LANDAU ASSOCIATES

August 3, 2016

Mr. Robert Williams
Oregon Department of Environmental Quality
Northwest Region Portland Office
2010 SE 4th Ave., Suite 400
Portland, OR 97201

Transmitted via email to: ***WILLIAMS.Robert@deq.state.or.us***

Re: D-2(i), D-3(i), and DP-4 Well Decommissioning Work Plan
Boeing Portland - Troutdale Gravel Aquifer Remedy
Gresham, Oregon
Project No. 0025116.116.440
(ECSI #13)

Dear Mr. Williams:

Landau Associates (LAI) has prepared this work plan for well decommissioning as part of the Boeing Portland Troutdale Gravel Aquifer (TGA) remedy being conducted by The Boeing Company (Boeing) at the Portland facility (Figure 1). The TGA remedy is being implemented under the Oregon Department of Environmental Quality (ODEQ) Consent Order No. LQSR-NWR-04-12(h). This work plan describes procedures to decommission two groundwater monitoring wells, [D-2(i) and D-3(i)]; and one former dual-phase extraction well (DP-4). The locations of these wells are shown on Figure 2. The three wells are no longer part of the current groundwater monitoring program, as discussed below.

This work plan also outlines the well construction information, decommissioning methodologies, reporting requirements, and proposed schedule for decommissioning. Well decommissioning activities will be conducted in accordance with the site health and safety plan (LAI 2008).

Well Overview

Historical concentrations for compounds of potential concern [COPCs including volatile organic compounds (VOC) trichloroethene (TCE); 1,1-dichloroethene (1,1-DCE); 1,1,1-trichloroethane (1,1,1-TCA); cis-1,2-dichloroethene (cisDCE); tetrachloroethene (PCE); and vinyl chloride (VC)] are summarized in Table 1. Both D-2(i) and D-3(i) were historically utilized for groundwater elevation monitoring. Groundwater elevation data is summarized in Table 2.

Wells D-2(i) and D-3(i), located north of Sandy Boulevard off Boeing property, as shown on Figure 2, were installed in 1988 to monitor groundwater quality downgradient of the TGA remedy area. COPC concentrations at well D-2(i) have consistently been below the respective laboratory reporting limits, with the exception of a single low-level detection in 2005 for TCE at 1.8 micrograms per liter (µg/L), which is well below the cleanup level (5.0 µg/L). Based on the historical COPC concentrations and the

large aerial distance between the well and the leading edge of the VOC plume, the well was approved by ODEQ to be removed from the site groundwater monitoring program in 2010.

Well D-3(i) is located approximately mid-distance from D-2(i), located approximately 600 feet (ft) East, and D-7(i), located approximately 400 ft West. Well D-3(i) was removed from the groundwater monitoring program in 1997 because D-7(i) was located closer to the plume and was better suited to characterize VOC concentration; therefore, the use of D-3(i) as a monitoring location was considered duplicative. The historical COPCs for D-3(i) are included in Table 1; however, as stated above, D-7(i) is currently utilized to characterize groundwater conditions in the area. TCE concentrations at D-7(i) have consistently been below the cleanup level (5 µg/L) since August 2000, and the current TCE concentration is 1.4 µg/L.

Well DP-4 was installed as part of the dual-phase extraction system pilot test conducted in the late 1990s. The results of the pilot test indicated the TGA was not conducive to dual-phase extraction. Rather than decommission the well, it was converted to use as part of the Soil Vapor Extraction (SVE) system. Between 1994 and 2009, the SVE system within the Central and West Corrective Action Areas removed approximately 3,750 pounds (lbs) of VOCs from the unsaturated zone. SVE system mass recovery declined with time and, in 2009, ODEQ approved the decommissioning of the system because VOC mass removal rates were below the shutoff criterion of 0.1 lbs/day (Kent 2009). One groundwater sample was collected for well DP-4 directly after well installation in 1998 as a baseline sample for the dual-phase extraction pilot test. The results of the baseline test indicated a TCE concentration (200 µg/L) and a PCE concentration (18 µg/l) above the cleanup levels (5.0 µg/L for both TCE and PCE). All other detected COPCs were below the respected cleanup levels.

Well Descriptions

Exploration logs and well as-builts are provided in Attachment 1 and as follows:

D-2(i)

- Borehole Diameter: 6 inches (outer diameter)
- Total Depth: 122 ft below ground surface (bgs)
- PVC Casing Diameter: 2 inches (outer diameter).

D-3(i)

- Borehole Diameter: 6 inches (outer diameter)
- Total Depth: 151.5 feet bgs
- PVC Casing Diameter: 2 inches (outer diameter).

DP-4

- Borehole Diameter: 10.75 inches (outer diameter)
- Total Depth: 82 feet bgs
- PVC Casing Diameter: 6 inches (outer diameter).

Methodology

Well decommissioning will follow applicable Oregon Administrative Rules (OARs) outlined in OAR 690-240 using an Oregon Certified Driller. LAI will subcontract with an Oregon-licensed driller to perform drilling activities.

Prior to decommissioning activities, the following activities will be performed:

- Perform underground utility locate survey to determine the potential presence and location of buried utilities in the well vicinity.
- Submit a well decommissioning start card, as required by OAR 690-240-0385.
- Measure the depth-to-water and the total depth of the well.

Overdrilling

D-2(i), D-3(i), and DP-4 will be decommissioned by over-drilling using a rotosonic drill rig. Decommissioning methods will be conducted in accordance with OAR 690-240-0510(1) and will follow these general steps:

- The concrete surface seal, well monument, and other surface items (e.g., bollards) will be removed using an excavator or similar heavy equipment.
- The schedule-80 PVC well casing and screen, and well seal materials (e.g., filter pack sand, bentonite) will be removed using the drilling rig by over-drilling the well from ground surface to total depth of each well [D-2(i) is 122 ft deep and D-3(i) is 151.5 ft deep.
  - Well DP-4 is 82 ft deep. Over-drilling equipment will be sized at a minimum of 2-inches larger than the diameter of the original borehole.
- The drill cuttings, sand filter pack, and other debris will be removed from the boring.
- The boring will be backfilled with bentonite grout slurry from the bottom of the boring to approximately 5 ft bgs. The bentonite grout slurry will meet the requirements of OAR 690-240-0475 for backfill materials. Grout mixture will be installed through a tremie pipe that is temporarily placed at the base of the well and raised as the well void space is filled with grout. Hydrated bentonite chips will be used to backfill the boring from 5 ft bgs to ground surface.
- The work area will be cleaned up, decommissioning materials and debris removed, and the ground surface restored to match surrounding terrain.

