed well: 150 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 18 - Diam. from 0 ft. to 150 ft.
Threaded [X] 18 - Diam. from 0 ft. to 150 ft.
Welded [X] 18 - Diam. from 0 ft. to 150 ft.

Perforations:
Yes [X] No [ ]
Type of perforator used:
Size of perforations:
- perforations from 0 ft. to 150 ft.
- perforations from 0 ft. to 150 ft.
- perforations from 0 ft. to 150 ft.

Screens:
Manufacturer's Name: Edward E. Johnson, Inc.
Type: Stainless Steel
Diam. 18" Slot size: 200 ft. to 140 ft.
Diam. 18" Slot size: 200 ft. to 140 ft.

Gravel packed:
Yes [X] No [ ]
Size of gravel:
Gravel placed from 0 ft. to 150 ft.

Surface seal:
Yes [X] No [ ] To what depth: 24 ft.
Material used in seal: Concrete
Any strata contains unusable water: Yes [X] No [ ]
Type of water:
Method of sealing strata off:

(7) PUMP:
Manufacturer's Name: Aurora
Type: Vertical Turbine
HP: 50

(8) WATER LEVELS:
Land-surface elevation above mean sea level: 2000 ft.
Static level: 67.8 ft. below top of well Date: 3/21/74
Artesian pressure: None lb. per square inch Date:
Artesian water is controlled by: (Cap, valve, etc.)

(9) WELL TESTS:
Draindown from water level is lowered below static level: Holman
Was a pump test made? Yes [X] No [ ] If yes, by whom: Holman
Yield: 3511 gal./min. with 5.1 ft. drawdown after 1/2 hrs.
3511 gal./min. with 5.3 ft. drawdown after 1/2 hrs.

Recovery data (time taken as pump when pump turned off) (water level measured from well top to water level)

<table>
<thead>
<tr>
<th>Time</th>
<th>Water Level</th>
<th>Time</th>
<th>Water Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>59.5</td>
<td>50sec.</td>
<td>57.8</td>
</tr>
</tbody>
</table>

March 27, 1974

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers in order of their occurrence, with at least one entry for each change of formation.

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand and Gravel</td>
<td>0 15</td>
<td></td>
</tr>
<tr>
<td>Boulder</td>
<td>15 19</td>
<td></td>
</tr>
<tr>
<td>Coarse Gravel 4&quot;+</td>
<td>19 27</td>
<td></td>
</tr>
<tr>
<td>Gravel</td>
<td>27 31</td>
<td></td>
</tr>
<tr>
<td>Sand and Gravel</td>
<td>31 143</td>
<td></td>
</tr>
<tr>
<td>Coarse Sand</td>
<td>143 150</td>
<td></td>
</tr>
</tbody>
</table>

RECEIVED

350

NAME (Well Driller): Holman
Address: E. 3410 Ninth Ave., Spokane, Wa. 99202

Signed: Holman
License No.: 180
Date: August 13, 1974

ADDITIONAL SHEETS IF NECESSARY

S. F. No. 139-05-(Rev. 4-71)
WATER WELL REPORT
STATE OF WASHINGTON
Application No.: G3-271001
Permit No.: G3-271001

(1) OWNER: Name: Cominco American, Inc. Address: E. 15138 E. Euclid, Spokane, WA 99216
County: Spokane
Location of Well: NE 1/4 NE 1/4 Sec. 11 T. 25 N., R. 45 E., WM.

(2) PROPOSED USE: Domestic [ ] Industrial [X] Municipal [ ]
Irrigation [ ] Test Well [ ] Other [ ]

(3) TYPE OF WORK: Owner's number of well 2
New well [ ] Method: Dug [ ] Bored [ ]
Deepened [ ] Cable [X] Driving [ ]
Reconditioned [ ] Rotary [ ] Jetted [ ]

(4) DIMENSIONS: Diameter of well 10 inches
Drilled 130 ft. Depth of completed well 130 ft.

(5) CONSTRUCTION DETAILS:
Casing installed: 10 ft. from 115 ft. to 117 ft.
Threaded [ ] Diameter from 1 in. to 1 in.
Wildcat [ ] Diameter from 1 in. to 1 in.
Perforations: Yes [X] No [ ]
Type of perforator used: Gruy
SIZE of perforations: in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screen: Yes [X] No [ ]
Manufacturer's Name: Gruy
Type: Stainless Steel
Model: Gruy
Diam. 10 in. Slot size: 70 ft. from 114 ft. to 130 ft.
Diam. 10 in. Slot size: ft. to ft.
Gravel packed: Yes [X] No [ ]
Size of gravel: 18 in.
Gravel placed from ft. to ft.

Surficial seal: Yes [X] No [ ]
Type of seal: Bentonite
Material used in seal: Bentonite

Did any strata contain unusable water? Yes [ ] No [X]
Type of water: Depth of strata:
Method of sealing strata off:

(7) PUMP: Manufacturer's Name: Jacuzzi
Type: 58-325-450-02 Bag

(8) WATER LEVELS:
Land surface elevation above mean sea level: 78 ft.
Static level: 78 ft. below top of well Date: 7/3/87
Artesian pressure: 100 lbs. per square inch Date:
Artesian water is controlled by:
(Cap, valve, etc.)

(9) WELL TESTS:
Drawdown is amount water level is lowered below static level:
Yield: 350 gal./min. with 0 ft. drawdown after 2 hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level):

<table>
<thead>
<tr>
<th>Time</th>
<th>Water Level</th>
<th>Time</th>
<th>Water Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Date of test: 11/3/87
Bailer test: 60 gal./min. with ft. drawdown after hrs.
Artesian flow: 7/3/87
Temperature of water: 70°F
Was a chemical analysis made? Yes [ ] No [X]

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and shear thickness of strata and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL FROM TO
Gravel, Sand & Gravel (Gray) 0' 8'
Bolter's Gravel (Gray) 8' 18'
Gravel & Sand (Gray) 18' 19'
Bolter's Gravel (Gray) 19' 60'
Gravel & Cables (Gray) 60' 67'
Gravel & Sand (Gray) 67' 72'
Gravel, Cables & Sand (Gray) 72' 130'

RECEIVED

DEPARTMENT OF ECOLOGY
SPokane REGIONAL OFFICE

NOV 8 1987

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME: AAA Pump Service, Inc.
(Person, firm, or corporation) (Type or print)
Address: 517 Willow, Spokane, WA 99206

(Signed) James H. Flamich
(Water Driller)
License No. 0133 Date: Nov. 3. 1987

(USE ADDITIONAL SHEETS IF NECESSARY)
WATER WELL REPORT
STATE OF WASHINGTON

(1) OWNER: Washington Water Power
Address: P.O. Box 3727, Spokane, WA 99220

(2) LOCATION OF WELL: Spokane

(3) PROPOSED USE: Domestic □ Industrial □ Municipal □ Irrigation □ Test Well □ Other □

(4) TYPE OF WORK: New well: Method: Dug □ Bored □ Deepened □ Cable □ Driven □ Reciprocated □ Rotary □ Jetted □

(5) DIMENSIONS: Diameter of well: 10 inches.

(6) CONSTRUCTION DETAILS:
Casing installed: 10 ft. Diam. from 1 ft. to 40 ft.
Threaded □ Diam. from ft. to ft. Weled □ Diam. from ft. to ft.
Perforations: Yes □ No □
Type of perforator used: □
SIZE of perforations: □ ft. to □ ft.
perforations from 1 ft. to □ ft.
perforations from 1 ft. to □ ft.
Perforations from 1 ft. to □ ft.

Screens: Yes □ No □
Manufacturer's Name □
Type □
Model No. □
Diam. □ Slot size □ ft. to □ ft.
Diam. □ Slot size □ ft. to □ ft.

Gravel packed: Yes □ No □
Size of gravel: □ ft. to □ ft.
Gravel placed from □ ft. to □ ft.

Surface seal: Yes □ No □
To what depth: 18 ft.
Material used: bentonite □

(7) PUMP:
Manufacturer's Name □
Type □
HP. □

(8) WATER LEVELS:
Land-surface elevation above mean sea level... ft.
Static level: N/A □ ft. below top of well: Date...
Artesian pressure: □ per square inch: Date...
Artesian water is controlled by □

(9) WELL TESTS:
Drawdown is amount water level is lowered below static level.
Was a pump test made? Yes □ No □ If yes, by whom?
Yield: N/A gal/min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level Time Water Level

Note of test
Bailer test: gal/min. with ft. drawdown after hrs.
Artesian flow: gpm. Date...
Temperature of water... Was a chemical analysis made? Yes □ No □

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of strata and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand &amp; gravel w/boulders</td>
<td>0</td>
<td>175</td>
</tr>
<tr>
<td>Cometed gravel</td>
<td>175</td>
<td>220</td>
</tr>
<tr>
<td>Clay, brown w/gravel</td>
<td>220</td>
<td>280</td>
</tr>
<tr>
<td>Clay, white</td>
<td>280</td>
<td>290</td>
</tr>
<tr>
<td>Granite, salt &amp; pepper</td>
<td>290</td>
<td>295</td>
</tr>
</tbody>
</table>

180° of 6" PVC Liner Installed
10" Drive shoe utilized

NOTE: THIS IS A GROUND BED HOLE
NOT INTENDED FOR USE AS A WATER WELL.

