
Groundwater Monitoring Well and Piezometer Decommissioning, RMC-Troutdale Facility, 2005

Technical Memorandum GW No. 32



Reynolds Metals Company
TROUTDALE FACILITY

CH2MHILL

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Groundwater Monitoring Well and Piezometer Decommissioning, RMC-Troutdale Facility, 2005

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Introduction

This technical memorandum provides a summary of well decommissioning activities accomplished at the Reynolds Metals Company (RMC)/Alcoa, Inc., aluminum reduction facility in Troutdale, Oregon, in December 2004 and January 2005. The well decommissioning work was conducted as part of the Troutdale facility closure and demolition program. Thirty-six monitoring wells and six piezometers were identified for decommissioning in RMC's *Memorandum WP No. 63: Work Plan for Decommissioning Groundwater Monitoring Wells at the RMC-Troutdale Facility* (CH2M HILL, November 2004). Well and piezometer locations included in *Memorandum WP No. 63* are shown in Figure 1.

Well Decommissioning

With the exception of monitoring wells MW44-011 and MW44-027, which were removed in July 2004, decommissioning work was performed at the site between December 8, 2004, and January 19, 2005, by Geo-Tech Explorations, Inc., a division of Boart Longyear. Decommissioning procedures were in accordance with the methods and approaches described in the submitted work plan (*Memorandum WP No. 63*). Wells were decommissioned in compliance with the following guidelines:

- *Groundwater Monitoring Well Drilling, Construction, and Decommissioning*, Oregon Department of Environmental Quality (DEQ) Guidance (1992)
- Oregon Administrative Rule (OAR) 690-200 through 690-240

On the basis of well construction and depth, the wells were decommissioned either by overdrilling (OAR 690-240-0510(1)) or by grout and backfill with an approved sealant (OAR 690-240-510(2) and 690-240-0475). Oregon Water Resources Department (OWRD) decommissioning start cards, original well drilling logs, monitoring well construction

reports, and decommissioning monitoring well reports filed with OWRD are included in Attachments 1, 2, 3, and 4 (provided on compact disk [CD]). Table 1 provides a construction summary of the decommissioned wells.

Special Standards

OWRD requires approval of a special standard for decommissioning wells in place by backfilling with sealant. OWRD issued a special standard in December 2004 that approved decommissioning in place for monitoring wells MW03-017, MW03-098, MW05-025, MW06-024, MW12-184, MW15-024, MW15-086, MW15-175, MW38-007, MW38-035, MW39-095, and MW48-055.

On the basis of field conditions, additional special standards were requested for MW06-94, MW06-176, and MW21-176 in January 2005. MW06-94 and MW06-176 were not decommissioned as originally planned because unsafe working conditions resulted from the installation of high-voltage overhead power lines after the wells were originally drilled. At MW21-176, borehole conditions encountered at 75 feet below ground surface (bgs) during overdrilling precluded drilling to a total depth of 176 feet bgs. OWRD approved a special standard for both these instances in January 2005. Copies of the approved special standard requests are presented in Attachment 5 (provided on compact disk [CD]).

Specific decommissioning activities performed in December 2004 and January 2005 are described below by decommissioning method.

Overdrilling

The appropriate overdrilling method was selected for each well based on well construction and depth. Direct push, hollow stem auger, and air rotary drilling methods were used to decommission the wells as follows:

- Direct Push: piezometers
- Hollow Stem Auger: 2-inch-diameter wells shallower than 100 feet
- Air Rotary: 2-inch-diameter wells deeper than 100 feet

Heaving sand conditions, which are well documented at the Troutdale facility, were generally not observed or were minor during well decommissioning activities. Soil cuttings and well materials were collected at the surface and placed in drums or totes and then transported to the Building 97 concrete pad. The cuttings and material were then bulked with other contaminated soils for disposal by the demolition contractor.

General Decommissioning Procedures

Prior to overdrilling, the protective casing, bollards, and surface completion were removed. An attempt was then made to remove the well casing and screen by pulling prior to overdrilling. Drilling action, penetration rate, depth, and surface return of well materials were monitored during overdrilling. After reaching total depth, the well was backfilled with bentonite chips or pressure grouted with grout slurry, depending on total depth of the well and height of the standing water column per OAR 690-240-0475. For example, bentonite

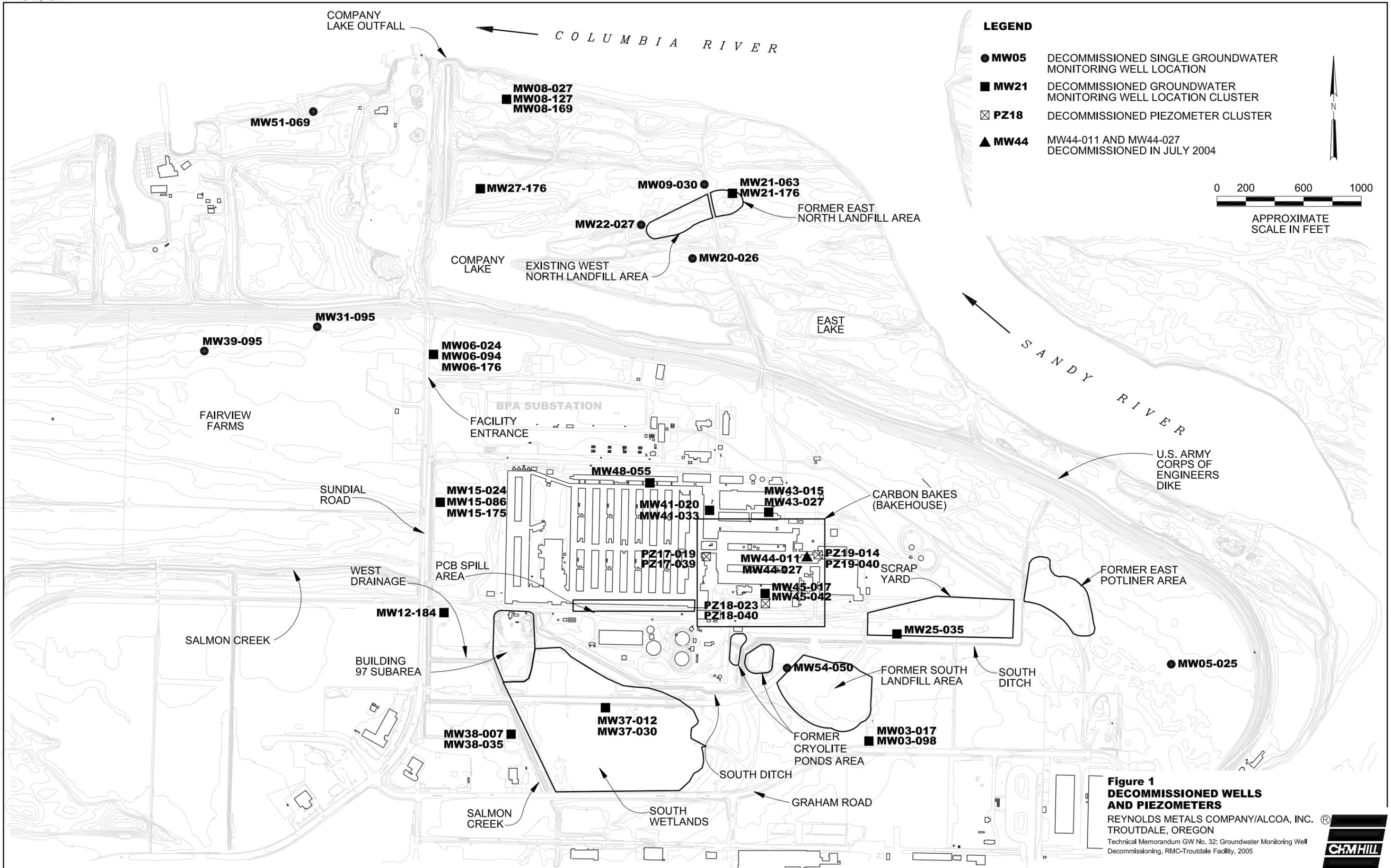


Table 1
Construction Summary of Decommissioned Groundwater Wells
 Reynolds Metals Company/Alcoa, Inc. - Troutdale, Oregon

Well ID	OWRD ID	Install Start Card No.	Unit ^a	Installation Date	Total Depth ^b	Casing Diameter ^c	Borehole Diameter	Screen Length (feet)	Screened Interval ^d	Top of Filter Pack ^e	MPE ^f	GSE ^g	Screened Material ^h	Well Location	Abandonment Method	Drilling Technology
MW03-017	MULT 4283	67349	S	07/09/94	18	2-inch	10-inch	8	9 to 17	7	29.69	27.4	Sand (SP, SM)	Perimeter	Grout/Backfill	Hollow Stem Auger
MW05-025	MULT 4282	67348	S	07/08/94	25	2-inch	10-inch	10	15 to 25	12	33.99	31.6	Silt (ML), Sand (SM)	Background	Grout/Backfill	Hollow Stem Auger
MW06-024	MULT 5281	67347	S	07/08/94	25	2-inch	10-inch	10	14 to 24	11.5	26.81	24.1	Silt (ML), Sand (SP, SM)	Perimeter	Grout/Backfill	Hollow Stem Auger
MW15-024	MULT 4925	80229	S	07/13/95	24	2-inch	10-inch	10	14 to 24	11.5	22.75	20.9	Silt (ML) Sand/silt (SP, SM)	Perimeter	Grout/Backfill	Hollow Stem Auger
MW37-012	MULT 52266	93714	S	10/23/96	12.5	2-inch	9-inch	5	7 to 12	5	21.48	17.8	Silt (ML)	South wetlands	Overdrill	Hollow Stem Auger
MW38-007	MULT 52268	93752	S	11/01/96	7	2-inch	10-inch	4	3 to 7	2	22.56	20.6	Sand (SW)	Along Salmon Creek	Grout/Backfill	Hollow Stem Auger
MW41-020	MULT 53786	100165	S	06/13/97	20.3	2-inch	11-inch	5	15 to 20	12	28.63	29.1	Silt (ML)	Bakehouse	Overdrill	Hollow Stem Auger
MW43-015	MULT 53788	100167	S	06/13/97	15.3	2-inch	11-inch	5	10 to 15	8	30.91	29.7	Silt (ML)	Bakehouse	Overdrill	Hollow Stem Auger
MW45-017	MULT 53791	100170	S	06/17/97	17.8	2-inch	11-inch	5	12 to 17	10	30.61	28.7	Silt (ML)	Bakehouse	Overdrill	Hollow Stem Auger
MW08-027	MULT 4280	67346	UGS	07/07/94	28	2-inch	10-inch	10	17 to 27	14	25.32	22.8	Sand (SP)	Perimeter	Overdrill	Air Rotary
MW09-030	MULT 4302	70153	UGS	08/04/94	32	2-inch	10-inch	10	20 to 30	18	29.27	27.0	Sand (SP)	North landfill	Overdrill	Hollow Stem Auger
MW20-026	MULT 4998	81122	UGS	09/01/95	26.5	2-inch	10-inch	10	16 to 26	15	28.46	25.8	Sand (SP)	North landfill	Overdrill	Hollow Stem Auger
MW22-027	MULT 4997	81473	UGS	09/06/95	27	2-inch	10-inch	10	17 to 27	15	25.35	22.6	Sand (SP)	North landfill	Overdrill	Hollow Stem Auger
MW25-035	MULT 4919	80236	UGS	07/24/95	35.5	2-inch	10-inch	5	30 to 35	29	30.89	28.4	Sand (SW, SP)	Scrap yard	Overdrill	Hollow Stem Auger
MW37-030	MULT 52473	93803	UGS	12/09/96	30.5	2-inch	9-inch	5	25 to 30	23	21.32	17.8	Sand with silt (SW-SM)	South wetlands	Overdrill	Hollow Stem Auger
MW38-035	MULT 52476	93798	UGS	12/02/96	36	2-inch	10-inch	5	30 to 35	28.5	23.07	20.7	Sand (SW)	Along Salmon Creek	Grout/Backfill	Hollow Stem Auger
MW41-033	MULT 53785	100164	UGS	06/12/97	35	2-inch	11-inch	5	28 to 33	26	28.71	29.1	Sand (SM)	Bakehouse	Overdrill	Hollow Stem Auger
MW43-027	MULT 53787	100166	UGS	06/13/97	29	2-inch	11-inch	5	22 to 27	20	30.72	29.7	Sand (SW)	Bakehouse	Overdrill	Hollow Stem Auger
MW45-042	MULT 53792	100171	UGS	06/16/97	43	2-inch	11-inch	5	37 to 42	35	30.26	28.9	Sand (SW)	Bakehouse	Overdrill	Hollow Stem Auger
MW54-050	MULT 62323	132598	UGS	09/18/00	50	2-inch	6-inch	10	40 to 50	38	30.09	26.97	Sand (SW)	South landfill	Overdrill	Hollow Stem Auger
MW03-098	MULT 52876	85677	I	06/26/96	100	2-inch	6-inch	10	88 to 98	87	30.65	28.7 ^g	Sand (SP)	Perimeter	Grout/Backfill	Hollow Stem Auger
MW06-094	MULT 52873	79940	I	09/20/96	96	2-inch	6-inch	10	84 to 94	83.5	27.85	25.5	Sand (SW)	South of dike	Overdrill	Hollow Stem Auger
MW08-127	MULT 52872	85711	I	07/10/96	129	2-inch	6-inch	10	117 to 127	116.5	25.62	23.5 ^g	Sandy gravel (GW)	Perimeter	Overdrill	Air Rotary
MW15-086	MULT 52866	85672	I	09/23/96	87	2-inch	6-inch	10	76 to 86	75	23.88	21.5	Sand (SW)	Perimeter	Grout/Backfill	Hollow Stem Auger
MW21-063	MULT 52863	79938	I	10/01/96	65	2-inch	6-inch	10	53 to 63	51	26.76	23.8	Sand (SW)	North landfill	Overdrill	Hollow Stem Auger
MW31-095	MULT 52919	89222	I	12/09/96	96	2-inch	6-inch	10	85 to 95	82	25.00	22.8	Sand (SW)	Fairview Farms	Overdrill	Hollow Stem Auger
MW39-095	MULT 53990	95695	I	06/26/97	95	2-inch	6.5-inch	10	85 to 95	82	25.18	22.3	Sand (SW)	Fairview Farms	Grout/Backfill	Hollow Stem Auger
MW48-055	MULT 54142	104245	I	09/02/97	56	2-inch	6-inch	10	45 to 55	42	28.19	28.4	Sand	No. Side Cauthouse	Grout/Backfill	Hollow Stem Auger
MW51-069	MULT 54610	100613	I	11/03/97	69	2-inch	6-inch	10	58 to 68	55	26.17	23.4	Sand	Adjacent to River	Overdrill	Hollow Stem Auger
MW06-176	MULT 52874	79941	D	05/03/96	178	2-inch	6-inch	10	166 to 176	165	27.74	25.4 ^g	Sand (SW-SP)	Perimeter	Overdrill	Air Rotary
MW08-169	MULT 52871	85712	D	05/23/96	170.5	2-inch	6-inch	10	159 to 169	158	25.88	23.7 ^g	Sand (SW) / Gravel (GW)	Perimeter	Overdrill	Air Rotary
MW12-184	MULT 52868	85676	D	05/21/96	184.5	2-inch	10-inch to 8.5 feet; 6-inch to 200 feet	10	174 to 184	171	23.04	20.7 ^g	Sand (SW)	Perimeter	Grout/Backfill	Hollow Stem Auger
MW15-175	MULT 52865	85678	D	06/04/96	175.8	2-inch	6-inch	10	165 to 175	164	23.88	21.8 ^g	Sand (SW)	Perimeter	Grout/Backfill	Hollow Stem Auger
MW21-176	MULT 52864	79939	D	08/14/96	177	2-inch	6-inch	10	166 to 176	165	26.01	23.3	Sand (SW)	North landfill	Overdrill	Air Rotary
MW27-176	MULT 52860	85715	D	08/26/96	176.5	2-inch	6-inch	10	164 to 174	163	31.94	29.5	Gravel (GW)	Adjacent to Company Lake	Overdrill	Air Rotary
Piezometers																
PZ17-019	MULT 54670	100606	S	10/29/97	19.3	1/2-inch	2-inch	3	16 to 19	14	28.73	NM	Silt	Bakehouse	Overdrill	Geoprobe
PZ18-023	MULT 54668	100604	S	10/31/97	23.3	1/2-inch	2-inch	3	20 to 23	18	27.87	NM	Silt	Bakehouse	Overdrill	Geoprobe
PZ19-014	MULT 54673	100609	S	10/31/97	14.3	1/2-inch	2-inch	3	11 to 14	9	29.30	NM	Silt	Bakehouse	Overdrill	Geoprobe
PZ17-039	MULT 54669	100605	UGS	10/29/97	40	1/2-inch	2-inch	3	36 to 39	34	28.69	NM	Sand	Bakehouse	Overdrill	Geoprobe
PZ18-040	MULT 54671	100607	UGS	10/30/97	42	1/2-inch	2-inch	3	37 to 40	35	27.81	NM	Sand	Bakehouse	Overdrill	Geoprobe
PZ19-040	MULT 54672	100608	UGS	10/31/97	40	1/2-inch	2-inch	3	37 to 40	35	29.43	NM	Sand	Bakehouse	Overdrill	Geoprobe

Notes:

- ^a S = Shallow well screened in silt.
- UGS = Shallow well screened in the upper gray sand.
- ^b Feet below ground surface (ft bgs).
- ^c Casing and screen constructed with flush-threaded Schedule 40 or 80 polyvinyl chloride with 0.010-inch machine-slotted screen.
- ^d MPE = Measuring point elevation, feet 1929 National Geodetic Vertical Datum (NGVD).
- ^e GSE = Ground surface elevation, feet 1929 NGVD.
- ^f For explanation of soil classification codes, refer to ASTM D 2488, Standard Practice for Description and Identification of Soils (American Society for Testing and Materials, August 1990).
- ^g Reference point is top of concrete pad (feet 1929 NGVD), not ground surface elevation.
- I = Intermediate-depth well screened in sand.
- D = Deep well screened in sand/gravel.
- NA = Information not available.

chips were used if the depth to the bottom of the seal was less than 50 feet and the standing water column in the borehole was less than 25 feet deep at the time of seal placement.

Baroid Holeplug™ 3/8-inch unhydrated sodium bentonite chips were poured into the borehole at locations backfilled with bentonite chips. Chips were poured slowly into the borehole to prevent bridging. Chips were hydrated during emplacement in approximately 2-foot lifts. The volume of chips used was compared with the amount calculated based on borehole dimensions.

Baroid Aquaguard™ high-solids (by weight) grout slurry, mixed to the manufacturer's specifications, was used at locations backfilled by pressure grouting. Grout slurry was mixed in 55-gallon drums at a ratio of two 50-pound bags per 40 gallons of water. The grout slurry was pumped into the borehole through a bottom discharge tremie pipe installed near the bottom of the borehole. The grout level in the borehole was maintained above the bottom of the casing or auger flights during the grouting process. Boreholes were backfilled to ground surface with grout slurry. The boreholes were later inspected for grout settlement. Bentonite chips were used to backfill the borehole when settlement had occurred to bring the grout level to near ground surface.

Actual grout volumes observed were compared with estimated grout volumes based on borehole dimensions. The borehole was inspected after the grout was allowed to settle overnight. If settlement was observed, the borehole was backfilled with bentonite chips to a depth of approximately 1 foot bgs. The hole was then backfilled to grade with native soil.

A brief summary for each of the overdrilling methods is presented below.

Direct Push

Six piezometers (PZ17-019, PZ17-039, PZ18-023, PZ18-040, PZ19-014, and PZ19-040) were decommissioned using a GeoProbe direct push drill rig. Casing was removed prior to overdrilling the boreholes. The piezometers were redrilled to the original borehole total depth as required by OAR 690-240-0510 (1). Table 2 provides details of decommissioning activities for the six piezometers.

Hollow Stem Auger

Monitoring wells MW09-030, MW20-026, MW21-063, MW22-027, MW25-035, MW31-095, MW37-012, MW37-030, MW41-020, MW41-033, MW43-015, MW43-027, MW45-017, MW45-042, MW51-069, and MW54-050 were decommissioned by overdrilling using a Mobile B-59 hollow stem auger drill rig. The wells were redrilled to a minimum of the original borehole depth using auger flights of at least the original borehole diameter. Where possible, all polyvinyl chloride (PVC) casing and screen were removed prior to overdrilling. All casing, screen, annular seal, and filter pack were removed by overdrilling prior to sealing. Boreholes were backfilled with grout as described in the General Decommissioning Procedures section, above. Overdrilling depths and grout volumes are presented in Table 3.

Table 2
Summary of Decommissioned Piezometers
 Reynolds Metals Company/Alcoa, Inc. - Troutdale, Oregon

Owner Well ID	OWRD ID	Install. Start Card No.	Decom. Start Card No.	Unit ^a	Installation Date	Decommission Date	Total Depth ^b	Over-Drilling Method	Depth Overdrilled	Estimated Grout Volume (gal)	Actual Volume of Grout (gal)
PZ17-019	MULT 54670	100606	167927	S	10/29/97	12/20/04	19.3	Geoprobe	20	3.1	5
PZ17-039	MULT 54669	100605	167930	UGS	10/29/97	12/21/04	40	Geoprobe	40	6.4	12
PZ18-023	MULT 54668	100604	167928	S	10/31/97	12/20/04	23.3	Geoprobe	24	3.7	8
PZ18-040	MULT 54671	100607	167931	UGS	10/30/97	12/20/04	42	Geoprobe	42	6.7	13
PZ19-014	MULT 54673	100609	167929	S	10/31/97	12/20/04	14.3	Geoprobe	15	2.3	4
PZ19-040	MULT 54672	100608	167932	UGS	10/31/97	12/20/04	40	Geoprobe	40	6.4	11

Notes:

- ^a S = Shallow well screened in silt.
 UGS = Shallow well screened in the upper gray sand.
 I = Intermediate-depth well screened in sand.
 D = Deep well screened in sand/gravel.
^b Feet below ground surface (ft bgs).

Table 3
Groundwater Wells Decommissioned by Overdrilling with Hollow Stem Auger Drilling
 Reynolds Metals Company/Alcoa, Inc. - Troutdale, Oregon

Owner Well ID	OWRD ID	Install. Start Card No.	Decom. Start Card No.	Unit ^a	Installation Date	Decommission Date	Total Depth ^b	Overdrilling Method	Depth Overdrilled	Calculated Grout Volume (bags) ^c	Actual Volume of Grout (gal)	No. of Bags of Bentonite Chips (50-lb bag)
MW09-030	MULT 4302	70153	167854	UGS	08/04/94	01/03/05	32	Overdrill/HSA	32	48.0	140	NA
MW20-026	MULT 4998	81122	167855	UGS	09/01/95	12/07/04	26.5	Overdrill/HSA	26.5	7.6	NA	17
MW21-063	MULT 52863	79938	167864	I	10/01/96	01/04/05	65	Overdrill/HSA	65	97.5	160	NA
MW22-027	MULT 4997	81473	167856	UGS	09/06/95	01/03/05	27	Overdrill/HSA	27	40.5	140	NA
MW25-035	MULT 4919	80236	167857	UGS	07/24/95	12/07/04	35.5	Overdrill/HSA	35.5	10.1	NA	19
MW31-095	MULT 52919	89222	167943	I	12/08/96	07/01/05	95	Overdrill/HSA	95	27.1	140	3.5
MW37-012	MULT 52266	93714	167850	S	10/23/96	12/21/04	12.5	Overdrill/HSA	13	3.6	NA	4.5
MW37-030	MULT 52473	93803	167858	UGS	12/09/96	12/21/04	30.5	Overdrill/HSA	31.5	8.7	NA	14.5
MW41-020	MULT 53786	100165	167851	S	06/13/97	12/08/04	20.3	Overdrill/HSA	20.5	5.8	NA	14
MW41-033	MULT 53785	100164	167859	UGS	06/12/97	12/08/04	35	Overdrill/HSA	35	10.0	NA	19
MW43-015	MULT 53788	100167	167852	S	06/13/97	12/10/04	15.3	Overdrill/HSA	15.3	4.4	NA	12
MW43-027	MULT 53787	100166	167860	UGS	06/13/97	12/10/04	29	Overdrill/HSA	29	8.3	NA	20
MW45-017	MULT 53791	100170	167853	S	06/17/97	12/09/04	17.8	Overdrill/HSA	18	5.1	NA	15
MW45-042	MULT 53792	100171	167861	UGS	06/16/97	12/08/04	43	Overdrill/HSA	43	12.3	NA	22
MW51-069	MULT 54610	100613	167865	I	11/03/97	12/10/04	69	Overdrill/HSA	69	103.5	200	NA
MW54-050	MULT 62323	132598	167862	UGS	09/18/00	01/03/05	50	Overdrill/HSA	50	75.0	70	NA

Notes:

- ^a S = Shallow well screened in silt.
 UGS = Shallow well screened in the upper gray sand.
 I = Intermediate-depth well screened in sand.
 D = Deep well screened in sand/gravel.
- ^b Feet below ground surface (ft bgs).
- ^c Shaded grout values are in gallons for wells pressure grouted with Baroid Aquaguard.

Air Rotary

Five deep monitoring wells (MW08-127, MW08-169, MW08-30, MW27-176, and MW21-176) were decommissioned using a direct air rotary drill rig for overdrilling. Air rotary was selected for overdrilling the deeper well locations because a hollow stem auger was unlikely to reach total depth before refusal. MW08-30 was originally identified to be overdrilled using a hollow stem auger, but because of limited work space at the MW08 well cluster, the method was changed to air rotary.

The overdrilling procedure for the deep wells was modified to include grouting of the monitoring well prior to overdrilling. This was done in the event that encountered borehole conditions prevented drilling to total depth. Grouting was not performed at MW21-176 prior to overdrilling because the monitoring well was blocked during site preparation for decommissioning. During removal of the surface monument, the PVC riser casing broke below the ground surface during drill site preparation. Sloughing of gravel installed for the drill pad prevented access of tremie pipe into the PVC. With the exception of MW21-176 (described below), all wells were overdrilled to the original depth at the original borehole diameter.

During initial overdrilling of MW21-176 using a 6-inch-diameter casing, PVC was not observed in drilling discharge between the depths of 20 and 40 feet bgs. The drive casing was advancing with only minor hammer force and grout was being returned at the surface, suggesting that the casing was following the borehole. Because of the lack of evidence of PVC in drill cuttings and the possibility of deviation from the borehole, the driller contacted Kristopher Byrd at OWRD. OWRD requested that the borehole continue to be overdrilled to the total depth of the monitoring well at a diameter of 10 inches. As a precaution, 14-inch-diameter surface casing was advanced to a depth of 10 feet. A visual check confirmed PVC riser casing near the base of the 14-inch-diameter surface casing at 10 feet. The driller advanced the casing while overdrilling the borehole at a 10-inch nominal diameter to 75 feet bgs after reestablishing the borehole. The PVC was observed in the surface discharge from 10 to 75 feet bgs.

At a depth of 75 feet bgs, partially cemented coarse sand and gravel material was encountered, penetration rates slowed, and PVC was no longer observed in the surface discharge. Drilling action and casing advancement rates indicated that the bit was no longer following the borehole at 75 feet bgs. To increase the drilling penetration rate, an air percussion hammer drill bit was installed and drilling continued to attempt to advance the borehole to depth per the request of OWRD staff. At a depth of 84 feet bgs, the driller determined that the bit was no longer following the borehole based on the drilling action and drive casing refusal. Kristopher Byrd at OWRD was contacted on January 18, 2005, to request a special standard to grout in place. After verbal approval was received from OWRD, approximately 82 feet (84 to 166 feet bgs) of 2-inch-diameter Schedule 40 PVC riser casing and 10 feet (166 to 176 feet bgs) of 0.010 slot screen were left in place. The overdrilled portion of the borehole at MW21-176 was grouted in place by pressure grouting from refusal (84 feet) to ground surface. Boreholes were backfilled with a high solids bentonite grout slurry, as described in the General Decommissioning Procedures section, above. Table 4 presents a summary of the overdrilling and grouting by air rotary methods.

Table 4
Groundwater Wells Decommissioned By Overdrilling Using Air Rotary Drilling
 Reynolds Metals Company/Alcoa, Inc. - Troutdale, Oregon

Owner Well ID	OWRD ID	Install. Start Card No.	Decom. Start Card No.	Unit ^a	Installation Date	Decommission Date	Over-Drilling Method	Depth Overdrilled	Calculated Grout Volume (gal)	Actual Volume of Grout (gal)
MW08-027	MULT 4280	67346	167854	UGS	07/07/94	01/11/04	Air Rotary	30	45.0	180
MW08-127	MULT 52872	85711	167879	I	07/10/96	01/05/04	Air Rotary	129	193.5	325
MW08-169	MULT 52871	85712	167881	D	05/23/96	01/05/05	Air Rotary	172	258.0	625
MW21-176	MULT 52864	79939	167882	D	08/14/96	01/13/05	Air Rotary	83	124.5	500
MW27-176	MULT 52860	85715	167883	D	08/26/96	01/11/05	Air Rotary	176.5	264.8	565

Notes:

^a S = Shallow well screened in silt.

UGS = Shallow well screened in the upper gray sand.

I = Intermediate-depth well screened in sand.

D = Deep well screened in sand/gravel.

^b Feet below ground surface (ft bgs).

Grout and Backfill

OWRD approved a special standard for monitoring wells MW03-017, MW03-098, MW05-025, MW06-024, MW12-184, MW15-024, MW15-086, MW15-175, MW38-007, MW38-035, MW39-095, and MW48-055 to be decommissioned by backfilling in place with an approved sealant as specified in OAR 690-240-0510 (2) and 690-240-0475. During the decommissioning work, MW31-095 was mistakenly decommissioned by backfilling instead of the approved well MW39-095. The mistake was identified during semiannual groundwater monitoring performed in February 2005. Well MW31-095 was later decommissioned by overdrilling, as described in the Hollow Stem Auger section. Well MW31-095R was installed to replace MW31-095 and is described later in this document in the Well Replacement section.

The drilling contractor contacted OWRD to request that MW06-94 and MW06-176 also be decommissioned by grouting in place, rather than by overdrilling, because of the presence of high-voltage power lines. Verbal approval to grout in place was received on January 11, 2005. Written approval of the special standard received from OWRD is presented in Attachment 5.

General Procedure

The protective casing, bollards, and surface completion were removed at each well. The well casing was removed to a depth of approximately 2 feet bgs. Wells were then backfilled by one of the following approved sealants:

- Baroid Holeplug™ 3/8-inch unhydrated sodium bentonite chips
- Baroid Aquaguard™ high-solids (by weight) grout slurry

Wells were backfilled with bentonite chips or pressure grouted with grout slurry, depending on total depth of the well and height of the standing water column per OAR 690-240-0475. For example, bentonite chips were used if the depth to the bottom of the seal was less than 50 feet and the standing water column in the borehole was less than 25 feet deep at the time of seal placement.

Where bentonite chips were used to backfill the borehole, the chips were poured slowly to prevent bridging in approximately 2-foot lifts. The borehole was filled with bentonite chips until observed at the ground surface. Bentonite chips were hydrated as they were introduced into the borehole above the standing water column.

Grout slurry was mixed to the manufacturer's specifications in 55-gallon drums at a ratio of two 50-pound bags per 40 gallons of water. The grout slurry was pumped into the borehole through a bottom discharge tremie pipe installed near the bottom of the well. Pressure grouting was continued until grout was observed at the top of the well.

Grout volumes for monitoring wells decommissioned in place are presented in Table 5. Because of the overhead power lines, a modified method of pressure grouting was used at MW06-176 and MW06-94. A threaded PVC cap with a camlock fitting was installed on the top of well. The pressure grout discharge was attached to the PVC cap, and grout was introduced into the well via pressure grouting. Grouting continued until the estimated grout volume (based on the well depth and dimensions) was injected. Visual checks were

Table 5
Groundwater Wells Decommissioned by Grout and Backfill in Place
 Reynolds Metals Company/Alcoa, Inc. - Troutdale, Oregon

Owner Well ID	OWRD ID	Install. Start Card No.	Decom. Start Card No.	Installation Date	Decommission Date	Total Depth ^b	Abandonment Method	Estimated Grout Volume (gal)	Actual Volume of Grout (gal)
MW03-017	MULT 4283	67349	167835	07/09/94	12/22/04	18	Grout/Backfill	2.9	11
MW03-098	MULT 52876	85677	167843	06/26/96	12/22/04	100	Grout/Backfill	16.0	30
MW05-025	MULT 4282	67348	167834	07/08/94	12/22/04	25	Grout/Backfill	4.0	12
MW06-024	MULT 5281	67347	167833	07/08/94	12/22/04	25	Grout/Backfill	4.0	15
MW06-094	MULT 52873	79940	167863	09/20/96	01/13/05	96	Grout/Backfill	15.4	17.5
MW06-176	MULT 52874	79941	167880	05/03/96	01/13/05	178	Grout/Backfill	28.5	30
MW12-184	MULT 52868	85676	167840	05/21/96	12/09/04	184.5	Grout/Backfill	29.5	30
MW15-024	MULT 4925	80229	167836	07/13/95	12/09/04	24	Grout/Backfill	3.8	5
MW15-086	MULT 52866	85672	167839	09/23/96	12/09/04	87	Grout/Backfill	13.9	20
MW15-175	MULT 52875	85678	167841	06/04/96	12/09/04	175.8	Grout/Backfill	28.1	30
MW31-095 ^c	MULT 52919	89222	167943	12/09/96	12/09/04	96	Grout/Backfill	15.4	30
MW38-007	MULT 52268	93752	167837	11/01/96	12/22/04	7	Grout/Backfill	1.1	5
MW38-035	MULT 52476	93798	167838	12/02/96	12/22/04	36	Grout/Backfill	5.8	35
MW39-095	MULT 53990	95695	167844	06/25/97	07/01/05	95	Grout/Backfill	15.2	60
MW48-055	MULT 54142	104245	167866	09/02/97	12/08/04	56	Grout/Backfill	9.0	9.5

Notes:

^a S = Shallow well screened in silt.

UGS = Shallow well screened in the upper gray sand.

I = Intermediate-depth well screened in sand.

D = Deep well screened in sand/gravel.

^b Feet below ground surface (ft bgs).

^c MW31-095 was later overdrilled (see Table 3).

made of the grout level, and grouting continued until the grout level reached the top of the PVC riser casing. After removal of the surface completion, the holes were backfilled from approximately 2 feet bgs to grade with native fill.

Well Replacement

Well MW31-095R was installed using a hollow stem auger to a depth of 98 feet to replace well MW31-095, which was mistakenly decommissioned. The monitoring well report is provided in Attachment 3, and a summary of construction details is provided in Table 6.

Table 6
Construction Summary of Groundwater Well MW31-095R
 Reynolds Metals Company/Alcoa, Inc. - Troutdale, Oregon

Well ID	OWRD ID	Start Card No.	Unit ^a	Installation Date	Total Depth ^b	Casing Diameter ^c	Borehole Diameter	Screen Length (feet)	Screened Interval ^b	Top of Filter Pack ^b	MPE ^d	GSE ^e	Screened Material ^f	Well Location	Driller Technology
MW31-095R	MULT 78688	174054	I	07/22/05	98	2-inch	10-inch	10	88 to 98	85	NA	NA	Sand (SW)	Fairview Farms	Hollow Stem Auger

Notes:

^a I = Intermediate Well.

^b Feet below ground surface (ft bgs).

^c Casing and screen constructed with flush-threaded Schedule 40 or 80 polyvinyl chloride with 0.010-inch machine-slotted screen.

^d MPE = Measuring point elevation, feet 1929 National Geodetic Vertical Datum (NGVD).

^e GSE = Ground surface elevation, feet 1929 NGVD.

^f For explanation of soil classification codes, refer to ASTM D 2488, Standard Practice for Description and Identification of Soils (American Society for Testing and Materials, August 1990).

^g Reference point is top of concrete pad (feet 1929 NGVD), not ground surface elevation.

NA = Not available

ATTACHMENT 1
OWRD Start Cards

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167833**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 3500 Summer St
Work Phone: () Tomball, TX 77080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. (6734)
Card No. _____

Proposed Commencement Date: 12/7/04

Existing or Proposed Well Depth: 25' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. McInnis License No. 1004
Date Signed _____ Company Geo Tech Explorations Date Signed 12/7/04

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

W 167834

Date Hand-Delivered _____

OWRD Receipt _____

Date Region Office Rec'd _____

Date Fee Received _____

Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION

(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sonchul Rd
Work Phone: () Troutdale, OR 97080

Type of work: Fee Required: New Construction Conversion Deepening Orig. Start Card No. _____
No Fee Required: Alteration (Repair/Recondition) Abandonment Orig. Start Card No. 107348
5025

Proposed Commencement Date: 12/7/04

Existing or Proposed Well Depth: 25' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:
County Multnomah Township 1 Range 3 Section 14 Tax Lot ROW
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.
Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. McInnis License No. 1006
Date Signed _____ Company Geo-Tech Explorations Date Signed 12/7/04

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

W 167835

Date Hand-Delivered _____

OWRD Receipt _____

Date Region Office Rec'd _____

Date Fee Received _____

Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION (as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Fields
Home Phone: () 5100 Sunlight Rd
Work Phone: () Troutdale OR 97080

Type of work: Fee Required: [] New Construction [] Conversion [] Deepening Orig. Start Card No.
No Fee Required: [] Alteration (Repair/Recondition) [X] Abandonment Orig. Start Card No. 167349

Proposed Commencement Date: December 7, 2007

Existing or Proposed Well Depth: 18' Diameter: 2" Original Well I.D. Label Number: _____

Use: [] Domestic [] Community (Public System) [] Industrial [] Irrigation [] Thermal [] Injection [X] Monitoring [] Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name Date Signed
G. McInnis Bonded Water Supply/Monitor Well Constructor Name Company
10011 License No.
12/7/07 Date Signed

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167836**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION

(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sundial Rd
Work Phone: () Trotter, OR 97080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 80229
Card No. _____ MWIS-024

Proposed Commencement Date: 12/7/04

Existing or Proposed Well Depth: 23' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 5 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. H. Inns License No. 1006
Date Signed _____ Company Geo-Tech Explorations Date Signed 12/7/04

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167837**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sunbeam Rd
Work Phone: () Trousdale, OR 97080

Type of work: Fee Required: New Construction Conversion Deepening No Fee Required: Alteration (Repair/Recondition) Abandonment Orig. Start
Card No. 93752
38-007

Proposed Commencement Date: 12/7/04

Existing or Proposed Well Depth: 7' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ G. McInnis _____ 10041 _____
Bonded Water Supply/Monitor Well Constructor Name License No.
Date Signed _____ Geo-Tech Explorations _____ 12-7-04 _____
Company Date Signed

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

W 167838

Date Hand-Delivered _____

OWRD Receipt _____

Date Region Office Rec'd _____

Date Fee Received _____

Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION (as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Hotels
Home Phone: () 5100 Gundlach Rd
Work Phone: () Troutdale, OR 97080

Type of work: Fee Required: [] New Construction [] Conversion [] Deepening Orig. Start Card No.
No Fee Required: [] Alteration (Repair/Recondition) [X] Abandonment Orig. Start Card No. 93798 38-085

Proposed Commencement Date: 12/7/04

Existing or Proposed Well Depth: 36' Diameter: 2" Original Well I.D. Label Number:

Use: [] Domestic [] Community (Public System) [] Industrial [] Irrigation [] Thermal [] Injection [X] Monitoring [] Other

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100

1/4 SW 1/4 SE Or Latitude Longitude

Street Address of well, if not assigned, nearest address:

Sumc

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name Date Signed G. McInnis Company Bonded Water Supply/Monitor Well Constructor Name Date Signed License No. Date Signed

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

W 167839

Date Hand-Delivered _____

OWRD Receipt _____

Date Region Office Rec'd _____

Date Fee Received _____

Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION

(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5102 Sunfield Rd
Work Phone: () Troutdale, OR 97080

Type of work: Fee Required: [] New Construction [] Conversion [] Deepening Orig. Start Card No.
No Fee Required: [] Alteration (Repair/Recondition) [X] Abandonment Orig. Start Card No. 85672 15-086

Proposed Commencement Date: December 7, 2004

Existing or Proposed Well Depth: 92' Diameter: 2" Original Well I.D. Label Number: _____

Use: [] Domestic [] Community (Public System) [] Industrial [] Irrigation [] Thermal [] Injection [X] Monitoring [] Other

Proposed Well Location: County Multnomah Township 1 Range 3 Section 14 Tax Lot 100

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address: Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name Date Signed G. Mc Innis Bonded Water Supply/Monitor Well Constructor Name Company Geo-Tech Explorations License No. 10011 Date Signed 12/7/09

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

W 167840

Date Hand-Delivered _____

OWRD Receipt _____

Date Region Office Rec'd _____

Date Fee Received _____

Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION

(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sandhill Rd
Work Phone: () Tomball, OR 97080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 85674
Card No. _____ MW12-184

Proposed Commencement Date: 12/07/04

Existing or Proposed Well Depth: 200' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name G-Mc Innis Bonded Water Supply/Monitor Well Constructor Name Geo-Tech Explorations License No. 10011
Date Signed _____ Company _____ Date Signed 12/7/04

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167841**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD
NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sandhill Rd
Work Phone: () Troutdale, OR 97050

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 85078
Card No. _____ MW15-175

Proposed Commencement Date: 12/7/04

Existing or Proposed Well Depth: 200' Diameter: 2' Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ G. McInnis _____ 10011 _____ License No.
Date Signed _____ Geo-Tech Explorations _____ 12/7/04 _____ Date Signed
Company

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

Date Posted: _____

W 167842

OWRD Receipt

Fee Received

Check No.

167842

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION (as required by ORS 537.762)

Amended
10-24-05

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5102 Sundial Rd
Work Phone: () Troutdale

Type of work: Fee New Construction Alteration (Repair/Recondition)
Required: Conversion Abandonment Orig. Start
 Deepening Orig. Start Card No. 3999
Card No. _____

1001676

Proposed Commencement Date: 12/7/04

Existing or Proposed Well Depth: 29' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location: _____

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.
Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. McInnis License No. 10011
Date Signed _____ Company Geo-Tech Explorations Date Signed 12/7/04

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

Date Hand-Delivered _____

Date Region Office Rec'd _____

W 167843

OWRD Receipt _____

Date Fee Received _____

Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION

(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals

Home Phone: () 5100 Sunnival Rd

Work Phone: () Troutdale OR 97140

Type of work: Fee Required: [] New Construction [] Conversion [] Deepening Orig. Start [] No Fee Required: [] Alteration (Repair/Recondition) [X] Abandonment Orig. Start Card No. 85677

Proposed Commencement Date: December 7, 2007

Existing or Proposed Well Depth: 100' Diameter: 2" Original Well I.D. Label Number: _____

Use: [] Domestic [] Community (Public System) [] Industrial [] Irrigation [] Thermal [] Injection [X] Monitoring [] Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Sumc

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name G. McInnis Bonded Water Supply/Monitor Well Constructor Name 1001 License No. Date Signed Geo-Tech Explorations Company 12/7/04 Date Signed

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

Date Received
Date Handled
Date of Approval/Revised

W 167844
OWNER RECEIVED
Date Fee Received
Check No.

167844

START CARD
NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)

Amend
10-24-05

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynold Metals
Home Phone: () 3500 Sandial Rd
Work Phone: () Trousdale, OR 97080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. _____
Card No. _____

Mult 53990
39-095

Proposed Commencement Date: 12/7/04

Existing or Proposed Well Depth: 25 95 Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:
County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West
1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name G. McInnis Bonded Water Supply/Monitor Well Constructor Name Geo-Tech Explorations License No. 10011
Date Signed _____ Company _____ Date Signed 12/07/04

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

W 167850

Date Hand-Delivered _____

OWRD Receipt _____

Date Region Office Rec'd _____

Date Fee Received _____

Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION

(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals

Home Phone: () 5100 Suncliff Rd

Work Phone: () Troutdale OR 97080

Type of work: Fee [] New Construction No Fee [] Alteration (Repair/Recondition)

Required: [] Conversion

Required: [X] Abandonment Orig. Start

[] Deepening Orig. Start

Card No. 92714 37-012

Card No. _____

Proposed Commencement Date: 12/7/04

Existing or Proposed Well Depth: 21.5' Diameter: 2" Original Well I.D. Label Number: _____

Use: [] Domestic [] Community (Public System) [] Industrial [] Irrigation [] Thermal [] Injection [X] Monitoring [] Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name G. McInnis Bonded Water Supply/Monitor Well Constructor Name 10011 License No. Date Signed Geo-Tech Explorations Company 12/7/04 Date Signed

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

W 167851

Date Hand-Delivered _____

OWRD Receipt _____

Date Region Office Rec'd _____

Date Fee Received _____

Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION

(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sundial Rd
Work Phone: () Trask, OR 97080

Type of work: Fee Required: [] New Construction [] Conversion [] Deepening Orig. Start Card No.
No Fee Required: [] Alteration (Repair/Recondition) [X] Abandonment Orig. Start Card No. 100165 41-020

Proposed Commencement Date: 12/7/04

Existing or Proposed Well Depth: 20.3 Diameter: 2" Original Well I.D. Label Number: _____

Use: [] Domestic [] Community (Public System) [] Industrial [] Irrigation [] Thermal [] Injection [X] Monitoring [] Other

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name Date Signed G. Mc Innis Geo Tech Explorations 10011 12/7/04
Bonded Water Supply/Monitor Well Constructor Name License No.

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

W 167852

Date Hand-Delivered _____

OWRD Receipt _____

Date Region Office Rec'd _____

Date Fee Received _____

Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION (as required by ORS 537.762)

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Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 NW Suncliff Rd
Work Phone: () Troutdale, OR 97080

Type of work: Fee Required: [] New Construction [] Conversion [] Deepening Orig. Start Card No.
No Fee Required: [] Alteration (Repair/Recondition) [X] Abandonment Orig. Start Card No. 100167 43-015

Proposed Commencement Date: 12/09/07

Existing or Proposed Well Depth: 15.3' Diameter: 2" Original Well I.D. Label Number: _____

Use: [] Domestic [] Community (Public System) [] Industrial [] Irrigation [] Thermal [] Injection [X] Monitoring [] Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name Date Signed G. Mc Innis Bonded Water Supply/Monitor Well Constructor Name Date Signed 10011 Gro-Tech Explorations License No. Date Signed 12/7/07

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

W 167853

Date Hand-Delivered _____

OWRD Receipt _____

Date Region Office Rec'd _____

Date Fee Received _____

Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION (as required by ORS 537.762)

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Owner's name and mailing address: Reynolds Metab
Home Phone: () 5100 Sundial Rd
Work Phone: () Troutdale, OR 97080

Type of work: Fee Required: [] New Construction [] Conversion [] Deepening [] Alteration (Repair/Recondition) [x] Abandonment Orig. Start Card No. 100170 45-017

Proposed Commencement Date: December 7, 2007

Existing or Proposed Well Depth: 17.8' Diameter: 2" Original Well I.D. Label Number: _____

Use: [] Domestic [] Community (Public System) [] Industrial [] Irrigation [] Thermal [] Injection [x] Monitoring [] Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name G. McInnis Bonded Water Supply/Monitor Well Constructor Name 1001 License No. Date Signed Geo-Team Exploration Company 1217107 Date Signed

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167854**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Geo-Tech Explorations
Home Phone: () 5100 Sunbeam Rd
Work Phone: () Troutdale OR 97050
Geo-Tech Explorations

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 07344
Card No. _____ MW08-027

Proposed Commencement Date: 12/7/07

Existing or Proposed Well Depth: 28' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Sumc

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ G. Mc Innis _____ 10011 _____ License No.
Date Signed _____ Geo-Tech Explorations _____ 12/7/07 _____ Date Signed
Company

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

W 167855

Date Hand-Delivered _____

OWRD Receipt _____

Date Region Office Rec'd _____

Date Fee Received _____

Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION (as required by ORS 537.762)

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Owner's name and mailing address: Reynolds Hotel
Home Phone: () 510 5nd St Rd
Work Phone: () Tualatin, OR 97080

Type of work: Fee Required: [] New Construction [] Conversion [] Deepening Orig. Start Card No.
No Fee Required: [] Alteration (Repair/Recondition) [X] Abandonment Orig. Start Card No. 70153 MW9-030

Proposed Commencement Date: 12/7/07

Existing or Proposed Well Depth: 32' Diameter: 2" Original Well I.D. Label Number: _____

Use: [] Domestic [] Community (Public System) [] Industrial [] Irrigation [] Thermal [] Injection [X] Monitoring [] Other

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name G.M. Innis Bonded Water Supply/Monitor Well Constructor Name License No. 10511
Date Signed Company Co-Tec Explorations Date Signed 12/7/07

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

Date Hand-Delivered _____

Date Region Office Rec'd _____

W 167856

OWRD Receipt _____

Date Fee Received _____

Check No. _____

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION

(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Mchds

Home Phone: () 5100 Sunlight Rd

Work Phone: () Troutdale, OR

Type of work: Fee [] New Construction No Fee [] Alteration (Repair/Recondition)
Required: [] Conversion Required: [X] Abandonment Orig. Start Card No. 81122
[] Deepening Orig. Start Card No. MW20-026

Proposed Commencement Date: 12/7/07

Existing or Proposed Well Depth: 26.5 Diameter: 2 Original Well I.D. Label Number:

Use: [] Domestic [] Community (Public System) [] Industrial [] Irrigation
[] Thermal [] Injection [X] Monitoring [] Other

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude Longitude

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name G. McInnis Bonded Water Supply/Monitor Well Constructor Name License No. 10011
Date Signed Company Co-Tech Explorations Date Signed 12/7/07

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167857**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sundial Rd
Work Phone: () Troutdale OR 97080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 81473
Card No. _____ 22-027

Proposed Commencement Date: 12/7/04

Existing or Proposed Well Depth: 27' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
(North or South) (East or West)

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ G. McInnis Bonded Water Supply/Monitor Well Constructor Name _____ 10011 License No. _____
Date Signed _____ Geo-Tech Explorations Company _____ 12/7/07 Date Signed _____

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167858**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sundial Rd
Work Phone: () Trousdale, OR 97180

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Deepening Abandonment Orig. Start
Card No. _____ 80236
25-035

Proposed Commencement Date: 12/7/07

Existing or Proposed Well Depth: 35.5' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Sumc

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ G. McInnis Bonded Water Supply/Monitor Well Constructor Name _____ 1004 License No. _____
Date Signed _____ Geo-Tech Explorations Company _____ 12/7/07 Date Signed _____

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167859**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds McLab
Home Phone: () 5100 S. Jackson Rd
Work Phone: () Traskdale OR 97050

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 93803
Card No. _____ 37-030

Proposed Commencement Date: 12/7/07

Existing or Proposed Well Depth: 32.5' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 141 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ G. McInnis _____ 10011 _____ License No.
Date Signed _____ Geo. Tom Explorations _____ 12/7/07 _____ Date Signed
Company

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167860**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sunland Rd
Work Phone: () Trousdale OR 97080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 100164
Card No. _____ 41-033

Proposed Commencement Date: 12/7/07

Existing or Proposed Well Depth: 29' ✓ Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot #00
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ G. McEnnis Bonded Water Supply/Monitor Well Constructor Name _____ License No. 1004
Date Signed _____ Geo-Tech Explorations Company _____ Date Signed 12-7-07

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167861**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Junction Rd
Work Phone: () Troutdale OR 97000

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 100171
Card No. _____ 45-012

Proposed Commencement Date: 12-7-07

Existing or Proposed Well Depth: 43' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. Tech Explorations License No. 10011
Date Signed _____ Company _____ Date Signed 12-7-07

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167862**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Summit Rd
Work Phone: () Troutdale OR 97080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 182598
Card No. _____ 54-050

Proposed Commencement Date: 12/07/07

Existing or Proposed Well Depth: 50' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. McInnis License No. 1004
Date Signed _____ Company Geo-Tech Exploration Date Signed 7/2/07/07

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167863**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Raypole Fields
Home Phone: () 5102 Sundial Rd
Work Phone: () Trusdale, OR 97082

Type of work: Fee Required: New Construction Conversion Deepening Orig. Start Card No. _____
No Fee Required: Alteration (Repair/Recondition) Abandonment Orig. Start Card No. 79940
MW06-094
MULTI 75515

Proposed Commencement Date: 12/7/07

Existing or Proposed Well Depth: 96' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ G. McEnnis _____ License No. _____
Date Signed _____ Geo-Tech Explorations _____ 12/7/07 _____
Company Date Signed

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
 Date Hand-Delivered _____
 Date Region Office Rec'd _____

W **167864**
 OWRD Receipt _____
 Date Fee Received _____
 Check No. _____

START CARD
NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Hotel
 Home Phone: () 5100 Sunbird Rd
 Work Phone: () Trestle, OR 97082

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
 Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 79938
 Card No. _____ *MW2F063*

Proposed Commencement Date: 12/7/07

Existing or Proposed Well Depth: 45 Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name	<u>G. McInnis</u>	Bonded Water Supply/Monitor Well Constructor Name	<u>1004</u>
Date Signed	<u>G. Tom Explorations</u>	Company	<u>12/7/07</u>
			Date Signed

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
 Date Hand-Delivered _____
 Date Region Office Rec'd _____

W 167865
 OWRD Receipt _____
 Date Fee Received _____
 Check No. _____

START CARD
NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Nichols
 Home Phone: () 5102 Sundial Rd
 Work Phone: () Traskdale OR 97130

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
 Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 100613
 Card No. _____ 51-069

Proposed Commencement Date: 12/7/07

Existing or Proposed Well Depth: 69' Diameter: 2' Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name	<u>G. Mc Innis</u>	Bonded Water Supply/Monitor Well Constructor Name	<u>1004</u>	License No.
Date Signed	<u>12/7/07</u>	Company	<u>Geo. Tech Explorations</u>	Date Signed

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167866**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

*Amended
10-24-05*

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Mahal
Home Phone: () 5100 Sandial Rd
Work Phone: () Troutdale OR 97087

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 104245

Proposed Commencement Date: 12/7/07

Existing or Proposed Well Depth: 20' 56" Diameter: 2' Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:
County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. H. Innis License No. 10011
Date Signed _____ Company Geo Tech Explorations Date Signed 12/7/07

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

Date Postmarked _____

W 167879

Date Hand-Delivered _____

OWRD Receipt _____

Date Region Office Rec'd _____

Date Fee Received _____

Check No. _____

START CARD

167879

NOTICE OF BEGINNING OF WELL CONSTRUCTION (as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sundial Rd
Work Phone: () Troutdale OR 97080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 85711
Card No. _____ MW08427

Proposed Commencement Date: 12-13-04

Existing or Proposed Well Depth: 129 Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:
County Multnomah Township 1N Range 3E Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. McInnis License No. 10011
Date Signed _____ Company Geo-Tech Explorations Date Signed 12-7-04

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167880**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

167880

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sundial Rd
Work Phone: () Troutdale, OR 97080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 79941
Card No. _____ 6-17P

Proposed Commencement Date: 12-13-04

Existing or Proposed Well Depth: 178' Diameter: 2'' Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:
County Multnomah Township 1 N Range 3 E Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.
Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. McInnis License No. 10011
Date Signed _____ Company Geo-Tech Explorations Date Signed 12-7-04

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167881**

OWRD Receipt _____
Date Fee Received _____
Check No. _____

167881

START CARD
NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sundial Rd
Work Phone: () Troutdale, OR 97080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start Card No. 85712
 Deepening Orig. Start Card No. MWB-169

Proposed Commencement Date: 12-13-04 Card No. _____

Existing or Proposed Well Depth: 170.5 Diameter: 2' Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:
County Multnomah Township 1 N Range 3 E Section 14 Tax Lot 100
North or South East or West
1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
same

We have read the back of this form and the information provided is accurate to the best of our knowledge.
Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. McInnis License No. 10011
Date Signed _____ Company Geo-Tek Explorations Date Signed 12-7-04

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)

167882

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals MW 21-176
Home Phone: () 5100 Sundial Rd
Work Phone: () Troutdale, OR 97080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 79939

Proposed Commencement Date: 12-13-04 Card No. _____

Existing or Proposed Well Depth: 177 Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:
County Multnomah Township 1 N Range 3 E Section 14 Tax Lot 100
1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.
Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. McInnis License No. 10011
Date Signed _____ Company Geo-Tech Explorations Date Signed 12-7-04

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.
ADDITIONAL IMPORTANT INFORMATION ON BACK.