Site Cleanup and Waste Management

Solid wastes and soil cuttings (investigation-derived waste [IDW]) generated during decommissioning activities will be contained in 10- to 20-cubic yard containers and placed into temporary storage pending characterization, permitting, and transport to the proper disposal facility. Based on conversations with ODEQ, the IDW from the wells will be field-screened for the possible presence of contamination using visual signs of soil staining or sheen, and vapor headspace measurements with a portable photoionization detector meter. One composite sample, consisting of five discrete subsamples, will be collected from the IDW generated for each boring and will be analyzed for the disposal facility requested analyte suite. If field screening results and/or analytical results indicate the

presence of contamination, ODEQ will be consulted for a "No Longer Contains" determination. Upon receipt of the No Longer Contains determination (if needed), the IDW will be transported offsite for disposal. The metal protective monuments removed from the well will be decontaminated and recycled at the appropriate facility.

Wastewater collected will be temporarily stored in a holding tank and decanted into the Boeing Groundwater Treatment System (GWTS).

Notification and Schedule

ODEQ will be notified via email prior to and upon the completion of the well decommissioning. Notification information will include the following, in accordance with OAR 690-240-0510(6) (notification requirements):

1. Well identification information
2. Decommissioning methodology
3. Amount and type of sealant/backfill material (i.e., bentonite grout) used
4. Any other information required by the ODEQ.

Well decommissioning activities will also be reported in the TGA 2016 annual report. Decommissioning of D-2(i), D-3(i), and DP-4 is scheduled to begin in late August and is expected to require 5 days to complete.

The completion notification email will be sent to ODEQ within 2 weeks after decommissioning activities are completed.

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We look forward to your review and approval of this work plan. Please contact Christine Kimmel, Landau Associates, at (425) 778-0907 with any questions regarding this work plan or if you need additional information.

LANDAU ASSOCIATES, INC.

Brett Borgeson
Project Scientist

Christine B. Kimmel, LG
Associate

BHB/CBK/tam
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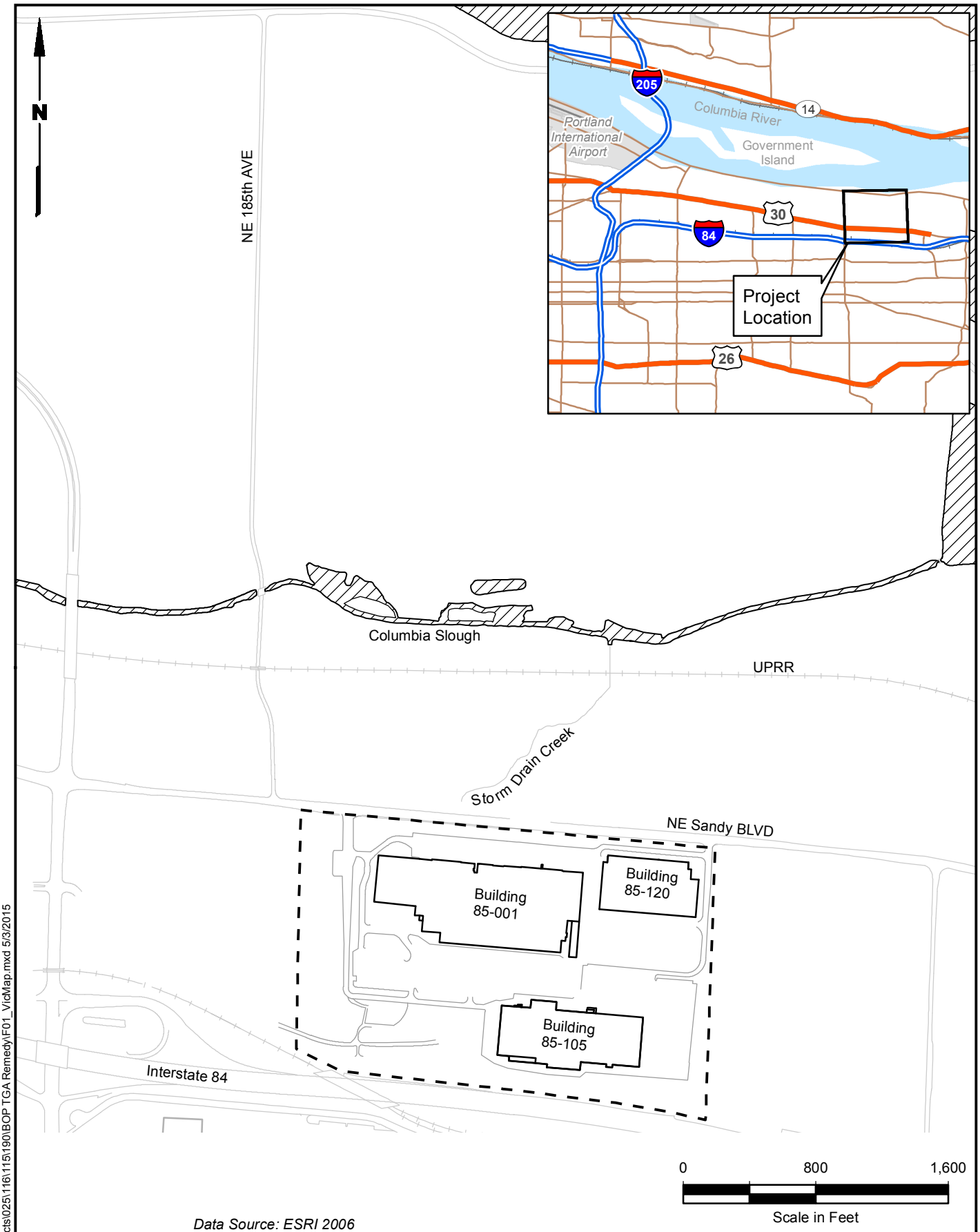
Attachments:

Figure 1	Vicinity Map
Figure 2	Site Map
Table 1	Historic COPC Data
Table 2	Groundwater Elevations
Attachment 1	D-2(i), D-3(i), and DP-4 Exploration Logs and Well As-builts

References

Kent, M. 2009. "Re: Proposal to Shutdown SVE System and Remaining Wells." Mavis Kent, Oregon Department of Environmental Quality. July 30.

LAI. 2008. Health and Safety Plan, 85-001 Building Expansion, Boeing Portland, Gresham, Oregon. Landau Associates, Inc. March 28.