RECEIVED
DEC 28 1986

DEPARTMENT OF ECOLOGY
SPOKANE REGIONAL OFFICE

Work started: 12/09 1986 Completed: 12/22 1986

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME: FONDEROSA DRILLING & DEVELOPMENT INC.
Address: E. 6010 Broadway, Spokane, WA 99212

(Water Driller)

W. Joseph Close Jr.  License No. 1040

(USE ADDITIONAL SHEETS IF NECESSARY)
RESOURCES PROTECTION WELL REPORT

Construction/Deconstruction (x in circle):
X Construction
O Decommission

Original Construction Notice
of Intent Number

Type of Well (x in circle):
X Resource Protection
O Geotech Soil Boring

Property Owner: General Electric Power Systems
Unique Ecology Well ID Tag No: AGS 116
Consulting Firm: URS

Driller or Traine Name: Dan Claassen
Driller or Trainee Signature: Dan Claassen
Driller or Trainee License No: 1827

Site Address: 3919 N Sullivan Rd
City: Spokane
County: Spokane
Location: NE 1/4 1/4 SE 1/4 Sec. 2
Town: SWY 1/4
Range: EWM circle 25
WWM:

Lat/Long (still REQUIRED)

Tax Parcel No
Cased or Uncased Diameter: 2" State Level: 78'
Work/Decommission Start Date: 7-24-02
Work/Decommission Completed Date: 7-24-02

Formation Description

<table>
<thead>
<tr>
<th>Construction/Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Data</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

89' total depth
Sand, Pac 89' to 61'
Bentonite chips 1 to 61'

0-5' sandy sand and
course gravels

5-90' sandy fine to
course gravels w/ large cobbles

saturation @ 80'

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Scale 1 = 30'
RESOURCE PROTECTION WELL REPORT
(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in circle)
O Construction
O Decommission Original Construction Notice

Type of Well ("x" in circle)
O Resource Protection
O Geotech Soil Boring

Property Owner: GENERAL ELECTRIC POWER SYSTEMS
Unique Ecology Well ID Tag No.: 8D5 116
Consulting Firm: 
Driller or Trainee Name: Wendel Hawley
Driller or Trainee Signature: Wendel Hawley
Driller or Trainee License No.: 1713

Site Address: 3919 N. Sullivan Rd
City: Spokane Valley
County: Spokane
Location: NE 1/4 SE 1/4 Sec. 2

Lat/Long (s. t. r. still REQUIRED)
Lat Deg. 44.5192
Lat Min/Sec 44.5192E
Long Deg. 117.0360
Long Min/Sec 117.0360

Tax Parcel No.: 
Cased or Uncased Diameter: 2
Well/Decommission Start Date: 5-19-05
Well/Decommission Completed Date: 5-19-05

Formation Description:
Densnite
2" PVC
Concrete

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Scale 1" = 30
Page 1 of 1
ECY 050-12 (Rev 2/01)
**RESOURCE PROTECTION WELL REPORT**  
Notice of Intent No **R53407**

**Construction/Decommission (X in circle)**  
- Construction
- Decommission

**Original Construction Notice of Intent Number**

**Type of Well (X in circle)**  
- Resource Protection
- Geotech Soil Boring

**Property Owner**

**General Electric Power Systems**

**Unique Ecology Well ID Tag No**

**AGS 117**

**Consulting Firm**

**URS**

**Driller or Trainee Name**

**Dan Claassen**

**Driller or Trainee License No**

**1827**

**Site Address**

**3519 N. Sullivan Rd**

**City**

**Spokane**

**Location**

**NE 1/4 1/4 SE 1/4 Sec 2**

**Lat/Long (still REQUIRED)**

**Lat Deg**

**114**

**Long Deg**

**89**

**Tax Parcel No**

**25**

**Cased or Uncased Diameter**

**2"**

**State Level**

**78'**

**Work/Decommission Start Date**

**7-24-02**

**Work/Decommission Completed Date**

**7-25-02**

**Construction/Design**

**Well Data**

**Formation Description**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
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<td>0-5'</td>
<td>Silty sand and course gravel</td>
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<tr>
<td>5-90'</td>
<td>Sandy, fine to course gravel w/ large cobbles</td>
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</table>

**896' total depth sand to 896' to 61' bentonite chips 1 to 61'**

**Scale 1" = 30'**

**Page 1 of 1**
RESOURCE PROTECTION WELL REPORT

Notice of Intent No. A65-721

Construction/Decommission ("x" in circle)

☐ Construction
☐ Decommission

Original Construction Notice of Intent Number

Property Owner: General Electric Power Systems
Unique Ecology Well ID Tag No. A65-117

Consulting Firm
Driller or Trainee Name: Wendell Hawley
Driller or Trainee Signature: Wendell Hawley
Driller or Trainee License No. 1713

If trainee, licensed driller's Signature and License no.

Type of Well ("x" in circle)

☐ Resource Protection
☐ Geotech Soil Boring

Site Address: 3919 N. Sullivan Rd
City: Spokane
County: Spokane

Location: NE 1/4-1/4 SE 1/4 Sec 2
Lat/Long (s, t, r still REQUIRED)
Lat Deg __________ Lat Min/Sec __________
Long Deg __________ Long Min/Sec __________

Tax Parcel No. __________
Cased or Uncased Diameter: __________ Static Level: __________
Work/Decommission Start Date: 5-19-05
Work/Decommission Completed Date: 5-19-05

Construction/Design
Well Data
Formation Description

Concrete
Densimetric
2" PVC

Scale 1" = 30

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Page of

ECD 030-12 (Rev 2/01)

JUN 20 2005
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE
RESOURCE PROTECTION WELL REPORT  Notice of Intent No R 53407
(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission (x in circle)
X Construction
O Decommission

Original Construction Notice
of Intent Number 18354

Type of Well (x in circle)
O Resource Protection
O Geotech Soil Boring

Property Owner
General Electric Power Systems

Unique Ecology Well ID Tag No
AGS 118

Consulting Firm
URS

Driller or Trainee Name
Dan Claassen

Driller or Trainee Signature
Dan Claassen

Driller or Trainee License No
1827

Site Address
3919 N. Sullivan Rd.

City
Spokane

County
Spokane

Location
NE 1/4 1/4 SE 1/4 Sec 25

Lat/Long (still REQUIRED)
Lat Deg 47
Lat Min/Sec 25

Long Deg 118
Long Min/Sec 27

Tax Parcel No

Cased or Uncased Diameter
2”

Static Level
78'

Work/Decommission Start Date
7-25-02

Work/Decommission Completed Date
7-25-02

Formation Description

0-5’ silty sand and course gravels

5-90’ sandy, fine to course gravels w/ large cobbles

Saturated @ 80’

89' total depth

sand, silt 89' to 67'

bentonite chips 1' to 67'

89' total depth

sand, silt 89' to 67'

bentonite chips 1' to 67'

Scale 1” = 30

Page 1 of 1

ECY 050 12 (Rev 2001)
RESOURCE PROTECTION WELL REPORT
(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in circle)
○ Construction
○ Decommission
Original Construction Notice of Intent Number

Type of Well ("x" in circle)
○ Resource Protection
○ Geotech Soil Boring

Property Owner: General Electric Power Systems
Unique Ecology Well ID Tag No.: AGS 118

Consulting Firm

Driller or Trainee Name: Wendell Hailey
Driller or Trainee Signature: Wendell Hailey
Driller or Trainee License No.: 1713

If trainee, licensed driller's Signature and License No.:

Site Address: 3819 N. Sullivan Rd
City: Spokane
County: Spokane
Location: NE 1/4, Sec 2, Twp 35N, R 44W, circle or one WWM
Lat/Long (s, t, r, still REQUIRED)
Lat Deg
Lat Min/Sec
Long Deg
Long Min/Sec

Tax Parcel No.

Cased or Uncased Diameter: 2
Static Level: 5-19-05
Work/Decommission Start Date: 5-19-05
Work/Decommission Completed Date:

Construction/Design

Well Data

Formation Description

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report. I Report.