START CARD

NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)

167883

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sundial Rd.
Work Phone: () Troutdale, OR 97080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start Card No. 85715
 Deepening Orig. Start Card No. _____

Proposed Commencement Date: 12-13-04

Existing or Proposed Well Depth: 176.5' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:
County Multnomah Township 1N Range 3E Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.
Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. McInnis License No. 10011
Date Signed _____ Company Geo-Tech Explorations Date Signed 12-7-04

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____

W 167927

Date Hand-Delivered _____

OWRD Receipt _____

Date Region Office Rec'd _____

Date Fee Received _____

Check No. _____

START CARD

PL17-019

NOTICE OF BEGINNING OF WELL CONSTRUCTION (as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Repair 121626
Home Phone: () 5100 2001 11
Work Phone: () 700 11 012 97000

Type of work: Fee [] New Construction No Fee [] Alteration (Repair/Recondition)
Required: [] Conversion Required: [X] Abandonment Orig. Start Card No. 100606
[] Deepening Orig. Start Card No. 1217-019

Proposed Commencement Date: 12/20/07

Existing or Proposed Well Depth: 19.3 Diameter: 2" Original Well I.D. Label Number: 100606

Use: [] Domestic [] Community (Public System) [] Industrial [] Irrigation
[] Thermal [] Injection [] Monitoring [X] Other P. 23 m. 12-

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude Longitude

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name Bonded Water Supply/Monitor Well Constructor Name License No.
Date Signed Company Date Signed

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167928**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

0218-023

START CARD
NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds, David
Home Phone: () 503-555-1234
Work Phone: () Tomblick OR 97080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 106604
Card No. _____ 106604
0218-023

Proposed Commencement Date: 12/20/07

Existing or Proposed Well Depth: 25.2 Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other Freeze Pit

Proposed Well Location:

County Washington Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SE 1/4 NE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name Reynolds, David Bonded Water Supply/Monitor Well Constructor Name _____ License No. _____
Date Signed _____ Company _____ Date Signed 12/20/07

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167929**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

P219-014

START CARD
NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: R. J. ...
Home Phone: () 510 500 180
Work Phone: () 77080

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Deepening Abandonment Orig. Start
 Deepening Orig. Start
Card No. _____

Proposed Commencement Date: 12/20/07

100609
P219-014

Existing or Proposed Well Depth: 14.3' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other Piezometer

Proposed Well Location:
County Multnomah Township 1 Range 2 Section 14 Tax Lot 100
North or South East or West
1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
None

We have read the back of this form and the information provided is accurate to the best of our knowledge.
Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name _____ License No. _____
Date Signed _____ Company _____ Date Signed _____

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167930**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

P 217-034

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Ronald Michel
Home Phone: () 5100 Summer St
Work Phone: () Trouble one 97050

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Abandonment Orig. Start
 Deepening Orig. Start Card No. 100605

Proposed Commencement Date: 12/20/07

Existing or Proposed Well Depth: 40' Diameter: 2' Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other Piezometer

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 _____ 1/4 _____ Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name _____ License No. _____
Date Signed _____ Company _____ Date Signed 12-20-07

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W 167931

OWRD Receipt _____
Date Fee Received _____
Check No. _____

12-18-04

START CARD
NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reginald McElroy
Home Phone: () 5100 Summer St
Work Phone: () Trenton OR 97138

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 10011
P218-040

Proposed Commencement Date: 12-20-07

Existing or Proposed Well Depth: 42' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name E. McElroy License No. 10011
Date Signed _____ Company Geo Tech Date Signed 12-20-07

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167932**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD

**NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)**

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 South 1st
Work Phone: () Tomball, OR 97053

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Abandonment Orig. Start
 Deepening Orig. Start
Card No. _____ P2-19-040

Proposed Commencement Date: 12-20-07

Existing or Proposed Well Depth: 40 Diameter: _____ Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:

County Clatsop Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 S1/4 1/4 25 Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name Geo-Tech Explorations License No. _____
Date Signed _____ Company _____ Date Signed 12-20-07

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

FOR WATER RESOURCES DEPARTMENT USE ONLY

Date Postmarked _____
Date Hand-Delivered _____
Date Region Office Rec'd _____

W **167943**
OWRD Receipt _____
Date Fee Received _____
Check No. _____

START CARD
NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)

*Amended
10-24-05*

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepenings (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$125 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
Home Phone: () 5100 Sundial Rd
Work Phone: () Troutdale, OR 97060

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
Required: Conversion Required: Abandonment Orig. Start
 Deepening Orig. Start Card No. 89222

Proposed Commencement Date: 12-9-04 Card No. _____

Existing or Proposed Well Depth: 94' 96" Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:
County Multnomah Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 SW 1/4 SE Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
5100 Sundial Rd

We have read the back of this form and the information provided is accurate to the best of our knowledge.
Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. McInnis License No. 10041
Date Signed _____ Company Geo-Tech Explorations Date Signed 1/13/05

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.
ADDITIONAL IMPORTANT INFORMATION ON BACK.

317311-04

L-76949

PAUL 7/22/05 1-2" to 95' Reynolds metals - Troutdale
MW31-095R

FOR WATER RESOURCES DEPARTMENT USE ONLY	
Date Postmarked	W 174054
Date Hand Delivered	OWRD Received
Date Region Office Received	Date Fee Received
	Check No.

START CARD
NOTICE OF BEGINNING OF WELL CONSTRUCTION
(as required by ORS 537.762)

This form must be completed and the original mailed or delivered to the Water Resources Department, 725 Summer Street NE Suite A, Salem OR 97301-1271 for all new construction, conversion, alteration, deepening and abandonments. This original must be mailed or delivered before work is commenced. A \$125 fee shall accompany the original for all new well construction, conversion, and deepening (make checks payable to the Water Resources Department). In addition, the constructor shall provide a legible copy of this notice to the region office within which the well is being constructed, converted, altered, deepened, or abandoned using one of the following methods: (a) by regular mail no later than three (3) calendar days (72 hours) prior to commencement of work; (b) by hand delivery, during regular office hours before work is commenced; or (c) by FAX before work is commenced. If method (c) is used, a legible copy of the start card shall also be mailed or delivered to the region office no later than the day work is commenced. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$125 fee with the start card, for failure to submit the \$ 25 fee in a timely manner, and for failure to timely submit start cards.

Owner's name and mailing address: Reynolds Metals
 Home Phone: () 5700 Sunlight Rd
 Work Phone: () Troutdale, OR

Type of work: Fee New Construction No Fee Alteration (Repair/Recondition)
 Required: Conversion Abandonment Orig. Start
 Deepening Orig. Start Card No. _____

Proposed Commencement Date: 7/22/05
 Card No. _____

Existing or Proposed Well Depth: 95' Diameter: 2" Original Well I.D. Label Number: _____

Use: Domestic Community (Public System) Industrial Irrigation
 Thermal Injection Monitoring Other _____

Proposed Well Location:
 County Mult Township 1 Range 3 Section 14 Tax Lot 100
North or South East or West

1/4 NW 1/4 NW Or Latitude _____ Longitude _____

Street Address of well, if not assigned, nearest address:
Same

We have read the back of this form and the information provided is accurate to the best of our knowledge.

Owner/Agent Name _____ Bonded Water Supply/Monitor Well Constructor Name G. McInnis License No. 10011
 Date Signed _____ Company Geo-Tech Explorations Date Signed 7-22-05

OWNER PLEASE NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required. The Oregon Health Division requires plans to be submitted and approved prior to construction if the well is to be used as a public system.

ADDITIONAL IMPORTANT INFORMATION ON BACK.

ATTACHMENT 2
Well Logs



PROJECT NUMBER
OPE39293.B1.01

WELL NUMBER
MW-03-17

SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Metals LOCATION Graham Road
 MEASURING POINT ELEV (NGVD) 29.69 DRILLING CONTRACTOR GeoTech-Mickey
 DRILLING METHOD AND EQUIPMENT HSA 6 1/4" Augers Canterra 250
 WATER LEVEL ELEV/DATE 7.19 START 7-9-94 FINISH 7-9-94 LOGGER Heidi Hoffmann

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" -6" -6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION	WELL COMPLETION DIAGRAM	
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET				DESCRIPTION	DIAGRAM
2.5					SILTY, ML, dk brown, dry.	ML	Locking Cap	
4.0	S-1	0.6	17-18-16 (34)	SAND, SP, strong brown, (7.5YR 4/6), wet, fine, dense. At 3.5': SILT, ML, v. dk gray, (10YR 3/1), wet. OVM=0.0, HCN=0.0.	SP	PVC Slickup = 2.5 ft		
5.0					SAND, SP, v. dk gray, (10YR 3/1), wet, medium, fining downward from medium to fine sand. OVM=0.0, HCN=0.0.	ML	Concrete Pad	
6.5	S-2	1.5	8-9-17 (26)		SAND, SP, v. dk gray, (10YR 3/1), wet, medium, fine sand, ~10% silt, Fe-oxide in top of spoon. OVM=0.0, HCN=0.0.		Void Clay Coarse Bentonite Chips	
7.5					SAND, SP, v. dk gray, (10YR 3/1), wet, medium, fine sand, ~10% silt, Fe-oxide in top of spoon. OVM=0.0, HCN=0.0.			
9.0	S-3	1.5	6-8-12 (20)		SAND, SP, v. dk gray, (10YR 3/1), wet, medium v. fine sand, well-sorted. OVM=0.0, HCN=0.0.	SP	Stainless Steel Centralizer	
10.0					SAND, SP, v. dk gray, (10YR 3/1), wet, medium v. fine sand, well-sorted. OVM=0.0, HCN=0.0.			
11.5	S-4	1.5	7-12-14 (26)		SAND, SP, v. dk grayish brown, (10YR 3/2), wet, medium, v. fine sand, well-sorted. OVM=0.0, HCN=0.0.		20x40 Colorado Silica Sand	
12.5					SAND, SP, v. dk grayish brown, (10YR 3/2), wet, medium, v. fine sand, well-sorted. OVM=0.0, HCN=0.0.			
14.0	S-5	1.5	6-12-6 (18)		SAND, SP, v. dk grayish brown, (10YR 3/2), wet, medium, v. fine sand, well-sorted. OVM=0.0, HCN=0.0.			
15.0					SAND, SP, v. dk grayish brown, (10YR 3/2), wet, medium, v. fine sand, well-sorted. OVM=0.0, HCN=0.0.			
16.5	S-6	0.6	1-2-3 (5)		SAND, SP, v. dk grayish brown, (10YR 3/2), wet, medium, v. fine sand, well-sorted. OVM=0.0, HCN=0.0.	SM	Stainless Steel Centralizer	
17.5					SAND, SP, v. dk grayish brown, (10YR 3/2), wet, medium, v. fine sand, well-sorted. OVM=0.0, HCN=0.0.			
19.0	S-7	1.5	1-3-2 (5)		SAND, SP, v. dk grayish brown, (10YR 3/2), wet, medium, v. fine sand, well-sorted. OVM=0.0, HCN=0.0.			
20.0					SAND, SP, v. dk grayish brown, (10YR 3/2), wet, medium, v. fine sand, well-sorted. OVM=0.0, HCN=0.0.			
25.0					BOH=18'			



PROJECT NUMBER 107493.08.02	BORING NUMBER MW03-088	SHEET 1 OF 4
SOIL BORING LOG		

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** Approximately 15 feet North of MW03 & MW03-11
ELEVATION _____ **DRILLING CONTRACTOR** Tacoma Pump & Drilling Company
DRILLING METHOD AND EQUIPMENT Cable Tool; 8" ID Steel Casing
WATER LEVELS _____ **START** 8-25-88 **FINISH** 8-28-88 **LOGGER** Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
5.0					0-2.0 feet: Crushed basalt fill for drill pad	
10.0	10.0					Driller adds 10 gallons of water.
	11.5		1.2	8-8-8 (18)	SAND, (SP), brownish gray (5 yr 4/1), wet, loose, fine-grained, 5 percent silt, trace of organic material, homogeneous, sub-angular to sub-rounded.	Drilling adds 10 gallons of water.
15.0	17.0					
	18.5		1.0	1-1-1 (2)	SILTY SAND with GRAVEL, (SM), dark yellowish brown (10 yr 4/2), wet, very loose, 15 percent gravel (to 0.5-inch maximum size), sand coarse-grained, 5 percent wood fragments (to 2-inch maximum size).	Sediment very disturbed.
20.0	23.5					
	25.0		0.8	1-3-3 (8)	SILT, (ML), dark greenish gray (5 gy 4/1), wet, soft, slightly plastic, homogeneous.	
25.0						



PROJECT NUMBER 107483.D8.02	BORING NUMBER MW03-098
SHEET 2 OF 4	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT Reynolds Metals --- RMC-Troutdale	LOCATION Approximately 15 feet North of MW03 & MW03-172
ELEVATION _____	DRILLING CONTRACTOR Tacoma Pump & Drilling Company
DRILLING METHOD AND EQUIPMENT Cable Tool; 6" ID Steel Casing	
WATER LEVELS _____	START 8-25-98 FINISH 8-28-98 LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
35.0					SILT, (ML), as above.	Driller adds 10 gallons of water.
38.5		1.5	4-4-3 (7)	Driller adds 5 gallons of water.		
39.0						
40.0	41.5		1.2	13-18-18 (35)	SAND, (SW), dark greenish gray (5 gy 4/1), wet, medium dense, thin silt laminae (less than 0.5 inch), fine-to-medium grained sand, coarsens downward.	
45.0						
48.0					SAND, (SP), dark greenish gray (5 gy 4/1), wet, medium dense, fine-grained, 5 percent silt, trace organic material, sand moderately well rounded to sub-angular, homogeneous.	48 feet bgs water sample collected: T=18 degrees C pH=7.25 cond=300 F=-0.23
60.0	48.5	1.1	15-23-24 (47)			
65.0					SAND, (SW), dark gray (N3), wet, medium dense, fine to medium-grained, sand sub-angular, homogeneous.	Driller reports 10 feet sand heaved into casing. Driller add 15 gallons of water.
58.0						
58.5		1.4	18-18-20 (38)			



PROJECT NUMBER
107483.D8.02

BORING NUMBER
MW03-088

SHEET 3 OF 4

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION Approximately 15 feet North of MW03 & MW03-1

ELEVATION _____

DRILLING CONTRACTOR

Tacoma Pump & Drilling Company

DRILLING METHOD AND EQUIPMENT Cable Tool; 8" ID Steel Casing

WATER LEVELS _____

START 8-25-88

FINISH 8-28-88

LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
65.0						
	68.0					
	69.5		1.4	12-17-17 (34)	SAND. (SW), dark gray (N3), wet, medium dense, fine-to-medium grained, sand subangular, homogeneous, trace wood fragments.	68 feet bgs water sample collected: T=13.5 degrees C pH=7.81 cond=320 F--=0.35
70.0						Driller reports 25 feet of sand heaved into casing.
75.0						Driller add 25 gallons of water.
	78.0					
	78.5		1.4	13-20-28 (48)	SAND. (SW), dark gray (N3), wet, medium dense, fine-grained, sand subangular, homogeneous, trace wood fragments.	
80.0						
85.0						
	87.0				SAND. (SP), as above except dense.	
	88.5		1.5	13-30-50 (80)		Driller add 25 gallons of water.



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW03-098
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SHEET 4 OF 4

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** Approximately 15 feet North of MW03 & MW03-1
ELEVATION _____ **DRILLING CONTRACTOR** Tacoma Pump & Drilling Company
DRILLING METHOD AND EQUIPMENT Cable Tool; 8" ID Steel Casing
WATER LEVELS _____ **START** 8-25-88 **FINISH** 8-28-88 **LOGGER** Ivan Gall

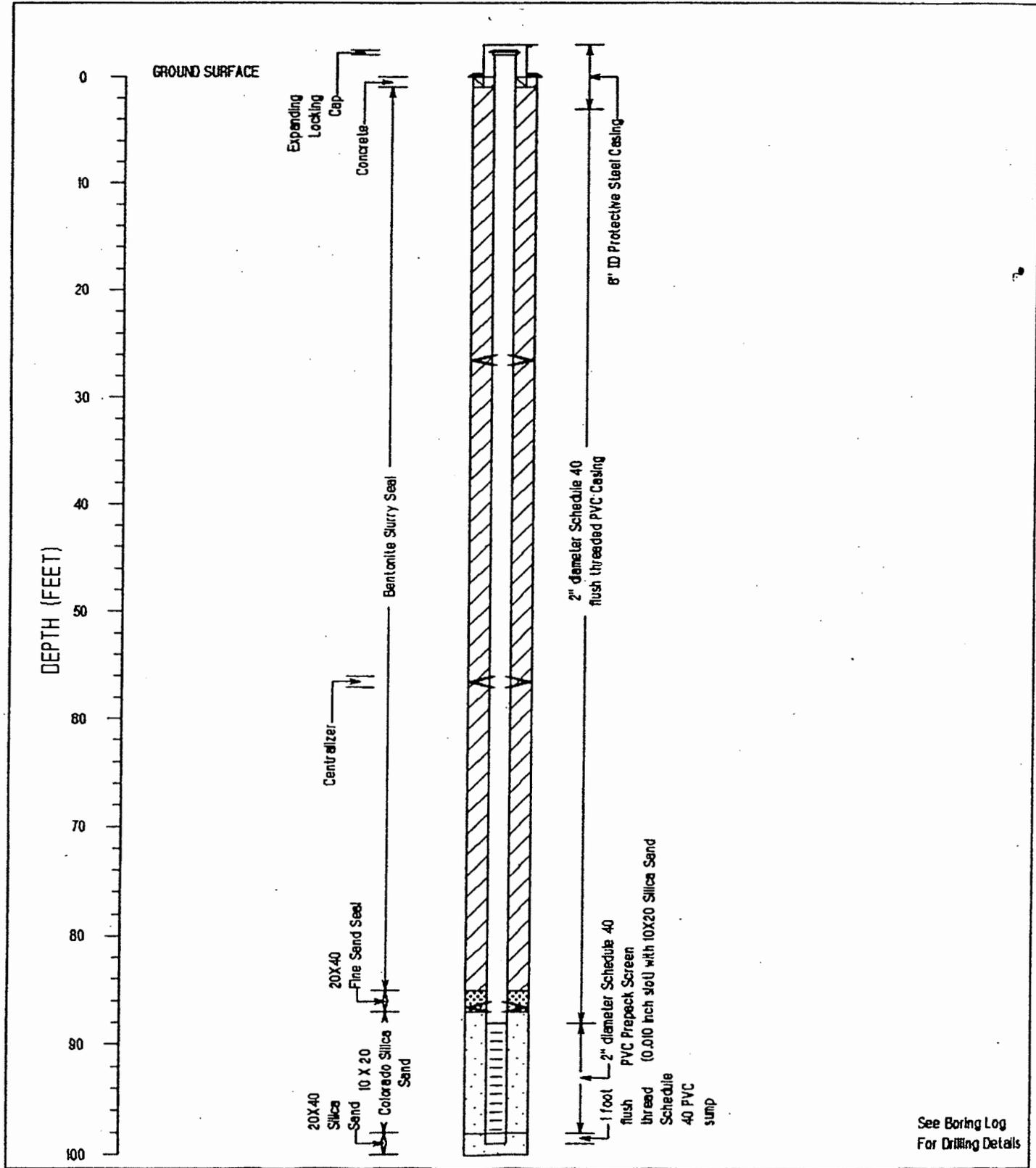
DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
95.0						
100.0	100.0				SAND, (SP), as above except very loose.	100 feet bgs water sample collected: T=12.8 degrees C pH=7.80 cond=250 F=-.50 100 feet total depth.
	101.5		0.8	2-2-2 (4)		
105.0						
110.0						
115.0						



PROJECT NUMBER 107493.08.02	BORING NUMBER MW03-088	SHEET 1 OF 1
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WELL COMPLETION LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION Approximately 15 feet North of MW03 & MW03-1
ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Company
DRILLING METHOD AND EQUIPMENT Cable Tool; 8" ID Steel Casing
WATER LEVELS _____ START 8-25-88 FINISH 8-28-88 LOGGER Ivan Gall



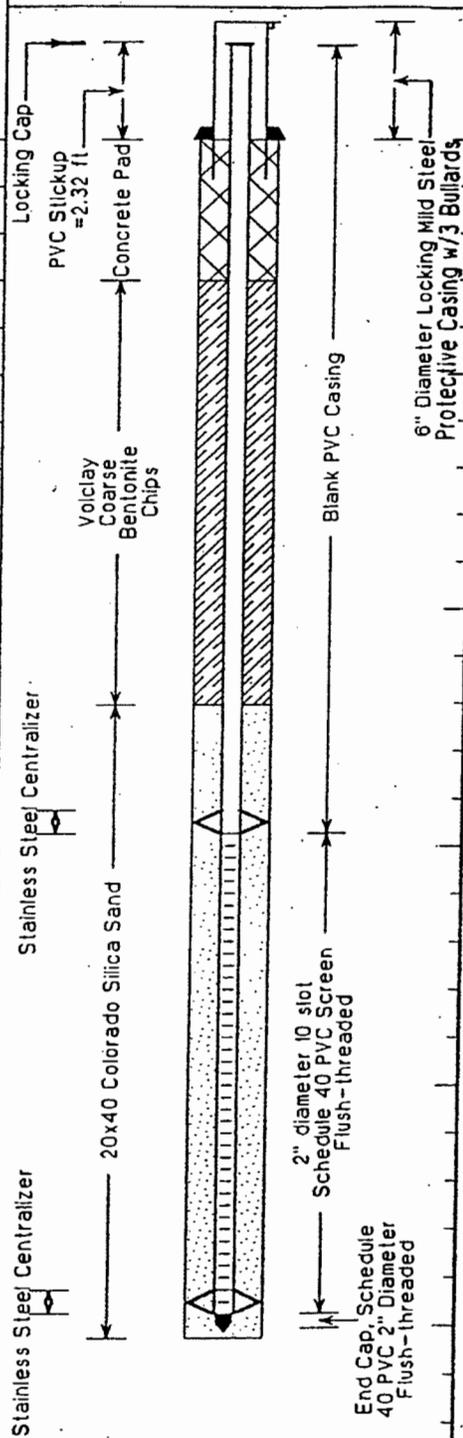
See Boring Log
For Drilling Details



PROJECT NUMBER OPE39293.B1.01	WELL NUMBER MW-05-025	SHEET 1 OF 1
MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG		

PROJECT Reynolds Metals	LOCATION Near Sandy River
MEASURING POINT ELEV (NGVD) 33.99	DRILLING CONTRACTOR GeoTech-Mickey
DRILLING METHOD AND EQUIPMENT HSA 6 1/4" Augers Canterra 250	
WATER LEVEL ELEV/DATE 12.65 7-18-94	START 7-8-94 FINISH 7-8-94
LOGGER Heidi Hoffmann	

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" -6" -6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION	WELL COMPLETION DIAGRAM	
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET				Diagram 1	Diagram 2
2.5							Locking Cap	
4.0	S-1	1.5	7-8-14 (22)	SAND, SP; dk grayish brown, (10YR 4/2), dry, medium, medium-coarse, sandy, loose. OVM=0.0, HCN=0.0.	SP	PVC Slickup = 2.32 ft	Concrete Pad	
5.0								
6.5	S-2	1.5	7-10-9 (19)	SAND, SP, dk grayish brown, (10YR 4/2), v. sl. moist, loose. OVM=0.0, HCN=0.0. At 6" SILT, ML, gray and Fe-stained, mottled, v. moist.				
7.5								
9.0	S-3	1.5	5-6-5 (11)	SILT, ML, gray and Fe-oxidized staining, mottled, v. moist to wet, plastic, stiff. OVM=0.0, HCN=0.0.				
10.0								
11.5	S-4	1.5	3-9-3 (12)	SILTY CLAY, ML/CL, dk brown w/gray and Fe-oxide staining, mottled, plastic, wet, stiff. OVM=0.0, HCN=0.0.	ML			
12.5								
14.0	S-5	1.5	2-1-2 (3)	SILT, ML, dk grayish brown, wet, soft, Fe-oxide and gray mottled vertical streaks. OVM=0.0, HCN=0.0.				
15.0								
16.5	S-6	1.5	3-4-7 (11)	SILT, ML, dk grayish brown, wet, stiff, 10-20% fine sand, less Fe-oxide. OVM=0.0, HCN=0.0.				
17.5								
19.0	S-7	1.5	7-2-8 (10)	SILT, ML, dk grayish brown, wet, stiff, plastic, stringers of SILTY SAND, SM, fine-medium sand.	SM ML			
20.0								
21.5	S-8	1.5	4-5-4 (9)	SANDY SILT, SM, dk grayish brown, orange, Fe-oxide and gray reduction staining, wet.				
22.5								
24.0	S-9	1.5	5-6-6 (12)	SILTY SAND, SM, dk grayish brown, wet, medium, fine-medium sand.	SM			
25.0				BOH=25.2'				





PROJECT NUMBER
OPE39293.B1.01

WELL NUMBER
MW-06-024

SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Metals LOCATION Field on NE corner of Sundial & Reynolds Plz

MEASURING POINT ELEV (NGVD) 28.81 DRILLING CONTRACTOR GeoTech-Mickey

DRILLING METHOD AND EQUIPMENT HSA 6 1/4" Augers Conterra 250

WATER LEVEL ELEV/DATE 11.79 7-13-94 START 7-8-94 FINISH 7-8-94 LOGGER Heidi Hoffmann

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" -6" -6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION	WELL COMPLETION DIAGRAM	
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET					
2.5					SAND, SP, dk grayish brown, (2.5Y 4/2), dry, medium, fine-medium sand, lenses of SILTY SAND, SM. OVM=0.0, HCN=0.0	SP	Locking Cap PVC Slickup = 2.7 ft Concrete Pad	
4.0	S-1	1.5	5-7-8 (15)	SM				
5.0					SILTY SAND, SM, dk brown, (10YR 3/3), wet. At 6": SILT, ML, dk grayish brown, (10YR 4/2), v. moist, Fe-oxide staining, stiff. OVM=0.0, HCN=0.0.	SM	Volclay Coarse Bentonite Chips	
6.5	S-2	1.5	1-4-2 (6)	SM				
7.5					SILT, ML, dk grayish brown, (10YR 4/2), v. moist, Fe-staining, root casts, plastic, stiff. OVM=0.0, HCN=0.0.		Blank PVC Casing	
9.0	S-3	1.5	3-4-5 (9)					
10.0					SILT, ML, dk grayish brown, wet, firm, 5-10% fine sand in stringers, Fe-oxide staining. OVM=0.0, HCN=0.0.		6" Diameter Locking and Ste...	
11.5	S-4	1.5	3-3-3 (6)					
12.5					SILT, ML same as above.	ML	Stainless Steel Centralizer	
14.0	S-5	1.5	2-5-6 (1)					
15.0					SILT, ML, same as above.		20x40 Colorado Silica Sand	
16.5	S-6	1.5	4-4-5 (9)					
17.5					SILT, ML, same as above.		2" diameter 10 slot Schedule 40 PVC Screen Flush-threaded	
19.0	S-7	1.5	3-3-4 (7)					
20.0					SAND, SP, v. dk grayish brown, (2.5YR 3/2), wet, medium sand.	SP	End Cap, Schedule 40 PVC 2" Diameter Flush-threaded	
21.5	S-8	1.5	4-4-9 (13)	SM				
22.5					SILTY SAND, SM, center of spoon.		Stainless Steel Centralizer	
24.0	S-9	1.5	2-3-3 (6)	SP				
25.0					SAND, SP, v. dk grayish brown, (2.5YR 3/2), wet, medium sand, loose, 10-15% silt.			
					BOH=25'			



PROJECT NUMBER

107493.D6.02

BORING NUMBER

MW08-084

SHEET 1 OF 4

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION MW08 Along Sundial Road

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool, Drilling 8-Inch I.D. Steel Casing

WATER LEVELS _____ START 8-16-88 FINISH 8-20-88 LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8' - 8' (N)	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
5.0						
10.0	10.0					
	11.5		1.5	2-2-5 (7)	SILT (MH), moderately yellow brown (10 yr 5/4), with orange mottling, damp, soft, 20-30 percent clay fraction, trace of very fine sand.	
15.0						
	18.0					
20.0	20.5		1.5	2-3-8 (8)	SILT (MH), as above, to 20.3 feet.	
					Sharp contact with SAND (SW), dark gray (N3), wet, loose, fine to medium grained, trace red grains.	
25.0						
30.0						



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW08-094
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SHEET 2 OF 4

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** MW08 Along Sundial Road

ELEVATION _____ **DRILLING CONTRACTOR** Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool; Drilling 8-inch I.D. Steel Casing

WATER LEVELS _____ **START** 8-18-88 **FINISH** 8-20-88 **LOGGER** Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
35.0	30.0 31.5		1.3	18-23-23 (48)	SAND, (SW), moderate yellowish brown (10 yr 5/4) wet, medium dense, fine to medium grained, trace of silt.	30 feet bgs water sample: T=18.5 degrees C pH=8.57 cond=188 F--=NA
40.0	40.0 41.5		1.4	15-8-23 (32)		
45.0					SAND, (SW), as above, to 41 feet bgs. Sharp contact with SAND, (SW), medium dark gray (N4), wet, loose to medium dense, fine to medium grained, with silt and organic-rich layers (0.1 feet thick).	
60.0					SAND, (SW), medium dark gray (N4), wet, loose, very fine to fine grained, with silt layers (to 0.1 feet thick), trace mica and red grains.	50 feet bgs water sample: T=13.7 degrees C pH=8.85 cond=180 F--=0.19
65.0						
80.0						



PROJECT NUMBER
107483.D8.02

BORING NUMBER
MW08-084

SHEET 3 OF 4

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION MW08 Along Sundial Road
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
 DRILLING METHOD AND EQUIPMENT Cable Tool; Drilling 8-Inch I.D. Steel Casing
 WATER LEVELS _____ START 9-18-98 FINISH 9-20-98 LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" -8" -8" (N)		
80.0	80.0			1-1-1 (2)	SAND, (SW), as above except very loose.	Driller adds 20 gallons of water to control heaving sand.
	81.5		0.1			
70.0	70.0				SAND, (SW), as above except loose, mica flakes larger, trace of organics.	70 feet bgs water sample: T=14.2 degrees C pH=7.15 cond=180 F--=0.38
	71.5		0.7	3-8-8 (12)		
80.0	80.0				SAND, (SW), as above.	
	81.5		0.8	8-8-4 (13)		
80.0	80.0					



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW08-094

SHEET 4 OF 4

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION MW08 Along Sundial Road

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool; Drilling 8-Inch I.D. Steel Casing

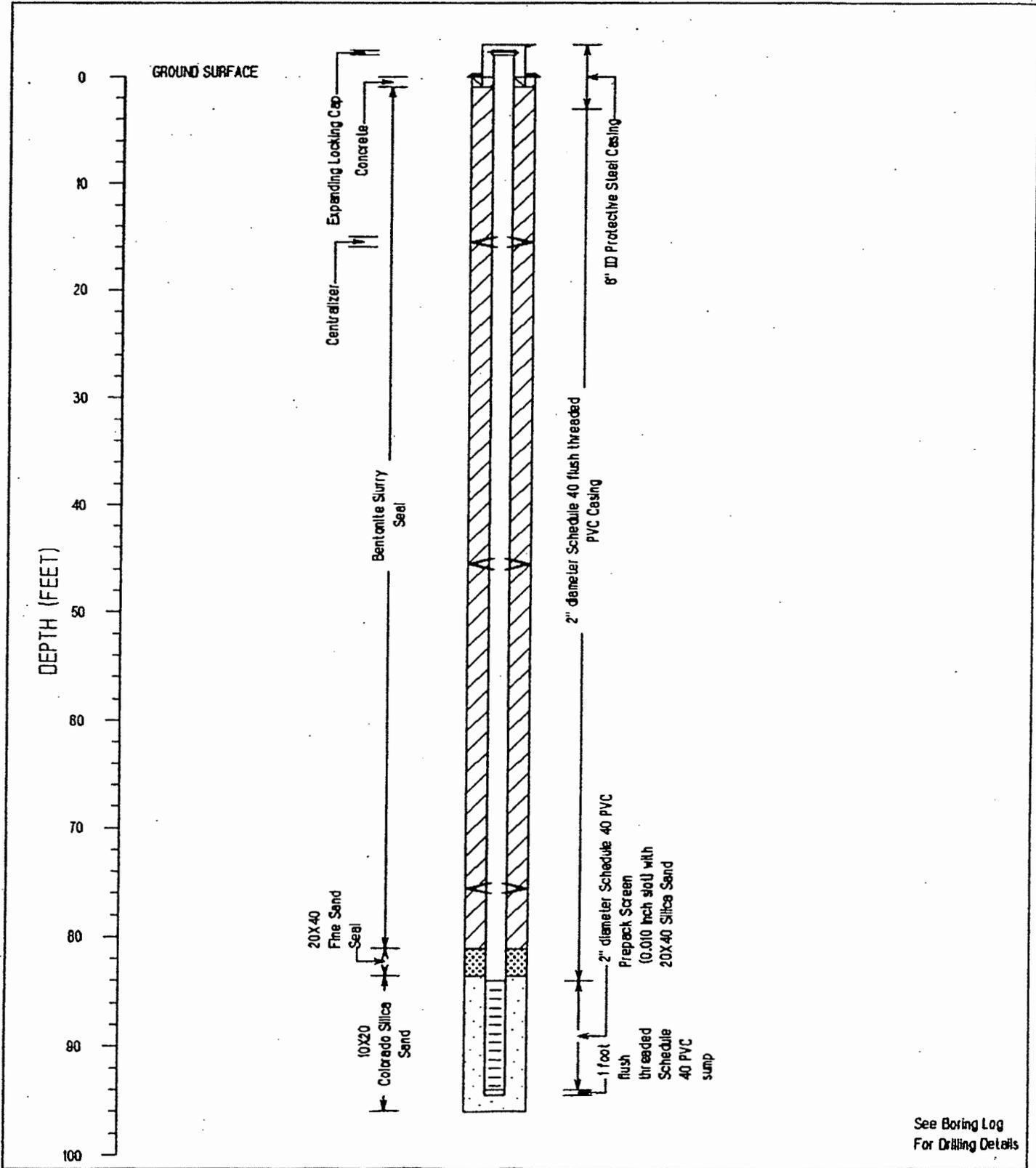
WATER LEVELS _____ START 9-18-88 FINISH 9-20-88 LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0' - 8' - 8' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
80.0			1.0	9-18-18 (35)	SANDL (SW), as above, except medium dense.	95 feet bgs water sample: T=14.2 degrees C pH=7.30 cond=220 F--=1.3 98 feet total depth. Soil sample from baller.
81.5					SAND, (SW), as above.	
95.0						
100.0						
105.0						
110.0						
115.0						



PROJECT NUMBER 107483.08.02	BORING NUMBER MW08-084	SHEET 1 OF 1
WELL COMPLETION LOG		

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION MW08 Along Sundial Road
ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Cable Tool; Drilling 8-inch I.D. Steel Casing
WATER LEVELS _____ START 9-18-88 FINISH 9-20-88 LOGGER Ivan Gall



See Boring Log
For Drilling Details



PROJECT NUMBER 107493.08.02	BORING NUMBER MW08-178	SHEET 1 OF 7
SOIL BORING LOG		

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** MW08 Along Sundial Road

ELEVATION _____ **DRILLING CONTRACTOR** Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Foremost Drill DR24 Air Rotary

WATER LEVELS _____ **START** 4-29-88 **FINISH** 5-3-88 **LOGGER** K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
5.0	5.0				0-1.5 feet <u>SILTY SANDY GRAVEL</u> , (GM), gray, moist, loose, fill placed for drilling pad.	
	8.5		1.5	2-2-5 (7)	<u>SAND</u> , (SP), brown, moist, loose, fine grained, well-sorted, <u>SILT</u> , (MH), brown from 8.67-7.0 feet bgs, firm, slightly plastic, 20 to 30% clay.	
10.0	10.0					
	11.5		1.5	2-4-13 (17)	<u>SILT</u> , (MH), light brown, moist to wet, firm to stiff plastic, 20 to 30% clay, 10% fine to medium sand.	
15.0	15.0					
	18.5		1.5	2-3-4 (7)	<u>SILT</u> , (MH), as above, except soft.	
20.0	20.0					
	21.5		1.5	5-20-25 (45)	<u>SAND with SILT</u> , (SW-SM), gray brown, wet, medium dense, fine to medium-grained (15% silt), sand subangular to subrounded.	
25.0	25.0					
	28.5		1.3	3-3-8 (8)	<u>SAND</u> , (SW), gray brown, wet, very loose, fine to medium grained, subangular, trace of silt.	
30.0						



PROJECT NUMBER 107483.08.02	BORING NUMBER MW08-178
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SHEET 2 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale	LOCATION MW08 Along Sundlal Road
ELEVATION _____	DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Foremost Drill DR24 Air Rotary	
WATER LEVELS _____	START 4-28-88 FINISH 5-3-88
LOGGER K. Gehweiler	

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	30.0				SAND, (SW), as above, except medium dense to dense.	
	31.5		1.5	25-50-25/1" (75)		
35.0	35.0				SAND, (SW), as above, except medium dense, no silt.	
	38.5		1.5	8-20-25 (45)		
40.0	40.0				SAND, (SW), gray wet dense, fine to medium-grained, subrounded to subangular. Becomes medium to fine-grained from 41.7-42 feet bgs. Some red sand grains observed.	Driller reports sand heaving into casing at 40 feet bgs. water sample collected with s.s. bailer after blowing out hole at 40 feet. 40 feet bgs water sample: T=11 degrees C pH=8.38 cond=130 F=-0.15
	41.5		1.1	25-35-40 (75)		
45.0	45.0				SAND, (SW), gray, wet, very loose to loose, medium to fine-grained, subrounded to subangular, with some red sand grains.	
	48.5		1.4	3-3-8 (12)		
50.0	50.0				SAND, (SW), as above except loose.	
	51.5		0.75	5-10-12 (22)		
55.0	55.0				SAND, (SW), as above except very loose.	
	58.5		0.8	2-3-5 (8)		
80.0						



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW08-178
SHEET 3 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION MW08 Along Sundial Road

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Foremost Drill DR24 Air Rotary

WATER LEVELS _____ START 4-28-88 FINISH 5-3-88 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
80.0	80.0		0.25	1-1-1 (2)	SAND, (SW), as above, except greater percentage of fine-grained sand.	Driller reports sand heaving at 80 feet bgs.
	81.5					
85.0	85.0				SAND, (SW), as above.	Driller reports significant volume of sand heaving into casing each time soil samples are collected.
	88.5		1.5	2-2-2 (4)		
70.0	70.0				SAND, (SW), as above.	
	71.5		0.2	2-2-2 (4)		
75.0	75.0				No Sample	Samples sand-locked in casing.
	78.5		0.0	1 for >8"		
80.0	80.0				SAND, (SW), as above at 70 feet.	80 feet bgs water sample: T=13 degrees C pH=7.35 cond=420 F--=0.30.
	81.5		0.4	3-3-8 (8)		
85.0	85.0				SAND, (SW), dark gray to black, wet, medium dense, medium to fine-grained, subrounded to subangular, trace mica flakes.	
	88.5		1.5	10-25-25 (50)		
90.0	90.0					



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW08-178
SHEET 4 OF 7	
SOIL BORING LOG	

PROJECT Reynolds Metals -- RMC-Troutdale	LOCATION MW08 Along Sundial Road
ELEVATION _____	DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Foremost Drill DR24 Air Rotary	
WATER LEVELS _____	START 4-28-88 FINISH 5-3-88
LOGGER K. Gehweller	

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS																																											
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION																																											
	80.0		1.5	1-3-3 (8)	SAND, (SW), black, wet, very loose, coarse to fine grained, subrounded.	Driller reports continuing difficulty with heaving sands.																																											
	81.5						95.0	95.0		1.5	10-13-18 (31)	SAND, (SW), as above except medium dense.	98.5		100.0	100.0		1.3	5-12-12 (24)	SAND, (SW), as above.	100 feet bgs water sample: T=13 degrees C pH=8.58 cond=440 F--=4.88	101.5		105.0	105.0		0.0	8-8-7 (13)	No Sample	108.5		110.0	110.0		0.0		No Sample	111.5		115.0	115.0		1.5	4-4-8 (10)	SAND, (SW), as above at 100 feet.	118 feet bgs water sample: T=10 degrees C pH=8.73 cond=500 F--=0.36	118.5		120.0
95.0	95.0		1.5	10-13-18 (31)	SAND, (SW), as above except medium dense.																																												
	98.5						100.0	100.0		1.3	5-12-12 (24)	SAND, (SW), as above.	100 feet bgs water sample: T=13 degrees C pH=8.58 cond=440 F--=4.88	101.5		105.0	105.0		0.0	8-8-7 (13)		No Sample	108.5		110.0	110.0		0.0		No Sample	111.5		115.0	115.0		1.5	4-4-8 (10)	SAND, (SW), as above at 100 feet.	118 feet bgs water sample: T=10 degrees C pH=8.73 cond=500 F--=0.36	118.5		120.0							
100.0	100.0		1.3	5-12-12 (24)	SAND, (SW), as above.			100 feet bgs water sample: T=13 degrees C pH=8.58 cond=440 F--=4.88																																									
	101.5						105.0		105.0		0.0	8-8-7 (13)		No Sample	108.5		110.0	110.0		0.0			No Sample	111.5		115.0	115.0		1.5	4-4-8 (10)	SAND, (SW), as above at 100 feet.	118 feet bgs water sample: T=10 degrees C pH=8.73 cond=500 F--=0.36	118.5		120.0														
105.0	105.0		0.0	8-8-7 (13)	No Sample																																												
	108.5						110.0		110.0		0.0			No Sample	111.5		115.0	115.0		1.5		4-4-8 (10)	SAND, (SW), as above at 100 feet.	118 feet bgs water sample: T=10 degrees C pH=8.73 cond=500 F--=0.36	118.5		120.0																						
110.0	110.0		0.0		No Sample																																												
	111.5						115.0		115.0		1.5	4-4-8 (10)		SAND, (SW), as above at 100 feet.	118 feet bgs water sample: T=10 degrees C pH=8.73 cond=500 F--=0.36	118.5		120.0																															
115.0	115.0		1.5	4-4-8 (10)	SAND, (SW), as above at 100 feet.	118 feet bgs water sample: T=10 degrees C pH=8.73 cond=500 F--=0.36																																											
	118.5						120.0																																										
120.0																																																	



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW08-178
SHEET 5 OF 7	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT Reynolds Metals -- RMC-Troutdale	LOCATION MW08 Along Sundial Road
ELEVATION _____	DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Foremost Drill DR24 Air Rotary	
WATER LEVELS _____	START 4-28-88 FINISH 5-3-88 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
125.0	120.0			3-8-8 (12)	SAND, (SW), dark gray to black, wet, loose, with some small (less than 0.25-inch) rounded to subangular gravel.	
	121.5		1.5			
128.0	125.0			3-8-12 (18)	SAND, (SW), dark gray to black, wet, loose to medium dense, medium to fine-grained, subangular to subrounded, no gravel.	
	128.5		1.5			
130.0	130.0			8-8-12 (20)	SAND, (SW), as above with trace small (less than 0.25 inch), subrounded gravel.	
	131.5		1.5			
135.0	135.0			1-1-8 (10)	SAND, (SW), as above except no gravel.	
	138.5		1.2			
140.0	140.0			50/5"	SAND, (SW), as above.	137 feet bgs water sample: T=13.5 degrees C pH=7.01 cond=502 F=-0.28 Partial retrieval.
	141.5		0.75			
145.0	145.0			14-50/3"	SAND, (SW), as above.	
	148.5		1.5			
150.0						



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW08-178

SHEET 8 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION MW08 Along Sundial Road

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Foremost Drill DR24 Air Rotary

WATER LEVELS _____ START 4-29-98 FINISH 5-3-98 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8' - 8' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
	150.0			1.5	2-2-5 (7)	SAND, (SW), as above except no gravel.
151.5						
155.0			1.5	15-50/2"	SAND, (SW), as above except coarser grain.	Gravel present in material being pumped from borehole. Fine rounded gravel. 157 feet bgs water sample: T=11.3 degrees C pH=8.5 cond=550 F--=0.18
158.5						
180.0			1.5	15-25-50/8"	SAND with GRAVEL, (SW), gray brown, wet, medium dense, coarse sand, small gravel (less than 0.25-inch), gravel subrounded, primarily black and green.	
181.5						
185.0			1.0	50/8"	SAND with GRAVEL, (SW), as above.	
188.5						
170.0			0.5	50/5"	SAND with GRAVEL, (SW), as above.	
171.5						
175.0			0.0	50/3"	No Sample	
178.5						
180.0						177 feet bgs water sample: T=12.1 degrees C pH=7.8 cond=850 F--=0.27



PROJECT NUMBER 107493.08.02	BORING NUMBER MW08-178
SHEET 7 OF 7	
SOIL BORING LOG	

PROJECT Reynolds Metals -- RMC-Troutdale	LOCATION MW08 Along Sundial Road
ELEVATION _____	DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Foremost Drill DR24 Air Rotary	
WATER LEVELS _____	START 4-29-88 FINISH 5-3-88 LOGGER K. Gehweiler

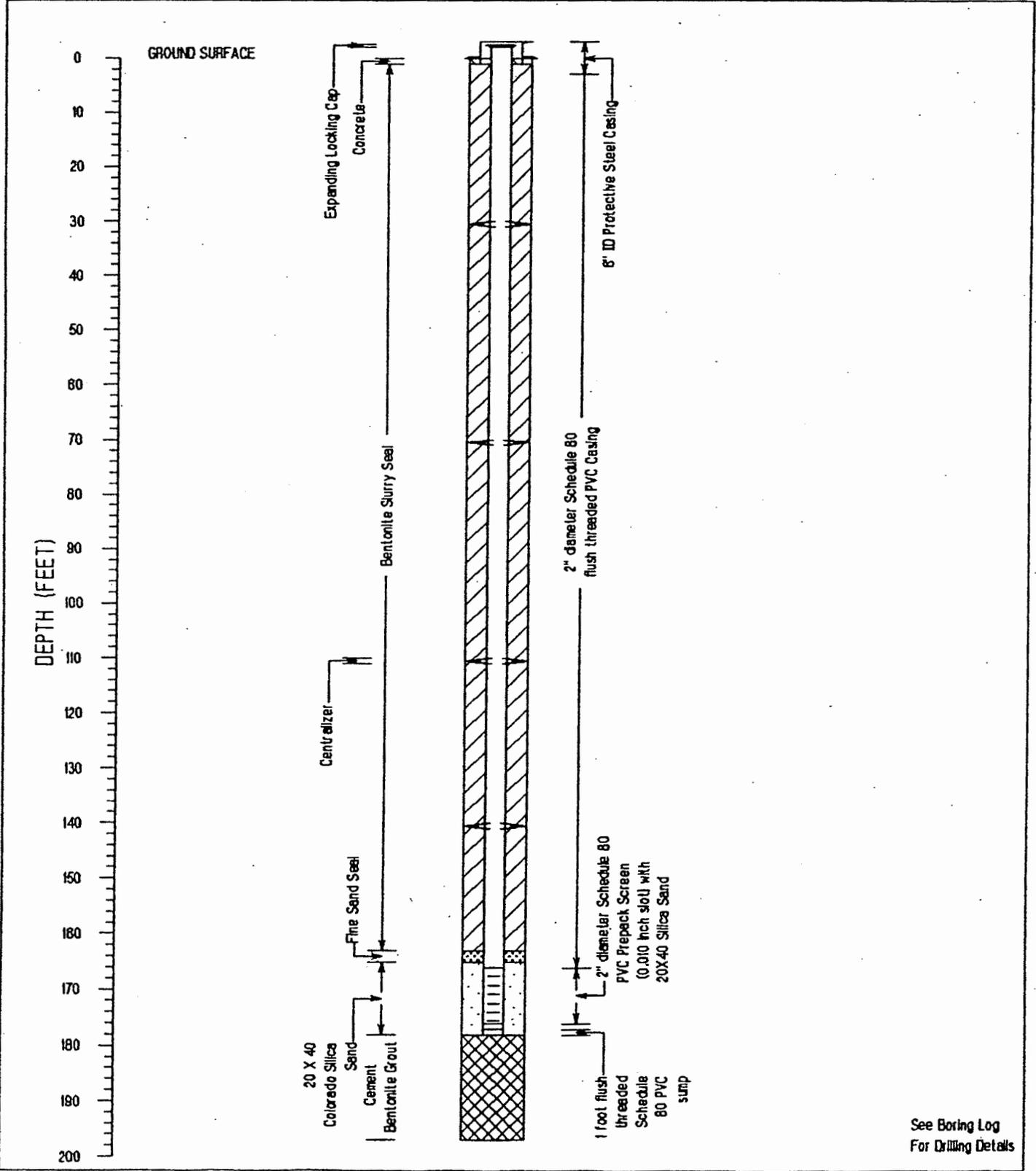
DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
185.0	180.0		1.2	50/4"	SAND with GRAVEL, (SW), gray brown, wet, very dense, higher percentage of fine to medium grained sand, slightly larger gravel than sample at 170 feet.	
	181.5					
	185.0					
	188.5		1.5	20-50/4"		
190.0	180.0		0.8	25-25-25 (50)	SILT, (ML), medium gray, wet, very stiff, homogeneous, with trace fine grained sand.	
	191.5					
195.0	187.0		1.5	12-25-25 (50)	SAND, (SP), medium gray, wet, medium dense, 187.0-187.5 feet fine grained.	Bottom of borehole 187 feet. Spilt-spooned to 188.5 feet. 187 feet bgs water sample: T=13.3 degrees C pH=7.4 cond=700 F=0.25
	188.5				SILT, (ML) as above at 188 feet, from 187.5-188.5.	
200.0						
205.0						



PROJECT NUMBER 107.493.08.02 BORING NUMBER MW08-176 SHEET 1 OF 1

WELL COMPLETION LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION MW08 Along Sundial Road
ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Foremost Drill DR24 Air Rotary
WATER LEVELS _____ START 4-29-88 FINISH 5-3-88 LOGGER K. Gehweiler



See Boring Log For Drilling Details



PROJECT NUMBER OPE39293.B1.01	WELL NUMBER MW-08-027	SHEET 1 OF 1
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MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Metals LOCATION Near Columbia River by Outlet of Company Lake
 MEASURING POINT ELEV (NGVD) 25.32 DRILLING CONTRACTOR GeoTech-Mickey
 DRILLING METHOD AND EQUIPMENT HSA 6 1/4" Augers Canterra 250
 WATER LEVEL ELEV/DATE 17.24 7-12-94 START 7-7-94 FINISH 7-7-94 LOGGER Heidi Hoffmann

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" - 6" - 6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION	WELL COMPLETION DIAGRAM
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET				
2.5							<p>Locking Cap PVC Stickup = 2.4 ft Concrete Pad Voilay Coarse Bentonite Chips Blank PVC Casing 6" Diameter Locking Mild Steel Supreme Sand 20x40 20x40 Colorado Silica Sand 2" diameter 10 slot Schedule 40 PVC Screen Flush-threaded End Cap, Schedule 40 PVC 2" Diameter Flush-threaded</p>
4.0	S-1	1.5	Spoon broke	SILTY SAND, SM, dk brown, (10YR 3/3), v. sl. moist. OVM=0.0.	SM		
5.0							
5.0	S-2	1.5	7-8-12 (20)	SILTY SAND, SM, dk brown, (10YR 3/3), sl. moist, medium.			
6.5				At 6.2' SAND, SP, salt & pepper, sl. moist, medium-coarse sand. OVM=0.0.			
7.5							
9.0	S-3	1.2	7-6-9 (15)	SAND, SP, salt & pepper, v. sl. moist, medium-coarse, medium. OVM=0.0.	SP		
10.0							
10.0	S-4	1.3	4-5-5 (10)	SAND, SP, salt & pepper w/red, v. sl. moist, loose. OVM=0.0.	SP		
11.5							
12.5							
14.0	S-5	1.3	5-7-8 (15)	SAND, SP, salt & pepper, moist-wet, medium, 6" of SM/ML, dk brown, (10YR 4/3), wet. OVM=0.0.	SM/ML		
15.0							
15.0	S-6	1.3	6-6-14 (20)	SAND, SP, salt & pepper, wet, medium, ~5% silt. OVM=0.0.			
16.5							
17.5							
19.0	S-7	1.2	5-6-6 (12)	SAND, SP, salt & pepper, wet, medium, medium-coarse, loose. OVM=0.0.			
20.0							
20.0	S-8	1.2	4-6-5 (11)	SAND, SP, same as above. OVM=0.0.	SP		
21.5							
22.5							
24.0	S-9	1.2	5-5-6 (11)	SAND, SP, same as above. OVM=1.1.			
25.0							
25.0	S-10	1.1	7-7-14 (21)	SAND, SP, salt & pepper, wet, medium, ~5% subrounded pebbles. OVM=0.0.			
26.5							
					BOH=28'		



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW08-127	SHEET 1 OF 5
SOIL BORING LOG		

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION MW08
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
 DRILLING METHOD AND EQUIPMENT Cable Tool
 WATER LEVELS _____ START 8-27-88 FINISH 7-10-88 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
	0-1.0					
8.0				SAND with SILT, (SW-SM), brown, wet, loose, fine to medium grained sand.	8 feet bgs water sample: T=17.1 degrees C pH=6.74 cond=200 F=0.318	
10.0				SAND, (SW), brown, wet, loose, fine to medium grained.		
15.0				SAND, (SW), as above.		
20.0				SAND, (SW), as above, with red and gray volcanics from Sandy River Basins, fine to coarse grained sand.		
25.0	25.0			SAND, (SW), as above with chunk of wood, dense, gray.	25 feet bgs water sample: T=20 degrees C pH=6.7 cond=800 F=4.08 High blow counts due to heaving sands.	
	28.5		1.5	34-84-82 (148)		



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW08-127

SHEET 2 OF 5

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION MW08

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool

WATER LEVELS _____ START 8-27-88 FINISH 7-10-88 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
35.0					SAND with GRAVEL, (SW), as above except fine gravel (up to 3/4 inch across), subrounded to angular, (gravel 10-15%).	Heaving sands.
40.0					SAND with GRAVEL, (SW), as above. Wood fragments at 38 feet bgs. Becoming coarser, gravel up to 1.5-inches across.	
45.0	45.0				SAND, (SW), as above with a trace of fine gravel, no wood fragments.	
	48.5		1.5	2-10-50 (80)	SAND, (SW), gray, wet, medium dense to dense, fine to coarse grained, sand with trace of fine (1/4 inch) gravel, micaceous.	Heaving sands. 45 feet bgs water sample: T=24.3 degrees C pH=8.88 cond=730 F--=1.30.
50.0					SAND, (SW), as above.	
55.0					SAND, (SW), as above.	Still heaving.