Data Source: ESRI 2006

G:\Projects\025\116\115\190\BOP TGA Remedy\F01_VicMap.mxd 5/3/2015

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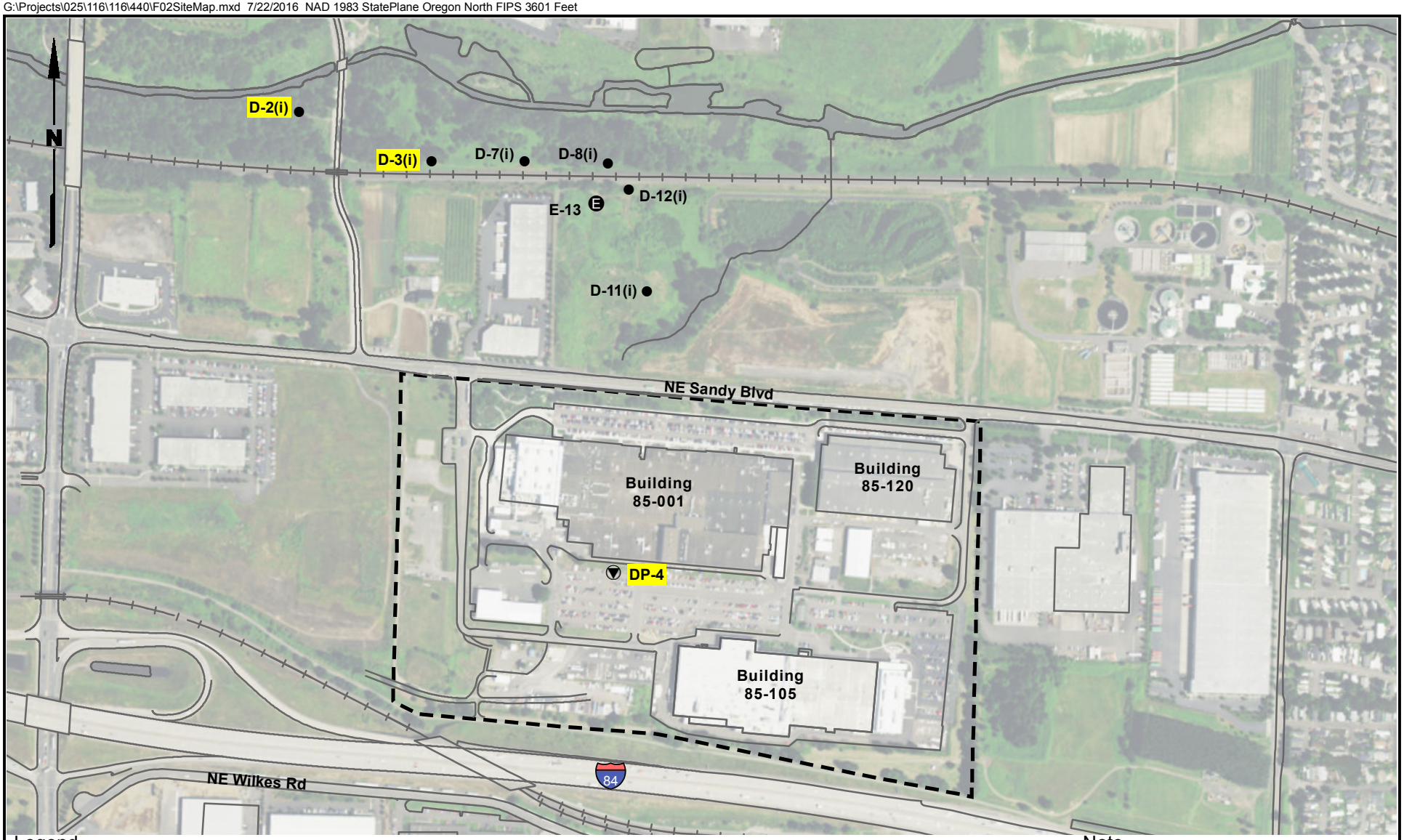
Boeing Portland Gresham, Oregon	**Vicinity Map**	Figure 1

G:\Projects\025\116\116\440\F02SiteMap.mxd 7/22/2016 NAD 1983 StatePlane Oregon North FIPS 3601 Feet



Legend

- TGA Monitoring Well
- TGA Extraction Well
- Dual-Phase Extraction Well
- Subject Property

DP-4 Wells Proposed for Decommissioning

0 600 1,200

Scale in Feet

Data Sources: Multnomah County GIS; Esri World Imagery.

Note

1. ND = Not Detected at reporting limit.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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Boeing Portland
Gresham, Oregon

Site Map

Figure 2

TABLE 1
HISTORIC COPC DATA
WELLS D-2(i), D-3(i), AND DP-4
BOEING OF PORTLAND

Location	Date Collected	TCE	PCE	Vinyl chloride	1,1-DCE	cis-1,2-DCE	1,1,1-TCA
	Cleanup Standards	5	5	2	7	70	200
D-2i	2/19/1991	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/20/1991	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-2i	1/15/1992	1.0 U	1.0 U	3.0 U	2.0 U	1.0 U	1.0 U
D-2i	7/21/1992	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/8/1993	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-2i	7/17/1993	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/22/1994	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/2/1994	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
D-2i	2/8/1995	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
D-2i	8/2/1995	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/19/1996	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/6/1996	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/12/1997	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/18/1997	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/25/1998	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/20/1998	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/16/1999	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/20/1999	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/17/2000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/28/2000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/26/2001	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/21/2001	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/25/2002	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/19/2002	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/21/2003	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/18/2003	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/26/2004	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/13/2004	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/15/2005	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/8/2005	**1.8**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/3/2006	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	8/10/2006	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/7/2007	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
D-2i	8/10/2007	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
D-2i	2/21/2008	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
D-2i	8/7/2008	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/10/2009	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-2i	2/3/2010	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
D-3i	5/5/1988	**15.0**	0.4 J	NA	0.4 J	0.5 J	**1.6**
D-3i	7/18/1988	**15.0**	NA	NA	NA	0.9 J	**3.2**
D-3i	11/29/1988	**23.0**	0.4 J	NA	NA	**1.1**	**5.0**
D-3i	7/31/1989	**16.0**	0.4 M	NA	0.3 J	**1.4**	**4.0**
D-3i	2/26/1990	**14.0**	NA	NA	1.0 U	0.8 M	**2.7**
D-3i	8/15/1990	**15.0**	NA	NA	NA	0.6 J	**1.5**
D-3i	2/19/1991	**15.0**	1.0 U	3.0 U	NA	0.7 M	**1.6**
D-3i	5/16/1991	**12.0**	1.0 U	2.0 U	1.0 U	0.6 J	0.6 M
D-3i	7/10/1991	**5.3**	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-3i	8/20/1991	**4.7**	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-3i	1/15/1992	**10.0**	1.0 U	3.0 U	2.0 U	1.0 U	0.7 J
D-3i	7/21/1992	**11.0**	1.0 U	2.0 U	1.0 U	1.0 U	0.7 M
D-3i	2/9/1993	**15.0**	1.0 U	2.0 U	1.0 U	1.0 U	0.9 M
D-3i	7/19/1993	**12.0**	1.0 U	2.0 U	0.7 J	1.0 U	0.9 J
D-3i	2/22/1994	**14.0**	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-3i	8/3/1994	**11.0**	**0.3**	0.2 U	**0.4**	**0.3**	**0.6**
D-3i	2/7/1995	**11.0**	**0.3**	0.2 U	**0.4**	**0.3**	**0.6**
D-3i	8/10/1995	**10.0**	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-3i	2/20/1996	**8.1**	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-3i	8/8/1996	**6.8**	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
D-3i	2/12/1997	**6.2**	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
DP-4	10/28/1998	**200**	**18**	2.0 U	**3.4**	**17**	**11**