Scale 1" = 30

Page of

JUN 20 2005
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE
ECY 830-12 (Rev 2001)
HOLT DRILLING, INC.
Resource Protection Well Report

Project Name: Index 10 / 13919 E. Trent
Well Identification #: VP-2 + VP-3
Drilling Method: 4" HSA
Driller: Michael Reynolds
License #: 2442

Date: 8/29/01
County: Spokane, NE ¼, SE ¼
Section: 3 T 25N R 44E
Street Address: 13919 E. Trent, Spokane
Start Card: RS5146
Consulting Firm: CDM

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

AS-BUILT

WELL DATA

MONUMENT TYPE:
Flasch

CONCRETE SURFACE SEAL
1.5 ft.

PVC BLANK: 2" x 9.8

BACKFILL: 5.5 ft.
TYPE: Bentonite

PVC SCREEN: 2" x 10
SLOT SIZE: .020
TYPE: PVC

GRAVEL PACK: 13 ft.
MATERIAL: 10/20 Silica

WELL DEPTH: 20 ft.

FORMATION DESCRIPTION

0 - 3 ft.
Asphalt

3 - 2 ft.
Lt. Bmr. Fine Sand

2 - 20 ft.
Bmr. Slightly Silt and Sand 4
Sm-Lg Gravels +Cobbles

REMARKS

Signature: Michael Reynolds
HOLT DRILLING, INC.
Resource Protection Well Report

Project Name: Index 10/13919 E. Trent
Well Identification #: VP. 2 + VP. 3
Drilling Method: 4" HSA
Driller: Michael Reynolds
License #: 2492

Date: 8-29-01
County: Spokane
Section: 3 T 25N R 44E
Street Address: 13919 E. Trent/Spokane
Start Card: R55146
Consulting Firm: COM

AS-BUILT

WELL DATA

MONUMENT TYPE:
Flush

CONCRETE SURFACE SEAL:
1.5 ft.

PVC BLANK: 2" x 9.8 ft.

BACKFILL: 5.5 ft.
TYPE: Bentonite

PVC SCREEN: 2" x 10 ft.
SLOT SIZE: .020
TYPE: PVC

GRAVEL PACK: 13 ft.
MATERIAL: 10/20 Silica

WELL DEPTH: 20 ft.

FORMATION DESCRIPTION

0 - 3 ft.
Asphalt

1.3 - 2 ft.
Lt. Brn. Fine Sand

2 - 20 ft.
Brn. Slightly Silty Sand w/ Sm. Gravel & Cobble

REMARKS

Signature: Michael Reynolds
APPENDIX A
WELL CONSTRUCTION DATA,
WELL LOGS,
WELL REPORTS, AND
CORE PHOTOGRAPHS
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*Measured along slope of well, actual elevations not determined.
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### Table A-1 - Summary of Well Installation Data (Post-2008 Survey)

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### Table A-1 - Summary of Well Installation Data (Post-2008 Survey)

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Elevations are in NAVD88 datum.  
Horizontal XY coordinates are in NAD83 datum.  
(a) Represents +15.00 feet on the staff gage.  
Note: Some of the elevations shown on the monitoring well logs were surveyed to a different datum and may be different than the post-2008 survey elevations shown in this table. Refer to Table A-1 of the 2003 Groundwater RI/FS (see enclosed CD) for monitoring well elevations based on the old survey datum.
### Table A-2 - Construction Details for Surrounding Area Wells

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<th>Depth to Water Level in Feet</th>
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<td>8</td>
<td>131</td>
<td>137</td>
<td>50</td>
<td>4/22/1971</td>
<td>Perforated Screen</td>
</tr>
<tr>
<td>--</td>
<td>Hillyard Processing Company</td>
<td>11</td>
<td>Cable</td>
<td>125</td>
<td>10</td>
<td>106</td>
<td>115</td>
<td>60</td>
<td>1/12/1966</td>
<td>Perforated Screen</td>
</tr>
<tr>
<td>--</td>
<td>Comico Products Inc.</td>
<td>11</td>
<td>--</td>
<td>115</td>
<td>10</td>
<td>80</td>
<td>108</td>
<td>74</td>
<td>9/1956</td>
<td>Perforated Screen</td>
</tr>
<tr>
<td>--</td>
<td>Comico Products Inc.</td>
<td>11</td>
<td>Cable</td>
<td>150</td>
<td>18</td>
<td>120</td>
<td>150</td>
<td>68</td>
<td>3/27/1974</td>
<td></td>
</tr>
<tr>
<td>Well #2</td>
<td>Comico Products Inc.</td>
<td>11</td>
<td>Cable</td>
<td>130</td>
<td>10</td>
<td>114</td>
<td>130</td>
<td>78</td>
<td>11/3/1987</td>
<td></td>
</tr>
</tbody>
</table>

#### Water Supply Wells

- **Well #4** Trentwood Irrigation District #3 - 7/20/1981
- **Well #5** Trentwood Irrigation District #3 - 2/15/1968
- **Well #1** Spokane Industrial Park - 9/10/1970
- **Well #2** Spokane Industrial Park - 9/10/1970
- **Well #3** Spokane Industrial Park - 9/10/1970
- **WRC 10215** Spokane Industrial Park - 4/22/1971
- **--** Hillyard Processing Company - 1/12/1966
- **--** Comico Products Inc. - 3/27/1974
- **Well #2** Comico Products Inc. - 11/3/1987

#### Resource Protection Wells

- **--** Washington Water Power - 12/9/1986 - Not intended as a water well
- **AGS 116** General Electric Power Systems - 7/24/2002 - Abandoned
- **AGS 117** General Electric Power Systems - 7/25/2002 - Abandoned
- **AGS 118** General Electric Power Systems - 7/25/2002 - Abandoned
- **AGF 868** - 8/29/2001 - Consultant is CDM
- **AGF 869** - 8/29/2001 - Consultant is CDM
- **AGF 870** - 8/29/2001 - Consultant is CDM

**Notes:**
- -- = Not reported on Driller's Well Log.
- Township and Range are 25N and 44E, respectively.
Key to Exploration Logs

Sample Description
Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency
Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

<table>
<thead>
<tr>
<th>SAND or GRAVEL Density</th>
<th>SILT or CLAY Consistency</th>
<th>Standard Penetration Resistance (N) in Blows/Foot</th>
<th>Standard Penetration Resistance (N) in Blows/Foot</th>
<th>Approximate Shear Strength in TSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very loose</td>
<td>Very soft</td>
<td>0 - 4</td>
<td>0 - 2</td>
<td>&lt;0.125</td>
</tr>
<tr>
<td>Loose</td>
<td>Soft</td>
<td>4 - 10</td>
<td>2 - 4</td>
<td>0.125 - 0.25</td>
</tr>
<tr>
<td>Medium dense</td>
<td>Medium stiff</td>
<td>10 - 30</td>
<td>4 - 8</td>
<td>0.25 - 0.5</td>
</tr>
<tr>
<td>Dense</td>
<td>Stiff</td>
<td>30 - 50</td>
<td>8 - 15</td>
<td>0.5 - 1.0</td>
</tr>
<tr>
<td>Very dense</td>
<td>Very stiff</td>
<td>&gt;50</td>
<td>15 - 30</td>
<td>1.0 - 2.0</td>
</tr>
<tr>
<td>Hard</td>
<td>&gt;30</td>
<td></td>
<td></td>
<td>&gt;2.0</td>
</tr>
</tbody>
</table>

Moisture
Dry Little perceptible moisture
Damp Some perceptible moisture, probably below optimum
Moist Probably near optimum moisture content
Wet Much perceptible moisture, probably above optimum

Minor Constituents
Not identified in description 0 - 5
Slightly (clayey, silty, etc.) 5 - 12
Clayey, silty, sandy, gravelly 12 - 30
Very (clayey, silty, etc.) 30 - 50

Legends

Sampling Test Symbols

<table>
<thead>
<tr>
<th>Boring Samples</th>
<th>Test Pit Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>❌ Split Spoon</td>
<td>❌ Grab (Jar)</td>
</tr>
<tr>
<td>❌ Shelby Tube</td>
<td>❌ Bag</td>
</tr>
<tr>
<td>❌ Cuttings</td>
<td>❌ Shelby Tube</td>
</tr>
<tr>
<td>❌ Core Run</td>
<td></td>
</tr>
<tr>
<td>* No Sample Recovery</td>
<td></td>
</tr>
<tr>
<td>P Tube Pushed, Not Driven</td>
<td></td>
</tr>
</tbody>
</table>

Groundwater Observation Wells

- Monument
- Surface Seal
- Gravel Backfill
- Riser Pipe
- Bentonite
- Groundwater Level on Date or at Time of Drilling (ATD)
- Well Screen
- Sand Pack
- Native Material
- Groundwater Seepage (Test Pits)