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW08-127

SHEET 3 OF 5

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION MW08

ELEVATION

DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool

WATER LEVELS

START 8-27-98

FINISH 7-10-98

LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8'-8"-8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
85.0	85.0				SAND, (SW), as above.	
	88.5		1.1	27-35-38 (73)	SAND, (SW), as above, except dense, trace fine to coarse (1 inch) rounded gravel.	85 feet bgs water sample: T=20.1 degrees C pH=7.28 cond=750 F=-0.35
70.0					SAND, (SW), as above.	
75.0					SAND, (SW), as above.	
80.0					At 79 feet start seeing increased percentage of coarse rounded gravel (up to 2 inches).	Harder bailing from 79 feet on.
	84.0				SILT, (ML), gray, wet, firm, with rounded to subangular fine gravel (up to 1 inch).	
85.0	85.5		0.2	75/2.5"	SILTY GRAVEL, (GM), wet, very dense.	Contact with hard gravel at 84 feet. 85 feet bgs water sample: T=18.2 degrees C pH=7.37 cond=800 F=-0.24



PROJECT NUMBER
107483.08.02

BORING NUMBER
MW08-127

SHEET 4 OF 5

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION MW08

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool

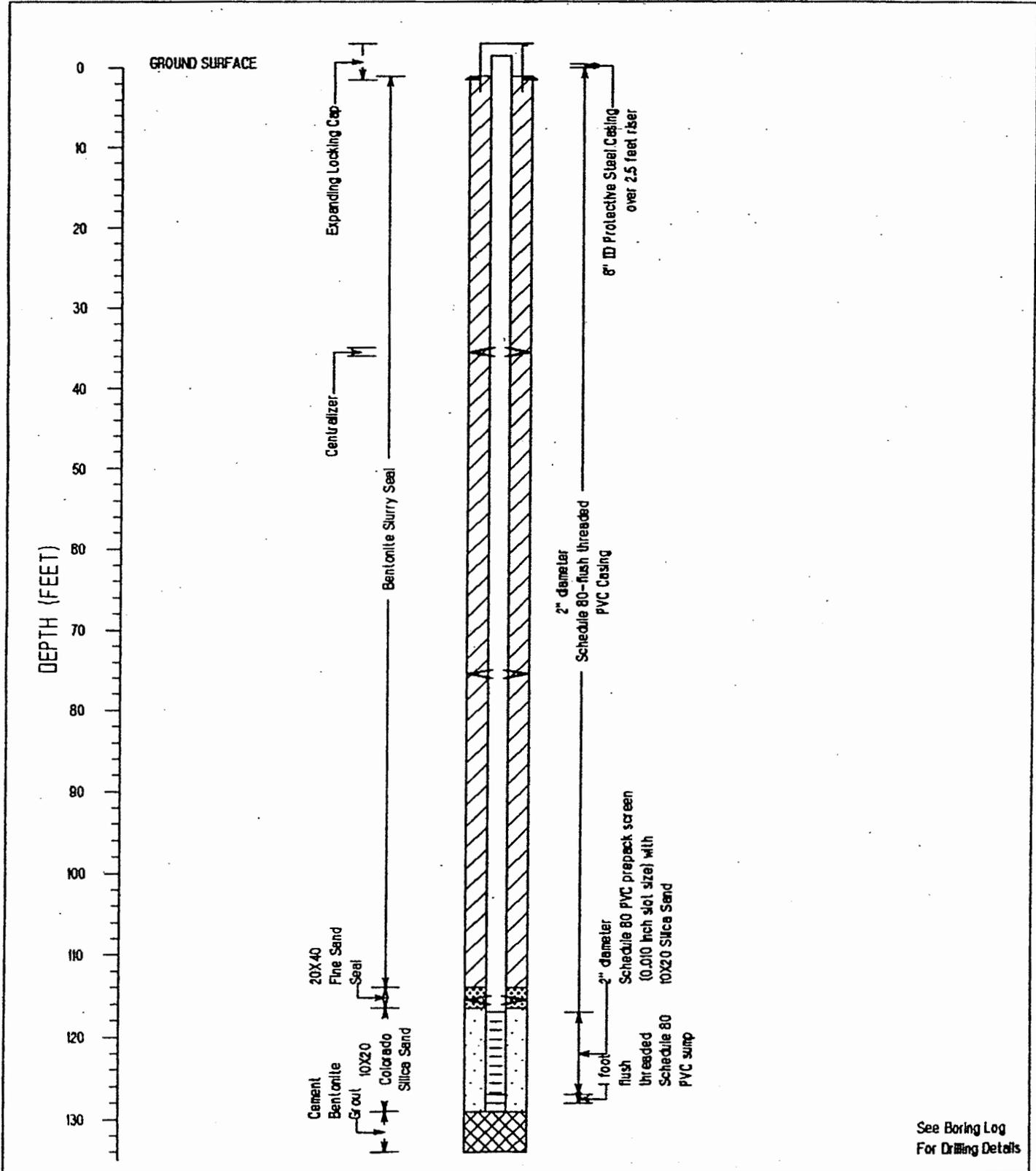
WATER LEVELS _____ START 8-27-88 FINISH 7-10-88 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
85.0	84.5				<p><u>SANDY GRAVEL</u>, (GW), gray-green, wet, dense, 20 percent fine to coarse sand, coarse gravel, rounded to angular up to 1 1/2 inches, evidence of cementing more obvious at 81-82 feet. Can smell naphthalene in air at top of cyclone (22 ppm) but not at bottom of cyclone where collect soil. Naphthalene being volatilized.</p> <p><u>SANDY GRAVEL</u>, (GW), as above.</p>	<p>22 ppm FID at top of cyclone.</p> <p>83 feet bgs water sample: T=14.2 degrees C pH=7.81 cond=150 F=0.48</p> <p>Soil sample at 84.5 mostly gravel (up to 1 1/2 inches) with some cementation. Strong naphthalene odor. Could only fill (1) 8 ounce jar.</p>
	88.0		0.25	50/2"		
100.0					<p><u>SANDY GRAVEL</u>, (GW), as above.</p>	
105.0					<p><u>SANDY GRAVEL</u>, (GW), as above, larger (up to 2 inches) rounded gravel, smaller broken angular pieces of gravel, medium to coarse sand, greater than or equal to 15 percent sand.</p>	
110.0					<p><u>SANDY GRAVEL</u>, (GW), as above.</p>	<p>110 feet bgs water sample: T=15.3 degrees C pH=7.75 cond=140 F=0.51</p>
115.0	115.0				<p>No sample recovery with 3 inch spoon. Try driving 2 inch spoon. No recovery.</p>	
	118.5			50/0"		



PROJECT NUMBER 107493.08.02	BORING NUMBER MW08-127	SHEET 1 OF 1
WELL COMPLETION LOG		

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION MW08
ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Cable Tool
WATER LEVELS _____ START 8-27-88 FINISH 7-10-88 LOGGER K. Gehweiler



See Boring Log For Drilling Details



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW08-169	SHEET 1 OF 7
SOIL BORING LOG		

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION MW08
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
 DRILLING METHOD AND EQUIPMENT 8" Cabletool to 85 ft, 8" air rotary to 200 ft
 WATER LEVELS _____ START 5-1-88 FINISH 5-8-88 LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
5.0	5.0				0-1.5 feet bgs: Rock fill for drill pad crushed basalt.	Driller adds 15 gallons of water.
	8.0		1.0	4-5-8 (II)	SAND with SILT, (GW-GM), dark yellowish brown (10 yr 4/2), wet, loose; sharp contact at 5.5 feet bgs with SAND, (SW), brownish gray (5 yr 4/1), wet, loose, poorly-rounded, fine to medium grained.	Casing advancing easily.
10.0	10.0				SAND, (SW), as above.	Driller adds 10 gallons of water. Sample with strainer. Sand heaving into casing.
	10.5		0.5	4-4-3 (7)		
20.0					SAND, (SW), as above.	Sample; check strainer. Add 15 gallons water.
					SAND, (SW), as above.	28 feet bgs water sample: T=18.5 degrees C pH=8.7 cond=480 F=3.38. Sample: Check strainer. Heaving sand in casing.
28.0					SAND, (SW), as above with gravel (15%), gravel poorly rounded, up to 1.5-inch diameter, red and gray colored gravel.	1-inch thick silt layer 27 feet bgs - gravel (15%) up to 1-inch at 28 feet bgs - red & gray volcanics from sandy river basin.
28.0			0.8	2-8-10 (18)		



PROJECT NUMBER
107483.D8.02

BORING NUMBER
MWO8-189

SHEET 2 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION MWO8

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT 8" Cabletool to 85 ft, 8" air rotary to 200 ft

WATER LEVELS _____ START 5-1-88 FINISH 5-8-88 LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8' - 8' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
36.0					SAND, (SW), with gravel, as above.	Add 5 gallons water. Add 15 gallons water heaving sand in casing; sample from strainer.
40.0					SAND, (SW), dark yellowish brown (10 yr 4/2), wet, loose, fine-to medium grained, poorly rounded. SILTY SAND, (SM), dark yellowish brown (10 yr 4/2), 15-20% silt, with SILT, (ML), dark gray (N3), layer 8-inch thick, 10% organic fragments (plant/wood debris) at 45 feet bgs.	Wood fragments 0.2-inch diameter.
45.0	48.0					
	47.0		1.0	2-2-2 (4)		No heaving sand in casing; Driller reports higher permeability. 48 feet bgs water sample: T=18.0 degrees C pH=7.0 cond=800 F=0.4
	48.0					
	48.0		1.0	4-11-12 (23)	48 feet: SAND, (SW), dark gray, (N3), wet, very loose, fine-medium grained. 47 feet: SAND, (SW), as above except loose.	Driller add 10 gallons of water. Bailing silt fragments with sand; wood fragments (<1%)
60.0						
	55.0					
	58.0		0.8	1-1-2 (3)	SAND, (SW), as above, except very loose, with SILT, (ML), layers 1-2 inches thick, dark gray (N3), wet, very soft.	Driller reports no heaving sand in casing (55 feet).
65.0						
					SAND, (SW), dark yellowish brown (10 yr 4/2), wet, loose, fine-to coarse-grained, poorly rounded.	58 feet: Driller reports 15 feet heaving sand in casing. 58 feet bgs water sample: T=11.3 degrees C pH=8.77 cond=520 F=0.34



PROJECT NUMBER 107483.D8.02	BORING NUMBER MWO8-189
SHEET 3 OF 7	
SOIL BORING LOG	

PROJECT Reynolds Metals -- RMC-Troutdale	LOCATION MWO8
ELEVATION _____	DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT 8" Cabletool to 85 ft, 8" air rotary to 200 ft	
WATER LEVELS _____	START 5-1-88 FINISH 5-8-88 LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
85.0					SAND, (SW) as above.	Driller reports 8 feet heaving sand in casing - sample collected from bailer with strainer.
70.0					SAND, (SW), as above, with trace gravel (to 0.5-inch; 2%).	Sample from strainer.
75.0					SAND, (SW), as above, no gravel.	Sample from strainer driller reports heaving sand in casing.
80.0					SAND, (SW), as above.	75 feet bgs water sample: T=11.2 degrees C pH=8.8 cond=580 F=-0.31 Sample from strainer driller reports 20 feet of heaving sand in casing balling out pebbles (<1%) & silt fragments (<1%).
85.0					SAND, (SW), as above with pebbles to 81 feet.	Sample from strainer - driller reports slower casing advance at 83 feet bgs.
					SILT (ML), olive gray (5 y 4/1), wet, firm, trace wood fragments.	Note: Drilling with cabletool ends at 85 feet - not a permeable zone- air rotary on 5-8-88.
					SILTY GRAVEL, (GM), olive gray (5 y 4/1), wet, dense, silt approximately 20%, gravel to 2-inches (basalt).	
85.0					SILTY GRAVEL, (GM), as above.	85 feet bgs water sample: T=11.4 degrees C pH=8.88 cond=370 F=-0.41



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW08-189
SHEET 4 OF 7	
SOIL BORING LOG	

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION MW08
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
 DRILLING METHOD AND EQUIPMENT 8" Cabletool to 85 ft, 8" air rotary to 200 ft
 WATER LEVELS _____ START 5-1-88 FINISH 5-8-88 LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
85.0					GRAVEL (GW), olive black (5 y 2/1), wet, dense, partially cemented, cement tan, gravel moderately well rounded, primarily	Samples collected in strainer. Driller reports increased permeability percent of cement varies higher permeability corresponds to less cement.
95.0					GRAVEL (GW), as above.	Sample collected in strainer cement visible on gravel.
100.0					GRAVEL (GW), as above.	100 feet bgs water sample: T=12.2 degrees C pH=7.30 cond=110 F=0.38
105.0					GRAVEL (GW), as above.	102 feet: Cement color change to light gray - 103 feet: Cement tan. Formation producing constant water less than 20' gpm.
110.0					GRAVEL (GW), as above.	110 feet bgs water sample: T=11.8 degrees C pH=7.81 cond=110 F=0.38 Formation producing approximately 35 gpm.
115.0						



PROJECT NUMBER 107493.D08.02	BORING NUMBER MW08-189
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SHEET 5 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION MW08
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
 DRILLING METHOD AND EQUIPMENT 8" Cabletool to 85 ft, 8" air rotary to 200 ft
 WATER LEVELS _____ START 5-1-98 FINISH 5-9-98 LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" -8" -8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
125.0					GRAVEL (GW), as above.	Sample from cyclone into strainer. 122 feet bgs water sample: T=11.7 degrees C pH=7.82 cond=140 F=-0.38
					GRAVEL (GW), as above.	125 feet: Driller reports decreased permeability.
130.0					SILT (ML), dark yellowish brown (10 yr 4/2), wet, firm.	No water discharging from cyclone.
135.0					GRAVEL (GW), same as at 125 feet.	138 feet bgs water sample: T=12.5 degrees C pH=7.98 cond=212 F=-0.25 Driller reports higher permeability.
140.0					136-137 feet SAND (SW), olive gray (5y 3/2), wet, dense, partially cemented, 15% gravel. 137: GRAVEL (GW), olive black (5y 2/1), wet, dense, cement light olive brown (5y 5/8) gravel moderately well rounded.	Driller reports approximately 80 gpm from cyclone. 142 feet bgs water sample: T=12.2 degrees C pH=7.98 cond=212 F=-0.25
145.0					GRAVEL (GW), as above, cement dark yellowish orange (10 yr 8/8).	



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW08-188
SHEET 8 OF 7	
SOIL BORING LOG	

PROJECT Reynolds Metals -- RMC-Troutdale	LOCATION MW08
ELEVATION _____	DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT 8" Cabletool to 85 ft, 8" air rotary to 200 ft	
WATER LEVELS _____	START 5-1-88 FINISH 5-8-88 LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
155.0					GRAVEL, (GW), as above, cement dusky yellow green (5gy 5/2), some silt.	Driller reports lower permeability. Water is very silty.
160.0					GRAVEL, (GW), as above, greenish black (5gy 2/1).	Driller reports harder drilling. 155 feet bgs water sample: T=14.0 degrees C pH=8.23 cond=240 F--=0.26
165.0					SAND, (SW), dusky yellowish green (10gy 3/2), wet, loose, fine to very coarse-grained, poorly rounded, trace pebbles.	Driller reports sand heaving into casing and high permeability 80 gpm from cyclone.
170.0					GRAVEL, (GW), as above, weakly cemented, 5% silt. Weathered basalt, very dusky red purple (5rp 2/2), very dense.	182 feet bgs water sample: T=12.7 degrees C pH=8.42 cond=250 F--=0.25 Lower permeability reported (approximately 30 gpm).
175.0					Weathered basalt, very dusky red purple (5rp 2/2), very dense.	187 feet: 5 percent sand, 5 percent silt. Driller reports very low permeability (no water), hard drilling, sample from strainer and cyclone.



PROJECT NUMBER
107483.D8.02

BORING NUMBER
MW08-189

SHEET 7 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION MW08

ELEVATION

DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT 8" Cabletool to 85 ft, 8" air rotary to 200 ft

WATER LEVELS

START 5-1-88

FINISH 5-9-88

LOGGER Ivan Gall

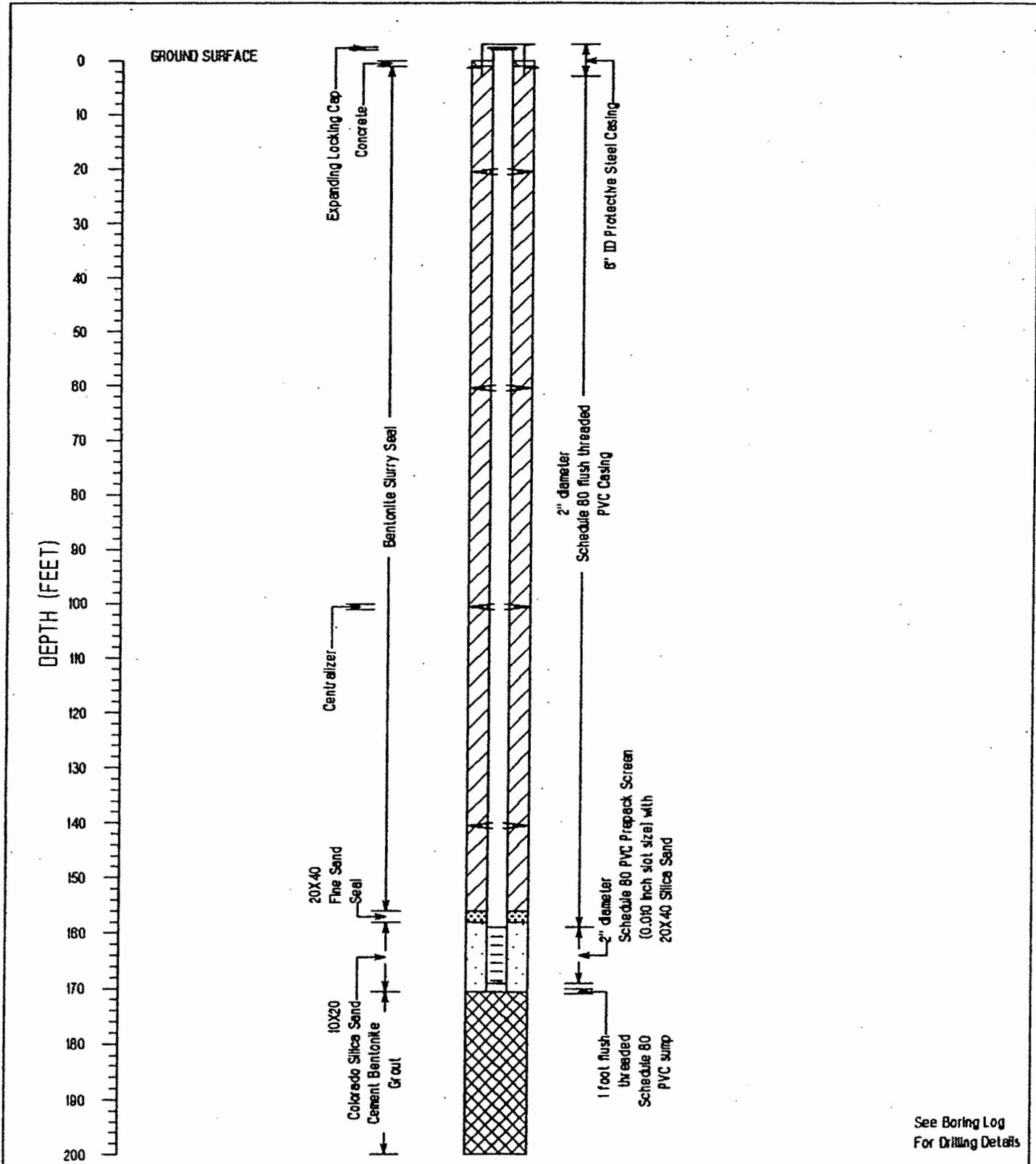
DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
	185.0					
190.0				Weathered basalt, as above, color now grayish purple (5p 4/2).	183-190 feet bgs water sample: T=14.0 degrees C pH=8.47 cond=280 F--=0.18	
195.0				188 feet: basalt, grayish black (N2), wet, very dense.	Driller reports harder drilling - low permeability (1-3 gpm). 183.0-200 feet bgs water sample: T=14.0 degrees C pH=8.37 cond=280 F--=0.18	
200.0				200 feet total depth bgs.	Total depth = 200 feet bgs.	
205.0						



PROJECT NUMBER 107493.D0.02	BORING NUMBER MW08-169	SHEET 1 OF 1
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WELL COMPLETION LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION MW08
ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT 8" Cabletool to 85 ft, 8" air rotary to 200 ft
WATER LEVELS _____ START 5-22-88 FINISH 5-23-88 LOGGER Ivan Gall





PROJECT NUMBER OPE39293.B1.01	WELL NUMBER MW-09 -030	SHEET 1 OF 1
MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG		

PROJECT RMC Troutdale LOCATION N. Landfill
 MEASURING POINT ELEV (NGVD) 29.27 DRILLING CONTRACTOR GeoTech Exploration
 DRILLING METHOD AND EQUIPMENT 8 3/4" ID HSA
 WATER LEVEL ELEV/DATE _____ START 8/4/94 8:30 AM FINISH 8- - - LOGGER Phil Brown

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" -6" -6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION	WELL COMPLETION DIAGRAM	
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET				DESCRIPTION	DIAGRAM
2.5					SANDY SILT W/GRAVEL, SM, loamy. 5% gravel to 1" angular, basaltic, dry, lt. gray/brown, firm.	SM	Locking Cap	<p>Concrete Pad</p> <p>Voiclay 3/4" Chips</p> <p>2" Diameter, Schedule 40 Flush-threaded PVC Casing</p> <p>6" Diameter Locking Mild Steel</p> <p>Stainless Steel Centralizer</p> <p>CSSI 20x40 Colorado Silica Sand</p> <p>2" Diameter Schedule 40 Flush-threaded PVC Screen</p> <p>2" Diameter Schedule 40 PVC Silt Trap w/Secured Bottom Plug</p>
5.0	5.0			5-8-7 (13)	SILTY SAND, SM, lt. brown, damp, medium fine, some minor coarse salt and pepper sand.	SM		
7.5				5-10-10 (20)	As above 6"; then coarser to med. Less silt, SM/SP, mottled reduction at base, some clay nodules (5%).	SM		
10.0	10.0			4-5-7 (12)	4" SM as above, then SAND, SP, medium, lt. brown, damp, loose.	SM		
12.5				8-12-10 (22)	4" SM, brown/gray, mottled, damp firm. Then SAND, SP, salt & pepper, s. moist, medium-coarse, loose.	SP		
15.0	15.0			4-6-8 (14)	As above; moist to wet.	SP		
17.5				9-9-8 (17)	SAND, SP, darker, coarser salt and pepper, more angular. Columbia River sand (?), v. moist.	SP		
20.0	20.0			6-8-9 (17)	As above. Wet at base, minor fine layer at 19.5'.	SP		
22.5				3-6-7 (13)	As above, wet.	SP		
25.0	25.0			4-9-11 (20)	As above. 0.5" silt layer at 24', red staining below silt.	SP		
27.5				3-4-5 (9)	As above. Silty clay layer=1.5' thick.	SP		
30.0	27.5				SP as above. 6" recovery.	SP		



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW12-184
SHEET 1 OF 7	
SOIL BORING LOG	

PROJECT Reynolds Metals -- RMC-Troutdale	LOCATION West Side of Site Along Sundial Road
ELEVATION _____	DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Cable Tool; 10"ID Steel Casing to 8.5 ft, 8"ID-200	
WATER LEVELS _____	START 5-10-98 FINISH 5-17-98 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
6.0					2-3 inch rock fill over geotextile liner drill pad. <u>SILTY SANDY GRAVEL</u> , (GM), brown, damp, loose, medium to coarse sand, fine gravel, approximately 20 percent silt, less than 15 percent sand.	Drive 10 inch diameter casing to 8.5 feet bgs, then drive 8 inch casing.
					<u>SILT</u> , (MH), gray, moist, soft, elastic.	
10.0	10.0				<u>SILT</u> , (MH), gray, moist, soft, elastic.	
	11.5		1.5	2-2-3 (5)		
15.0					<u>SILT</u> , (MH), as above except with sand, medium grained.	
20.0	20.0				<u>SILT with SAND</u> , (MH), as above except firm.	20 feet bgs water sample: T=14 degrees C pH=8.58 cond=380 F=-0.81
	21.5		1.5	8-5-5 (10)		
25.0					<u>SILT with SAND</u> , (MH), as above, increased percentage of sand.	Increased percentage of sand.



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW12-184

SHEET 2 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION West Side of Site Along Sundial Road

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool, 10"ID Steel Casing to 8.5 ft, 8"ID-200

WATER LEVELS _____ START 5-10-88 FINISH 5-17-88 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0' - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
35.0					SILT with SAND, (MH), as above.	30 feet bgs water sample: T=15 degrees C pH=8.37 cond=800 F=-0.20
40.0	40.0		1.5	10-12-20 (32)	SAND, (SW), gray, wet, medium dense, fine to medium grained with a trace of silt.	40 feet bgs water sample: T=15 degrees C pH=8.81 cond=810 F=-0.30
45.0					SAND, (SW), as above.	Driller reports sand heaving into casing.
50.0					SAND, (SW), as above.	50 feet bgs water sample: T=18.5 degrees C pH=8.23 cond=750 F=-0.51
55.0					SAND, (SW), as above.	Driller reports sand heaving into casing.
80.0	80.0					



PROJECT NUMBER 107493.08.02	BORING NUMBER MW12-184	SHEET 3 OF 7
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SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION West Side of Site Along Sundial Road
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
 DRILLING METHOD AND EQUIPMENT Cable Tool; 10"ID Steel Casing to 8.5 ft, 8"ID-200
 WATER LEVELS _____ START 5-10-88 FINISH 5-17-88 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
80.0	80.0		1.5	10-50-80/1"	SAND. (SW), gray, wet, medium dense to dense, fine to medium grained, no silt. Trace of micaceous flakes and red grains of sand.	80 feet bgs water sample: T=18 degrees C pH=8.54 cond=820 F--=0.48
85.0	81.5				SAND. (SW), as above.	Driller reports sand heaving into casing. At approximately 70 feet bgs driller notices sheen and change in water color to brown from gray. Brown sudsy bubbles on water surface.
70.0					SAND. (SW), as above.	70 feet bgs water sample: T=17 degrees C pH=8.5 cond=500 F--=0.55
75.0					SAND. (SW), as above.	Collected soil sample at 80 feet from bailer with strainer. Driller reports sand heaving into casing.
80.0					SAND. (SW), as above.	80 feet bgs water sample: T=18.5 degrees C pH=8.72 cond=800 F--=0.58
85.0					SAND. (SW), as above.	No more brown foam observed at 87 feet bgs.



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW12-184
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SHEET 4 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** West Side of Site Along Sundial Road
ELEVATION _____ **DRILLING CONTRACTOR** Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Cable Tool; 10" ID Steel Casing to 8.5 ft, 8" ID-200
WATER LEVELS _____ **START** 5-10-88 **FINISH** 5-17-88 **LOGGER** K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
85.0					SAND, (SW), as above except a little coarse grained.	90 feet bgs water sample: T=17.1 degrees C pH=8.88 cond=580 F=-0.347,
85.0					SAND, (SW), as above with trace fine subangular gravel, coarser to fine grained sand, still micaceous.	85 feet bgs water sample: T=16.8 degrees C pH=8.78 cond=480 F=-0.382
100.0					SAND, (SW), as above.	Drilling reports harder drilling.
105.0					SAND, (SW), as above except no coarse sand or fine gravel.	105 feet bgs water sample: T=18.3 degrees C pH=8.87 cond=800 F=-0.48
110.0					SAND, (SW), as above except some coarse sand and fine gravel.	
115.0					SAND, (SW), as above with a trace of light weight white pumice or ash.	115 feet bgs water sample: T=21.4 degrees C pH=7.17 cond=800 F=-0.33



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW12-184	SHEET 5 OF 7
SOIL BORING LOG		

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION West Side of Site Along Sundial Road
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
 DRILLING METHOD AND EQUIPMENT Cable Tool; 10"ID Steel Casing to 8.5 ft, 8"ID-200
 WATER LEVELS _____ START 5-10-88 FINISH 5-17-88 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
125.0	125.0				SAND, (SW), as above with rounded fine to coarse gravel.	Driller reports sand heaving into casing.
	128.5		0.0	30-30-30/3"	No recovery	125 feet bgs water sample: T=18 degrees C pH=8.47 cond=720 F--=0.48
130.0					SAND, (SW), as above.	Collected sample with strainer from baller.
135.0	135.0				SAND, (SW), gray, wet, medium dense to dense, fine to medium grained, no gravel, some mica and red sand grains.	135 feet bgs water sample: T=15 degrees C pH=8.34 cond=580 F--=0.34
	138.5		1.0	8-12-80 (72)		
140.0					SAND, (SW), as above. Some gravel starting to appear in cuttings along with some coarse sand.	Drilling becomes harder at 140 feet.
145.0					SAND, (SW), as above with some coarse sand and fine black gravel, angular to subrounded.	145 feet bgs water sample: T=15 degrees C pH=8.82 cond=700 F--=0.48



PROJECT NUMBER
107483.08.02

BORING NUMBER
MW12-184

SHEET 8 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION West Side of Site Along Sundial Road

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool; 10"ID Steel Casing to 8.5 ft, 8"ID-200

WATER LEVELS _____ START 5-10-98 FINISH 5-17-98 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
					SAND, (SW), as above.	Driller reports difficulty driving casing.
155.0					SAND, (SW), as above.	155 feet bgs water sample: T=18 degrees C pH=7.47 cond=800 F--=0.52
160.0					SAND, (SW), as above. Some fine gravel.	
165.0					SAND, (SW), as above.	165 feet bgs water sample: T=14 degrees C pH=7.25 cond=420 F--=0.24
170.0					SAND, (SW), as above.	
175.0					SAND, (SW), as above with some fine subangular gravel, wood fragments.	175 feet bgs water sample: T=18 degrees C pH=7.35 cond=520 F--=0.18



PROJECT NUMBER 107493.08.02	BORING NUMBER MW12-184	SHEET 7 OF 7
SOIL BORING LOG		

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** West Side of Site Along Sundial Road

ELEVATION _____ **DRILLING CONTRACTOR** Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool, 10" ID Steel Casing to 8.5 ft, 8" ID-200

WATER LEVELS _____ **START** 5-10-98 **FINISH** 5-17-98 **LOGGER** K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8' - 8' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
185.0					SAND, (SW), as above, coarser gravel, angular to subrounded.	Driller reports sand heaving into casing.
195.0					SAND, (SW), as above.	195 feet bgs water sample: T=20 degrees C pH=7.39 cond=880 F--=0.15
190.0					SAND, (SW), as above except increasing percentage of fine to coarse gravel, subangular to rounded (1/4" - 4" diameter), evidence of cementing, some wood fragments.	Driller reports sand heaving into casing.
195.0					SAND, (SW), as above.	195 feet bgs water sample: T=18 degrees C pH=7.82 cond=520 F--=0.14
200.0					SAND, (SW), as above. Bottom of hole at 200 feet.	200 feet bgs water sample: T=14 degrees C pH=7.7 cond=580 F--=0.20
205.0						



PROJECT NUMBER

107493.08.02

BORING NUMBER

MW12-184

SHEET 1 OF 1

WELL COMPLETION LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION West Side of Site Along Sundlal Road

ELEVATION _____

DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

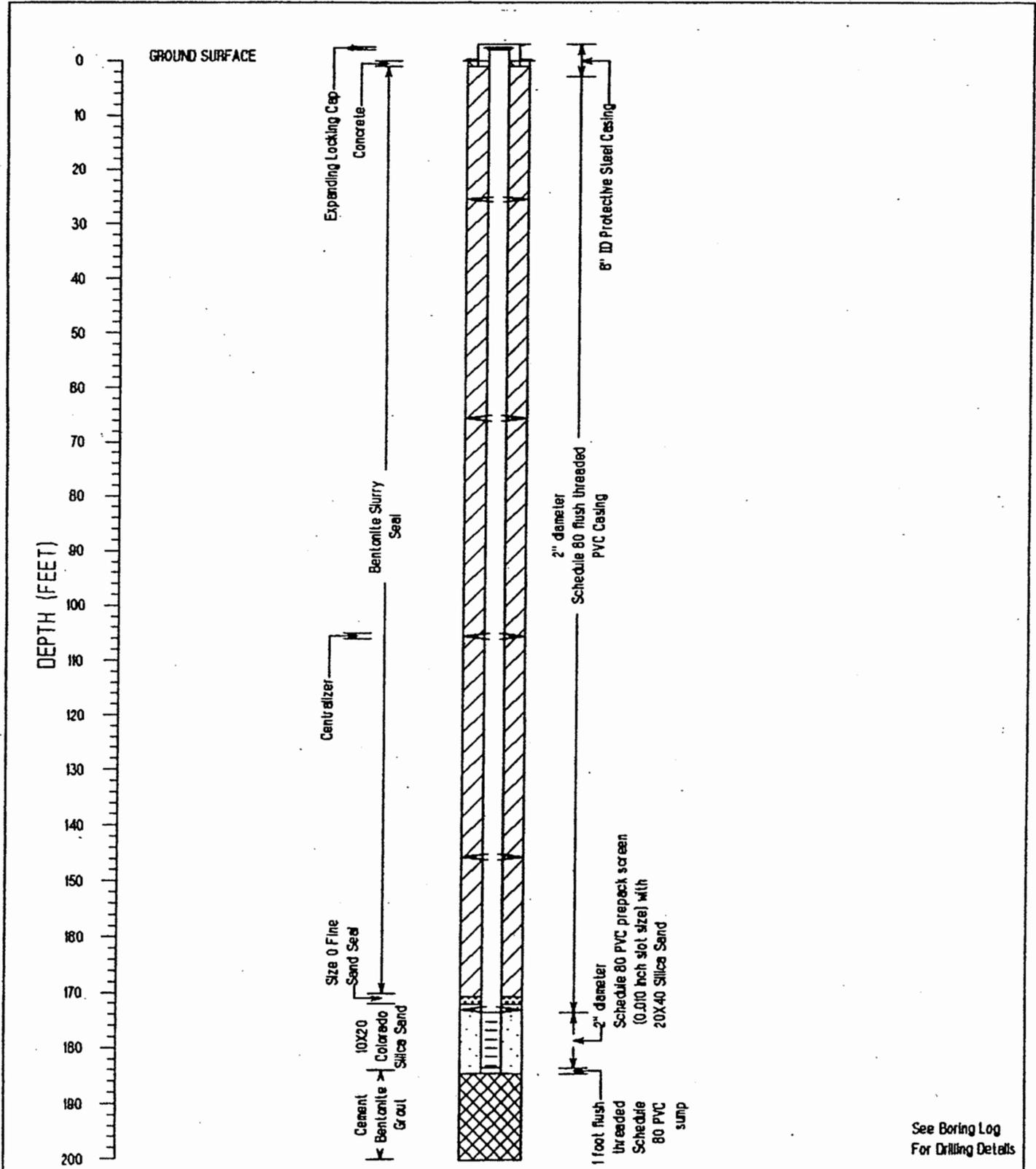
DRILLING METHOD AND EQUIPMENT Cable Tool, 10" ID Steel Casing to 8.5 ft, 8" ID-200

WATER LEVELS _____

START 5-17-98

FINISH 5-21-98

LOGGER K. Gehweiler



See Boring Log
For Drilling Details



PROJECT NUMBER
107493.L1.02

WELL NUMBER
MW15

SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Aluminum Company - Troutdale, OR

LOCATION Fairview Farms

MEASURING POINT ELEV (NGVD) 22.75

DRILLING CONTRACTOR Geo-Tech Explorations

DRILLING METHOD AND EQUIPMENT HSA - Mobile Drill B-59, 8-1/4" ID Auger

WATER LEVEL ELEV/DATE START 7/13/95

FINISH 7/13/95

LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0'-0'-0' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION	WELL COMPLETION DIAGRAM
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET				
5.0	2.5				Silty Loam, Med. brown, dry, firm, grassroots Comments: MW15-0000-0*	ML	<p>8-in. diameter steel locking casing Concrete Bentonite pellet seal 3/4-inch Envrwrapug 15 feet of 2-inch diameter, Sch. 40 flush-threaded PVC casing 2-inch diameter, Sch. 40, flush-threaded PVC screen (0.010 inch slot size) 2-inch diameter, Sch. 40 PVC silt trap w/secured bottom plug</p>
	4.0		1.2	4-2-3 (9)	Silt w/Sand, (ML), Lt. orange tan, dry, firm, orange mottling, sand ~15%, v. fine grained Comments: MW15-0025-0*		
	5.0						
	8.5		1.3	1-2-3 (8)	Silt, (ML), orange tan, damp, v. firm, orange mottling, 5% v. fine sand Comments: MW15-0050-0*		
	7.5						
10.0	9.0		1.5	2-1-2 (5)	Silt, (ML), as above, Some carbon frags, worm burrows contain water, damp	ML	
	10.0						
	11.5		1.5	2-2-3 (7)	Silt, (ML), as above, Wet in worm burrows		
	12.5						
15.0	14.0		1.5	1-3-2 (8)	Silt, (ML) as above, Wet, to 13 ft. sharp contact with sand w/ silt, SP-SM, gray-green, firm, wet, 15% silt, v. fine sand	ML	
	15.0						
	18.5		1.5	2-3-4 (9)	Silt, (ML), tan w/orange mottling, damp, v. firm, to 18.2 ft. silt w/sand, ML, gray-green, wet, firm, ~10% v. fine sand		
	17.5						
	19.0		1.5	2-2-3 (7)	Sand w/Silt, (SP-SM), gray-green, wet, loose, alternating silt-rich layers, sand fine-grained, silt slightly plastic Comments: Driller Reports Heaving		
20.0	20.0					ML	
	21.5		1.5	2-2-3 (7)	Silt w/Sand, (ML), gray-green, damp, v. firm, ~10% - 15% v. fine sand (to 21.1 ft.) - Sharp contact with sand w/silt, (SP-SM), gray-green, wet, loose, 20% silt		
	22.5						
25.0	24.0		1.5	2-2-4 (8)	Silt, (ML), OK gray, wet, v. firm, variable grain size and moisture content	ML	
	25.0						
	28.5			4-7-11 (22)	Silt, (ML), as above * = Soil Sample		



PROJECT NUMBER

107493.08.02

BORING NUMBER

MW15-088

SHEET 1 OF 4

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION West Side of Site Along Sundial Road

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool; Drilling 8-inch I.D. Steel Casing

WATER LEVELS _____ START 9-3-88 FINISH 9-5-88 LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8' - 8' (N)	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
50					0-1 feet: Crushed basalt pad	
100	10.0					Driller adds 10 gallons of water for balling. Casing advancing very easily.
	11.5		1.5	1-1-2 (3)	SILT (ML), light olive gray with orange mottling, damp, very soft, trace fine sand and mica.	
150						Casing/Drilling very easy, driller adds 5 gallons of water. Percentage of sand in silt increases with depth.
200	20.0					20 feet bgs water sample: T=18 degrees C pH=8.42 cond=180 F=-1.8, Eh=-312
	21.5		1.2	4-4-8 (10)	SAND with SILT, (SW-SM), light olive gray, wet, loose, approximately 15 percent silt, sand fine to medium grained.	Water level in 8 inch casing recovers to approximately 10 feet bgs in 5 minutes. Driller reports good permeability in formation.
250	27.0					
	28.5		1.2	13-14-19 (33)	SAND, (SW), grayish olive green (5yr 3/2), wet, medium dense, fine to medium grained, trace of silt and mica, with silt-rich laminae 1-2 inches thick.	

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION West Side of Site Along Sundial Road

ELEVATION _____

DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool; Drilling 8-inch I.D. Steel Casing

WATER LEVELS _____

START 8-3-88

FINISH 8-5-88

LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
	80.0	81.5		1.0	8-4-3 (7)	<p>SAND, (SW), grayish olive green (5 yr 3/2), wet, loose, fine to medium grained, approximately 5% silt, trace wood fragments.</p>
70.0	71.5		1.3	38-50-42 (82)		
75.0					<p>SAND, (SW), medium dark gray (N4), wet, dense, fine to medium grained, trace red grains and mica, some siltier laminae (to 1-inch thick).</p>	<p>70 feet bgs water sample: T=15.5 degrees C pH=7.18 cond=220 F=-0.42, Eh=-283</p> <p>Driller adds 15 gallons of water to casing.</p>
80.0	81.5		0.7	5-8-10 (18)	<p>SAND, (SW), as above, except loose, trace of wood fragments (to 2-inch length), no silt.</p>	<p>80 feet bgs water sample: T=14.5 degrees C pH=8.88 cond=210 F=-0.38, Eh=-113</p> <p>Driller adds 20 gallons of water to casing.</p>



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW15-088
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SHEET 4 OF 4

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC--Troutdale LOCATION West Side of Site Along Sundial Road
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
 DRILLING METHOD AND EQUIPMENT Cable Tool; Drilling 8-Inch I.D. Steel Casing
 WATER LEVELS _____ START 8-3-88 FINISH 8-5-88 LOGGER Ivan Gall

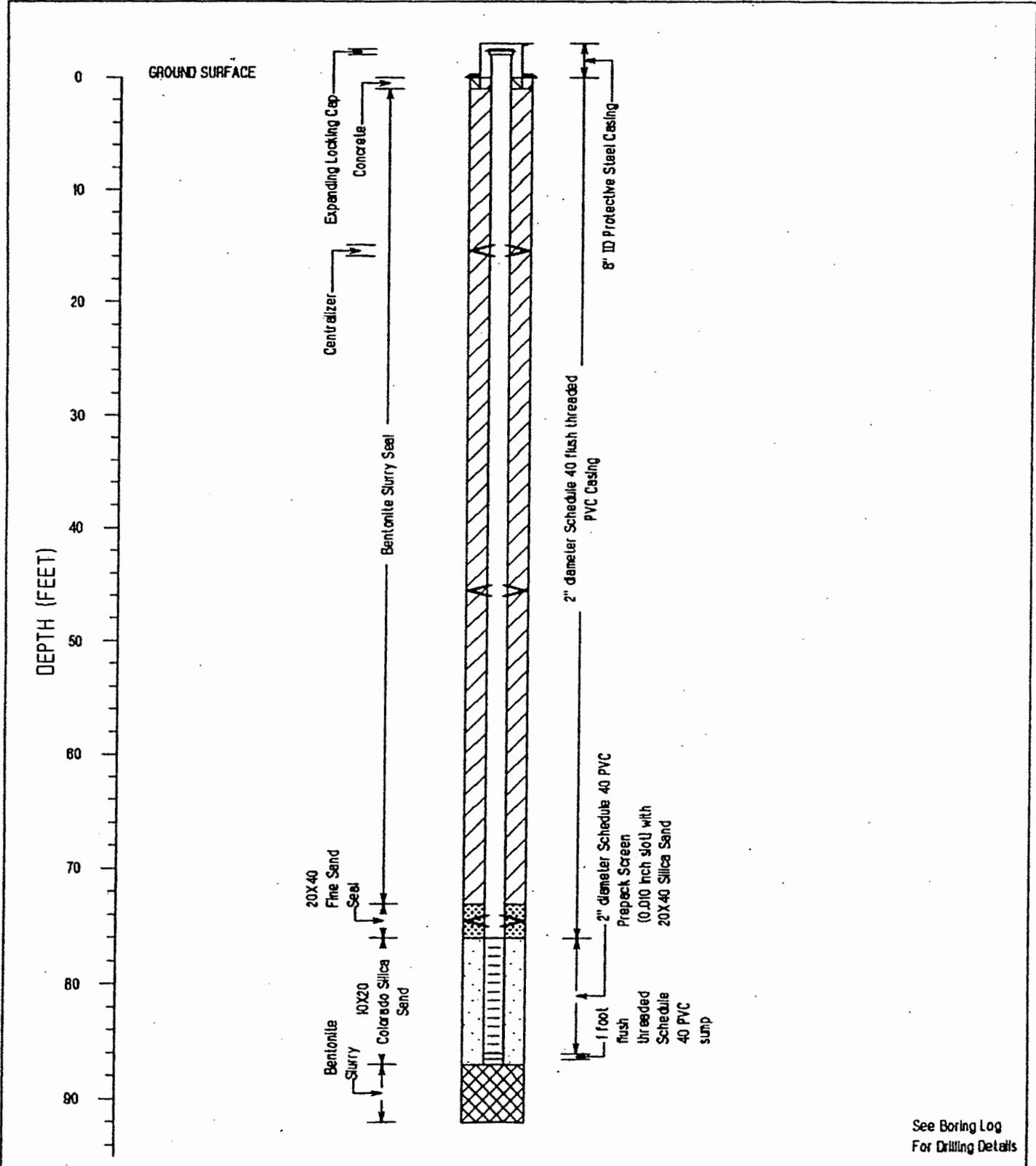
DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
82.0					SAND, (SW), as above, except no silt or wood fragments.	82 feet bgs water sample: T=13 degrees C pH=8.82 cond=175 F=-0.41, Eh=-88
83.5			1.5	8-23-28 (51)		
85.0						
90.0						
95.0						
100.0						
105.0						
110.0						
115.0						



PROJECT NUMBER 107493.08.02	BORING NUMBER MW15-088	SHEET 1 OF 1
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WELL COMPLETION LOG

PROJECT Reynolds Metals -- RMC-Troutdale	LOCATION West Side of Site Along Sundial Road		
ELEVATION _____	DRILLING CONTRACTOR Tacoma Pump & Drilling Co.		
DRILLING METHOD AND EQUIPMENT Cable Tool; Drilling 8-Inch I.D. Steel Casing			
WATER LEVELS _____	START 9-23-98	FINISH 9-23-98	LOGGER Ivan Gall





PROJECT NUMBER
107483.DB.02

BORING NUMBER
MW15-175

SHEET 1 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION West Side of Site Along Sundlal Road

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool

WATER LEVELS _____ START 5-22-88 FINISH 5-30-88 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0' - 0' - 0' (N)	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET.			
5.0					0-0.5 feet III, GRAVEL (GW), gray, dry, loose, coarse, angular to subrounded.	
					0.5-2 SILTY SANDY GRAVEL (GM), brown, damp, loose. SILT with SAND, (MH), brown, damp, soft.	
10.0					SILT with SAND, (MH), brown, damp, soft, slightly elastic.	
					SILT with SAND, (MH), brown, damp, soft.	
20.0	20.0				SILT with SAND, (MH), as above except gray.	20 feet bgs water sample: T=13 degrees C pH=8.3 cond=212 F--=0.23.
	21.5		1.5	4-4-5 (9)		
25.0					SILT with SAND, (MH), as above, higher percentage of sand.	