µg/L = micrograms per liter
TCE = trichloroethene
PCE = tetracloroethene
1,1-DCE = 1,1-dichloroethene
cis-1,2-DCE = cis-1,2-dichloroethene
1,1,1-TCA = 1,1,1-trichloroethane
NA = Not Analyzed

U = Indicates the compound was undetected at the reported concentration.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
M = Estimated value of analyte found and confirmed by analyst, but with low spectral match.
Bold = Detected Compounds
Boxed = Exceeds Cleanup Standard

Note: All units in µg/L

TABLE 2
GROUNDWATER ELEVATIONS
WELLS D-2(i), D-3(i), AND DP-4
BOEING OF PORTLAND

Location	DateMeasured	Groundwater Elevation
D-02i	6/29/1988	10.83
D-02i	7/29/1988	10.21
D-02i	8/24/1988	10.14
D-02i	9/19/1988	10.18
D-02i	11/4/1988	10.14
D-02i	11/30/1988	11.05
D-02i	1/5/1989	11.07
D-02i	2/9/1989	10.74
D-02i	3/17/1989	12.28
D-02i	4/17/1989	10.98
D-02i	5/17/1989	10.45
D-02i	6/21/1989	10.46
D-02i	7/12/1989	9.93
D-02i	8/24/1989	9.85
D-02i	9/21/1989	9.36
D-02i	10/19/1989	9.42
D-02i	11/16/1989	9.24
D-02i	12/21/1989	9.31
D-02i	1/17/1990	10.15
D-02i	2/28/1990	10.48
D-02i	3/19/1990	10.3
D-02i	4/16/1990	9.53
D-02i	5/10/1990	10.05
D-02i	6/27/1990	10.04
D-02i	7/23/1990	9.43
D-02i	8/24/1990	8.85
D-02i	9/28/1990	8.7
D-02i	10/31/1990	9.73
D-02i	11/29/1990	9.79
D-02i	1/8/1991	9.38
D-02i	1/31/1991	9.86
D-02i	2/28/1991	10.79
D-02i	3/28/1991	10.51
D-02i	4/25/1991	10.54
D-02i	5/23/1991	10.17
D-02i	6/27/1991	7.29
D-02i	7/25/1991	7.96
D-02i	8/22/1991	7.71
D-02i	9/26/1991	8.45
D-02i	10/24/1991	8.68
D-02i	11/21/1991	9.66
D-02i	12/19/1991	9.67
D-02i	1/23/1992	9.37
D-02i	2/27/1992	10.5
D-02i	3/26/1992	9.37
D-02i	4/30/1992	9.91
D-02i	5/28/1992	9.16
D-02i	6/25/1992	8.96
D-02i	7/30/1992	8.93
D-02i	8/27/1992	8.74
D-02i	9/24/1992	8.66
D-02i	10/29/1992	8.42

TABLE 2
GROUNDWATER ELEVATIONS
WELLS D-2(i), D-3(i), AND DP-4
BOEING OF PORTLAND

Location	DateMeasured	Groundwater Elevation
D-02i	11/25/1992	9.44
D-02i	12/31/1992	9.89
D-02i	1/28/1993	10.22
D-02i	2/24/1993	8.9
D-02i	3/25/1993	10.34
D-02i	4/29/1993	10.19
D-02i	5/27/1993	9.81
D-02i	6/24/1993	9.77
D-02i	7/29/1993	9.63
D-02i	8/26/1993	8.89
D-02i	9/30/1993	8.35
D-02i	10/28/1993	8.66
D-02i	11/23/1993	8.12
D-02i	12/30/1993	8.62
D-02i	1/27/1994	9.39
D-02i	2/25/1994	10.8
D-02i	4/1/1994	9.45
D-02i	4/28/1994	9.31
D-02i	5/26/1994	9.08
D-02i	6/30/1994	8.96
D-02i	7/28/1994	8.8
D-02i	8/24/1994	8.61
D-02i	9/29/1994	9.23
D-02i	10/27/1994	10.12
D-02i	11/28/1994	10.08
D-02i	12/21/1994	10.55
D-02i	1/25/1995	10.64
D-02i	2/2/1995	11.77
D-02i	3/29/1995	10.51
D-02i	4/26/1995	9.65
D-02i	5/24/1995	10.47
D-02i	6/27/1995	9.52
D-02i	7/26/1995	8.82
D-02i	8/30/1995	8.03
D-02i	9/28/1995	8.43
D-02i	10/26/1995	8.28
D-02i	11/28/1995	9.96
D-02i	12/20/1995	10.08
D-02i	1/30/1996	10.68
D-02i	2/27/1996	11.93
D-02i	3/27/1996	10.16
D-02i	4/25/1996	10.39
D-02i	5/29/1996	10.15
D-02i	6/26/1996	10.25
D-02i	7/29/1996	9.61
D-02i	8/28/1996	9.47
D-02i	9/25/1996	8.85
D-02i	10/31/1996	9.06
D-02i	11/20/1996	10.69
D-02i	12/18/1996	10.8
D-02i	1/29/1997	10.83
D-02i	2/26/1997	10.54

TABLE 2
GROUNDWATER ELEVATIONS
WELLS D-2(i), D-3(i), AND DP-4
BOEING OF PORTLAND

Location	DateMeasured	Groundwater Elevation
D-02i	3/25/1997	10.95
D-02i	4/28/1997	10.49
D-02i	5/28/1997	9.64
D-02i	6/26/1997	10.02
D-02i	8/1/1997	10.06
D-02i	8/28/1997	9.65
D-02i	11/21/1997	9.34
D-02i	2/23/1998	10.45
D-02i	4/30/1998	9.45
D-02i	8/5/1998	8.84
D-02i	2/4/1999	6.5
D-02i	5/12/1999	6.95
D-02i	8/3/1999	5.52
D-02i	11/2/1999	4.59
D-02i	2/5/2000	6.11
D-02i	5/3/2000	6.1
D-02i	8/7/2000	4.9
D-02i	11/8/2000	3.88
D-02i	2/2/2001	3.26
D-02i	5/4/2001	3.92
D-02i	8/4/2001	3.75
D-02i	2/8/2002	5.81
D-02i	5/1/2002	6.99
D-02i	8/2/2002	4.47
D-02i	2/5/2003	7.11
D-02i	7/30/2003	4.45
D-02i	2/6/2004	6.12
D-02i	2/1/2005	4.17
D-02i	8/1/2005	4.17
D-02i	2/2/2006	9.15
D-02i	8/2/2006	6.3
D-02i	2/2/2007	6.93
D-02i	5/2/2007	8.3
D-02i	8/1/2007	5.51
D-02i	11/6/2007	5.51
D-02i	2/22/2008	9.2
D-02i	8/6/2008	4.57
D-02i	2/3/2009	9.92
D-02i	2/2/2010	11.14
D-02i	8/5/2010	10.79
D-02i	2/4/2011	10.67
D-02i	8/1/2011	18.77
D-02i	5/1/2013	18.77
D-03i	6/29/1988	12.85
D-03i	7/29/1988	12.25
D-03i	8/24/1988	12.16
D-03i	9/19/1988	12.22
D-03i	11/4/1988	11.98
D-03i	11/30/1988	12.84
D-03i	1/5/1989	12.92