Test Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS</td>
<td>Grain Size Classification</td>
</tr>
<tr>
<td>CN</td>
<td>Consolidation</td>
</tr>
<tr>
<td>UU</td>
<td>Unconsolidated Undrained Triaxial</td>
</tr>
<tr>
<td>CU</td>
<td>Consolidated Undrained Triaxial</td>
</tr>
<tr>
<td>CD</td>
<td>Consolidated Drained Triaxial</td>
</tr>
<tr>
<td>QU</td>
<td>Unconfined Compression</td>
</tr>
<tr>
<td>DS</td>
<td>Direct Shear</td>
</tr>
<tr>
<td>K</td>
<td>Permeability</td>
</tr>
<tr>
<td>PP</td>
<td>Pocket Penetrometer Approximate Compressive Strength in TSF</td>
</tr>
<tr>
<td>TV</td>
<td>Torvane Approximate Shear Strength in TSF</td>
</tr>
<tr>
<td>CBR</td>
<td>California Bearing Ratio</td>
</tr>
<tr>
<td>MD</td>
<td>Moisture Density Relationship</td>
</tr>
<tr>
<td>AL</td>
<td>Atterberg Limits Water Content in Percent Liquid Limit Natural Plastic Limit</td>
</tr>
<tr>
<td>PID</td>
<td>Photoionization Detector Reading</td>
</tr>
<tr>
<td>CA</td>
<td>Chemical Analysis</td>
</tr>
<tr>
<td>DT</td>
<td>In Situ Density Test</td>
</tr>
</tbody>
</table>

HARTCROWSER 2644-114 5/09
Figure A-1

1/2
**Key to Exploration Logs**

**Sample Description**
Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

### Density/Consistency
Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

<table>
<thead>
<tr>
<th>Density</th>
<th>SAND or GRAVEL PENETRATION RESISTANCE (N) in Blows/Foot</th>
<th>SILT or CLAY CONSISTENCY</th>
<th>Standard Penetration Resistance (N) in Blows/Foot</th>
<th>Approximate Shear Strength in TSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very loose</td>
<td>0 - 4</td>
<td>Very soft</td>
<td>0 - 2</td>
<td>&lt;0.125</td>
</tr>
<tr>
<td>Loose</td>
<td>4 - 10</td>
<td>Soft</td>
<td>2 - 4</td>
<td>0.125 - 0.25</td>
</tr>
<tr>
<td>Medium dense</td>
<td>10 - 30</td>
<td>Medium stiff</td>
<td>4 - 8</td>
<td>0.25 - 0.5</td>
</tr>
<tr>
<td>Dense</td>
<td>30 - 50</td>
<td>Stiff</td>
<td>8 - 15</td>
<td>0.5 - 1.0</td>
</tr>
<tr>
<td>Very dense</td>
<td>&gt;50</td>
<td>Very stiff</td>
<td>15 - 30</td>
<td>1.0 - 2.0</td>
</tr>
</tbody>
</table>

### Moisture
- Dry: Little perceptible moisture
- Damp: Some perceptible moisture, probably below optimum
- Moist: Probably near optimum moisture content
- Wet: Much perceptible moisture, probably above optimum

### Minor Constituents

<table>
<thead>
<tr>
<th>Estimated Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not identified in description</td>
</tr>
<tr>
<td>Slightly (clayey, silty, etc.)</td>
</tr>
<tr>
<td>Clayey, silty, sandy, gravelly</td>
</tr>
<tr>
<td>Very (clayey, silty, etc.)</td>
</tr>
</tbody>
</table>

### Test Symbols
- NS  No Sheen
- SS  Slight Sheen
- MS  Moderate Sheen
- HS  Heavy Sheen
- TCD Triaxial Consolidated Drained
- QU  Unconfined Compression
- DS  Direct Shear
- K   Permeability
- PP  Pocket Penetrometer
- TV  Torvane
- CBR California Bearing Ratio
- MD  Moisture Density Relationship
- AL  Atterberg Limits
- PID Photoionization Detector Reading
- CA  Chemical Analysis
- DT  In Situ Density Test

**Exploration and Completion Details**
- Surface Seal
- Groundwater Level (ATD) At Time of Drilling
- Observation Well Tip or Slotted Section
- Groundwater Seepage (Test Pits)
Boring Log & Construction Data for Monitoring Well CM-MW-1S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.6

- Crushed Gravel over medium dense to dense, moist, brown, sandy GRAVEL with occasional cobbles.
- Grading to gravelly SAND with increased moisture content.
- Grading to sandy GRAVEL.
- Medium dense to dense, moist, brown to grayish brown, sandy GRAVEL with occasional cobbles.
- Dense, moist, brown to grayish brown, sandy GRAVEL with occasional cobbles. No detectable staining, odor, or sheen.

Grading wet.

- Medium dense, wet, brown to grayish brown, gravelly SAND.

Bottom of Boring at 90.7 Feet.
Completed 09/22/04.

Casing Stick-up in Feet: 2.5
Top of Casing Elevation in Feet: 2011.09

STANDARD PENETRATION RESISTANCE

LAB
TESTS
& (PID)

<0.1 CA

<0.1 CA

<0.1 CA

<0.1 CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log & Construction Data for Monitoring Well CM-MW-2S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.7

- Brick over Concrete
  Brown, sandy GRAVEL. No detectable staining, odor, or sheen.

- Moist, brown, gravelly SAND.

- Moist, brown and grayish brown, sandy GRAVEL.

- Zones of gravelly SAND.

- Oil-like odor detected.

- Dense to very dense, wet, brownish gray, sandy GRAVEL with visible product and odor.

Bottom of Boring at 90.9 Feet.
Completed 09/23/04.

Casing Stick-up in Feet: -0.5
Top of Casing Elevation in Feet: 2008.24

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

Figure A-3
Boring Log & Construction Data for Monitoring Well CM-MW-3S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.6

- Brick over Concrete.
  - Moist, brown to grayish brown, sandy GRAVEL with occasional cobbles. No detectable staining, odor, or sheen.

- Small boulder.

- Suspect free oil product on water table. Noticeable oil on sampler. Oil (free product) on rods from a depth of 75 to 85 feet.

- Wet, sandy GRAVEL.
  - Wet, gray to brownish gray, gravelly SAND.

- Heaving conditions and oil (free product) observed.

Bottom of Boring at 90.0 Feet.
Completed 09/22/04.

Casing Stick-up in Feet: -0.5
Top of Casing Elevation in Feet: 2008.14

STANDARD PENETRATION RESISTANCE

Sample
A Blows per Foot

LAB TESTS & (PID)

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

2644-84  9/04
Figure A-4
Boring Log & Construction Data for Monitoring Well CM-MW-4S

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2088.7

3-inch Wood Block Floor over 13 inches of Concrete.

Moist, brown, slightly sandy to sandy GRANITE. No detectable staining, odor, or sheen.

Moist, gray to brown, sandy to very sandy GRANITE. No detectable staining, odor, or sheen.

Dry to damp, brown GRANITE with trace of sand and scattered cobbles.

Grading slightly sandy.

Very dense, wet, brown, sandy GRANITE with cobbles. No detectable staining, odor, or sheen.

Bottom of Boring at 91.0 Feet.
Completed 09/27/04.

Casing Stick-up in Feet: -0.75
Top of Casing Elevation in Feet: 2007.96

STANDARD PENETRATION RESISTANCE

Sample
Blows per Foot

1 2 5 10 20 50 100

LAB TESTS & (PID)

Boring Log with Blow Counts 2644-84 HCC 05/08

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log & Construction Data for Monitoring Well CM-MW-5S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.7

Brick over Concrete
Moist, brown to grayish brown, sandy GRAVEL with occasional cobbles. No detectable staining, odor, or sheen.

Grading wet. No detectable staining, odor, or sheen.
Very dense, wet, brown to grayish brown, sandy GRAVEL.

Bottom of Boring at 90.0 Feet.
Completed 09/24/04.

Casing Stick-up in Feet: 0.41
Top of Casing Elevation in Feet: 2008.28

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log & Construction Data for Monitoring Well CM-MW-6S

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2008.8

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10</td>
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<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>20</td>
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<td>25</td>
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<td>30</td>
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<tr>
<td>95</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

STANDARD PENETRATION RESISTANCE

<table>
<thead>
<tr>
<th>Blows per Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1   2   5   10  20  50  100</td>
</tr>
</tbody>
</table>

LAB TESTS & (PID)

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(~0.1) CA</td>
</tr>
<tr>
<td>(~0.1)</td>
</tr>
</tbody>
</table>

Brick over Concrete

Moist, brown, sandy GRAVEL with occasional cobbles. No detectable staining, odor, or sheen.

Moist, brown to grayish brown, sandy GRAVEL with occasional cobbles. No detectable staining, odor, or sheen.

Large cobble/boulder.

Grading wet. No detectable staining, odor, or sheen.

Wet, brown to grayish brown, sandy GRAVEL with occasional cobbles.

Bottom of Boring at 85.3 Feet.
Completed 10/11/04.