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW15-175
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SHEET 2 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION West Side of Site Along Sundial Road
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
 DRILLING METHOD AND EQUIPMENT Cable Tool
 WATER LEVELS _____ START 5-22-88 FINISH 5-30-88 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
35.0	35.0				SAND, (SW), dark gray, wet, loose to medium dense, fine to medium grained, no silt, some red sand grains.	30 feet bgs water sample: T=14 degrees C pH=8.35 cond=212 F--=0.18.
	38.5		1.5	4-10-50/4"	SAND, (SW), as above.	35 feet bgs water sample: T=15 degrees C pH=8.9 cond=500 F--=0.31.
40.0					SAND, (SW), as above slightly coarser grained.	
45.0					SAND, (SW), as above.	45 feet bgs water sample: T=18 degrees C pH=8.8 cond=810 F--=0.27
60.0					SAND, (SW), as above.	
65.0					SAND, (SW), as above.	55 feet bgs water sample: T=15 degrees C pH=8.5 cond=520 F--=0.28.



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW15-175	SHEET 3 OF 7
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SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION West Side of Site Along Sundial Road
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
 DRILLING METHOD AND EQUIPMENT Cable Tool
 WATER LEVELS _____ START 5-22-88 FINISH 5-30-88 LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
					SANDL (SW), as above.	
65.0					SANDL (SW), as above.	85 feet bgs water sample: T=14 degrees C pH=8.5 cond=500 F=-0.34.
70.0					SANDL (SW), as above.	
75.0					SANDL (SW), as above.	
80.0					SANDL (SW), as above except fine to coarse grained sand.	Sheen and some brown foam observed in bailed water from 75-85 interval. Appears similar to sheen and foam noted during drilling of MW12-D.
85.0					SANDL (SW), as above.	85 feet bgs water sample: T=16 degrees C pH=8.5 cond=580 F=-0.33.



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW15-175

SHEET 4 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION West Side of Site Along Sundial Road

ELEVATION _____

DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool

WATER LEVELS _____

START 5-22-88

FINISH 5-30-88

LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0' - 0' - 0' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
85.0	85.0				SAND. (SW), as above.	
	88.5		1.5	18-50-50 (100)	SAND. (SW), as above except well-graded sand with fine to coarse, rounded to angular gravel.	
100.0					SAND. (SW), as above.	87 feet bgs water sample: T=18 degrees C pH=8.8 cond=810 F=-0.31. Soil Sample at 87 feet was sand heaved into casing.
105.0					SAND. (SW), as above except less gravel and a little finer grained.	105 feet bgs water sample: T=14 degrees C pH=8.8 cond=800 F=-0.44
115.0	115.0					
	118.5		1.5	25-80-50/3"	SAND. (SW), gray, wet, very dense, fine to coarse grained with trace fine rounded to subangular gravel.	115 feet bgs water sample: T=17.5 degrees C pH=8.5 cond=800 F=-0.41 Soil: PID=1.5 ppm, FID=35 ppm Background=0.2-0.8



PROJECT NUMBER

107493.08.02

BORING NUMBER

MW15-175

SHEET 5 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION West Side of Site Along Sundial Road

ELEVATION

DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool

WATER LEVELS

START 5-22-88

FINISH 5-30-88

LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	0'-8"-8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
125.0					SAND, (SW), as above.	
130.0					SAND, (SW), as above except loose to medium dense.	125 feet bgs water sample: T=17.5 degrees C pH=8.7 cond=580 F=-0.32.
135.0	135.0				SAND, (SW), as above.	
136.5	136.5		1.2	3-8-15 (24)	SAND, (SW), as above with trace of wood fragments/plant material.	135 feet bgs water sample: T=18.4 degrees C pH=8.48 cond=580 F=-0.34 PID=0.22 ppm FID=240 ppm max Background=0.02 ppm
140.0					SAND, (SW), as above.	
145.0					SAND, (SW), as above.	145 feet bgs water sample: T=15 degrees C pH=8.58 cond=480 F=-0.35.



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW15-175

SHEET 8 OF 7

SOIL BORING LOG

PROJECT Reynolds Metals --- RMC-Troutdale

LOCATION West Side of Site Along Sundial Road

ELEVATION _____

DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool

WATER LEVELS _____

START 5-22-88 -

FINISH 5-30-88

LOGGER K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
155.0	155.0				SAND, (SW), as above except no plant material.	
158.5	158.5		1.2	3-7-25 (32)	SAND, (SW), gray, wet, medium dense, fine to coarse grained sand, some fine 1/4 inch gravel subrounded, no plant material.	155 feet bgs water sample: T=15.8 degrees C pH=8.85 cond=318 F--=0.34. Sol: PID=0.7 ppm FID=280 max Background: PID=0 FID=1
180.0					SAND, (SW), as above.	
185.0					SAND, (SW), as above.	185 feet bgs water sample: T=17.2 degrees C pH=8.8 cond=410 F--=0.38. PID/FID detects 0/5 ppm in borehole at 185 feet bgs.
172.0	172.0				SAND, (SW), as above except medium dense to dense.	
173.5	173.5		1.0	18-20-35 (55)		173 feet bgs water sample: T=14.8 degrees C pH=7.04 cond=440 F--=0.32 PID/FID 0/80
175.0						



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW15-175	SHEET 7 OF 7
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SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** West Side of Site Along Sundial Road
ELEVATION _____ **DRILLING CONTRACTOR** Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Cable Tool
WATER LEVELS _____ **START** 5-22-88 **FINISH** 5-30-88 **LOGGER** K. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8' - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
186.0					SAND, (SW), as above.	181 feet bgs water sample: T=14.4 degrees C pH=8.55 cond=550 F--=0.32
190.0	181.0				SAND, (SW), as above.	
	192.5		1.5	3-12-40 (52)	SAND, (SW), as above.	181 feet bgs water sample: T=20.3 degrees C pH=7.28 cond=330 F--=0.34.
195.0					SAND, (SW), as above.	
200.0					SAND, (SW), as above. Bottom of hole at 200 feet bgs.	200 feet bgs water sample: T=13 degrees C pH=8.8 cond=382 F--=0.28.
205.0						



PROJECT NUMBER

107493.08.02

BORING NUMBER

MW15-175

SHEET 1 OF 1

WELL COMPLETION LOG

PROJECT Reynolds Metals --- RMC-Troutdale

LOCATION West Side of Site Along Sundial Road

ELEVATION

DRILLING CONTRACTOR

Tacoma Pump & Drilling Co.

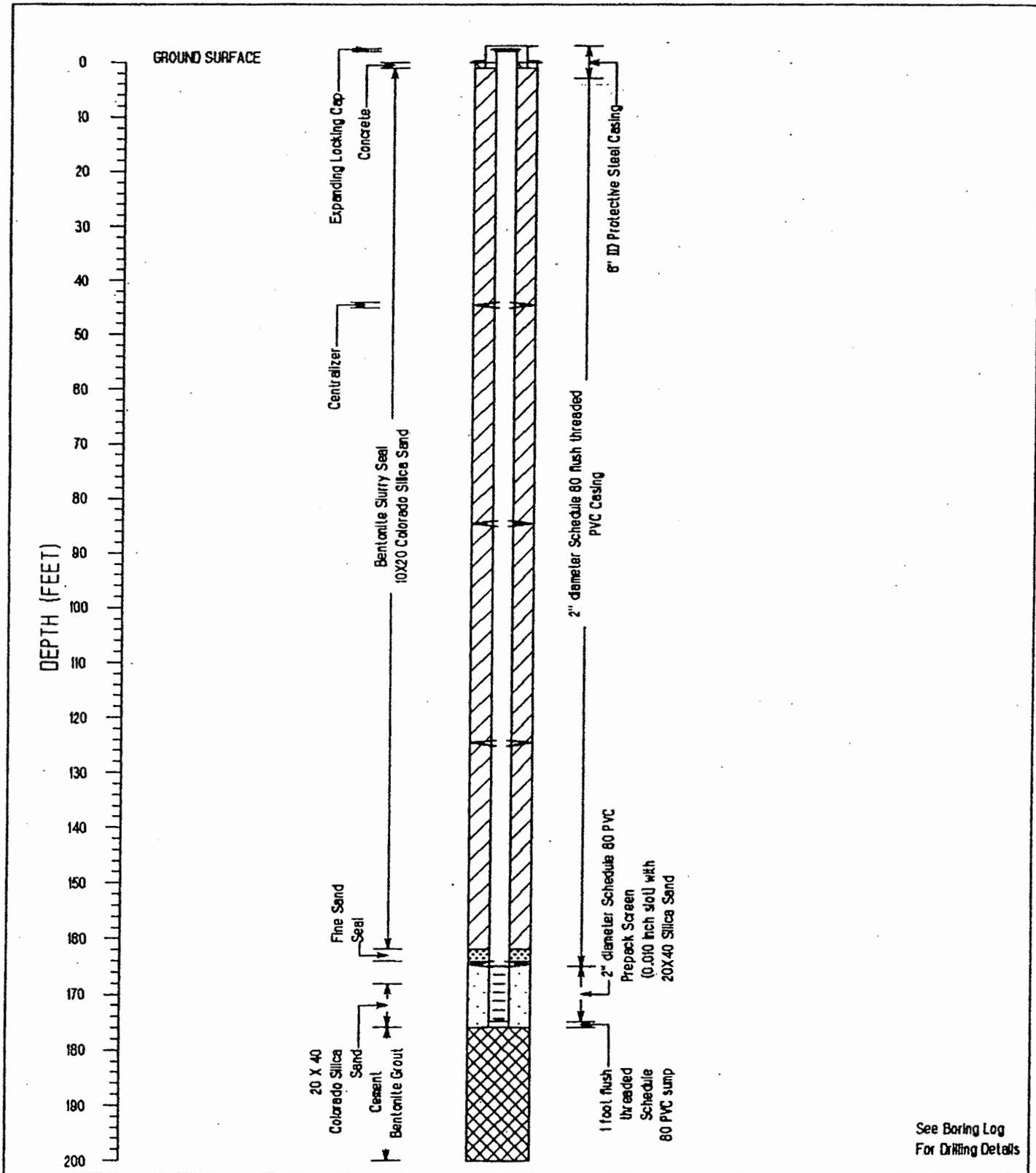
DRILLING METHOD AND EQUIPMENT Cable Tool

WATER LEVELS

START 5-22-88

FINISH 5-30-88

LOGGER K. Gehweller





PROJECT NUMBER
107493.NI.02

WELL NUMBER
MW20-024

SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Aluminum Company - Troutdale, OR

LOCATION Company Lake

MEASURING POINT ELEV (NGVD) 28.48

DRILLING CONTRACTOR Geo-Tech Explorations

DRILLING METHOD AND EQUIPMENT 8-1/4" ID HSA

WATER LEVEL ELEV/DATE

START 9/1/95

FINISH 9/1/95

LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0" - 0" - 0" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION	WELL COMPLETION DIAGRAM	
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET					
	2.5				0-0.5 ft. gravel for road 0.5 ft. silty loam w/plant roots		Concrete	
5.0	4.0		0.5	2-3-3 (8)	Silt, (ML), Brownish gray; (5 yr 4/1) to-ft. brownish-gray (5 yr 8/1), damp, firm	ML	Bentonite pellet seal Coarse Enviroplug	18.1 feet of 2-inch diameter, Sch. 40 flush-threaded PVC casing
	5.0				Silt, (ML), as above, dusky yellowish-brown (10 yr 2/2)			
	6.5		0.5	3-4-4 (11)				
	7.5							
10.0	8.0		1.0	2-2-4 (8)	Silt w/Sand, (ML), Brownish-gray, (5 yr 4/1), Moist, firm, 15% very fine sand	SP	Colorado silica sand 20-40	2-inch diameter, Sch. 40, flush-threaded PVC screen (0.010 inch slot size)
	10.0				Sand, (SP), Brownish-gray (5 yr 4/1) damp, loose, fine-medium grained			
	11.5		0.8	3-4-5 (12)				
	12.5							
15.0	14.0		0.8	4-3-8 (13)	Sand, (SP), As above, medium to coarse grained, damp	SP	Stainless Steel Centralizer	Stainless Steel Centralizer
	15.0				Sand, (SP), As above, damp			
	16.5		0.7	4-4-8 (14)				
	17.5							
20.0	19.0		1.0	7-8-5 (18)	Sand, (SP), As above, wet	SP	Stainless Steel Centralizer	Stainless Steel Centralizer
	20.0				Sand, (SP), As above, wet			
	21.5		1.2	1-4-7 (12)				
	22.5				No Sample			
25.0	24.0					SP	Stainless Steel Centralizer	Stainless Steel Centralizer
	25.0				Sand, (SP), As above, wet			
	26.5			2-2-3 (7)				



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW21-083

SHEET 1 OF 3

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC--Troutdale LOCATION Northeast Corner of NLF

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool; Drilling 8-Inch ID Steel Casing

WATER LEVELS _____ START 9-30-98 FINISH 10-1-98 LOGGER T. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
				8" -8" -8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.0					0-1.5 feet: Crushed basalt fill.	Driller adds water to bail out hole.
					SILT, (ML), brown, damp, firm. Hit root at 4 feet.	
10.0	10.0				SAND, (SW), yellow brown, moist, very loose, medium to fine grained, no silt.	Casing advancing easily; add water to bail hole.
	11.5		1.5	4-4-8 (10)	SAND, (SW), as above, except wet, loose.	
25.0					SAND, (SW), as above, except fine to coarse grained.	25 feet bgs water sample: T=18.5 degrees C pH=8.88 cond=348 F=-6.8
	28.5		1.5	4-4-8 (12)	SAND, (SW), as above, except medium to coarse grained.	



PROJECT NUMBER 107483.D8.02	BORING NUMBER MW21-083
SHEET 2 OF 3	
SOIL BORING LOG	

PROJECT Reynolds Metals -- RMC-Troutdale	LOCATION Northeast Corner of NLF
ELEVATION _____	DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Cable Tool, Drilling 8-Inch ID Steel Casing	
WATER LEVELS _____	START 8-30-88 FINISH 10-1-88 LOGGER T. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
35.0				8" - 8" - 8" (N)	SAND, (SW), as above, except fine to medium grained.	
40.0	40.0					
40.0	41.5		1.5	4-12-12 (24)	SAND, (SW), gray brown, wet, medium dense, fine to medium grained.	50 feet bgs water sample: T=14.0 degrees C pH=8.4 cond=338 F--=0.84
45.0					SAND, (SW), as above, except trace coarse grains, mica flakes, and red grains of sand.	
50.0	50.0				SAND, (SW), as above except trace wood fragments, very loose.	
50.0	51.5		0.8	2-3-4 (7)		
55.0					SAND, (SW), as above except loose, with 5 percent silt.	



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW21-083

SHEET 3 OF 3

SOIL BORING LOG

PROJECT Reynolds Metals --- RMC-Troutdale

LOCATION Northeast Corner of NLF

ELEVATION

DRILLING CONTRACTOR

Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool; Drilling 8-inch ID Steel Casing

WATER LEVELS

START 8-30-88

FINISH 10-1-88

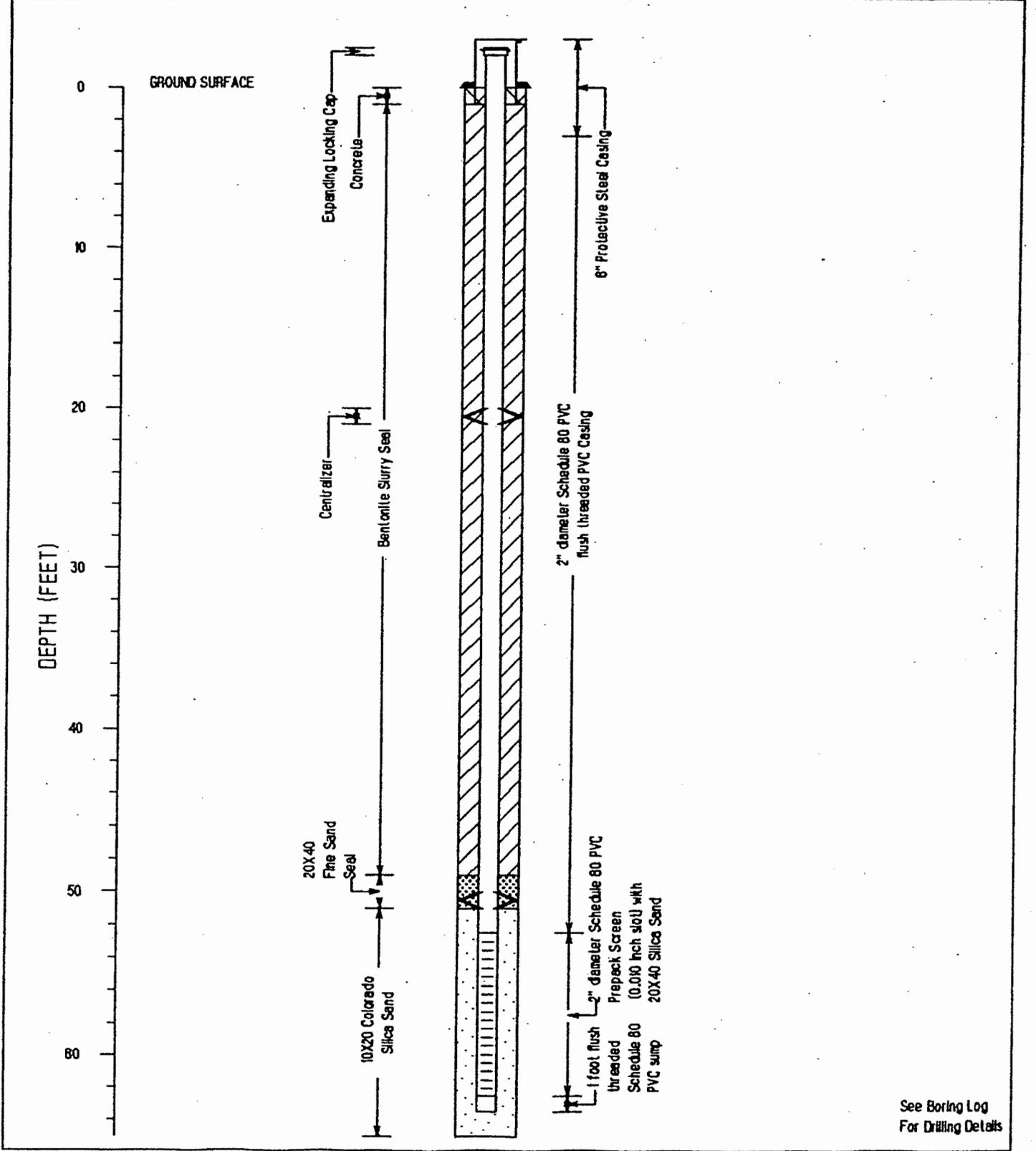
LOGGER T. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0' - 0' - 0' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
85.0					SAND, (SW), as above.	
88.5			0.8	3-3-3 (8)	SAND, (SW), as above except 20 percent wood fragments. Total depth equals 85 feet.	85 feet bgs water sample: T=14.3 degrees C pH=7.42 cond=400 F--=0.34



PROJECT NUMBER 107493.08.02	BORING NUMBER MW21-083	SHEET 1 OF 1
WELL COMPLETION LOG		

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION Northeast Corner of NLF
ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Cable Tool; Drilling 8-inch ID Steel Casing
WATER LEVELS _____ START 10-1-88 FINISH 10-1-88 LOGGER T. Gehweller



See Boring Log
For Drilling Details



PROJECT NUMBER
107483.D8.02

BORING NUMBER
MW21-17B

SHEET 1 OF 13

SOIL BORING LOG

PROJECT Reynolds Metals -- RNC-Troutdale

LOCATION Northeast Corner of NLF

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;

WATER LEVELS _____ START 5-8-88 FINISH _____ LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	0" - 0" - 0" (N)		
5.0	5.0				0-1.5 feet: Crushed basalt fill.	Driller adds approximately 10 gallons of water.
	8.5		0.8	1-3-7 (10)	SILT, (ML), dark yellowish brown (10yr 4/2), damp, firm, orange, mottling;	Drilled open hole 5-12 feet bgs.
7.5				Sharp contact at 8 feet bgs with SAND, (SW), moderate yellow brown (10yr 5/4), damp, loose, fine-medium-grained, poorly rounded.		
10.0	9.5		1.4	8-8-8 (18)	SAND, (SW), dark yellow brown (10yr 4/2), wet, loose, fine-medium-grained, poorly rounded.	Driller reports increased permeability. 12 feet bgs water sample: T=11.8 degrees C pH=8.02 cond=350 F--=5.30.
	10.0				SAND, (SW), brownish gray (5yr 4/1), wet, loose, fine-coarse-grained, trace (less than 1 percent) wood fragments.	
15.0	11.5		1.0	8-7-8 (15)	SAND, (SW), as above.	10-inch casing total depth = 18 feet bgs.
	15.0				SAND, (SW), as above, except trace of wood fragments.	
20.0	18.5		0.8	3-4-5 (9)		Driller adds 10 gallons of water. Driller reports heaving sand in casing. Casing advances easily.
	20.0				SAND, (SW), as above.	
25.0	21.5		1.0	1-1-3 (4)		29 feet bgs water sample: T=17 degrees C pH=8.31 cond=550 F--=2.81. Driller reports 10 feet of heaving sand in casing.
	24.5					
	28.0		1.2	5-8-10 (19)	SAND, (SW), as above, except medium-coarse-grained, trace gravel (to 1-inch diameter)	



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW21-178

SHEET 2 OF 13

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION Northeast Corner of NLF

ELEVATION _____

DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;

WATER LEVELS _____

START 5-8-98

FINISH _____

LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8' - 8' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
35.0	35.0				SAND, (SW), as above, except fine-medium-grained.	Small silt fragments, sample from strainer.
	38.5		1.4	8-8-10 (18)	SAND, (SW), dark gray (N3), wet, loose, fine-medium grained, poorly rounded.	Driller reports heaving sand in casing - silt fragments in bailer casing advances easily.
40.0					SAND, (SW), as above, except trace of wood fragments.	Driller reports heaving sand in casing (12 feet).
	48.0				SAND, (SW), as above, except trace of wood fragments and gravel.	45 feet bgs water sample: T=11.2 degrees C pH=8.40 cond=420 F--=0.58. Sample from strainer
60.0	49.5		1.4	11-11-12 (23)		Driller adds 15 gallons of water, casing advances easily.
	54.0				SAND, (SW), as above.	
65.0	58.0		1.2	3-4-8-4 (10)	SAND, (SW), dark gray (N3), wet, loose, fine-medium-grained, poorly rounded, with 5 percent silt.	Driller reports 5 feet heaving sand in casing. 58 feet bgs water sample: T=12 degrees C pH=8.45 cond=850 F--=0.28.



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW21-178
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SHEET 3 OF 13

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale	LOCATION Northeast Corner of NLF
ELEVATION _____	DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;	
WATER LEVELS _____	START 5-8-88 FINISH _____
LOGGER I. Gall	

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
	85.0	85.0				
87.0	87.0		1.3	2-4-4-8 (12)	SAND, (SW), as above.	
70.0					GRAVEL with SAND, (GW), dark gray (N3), wet, loose, moderately well rounded, up to 1-inch diameter. Approximately 20 percent sand (medium to coarse-grained). Silt less than 20 percent at 88 feet bgs.	Drilling open hole, balling weathered basalt fragments, drilling and casing advancing slowly, driller reports gravel/sand heaving into casing. 70 feet bgs water sample: T=12.8 degrees C pH=8.88 cond=370 F--=0.28. Begin air rotary drilling at 70 feet bgs on 5-13-88. Soil sample collected with strainer.
75.0					GRAVEL with SAND, (GW), as above.	Very permeable (Hole producing greater than 50 percent gpm.
80.0					GRAVEL, (GW), dark gray (N3), wet, dense, moderately well-rounded, primarily basalt.	80 feet bgs water sample: T=14.5 degrees C pH=8.95 cond=350 F--=0.28.
85.0						



PROJECT NUMBER 107483.D8.02	BORING NUMBER MW21-178	SHEET 4 OF 13
SOIL BORING LOG		

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION Northeast Corner of NLF
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
 DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;
 WATER LEVELS _____ START 5-8-88 FINISH _____ LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0'-0'-0' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
85.0					GRAVEL, (GW), as above. GRAVEL, (GW), dark gray (N3) with olive gray (5yr 3/2) cement, wet, dense, gravel moderately well-rounded, primarily basalt partially cemented.	Hole producing greater than 50 gpm, no evidence of cement in cuttings. Lower permeability (approximately 10 gpm).
100.0					GRAVEL, (GW), grayish black (N2), wet very dense.	Driller reports very hard drilling, cuttings 90 percent crushed basalt, likely from cobbles, hole producing less than 1 gpm, no evidence of cement. 100 feet bgs water sample: T=18.2 degrees C pH=7.08 cond=230 F--=0.52
105.0					GRAVEL, (GW), dark gray (N3) with olive gray (5yr 3/2) cement, wet, dense, gravel moderately well rounded, partially cemented.	Permeability increases slightly (approximately 2 gpm), cement evident on gravel, drilling rate increases.
110.0						
115.0						Permeability increases (approximately 5 gpm).



PROJECT NUMBER
107483.D8.02

BORING NUMBER
MW21-178

SHEET 5 OF 13

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION Northeast Corner of NLF

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;

WATER LEVELS _____ START 5-8-88 FINISH _____ LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8' - 8' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
25.0					GRAVEL, (GW), as above.	120 feet bgs water sample: T=17 degrees C pH=7.08 cond=210 F--=0.38
30.0					GRAVEL, (GW), as above.	
35.0					GRAVEL, (GW), as above.	Discharge increase to 10-15 gpm less cement evident, percentage of basalt gravel decreases.
140.0					GRAVEL, (GW), as above.	140 feet bgs water sample: T=15 degrees C pH=8.73 cond=250 F--=0.57
145.0					GRAVEL, (GW), as above.	



PROJECT NUMBER
107483.D8.02

BORING NUMBER
MW21-17B

SHEET 8 OF 13

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION Northeast Corner of NLF

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;

WATER LEVELS _____ START 5-8-88 FINISH _____ LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" - 6" - 6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
					GRAVEL (GW), as above.	More cement evident in cuttings
					SAND (SW), dusky yellow (5yr 8/4), wet, loose, fine-to-coarse-grained, mica flakes, 5 percent gravel.	Driller reports sand heaving into casing and increased permeability.
165.0					SAND with GRAVEL (SW), olive gray (5yr 3/2), wet, loose, fine to coarse-grained, gravel moderately well-rounded.	
180.0						180 feet bgs water sample: T=12.1 degrees C pH=7.22 cond=210 F=-0.28
185.0					SAND with GRAVEL (SW), as above. SAND (SW), light olive gray (5yr 5/2), wet, loose, medium to very coarse grained, large mica flakes, trace of gravel.	Driller reports sand heaving into casing producing greater than 50 gpm.
170.0					SAND (SW), as above.	
175.0					SAND (SW), as above.	



PROJECT NUMBER 107493.D6.02	BORING NUMBER MW21-178
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SHEET 7 OF 13

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION Northeast Corner of NLF

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;

WATER LEVELS _____ START 5-8-88 FINISH _____ LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
	185.0					
190.0				<p>SAND, (SW), medium light gray (N8), wet, loose, medium to coarse grained sand, large mica flakes, trace of gravel less than 5 percent.</p>	<p>Driller reports sand heaving into casing producing greater than 50 gpm.</p> <p>Some pieces of wood from 185 feet.</p>	
195.0				<p>SAND with GRAVEL, (SW), medium light gray (N8) wet, loose, fine to coarse-grained, rounded gravels, large micas.</p>	<p>Driller reports casing becoming harder to rotate.</p>	
200.0					<p>200 feet bgs water sample: T=12.8 degrees C pH=7.27 cond=138 F--=0.298</p>	
205.0				<p>SILT (ML) grayish olive green (5yr 3/2), wet, very firm, slightly plastic, trace of sand.</p>	<p>Formation producing no water.</p>	



PROJECT NUMBER 107483.D8.02	BORING NUMBER MW21-178
SHEET 8 OF 13	
SOIL BORING LOG	

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION Northeast Corner of NLF
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
 DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary:
 WATER LEVELS _____ START 5-8-88 FINISH _____ LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8' - 8' - 8' (N)		
215.0					SILT (ML) as above to 215 feet bgs.	Producing approximately 20 gpm.
					SAND (SW), grayish olive green (5yr 3/2), wet, loose, fine to coarse-grained, mica flakes, grading to 218 feet.	Percentage of gravel increases with depth to 217 feet bgs.
220.0					GRAVEL (GW), dark gray (N3), wet, loose, moderately well rounded, gravel to 2-inch, 5 percent sand.	Gravel at 218 feet bgs. Producing greater than 80 gpm. 220 feet bgs water sample: T=13 degrees C pH=7.8 cond=140 F--=0.25
225.0					GRAVEL (GW), as above.	Producing greater than 80 gpm.
230.0					GRAVEL (GW), as above.	
235.0					GRAVEL (GW), as above.	234 feet bgs water sample: T=14 degrees C pH=7.70 cond=130 F--=0.28 Producing greater than 80 gpm.



PROJECT NUMBER
107483.D8.02

BORING NUMBER
MW21-178

SHEET 8 OF 13

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION Northeast Corner of NLF

ELEVATION _____

DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;

WATER LEVELS _____

START 5-8-88

FINISH _____

LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8' - 8' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
					GRAVEL. (GW), as above.	
2450					GRAVEL. (GW), as above.	
					SILT. (ML), olive gray (5yr 4/1) wet, firm.	
2600					SAND. (SW), dark greenish gray (5yr 4/1), wet, loose, fine-to-coarse-grained, trace of gravel, wood fragments, grading at 250.	
					GRAVEL. (GW), with sand, dark gray (N3), wet, loose, gravel, poorly rounded, trace of wood fragments.	Producing greater than 50 gpm.
2650					SAND. (SW), medium gray (N5), wet, loose, fine-to-coarse-grained, mica flakes, trace wood fragments, 10 percent silt.	Driller reports sand heaving into casing producing approximately 40 gpm.
2800					SAND. (SW), as above, except no silt.	280 feet total depth 5/14/88. 280 feet bgs water sample: T=15 degrees C pH=8.25 cond=130 F--=0.27
2850					SAND. (SW), as above.	Producing approximately 70 gpm, sand is heaving into casing.



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW21-176

SHEET 10 OF 13

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION Northeast Corner of NLF

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;

WATER LEVELS _____ START 5-8-88 _____ FINISH _____ LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0' - 0' - 0' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
275.0					GRAVEL (GW), dark gray (N3), wet, very dense, partially-cemented, moderately well-rounded, primarily basalt.	Cuttings primarily crushed basalt, driller reports very hard drilling, producing approximately 120 gpm.
280.0					GRAVEL (GW), as above.	277 feet bgs water sample: T=18.1 degrees C pH=7.72 cond=130 F=0.21 Producing approximately 120 gpm, drilled open hole 280-285 ft bgs.
285.0					SAND (SW), medium gray (N5), wet, loose, fine-to-medium-grained, mica flakes, trace wood fragments, less than 1 percent gravel.	
290.0					SAND (SW), as above.	Producing approximately 50 gpm, driller reports sand heaving into casing.
295.0					SAND (SW), as above.	Note: Removed 4 cubic yards of sand from 280-300 feet bgs.



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW21-178

SHEET II OF 13

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION Northeast Corner of NLF

ELEVATION DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;

WATER LEVELS START 5-8-88 FINISH LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
305.0				SAND, (SW), as above.	300 feet bgs water sample: T=18.1 degrees C pH=8.28 cond=170 F=-0.18 Driller reports sand heaving into casing producing approximately 50 gpm.	
30.0				SAND, (SW), as above.		
30.0				SAND, (SW), as above, except with 5 percent gravel.		
35.0				SAND, (SW), as above, except with 5 percent silt.	Note: Removed 4 cubic yards of sand from 300-320 feet bgs.	
320.0				SAND, (SW), as above, except 10 percent gravel.	320 feet bgs water sample: T=18 degrees C pH=7.84 cond=188 F=-0.32	
325.0				GRAVEL, (GW), dark gray (N3), wet, very dense, moderately well rounded, primarily basalt, 10-15 percent sand, partially cemented, trace wood fragments.	Driller reports very slow drilling rate. Producing greater than 100 gpm.	



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW21-178
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SHEET 12 OF 13

SOIL BORING LOG

PROJECT Reynolds Metals --- RMC-Troutdale LOCATION Northeast Corner of NLF

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.

DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;

WATER LEVELS _____ START 5-8-88 FINISH _____ LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" - 8" - 6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
336.0					GRAVEL (GW), as above.	Driller reports very slow drilling rate. Producing greater than 100 gpm. 340 feet total depth on 5/15/88. 340 feet bgs water sample: T=18.7 degrees C pH=7.81 cond=180 F=-0.28
340.0					GRAVEL (GW), as above.	
345.0					GRAVEL (GW), as above.	
360.0					Basalt grayish black (N2), wet, very dense, fragmented, sharp edges, small pieces, very small amount sand grains less than 2 percent.	Drilling open hole producing roughly 1-2 gpm. Driller believes sand came in from above.
365.0					Basalt, as above, except no fines present.	
365.0					Basalt, as above, except with small fragments of silt stone (light olive gray (5yr 8/1) angular less than 5 percent, present for 1 foot to .5 foot.	Driller noted that there was a slight quick drop after going through section which showed siltstone fragments.



PROJECT NUMBER 107483.D8.02	BORING NUMBER NW21-178	SHEET 13 OF 13
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SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** Northeast Corner of NLF
ELEVATION _____ **DRILLING CONTRACTOR** Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;
WATER LEVELS _____ **START** 5-8-98 **FINISH** _____ **LOGGER** I. Gall

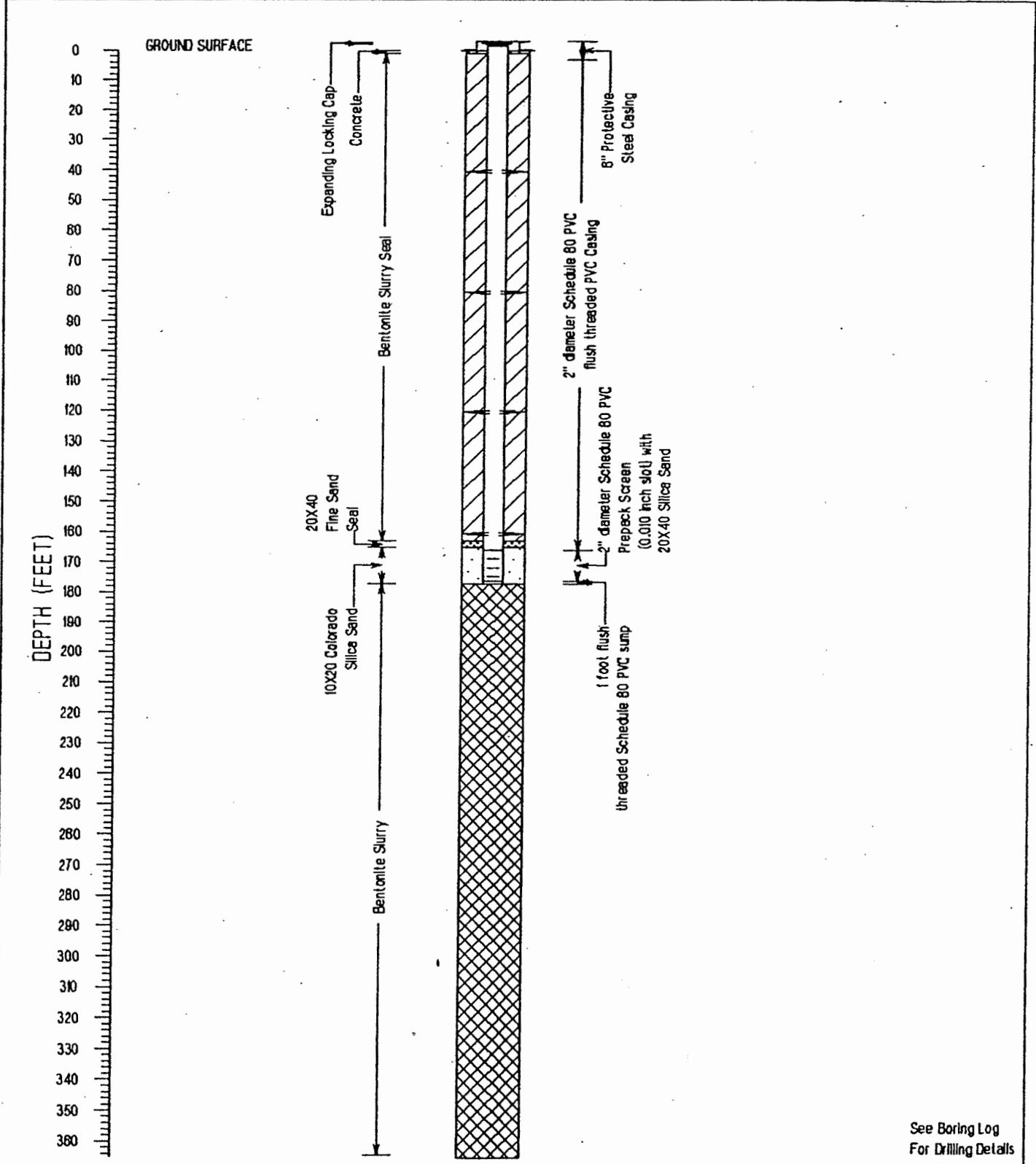
DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0' - 0' - 0' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
365.0					Basalt, as above.	360 feet bgs water sample: T=20.2 degrees C pH=8.54 cond=290 F=-0.18
370.0					End of Boring	
375.0						
380.0						
385.0						



PROJECT NUMBER 107493.08.02 BORING NUMBER MW21-178 SHEET 1 OF 1

WELL COMPLETION LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION Northeast Corner of NLF
ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling Co.
DRILLING METHOD AND EQUIPMENT Cable Tool Air Rotary;
WATER LEVELS _____ START 5-8-88 FINISH _____ LOGGER I. Gall



See Boring Log For Drilling Details



PROJECT NUMBER 107.493.HI.02	WELL NUMBER MW25-35
SHEET 1 OF 2	
MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG	

PROJECT Reynolds Aluminum Company - Troutdale, OR	LOCATION Scrap Yard
MEASURING POINT ELEV (NGVD) 30.89	DRILLING CONTRACTOR Geo-Tech Explorations
DRILLING METHOD AND EQUIPMENT HSA - Mobile Drill B-59, 8-1/4" ID Augers	
WATER LEVEL ELEV/DATE	START 7/24/95
FINISH 7/24/95	
LOGGER Ivan Gall	

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	USCS DESCRIPTION	WELL COMPLETION DIAGRAM
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		
					Sand. (SP), Brown-gray, loose, dry Comment: Refractory brick to 1 ft.		
	2.5						
	4.0		1.3	4-4-3 (II)	Sand. (SP), Tan-brown, loose, dry, fine- to med.-grained, 5 - 10% silt	SP	
5.0	5.0						
	6.5		1.3	2-2-1 (5)	Sand. (SP), As above, damp		
	7.5						
	9.0		1.0	3-3-2 (8)	Silt. (ML), Brown w/orange mottling, firm, wet, 10 - 15% v. fine sand		
10.0	10.0						
	11.5		1.5	1-1-1 (3)	Silt. (ML), Gray-brown w/orange mottling, firm, damp, slightly elastic	ML	
	12.5						
	14.0		1.5	1-1-1 (3)	Silt. (ML), Lt. gray-brown w/orange mottling, firm, damp, slightly plastic, 5% v. fine sand		
15.0	15.0						
	16.5		1.5	1-1-1 (3)	Silt w/Sand. (ML), Lt. gray-brown w/orange mottling, firm, wet, 15% v. fine sand		
	17.5						
	19.0		1.0	1-1-1 (3)	Silty Sand. (SM), Gray-green, firm, wet, 20% silt, sand fine-grained	SM	
20.0	20.0						
	21.5		1.3	2-2-2 (8)	Silty Sand. As above, damp to wet		
	22.5						
	24.0		1.3	1-1-4 (8)	Silt w/Sand. (ML), Gray-green, firm, damp, 15% fine sand	ML	
25.0	25.0						
	28.5		1.2	2-3-4 (8)	Silty Sand. (SM), Gray-green, firm, damp to wet, 20% silt, sand fine-grained	SM	
	27.5						
	29.0		1.0	1-1-1 (3)	Silty Sand. (SM), As above, to 28.5 ft. BGS; Sand. (SW), Gray, loose, wet, sand med.-grained	SW	
30.0	30.0						



PROJECT NUMBER 107493.H1.02	WELL NUMBER MW25-35
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SHEET 2 OF 2

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Aluminum Company - Troutdale, OR LOCATION Scrap Yard
 MEASURING POINT ELEV (NGVD) 30.89 DRILLING CONTRACTOR Geo-Tech Explorations
 DRILLING METHOD AND EQUIPMENT HSA - Mobile Drill B-59, 8-1/4" ID Augers
 WATER LEVEL ELEV/DATE _____ START 7/24/95 FINISH 7/24/95 LOGGER Ivan Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	USCS DESCRIPTION	WELL COMPLETION DIAGRAM
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET				
30.0				3-5-10 (18)	Sand, (SW), As above Comment: Driller reports heave in auger	SW	
31.5							
32.5							
34.0			1.0	7-9-9 (25)	Sand, (SW/SP), Gray, wet, loose, med.-grained	SW	
35.0							
35.0			1.2	3-9-13 (25)	Sand, (SW/SP), Gray-green, wet, loose, w/silt laminations	SW	
38.5							
40.0							
45.0							
50.0							
55.0							



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW27-178
SHEET 1 OF 8	

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION Approx. 40 ft. East of Co. Lake Outfall Ditches
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling
 DRILLING METHOD AND EQUIPMENT Cable Tool to 100 feet/Air Rotary to 280 feet.
 WATER LEVELS _____ START 7-8-98 FINISH 7-17-98 LOGGER Kathy Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8'-8"-8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.0					0 - 0.25 feet crushed basalt road base (#1).	
5.0					<u>SILT with SAND</u> , (ML), brown, damp, very soft, sand fine to medium grained, 15 - 20 percent sand.	
10.0	10.0				<u>SILT with SAND</u> , (ML), as above.	
11.5			1.2	8-8-8 (18)	At 11 feet becomes: <u>SAND</u> , (SP), brown, damp, loose, fine to medium grained.	
15.0					<u>SAND with SILT</u> , (SW-SM), brown, damp loose, interbedded with 1-inch thick layers of <u>SAND</u> , (SP), and <u>SILTY SAND</u> , (SM).	
20.0	20.0				<u>SAND</u> , (SW), brownish gray, wet, very loose, fine to medium grained, less than 5 percent coarse subangular sand. No silt. Red sand grains observed approximately 5 percent or less.	20 feet below ground surface (bgs) water sample: F=3.19 pH=8.23 T=21.1 degrees C cond=500.
21.5			0.8	2-3-4 (7)		
25.0					<u>SAND</u> , (SW), as above.	
30.0						



SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** Approx. 40 ft. East of Co. Lake Outfall Ditches
ELEVATION _____ **DRILLING CONTRACTOR** Tacoma Pump & Drilling
DRILLING METHOD AND EQUIPMENT Cable Tool to 100 feet/Air Rotary to 280 feet.
WATER LEVELS _____ **START** 7-8-98 **FINISH** 7-17-98 **LOGGER** Kathy Gehweller

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30.0	30.0				SAND, (SW), as above, except goes from brown to brownish yellow at 30.5 feet, to brownish gray at 31 feet. Brown <u>SILTY SAND</u> , (SM), layer 1-inch thick at 30.9 feet. Sand is fine to medium grained with red grains less than 5 percent, loose.	Driller reports heaving sand in casing.
	31.5		2.0	8-8-12 (20)		
35.0					SAND, (SW), brownish gray (5 yr 4/1), wet, loose, fine-to-coarse grained sand, less than 10 percent fine (1/4) to coarse (1-inch) subangular gravel varying in color from dark gray to red.	Driller reports small silt layer at 35 feet.
40.0	40.0				SAND, (SW), as above, except thin silt layer (.5 - 1 inch) at 40 feet, less red sand, less than 5 percent fine gravel, mica flakes observed (less than 5 percent).	40 feet bgs water sample: F--=8.0 pH=8.98 T=15.0 degrees C cond=450.
	41.5		0.4	8-8-8 (18)		
45.0					SAND, (SW), as above, except no silt, less than 5 percent gravel, one piece of wood.	Driller reports heaving sand in casing.
60.0	50.0				SAND, (SW), as above, except gray, no gravel, fine to medium grained sand, one piece vegetation, dense.	
	51.5		2.0	20-35-35 (70)		
65.0					SAND, (SW), as above.	
80.0						



PROJECT NUMBER

107493.06.02

BORING NUMBER

MW27-178

SHEET 3 OF 9

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION Approx. 40 ft. East of Co. Lake Outfall Ditches

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling

DRILLING METHOD AND EQUIPMENT Cable Tool to 100 feet/Air Rotary to 280 feet.

WATER LEVELS _____ START 7-8-88 FINISH 7-17-88 LOGGER Kathy Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
80.0	80.0		0.5	10/8"	SAND, (SW), dark gray, wet, loose, fine to medium grained, trace red grains, micaceous, trace (less than 5 percent) vegetation and coarse sand.	80 feet bgs water sample: F--=11.5 pH=7.08 T=18 degrees C cond=720.
	81.5					
70.0	70.0		1.0	8-20-35 (55)	SAND, (SW), as above, except medium dense, no vegetation, and 2-3 inch thick SILT, (ML), layer from 70.7 - 70.8 feet, followed by SAND, (SW) as above.	
	71.5					
80.0	80.0		0.3	8-8/2"	SAND, (SW), dark gray, wet, loose, fine to coarse-grained. Trace red sand, micaceous.	80 feet bgs water sample: F--=1.51 pH=7.52 T=14.8 degrees C cond=780.
	81.5					
85.0					SAND, (SW), as above.	
86.0					SAND, (SW), as above except no silt.	
80.0						
85.0						
80.0						



PROJECT NUMBER
107483.D8.02

BORING NUMBER
MW27-178

SHEET 4 OF 8

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION Approx. 40 ft. East of Co. Lake Outfall Ditches

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling

DRILLING METHOD AND EQUIPMENT Cable Tool to 100 feet/Air Rotary to 280 feet.

WATER LEVELS _____ START 7-8-88 FINISH 7-17-88 LOGGER Kathy Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
80.0			1.5	8-10-20 (30)	SAND, (SW), as above, except with trace pebbles, (to 0.5-inch maximum size).	
81.5						
88.0					SAND, (SW), as above, with trace of gravel (to 3 inch maximum size) and trace of wood fragments.	100 feet: Driller reports gravel in baller. 100 feet bgs water sample: F--=11.6 pH=7.25 T=14.2 degrees C cond=800.
100.0	100.5		1.3	3-4-10 (14)		
105.0					101 feet: GRAVEL, (GW), gray black (N2), wet, dense, moderately well rounded primarily basalt with trace quartz, volcanics, and metamorphics, trace wood fragments, sand.	Air rotary takes over at 100 feet bgs. Gravel at 101 feet bgs. Casing producing approximately 3 gpm. Casing producing approximately 50 gpm water.
110.0	110.0			50/0"	GRAVEL, (GW), as above.	Slight sheen noted on water. 110 feet bgs water sample: F--=0.28 pH=7.80 T=14.5 degrees C cond=500. Casing producing approximately 80 gpm.
115.0					GRAVEL, (GW), as above.	
					GRAVEL, (GW), gray black (N2) with red (possibly matrix or cement) wet, dense, gravel moderately well rounded (to 1.5-inch maximum size).	Casing producing 3-5 gpm. 118 feet bgs water sample: F--=0.28 pH=7.84 T=14.0 degrees C cond=430.



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW27-178
SHEET 5 OF 9	
SOIL BORING LOG	

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** Approx. 40 ft. East of Co. Lake Outfall Ditches
ELEVATION _____ **DRILLING CONTRACTOR** Tacoma Pump & Drilling
DRILLING METHOD AND EQUIPMENT Cable Tool to 100 feet/Air Rotary to 280 feet.
WATER LEVELS _____ **START** 7-8-88 **FINISH** 7-17-88 **LOGGER** Kathy Gehweller

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0' - 0' - 0' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
125.0					GRAVEL, (GW), as above.	Casing producing approximately 50 gpm. 122 feet bgs water sample: F--=0.30 pH=7.48 T=14.8 degrees C cond=440. Gray sand with gravel at 123-125 feet sheen and odor on water.
130.0					GRAVEL, (GW), gray black (N2), wet, dense, moderately well rounded (to 1.5-inch maximum size), 85 percent basalt, some quartz.	
135.0					GRAVEL, (GW), as above.	Casing producing approximately 70 gpm.
140.0					GRAVEL, (GW), moderate olive brown (5 yr 4/4), wet, dense, moderately well rounded, partially cemented, primarily basalt (85-90 percent), some white/yellow quartz, red volcanics.	Casing producing approximately 70 gpm.
145.0					GRAVEL, (GW), as above.	PID/FID less than 1 ppm 140 feet: water production approximately 10 gpm, sheen and odor on water. Some (10 percent) sand at 148 feet.



PROJECT NUMBER I07493.D8.02	BORING NUMBER MW27-178
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SHEET 8 OF 9

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** Approx. 40 ft. East of Co. Lake Outfall Ditches
ELEVATION _____ **DRILLING CONTRACTOR** Tacoma Pump & Drilling
DRILLING METHOD AND EQUIPMENT Cable Tool to 100 feet/Air Rotary to 280 feet.
WATER LEVELS _____ **START** 7-8-88 **FINISH** 7-17-88 **LOGGER** Kathy Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
	165.0					
180.0				GRAVEL, (GW), as above.	154 feet: water production approximately 50 gpm, sheen and odor on water.	
185.0				GRAVEL, (GW), as above.	Water production from casing approximately 80 gpm. 181-183 feet: less water production approximately 10 gpm.	
170.0				GRAVEL, (GW), as above.	Casing producing approximately 50 gpm. 170 feet bgs water sample: F=0.28 pH=7.54 T=15.8 degrees C cond=210. Sheen and odor on water.	
175.0				GRAVEL with SILT, (GW-GM), dark gray (N3), gravel with pale yellowish brown (10 yr 8/2) silt matrix, wet, dense, (silt firm), gravel as above.	Casing producing approximately 80 gpm in gravel.	
				SAND, (SW), light olive (10 yr 5/4), wet, loose, angular, fine-to-medium-grained, trace pebbles, mica flakes.	178 feet bgs water sample: F=0.31 pH=7.54 T=15.8 degrees C cond=210. No sheen or odor. Casing producing approximately 5 gpm in gravel with silt.	



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW27-178
SHEET 7 OF 8	
SOIL BORING LOG	

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION Approx. 40 ft. East of Co. Lake Outfall Ditches
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling
 DRILLING METHOD AND EQUIPMENT Cable Tool to 100 feet/Air Rotary to 280 feet.
 WATER LEVELS _____ START 7-8-88 FINISH 7-17-88 LOGGER Kathy Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8' - 8' (N)	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
185.0					SAND (SW), as above.	Casing producing approximately 50 gpm and significant amounts of sand.
					GRAVEL (GW), dark gray (N3), wet, dense, partially cemented, 85 percent basalt, moderately well rounded.	Casing producing less than 5 gpm - air possibly pushing water into formation.
					SAND with SILT (SW-SM), dusky yellow (5 yr 8/4), wet, loose, approximately 15 percent silt, sand fine to coarse-grained, subangular to subrounded, mica flakes.	PID/FID less than 1 ppm on cyclone casing producing less than 3 gpm water.
190.0					SAND (SW), dusky yellow green (5 yr 5/2), wet, loose, fine to coarse-grained, subangular to subrounded.	Casing producing approximately 50 gpm water. 182 feet bgs water sample: F--=0.34 pH=7.41 T=13.8 degrees C cond=340. No odor, slight sheen.
195.0					GRAVEL (GW), grayish black (N2), wet, dense, moderately well rounded, primarily basalt, partially cemented.	Casing producing less than 1 gpm water.
	187.0				SAND (SW), medium dark gray (N4), wet, loose, fine-coarse-grained, sub-angular to subrounded, trace of gravel and mica.	Casing producing approximately 80 gpm water.
	188.5		0.0	50/2"		
200.0					GRAVEL (GW), grayish black (N2), wet, dense, moderately well rounded, maximum size 2 inches, primarily basalt, trace of sand.	Casing producing approximately 80 gpm.
205.0						208 feet bgs water sample: F--=0.31 pH=7.47 T=14.4 degrees C cond=370. No odor or sheen.