TABLE 2
GROUNDWATER ELEVATIONS
WELLS D-2(i), D-3(i), AND DP-4
BOEING OF PORTLAND

Location	DateMeasured	Groundwater Elevation
D-03i	2/9/1989	12.81
D-03i	3/17/1989	14.53
D-03i	4/17/1989	12.3
D-03i	5/17/1989	11.54
D-03i	6/21/1989	11.36
D-03i	7/12/1989	10.86
D-03i	8/24/1989	10.72
D-03i	9/21/1989	10.22
D-03i	10/19/1989	10.15
D-03i	11/16/1989	9.84
D-03i	12/21/1989	9.37
D-03i	1/17/1990	9.97
D-03i	2/28/1990	10.24
D-03i	3/19/1990	9.95
D-03i	4/16/1990	9.16
D-03i	5/10/1990	9.69
D-03i	6/27/1990	9.71
D-03i	7/23/1990	9.11
D-03i	8/24/1990	8.58
D-03i	9/28/1990	8.44
D-03i	10/31/1990	9.3
D-03i	11/29/1990	9.29
D-03i	1/8/1991	8.94
D-03i	1/31/1991	9.48
D-03i	2/28/1991	10.19
D-03i	3/28/1991	10.21
D-03i	4/25/1991	9.85
D-03i	5/23/1991	10
D-03i	6/27/1991	8.44
D-03i	7/25/1991	8.35
D-03i	8/22/1991	8.18
D-03i	9/26/1991	8.37
D-03i	10/24/1991	8.4
D-03i	11/21/1991	9.07
D-03i	12/19/1991	9.01
D-03i	1/23/1992	8.77
D-03i	2/27/1992	9.93
D-03i	3/26/1992	8.75
D-03i	4/30/1992	9.31
D-03i	5/28/1992	8.66
D-03i	6/25/1992	8.55
D-03i	7/30/1992	8.57
D-03i	8/27/1992	8.37
D-03i	9/24/1992	8.3
D-03i	10/29/1992	8
D-03i	11/25/1992	8.86
D-03i	12/31/1992	9.25
D-03i	1/28/1993	9.78
D-03i	2/24/1993	8.19
D-03i	3/25/1993	9.73
D-03i	4/29/1993	9.56
D-03i	5/27/1993	9.18

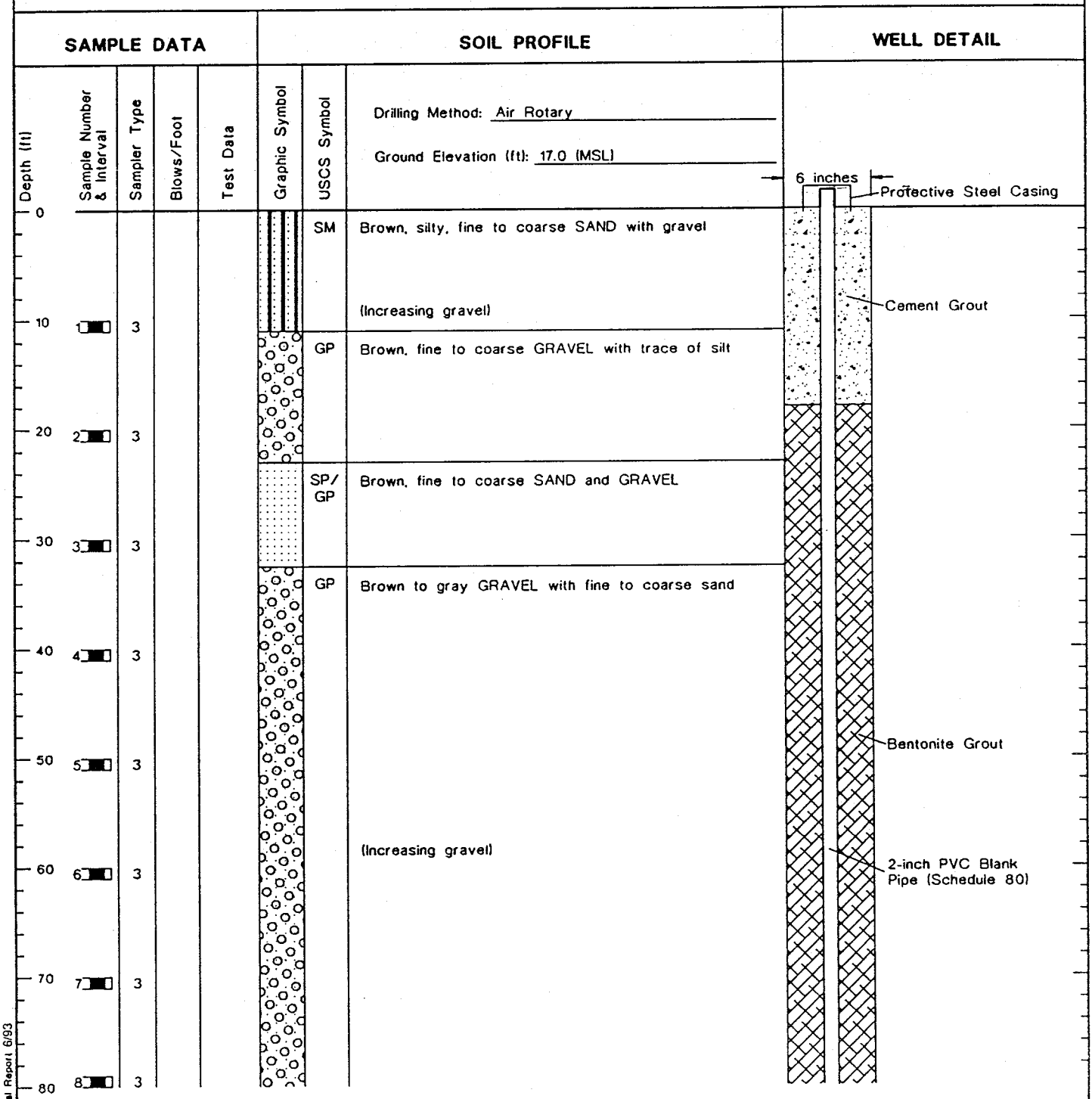
TABLE 2
GROUNDWATER ELEVATIONS
WELLS D-2(i), D-3(i), AND DP-4
BOEING OF PORTLAND