Casing Stick-up in Feet: -0.6
Top of Casing Elevation in Feet: 2008.18

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log & Construction Data for Monitoring Well CM-MW-7S

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2008.7

Concrete

Moist, brown to grayish brown, sandy GRAVEL. No detectable staining, odor, or sheen.

(Very loose).

Detectable odor to water table.

Moist, brown to grayish brown, sandy GRAVEL with occasional cobbles.

Grading wet with detectable odor.

Wet, brown to grayish brown, sandy GRAVEL.

Bottom of Boring at 85.5 Feet.
Completed 10/12/04.

Casing Stick-up in Feet: -0.7
Top of Casing Elevation in Feet: 2007.97

STANDARD PENETRATION RESISTANCE

Sample
△ Blows per Foot

LAB TESTS & (PID)

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
# Boring Log & Construction Data for Monitoring Well CM-MW-8S

## Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2011.2

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
<th>STANDART PENETRATION RESISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>▲ Blows per Foot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1  2  5  10  20  50  100</td>
</tr>
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<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Imported Gravel Fill surface over Brick over PVC Conduit**
  - Moist, brown to grayish brown, sandy GRAVEL with occasional cobbles. No detectable staining, odor, or sheen.

- **Moist, brown, sandy GRAVEL with occasional cobbles.**

- **Moist, brown to grayish brown, sandy GRAVEL with occasional cobbles. No detectable staining, odor, or sheen.**

- **Small boulders.**
  - Brown, sandy GRAVEL. No detectable staining, odor, or sheen.

Bottom of Boring at 85.0 Feet.
Completed 10/13/04.

Casing Stick-up in Feet: -0.6
Top of Casing Elevation in Feet: 2010.56

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

---

**HARTCROWSER**

2644-84 10/04

Figure A-9
Boring Log/Construction Data for Monitoring Well FO-MW-1S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2007.9

Dry to moist, dark brown FILL soil.

Moist, brown to grayish brown, sandy GRAVEL with open work zones and scattered cobbles. Rapid penetration.

Circulation loss indicates open work Gravel with scattered cobbles.

Moist, brown, sandy GRAVEL. Increased cuttings return.

Increasing moisture with depth.

Wet, gray to dark gray, slightly sandy to sandy GRAVEL. Very strong petroleum-like odor.

Visible product sheen with odor.

Bottom of Boring at 90.9 Feet. Completed 02/22/06.

Casing Stick-up in Feet: 2.9
Top of Casing Elevation in Feet: 2009.39

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Monitoring Well Log HL-MW-12S

Northing (ft): 11199.4
Easting (ft): 10086.6

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2004.2

Grass over moist, dark brown, slightly sandy, very silty GRAVEL.

Damp, light brown-gray, sandy GRAVEL with trace Silt.

Damp, gray-light brown, gravely, very silty SAND to sandy SILT.

Wet, brown, sandy, very silty GRAVEL.

Bottom of Boring at 90.0 Feet.
Completed 10/07/03.

Casing Stick-up in Feet: 2.23
Top of Casing in Feet: 2006.43

STANDARD PENETRATION RESISTANCE

LAB TESTS & (PID)

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Monitoring Well Log HL-MW-13DD

Nothing (ft): 11062.8
Easting (ft): 10057.7

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2001.6

- Damp, brown, slightly silty, sandy GRAVEL
- Dry, gray GRAVEL
- Grades to sandy GRAVEL
- Damp and brown between 47 and 51 feet
- Damp to moist and brown between 63 and 65 feet.
- Wet, gray-brown, slightly sandy GRAVEL

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Monitoring Well Log HL-MW-13DD

Northing (ft): 11082.8
Easting (ft): 10057.7

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2001.6

- Wet, gray-brown, slightly sandy GRAVEL.
- Grades to brown, non-silty to slightly silty, sandy GRAVEL and gravelly SAND.

Bottom of Boring at 150.5 Feet.
Completed 09/28/03

Casing Stick-up in Feet: 2.51
Top of Casing in Feet: 2004.11

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTRCOWSER

2644-78   9/03
Figure A-12   2/2
Monitoring Well Log HL-MW-14S

Northing (ft): 10868.4
Easting (ft): 9815.1

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2000

- Grass over dry to damp, brown, slightly silty to silty, sandy GRAVEL.
- Wet, brown, very silty, sandy GRAVEL.
- Wet, brown, very sandy GRAVEL.
- Bottom of Boring at 90.0 Feet. Completed 10/07/03.
- Casing Stick-up in Feet: 2.21
  Top of Casing in Feet: 2002.21

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Monitoring Well Log HL-MW-15DD

Northing (ft): 10990
Easting (ft): 10307.5

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2004.0

Brown to gray, sandy to very sandy GRAVEL.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
### Monitoring Well Log HL-MW-15DD

- **Northing (ft):** 10960
- **Easting (ft):** 10307.5

#### Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2004.0

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
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<tr>
<td>195</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
</tr>
</tbody>
</table>

1. **Wet, brown to gray, sandy to very sandy GRAVEL.**
2. **Wet, brownish gray SAND with scattered Gravel.**
3. **Bottom of Boring at 151.0 Feet.**
   - Completed 10/03/03.
4. **Casing Stick-up in Feet:** 2.1
   - **Top of Casing in Feet:** 2006.10

#### Standard Penetration Resistance

<table>
<thead>
<tr>
<th>Blows per Foot</th>
<th>1</th>
<th>2</th>
<th>5</th>
<th>10</th>
<th>20</th>
<th>50</th>
<th>100</th>
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<tbody>
<tr>
<td>Sample</td>
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<td>(0)</td>
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<td></td>
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---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Monitoring Well Log HL-MW-16S

Northing (ft): 10800.7
Easting (ft): 10366.7

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2002.6

- Damp to moist, dark to light brown, silty to non-silty, sandy GRAVEL.
- Dry, gray, slightly sandy, very silty GRAVEL.
- Damp to wet, brown, silty, very sandy to sandy GRAVEL.

Depth in Feet

Bottom of Boring at 90.5 Feet.
Completed 10/08/03.

Casing Stick-up in Feet: 2.16
Top of Casing in Feet: 2004.76

STANDARD PENETRATION RESISTANCE

Sample ▲ Blows per Foot

LAB TESTS & (PID)

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Monitoring Well Log HL-MW-17S

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2004.7

2 inches of Asphalt over damp to dry, brown, silty, sandy GRAVEL.

Dry, gray-brown, sandy GRAVEL

Becomes damp.

Wet, gray-brown GRAVEL.

Wet, gray-brown, sandy GRAVEL grading to very sandy GRAVEL to very gravelly SAND.

Bottom of Boring at 91.7 Feet.
Completed 09/26/03.

Casing Stick-up in Feet: 2.85
Top of Casing in Feet: 2007.55

STANDARD PENETRATION RESISTANCE

Sample

△ Blows per Foot

1 2 5 10 20 50 100

LAB TESTS & (PID)

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
**Soil Descriptions**

**Approximate Ground Surface Elevation in Feet: 2007.8**

- **Sandy GRAVEL** surface over damp, brown, coarse sandy GRAVEL. No stain, no odor.

- **Dry, gray, slightly sandy GRAVEL.** No stain, no odor.

- **Grading less sandy, rounded GRAVEL.**

- **Grading to subangular GRAVEL.**

- **Dry, brown, subangular GRAVEL with trace of sand or silt.**

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well HL-MW-18S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2007.4

- Dry, brown, subangular GRAVEL with trace of sand or silt.

- Dry, brown, coarse sandy GRAVEL
  - Hard drilling to 63 feet.

- Dry to damp, brown, coarse very sandy GRAVEL. No stain, no odor.
  - Grading to wet.

- Very dense, wet, gray-brown, coarse slightly sandy GRAVEL. No stain, no odor.

Bottom of Boring at 89.0 Feet.
Completed 01/04/05.