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW27-178
SHEET 8 OF 8	
SOIL BORING LOG	

PROJECT Reynolds Metals -- RMC-Troutdale	LOCATION Approx. 40 ft. East of Co. Lake Outfall Ditches
ELEVATION	DRILLING CONTRACTOR Tacoma Pump & Drilling
DRILLING METHOD AND EQUIPMENT Cable Tool to 100 feet/Air Rotary to 280 feet.	
WATER LEVELS	START 7-8-88 FINISH 7-17-88 LOGGER Kathy Gehweller

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
215.0					GRAVEL (GW), as above.	
					GRAVEL (GW), as above, 10 percent silt.	212 feet: Silt and sand in gravel; casing producing less than 5 gpm.
220.0					GRAVEL (GW), as above.	Casing producing approximately 10 gpm water. 220 feet bgs water sample:
					Weathered basalt, silt matrix, medium dark gray (N4), gravel grayish black (N2), grayish red purple (5 rp 4/2), and grayish green (5 g 5/2) wet, medium dense, gravel to 0.5-inch maximum size, subangular to subrounded, 20-25 percent gravel.	F--=0.31 pH=7.88 T=14.8 degrees C cond=270. Slight HC odor; slight sheen on water.
225.0						Casing produces no water.
						Casing produces no water.
230.0	230.0					
			0.8	45-80/4"	Weathered basalt, mottled gray, red, and blue-green, dense, damp, silt-matrix with gravel (maximum size less than 0.5 inch).	
	231.5					
235.0					Weathered basalt, as above.	Casing produces no water.



PROJECT NUMBER 107493.D6.02	BORING NUMBER MW27-178
SHEET 9 OF 9	

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION Approx. 40 ft. East of Co. Lake Outfall Ditches
 ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling
 DRILLING METHOD AND EQUIPMENT Cable Tool to 100 feet/Air Rotary to 280 feet.
 WATER LEVELS _____ START 7-8-88 FINISH 7-17-88 LOGGER Kathy Gehweller

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET		SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
245.0					Weathered basalt, grayish red (5 yr 4/2), wet, very dense, weathered to silt and clay plus gravel.	Casing producing no water. Driller adds 40 gallons of water.
						Contact at 247 feet bgs
250.0					Basalt, grayish black (N2) to grayish red (5 yr 4/2), wet, very dense.	Casing producing less than 1 gpm driller adds 20 gallons of water.
266.0					Basalt, as above.	
280.0					Basalt, as above.	280 feet bgs water sample: F--=0.28 pH=8.21 T=14.4 degrees C cond=470. Slight HC odor, water tea colored. Total Depth = 280 feet bgs Casing shoe cut at approximately 248 feet bgs on 7/18/88.
285.0						



PROJECT NUMBER

107493.08.02

BORING NUMBER

MW27-176

SHEET 1 OF 1

WELL COMPLETION LOG

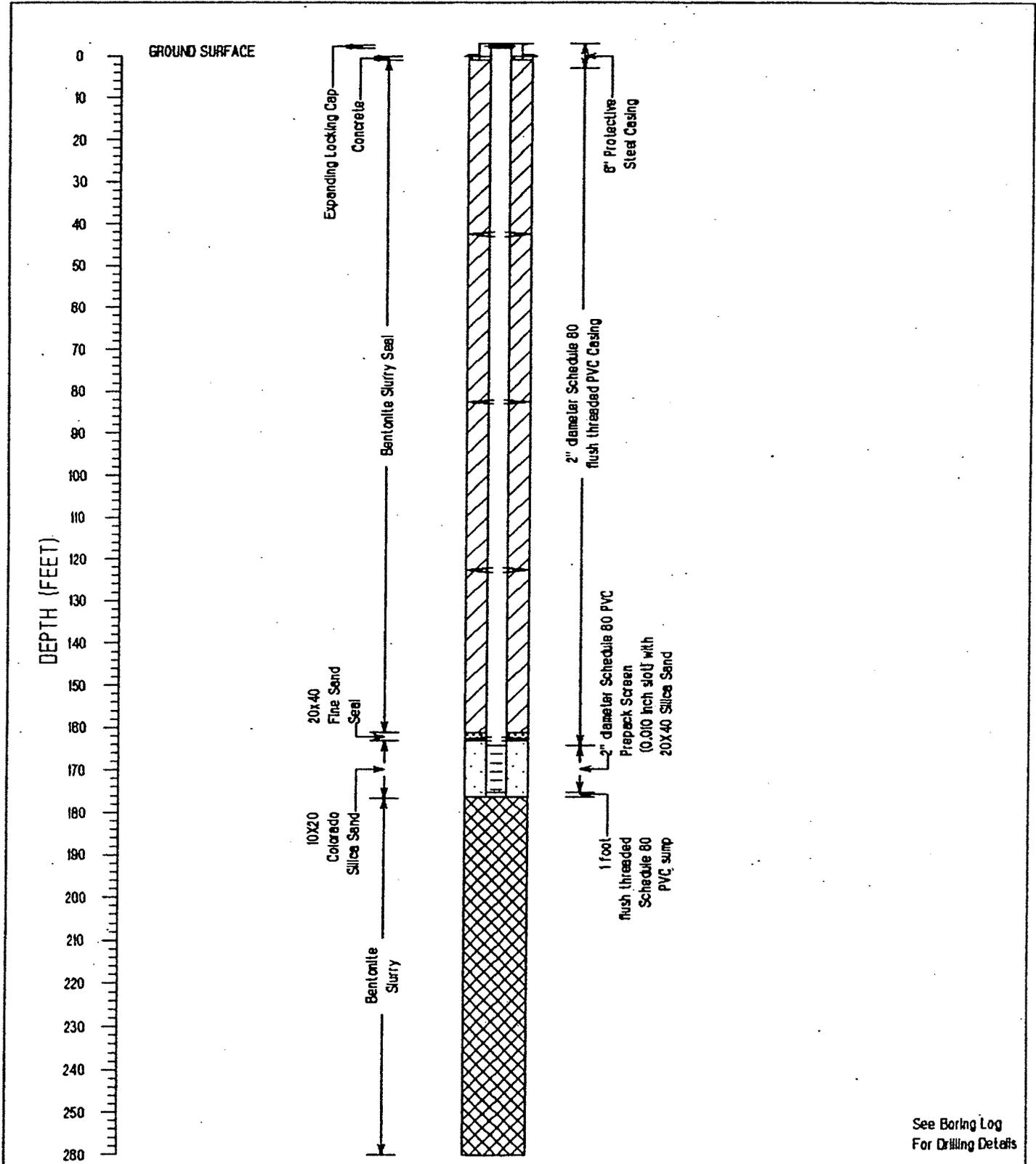
PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION Approx. 40 ft. East of Co. Lake Outfall Ditches

ELEVATION _____ DRILLING CONTRACTOR Tacoma Pump & Drilling

DRILLING METHOD AND EQUIPMENT Cable Tool to 100 feet/Air Rotary to 280 feet.

WATER LEVELS _____ START 8-8-88 _____ FINISH 8-14-88 _____ LOGGER Kathy Gehweller





PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW37-012

SHEET 1 OF 1

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION South Wetlands; RR Dike on Old Existing Road

ELEVATION _____ DRILLING CONTRACTOR GeoTech Explorations, Inc.

DRILLING METHOD AND EQUIPMENT Little Beaver HSA rig; 4 1/4-Inch I.D. Auger

WATER LEVELS _____ START 10-23-88 FINISH 10-23-88. LOGGER T. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
	2.5				0-2 Feet: Grass and moss covered surface. SAND, (SM), dark brown, damp, dense, 50% old brick fill, roots, vegetation, organics. Old roadbed.	Collect Soil samples for TOC analysis at: 2.5 - 4 foot time: 800
	4.0		0.8	1-2/12"	2.5-4.5 Feet: SILT, (MH), brown, wet, very soft to soft, some orange-brown mottling, plastic	4 - 5.5 foot time: 813
5.0	5.5		1.0	1-2-3 (5)	4.5-5.3 Feet: SILT WITH SAND, (ML), dark gray, wet, soft, medium grained sand, 10% decomposed yellow brick.	8 - 7.5 foot time: 830
	6.0					
	7.5		1.5	3-3-3 (8)	5.3-8 Feet: SANDY SILT, (ML), brown, wet, soft, mottled, not plastic. Becomes gray at 8 ft bgs.	8.5 - 10 foot time: 1000
	8.5					
10.0	10.0		1.5	1-2-1 (3)	8-12 Feet: SANDY SILT, (ML), gray, wet, soft, not plastic.	12.5 - 14 foot time: 1020
	12.5				12-12.5 Feet: SANDY SILT, (MH), gray, wet, very soft, plastic.	
	14.0		1.5	1-1-1 (2)	12.5-13 Feet: SILT, (MH), gray, wet, very soft, plastic.	14.5 - 18 foot time: 1045
	14.5					Driller reports slight odor at 7.5 feet. Hand dug hole from 0 - 2.5 feet.
15.0	18.0		1.5	2-2-2 (4)	13-15 Feet: SILTY SAND, (SM), gray, wet, very loose, wet, fine grained, less than 1% vegetation. 15-18 Feet: SILT, (MH), gray, wet, soft, plastic.	
					Total Depth = 18 Feet bgs with sampler; 15 Feet bgs with auger	
20.0						
25.0						



PROJECT NUMBER
107483.D8.02

BORING NUMBER
MW3I-085

SHEET 2 OF 5

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION Northeast Corner of Fairview Farms

ELEVATION _____ DRILLING CONTRACTOR Staco Well Services

DRILLING METHOD AND EQUIPMENT Cable Tool with 8" Threaded Casing

WATER LEVELS _____ START 11-28-88 FINISH 12-8-88 LOGGER J. Bowker

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" -8" -8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
35.0						
40.0	40.0				SAND, (SW), same as above.	Soil sample MW3I-0400-0 40 feet bgs water sample: T=7.0 degrees C pH=7.33 cond=195 F=-0.285
	41.5		1.5	7-7-7 (14)		
45.0						
50.0	50.0				SAND, (SW), same as above.	
	51.5		1.5	7-8-11 (18)		
55.0						
60.0						
65.0						
70.0						
75.0						
80.0						



PROJECT NUMBER 107483.D8.02	BORING NUMBER MW31-085
SHEET 3 OF 5	
SOIL BORING LOG	

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** Northeast Corner of Fairview Farms
ELEVATION _____ **DRILLING CONTRACTOR** Staco Well Services
DRILLING METHOD AND EQUIPMENT Cable Tool with 8" Threaded Casing
WATER LEVELS _____ **START** 11-28-88 **FINISH** 12-8-88 **LOGGER** J. Bowker

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS	
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET				8" - 8" - 8" (N)
65.0	60.0 - 61.5		1.5	7-10-11 (21)	SAND, (SW), same as above, with little to no fines and slightly coarser sand grains.	Soil sample MW31I-0800-0 80 feet bgs water sample: T=8.4 degrees C pH=8.82 cond=250 F--=1.84	
	61.5 - 70.0						
70.0	70.0 - 71.5		0.2	10-11-9 (20)	SAND, (SW), same as above with 5-10% fines.		
	71.5 - 75.0						
80.0	80.0 - 81.5		1.5		SAND, (SW), same as above.	Soil sample MW31I-0800-0 80 feet bgs water sample: T=NA degrees C pH=7.50 cond=180 F--=11.1	
	81.5 - 85.0						
85.0	85.0 - 88.0						
88.0	88.0 - 90.0						



PROJECT NUMBER
107483.D8.02

BORING NUMBER
MW31-085

SHEET 4 OF 5

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION Northeast Corner of Fairview Farms

ELEVATION _____

DRILLING CONTRACTOR Staco Well Services

DRILLING METHOD AND EQUIPMENT Cable Tool with 8" Threaded Casing

WATER LEVELS _____

START 11-28-88

FINISH 12-8-88

LOGGER J. Bowker

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
80.0			1.5		SAND, (SW), same as above.	90 feet bgs water sample: T=8.4 degrees C pH=8.83 cond=270 F-=13.5
81.5						
100.0			1.5		SAND, (SW), same as above.	Soil sample MW31I-1000-0 100 feet bgs water sample: T=8.5 degrees C pH=7.08 cond=285 F-=14.1
101.5						
110.0			1.5		SAND, (SW), same as above.	110 feet bgs water sample: T=8.4 degrees C pH=7.20 cond=280 F-=13.2
111.5						
120.0						



PROJECT NUMBER
107493.D8.02

BORING NUMBER
MW31-095

SHEET 5 OF 5

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION Northeast Corner of Fairview Farms

ELEVATION

DRILLING CONTRACTOR Staco Well Services

DRILLING METHOD AND EQUIPMENT Cable Tool with 6" Threaded Casing

WATER LEVELS

START 11-28-98

FINISH 12-8-98

LOGGER J. Bowker

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6' - 8' - 8' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
120.0			1.5		SAND, (SW), same as above.	Driller reports bailing gravels Soil sample MW-311-1200-0 120 feet bgs water sample: T=9.8 degrees C pH=7.07 cond=210 F=3.20
121.5						
125.0						
130.0						
135.0						
140.0						
145.0						



PROJECT NUMBER

107493.D8.02

BORING NUMBER

MW31-095

SHEET 1 OF 1

WELL COMPLETION LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION Northeast Corner of Fairview Farms

ELEVATION

DRILLING CONTRACTOR

Staco Well Services

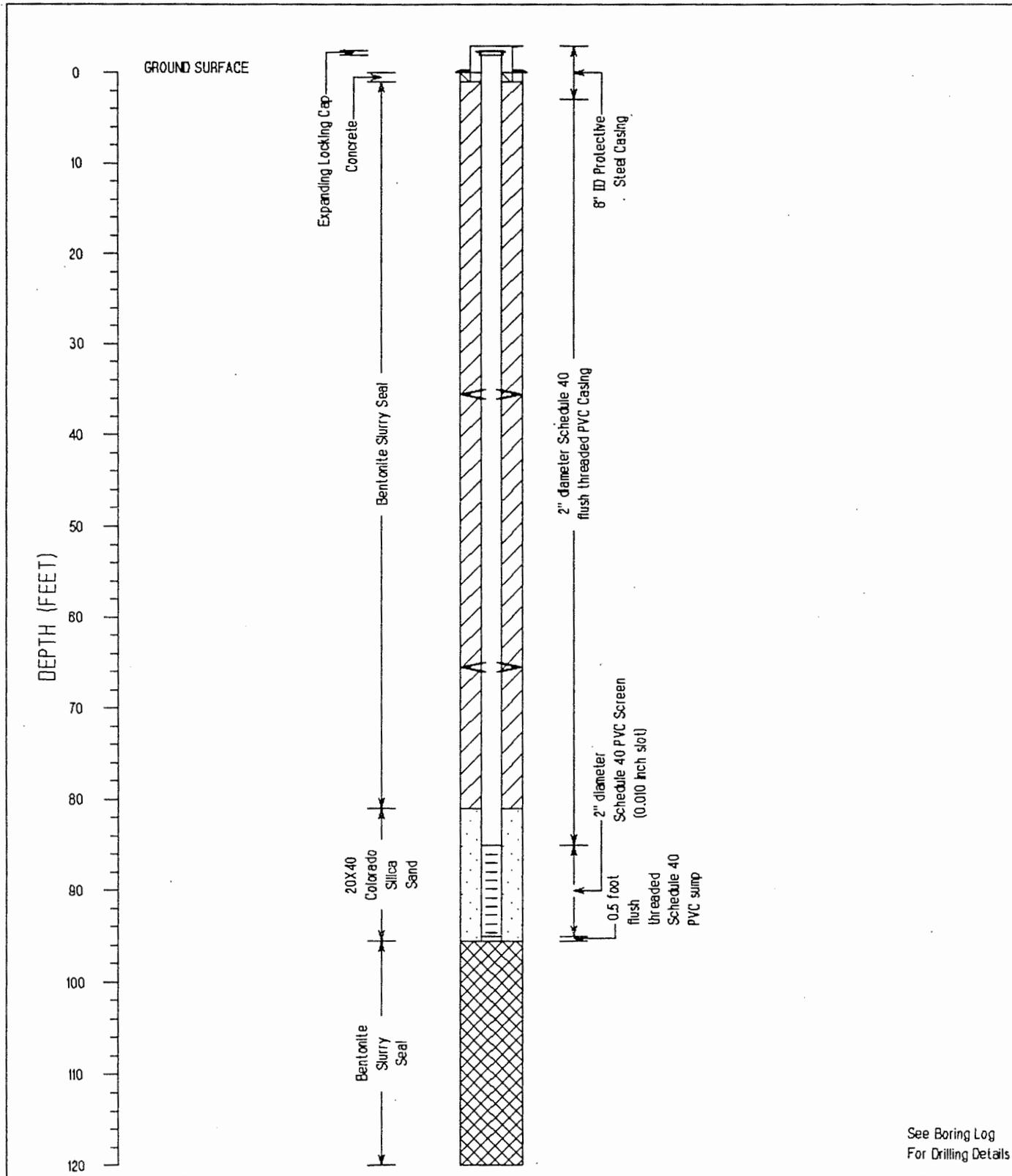
DRILLING METHOD AND EQUIPMENT Cable Tool with 8" Threaded Casing

WATER LEVELS

START 12-8-86

FINISH 12-9-86

LOGGER J. Bowker





PROJECT NUMBER 107493.D8.02	BORING NUMBER MW37-012
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SHEET 1 OF 1

SOIL BORING LOG

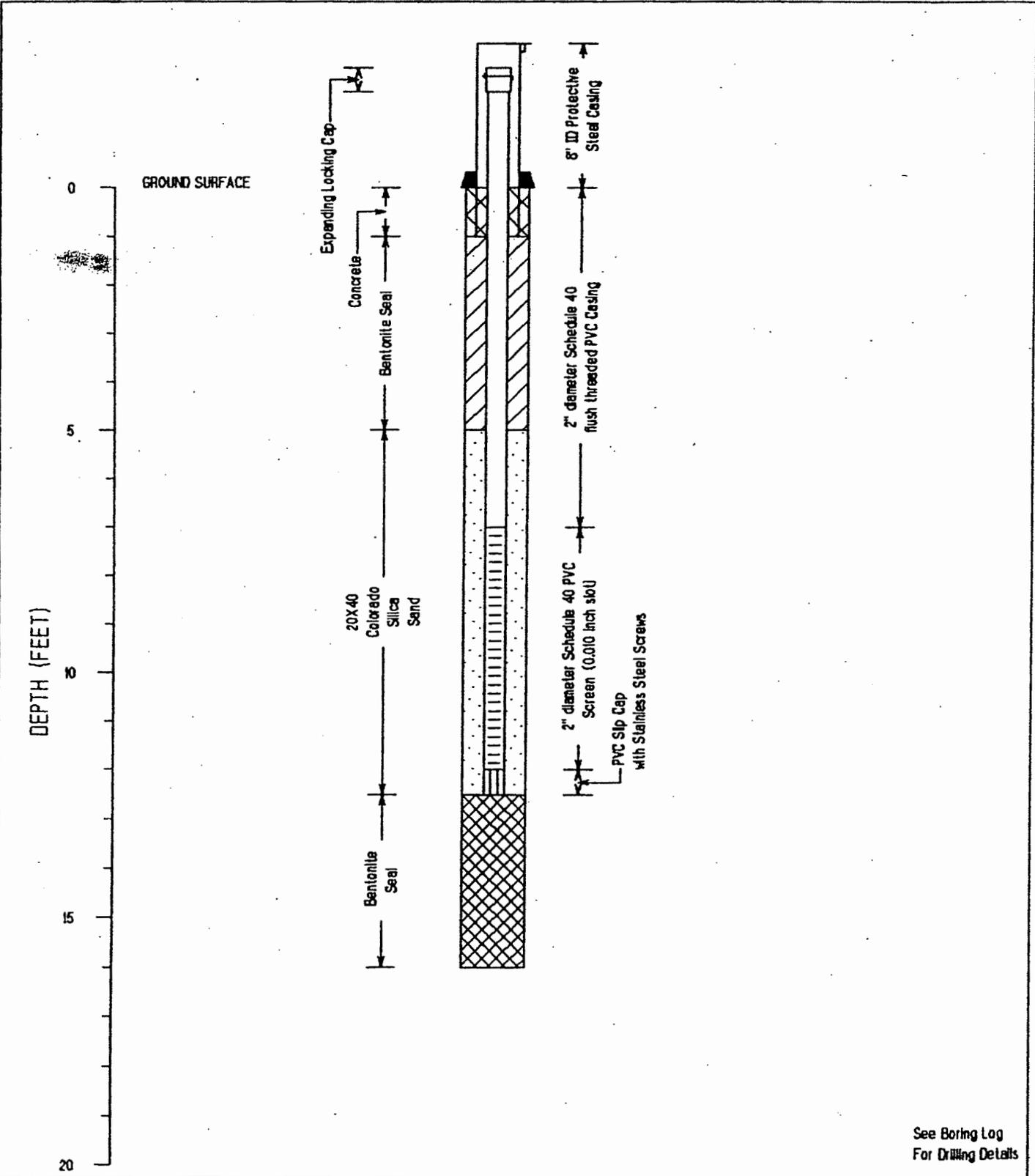
PROJECT Reynolds Metals -- RMC-Troutdale LOCATION South Wetlands; RR Dike on Old Existing Road
 ELEVATION _____ DRILLING CONTRACTOR GeoTech Explorations, Inc.
 DRILLING METHOD AND EQUIPMENT Little Beaver HSA rig; 4 1/4-Inch I.D. Auger
 WATER LEVELS _____ START 10-23-98 FINISH 10-23-98 LOGGER T. Gehweiler

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	6" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
5.0	2.5				0-2 Feet: Grass and moss covered surface. SAND, (SM), dark brown, damp, dense, 50% old brick fill, roots, vegetation, organics. Old roadbed.	Collect Soil samples for TOC analysis at: 2.5 - 4 foot time: 900 4 - 5.5 foot time: 913 8 - 7.5 foot time: 930 8.5 - 10 foot time: 1000 12.5 - 14 foot time: 1020 14.5 - 18 foot time: 1045 Driller reports slight odor at 7.5 feet. Hand dug hole from 0 - 2.5 feet.
	4.0		0.9	1-2/12"	Water observed at 2.5 feet bgs 2.5-4.5 Feet: SILT, (MH), brown, wet, very soft to soft, some orange-brown mottling, plastic	
	5.5		1.0	1-2-3 (5)	4.5-5.3 Feet: SILT WITH SAND, (ML), dark gray, wet, soft, medium grained sand, 10% decomposed yellow brick.	
	8.0				5.3-9 Feet: SANDY SILT, (ML), brown, wet, soft, mottled, not plastic. Becomes gray at 9 ft bgs.	
	7.5		1.5	3-3-3 (8)		
	8.5					
10.0	10.0		1.5	1-2-1 (3)	9-12 Feet: SANDY SILT, (ML), gray, wet, soft, not plastic.	
	12.5				12-12.5 Feet: SANDY SILT, (MH), gray, wet, very soft, plastic.	
	14.0		1.5	1-1-1 (2)	12.5-13 Feet: SILT, (MH), gray, wet, very soft, plastic.	
15.0	14.5				13-15 Feet: SILTY SAND, (SM), gray, wet, very loose, wet, fine grained, less than 1% vegetation.	
	18.0		1.5	2-2-2 (4)	15-18 Feet: SILT, (MH), gray, wet, soft, plastic.	
20.0					Total Depth = 18 Feet bgs with sampler; 15 Feet bgs with auger	
25.0						



PROJECT NUMBER 107.493.08.02	BORING NUMBER MW37-012	SHEET 1 OF 1
WELL COMPLETION LOG		

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION South Wetlands; RR Dike on Old Existing Road
ELEVATION _____ DRILLING CONTRACTOR GeoTech Explorations, Inc.
DRILLING METHOD AND EQUIPMENT Little Beaver HSA rig; 4 1/4-Inch I.D. Auger
WATER LEVELS _____ START 10-23-88 FINISH 10-23-88 LOGGER T. Gehweller





PROJECT NUMBER 107483.D8.02	BORING NUMBER MW37-030	SHEET 1 OF 2
SOIL BORING LOG		

PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** So. Wetlands; South of RR Dike on Old Exist. Rd.
ELEVATION _____ **DRILLING CONTRACTOR** GeoTech Explorations, Inc.
DRILLING METHOD AND EQUIPMENT Little Beaver with 4.25-inch I.D. HSA
WATER LEVELS Approximately 1 Feet BGS **START** 12-08-88 **FINISH** 12-09-88 **LOGGER** I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8'-8"-8' (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION	
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET				
5.0					See MW37-012 Boring Log		
10.0							
15.0							
20.0	20.0						
	21.5		0.1	3-3-4 (7)		SAND WITH SILT. (SM), dark gray (N3), wet, loose, fine to very fine grained, 20-25% silt.	Poor sample recovery, blow counts from short stroke and lite hammer
	23.0						
	24.5		0.1	3-4-4 (8)	SAND WITH SILT. (SM), as above - pebble in spoon.	Driller reports possible sand contact approximately 22.5 feet bgs from change in drilling conditions	
25.0	27.0						
	28.5		0.8	2-4-4 (8)	SAND WITH SILT. (SM), as above, 10-15% silt, sand fine to medium grained.	Soil sample MW37I-0270-0	
	30.0						



PROJECT NUMBER
107493.08.02

BORING NUMBER
MW37-030

SHEET 2 OF 2

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION So. Wetlands; South of RR Dike on Old Exist. Rd.

ELEVATION _____ DRILLING CONTRACTOR GeoTech Explorations, Inc.

DRILLING METHOD AND EQUIPMENT Little Beaver with 4.25-Inch I.D. HSA

WATER LEVELS Approximately 1 Feet BGS START 12-08-88 FINISH 12-08-88 LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	8" - 8" - 8" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	30.0		1.0	3-4-5 (9)	SAND. (SW), dark gray (N3), wet, loose, fine to medium grained, trace silt and red grains.	Total Depth = 30.5 Feet
	31.5					
35.0						
40.0						
45.0						
50.0						
55.0						



PROJECT NUMBER

107493.08.02

BORING NUMBER

MW37-030

SHEET 1 OF 1

WELL COMPLETION LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION So. Wetlands; South of RR Dike on Old Exist. Rd.

ELEVATION

DRILLING CONTRACTOR

GeoTech Explorations, Inc.

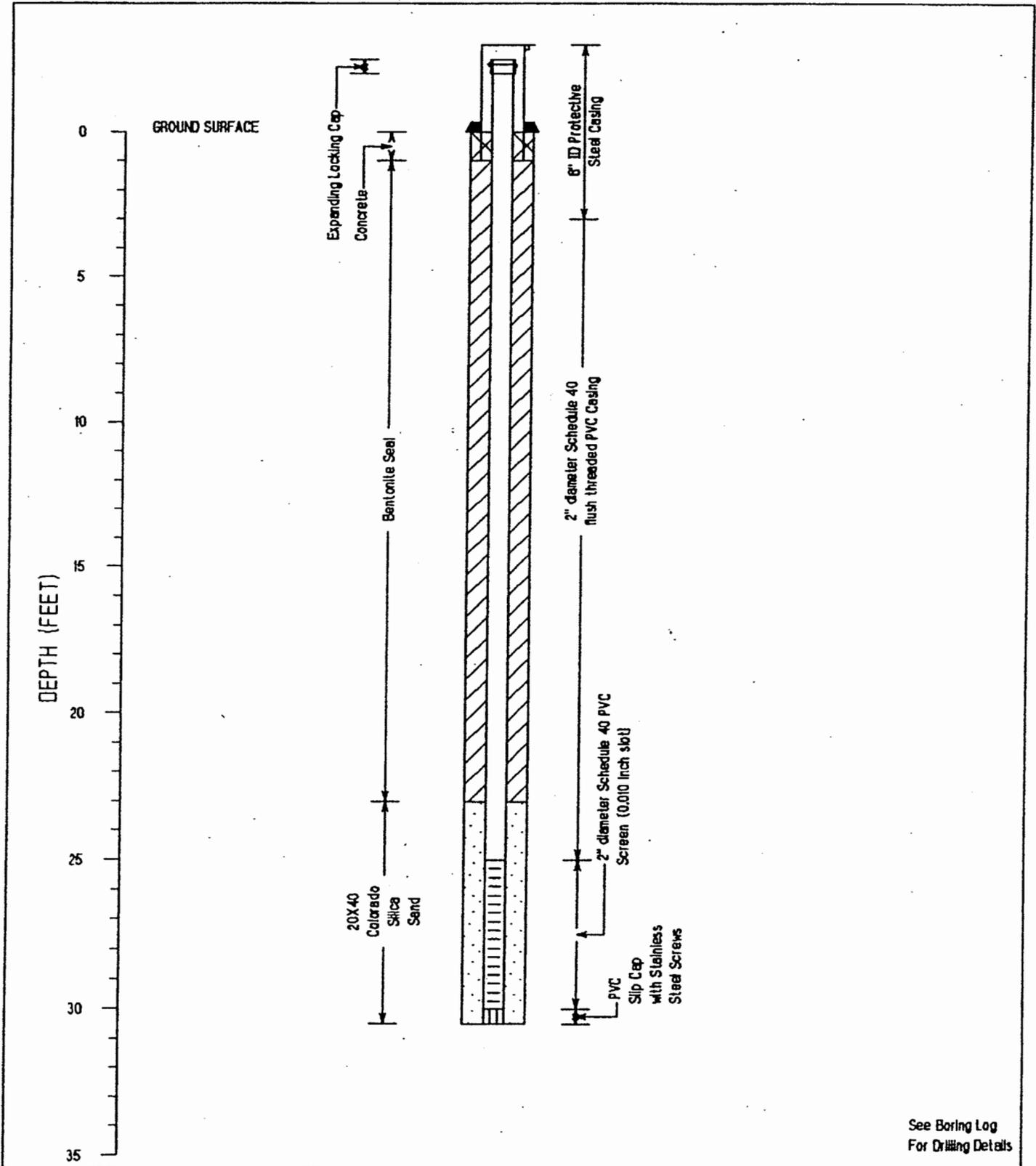
DRILLING METHOD AND EQUIPMENT Little Beaver with 4.25-Inch I.D. HSA

WATER LEVELS Approximately 1 Feet BGS

START 12-09-98

FINISH 12-08-98

LOGGER I. Gall





PROJECT NUMBER 107493.D8.02	BORING NUMBER MW38-007
SHEET 1 OF 1	
SOIL BORING LOG	

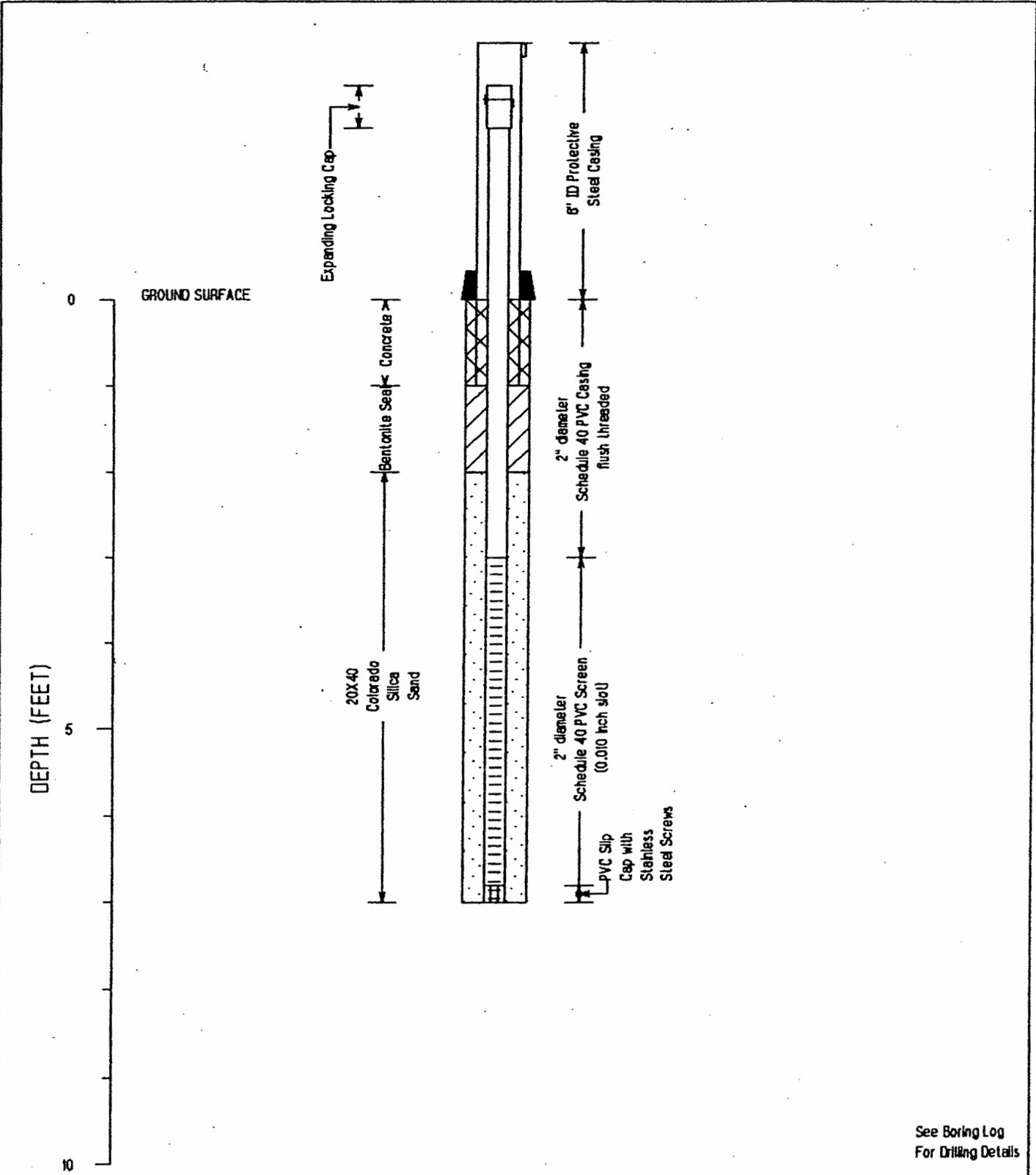
PROJECT Reynolds Metals -- RMC-Troutdale **LOCATION** RMC Property, East of Walsh Trucking
ELEVATION _____ **DRILLING CONTRACTOR** GeoTech Explorations, Inc.
DRILLING METHOD AND EQUIPMENT Mobile HSA rig; 8 5/8" Auger
WATER LEVELS _____ **START** 11-01-88 **FINISH** 11-01-88 **LOGGER** T. Gehweller

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 0' - 0' - 0' (N)	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
6.0	1.0				0-1 Feet: Crushed basalt road base	TOC soil samples collected at: 1 - 2.5 feet time: 1400 2.5 - 4 feet time: 1405 4 - 5.5 feet time: 1410 5.5 - 7 feet time: 1415
	2.5		0.8	4-5-5 (10)	1-2 Feet: SAND, (SP), brown, damp, loose, fine grained, with less than 5% silt, trace roots.	
	4.0		1.5	4-8-8 (17)	2-5 Feet: SAND, (SW), brown, damp, loose, fine to medium grained with orange mottling and red sand grains (less than 10%).	
	5.5		1.5	8-8-7 (13)	5-5.5 Feet: SILT, (ML), brown, damp, medium stiff.	
	7.0		1.4	3-2-2 (4)	5.5-8.5 Feet: SAND, (SW), gray, brown, wet, loose, fine to medium grained, orange mottling, trace red sand grains	
					8.5-7 Feet: SILT, (MH), brown, wet, soft, plastic, becomes gray at 7 feet.	
10.0					Total Depth = 7 Feet BGS	
15.0						
20.0						
25.0						



PROJECT NUMBER 107493.08.02	BORING NUMBER MW38-007	SHEET 1 OF 1
WELL COMPLETION LOG		

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION RMC Property, East of Walsh Trucking
ELEVATION _____ DRILLING CONTRACTOR GeoTech Explorations, Inc.
DRILLING METHOD AND EQUIPMENT Mobile HSA rig; 8 5/8" Auger
WATER LEVELS _____ START 11-01-88 FINISH 11-01-88 LOGGER T. Gehweiler





PROJECT NUMBER 107493.D6.02	BORING NUMBER MW38-035	SHEET 1 OF 2
SOIL BORING LOG		

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION RMC Property, East of Walsh Trucking
 ELEVATION _____ DRILLING CONTRACTOR GeoTech Explorations, Inc.
 DRILLING METHOD AND EQUIPMENT HSA (10" O.D., 6.25" I.D.) Mobile Drill B-59
 WATER LEVELS _____ START 12-02-96 FINISH 12-02-96 LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" - 6" - 6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
					See MW38-7 for first 10 feet of log	
5.0						
	10.0					
			1.5	2-2-2 (4)	SILT (ML), medium dark gray (N4), wet, soft, trace organics and very fine sand.	
	11.5					
	15.0					
			1.4	1-2-1 (3)	SILT with SAND, (ML), medium dark gray (N4), wet, soft, 15-20% very fine sand, trace organics.	Soil sample MW38I-0150-0 Driller reports formation appears to be moderately permeable
	16.5					
	17.5				SILT with SAND, (ML), as above.	
			1.0	2-2-2 (4)		
	19.0					
	20.0					
			1.4	2-2-2 (4)	SILT with SAND, (ML), as above, percent very fine sand increasing to 25-30%.	
	21.5					
	22.5				SILT with SAND, (ML), as above.	
			1.5	2-3-3 (6)		
	24.0					
	25.0					
			1.5	2-3-3 (6)	SILT, (ML), medium dark gray (N4), wet, soft, trace organics.	Soil sample MW38I-0250-0
	26.5					
	27.5					
			1.5	3-4-5 (9)	SILT (ML), as above, to 28 feet - grades to SAND with SILT (SM), medium dark gray (N4), wet, very loose, very fine to fine grained, 15-25% silt.	
	29.0					
	30.0					



PROJECT NUMBER 107493.D6.02	BORING NUMBER MW38-035
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SHEET 2 OF 2

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION RMC Property, East of Walsh Trucking
 ELEVATION _____ DRILLING CONTRACTOR GeoTech Explorations, Inc.
 DRILLING METHOD AND EQUIPMENT HSA (10" O.D., 6.25" I.D.) Mobile Drill B-59
 WATER LEVELS _____ START 12-02-96 FINISH 12-02-96 LOGGER I. Gall

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	6" -6" -6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	30.0		0.6	3-5-5 (10)	SAND, (SW), medium dark gray (N4), loose, wet, fine to medium grained, 10% silt, red grains present.	Soil sample MW38I-0350-0 Total Depth = 36 Feet BGS
	31.5					
	32.5					
	34.0		0.5	2-3-3 (6)	SAND, (SW), as above except very loose.	
35.0	35.0					
	36.0		1.0	3-4-4 (8)	SAND, (SW), as above, trace wood fragments.	
40.0						
45.0						
50.0						
55.0						



PROJECT NUMBER

107493.08.02

BORING NUMBER

MW38-035

SHEET 1 OF 1

WELL COMPLETION LOG

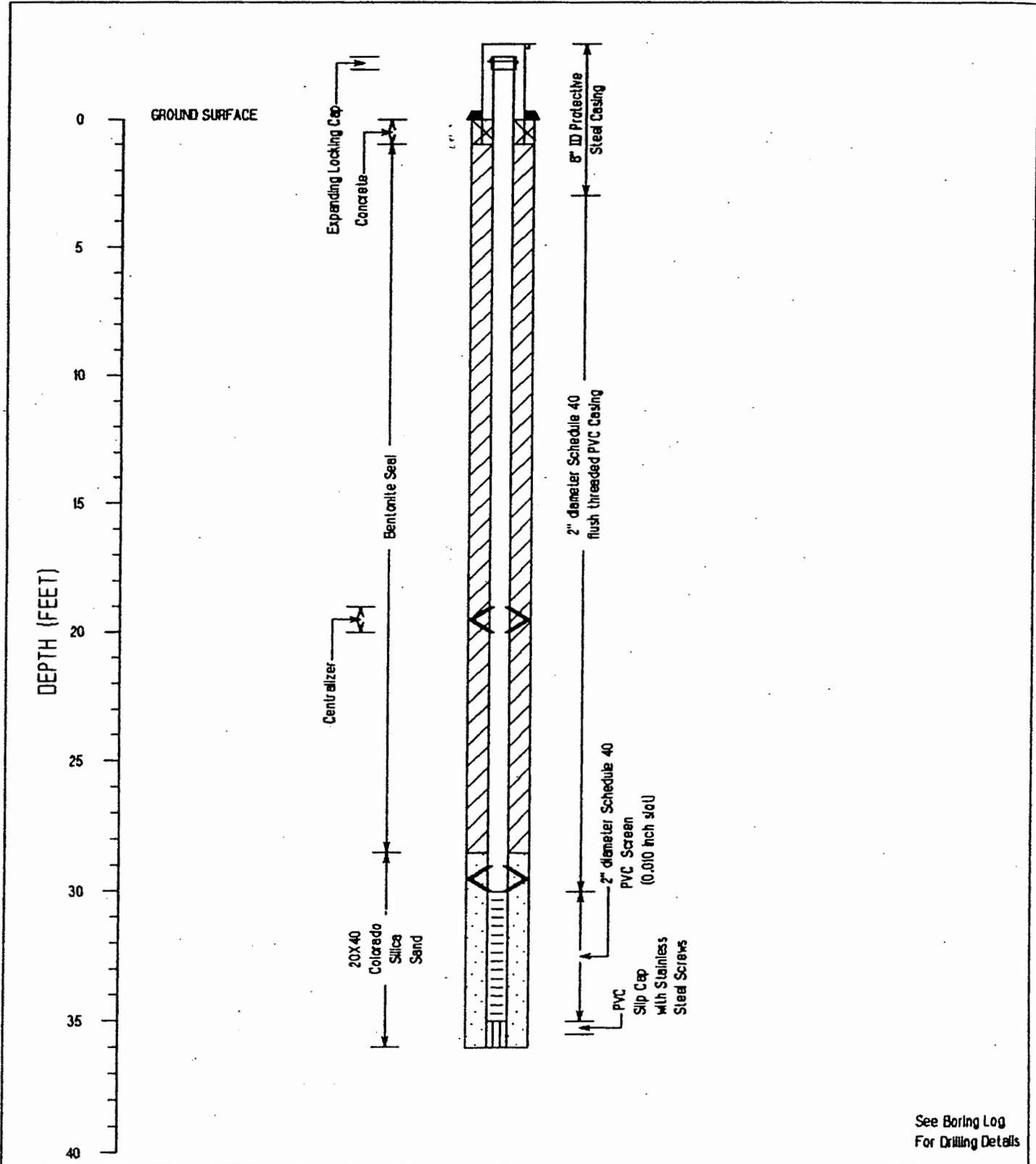
PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION RMC Property, East of Walsh Trucking

ELEVATION _____ DRILLING CONTRACTOR GeoTech Explorations, Inc.

DRILLING METHOD AND EQUIPMENT HSA (10" O.D., 8.25" I.D.) Mobile Drill B-59

WATER LEVELS _____ START 12-02-88 FINISH 12-02-88 LOGGER I. Gall





PROJECT NUMBER 107493.08.02	BORING NUMBER MW39-095	SHEET 1 OF 4
SOIL BORING LOG		

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION FAIRVIEW FARMS 800' W OF WW31
 ELEVATION _____ DRILLING CONTRACTOR STACO WELL SERVICES
 DRILLING METHOD AND EQUIPMENT FOREMOST DRILL - BARBER RIG W/ 8" CASING
 WATER LEVELS _____ START 8-23-97 FINISH 8-27-97 LOGGER ERIC BROBERG

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" - 6" - 6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
					0-2' cobble/gravel fill for drilling pad	
					Loamy topsoil	5" of soil cored with casing during plumbing of casing
5.0	5.0				SILT (ML), brownish gray (5yr., 2/1), soft, wet, mottled appearance, trace of organics/roots	F10 = 3ppm PID = BKGRD
	8.0				SAND WITH SILT (SM), pale brown (5 yr., 5/2), soft, wet, some mottling, 30% silt	Soil and water samples collected below 5' with sieve and bowl at cyclone hopper, logged from cuttings
	9.0					
10.0	10.0				SILT (ML), dark yellowish brown (10yr., 4/2), wet, soft, plastic	
15.0						
20.0	21.0					
	22.0				SILT WITH SAND (ML), dark yellowish brown (10yr., 4/2), wet, soft, 20-25% fine grained sand, subangular grains	
25.0						



PROJECT NUMBER
107493.D06.02

BORING NUMBER
MW39-095

SHEET 2 OF 4

SOIL BORING LOG

PROJECT Reynolds Metals --- RMC-Troutdale

LOCATION FAIRVIEW FARMS 800' W OF WW31

ELEVATION _____ DRILLING CONTRACTOR STACO WELL SERVICES

DRILLING METHOD AND EQUIPMENT FOREMOST DRILL - BARBER RIG W/ 8" CASING

WATER LEVELS _____ START 8-23-87 FINISH 8-27-87 LOGGER ERIC BROBERG

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8' - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
35.0						Water sample at 35' BGS F = 0.105ppm
40.0	40.0					
	41.0				SAND, (SW), dark gray (N3), wet, loose, fine to medium grained, red grains, organics (wood), 5-10% fine, subangular grains	
46.0						
60.0						Water sample at 50' BGS F = 0.115ppm
65.0	58.0				SAND, (SW), as above, with mica flakes	
	57.0					



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW39-095
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SHEET 3 OF 4

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION FAIRVIEW FARMS 800' W OF WW31
 ELEVATION _____ DRILLING CONTRACTOR STACO WELL SERVICES
 DRILLING METHOD AND EQUIPMENT FOREMOST DRILL - BARBER RIG W/ 8" CASING
 WATER LEVELS _____ START 8-23-97 FINISH 8-27-97 LOGGER ERIC BROBERG

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET	0' - 0' - 0' (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
85.0	85.0 88.0				SAND, (SW), same as above	
70.0						Water sample at 70' BGS F = 0.072ppm
75.0	75.0 78.0				SAND, (SW), same as above	
80.0						
85.0					SAND, (SW), same as above	Water sample at 85' BGS F = 0.101ppm



PROJECT NUMBER
107483.D8.02

BORING NUMBER
MW38-085

SHEET 4 OF 4

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION FAIRVIEW FARMS 800' W OF WW31

ELEVATION

DRILLING CONTRACTOR STACO WELL SERVICES

DRILLING METHOD AND EQUIPMENT FOREMOST DRILL - BARBER RIG W/ 8" CASING

WATER LEVELS

START 8-23-97

FINISH 8-27-97

LOGGER ERIC BROBERG

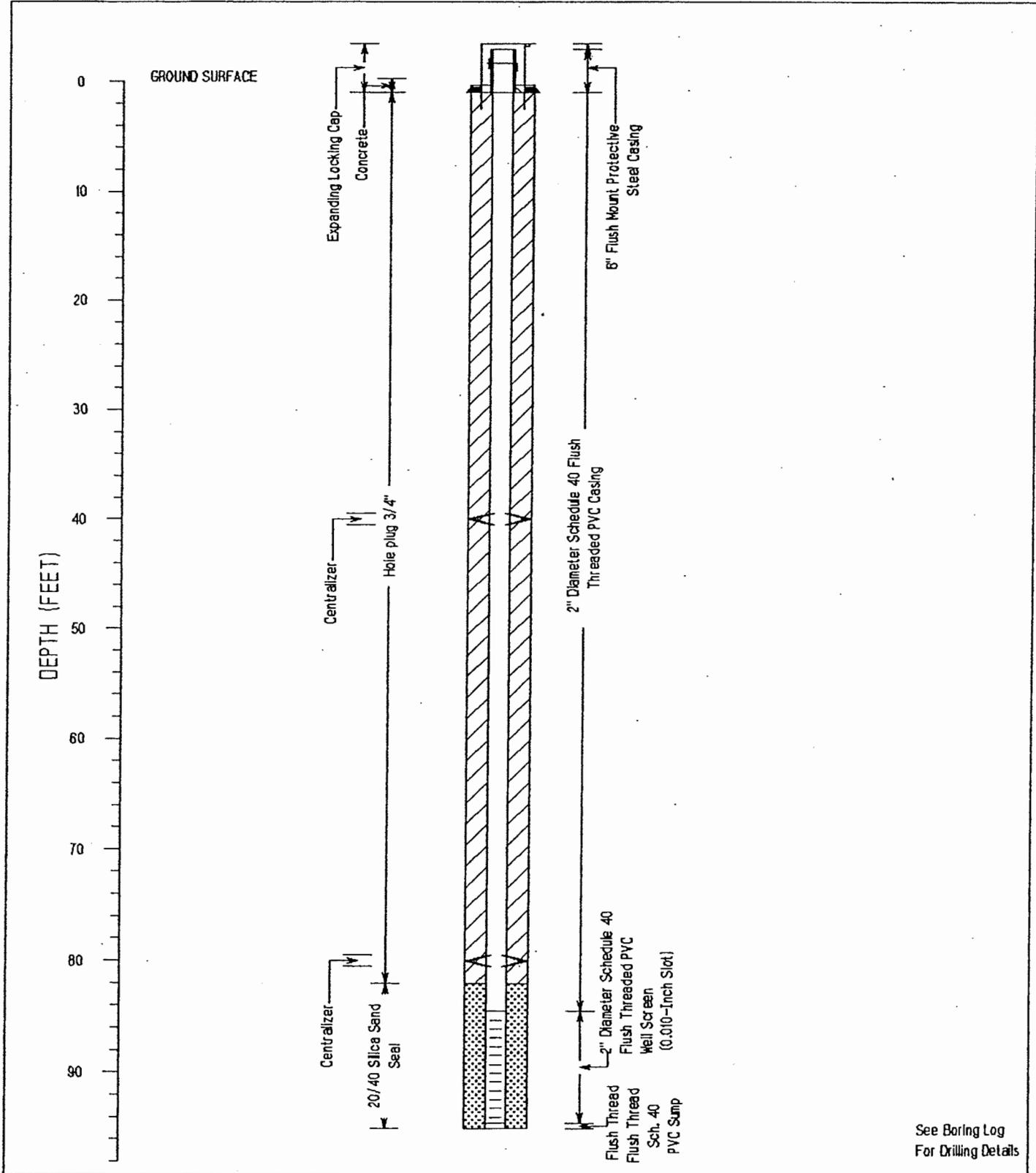
DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 8" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
85.0					SAND, (SW), same as above	
100.0					End of boring at 95'	
105.0						
110.0						
115.0						



PROJECT NUMBER 107493.08.02 BORING NUMBER MW39-095 SHEET 1 OF

WELL COMPLETION LOG

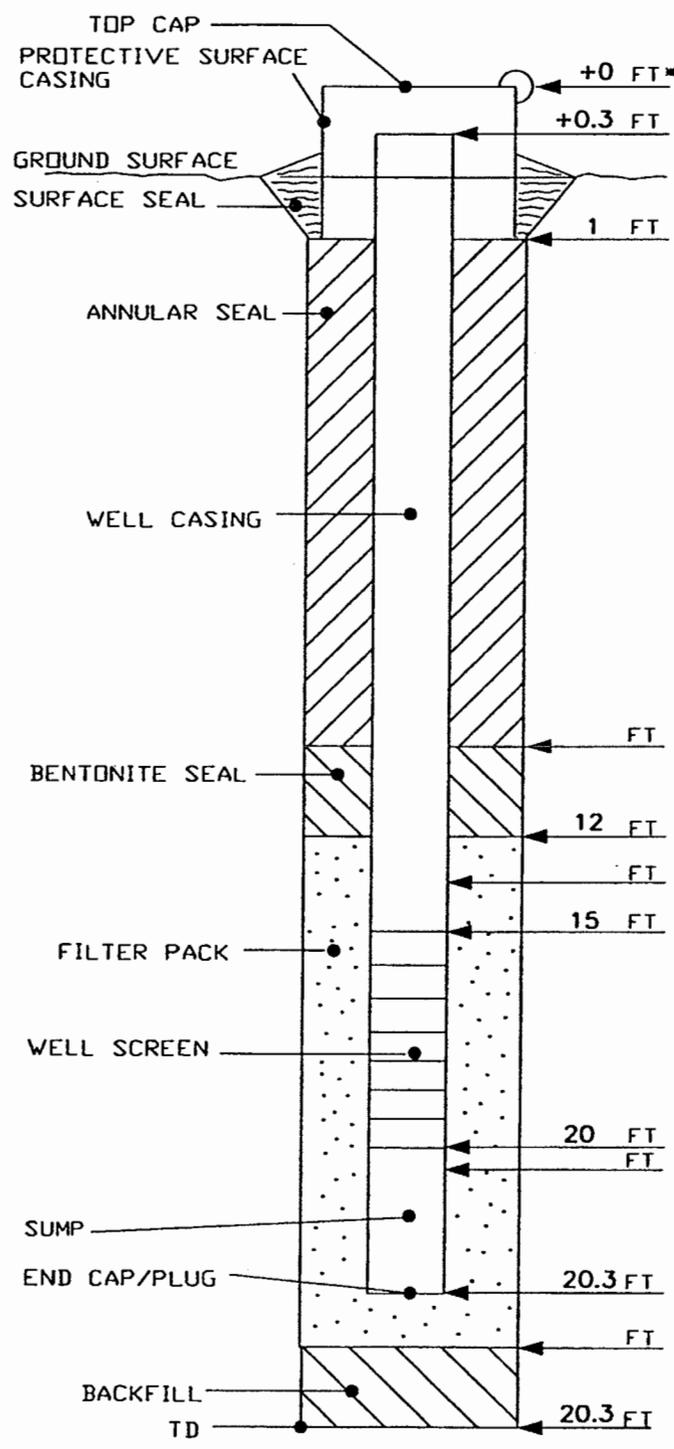
PROJECT Reynolds Metals -- RMC-Troutdale LOCATION FAIRVIEW FARMS 800' W OF WW31
ELEVATION _____ DRILLING CONTRACTOR STACO WELL SERVICES
DRILLING METHOD AND EQUIPMENT FOREMOST DRILL - BARBER RIG W/ 8" CASING
WATER LEVELS _____ START 8-23-97 FINISH 8-27-97 LOGGER ERIC BROBERG