Location	DateMeasured	Groundwater Elevation
D-03i	6/24/1993	9.17
D-03i	7/29/1993	9.09
D-03i	8/26/1993	8.4
D-03i	9/30/1993	7.9
D-03i	10/28/1993	8.22
D-03i	11/23/1993	7.61
D-03i	12/30/1993	7.99
D-03i	1/28/1994	8.55
D-03i	2/25/1994	10.28
D-03i	4/1/1994	8.81
D-03i	4/28/1994	8.68
D-03i	5/26/1994	8.51
D-03i	6/30/1994	8.48
D-03i	7/28/1994	8.35
D-03i	8/24/1994	8.36
D-03i	9/29/1994	9.04
D-03i	10/27/1994	10.52
D-03i	11/28/1994	9.66
D-03i	12/21/1994	10.03
D-03i	1/25/1995	10.14
D-03i	2/2/1995	11.49
D-03i	3/29/1995	10.03
D-03i	4/26/1995	7.13
D-03i	5/24/1995	9.82
D-03i	6/27/1995	7.43
D-03i	7/26/1995	6.69
D-03i	8/30/1995	5.78
D-03i	9/28/1995	6.1
D-03i	10/26/1995	5.88
D-03i	11/28/1995	7.42
D-03i	12/20/1995	7.69
D-03i	1/30/1996	8.38
D-03i	2/27/1996	11.53
D-03i	3/27/1996	8.11
D-03i	4/25/1996	8.21
D-03i	5/29/1996	7.89
D-03i	6/26/1996	8.1
D-03i	7/29/1996	7.37
D-03i	8/28/1996	7.5
D-03i	9/24/1996	6.83
D-03i	10/31/1996	6.46
D-03i	11/20/1996	8.26
D-03i	12/18/1996	8.59
D-03i	1/29/1997	8.6
D-03i	2/26/1997	8.51
D-03i	3/25/1997	9.01
D-03i	4/28/1997	8.34
D-03i	5/28/1997	7.24
D-03i	6/26/1997	7.98
D-03i	8/1/1997	8.3

ATTACHMENT 1

D-2(i), D-3(i), and DP-4
Exploration Logs and Well As-builts

D-2(i)



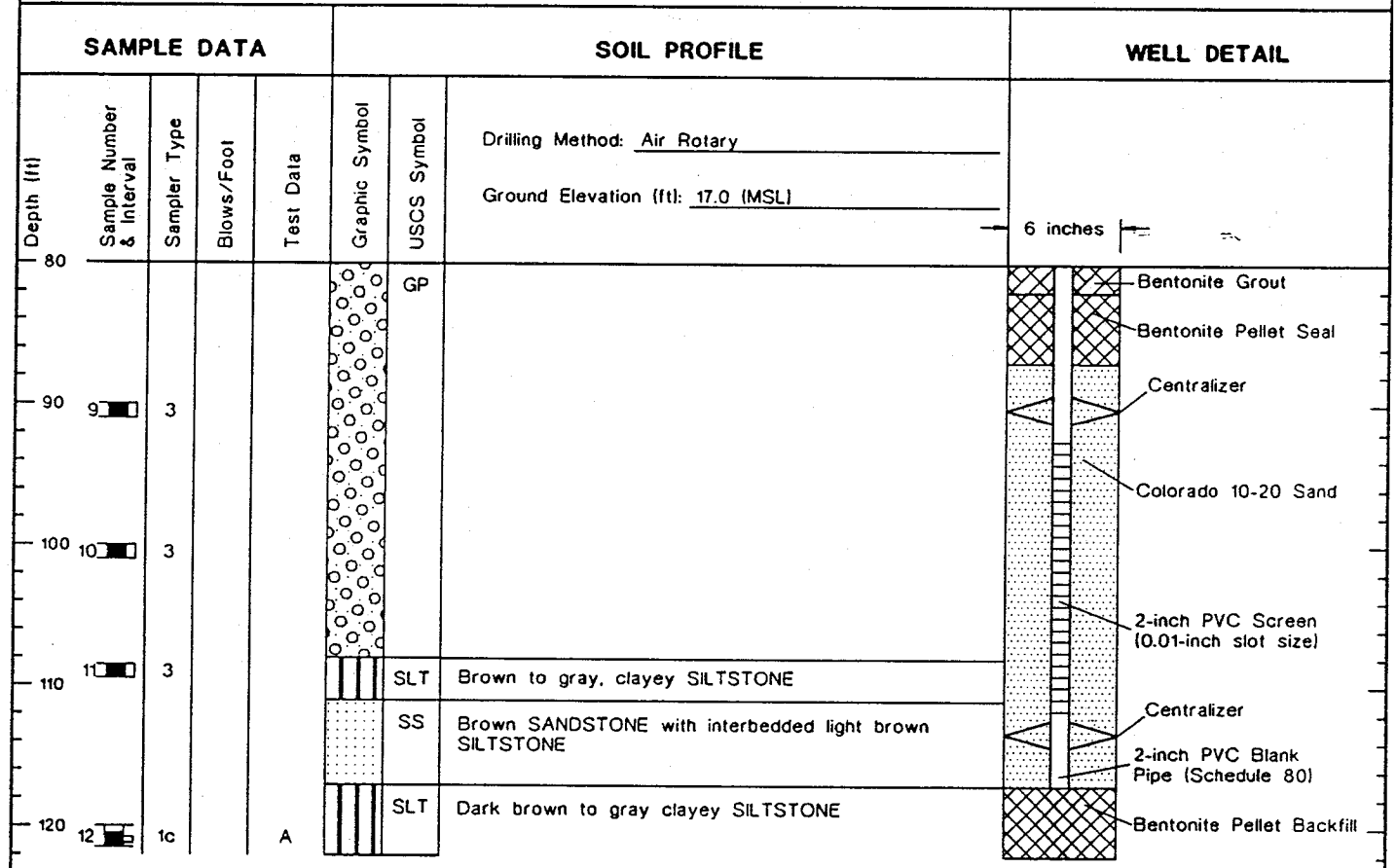
(Continued Next Page)

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Key and Soil Classification System" figure for explanation of graphics and symbols.