Casing Stick-up in Feet: -0.4
Top of Casing in Feet: 2007.4

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTrCrowser

2644-87  1/05
Figure A-17  2/2
Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.3

- Loose GRAVEL surface over moist, brown, sandy to very sandy GRAVEL.
- Grading dry, slightly sandy
- Grading dry to damp, sandy.
- Grading dry, less sandy.
- Dry, brown, gravelly SAND.
- Drill action indicates GRAVEL and COBBLES.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well HL-MW-19S

<table>
<thead>
<tr>
<th>Soil Descriptions</th>
<th>Depth in Feet</th>
<th>LAB TESTS &amp; (PID)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximate Ground Surface Elevation in Feet: 2008.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry to damp, brown GRAVEL with trace of sand.</td>
<td>50</td>
<td>(&lt;0.1)</td>
</tr>
<tr>
<td>Dry, gray, slightly sandy GRAVEL and COBBLES.</td>
<td>55</td>
<td>(&lt;0.1)</td>
</tr>
<tr>
<td>Hard drilling to 70 feet, COBBLE or BOULDER?</td>
<td>60</td>
<td>(&lt;0.1)</td>
</tr>
<tr>
<td>Grading wet. Very dense, wet, brown, coarse sandy GRAVEL. No stain, no odor.</td>
<td>65</td>
<td>(&lt;0.1) CA</td>
</tr>
<tr>
<td>Grading to very gravelly SAND.</td>
<td>70</td>
<td>(&lt;0.1)</td>
</tr>
<tr>
<td>Very dense, wet, brown, gravelly SAND.</td>
<td>75</td>
<td>(&lt;0.1) CA</td>
</tr>
<tr>
<td>Grading to sandy GRAVEL.</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Bottom of Boring at 90.0 Feet. Completed 01/03/05.</td>
<td>85</td>
<td></td>
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<tr>
<td>Casing Stick-up in Feet: 2.96 Top of Casing in Feet: 2011.26</td>
<td>90</td>
<td></td>
</tr>
</tbody>
</table>

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2009.1

- Stained GRAVEL surface over dry, dark brown, sandy GRAVEL with slight stain, no odor.
- Moist, dark brown, coarse very sandy GRAVEL with staning and product odor.
- No stains, no odor.
- Dry, gray-brown, very sandy, subangular GRAVEL with trace of silt. No stain, no odor.
- Damp to moist, brown, slightly sily, sandy GRAVEL. More silt than normal, no stain, no odor.

STANDARD PENETRATION RESISTANCE

Sample
△ Blows per Foot

LAB TESTS & (PID)

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2009.1

- Dry, brown, silty, medium sandy, subrounded GRAVEL. No stain, no odor.
- Damp, brown, coarse sandy, subrounded GRAVEL with trace silt. No stain, no odor.
- Hard drilling to 74 feet-BOULDER.
- Very dense, moist grading to wet, brown, coarse sandy GRAVEL. No stain, no odor.
- Very dense, wet, dark gray, sandy GRAVEL with staining and product odor.

Bottom of Boring at 91.0 Feet. Completed 01/05/05.

Casing Stick-up in Feet: 2.83 Top of Casing in Feet: 2011.93

STANDARD PENETRATION RESISTANCE

Sample
\[ \text{Blows per Foot} \]

1 2 5 10 20 50 100

LAB TESTS & (PID)

\[ <0.1 \]

\[ <0.1 \]

\[ <0.1 \]

\[ <0.1 \] CA

\[ 45/3' \]

\[ 79/10' \] CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well HL-MW-21S

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2007.7

- (Loose), moist, brownish gray, slightly sandy GRAVEL/COBBLE.
- (Loose), moist, brownish gray, slightly sandy GRAVEL with scattered Cobbles.
- (Medium dense), moist, brownish gray, sandy GRAVEL.

Grading to brown.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well HL-MW-21S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2007.7

(Medium dense), moist, brown, sandy GRAVEL with possible scattered Cobbles.

COBBLE/BOULDER.

Cuttings indicate increased moisture content.

(Very dense), we., gray, sandy GRAVEL.

(Very dense), we., brownish gray, sandy GRAVEL.

Bottom of Boring at 81.0 Feet.
Completed 01/28/05.

Casing Stick-up in Feet: 3.49
Top of Casing in Feet: 2011.19

STANDARD PENETRATION RESISTANCE

Blows per Foot

Sample

LAB TESTS & (PID)

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

2644-89 1/05
Figure A-20 2/2
Boring Log/Construction Data for Monitoring Well HL-MW-22S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.3

GRAVEL surface over damp, brown, coarse sandy GRAVEL. No stain, no odor.

Dry, brown, coarse slightly sandy, subrounded GRAVEL. No stain, no odor.

Dry to damp, brown, coarse sandy to very sandy GRAVEL. No stain, no odor.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2008.3

Slight stain and oil-like odor.

Dry to damp, brown GRAVEL with trace of sand. No stain, no odor.

Dry to damp, brown, rounded GRAVEL with trace of silt. No stain, no odor.

Very dense, wet, very sandy GRAVEL. No stain, no odor.

Very dense, wet, brown, sandy GRAVEL. No stain, no odor.

Bottom of Boring at 90.0 Feet.
Completed 01/04/05.

Casing Stick-up in Feet: 2.49
Top of Casing in Feet: 2010.79

STANDARD PENETRATION RESISTANCE

<table>
<thead>
<tr>
<th>Sample</th>
<th>Blows per Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-3</td>
<td></td>
</tr>
</tbody>
</table>

LAB TESTS & (PID)

<0.1 CA

<0.1

<0.1 CA

50/5°

50/4°

<0.1 CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2004.0

Moist, dark brown, slightly silty, sandy GRAVEL (Recent FILL).

Moist, brownish gray to grayish brown, sandy GRAVEL with scattered open work Gravel zones.

Circulation loss, open work zones.

Moist, grayish brown to brownish gray, sandy GRAVEL.

Increased cuttings return.

Grading wet.

Heaving conditions.

Heaving conditions, no drive sample attempt.

Bottom of Boring at 94.0 Feet.
Completed 02/13/06.

Casing Stick-up in Feet: 2.82
Top of Casing Elevation in Feet: 2006.82

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well HL-MW-24DD

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2003.3

- SOD over dark brown, slightly silty, sandy GRAVEL over moist, grayish brown, slightly silty, sandy GRAVEL with slightly sandy, open work Gravel zones.
- Circulation loss, open work zones.

- Moist, brownish gray, sandy GRAVEL. Increased cuttings return.

- Grading wet. Wet, gray to grayish brown, slightly sandy to sandy GRAVEL.

- Heaving conditions with increased Sand content.
- Wet, grayish brown, well-graded, very sandy GRAVEL.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well HL-MW-24DD

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2003.3

- Wet, grayish brown, well-graded, very sandy GRAVEL
- Wet, grayish brown to brownish gray, well-graded, very sandy GRAVEL
- Increased Sand content with depth. Heaving conditions.
- Wet, grayish brown, very sandy GRAVEL
- Heaving conditions
- Wet, grayish brown, very sandy GRAVEL to very gravelly SAND
- Bottom of Boring at 150.0 Feet. Completed 02/09/06.

Casing Stick-up in Feet: 2.81
Top of Casing Elevation in Feet: 2006.11

STANDARD PENETRATION RESISTANCE

<table>
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<tr>
<th>Sample</th>
<th>Blows per Foot</th>
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<tbody>
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<td>S-12</td>
<td>(2.7)</td>
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LAB TESTS & (PID)

GS

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well HL-MW-25S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2004.7

4 inches of Asphalt over brown, sandy GRAVEL.

Moist, brown to brownish gray, slightly silty, sandy GRAVEL with scattered open work Gravel zones.

Circulation loss, open work zone.

Moist, brownish gray to grayish brown, sandy GRAVEL.

Grading wet.

Wet, grayish brown, sandy GRAVEL.

Decreasing sand content.

Bottom of Boring at 91.5 Feet.
Completed 02/15/06.

Casing Stick-up in Feet: -0.43
Top of Casing Elevation in Feet: 2004.27

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well HL-MW-26S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.3

- Moist, dark brown (to 5 feet) over brown (to 10 feet) over brownish gray, sandy GRAVEL.
  - Rapid penetration.

- Moist, brown, sandy to slightly sandy GRAVEL with open work zones.
  - Circulation loss indicates open work Gravel.

- Moist, brownish gray to grayish brown, sandy GRAVEL.
  - Increased cuttings return.
  - Increasing moisture with depth.

- Wet, brownish gray, slightly sandy to sandy GRAVEL.

Bottom of Boring at 91.0 Feet.
Completed 02/16/06.
Casing Stick-up in Feet: -0.66
Top of Casing Elevation in Feet: 2007.64

STANDARD PENETRATION RESISTANCE

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well HL-MW-27D

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.6

Moist, dark brown (to 10 feet) over brownish gray, sandy to slightly sandy GRAVEL.

Rapid penetration.

Moist, brownish gray, slightly sandy GRAVEL with open work zones. Circulation loss indicates open work Gravel.

Moist, grayish brown, very sandy GRAVEL. Increased cuttings return.

Increasing moisture and cobbles encountered.

Wet, grayish brown to brownish gray, very sandy GRAVEL.

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well HL-MW-27D

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.6

- Wet, grayish brown to brownish gray, very sandy GRAVEL.
  - Cuttings appear well graded.
- Heaving conditions in borehole.

Bottom of Boring at 130.9 Feet.
Completed 02/21/06.