See Boring Log For Drilling Details

MONITORING WELL RECORD DRAWING & CONSTRUCTION LOG

PROJECT NAME RMC-TROUTDALE PROJECT NO. 107493.06.02
 WELL NO. MW41-020 FIELD OBSERVERS BROBERG
 ELEV, NGVD (top of well casing) 28.63 SURFACE ELEV, NGVD 29.1
 WATER LEVEL ELEV/DATE, NGVD _____ START DATE 6/13/97
 DRILLING CONTRACTOR GEOTECH FINISH DATE 6/13/97
 DRILLING METHOD 11" OD; 6.5" ID HSA/LOCATION: BAKEHOUSE



WELL CONSTRUCTION MATERIALS

BOREHOLE DIA(S) 11 INCHES TO 20.3 FT BGS
 _____ INCHES TO _____ FT BGS
 _____ INCHES TO _____ FT BGS
 PROTECTIVE CASING TYPE FLUSH MOUNT-SHERWOOD
 PROTECTIVE CASING DIAMETER 6"
 WELL CASING TYPE SCH 40 PVC DIAMETER 2"
 COUPLING TYPE FLUSH THREAD
 SCREEN TYPE SCH 40 PVC DIAMETER 2"
 SLOT SIZE 0.010" SCREEN LENGTH 5'
 TOP CAP TYPE EXPANDABLE LOCKING
 END CAP/PLUG TYPE SCH 40 PVC FLUSH THREAD
 CENTRALIZER TYPE _____
 CENTRALIZER LOCATION(S) _____
 FILTER PACK TYPE SILICA SAND (9 BAGS)
 GRADATION 20/40

SEAL(S)

SURFACE CONCRETE (2.5 BAGS)
 ANNULAR 3/4" HOLEPLUG (10 BAGS)
 BENTONITE _____
 BACKFILL _____

WELL DEVELOPMENT

DATE _____
 METHOD _____
 COMMENTS MW41-020 START CARD #100165
TAG #L05781

* REFER TO MW41-033 FOR SUBSURFACE
GEOLOGY INFORMATION

* DEPTHS ABOVE/BELOW GROUND SURFACE
 MW-41.DWG



CH2MHILL

PROJECT NUMBER :
107493.D6.02

WELL NUMBER : MW41-033

SHEET 1 OF 2

WELL CONSTRUCTION/BORING LOG

PROJECT : RMC - TROUTDALE

LOCATION : NW SIDE OF ENGINEERING

ELEVATION : MPE = 28.71' / GSE = 29.1'

DRILLING CONTRACTOR : GEOTECH EXPLORATION, TUALATIN, OREGON

DRILLING METHOD AND EQUIPMENT USED : 11" OD; 6.5" HSA, ID B59 MOBILE DRILL

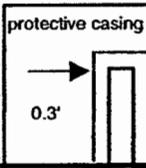
WATER LEVELS :

START : 6/12/97

END : 6/13/97

LOGGER: EMB

DEPTH BELOW SURFACE (FT)	Interval	Type and Number	Recovery (ft)	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
0					CONCRETE	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.3'					GRAVELLY SAND (SW), pale brown (5YR 5/2) damp, loose, fine to medium grained sand with >15% fine to coarse gravel, less 5% silt	LAB Sample: 1510 MW41-0050-16397-0
5.0			1.4	6-8-14 (22)	SAND (SW), pale brown (5YR 5/2) damp, fine to medium grained, loss 5% silt	PID = 33 ppm FID = acgrd LEL = ND Dust = 0
10.0			1.4	4-3-3 (6)	SAND WITH SILT (SW-SM.), pale brown (5YR 5/2) to pale medium brown (10YR 5/4), wet yellow, very fine grained, loose, 20-25% silt	
15.0			1.5	3-4-5 (9)	SILT (ML), medium gray, wet, soft, plastic, some worm/root holes	LAB Sample: 0830 MW41-0160-16497-0
20.0			1.5	2-2-2 / (4)	SILT (ML), same as above	
25.0			1.5	4-6-7 (13)	SILT (ML), same as above	
28.0			1.5	10-11-14 (25)	SILT (ML), same as above	
				10-10-10 (20)	SAND (SM.), dark yellowish brown (10YR 4/2), wet loose, fine to medium grained, some mica 5% silt	
					SAND (SM.), same as above	



Cement Grout

20X40 Silica Sand



PROJECT NUMBER :
107493.D6.02

WELL NUMBER : MW41-033

SHEET 2 OF 2

WELL CONSTRUCTION/BORING LOG

PROJECT : RMC - TROUTDALE

LOCATION : NW SIDE OF ENGINEERING

ELEVATION : MPE = 28.71' / GSE = 29.1'

DRILLING CONTRACTOR : GEOTECH EXPLORATION, TUALATIN, OREGON

DRILLING METHOD AND EQUIPMENT USED : 11" OD; 6.5" HSA, ID B59 MOBILE DRILL

WATER LEVELS :

START : 6/12/97

END : 6/13/97

LOGGER: EMB

DEPTH BELOW SURFACE (FT)	Interval	Type and Number	Recovery (ft)	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
				6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
33	31.5		1.4	8-10-10 (20)	SAND (SM.), same as above	LAB Sample: 1615 MW41-0310-16397-0
35			1.4	10-10-12 (22)	SAND (SM.), same as above	
40					End of Boring @ 35.0' bgs	Start Card # = 100164
					Well Developed on 06/19/97	Tag # L05780
					Borehole diameter = 11" to 35.0' bgs	

20X40 Silica Sand



2" diameter Schedule 40
10" slot PVC



PROJECT NUMBER 107493.08.02	BORING NUMBER MW43-027/MW43-015 SHEET 1 OF 1
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SOIL BORING LOG

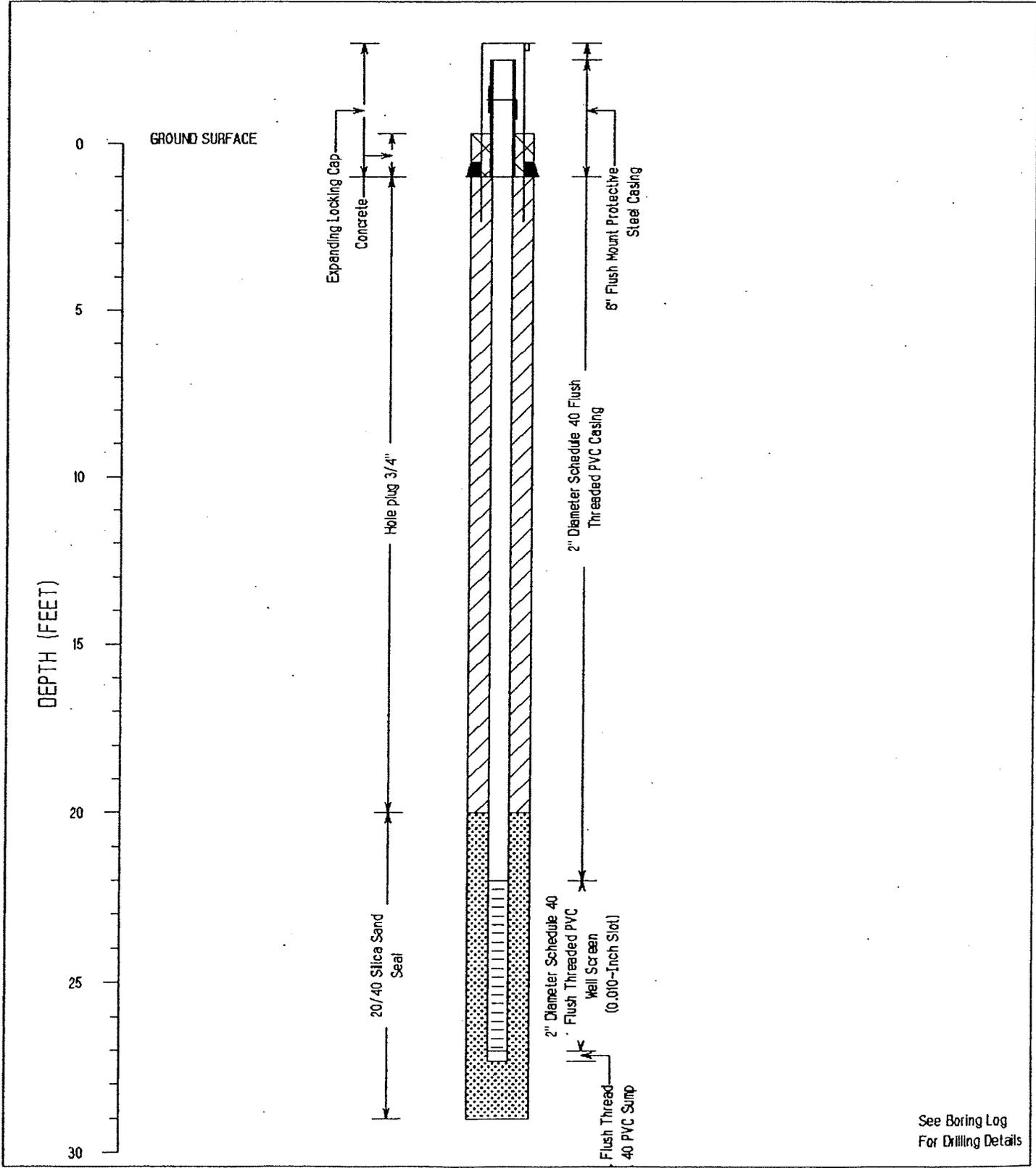
PROJECT Reynolds Metals --- RMC-Troutdale **LOCATION** NE SIDE OF ENGINEERING BUILDING
ELEVATION _____ **DRILLING CONTRACTOR** GEOTECH
DRILLING METHOD AND EQUIPMENT 11" O.D. 8.5" ID, 8-59 MOBIL DRILL
WATER LEVELS _____ **START** 8-13-97 **FINISH** 8-13-97 **LOGGER** ERIC BROBERG

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" - 6" - 6" (N)	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
					4" asphalt	
5.0	5.0				GRAVELLY SAND, (SW), gray brown (5yr., 3/2), damp, loose, fine, medium grained 15% fine // gravek, less than 5% silt	Lab sample: 1330 MW43-0050-18497-0 FID = 0.25ppm PID = 24ppm LEL = ND 21% O2, 0% Pentane Dubt = 0
	8.5		1.3	12-15-8 (23)	SAND, (ML), pale brown (5yr., 8/2), damp, loose, fine to medium grained <5% silt, subangular grains	
10.0	10.0					
	11.5		1.5	2-3-2 (5)	SILT, (ML), dark yellowish brown (10yr., 4/2), wet, firm, plastic mottling, with worm/root holes	Lab sample: 1410 W43-0110-18497-0
	13.5				SILT, (ML), as above	
15.0	15.0		1.5	4-3-2 (5)		
	18.5		1.5	2-3-5 (83)	SILT WITH SAND, (ML-SW), moderate yellowish brown (10YR., 5/8), firm, orange mottling, 20%-25% very fine sand	
	17.5					
	19.0		1.5	3-5-18 (23)	SAND, (SW), dark yellowish brown (10yr., 4/2), wet, loose, mica flakes, 5% silts, subangular grains	
20.0						
	21.5		1.5	6-7-13 (20)	SAND, (SW), brownish gray (5yr., 4/1), wet, loose, mica flakes	
	25.0					
25.0						
	28.5		1.5	7-10-18 (28)	SAND, (SW), same as above	Lab sample: 1120 MW43-0280-18497-0
					SAND, (SW), same as above	
						Total depth 28.0' BGS



PROJECT NUMBER 107483.08.02	BORING NUMBER MW43-027/MW43-015 SHEET 1 OF 1
WELL COMPLETION LOG	

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION NE SIDE OF ENGINEERING BUILDING
ELEVATION _____ DRILLING CONTRACTOR GEOTECH
DRILLING METHOD AND EQUIPMENT 11" O.D. 8.5" I.D. 8-59 MOBIL DRILL
WATER LEVELS _____ START 8-13-97 FINISH 8-13-97 LOGGER ERIC BROBERG



See Boring Log
For Drilling Details



PROJECT NUMBER

107493.D8.02

BORING NUMBER

MW43-015

SHEET 1 OF 1

WELL COMPLETION LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION NE SIDE OF ENGINEERING BUILDING

ELEVATION

DRILLING CONTRACTOR GEOTECH

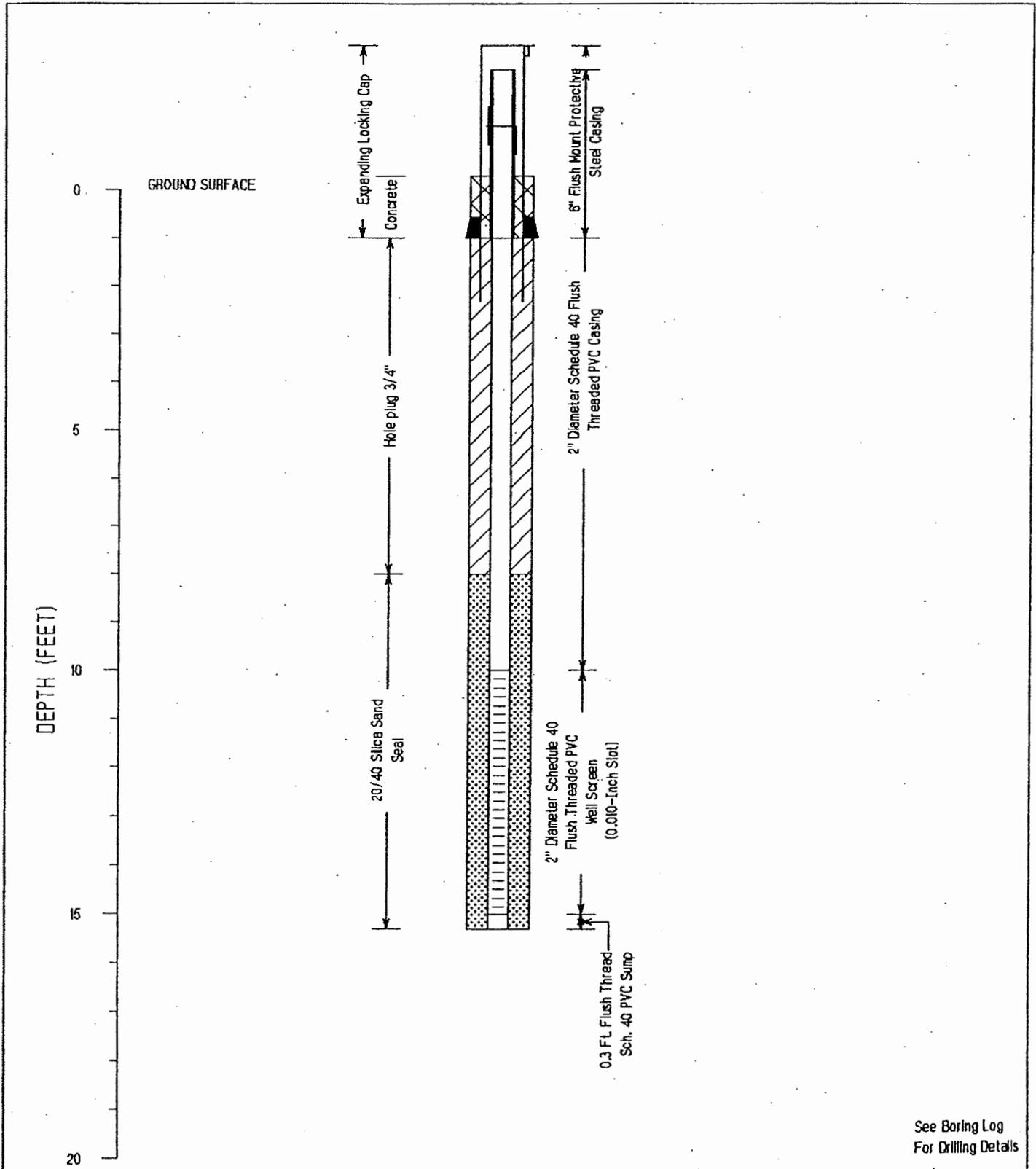
DRILLING METHOD AND EQUIPMENT 11" O.D. 8.5" I.D., 8-58 MOBIL DRILL

WATER LEVELS

START 8-13-87

FINISH 8-13-87

LOGGER ERIC BROBERG





PROJECT NUMBER

107493.08.02

BORING NUMBER

MW44-027/MW44-011 SHEET 1 OF 1

SOIL BORING LOG

PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION EAST SIDE OF BAKEHOUSE

ELEVATION _____ DRILLING CONTRACTOR GEOTECH

DRILLING METHOD AND EQUIPMENT 11" O.D. HSA 8.5"ID, B59 MOBILE DRILL

WATER LEVELS _____ START 8-12-97 FINISH 8-12-97 LOGGER ERIC BROBERG

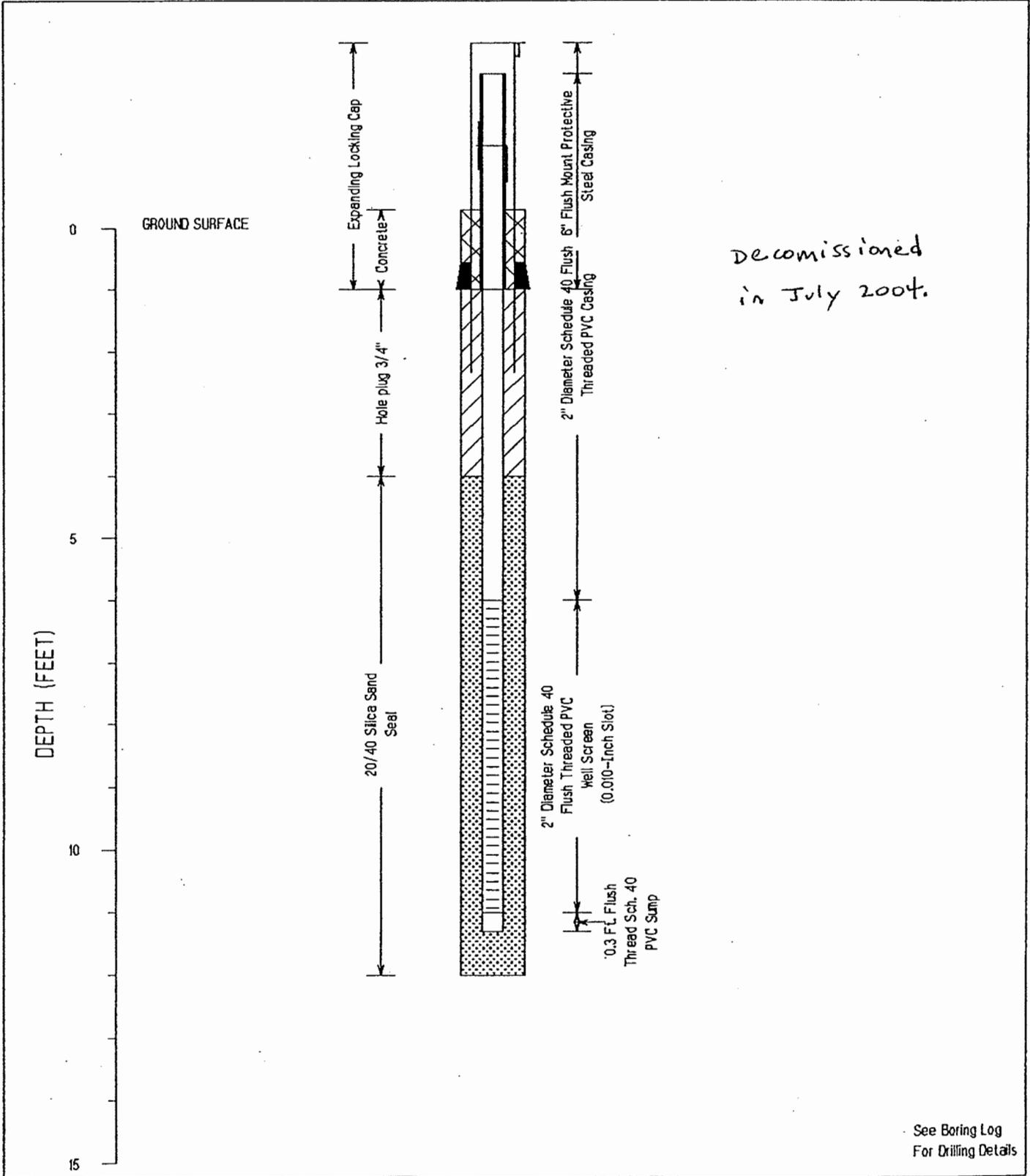
DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" - 8" - 8" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY FEET			
					Surface - sand/gravel fill	Sampling with 3" "California Modified" split spoon
5.0	5.50					
	6.5		1.5	5-4-4 (13)	SAND, (SW), pale brown (5yr., 4/2), damp, loose, fine to very fine-grained SAND WITH SILT, (SW-SM), at 6', damp, loose, fine grained	
	7.5					
	8.0		1.5	2-3-4 (8)	SILT, (ML), pale yellow-brown (10yr., 8/2), wet, firm, orange mottling, worm at root holes	Soil PID = 21ppm Soil FID = Background LEL = ND
10.0						
	15.0					
	16.5		1.4	4-8-10 (22)	SAND, (SW), moderate yellow brown with orange (10yr., 5/4), wet, firm, fine to medium grained, mica flakes, 5% silt, subangular grains	
	17.5					
	19.0		1.5	8-17-20 (45)	SAND, (SW), dark yellow brown (10YR., 8/2), wet, firm fine to medium grained, mica flakes, subangular grains	
20.0	20.0					
	21.5		1.4	8-14-20 (40)	SAND, (SW), light olive gray, (5yr., 5/2), fine to medium grained, mica flakes	
	22.5					
	24.0		1.5	4-8-8 (18)		
	25.0				SAND, (SW), olive gray (5yr., 3/2), wet, fine to medium grained, mica flakes, subangular grains	
25.0	26.5		1.5	8-10-12 (30)	SAND, (SW), same as above	
	27.0					
	28.5		1.5	8-8-12 (28)	SAND, (SW), same as above	
						Total depth 27.5' BGS

Decommissioned
in July
2004,



PROJECT NUMBER 107493.D8.02	BORING NUMBER MW44-011	SHEET 1 OF
WELL COMPLETION LOG		

PROJECT Reynolds Metals -- RMC-Troutdale LOCATION EAST SIDE OF BAKEHOUSE
ELEVATION _____ DRILLING CONTRACTOR GEOTECH
DRILLING METHOD AND EQUIPMENT 11" O.D. HSA 8.5" ID, B59 MOBILE DRILL
WATER LEVELS _____ START 8-12-97 FINISH 8-12-97 LOGGER ERIC BROBERG





PROJECT NUMBER

107.493.D8.02

BORING NUMBER

MW44-027/MW44-011 SHEET 1 OF

WELL COMPLETION LOG

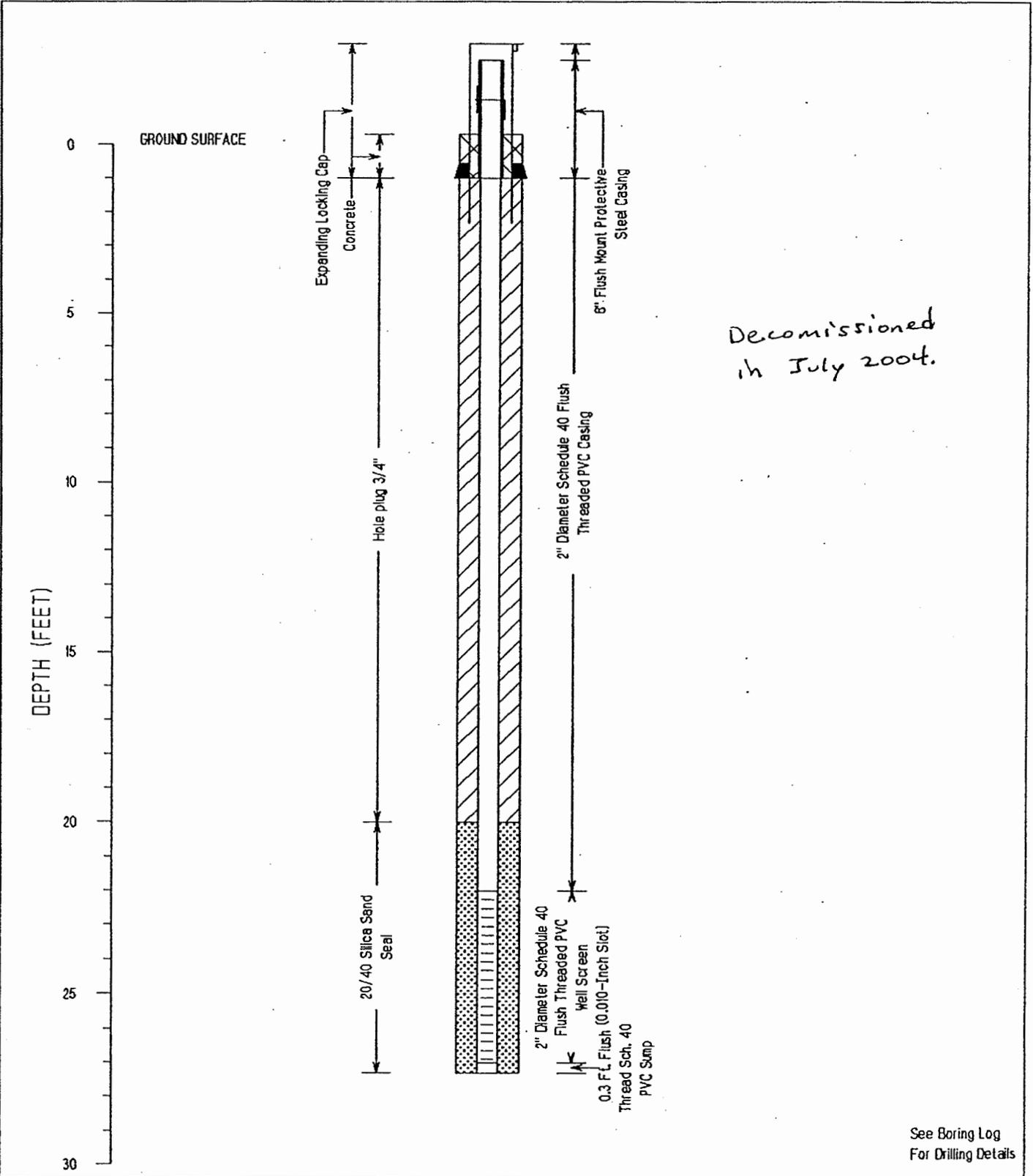
PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION EAST SIDE OF BAKEHOUSE

ELEVATION _____ DRILLING CONTRACTOR GEOTECH

DRILLING METHOD AND EQUIPMENT 11" O.D. HSA 8.5"ID, B59 MOBILE DRILL

WATER LEVELS _____ START 8-12-97 _____ FINISH 8-12-97 _____ LOGGER ERIC BROBERG



See Boring Log
For Drilling Details



PROJECT NUMBER

107493.D8.02

BORING NUMBER

MW45-042/MW45-017 SHEET 1 OF 1

WELL COMPLETION LOG

PROJECT Reynolds Metals --- RMC-Troutdale

LOCATION SOUTH SIDE OF BAKEHOUSE

ELEVATION

DRILLING CONTRACTOR GEOTECH

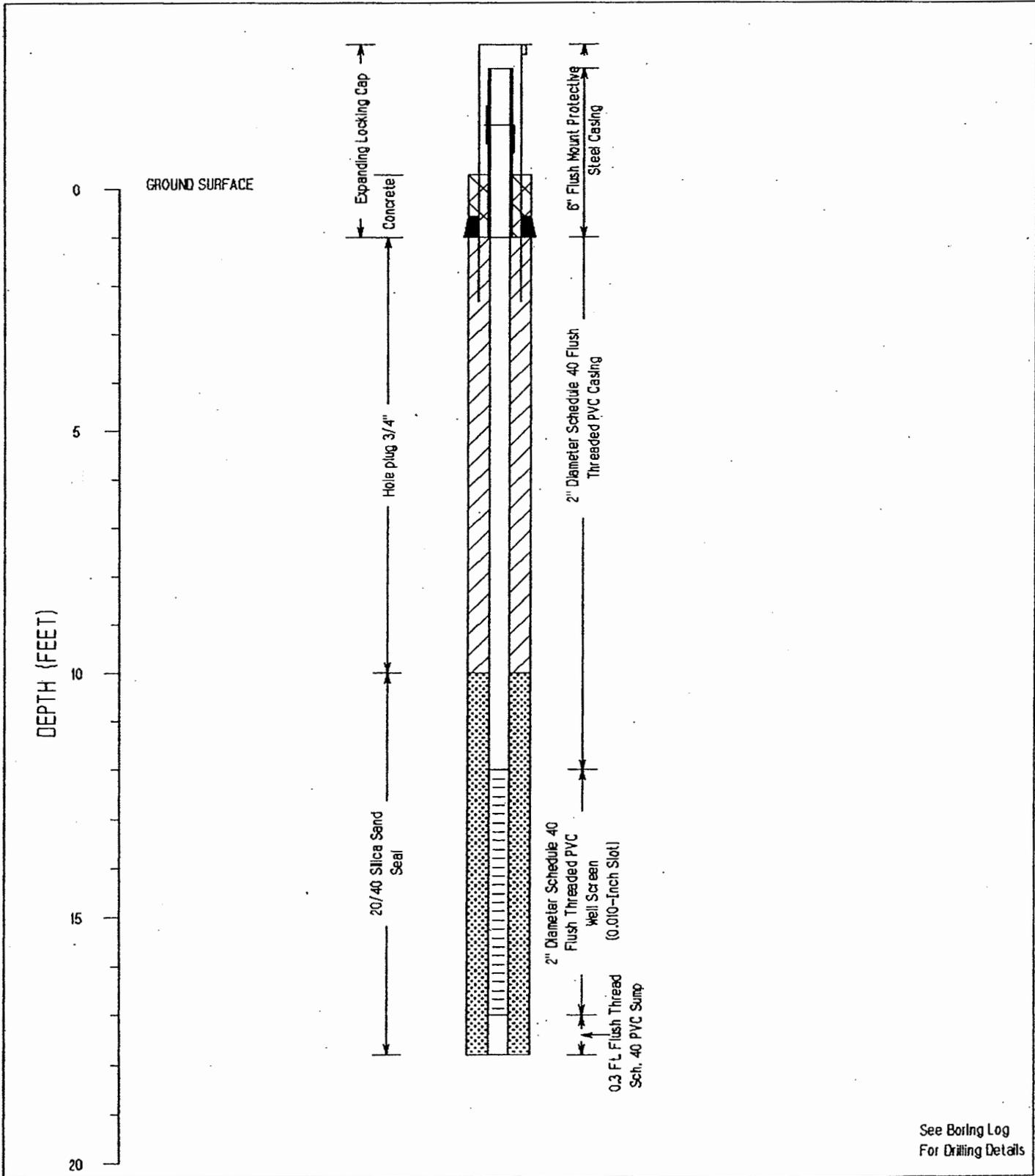
DRILLING METHOD AND EQUIPMENT 11" O.D. HSA 8.5"ID, B58 MOBILE DRILL

WATER LEVELS

START 8-16-87

FINISH 8-17-87

LOGGER ERIC BROBERG





PROJECT NUMBER

107493.08.02

BORING NUMBER

MW45-042/MW45-017 SHEET 1 OF 1

WELL COMPLETION LOG

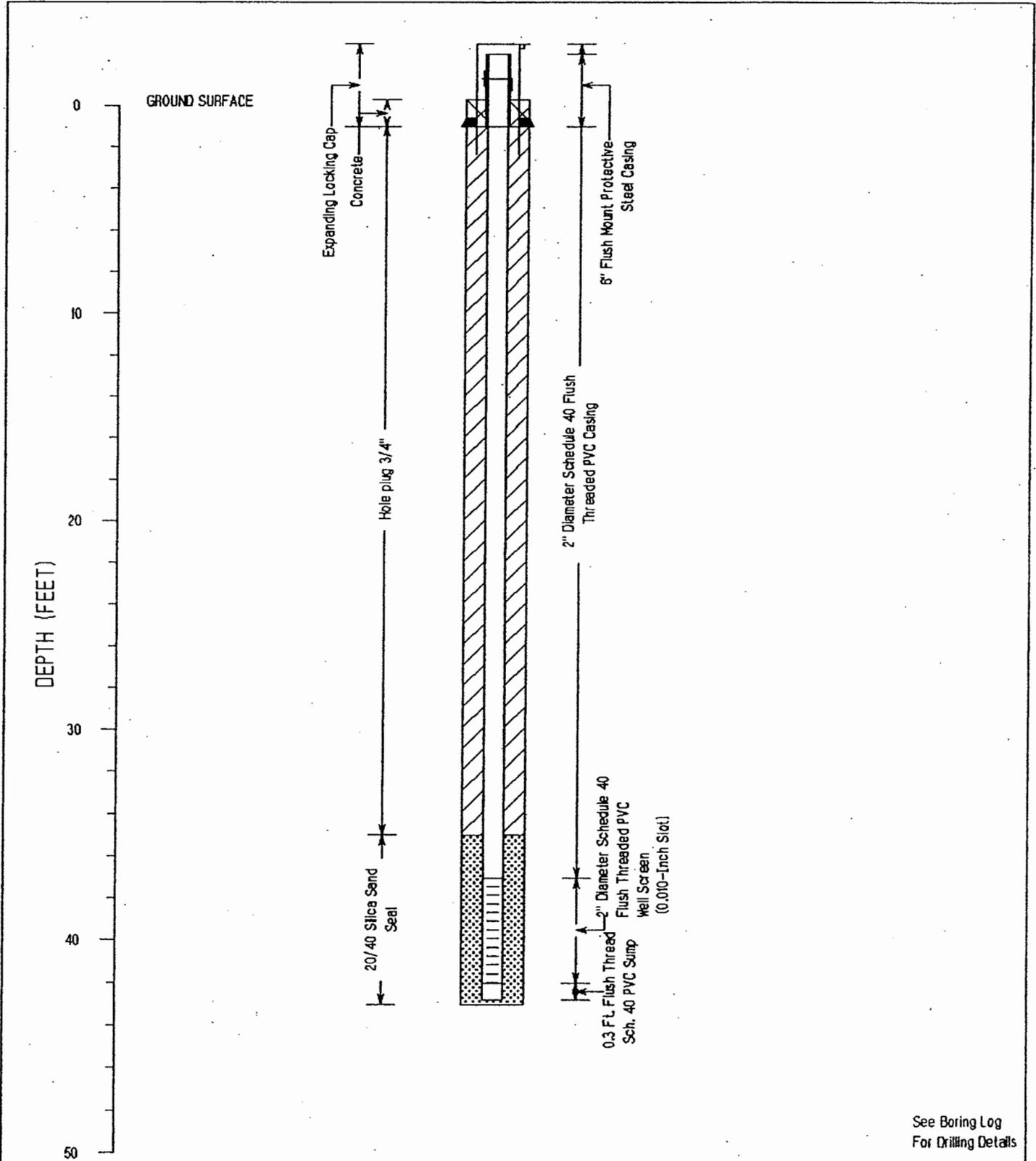
PROJECT Reynolds Metals -- RMC-Troutdale

LOCATION SOUTH SIDE OF BAKEHOUSE

ELEVATION _____ DRILLING CONTRACTOR GEOTECH

DRILLING METHOD AND EQUIPMENT 11" O.D. HSA 6.5"ID, B59 MOBILE DRILL

WATER LEVELS _____ START 8-18-87 FINISH 8-17-87 LOGGER ERIC BROBERG



See Boring Log For Drilling Details



CH2MHILL

PROJECT NUMBER :
107493.D6.02

WELL NUMBER : MW48-055

SHEET 1 OF 2

WELL CONSTRUCTION/BORING LOG

PROJECT : RMC - TROUTDALE

LOCATION : NO. SIDE OF CASTHOUSE

ELEVATION : MPE = 28.19' / GSE = 28.4'

DRILLING CONTRACTOR : STACO, TROY REYNOLDS

DRILLING METHOD AND EQUIPMENT USED : AIR ROTARY

WATER LEVELS : 17.77

START : 8/28/97

END : 9/2/97

LOGGER: R. KAZMIEKZAK

DEPTH BELOW SURFACE (FT)	Interval	Type and Number	Recovery (ft)	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
				6"-6"-6" (N)		
0						DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						Spud-In with 6" hole
5	5.0				SAND (SW), grayish brown (5YR 3/2), dry to damp, loose, fine to medium grained, thin lamina of silty, subangular grains	Soil from cyclone, collected with SS bowl, logged from cuttings
	6.0					
10						
	14.0				SILT (ML), dark yellowish brown (10YR 4/2), wet, soft, 10% fine grained sand	Drive casing to 15.0'
15	15.0					
20						Water @ 20.0'
	24.0				SAND WITH SILT (SW-SM), brownish gray (5YR 4/1), wet, very loose, fine grained sand, subangular grains	Soil from cyclone, drive casing to 25.0'
25	25.0					

protective casing

Cement Grout



PROJECT NUMBER :
107493.D6.02

WELL NUMBER : MW48-055

SHEET 2 OF 2

WELL CONSTRUCTION/BORING LOG

PROJECT : RMC - TROUTDALE

LOCATION : NO. SIDE OF CASTHOUSE

ELEVATION : MPE = 28.19' / GSE = 28.4'

DRILLING CONTRACTOR : STACO, TROY REYNOLDS

DRILLING METHOD AND EQUIPMENT USED : AIR ROTARY

WATER LEVELS : 17.77

START : 8/28/97

END : 9/2/97

LOGGER: R. KAZMIEKZAK

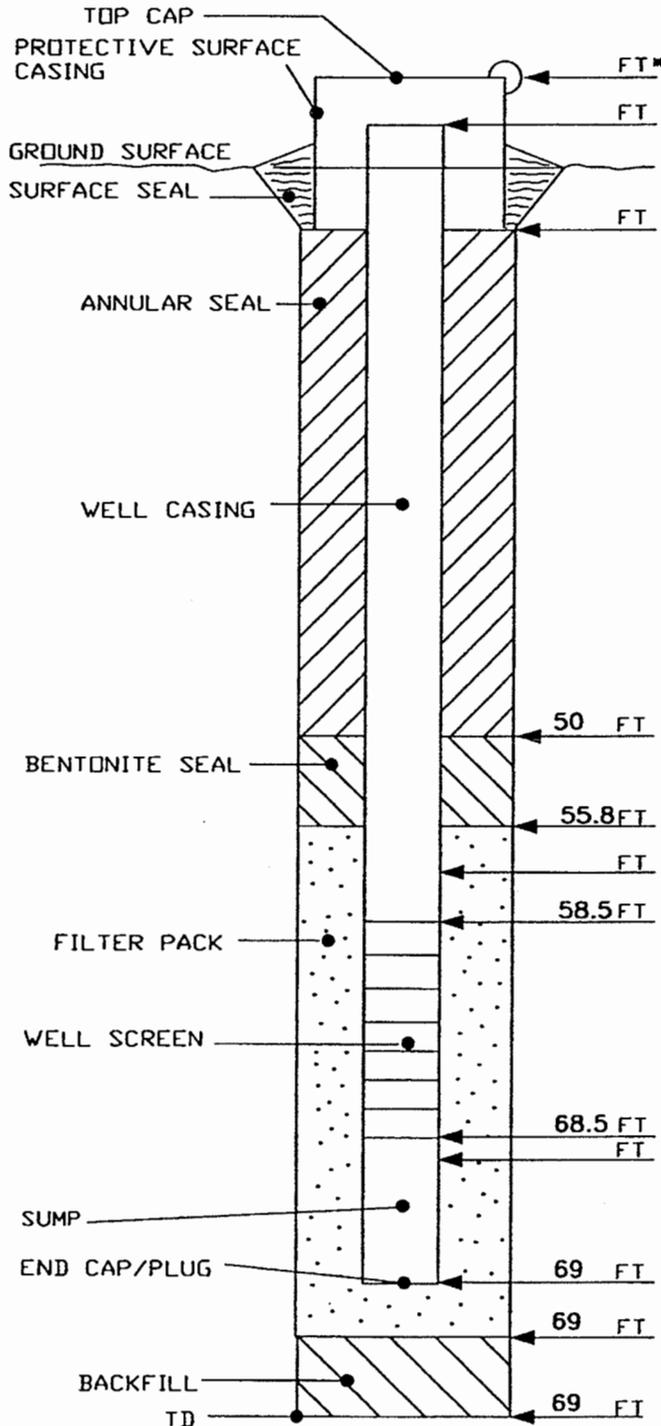
DEPTH BELOW SURFACE (FT)	Interval	Type and Number	Recovery (ft)	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
				6"-6"-6" (N)		
35.0						
36.0					SANDY SILT (ML), dark gray (N3), wet, loose, fine grained sand, trace mica, red grains	
45.0						
46.0					SAND (SW), medium dark gray (N4), wet, loose, fine to medium grained, <5% silt, trace mica and red grains, subangular grains	
54.0						
55.0					SAND (SW), as above	
End of Boring @ 55.9' bgs						
Borehole diameter = 6" to 56" bgs						Well developed on 9/02/97.

20X40 Silica Sand

2" diameter Schedule 40
10" slot PVC

MONITORING WELL RECORD DRAWING & CONSTRUCTION LOG

PROJECT NAME RMC-TROUTDALE PROJECT NO. 107493.06.02
 WELL NO. MW51-069 FIELD OBSERVERS SMKREKOS
 ELEV, NGVD (top of well casing) 26.17 SURFACE ELEV, NGVD 23.4
 WATER LEVEL ELEV/DATE, NGVD _____ START DATE 11/3/97
 DRILLING CONTRACTOR GEOTECH FINISH DATE 11/3/97
 DRILLING METHOD 6" HSA/LOCATION: NORTHWEST, ADJACENT TO RIVER



NOT TO SCALE

* DEPTHS ABOVE/BELOW GROUND SURFACE

MW-51.DWG

WELL CONSTRUCTION MATERIALS

BOREHOLE DIA(S) 6 INCHES TO 69 FT BGS
 _____ INCHES TO _____ FT BGS
 _____ INCHES TO _____ FT BGS
 PROTECTIVE CASING TYPE SURFACE
 PROTECTIVE CASING DIAMETER 6"
 WELL CASING TYPE SCH 40 PVC DIAMETER 2"
 COUPLING TYPE NONE
 SCREEN TYPE _____ DIAMETER 2"
 SLOT SIZE 0.010" SCREEN LENGTH 10'
 TOP CAP TYPE _____
 END CAP/PLUG TYPE 0.5' THREADED
 CENTRALIZER TYPE NONE
 CENTRALIZER LOCATION(S) NA
 FILTER PACK TYPE _____
 GRADATION 20/40

SEAL(S)

SURFACE _____
 ANNULAR BENTONITE SLURRY (115 GAL)
 BENTONITE _____
 BACKFILL NONE

WELL DEVELOPMENT

DATE _____
 METHOD _____
 COMMENTS _____

* NO SUBSURFACE GEOLOGIC INFORMATION

AVAILABLE



PROJECT NUMBER
153269.04.04.03

BORING NUMBER
MW 54-050 SHEET 1

SOIL BORING LOG 9/18/00

PROJECT SLF Investigation

LOCATION 10' West G-P77

ELEVATION _____ DRILLING CONTRACTOR

Geo Tech

DRILLING METHOD AND EQUIPMENT HSA

WATER LEVELS _____ START 9:20 FINISH 10:50 LOGGER M. Leece

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5						No Sample
10		0%	1.25	9/10/18	Sand/SP/Brown-Grey/Wet loose / Med-grained	
10		0%	1.5	9/12/19	Silt/ML/Brown/Damp/stiff / 70% plasticity	@ 11.5
10		0%	1.5	8/9/12	Sand/SP/Brown-grey/wet/loose	@ 11.5 Slough
15		0%	1.5	3/14/4	Silt/ML/Grey-Green/Damp	Slough
15		0%	1.5		stiff / some black mottling	@ 15'
20						Drill to 30'
25						No Sample
30		0%	1.5	3/3/4	Sandy-Silt/ML/Green Grey / Moist / <5% sand / coarse grained	sample 29-30 1/2



PROJECT NUMBER

BORING NUMBER

MW 54

SHEET

2 0

SOIL BORING LOG

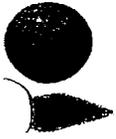
PROJECT _____ LOCATION West of GP77

ELEVATION _____ DRILLING CONTRACTOR _____

DRILLING METHOD AND EQUIPMENT _____

WATER LEVELS _____ START _____ FINISH _____ LOGGER _____

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
35		Ø	1.5	2-2-3	Sandy-silt/SP/ML/Brown-grey / wet / loose med grained.	
		Ø	1.5	2-3-4	Silt/ML / Grey-Green / moist slightly plastic	
		Ø	1.5	4-5-9	Sandy-silt/SP/ML / Grey / wet / loose med grained / fine grained	becoming less silty
40		Ø	1.5	1-2-3	Sand/SP-ML / Grey - Black / wet med grained	Top of UGS @ 37.5'
		Ø	1.5	2-3-5		
45		Ø	1.5	7-9-12	Sand/SW / Grey - Black / wet med-grained.	UGS
50		Ø	1.5	12-29-35	Sand/SW / Grey - Black / wet med-grained	UGS
					EOB 50' @ 10:50	
					9/18/2000	



CH2MHILL

PROJECT NUMBER:

153269.04.04.03

WELL NUMBER: MW54-050

SHEET 1 OF 2

WELL CONSTRUCTION/BORING LOG

PROJECT: RMC - Troutdale (SLF Investigation)

LOCATION: 10' West GP77 - South Landfill

ELEVATION (feet): MPE = 30.09 / GSE = 26.97 DRILLING CONTRACTOR: GeoTech

DRILLING METHOD AND EQUIPMENT USED: HSA 6-5/8"

WATER LEVELS:

START: 9/18/00 @ 9:20

END: 9/18/00 @ 10:50

LOGGER: M. Leece

DEPTH BELOW SURFACE (FT)	Interval	Type and Number	Recovery (ft)	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING (ft bgs), DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
				6"-6"-6" (N)		
0 - 3						
3 - 5						
5 - 11.5			1.25	9-10-18	Sand (SP) brown-grey, wet, loose, medium grained	
11.5 - 13			1.5	9-12-9	Silt (ML) brown, damp, stiff, no plasticity	
13 - 14.5			1.5	8-9-12	Sand (SP) brown-grey, wet, loose	@ 11.5
14.5 - 15.5			1.5	3-4-4	Silt (ML) grey-green, damp, stiff, some black mottling	@ 15'
15.5 - 17			1.5	3-4-4	Silt (ML) grey-green, damp, stiff, some black mottling	Drill to 30'
17 - 30						No Sample

TOC @ 3' above grnd surface

steel cap w/ lock

locking cap

steel monument

Bentonite Slurry

▽ -15'

No Sample

@ 11.5

@ 15'

Drill to 30'

No Sample



CH2MHILL

PROJECT NUMBER:

153269.04.04.03

WELL NUMBER: MW54-050

SHEET 2 OF 2

WELL CONSTRUCTION/BORING LOG

PROJECT: RMC - Troutdale - SLF Investigation

LOCATION: 10' West of GP77 - South Landfill

ELEVATION (feet): MPE = 30.09/GSE = 26.97 DRILLING CONTRACTOR: GeoTech

DRILLING METHOD AND EQUIPMENT USED: HSA 6-5/8

WATER LEVELS: START: 9/18/00 @ 9:20 END: 9/18/00 @ 10:50 LOGGER: Mark Leece

DEPTH BELOW SURFACE (FT)	Interval	Type and Number	Recovery (ft)	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING (ft bgs), DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
				6"-6"-6" (N)		
30			1.5	3-3-4	Sandy-Silt (ML) green-grey, moist, <5% sand, coarse grained	
35			1.5	2-3-4	Sandy-Silt (SP-ML) brown-grey, wet, loose, medium grained	
			1.5	4-5-9	Silt (ML) grey-green, moist, slightly plastic	
			1.5	1-2-3	Sandy-Silt (SP-ML) grey, wet, loose, becoming less silty, medium grained/fine grained	
40			1.5	2-3-5	Sand (SP-ML) grey-black, wet, medium grained	Top of UGS @ 39.5' bgs
45			1.5	7-9-12	Sand (SW) grey-black, wet, medium grained	UGS
50			1.5	12-29-35	Sand (SW) grey-black, wet, medium grained	UGS
55					EOB 50' bgs @ 10:50 on 9/18/00 Well Development: 10/3/00	



PROJECT NUMBER	BORING NUMBER
	PZ17-039/PZ17-019 SHEET 1 OF 2
SOIL BORING LOG	

PROJECT Rmc Troutdale LOCATION 60' west of MW46
 ELEVATION _____ DRILLING CONTRACTOR Geo-Tech (Keith Vicks)
 DRILLING METHOD AND EQUIPMENT Geoprobe Unit
 WATER LEVELS _____ START 10/29/97 FINISH 10/29/97 LOGGER Ochs / Bowker

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
2					Surface - Gravel + sand, Fill material	
4					Sand (SW) Pale Brown, Damp loose, medium to fine grained, subrounded grains. 5% fines.	
6					Silt (ML) Pale yellow Brown, med. moist, med. stiff, orange mottling present	
8					Silt (ML) Pale yellow Brown, wet, med stiff low plasticity, friable, orange mottling. 10% fine grained sand.	
10					Sand (SW) Pale brown to dark brownish gray (5YR 4/1) moist loose, fine to med. grained, subangular grains. Red grains.	
13					Silt (ML) Dark gray (N4) wet, med stiff, orange mottling, med plasticity	
18					Silt (ML) Dark gray (N4) wet, med stiff, orange mottling, med plasticity 16 ft - 18 ft. silt (ML) yellowish brown wet, med stiff, friable, low plasticity trace organic material. 18-20 ft. Silt (ML) med Gray (N4) wet, med stiff. 5 to 10% fine grained sand. orange mottling. 20-22 ft. Silt (ML) med Gray (N4) wet med stiff. med plasticity No sand 22-24 ft. Silt (ML) Dark yellowish brown (5YR 4/2). med stiff. 5-10% sand fine grained.	
23					26-28 ft. ^{light med gray (5Y)} Silt (ML) Dark yellow Brown wet 25% sand, fine grained	
28					28-30 ft. Silt (ML) Sand + silt (SM) Brownish Gray - Med gray. 20% fines. wet. silt - med to low plasticity. sand fine to medium grained. light orange mottling.	