Log of Boring and Monitoring Well D-2(i)

Figure B-4

D-2(i) (Continued)



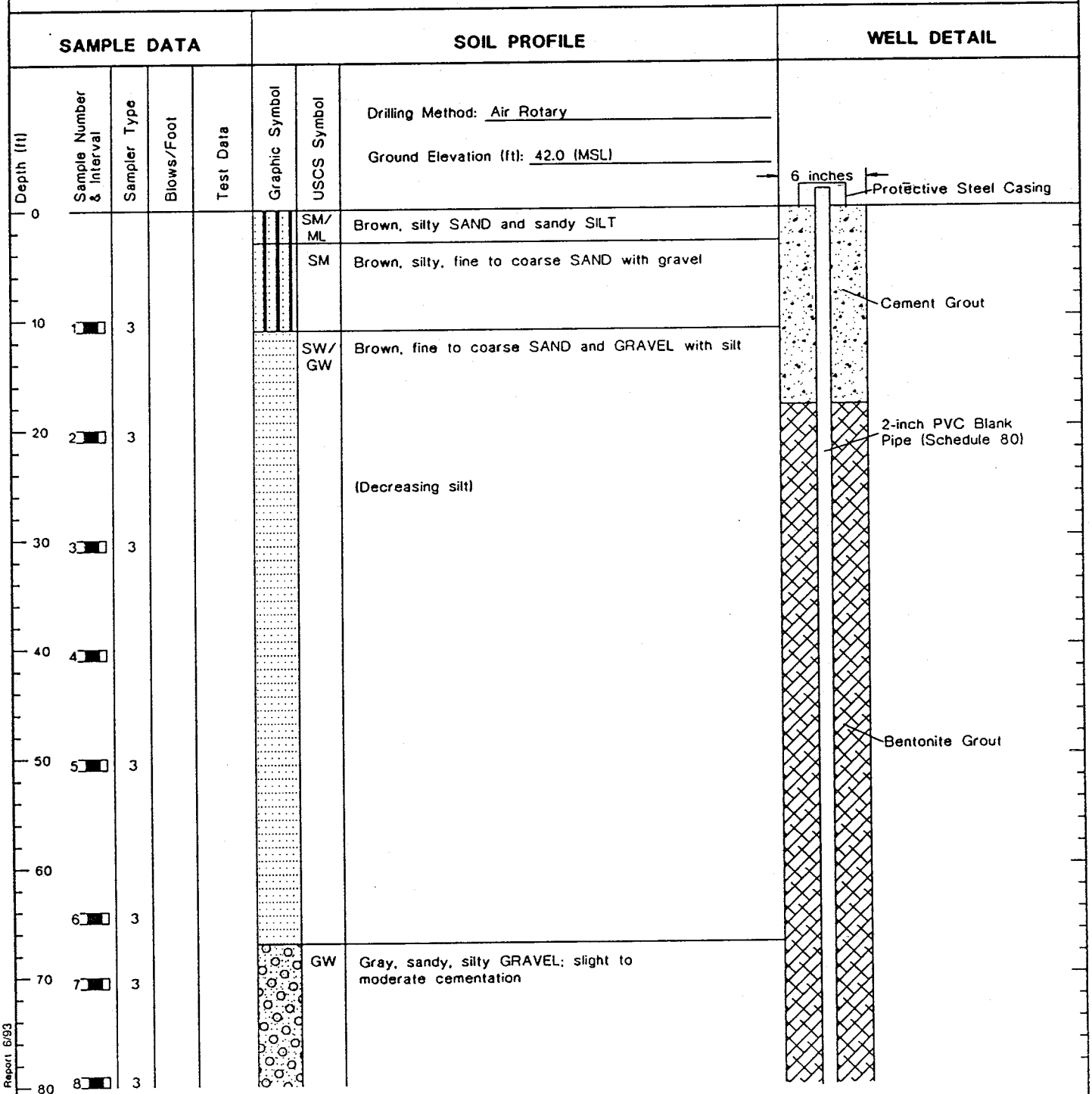
Boring Completed : 5/11/88
Total Depth : 122.0 ft

Well Completed : 5/12/88
Elevation at Top of PVC Casing : 18.77 (MSL)

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Key and Soil Classification System" figure for explanation of graphics and symbols.

Log of Boring and Monitoring Well D-2(i) | Figure B-4

D-3(i)



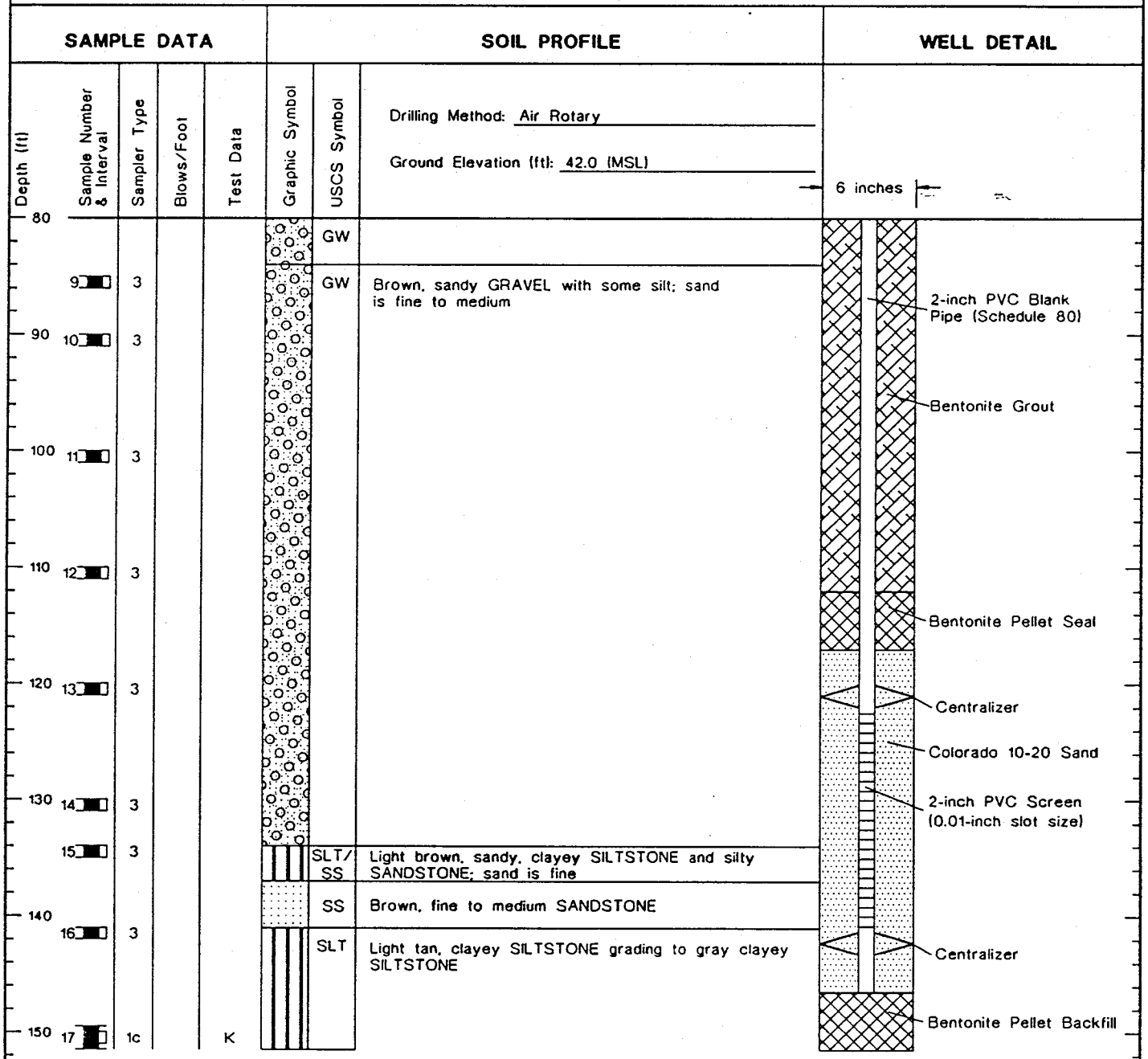
(Continued Next Page)

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Key and Soil Classification System" figure for explanation of graphics and symbols.