- Casing Stick-up in Feet: 0.55
- Top of Casing Elevation in Feet: 2008.05

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well HL-MW-28DD

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2005.7

- Brown to dark brown, sandy GRAVEL, weathered.
- Brownish gray, sandy GRAVEL.
- Large GRAVEL based on drill action.
- Brown to dark brown, sandy GRAVEL.
- Brownish gray, slightly sandy GRAVEL with scattered slightly to moderately open work zones.
- Open work with Slit matrix.
- Sandy GRAVEL.
- Open work GRAVEL.
- Large COBBLES based on drill action.
- Sandy GRAVEL.
- Brownish gray, sandy GRAVEL with scattered Cobbles.
- Slightly sandy GRAVEL.
- Open work GRAVEL.
- Brownish gray, sandy GRAVEL.

STANDARD PENETRATION RESISTANCE

Sample

1 2 5 10 20 50 100

Blows per Foot

LAB TESTS

- CA
- CA
- CA
- CA
- CA
- CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Note: Boring by Sonic Rig.
Boring Log/Construction Data for Monitoring Well HL-MW-28DD

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2005.7

- Brownish gray, sandy GRAVEL.
  - Brown, sandy GRAVEL.
  - Moderately open work zone with some Silt matrix.
  - Dark brown, open work GRAVEL with some Silt matrix.
  - Brown, sandy GRAVEL.
  - Brownish gray, very sandy GRAVEL.
  - Brownish gray, sandy GRAVEL.
  - Open work GRAVEL.
  - Brown, sandy GRAVEL.
  - Open work GRAVEL.
  - Gray, sandy GRAVEL.
  - Large GRAVEL/COBBLIES.
    - Brown, slightly sandy, moderately open work GRAVEL.
    - Open work GRAVEL with Cobbles.
    - Slightly silty, sandy GRAVEL.
      - Brownish gray, slightly sandy GRAVEL with scattered Cobbles and open work zones.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Note: Boring by Sonic Rig.
Boring Log/Construction Data for Monitoring Well HL-MW-28DD

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2005.7

Brownish gray, slightly sandy GRAVEL with scattered Cobble and open work zones.

Brownish gray SAND

Brownish gray, sandy GRAVEL.

Moderately open work GRAVEL.

Gray, very sandy GRAVEL to very gravelly SAND with scattered Gravel and Cobble.

Open work GRAVEL.

Gray, slightly sandy GRAVEL.

Grading to very gravelly SAND to very sandy GRAVEL.

Open work GRAVEL.

Gray, sandy, slightly to moderately open work GRAVEL.

Brownish gray, slightly gravelly, fine to medium SAND with scattered Gravel.

Bottom of Boring at 150.0 Feet.
Completed 09/06/06.

Casing Stick-up in Feet: 2.5
Top of Casing Elevation in Feet: 2008.22

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Note: Boring by Sonic Rig.
Boring Log/Construction Data for Monitoring Well HL-MW-29S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2007.8

- Brown to dark brown, sandy GRAVEL with organic material.
- Brown to gray, slightly sandy GRAVEL.
- Open work GRAVEL zone.
- GRAVEL with cobbles.
- Brownish gray, sandy GRAVEL.
- Brownish gray, gravelly COBBLES.
- Open work zone with scattered dark gray-brown zones with minor silts/sand.

STANDARD PENETRATION RESISTANCE

Blows per Foot

Sample

S-1

S-2

S-3

S-4

S-5

S-6

LAB TESTS

- CA
- CA
- CA
- CA
- CA
- CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Note: Boring continuously cored by Sonic Rig with composite samples collected as indicated.
Boring Log/Construction Data for Monitoring Well HL-MW-29S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2007.8

Brownish gray, sandy, open work GRAVEL with cobbles and scattered dark gray-brown zones.

Brownish gray, sandy GRAVEL.

Grading wet.

Bottom of Boring at 92.0 Feet. Completed 06/07/07.
Casing Stick-up in Feet: 2.43
Top of Casing Elevation in Feet: 2010.18

STANDARD PENETRATION RESISTANCE

LAB TESTS

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Note: Boring continuously cored by Sonic Rig with composite samples collected as indicated.
Boring Log/Construction Data for Monitoring Well HL-MW-30S

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2002

- Brown and gray, sandy GRAVEL with scattered concrete fragments and wire. (FILL)

- Dark gray, reworked organic material (Topsoil)

- Brownish gray, sandy GRAVEL

- Grades to slightly sandy, open work GRAVEL with cobbles and some silt infilling.

- Grades to brownish gray, gravelly COBBLES.

- Brownish gray, slightly sandy, open work GRAVEL with scattered cobbles and some silt infilling.

- Large cobbles

- Dark brown, sandy GRAVEL

- Brownish gray, sandy GRAVEL with scattered dark brown zones.

- Gray, slightly silty, sandy GRAVEL.

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Note: Boring continuously cored by Sonic Rig with composite samples collected as indicated.

2644-109

Figure A-29
1/2
Boring Log/Construction Data for Monitoring Well HL-MW-30S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2002.7

Gray, slightly silty, sandy GRAVEL

Brownish gray to gray, sandy GRAVEL with scattered cobbles and open work zones.
Boulder from 67 to 70 feet

Grading wet

Open work zone with no sand matrix.

Bottom of Boring at 90.0 Feet. Completed 06/08/07.

Casing Stick-up in Feet: 2.3
Top of Casing Elevation in Feet: 2005

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Note: Boring continuously cored by Sonic Rig with composite samples collected as indicated.
Monitoring Well Log RM-MW-1S

Northing (ft): 11216
Easting (ft): 10498.9

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2004.6

Brick and Concrete over damp, gray-brown, silty, sandy GRAVEL.

Damp, gray, silty, sandy GRAVEL.

Moist to wet, brown, slightly silty to silty, sandy GRAVEL.

Bottom of Boring at 90.0 Feet.
Completed 10/06/03.

Casing Stick-up in Feet: 1.89
Top of Casing in Feet: 2006.49

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

STANDARD PENETRATION RESISTANCE

Sample
▲ Blows per Foot

LAB TESTS & (PID)

2644-78
Figure A-30

10/03
Monitoring Well Log RM-MW-2D

Northing (ft): 11228.8
Easting (ft): 10499.2

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2004.6

One foot of Concrete over moist, brown to gray, sandy GRAVEL.

Wet, gray, fine to coarse GRAVEL with trace Sand grading to slightly silty, sandy GRAVEL.

Wet, brown-gray, fine to coarse SAND with trace Gravel.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Monitoring Well Log RM-MW-2D

Northing (ft): 11228.8
Easting (ft): 10499.2

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2004.6

Wet, brown-gray, fine to coarse SAND with trace Gravel.

---

Wet, brown-gray, fine to coarse SAND with silty SAND lenses.

Bottom of Boring at 155.0 Feet:
Completed 10/04/03

Casing Stick-up in Feet: 1.91
Top of Casing in Feet: 2006.51

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Monitoring Well Log RM-MW-3S

Northing (ft): 11301.7
Easting (ft): 10924.4

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2002.8

14 inches of Concrete over dry, gray to light brown GRAVEL.

Damp to wet, brown, slightly silty, sandy GRAVEL grading to wet, gray-brown, gravelly, fine to medium SAND with trace Silt.

Bottom of Borring at 91.5 Feet. Completed 09/27/03.
Casing Stick-up in Feet: -0.55
Top of Casing in Feet: 2002.25

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER
2644-78 9/03
Figure A-32
Monitoring Well Log RM-MW-4D

Northing (ft): 11290.6
Easting (ft): 10924.9

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2003.9

3 inches of Brick and 12 inches of Concrete over very dense, dry to damp, gray-brown, slightly silty, sandy GRAVEL with occasional cobbles.

Large rock from 55 to 59 feet.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
### Soil Descriptions

**Very dense, wet, slightly gravelly, coarse SAND.**

**Very dense, wet, brown, sandy to non-sandy GRAVEL.**

**Bottom of Bore at 151.0 Feet.**
Completed 10/04/03.

Casing Stick-up in Feet: -0.59
Top of Casing in Feet: 2003.31

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**STANDARD PENETRATION RESISTANCE**

<table>
<thead>
<tr>
<th>Blows per Foot</th>
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<tbody>
<tr>
<td>1</td>
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</table>

**LAB TESTS & (PID)**

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1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Monitoring Well Log RM-MW-5S

Northing (ft): 11414.8
Easting (ft): 11405.7

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2001.0

2 inches of Asphalt over damp to dry, gray-brown, silty to slightly silty, sandy GRAVEL.

Bottom of Boring at 91.0 Feet.
Completed 10/14/03.

Casing Stick-up in Feet: 2.14
Top of Casing in Feet: 2003.14

STANDARD PENETRATION RESISTANCE

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

2644-78 10/03
Figure A-34
**Boring Log/Construction Data for Monitoring Well RM-MW-8S**

**Soil Descriptions**

Approximate Ground Surface Elevation in Feet: 2005.4

- Concrete Floor Slab over medium dense to very dense, moist, brown to brownish gray, slightly sandy to sandy GRAVEL.