(8.30)



PROJECT NUMBER

BORING NUMBER

PZ17-039/PZ17-019 SHEET 1 OF 2

SOIL BORING LOG

PROJECT Rmc Troutdale

LOCATION 60' west of MW46

ELEVATION _____

DRILLING CONTRACTOR Geo-Tech (Keith Victor)

DRILLING METHOD AND EQUIPMENT Geoprobe Unit

WATER LEVELS _____

START 10/29/97

FINISH 10/29/97

LOGGER Ochs / Bowker

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
2					Surface - Gravel + sand, Fill material	
4					Sand (SW) Pale Brown, Damp loose, medium to fine grained, subangular grains. 5% fines.	
6					Silt (ML) Pale yellow Brown, med. moist, med. stiff. orange mottling present	
8					Silt (ML) Pale Yellow Brown, wet, med stiff low plasticity, friable, orange mottling. 0% fine grained sand.	
10					Sand (SW) Pale Brown to Dark Brownish Gray (SYR 4/1) med moist loose, fine to med. grained. subangular grains. Red grains.	
13					Silt (ML) Dark Gray (N4) wet, med stiff. orange mottling, med plasticity	
18					Silt (ML) Dark Gray (N4) alternating to yellowish brown wet, stiff orange 16ft - 18ft. Silt (ML) yellowish brown wet, med stiff. friable, low plasticity trace organic material.	
22					18-20 ft. Silt (ML) med Gray (N4) wet, med stiff. 5 to 10% fine grained sand. orange mottling. 20-22 ft. Silt (ML) med Gray (N4) wet med stiff. med plasticity No sand	
24					22-24 ft. Silt (ML) Dark yellowish brown (SYR 4/2). med stiff. 5-10% sand fine grained.	
26					24-26 ft. (ML) Dark Yellow Brown wet ^{light med gray (S)} 25% sand. Fine grained	
28					26-28 ft. (ML) Sand + Silt (SM) Brownish Gray - Med gray. 20% fines. wet. Silt - med to low plasticity. Sand fine to medium grained. light orange mottling.	



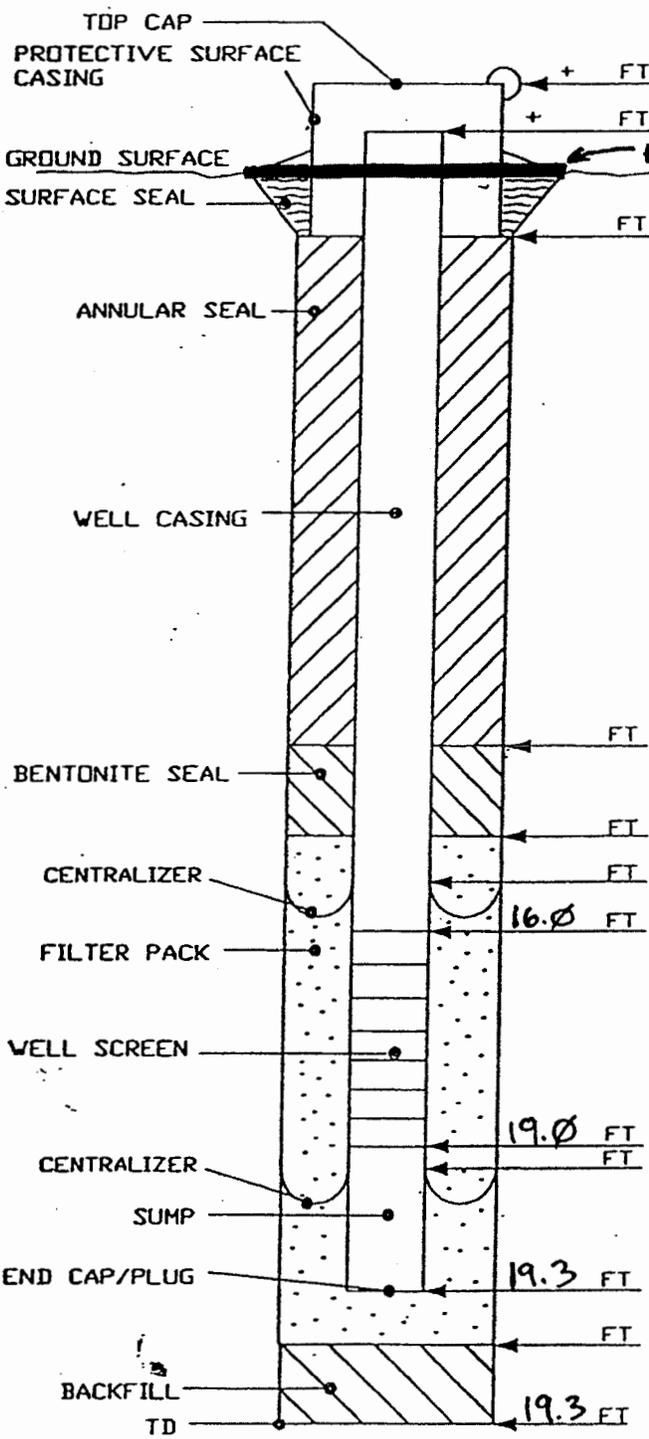
PROJECT NUMBER	BORING NUMBER
	P217-039/P217-019 SHEET 2 OF 2
SOIL BORING LOG	

PROJECT BMC Troutdale LOCATION 60' west of MW46
 ELEVATION _____ DRILLING CONTRACTOR Geo-Tech (Keith Vidos)
 DRILLING METHOD AND EQUIPMENT Geoprobe Unit.
 WATER LEVELS _____ START 10/29/97 FINISH 10/29/97 LOGGER Ochs/Bowker

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION	COMMENTS
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
32	X				Sand with (SM) Brownish gray (5YR 4/1) wet. 30% fines. med. stiff sand-med to fine grained loose, subrounded grains. Red grains present.	
34	X				Sand (SW) Dark gray (N9) wet loose, fine to medium grained. Subrounded to subangular grains. Red grains present.	
36	X				Sand (SW) same as above	
38	X				Sand (SW) same as above	
40	X				Sand (SW) same as above	
					END of BORING 40 FT BGS.	

MONITORING WELL RECORD DRAWING & CONSTRUCTION LOG

PROJECT NAME RMC Troutdale PROJECT NO. 107493.06.02
 WELL NO. PZ-17 shallow FIELD OBSERVERS GVO
 ELEV, NGVD (top of well casing) _____ SURFACE ELEV, NGVD _____
 WATER LEVEL ELEV/DATE, NGVD _____ START DATE 10/29/97
 DRILLING CONTRACTOR Geo-Tech FINISH DATE 10/29/97
 DRILLING METHOD Geoprobe unit



WELL CONSTRUCTION MATERIALS

BOREHOLE DIA(S) _____ INCHES TO _____ FT BGS
 _____ INCHES TO _____ FT BGS
 _____ INCHES TO _____ FT BGS
 PROTECTIVE CASING TYPE NA/ PVC Piezo
 PROTECTIVE CASING DIAMETER _____
 WELL CASING TYPE _____ DIAMETER _____
 COUPLING TYPE Flush Thread
 SCREEN TYPE Prepacked Geotextile DIAMETER _____
 SLOT SIZE _____ SCREEN LENGTH 3'-0"
 TOP CAP TYPE Flush mount w/Box
 END CAP/PLUG TYPE _____
 CENTRALIZER TYPE _____
 CENTRALIZER LOCATION(S) _____
 FILTER PACK TYPE Silica Sand GRADATION _____
 FILTER PACK VOLUME Prepacked Screen

SEAL(S)
 SURFACE _____ VOLUME _____
 ANNULAR _____ VOLUME _____
 BENTONITE _____ VOLUME _____
 BACKFILL _____ VOLUME _____

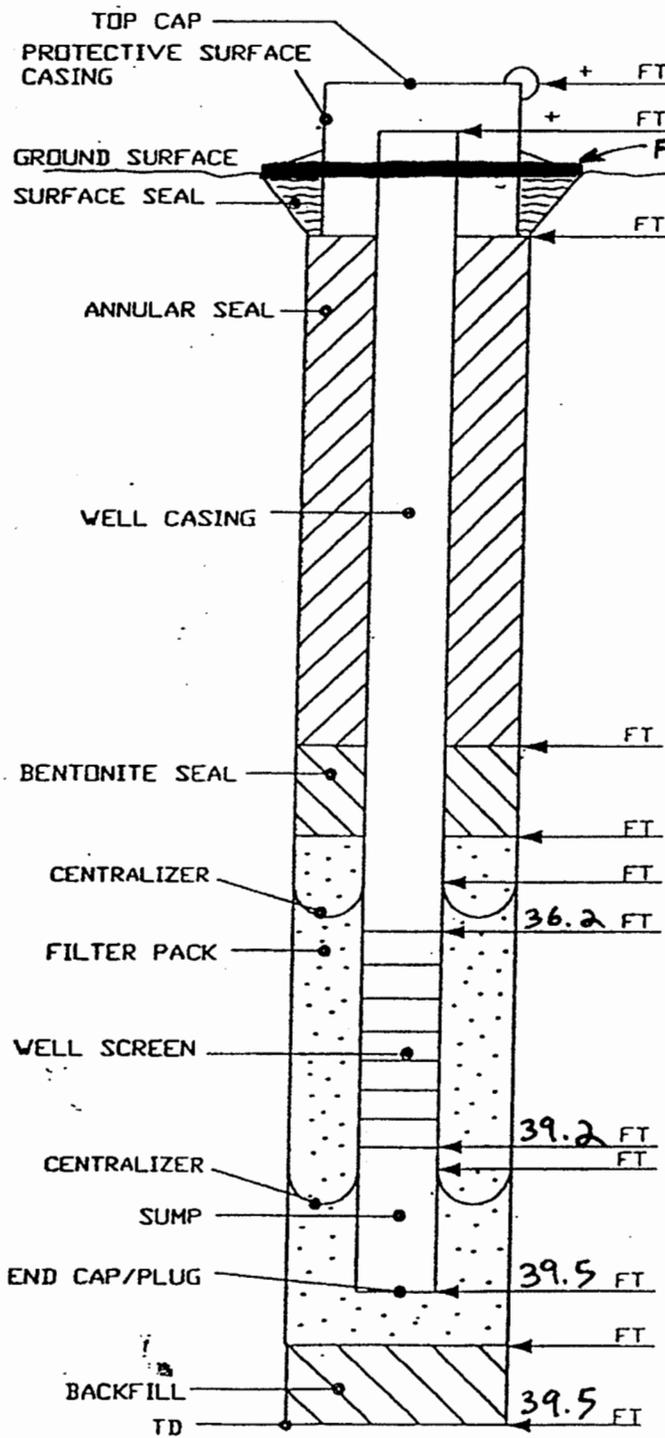
WELL DEVELOPMENT
 DATE _____
 METHOD _____
 COMMENTS _____

NOT TO SCALE

* DEPTHS ABOVE/BELOW GROUND SURFACE

MONITORING WELL RECORD DRAWING & CONSTRUCTION LOG

PROJECT NAME RMC Troutdale PROJECT NO. 107493.DG.02
 WELL NO. PZ-17 Deep FIELD OBSERVERS GVO
 ELEV, NGVD (top of well casing) _____ SURFACE ELEV, NGVD _____
 WATER LEVEL ELEV/DATE, NGVD _____ START DATE 10/29/97
 DRILLING CONTRACTOR Geo-Tech FINISH DATE 10/29/97
 DRILLING METHOD Geoprobe Unit



WELL CONSTRUCTION MATERIALS

FT BOREHOLE DIA(S) _____ INCHES TO _____ FT BGS
 _____ INCHES TO _____ FT BGS
 _____ INCHES TO _____ FT BGS
 PROTECTIVE CASING TYPE UA / PVC Pipe
 PROTECTIVE CASING DIAMETER _____
 WELL CASING TYPE _____ DIAMETER _____
 COUPLING TYPE Flush Thread
 SCREEN TYPE Gw200 Prepacked DIAMETER 1.5" OD
 SLOT SIZE _____ SCREEN LENGTH 3'-0"
 TOP CAP TYPE Flush mount w/ BOX
 END CAP/PLUG TYPE _____
 CENTRALIZER TYPE _____
 CENTRALIZER LOCATION(S) _____
 FILTER PACK TYPE Silica Sand GRADATION _____
 FILTER PACK VOLUME Prepacked Screen

SEAL(S)
 SURFACE _____ VOLUME _____
 ANNULAR _____ VOLUME _____
 BENTONITE _____ VOLUME _____
 BACKFILL _____ VOLUME _____

WELL DEVELOPMENT
 DATE _____
 METHOD _____
 COMMENTS _____

NOT TO SCALE

✱ DEPTHS ABOVE/BELOW GROUND SURFACE



PROJECT NUMBER
107493.D6.p2

BORING NUMBER
PZ18-040/PZ18-023 SHEET 1 OF 2

SOIL BORING LOG

PROJECT RmZ Troutdale LOCATION 80' South of MW45
 ELEVATION _____ DRILLING CONTRACTOR Geo-Tech (Keith Vidor)
 DRILLING METHOD AND EQUIPMENT Geoprobe unit
 WATER LEVELS _____ START 10/30/97 FINISH 10/30/97 LOGGER Achs/Bowker

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
4					Sand (SW) Gray Brown, Damp loose, medium to fine grained	
5					Sand w/ silt (SM) Dark Brown 10YR4/3 Silt w/ sand Sand w/ silt (SM) Dark Brown 10YR4/3 transitioning to Dark grayish Brown 10YR4/2 med-fine grained, subangular grains moist-wet orange mottling, low plasticity silt & loose sand.	
8					Sand (SW) Bottom 2-ft. moist-wet loose Dark Gray (NA) Red grains subangular little to no fines	
10					Silt w/ sand (ML) TOP 3.5 FT as above (SM) Bottom .5 Ft. Silt w/ Sand (ML) yellowish orange, moist-wet, not plasticity 20% fine grained sand.	
12					Sand (SW) Dark Gray (NA) moist-wet loose, little to no fines, Red grains present. Subangular grains.	
15					Sand (SW) as above	
16					Silt (ML) Dark Gray (NA) wet med stiff, < 5% fine grained sand medium plasticity.	
20						
24					Silt w/ sand (ML) Brown 10YR 5/2 ^{wet, med stiff} Slight orange mottling present. 15% fine grained sand.	
25						
26						



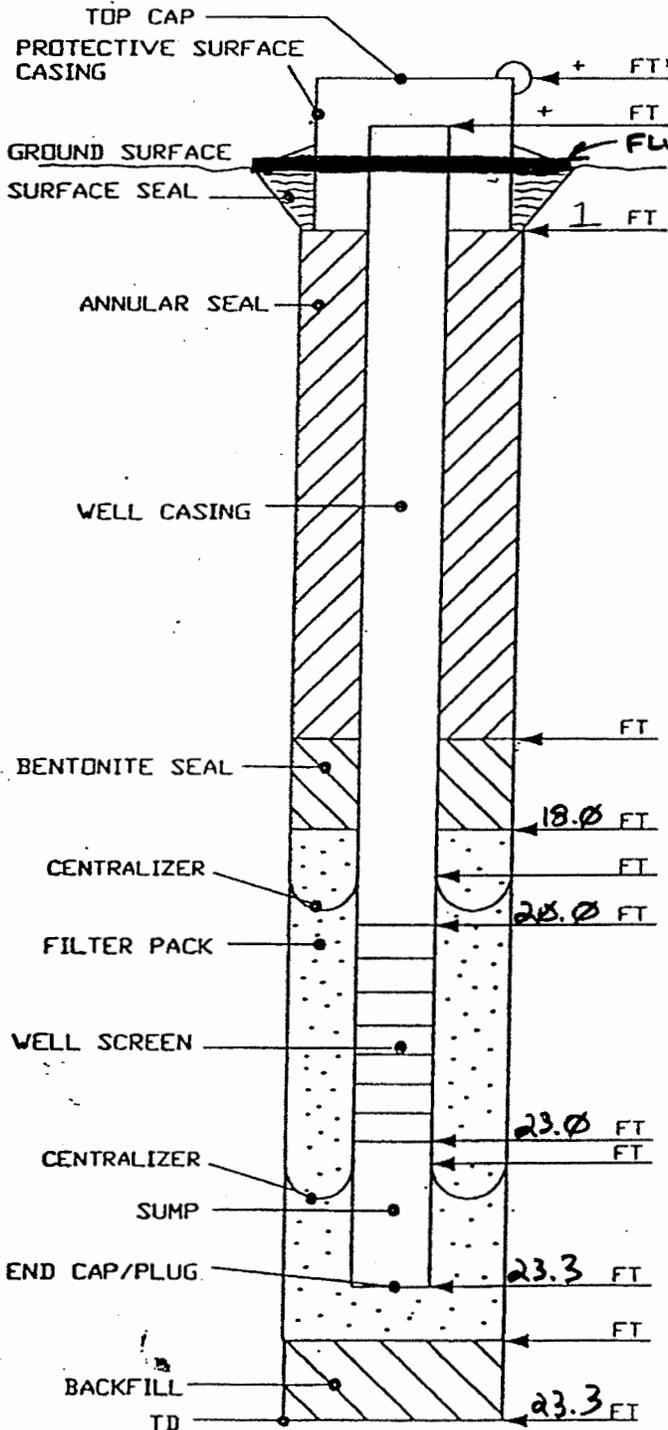
PROJECT NUMBER 107993.DG.02	BORING NUMBER PZ 18-040/PZ18-023 SHEET 2 OF 2
SOIL BORING LOG	

PROJECT RMC Troutdale LOCATION 80' South of MW45
 ELEVATION _____ DRILLING CONTRACTOR Geo Tech (Keith Vidor)
 DRILLING METHOD AND EQUIPMENT Geoprobe Unit
 WATER LEVELS _____ START 10/30/97 FINISH 10/30/97 LOGGER Ochs/Bowker

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
32	X				Silt (ML) w/ Sand. Top 1.8 ft. Coarse Brown 10YR 5/2 Bottom. 2 ft. Dark Gray (N4). 10% fine grained sand. Sand (SW) Dark Gray (N4) wet loose, fine to med. grained red grains. pres. sub angular to sub rounded grains. little to no fines Sand (SW) same as above	
	X					
	X					
	X					
40	X					
					END OF BORING 42 FT BGS.	

MONITORING WELL RECORD DRAWING & CONSTRUCTION LOG

PROJECT NAME RMC Trustdele PROJECT NO. 187493.06.02
 WELL NO. PZ18⁰¹²³ Shallow FIELD OBSERVERS GVO
 ELEV, NGVD (top of well casing) _____ SURFACE ELEV, NGVD _____
 WATER LEVEL ELEV/DATE, NGVD _____ START DATE 10/31/97
 DRILLING CONTRACTOR Geo-Tech FINISH DATE 10/31/97
 DRILLING METHOD Geoprobe Unit



WELL CONSTRUCTION MATERIALS

BOREHOLE DIA(S) _____ INCHES TO _____ FT BGS
 _____ INCHES TO _____ FT BGS
 _____ INCHES TO _____ FT BGS
 PROTECTIVE CASING TYPE NA / PVC piezo
 PROTECTIVE CASING DIAMETER 6"
 WELL CASING TYPE PVC Sch 80 DIAMETER .5"
 COUPLING TYPE Flush Thread
 SCREEN TYPE Prepacked Sw2010 DIAMETER .5"
 SLOT SIZE _____ SCREEN LENGTH 3'-0"
 TOP CAP TYPE Flush mount w/BOX
 END CAP/PLUG TYPE _____
 CENTRALIZER TYPE _____
 CENTRALIZER LOCATION(S) _____
 FILTER PACK TYPE Silica Sand GRADATION _____
 FILTER PACK VOLUME Prepacked Screen

SEAL(S)

SURFACE _____ VOLUME _____
 ANNULAR Bentonite chips VOLUME 1 bag
 BENTONITE _____ VOLUME _____
 BACKFILL _____ VOLUME _____

WELL DEVELOPMENT

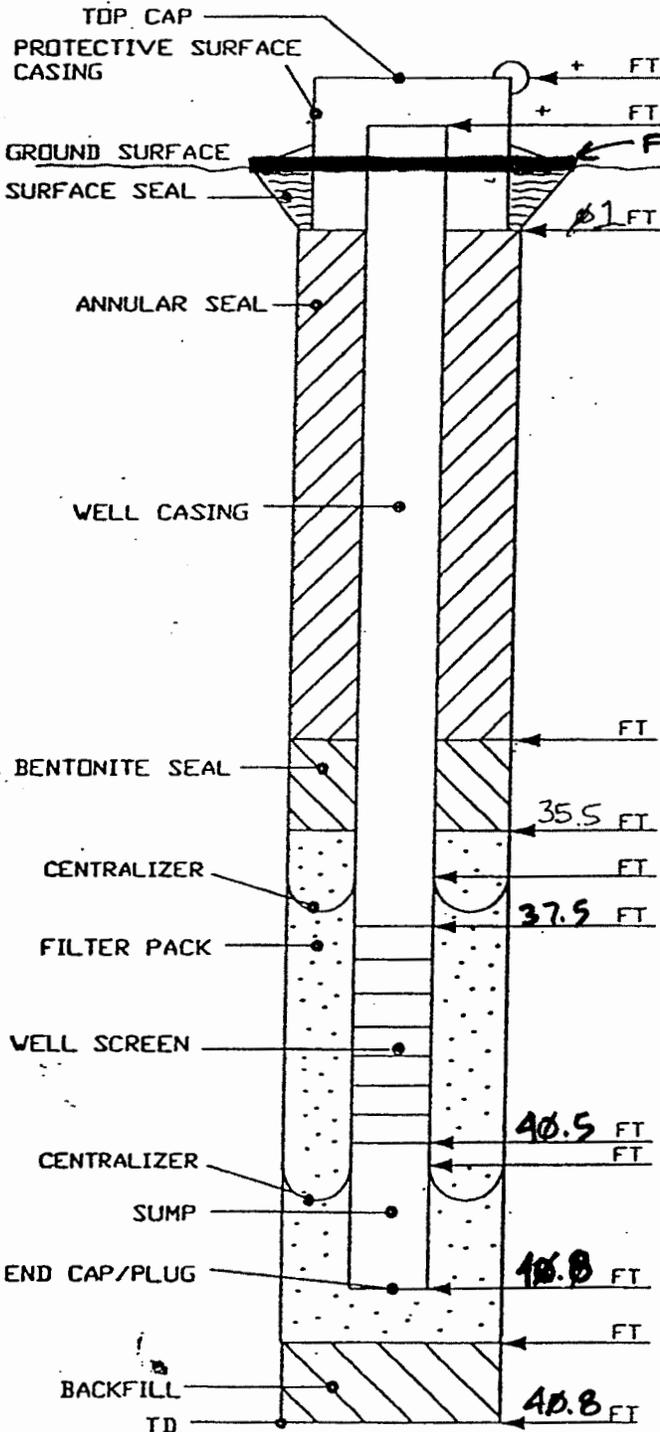
DATE _____
 METHOD _____
 COMMENTS _____

NOT TO SCALE

× DEPTHS ABOVE/BELOW GROUND SURFACE

MONITORING WELL RECORD DRAWING & CONSTRUCTION LOG

PROJECT NAME RMC Troutdale PROJECT NO. 107493.D6.02
 WELL NO. P218⁰⁰ Deep FIELD OBSERVERS GVO
 ELEV, NGVD (top of well casing) _____ SURFACE ELEV, NGVD _____
 WATER LEVEL ELEV/DATE, NGVD _____ START DATE 10/30/97
 DRILLING CONTRACTOR Geo-Tech FINISH DATE 10/30/97
 DRILLING METHOD Geo probe unit



WELL CONSTRUCTION MATERIALS

BOREHOLE DIA(S) _____ INCHES TO _____ FT BGS
 FLUSH MOUNT W/BOX _____ INCHES TO _____ FT BGS
 PROTECTIVE CASING TYPE NA/ PVC Pipe 30
 PROTECTIVE CASING DIAMETER 6"
 WELL CASING TYPE PVC 6x80 DIAMETER 4.5"
 COUPLING TYPE Flush Thread
 SCREEN TYPE Prepacked GW 20x40 DIAMETER 4.5"
 SLOT SIZE .010 SCREEN LENGTH 3'
 TOP CAP TYPE Flush mount w/ Box
 END CAP/PLUG TYPE _____
 CENTRALIZER TYPE _____
 CENTRALIZER LOCATION(S) _____
 FILTER PACK TYPE Silica Sand GRADATION 20x40
 FILTER PACK VOLUME Prepacked Screen

SEAL(S)

SURFACE Cement VOLUME _____
 ANNULAR Bentonite Chips VOLUME 2 bgs
 BENTONITE _____ VOLUME _____
 BACKFILL _____ VOLUME _____

WELL DEVELOPMENT

DATE _____
 METHOD _____
 COMMENTS _____

NOT TO SCALE

* DEPTHS ABOVE/BELOW GROUND SURFACE



PROJECT NUMBER
107493.D6.02

BORING NUMBER
PZ 19-040 / PZ 19-014 SHEET 1 OF 2

SOIL BORING LOG

PROJECT RMC Troutdale

LOCATION East side backhouse ~150' E of MW44

ELEVATION _____ DRILLING CONTRACTOR Geo-Tech (Pete Larson)

DRILLING METHOD AND EQUIPMENT Geoprobe Unit

WATER LEVELS _____ START 10/31/97 FINISH 10/31/97 LOGGER Ochr/Bowker

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5					Surface - gravel - 1 ft. 1-5 ft. SAND (SW) Dark yellowish Brown Damp, loose, fine to medium grained	
					SAND (SW) Pale Yellow Brown, Damp loose Med → fine grained. Subangular grains.	
10					Silt (ML) Pale yellow moist → friable, low plasticity, 5% fine grained sand, orange mottling	
15					11-15 ft Silt (ML) Dark Gray (N4) moist → wet. med plasticity. med stiff. small lenses of med-fine grained sand.	
					15-20 ft silt (ML) yellowish Brown wet, < 5% sand, orange mottling, trace organic material	
20					SAND (SW) Light Olive Gray wet, loose, med fine grained subangular grains. Trace fines.	
30					SAND (SW) same as above	



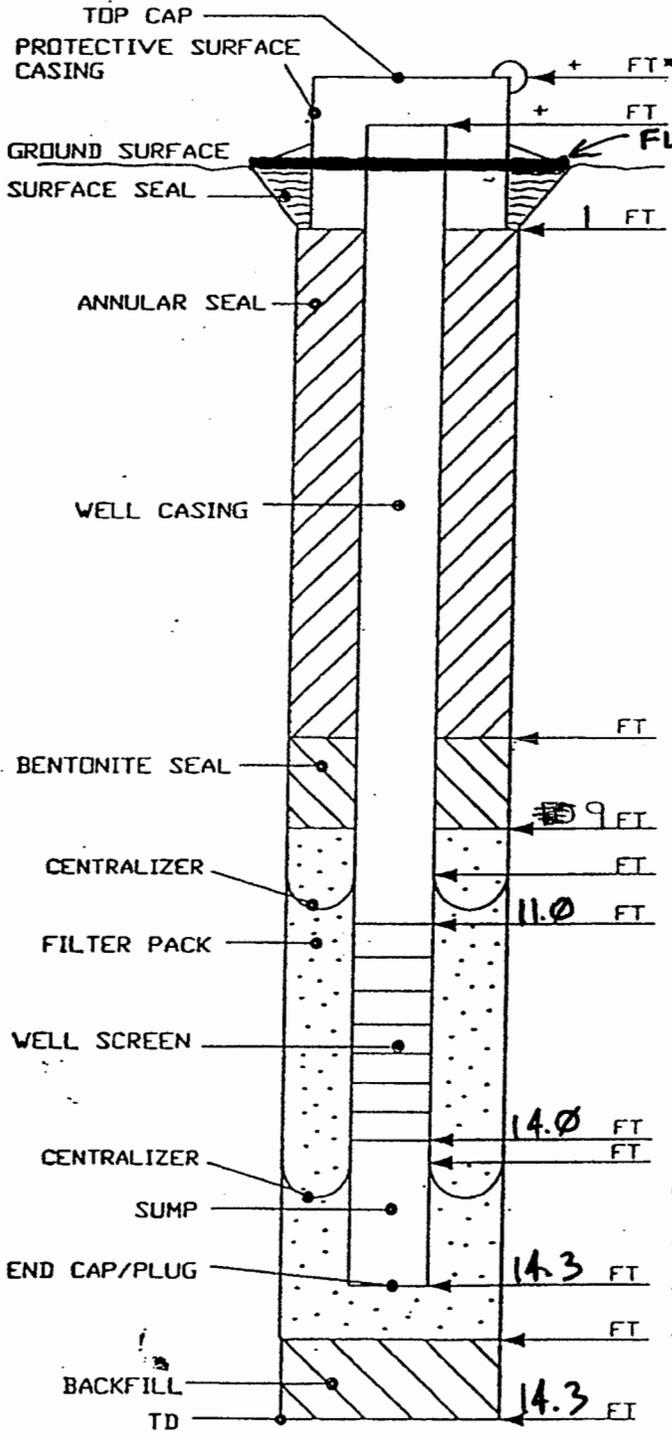
PROJECT NUMBER 107493.D6.02	BORING NUMBER PZ19-090/PZ19-014	SHEET 2 OF 2
SOIL BORING LOG		

PROJECT Bmc Troutdale LOCATION Eastside bakehouse ~150' E of MW 49
 ELEVATION _____ DRILLING CONTRACTOR Geo-Tech (Pete Larson)
 DRILLING METHOD AND EQUIPMENT Geoprobe Unit
 WATER LEVELS _____ START 10/31/97 FINISH 10/31/97 LOGGER Ochs/Bowker

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
31	X				SAND(SW) As above	
35					SAND(SW) Dark Gray (NA) wet, loose, fine to medium grained. subangular subangular grains. red grains present.	
40					SAND (SW) same as above	
					END of boring 40 Ft. BGS.	

MONITORING WELL RECORD DRAWING & CONSTRUCTION LOG

PROJECT NAME RMC Troutdale PROJECT NO. 107493.06.02
 WELL NO. P2 193 FIELD OBSERVERS GVO
 ELEV, NGVD (top of well casing) _____ SURFACE ELEV, NGVD _____
 WATER LEVEL ELEV/DATE, NGVD _____ START DATE 10/31/97
 DRILLING CONTRACTOR Geo-Tech (Pete Larson) FINISH DATE 10/31/97
 DRILLING METHOD Geoprobe Unit



WELL CONSTRUCTION MATERIALS

BOREHOLE DIA(S) _____ INCHES TO _____ FT BGS
 FLUSH MOUNT _____ INCHES TO _____ FT BGS
 W/BOX _____ INCHES TO _____ FT BGS
 PROTECTIVE CASING TYPE Flush mount
 PROTECTIVE CASING DIAMETER 6"
 WELL CASING TYPE PVC Sch 80 DIAMETER .5"
 COUPLING TYPE _____
 SCREEN TYPE propack PVC DIAMETER .5"
 SLOT SIZE 0.10 SCREEN LENGTH 3'
 TOP CAP TYPE SLIP CAP
 END CAP/PLUG TYPE _____
 CENTRALIZER TYPE _____
 CENTRALIZER LOCATION(S) _____
 FILTER PACK TYPE Sand GRADATION 20x40
 FILTER PACK VOLUME _____

SEAL(S)
 SURFACE concrete VOLUME _____
 ANNULAR Bentonite VOLUME _____
 BENTONITE _____ VOLUME _____
 BACKFILL _____ VOLUME _____

WELL DEVELOPMENT
 DATE _____
 METHOD _____
 COMMENTS _____

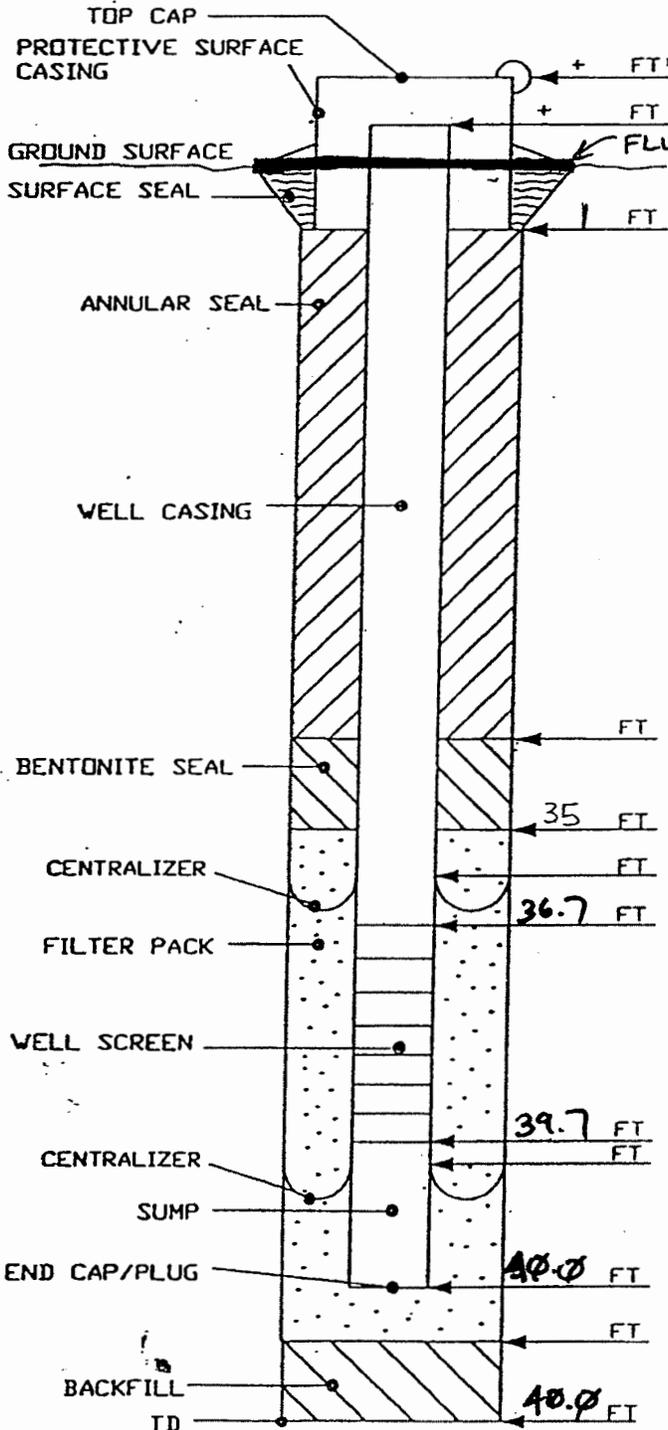
NOT TO SCALE

✱ DEPTHS ABOVE/BELOW GROUND SURFACE

P330

MONITORING WELL RECORD DRAWING & CONSTRUCTION LOG

PROJECT NAME RMC Troutdale PROJECT NO. 107493.06.07
 WELL NO. PZ19-2040 FIELD OBSERVERS GVO
 ELEV, NGVD (top of well casing) _____ SURFACE ELEV, NGVD _____
 WATER LEVEL ELEV/DATE, NGVD _____ START DATE 10/31/97
 DRILLING CONTRACTOR _____ FINISH DATE 10/31/97
 DRILLING METHOD _____



WELL CONSTRUCTION MATERIALS

BOREHOLE DIA(S) _____ INCHES TO _____ FT BGS
 FLUSH MOUNT _____ INCHES TO _____ FT BGS
 W/BOX _____ INCHES TO _____ FT BGS
 PROTECTIVE CASING TYPE Flush mount
 PROTECTIVE CASING DIAMETER 6"
 WELL CASING TYPE S&B PVC DIAMETER .5"
 COUPLING TYPE _____
 SCREEN TYPE Prepack PVC DIAMETER .5"
 SLOT SIZE .010 SCREEN LENGTH 3'
 TOP CAP TYPE SLIP CAP
 END CAP/PLUG TYPE _____
 CENTRALIZER TYPE _____
 CENTRALIZER LOCATION(S) _____
 FILTER PACK TYPE SAND GRADATION 20x40
 FILTER PACK VOLUME _____

SEAL(S)

SURFACE Concrete VOLUME _____
 ANNULAR Bentonite VOLUME _____
 BENTONITE _____ VOLUME _____
 BACKFILL _____ VOLUME _____

WELL DEVELOPMENT

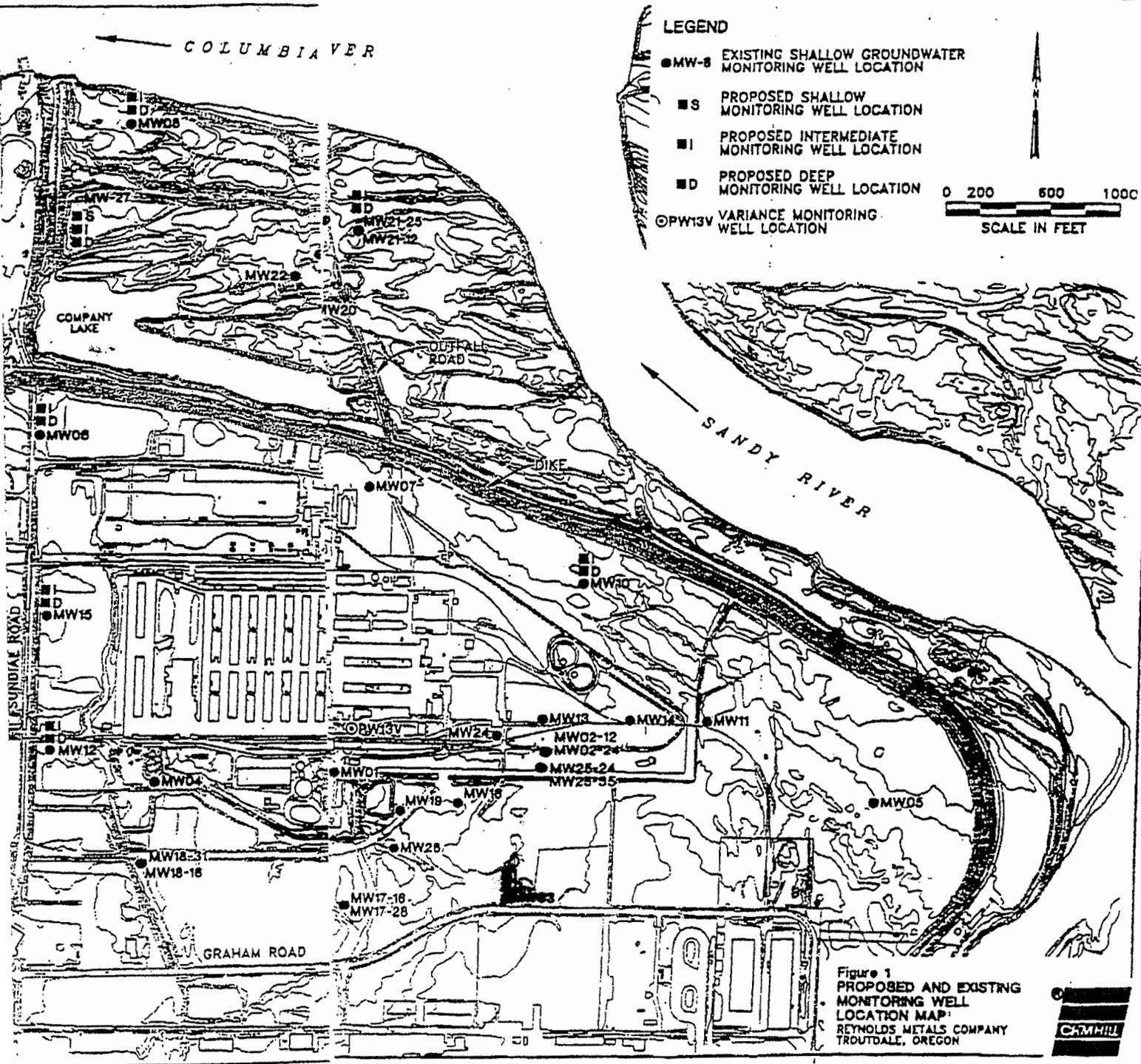
DATE _____
 METHOD _____
 COMMENTS _____

NOT TO SCALE

✱ DEPTHS ABOVE/BELOW GROUND SURFACE

ATTACHMENT 3

OWRD Monitoring Well Reports



LEGEND

- MW-8 EXISTING SHALLOW GROUNDWATER MONITORING WELL LOCATION
- S PROPOSED SHALLOW MONITORING WELL LOCATION
- I PROPOSED INTERMEDIATE MONITORING WELL LOCATION
- D PROPOSED DEEP MONITORING WELL LOCATION
- ⊙ PW13V VARIANCE MONITORING WELL LOCATION

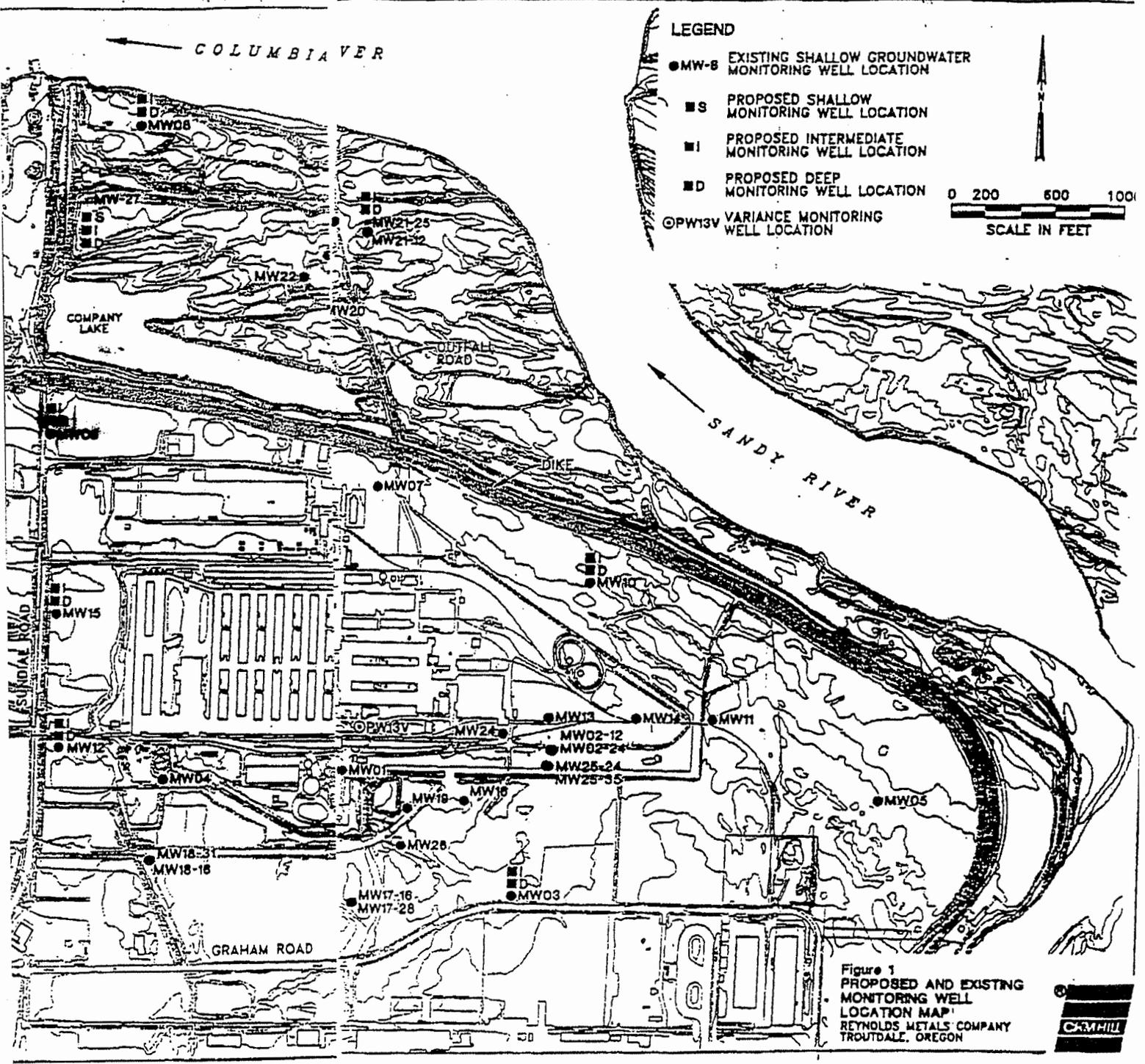
0 200 600 1000
SCALE IN FEET

Figure 1
PROPOSED AND EXISTING
MONITORING WELL
LOCATION MAP
REYNOLDS METALS COMPANY
TROUTDALE, OREGON



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SALEM, OREGON



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COLUMBIA RIVER

LEGEND

- MW-8 EXISTING SHALLOW GROUNDWATER MONITORING WELL LOCATION
- S PROPOSED SHALLOW MONITORING WELL LOCATION
- I PROPOSED INTERMEDIATE MONITORING WELL LOCATION
- D PROPOSED DEEP MONITORING WELL LOCATION
- ⊙ PW13V VARIANCE MONITORING WELL LOCATION

0 200 600 1000
SCALE IN FEET

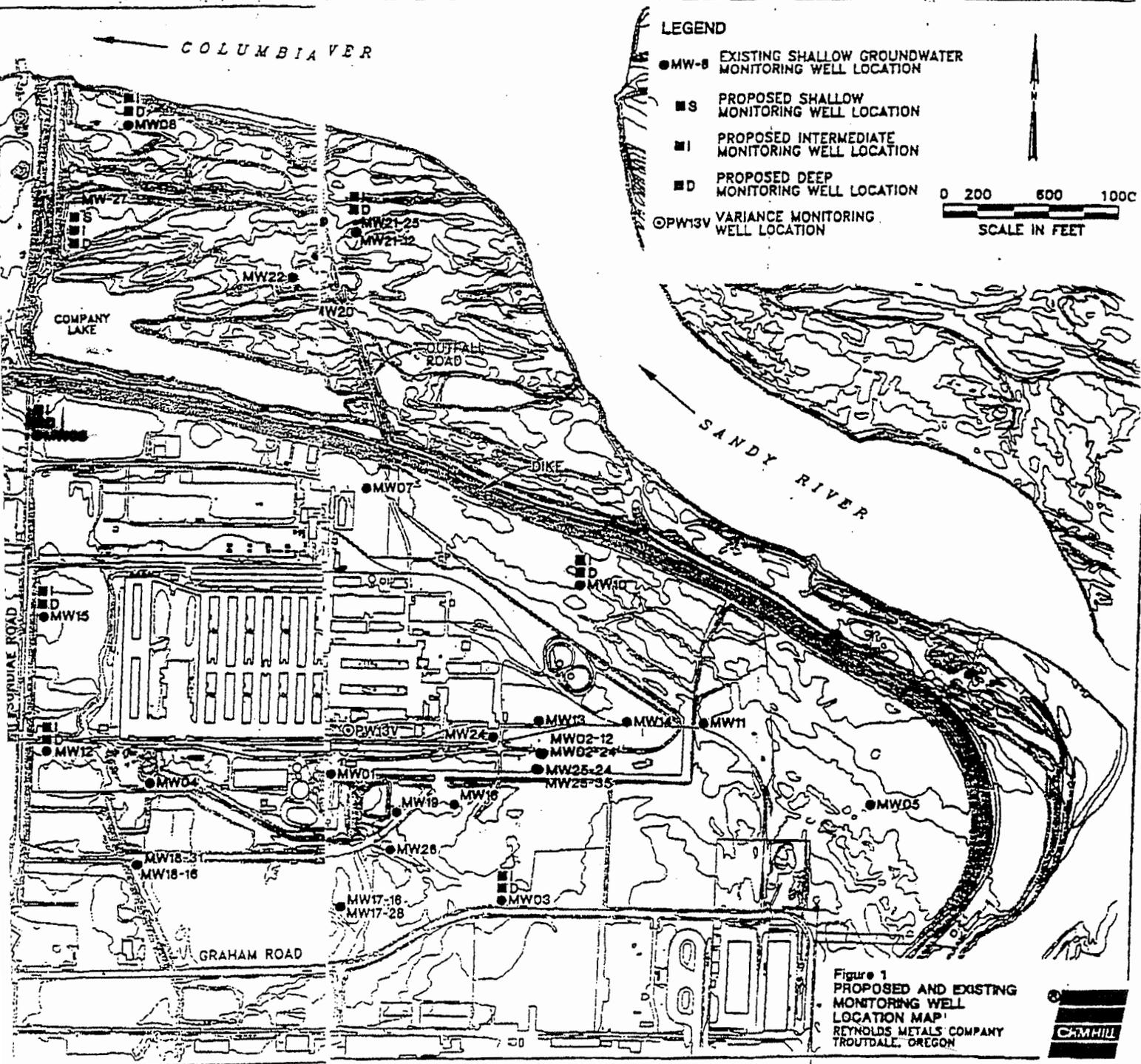


Figure 1
PROPOSED AND EXISTING
MONITORING WELL
LOCATION MAP
REYNOLDS METALS COMPANY
TROUTDALE, OREGON



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SUNNYVALE, CALIF.

STATE OF OREGON
MONITORING WELL REPORT 52872 JAN 23 1997
 (as required by ORS 537.765 & OAR 690-240-095)

WELL ID # L10755 MW08027
 Start Card # W85711

Instructions for completing this report are on the last page of this form. WATER RESOURCES DEPT. SALEM, OREGON

(1) OWNER/PROJECT: WELL NO. MW08-127
 Name REYNOLDS METALS COMPANY
 Address 5100 SUNDIAL ROAD
 City TROUTDALE State OR Zip 97060

(6) LOCATION OF WELL By legal description
 Well Location: County MULTNOMAH
 Township 1 (N or S) Range 3 (E or W) Section 14
 1. SE 1/4 of SW 1/4 of above section.

(2) TYPE OF WORK:
 New construction Alteration (Repair/Recondition)
 Conversion Deepening Abandonment

2. Either Street address of well location
5100 SUNDIAL ROAD TROUTDALE, OR
 or Tax lot number of well location _____
 3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

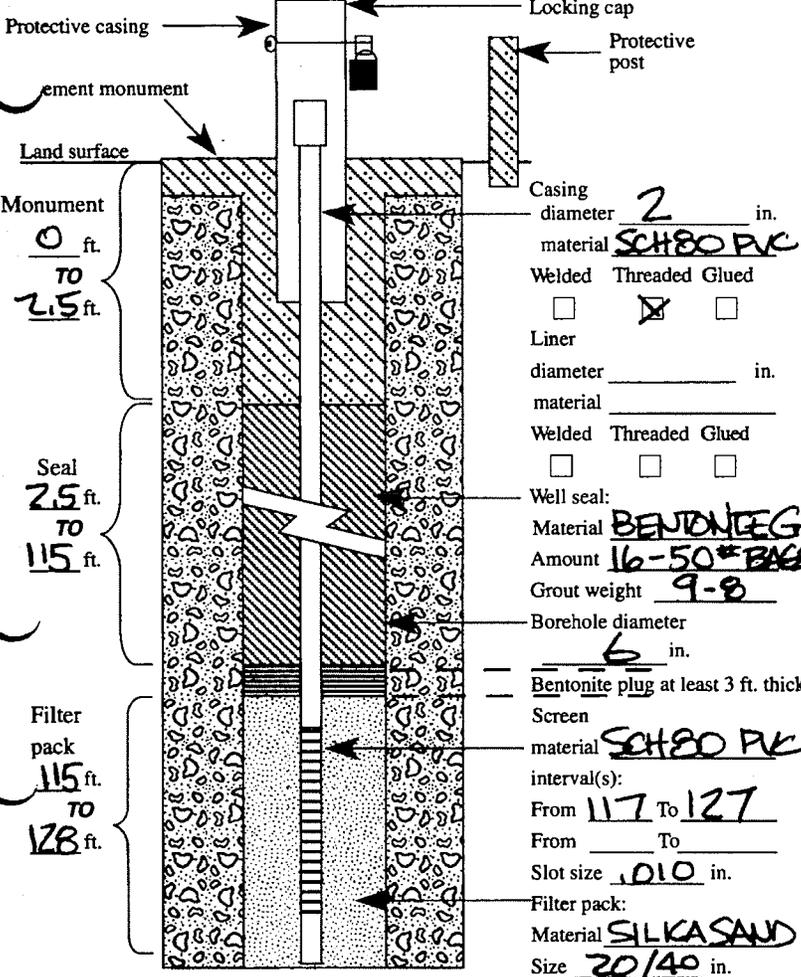
(3) DRILLING METHOD
 Rotary Air Rotary Mud Cable
 Hollow Stem Auger Other _____

(7) STATIC WATER LEVEL:
16 Ft. below land surface. Date 7-9-96
 Artesian Pressure _____ lb/sq. in. Date _____

(4) BORE HOLE CONSTRUCTION
 Special Standards Yes No Depth of completed well 127 ft.