Log of Boring and Monitoring Well D-3(i)

Figure B-5

D-3(i) (Continued)



Boring Completed = 4/26/88
Total Depth = 151.5 ft

Well Completed = 5/3/88
Elevation at Top of PVC Casing = 43.72 (MSL)

Notes: 1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Key and Soil Classification System" figure for explanation of graphics and symbols.

Log of Boring and Monitoring Well D-3(i) | Figure B-5

DP-4

SAMPLE DATA				SOIL PROFILE			WELL DETAIL
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	
0						CL	Blue-green-gray with brown silty CLAY with organic material (wood, roots) (moist)
		d		0.0		SM	Dark brown sandy gravelly SILT (moist)
5		d		0.0		GW-GM	Dark gray-brown silty sandy fine to medium GRAVEL (dry-moist)
							Increasing coarse gravel
10		d		0.0			
		d		0.0		SP	Medium brown gravelly fine SAND with medium to coarse sand, trace silt (dry-moist)
15		d		0.0		GW-GM	Dark gray-brown silty sandy fine to coarse GRAVEL (dry-moist)
20		d		0.0			
		d		0.0		GW-GM	Medium to dark brown sandy fine to coarse GRAVEL with silt (dry)
25		d		0.0		GW-GM	Dark gray-brown silty sandy fine to coarse GRAVEL (dry)
30		d		0.0		SM	Medium brown silty fine SAND with gravel, trace medium to coarse sand (dry-moist)
		d		0.0		GW-GM	Dark gray-brown silty sandy fine to coarse GRAVEL (dry-moist)
35							
40		d		0.0			
45							

Drilling Method: Air Rotary

Ground Elevation (ft): _____

Drilled By: Cascade Drilling

10.75"

Temporary Protective Well Monument

Lean Concrete

6-inch Diameter Steel Well Casing

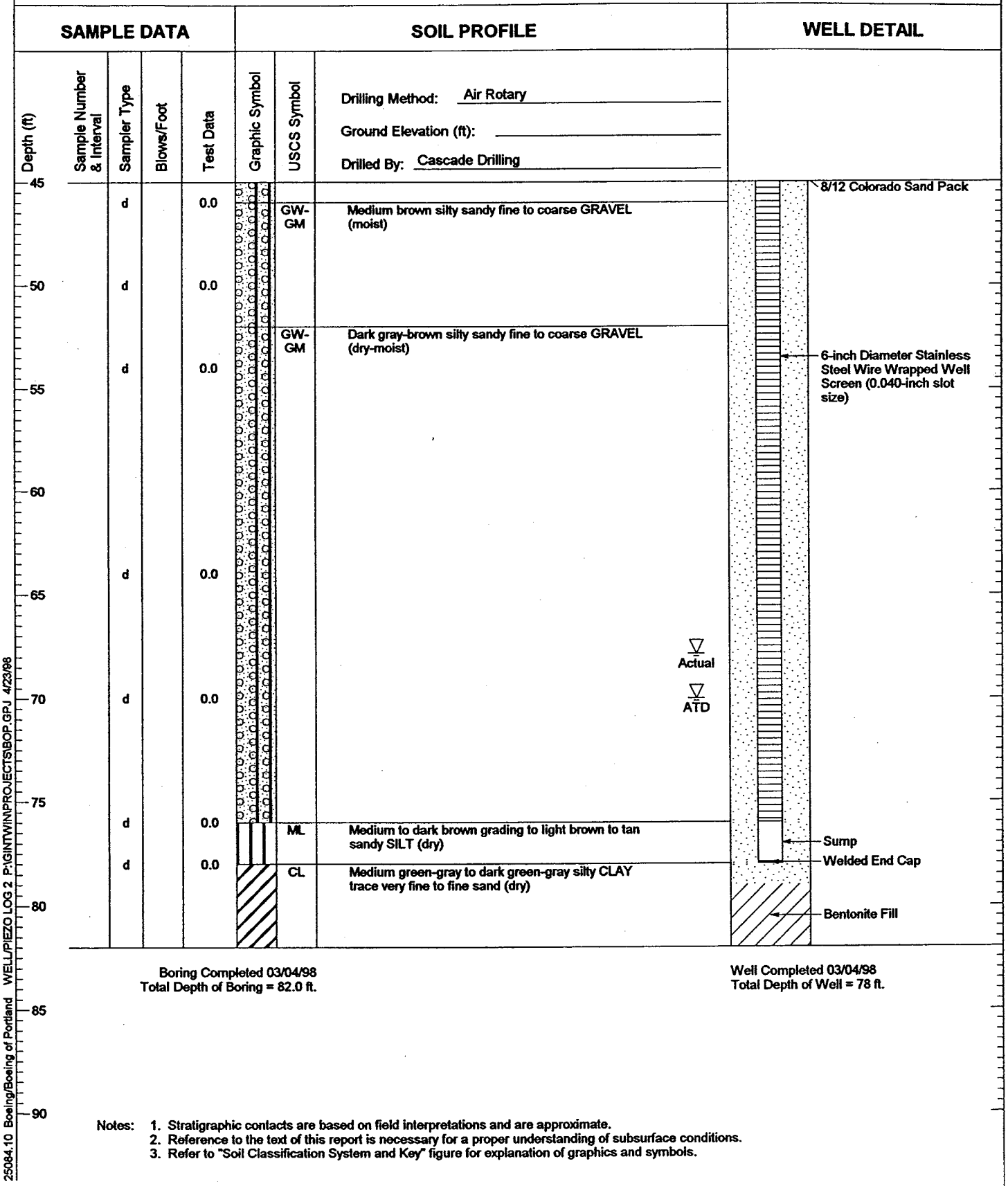
Bentonite Chips (hydrated)

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

Boring and Monitoring Well DP-4

Figure C-5
(1 of 2)

DP-4



Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Boring and Monitoring Well DP-4

Figure C-5
(2 of 2)