- Slight moisture increase.

- Grading gray to brownish gray.

- Grading dry, open works GRAVEL with dusty air discharge. Possible cobbles.

- Increasing moisture content.

- Very dense, wet, gray, sandy GRAVEL.

**Bottom of Boring at 90.0 Feet.**

Completed 03/01/05.

Casing Stick-up in Feet: -0.4
Top of Casing in Feet: 2005.01

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well RM-MW-9S

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 206.8

Concrete Floor Slab over medium dense, moist, gray, sandy GRAVEL with concrete debris. (FILL)

Loose to medium dense, moist, dark brown to brownish gray, slightly silty to silty, sandy GRAVEL with organic material. (FILL)

Slight organic odor.

Very dense, moist, gray, sandy GRAVEL

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well RM-MW-9S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2006.8

Very dense, moist, gray, sandy GRAVEL.
Grading brownish gray.

Grading to gray.

Grading brownish gray.

Increasing moisture content.

Very dense, wet, gray to brownish gray, sandy GRAVEL.

Medium dense, wet, gray to brownish gray, slightly gravelly SAND with Gravel layers.

Bottom of Boring at 90.6 Feet.
Completed 03/03/05.

Casing Stick-up in Feet: 1.42
Top of Casing in Feet: 2008.2

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Boring drilled on 73° slant relative to horizontal. Depths indicated are dimensions along slope, not vertical depths. Prepacked well screen installed and casing withdrawn allowing native material to collapse around screen below depth of 65 feet.
Boring Log/Construction Data for Monitoring Well RM-MW-12S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2006.6

- Concrete Floor Slab:
  Very dense, moist, brown, sandy GRAVEL.

- Very dense, moist, brown, gravelly SAND.

- Very dense, moist, brown, slightly sandy GRAVEL (Open Work Gravel)

- Very dense, moist, gravelly SAND.

- Very dense, moist, brown, slightly sandy GRAVEL with cobble zones.

- Cobbles based on drill action.

- Grading wet with scattered cobbles.

- Heave in auger

- Very dense, wet, brown GRAVEL.

- Very dense, wet, brownish gray, sandy GRAVEL.

- Bottom of Boring at 85.9 Feet.
  Completed 04/26/05.

- Casing Stick-up in Feet: -.7
  Top of Casing Elevation in Feet: 2005.93

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1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well RM-MW-13S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.6

Concrete Floor Slab
- Very dense, moist, brown, sandy GRAVEL.

Very dense, moist, brown, slightly sandy GRAVEL with open work zones.

Scattered cobbles and cobble zones.

Grading wet with increasing fines.
- Very dense, wet, brown, sandy GRAVEL.

Bottom of Boring at 90.9 Feet.
Completed 04/28/05.

Casing Stick-up in Feet: 0.5
Top of Casing Elevation in Feet: 2008.07

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
**Boring Log/Construction Data for Monitoring Well RM-MW-14S**

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2008.6

- **Fire Brick and Concrete.**
  - (Medium dense to dense), moist, grayish brown, sandy GRAVEL with scattered open work zones.

  Drill action indicates large Gravel and Cobbles.

- **(Dense), moist, grayish brown, sandy GRAVEL with open work zones and large Gravel and Cobbles.**

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

---

**STANDARD PENETRATION RESISTANCE**

- **Sample**
  - Blows per Foot

  - 1 2 5 10 20 50 100

  - S-1
  - S-2
  - S-3
  - S-4

  - 50/5"**

  - 50/2"**

  - (0.1) CA
  - (0.2) CA

**LAB TESTS & (PID)**

- **2644-99**
- **9/06**
- **Figure A-41** 1/2
**Boring Log/Construction Data for Monitoring Well RM-MW-14S**

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.6

(Dense), moist, grayish brown, sandy GRAVEL with open work zones and large gravel and cobbles.

(Medium dense to dense), wet, grayish brown, sandy GRAVEL with open work zones.

Bottom of Boring at 91.5 Feet. Completed 09/20/06.

Casing Stick-up in Feet: -0.57
Top of Casing Elevation in Feet: 2008.02

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well RM-MW-15S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.7

Concrete Floor Sab.

(Dense), moist, grayish brown, sandy GRAVEL with scattered open work zones.

STANDARD PENETRATION RESISTANCE
Sample
Blows per Foot

<table>
<thead>
<tr>
<th>Depth in Feet</th>
</tr>
</thead>
<tbody>
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<td>45</td>
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<td>50</td>
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</tbody>
</table>

LAB TESTS & (PID)

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well RM-MW-15S

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Soil Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-50</td>
<td>(Dense), moist, grayish brown, sandy GRAVEL with scattered open work zones</td>
</tr>
<tr>
<td>51-90</td>
<td>Some Silt infilling between open work zones and increased moisture content</td>
</tr>
</tbody>
</table>

*Bottom of Boring at 91.5 Feet. Completed 09/19/06.*

*Casing Stick-up in Feet: -0.57 Top of Casing Elevation in Feet: 2008.11*

---

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well RM-MW-16S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.7

(Dense), moist, grayish brown, sandy GRAVEL with scattered open work zones.

(Medium dense to dense), wet, grayish brown, sandy GRAVEL with open work zones.

Bottom of Boring at 91.5 Feet.
Completed 09/18/06.

Casing Stick-up in Feet: -0.48
Top of Casing Elevation in Feet: 2008.23

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well RM-MW-17S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.6

- Concrete Floor Slab with 0.2 foot of Fire Brick.
- (Medium dense to dense), moist, brownish gray to grayish brown, sandy GRAVEL with scattered open work zones.

STANDARD PENETRATION RESISTANCE

Sample

<table>
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<tr>
<th>Depth in Feet</th>
<th>1</th>
<th>2</th>
<th>5</th>
<th>10</th>
<th>20</th>
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<td></td>
</tr>
</tbody>
</table>

LAB TESTS & (PID)

- S-1: (<0.1) CA
- S-2: (<0.1) CA
- S-3: (<0.1) CA
- S-4: (<0.1) CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Boring Log/Construction Data for Monitoring Well RM-MW-17S

Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.6

(Medium dense to dense), moist, brownish gray to grayish brown, sandy GRAVEL with scattered open work zones.

COBBLES

Sandy GRAVEL

Grading moist to wet.

(Dense), wet, grayish brown, sandy GRAVEL.

Bottom of Boring at 91.5 Feet.
Completed 09/14/06.

Casing Stick-up in Feet: -0.66
Top of Casing Elevation in Feet: 2007.89

STANDARD PENETRATION RESISTANCE

Sample
Blows per Foot

1 2 5 10 20 50 100

S-5

S-6

S-7

S-8

S-9

<0.1 CA

<0.1 CA

<0.1 CA

<0.1 CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
Soil Descriptions
Approximate Ground Surface Elevation in Feet: 2008.5

- Loose, crushed, minus 3/4-inch, import GRAVEL
- Medium dense, moist, dark gray, silty, sandy GRAVEL with TPH-like odor
- Medium dense, moist, grayish brown, sandy GRAVEL
  Very dense, moist, grayish brown, sandy GRAVEL with open work zones
- Very dense, moist, gray-brown to brownish gray, slightly sandy GRAVEL with scattered cobbles and cobble zones
- Grading wet
- Very dense, wet, gray, slightly sandy to sandy GRAVEL

Bottom of Boring at 85.8 Feet
Completed 05/19/05
Casing Stick-up in Feet: 1.8
Top of Casing Elevation in Feet: 2010.25

STANDARD PENETRATION RESISTANCE

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Boring drilled to depth of 17 feet and abandoned with second boring drilled 4.5 feet to the south. Second boring drilled unsampled to depth of 15 feet with no recovery at that depth. Samples S-4 on are from second boring.
Boring Log/Construction Data for Monitoring Well TS-MW-2S

Soil Descriptions

Approximate Ground Surface Elevation in Feet: 2008.0

- 3 inches of Asphalt over 12 inches of crushed, minus 3/4 inch, imported GRAVEL.
  Very dense, moist, brown, slightly silty, sandy GRAVEL.

- Very dense, moist, brown GRAVEL

- Very dense, moist, brown GRAVEL (Open Work Gravel)

- Very dense, moist, grayish brown, sandy GRAVEL

Possible scattered large cobbles based on drill action.

Grading wet

Very dense, wet, grayish brown, slightly sandy to sandy GRAVEL

Bottom of Boring at 85.8 Feet.
Completed 05/20/05.

Casing Stick-up in Feet: -0.38
Top of Casing Elevation in Feet: 2008.22

STANDARD PENETRATION RESISTANCE

Sample

Boring Log with Blow Counts

HARTCROWSER

2644-92 5/05

Figure A-46

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. PID readings not consistent with field observations and laboratory data.