(8) WATER BEARING ZONES:
 Depth at which water was first found 18'

From	To	Est. Flow Rate	SWL
16	80	± 5 GPM	16'
80	134	± 100 GPM	



(9) WELL LOG: Ground elevation ± 36'

Material	From	To	SWL
FILL, CRUSHED ROCK	0	2	
SILTY SAND	2	7	
SAND, F-M BROWN	7	28	
SAND, W/GRAVELS	28	44	
SILTY SAND WITH WOOD FRAGMENT	44	82	
SILT, GRAY	82	83	
SILTY, GRAVELS VERY DENSE	83	124	
BOREHOLE BELOW 128' ABANDONED WITH BENTONITE GROUT			

(5) WELL TEST:
 Pump Bailer Air Flowing Artesian
 Permeability _____ Yield _____ GPM
 Conductivity _____ PH _____
 Temperature of water 50 °C Depth artesian flow found _____ ft.
 Was water analysis done? Yes No
 By whom? CHZMHILL-RMC
 Depth of strata to be analyzed. From _____ ft. to _____ ft.
 Remarks: _____

Date started 6-7-96 Completed 7-9-96
 (unbonded) Monitor Well Constructor Certification:
 I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.
 Signed John W. Morris MWC Number 10359 Date 1-15-97

(bonded) Monitor Well Constructor Certification:
 I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
 Signed [Signature] MWC Number 10067 Date 1-15-97

STATE OF OREGON
MONITORING WELL REPORT
 (as required by ORS 537.765 & OAR 690-240-095)

Mult
 52871 JAN 23 1997

110756
 Start Card # W85712

WATER RESOURCES DEPT.
 SALEM, OREGON

(1) OWNER/PROJECT: WELL NO. MW08-169
 Name REYNOLDS METALS COMPANY
 Address 5100 SUNDIAL ROAD
 City TROUTDALE State OR Zip _____

(6) LOCATION OF WELL By legal description
 Well Location: County MULTNOMAH
 Township 1 (N or S) Range 3 (E or W) Section 14
 1. SE 1/4 of SW 1/4 of above section.
 2. Either Street address of well location
5100 SUNDIAL ROAD TROUTDALE, OR
 or Tax lot number of well location _____

(2) TYPE OF WORK:
 New construction Alteration (Repair/Recondition)
 Conversion Deepening Abandonment

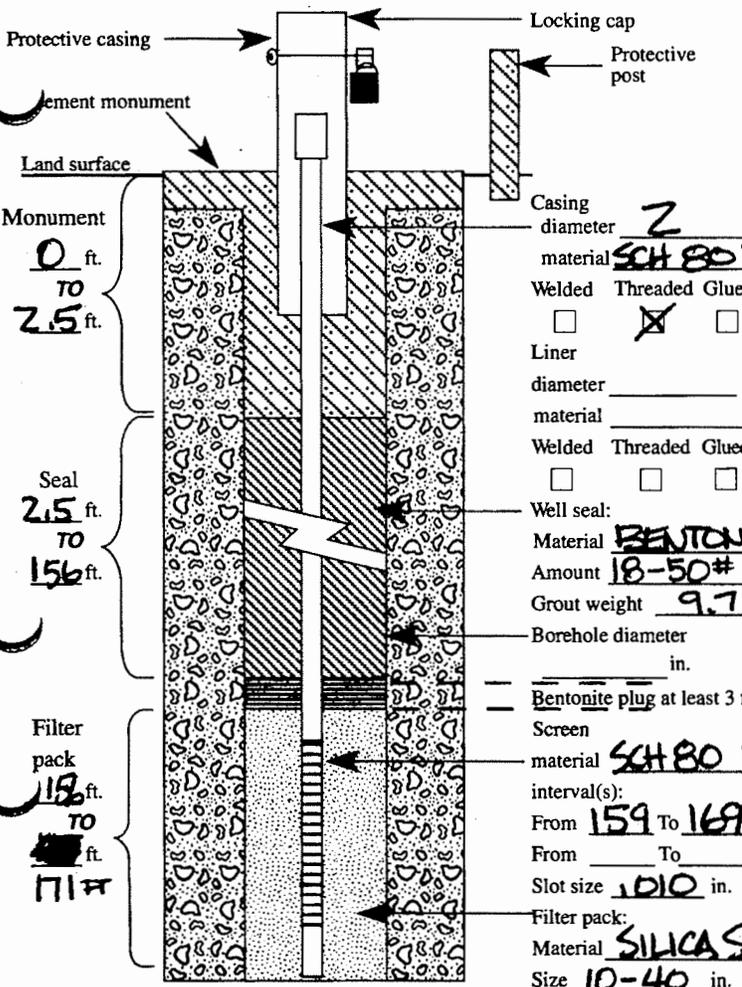
3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(3) DRILLING METHOD
 Rotary Air Rotary Mud Cable
 Hollow Stem Auger Other _____

(7) STATIC WATER LEVEL:
16 Ft. below land surface. Date 5/26/96
 Artesian Pressure _____ lb/sq. in. Date _____

(4) BORE HOLE CONSTRUCTION

Special Standards Yes No
 Depth of completed well 169 ft.



(8) WATER BEARING ZONES:
 Depth at which water was first found 18'

From	To	Est. Flow Rate	SWL
16	80	± 5 GPM	16'
80	197	± 50 - 100 GPM	16'

(9) WELLLOG: Ground elevation ± 36'

Material	From	To	SWL
CRUSHED BASALT	0	2	
SILTY SAND	2	7	
SAND, BROWN	7	28	16'
SAND, GRAVELS	28	44	
SILTY SAND WITH WOOD FRAGMENTS	44	82	
SILT, GRAY	82	83	
SILTY, GRAVELS	83	130	
VERY DENSE SILT BROWN	130	135	
GRAVEL	135	138	
SAND, GRAVEL, GRAY	138	158	
SAND, GRAY	158	163	
GRAVEL, VERY DENSE	163	172	
WEATHERED BASALT	172	197	
BASALT - GRAY BLACK	197	200	
7 BAGS CEMENT USED TO ABANDON BOTTOM BOREHOLE FROM 200-170			

Date started 5-22-96 Completed 5-23-96

(5) WELL TEST:

Pump Bailer Air Flowing Artesian
 Permeability _____ Yield _____ GPM
 Conductivity _____ PH _____
 Temperature of water 50 °F Depth artesian flow found _____ ft.
 Was water analysis done? Yes No
 By whom? CH2MHILL - RMC
 Depth of strata to be analyzed. From _____ ft. to _____ ft.
 Remarks: _____

(unbonded) Monitor Well Constructor Certification:
 I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.
 Signed [Signature] MWC Number 10102
 Date JAN 15, 97

(bonded) Monitor Well Constructor Certification:
 I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
 MWC Number 10067
 Date 1-15-97

Name of supervising Geologist/Engineer IVANGALL/CH2MHILL Signed [Signature] Date 1-15-97
 ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

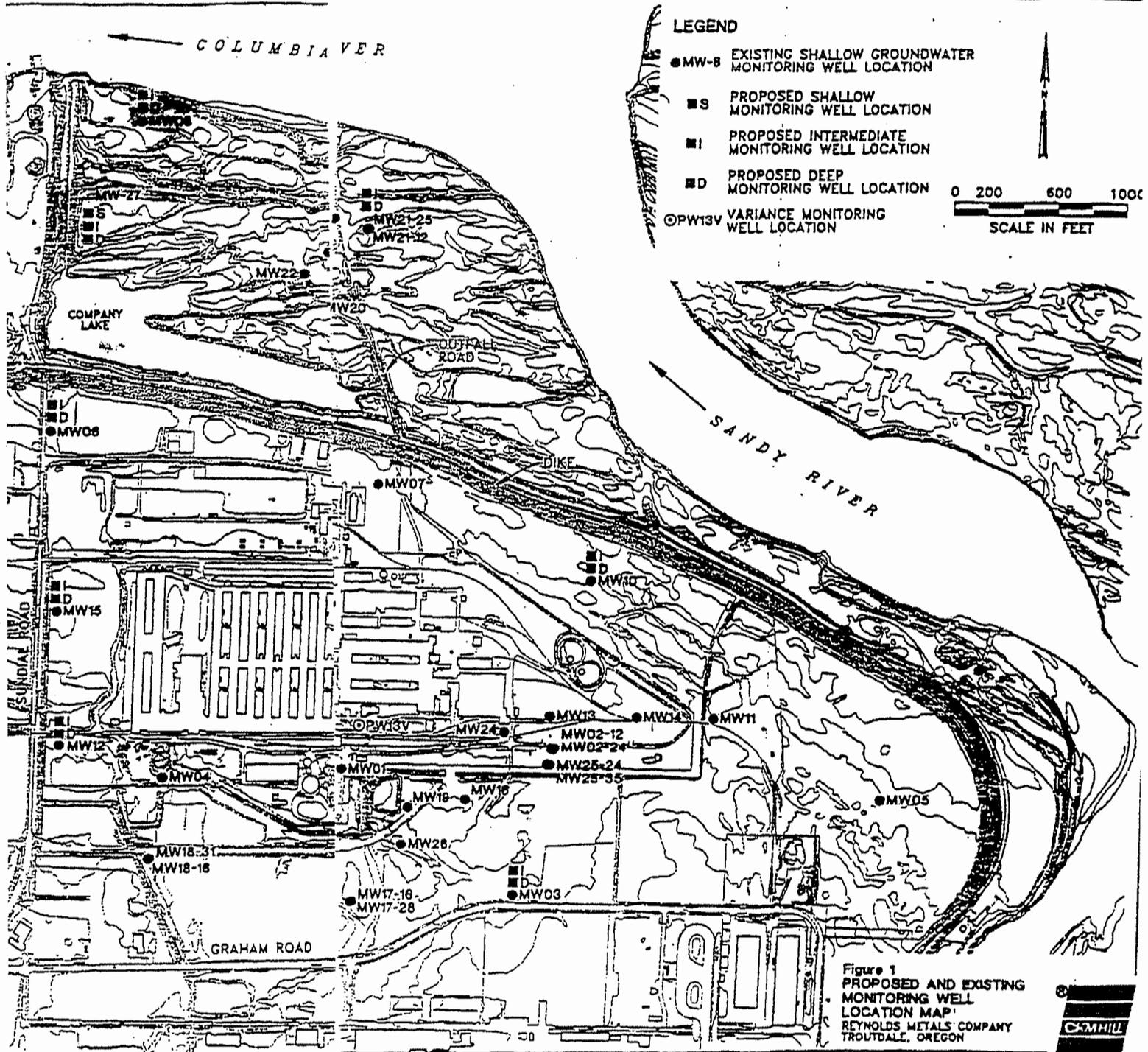


Figure 1
 PROPOSED AND EXISTING
 MONITORING WELL
 LOCATION MAP
 REYNOLDS METALS COMPANY
 TROUTDALE, OREGON



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 SALEM, OREGON

MW08
10
21
27

Oregon Water Resources Department

REQUEST FOR WRITTEN APPROVAL TO USE CONSTRUCTION METHODS NOT INCLUDED IN OREGON ADMINISTRATIVE RULES 690-200 THROUGH 690-240

Before request can be considered, the following must be answered. Requests shall be submitted to the Well Construction Specialist, Water Resources Department. Requests may also be considered by the appropriate Regional Manager.

Date of request JUNE 26, 1996

Bonded Well Constructor (name, license and mailing address): ERIC HANSEN
30316 MOUNTAIN HWY GRAHAM WA 98338 LIC # 10067

(1) Location of Well: 1/4 1/4 of Section 23, Township 1N
Range 3E MULTNOMAH County.

Address at well site: 5100 SUNDIAL ROAD
TROUTDALE, OR.

(2) Start Card Number(s): MIN 10, 08, 21, 27 (W85671, W85712, W79939, W85715)

(3) Name and Address of Land Owner: REYNOLDS METALS COMPANY

(4) The distance to the nearest well, septic tank or drainfield (if water supply well):
OVER 500 FT.

(5) The unusual conditions which necessitate this request: FORMATION MATERIAL
COMPOSED OF LOOSE SANDS WHICH HEAVES BADLY, GEOLOGIST WANTS
TO ENSURE ADEQUATE SILICA SAND THICKNESS BETWEEN BASE OF
WELL SCREEN & TOP OF BENTONITE SLURRY SEAL BELOW IT.

(6) The proposed construction methods that the well constructor believes will be adequate for this well (attach additional pages if needed)

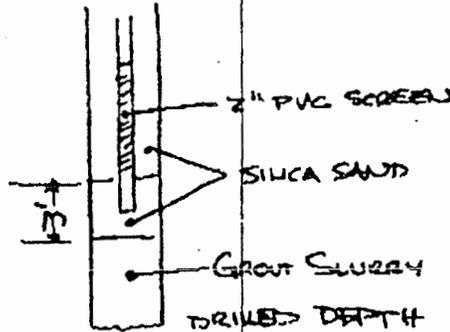
PER DIAGRAM

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SALEM, OREGON

(7) Diagram showing the pertinent features of the proposed well design and construction (attach additional pages if needed):



PLEASE NOTE:

- (1) If approved, all other phases of well construction must comply with the appropriate standards described in OAR 690-200 through 690-240.
- (2) If it should be determined at some future date that the well, due to its construction, is allowing groundwater contamination, waste or loss of artesian pressure, the undersigned shall return to the site and rectify the problem.
- (3) If verbal approval was granted, a written request must be submitted to the Department either within three (3) working days of the date of verbal approval or prior to the completion of the associated well work. Failure to submit a written request as described above may void prior approval.

I have read and understand the above information. I further attest that the information provided is accurate to the best of my knowledge.

Bonded Constructor Signature: _____

[Handwritten Signature]

10067

VERBAL APPROVAL ROS CARTER VIA CHEM HILL

For Water Resources Department Use Only

Date: _____

7-9-96

Approved by: _____

[Handwritten Signature]

Denied by: _____

Remarks: _____

revised: 4-96

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AUG 30 1994

SITE MAP

WATER RESOURCES DEPT.
SALEM, OREGON

N ↑

MW-9

MW-10

MW-11

Clade

Sundral Rd

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NOV 10 1994

WATER RESOURCES DEPT.
SALEM, OREGON

MW-12

1" = 1000'

Mult
 52868
 JAN 23 1997

L10760
 WATER RESOURCES DEPT. Start Card # W85676

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT: WELL NO. MW12-184
 Name REYNOLDS METALS COMPANY
 Address 5100 SUNDIAL ROAD
 City TROUTDALE State OR Zip

(6) LOCATION OF WELL By legal description
 Well Location: County MULTNOMAH
 Township 1 (N or S) Range 3 (E or W) Section 23
 1. NW 1/4 of SE 1/4 of above section.

(2) TYPE OF WORK:
 New construction
 Conversion
 Alteration (Repair/Recondition)
 Deepening
 Abandonment

2. Either Street address of well location
 5100 SUNDIAL ROAD TROUTDALE, OR
 or Tax lot number of well location

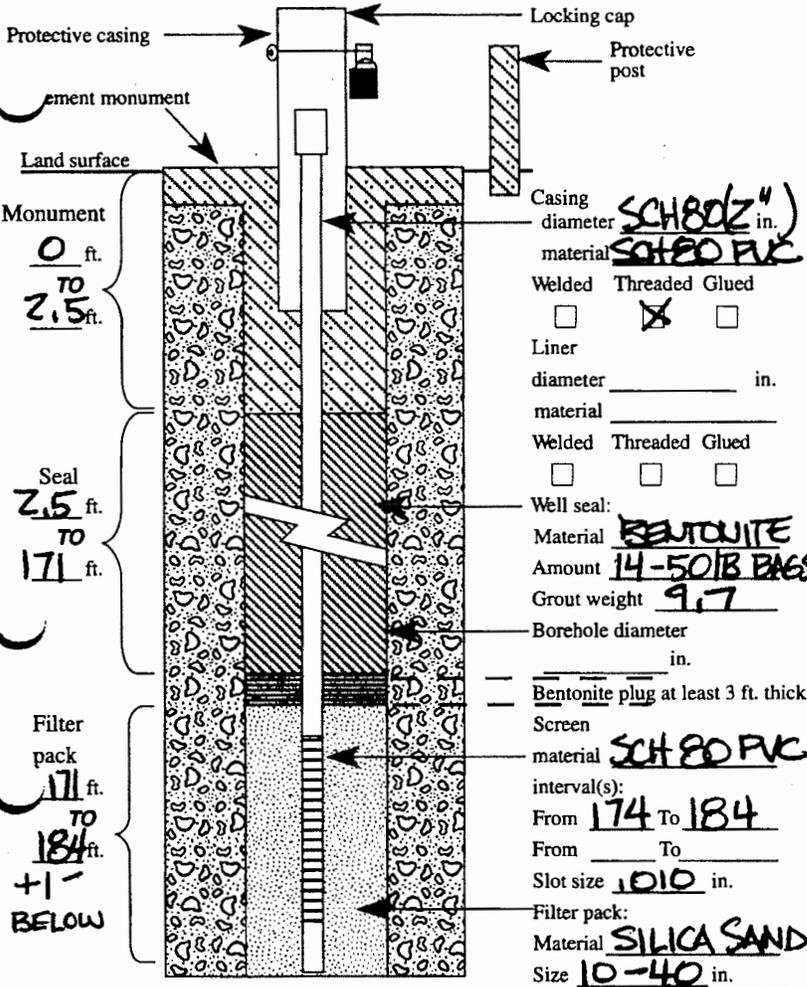
(3) DRILLING METHOD
 Rotary Air
 Rotary Mud
 Cable
 Hollow Stem Auger
 Other

(7) STATIC WATER LEVEL:
 20 Ft. below land surface. Date 5-16-96
 Artesian Pressure lb/sq. in. Date

(4) BORE HOLE CONSTRUCTION
 Special Standards: Yes No
 Depth of completed well 184 ft.

(8) WATER BEARING ZONES:
 Depth at which water was first found 20'

From	To	Est. Flow Rate	SWL
35	200	± 5 GPM	20



(9) WELLOG: Ground elevation ± 39'

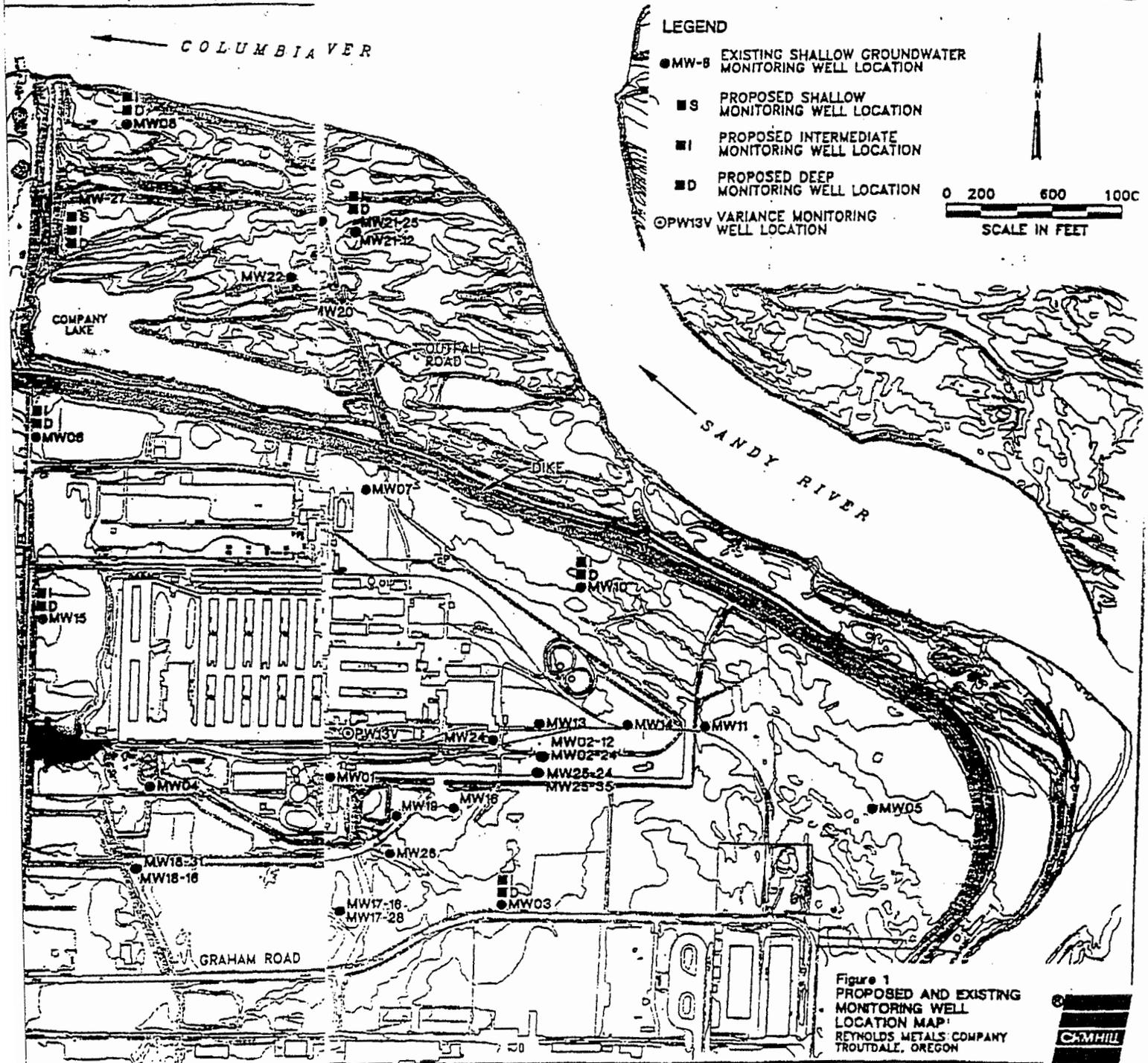
Material	From	To	SWL
CRUSHED BASALT	0	2	
SILTY SAND	2	5	
SILT, GRAY	5	20	
SILT w/ SAND	20	35	
SAND, GRAY, (M)	35	90	
SAND, MED-COARSE GRAY	90	170	
SAND, COARSE	170	200	
BOTTOM OF BOREHOLE 185-200' ABANDONED WITH 4 BAGS CEMENT GROUT			

Date started 5-10-96 Completed 5-21-96

(5) WELL TEST:
 Pump
 Bailer
 Air
 Flowing Artesian
 Permeability _____ Yield _____ GPM
 Conductivity _____ PH _____
 Temperature of water 50 °C Depth artesian flow found _____ ft.
 Was water analysis done? Yes No
 By whom? CHZMHILL - EMC
 Depth of strata to be analyzed. From _____ ft. to _____ ft.
 Remarks: _____

(unbonded) Monitor Well Constructor Certification:
 I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.
 Signed JAMES VIGUAY BY: [Signature] Date 1-15-97 MWC Number 10345

(bonded) Monitor Well Constructor Certification:
 I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
 Signed [Signature] Date 1-15-97 MWC Number 10067



LEGEND

- MW-8 EXISTING SHALLOW GROUNDWATER MONITORING WELL LOCATION
- S PROPOSED SHALLOW MONITORING WELL LOCATION
- I PROPOSED INTERMEDIATE MONITORING WELL LOCATION
- D PROPOSED DEEP MONITORING WELL LOCATION
- ◻ OPW13V VARIANCE MONITORING WELL LOCATION

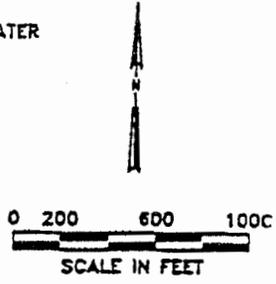


Figure 1
PROPOSED AND EXISTING
MONITORING WELL
LOCATION MAP
REYNOLDS METALS COMPANY
TROUTDALE, OREGON



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SALEM, OREGON

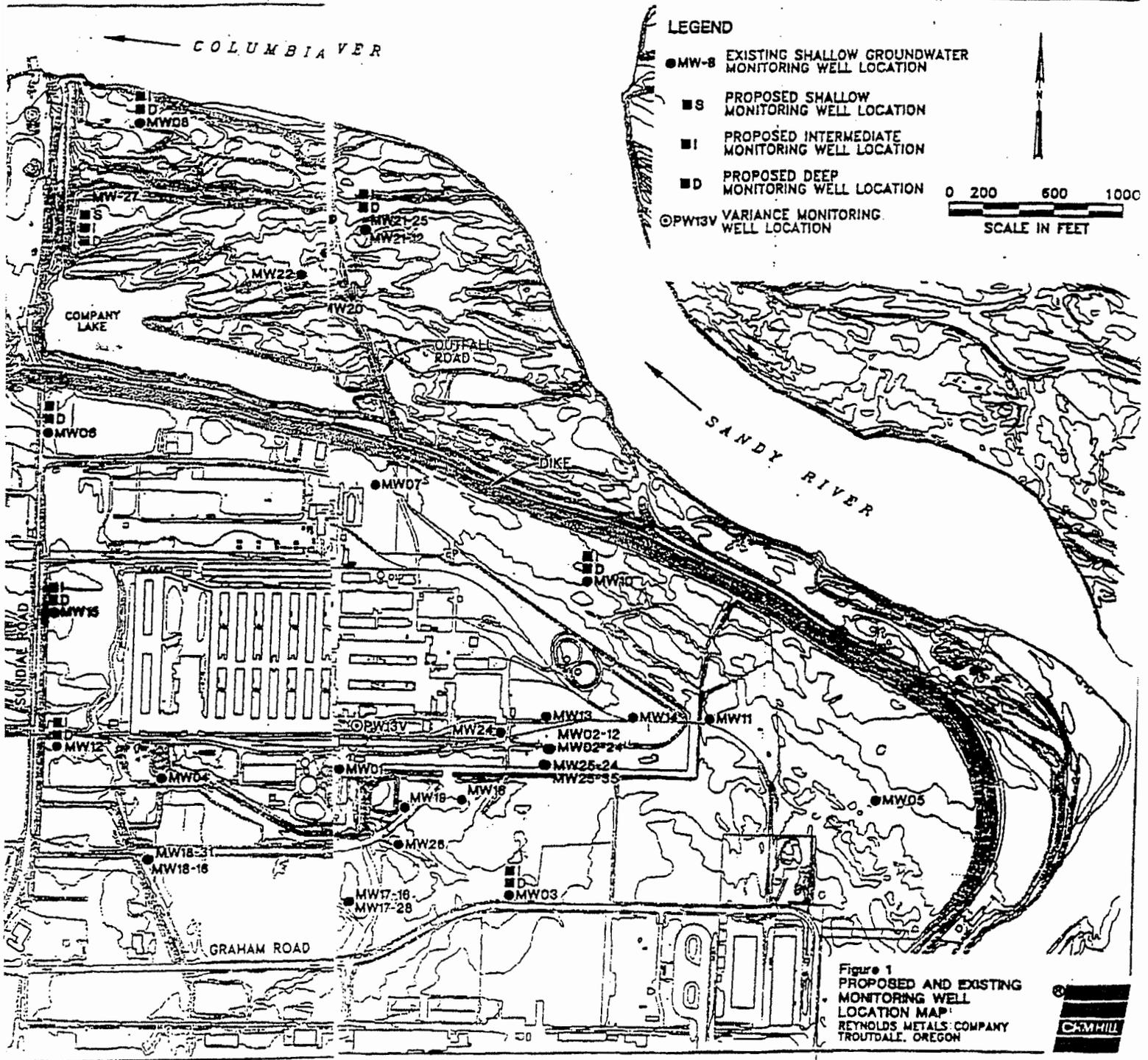


Figure 1
 PROPOSED AND EXISTING
 MONITORING WELL
 LOCATION MAP
 REYNOLDS METALS COMPANY
 TROUTDALE, OREGON



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 SALEM, OREGON

STATE OF OREGON
MONITORING WELL REPORT
 (as required by ORS 537.765 & OAR 690-240-095)

Mult
 52865 JAN 28 1997

WATER RESOURCES DEPT.
 SALEM, OREGON

WELL ID L10762 amended
 Start Card # W85674 (W 85678)
 85678?

Instructions for completing this report are on the last page of this form.

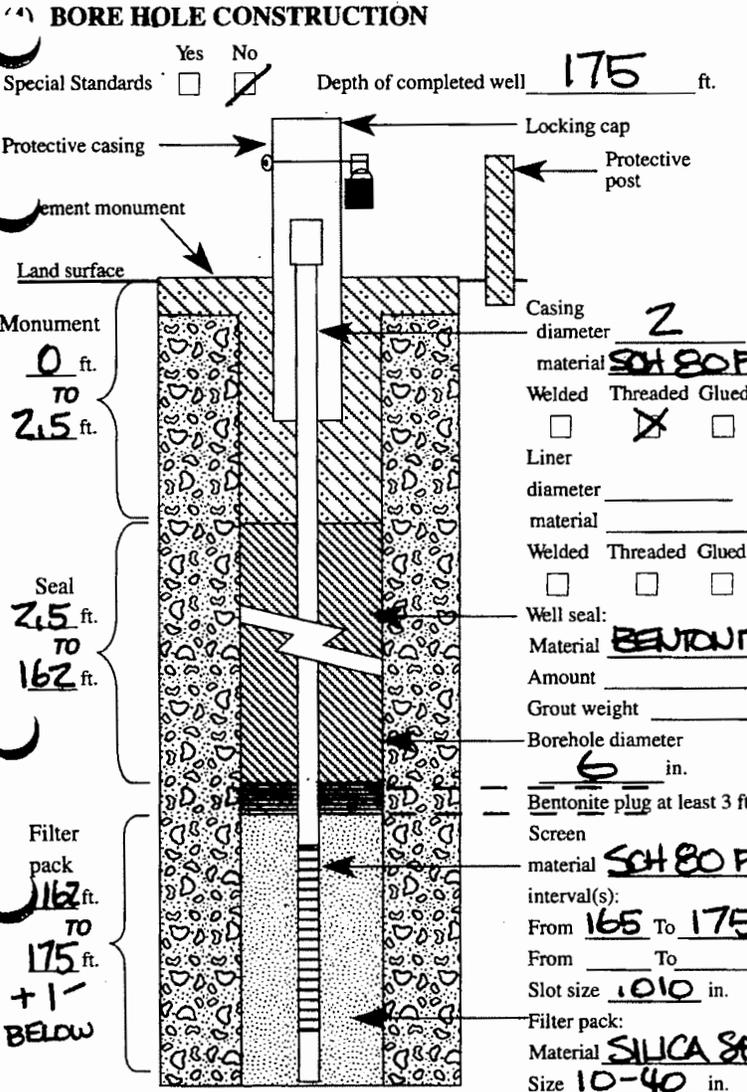
(1) OWNER/PROJECT: WELL NO. MW15-175
 Name REYNOLDS METALS COMPANY
 Address 5100 SUNDIAL ROAD
 City TROUTDALE State OR Zip _____

(6) LOCATION OF WELL By legal description
 Well Location: County MULTNOMAH
 Township 1 (N or S) Range 3 (E or W) Section 23
 1. NW 1/4 of SW 1/4 of above section.
 2. Either Street address of well location
5100 SUNDIAL ROAD TROUTDALE, OR
 or Tax lot number of well location _____
 3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(2) TYPE OF WORK:
 New construction Alteration (Repair/Recondition)
 Conversion Deepening Abandonment

(3) DRILLING METHOD
 Rotary Air Rotary Mud Cable
 Hollow Stem Auger Other _____

(7) STATIC WATER LEVEL:
20 Ft. below land surface. Date 5/24/96
 Artesian Pressure _____ lb/sq. in. Date _____



(8) WATER BEARING ZONES:

Depth at which water was first found _____

From	To	Est. Flow Rate	SWL
30	700	+56GPM	20'

(9) WELL LOG: Ground elevation ±39'

Material	From	To	SWL
CRUSHED BASALT	0	2	
SILT, LITE BROWN	2	30	
SAND, MED, BROWN	30	87	
SAND, COARSE, SOME GRAVELS	87	102	
SAND, MED-FINE GRAY	102	150	
SAND, MED-COARSE GRAY	150	200	
BOREHOLE BELOW 176' ABANDONED WITH CEMENT GROUT			

Date started 5-22-96 Completed _____

(5) WELL TEST:
 Pump Bailer Air Flowing Artesian
 Permeability _____ Yield _____ GPM
 Conductivity _____ PH _____
 Temperature of water 50 °C Depth artesian flow found _____ ft.
 Was water analysis done? Yes No
 By whom? CHZMHILL - RMC
 Depth of strata to be analyzed. From _____ ft. to _____ ft.
 Remarks: _____

(unbonded) Monitor Well Constructor Certification:
 I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.
 Signed JAMES VIGLIANI MWC Number 10345 Date 1-15-97

(bonded) Monitor Well Constructor Certification:
 I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
 MWC Number 10067 Date 1-15-97

COLUMBIA VER

LEGEND

- MW-8 EXISTING SHALLOW GROUNDWATER MONITORING WELL LOCATION
- S PROPOSED SHALLOW MONITORING WELL LOCATION
- I PROPOSED INTERMEDIATE MONITORING WELL LOCATION
- D PROPOSED DEEP MONITORING WELL LOCATION
- ⊙ PW13V VARIANCE MONITORING WELL LOCATION

0 200 600 1000
SCALE IN FEET

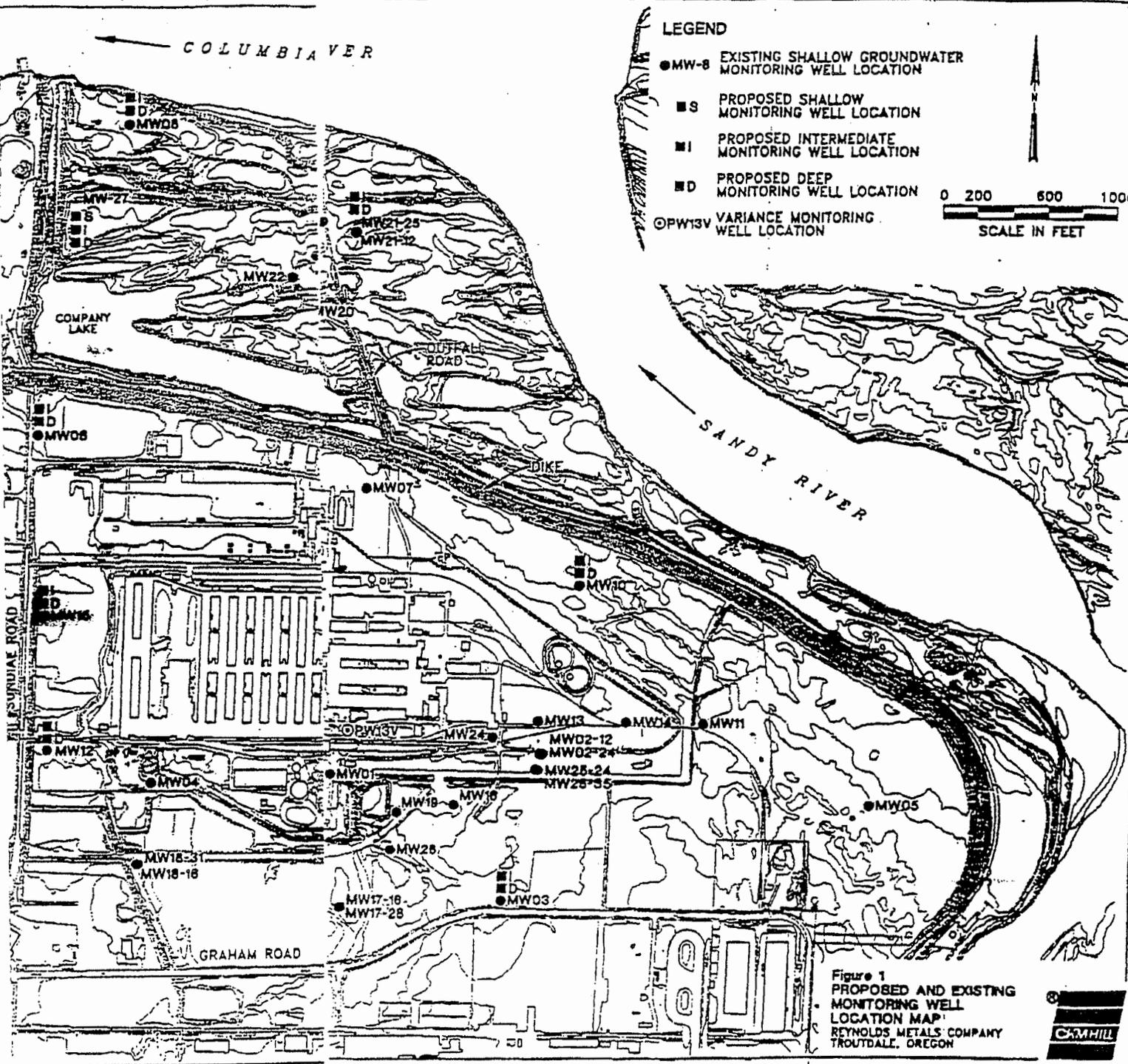


Figure 1
PROPOSED AND EXISTING
MONITORING WELL
LOCATION MAP
REYNOLDS METALS COMPANY
TROUTDALE, OREGON



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WATER RESOURCES DEPT.
SALEM, OREGON

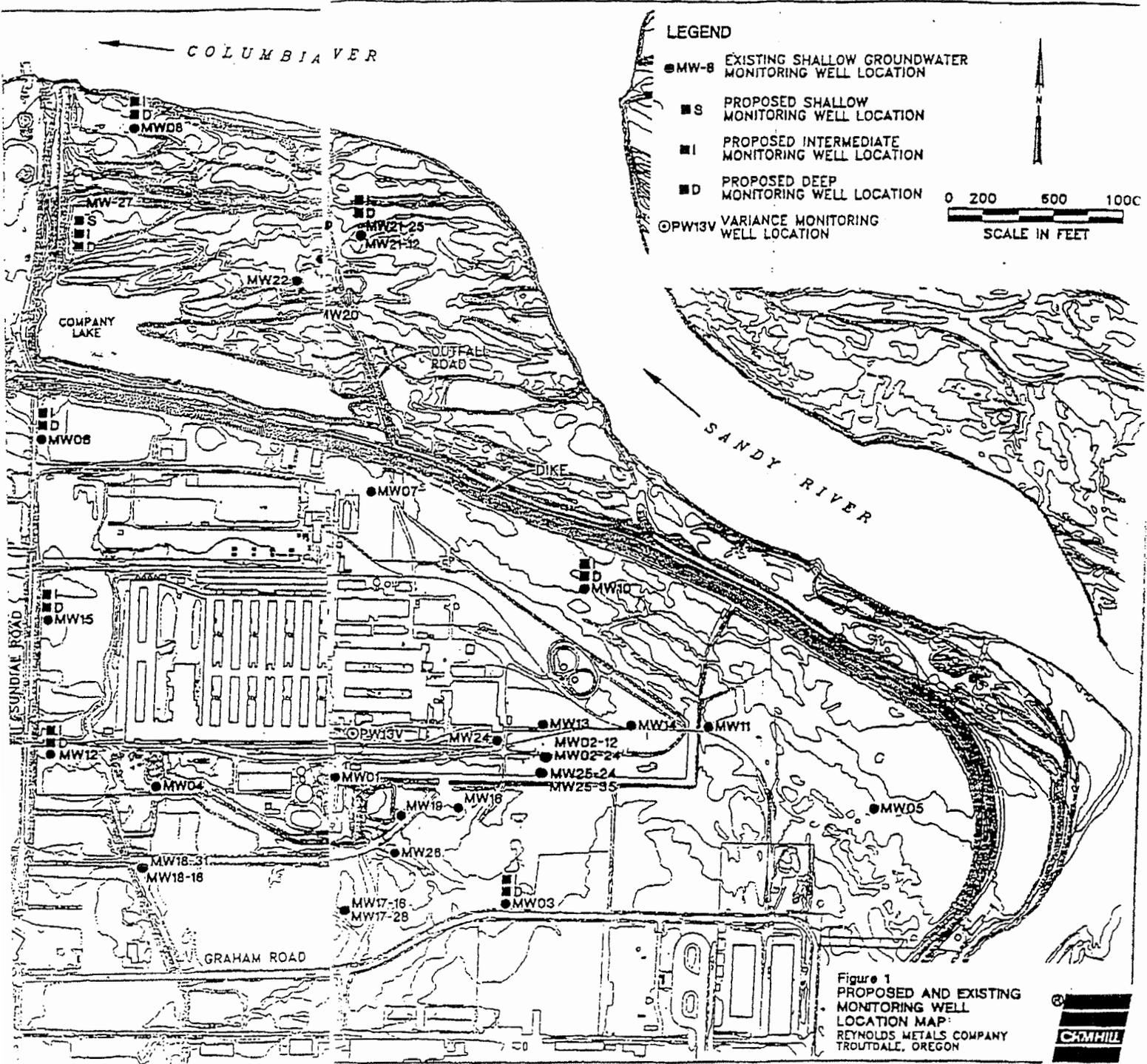


Figure 1
PROPOSED AND EXISTING
MONITORING WELL
LOCATION MAP
REYNOLDS METALS COMPANY
TROUTDALE, OREGON



JAN 23 1987

Mult JAN 23 1997

L10764
 Start Card # W79939

(1) OWNER/PROJECT: WELL NO. MWZ1-176
 Name REYNOLDS METALS COMPANY
 Address 5100 SUNDIAL ROAD
 City TROUTDALE State OR Zip _____

(6) LOCATION OF WELL By legal description
 Well Location: County MULTNOMAH
 Township 1 (N or S) Range 3 (E or W) Section 23
 1. NW 1/4 of NE 1/4 of above section.
 2. Either Street address of well location
5100 SUNDIAL ROAD TROUTDALE, OR
 or Tax lot number of well location _____

(2) TYPE OF WORK:
 New construction Alteration (Repair/Recondition)
 Conversion Deepening Abandonment

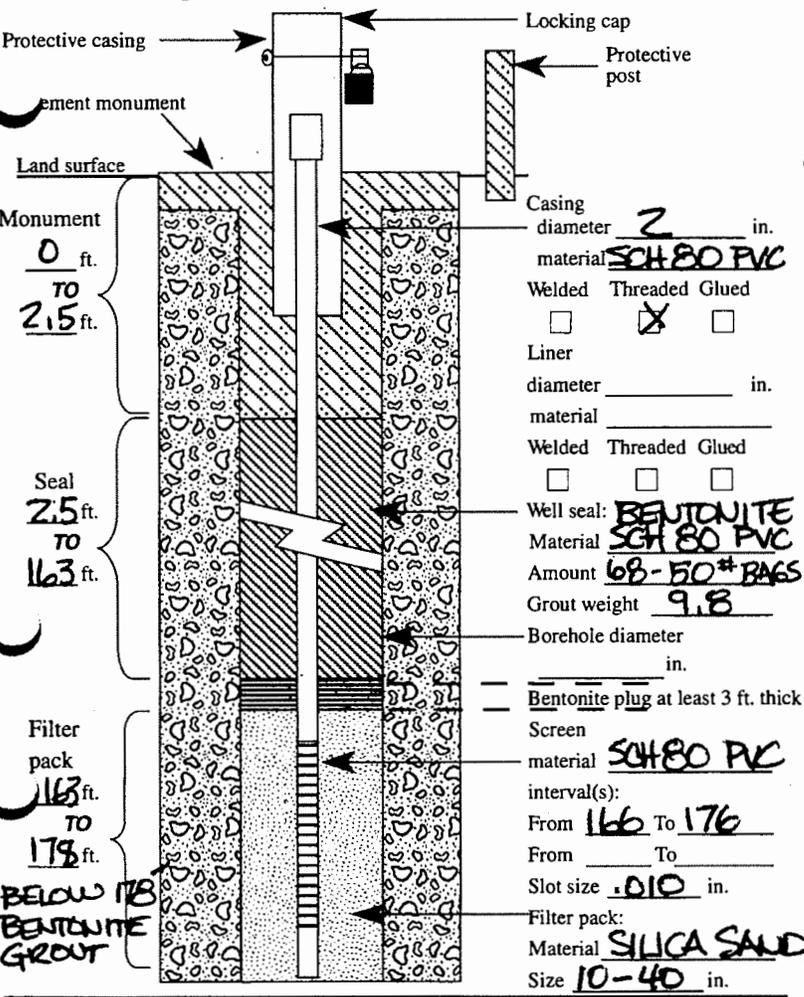
3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.
 (7) STATIC WATER LEVEL:
 _____ 17 Ft. below land surface. Date 8/12/96
 Artesian Pressure _____ lb/sq. in. Date _____

(3) DRILLING METHOD
 Rotary Air Rotary Mud Cable
 Hollow Stem Auger Other _____

(4) BORE HOLE CONSTRUCTION
 Special Standards Yes No
 Depth of completed well 176 ft.

(8) WATER BEARING ZONES:
 Depth at which water was first found 20'

From	To	Est. Flow Rate	SWL
20	340	5-150 GPM	18'



(9) WELL LOG: Ground elevation ±37'

Material	From	To	SWL
CRUSHED BASALT	0	2	
SILT, BROWN	2	8	
SAND, F-M, BROWN	8		
WOOD FRAGMENTS		67	
GRAVEL, SAND	67		
ANGULAR		72	
GRAVELS, DENSE	72		
PARTIAL CEMENTATION		152	
SAND, F-C WITH	152		
GRAVELS F-C		164	
SAND, M-C, GRAY	164	205	
SILT, M, GRAY, GREEN	205	215	
SAND, F-C, GRAY	215	218	
GRAVEL, F-C, GRAY	218	245	
SILT, M, GRAY	245	247	
SAND, F-C, GRAY	247		
SOME GRAVELS		267	
GRAVEL, DENSE	267	285	
SAND, MED, GRAY	285	322	
GRAVEL, CEMENTED	322	345	
BASALT, GRAY BLACK	345	360	

Date started 5-6-96 Completed 8-12-96

(5) WELL TEST:
 Pump Bailer Air Flowing Artesian
 Permeability _____ Yield _____ GPM
 Conductivity _____ PH _____
 Temperature of water 50 °F/C Depth artesian flow found _____ ft.
 Was water analysis done? Yes No
 By whom? CHZMHILL - RMC
 Depth of strata to be analyzed. From _____ ft. to _____ ft.
 Remarks: _____

(unbonded) Monitor Well Constructor Certification:
 I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.
 MWC Number 10359
 Signed John W. Morris Date 1-15-97

(bonded) Monitor Well Constructor Certification:
 I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
 MWC Number 10067
 Signed [Signature] Date 1-15-97

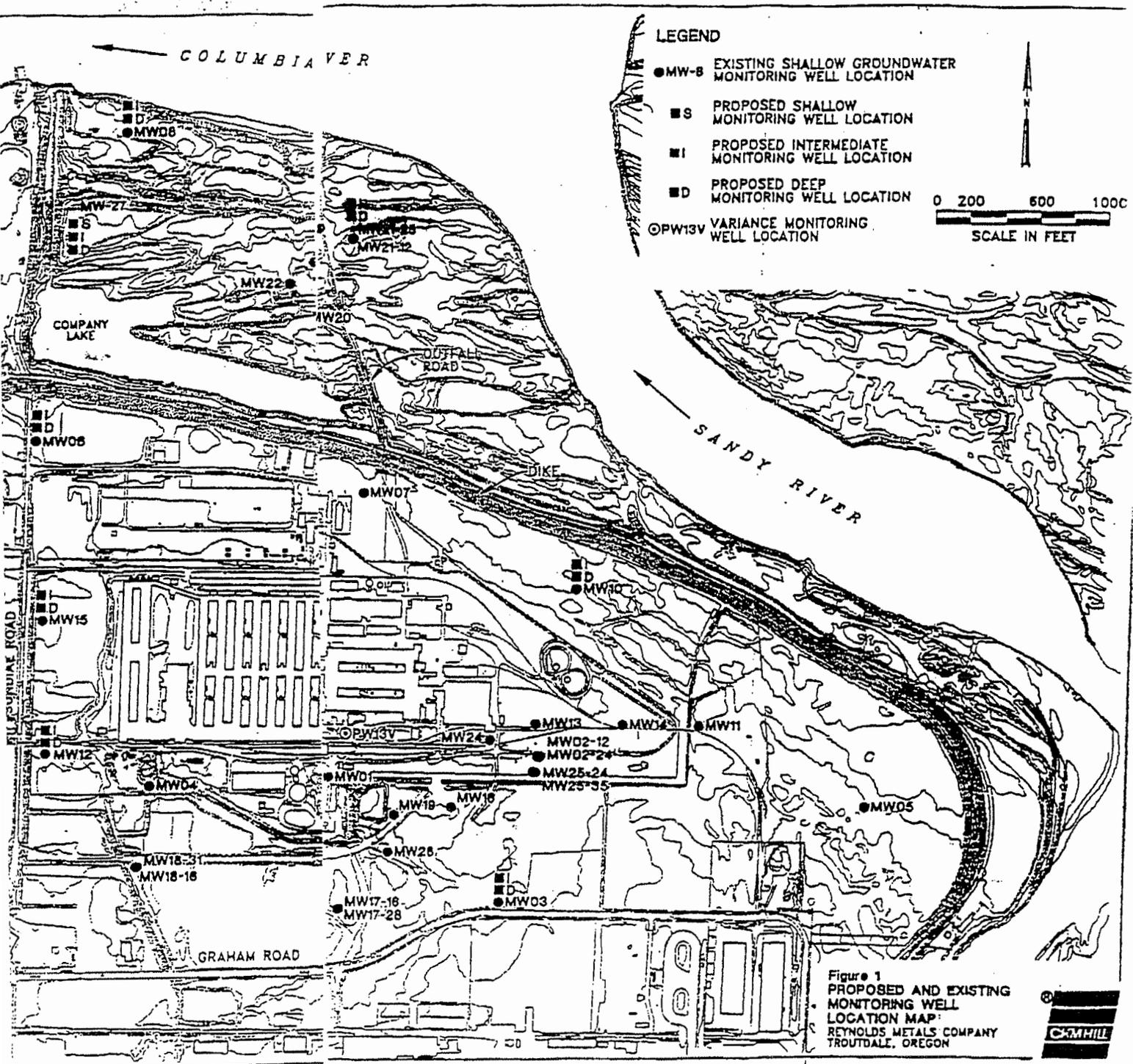


Figure 1
 PROPOSED AND EXISTING
 MONITORING WELL
 LOCATION MAP
 REYNOLDS METALS COMPANY
 TROUTDALE, OREGON



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JAN 23 1997

WATER RESOURCES DEPT.
 SALEM, OREGON

Oregon Water Resources Department

REQUEST FOR WRITTEN APPROVAL TO USE CONSTRUCTION METHODS NOT INCLUDED IN OREGON ADMINISTRATIVE RULES 690-200 THROUGH 690-240

Before request can be considered, the following must be answered. Requests shall be submitted to the Well Construction Specialist, Water Resources Department. Requests may also be considered by the appropriate Regional Manager.

Date of request JUNE 26, 1996

Bonded Well Constructor (name, license and mailing address): ERIC HANSEN
30316 MOUNTAIN HWY GRAHAM WA 98338 LC # 10067

(1) Location of Well: 1/4 1/4 of Section 23, Township 1N
Range 3E MULTNOMAH County.

Address at well site: 5100 SUNDIAL ROAD
TROUTDALE, OR.

(2) Start Card Number(s): MW 10, DB, 21, 27 (W85671, W85712, W79939, W85715)

(3) Name and Address of Land Owner: REYNOLDS METALS COMPANY

(4) The distance to the nearest well, septic tank or drainfield (if water supply well):
OVER 500 FT.

(5) The unusual conditions which necessitate this request: FORMATION MATERIAL
COMPOSED OF LOOSE SANDS WHICH HEAVES BADLY, GEOLOGIST WANTS
TO ENSURE ADEQUATE SILICA SAND THICKNESS BETWEEN BASE OF
WELL SCREEN & TOP OF BENTONITE SLURRY SEAL BELOW IT.

(6) The proposed construction methods that the well constructor believes will be adequate for this well (attach additional pages if needed)

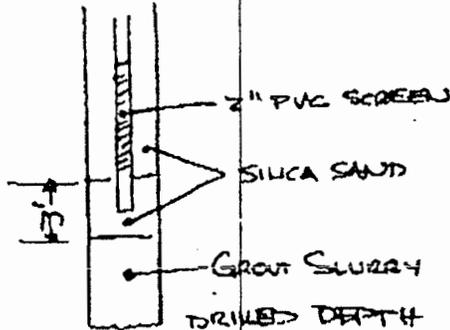
PER DIAGRAM

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JAN 23 1997

WATER RESOURCES DEPT.
SALEM, OREGON

(7) Diagram showing the pertinent features of the proposed well design and construction (attach additional pages if needed):



PLEASE NOTE:

- (1) If approved, all other phases of well construction must comply with the appropriate standards described in OAR 690-200 through 690-240.
- (2) If it should be determined at some future date that the well, due to its construction, is allowing groundwater contamination, waste or loss of artesian pressure, the undersigned shall return to the site and rectify the problem.
- (3) If verbal approval was granted, a written request must be submitted to the Department either within three (3) working days of the date of verbal approval or prior to the completion of the associated well work. Failure to submit a written request as described above may void prior approval.

I have read and understand the above information. I further attest that the information provided is accurate to the best of my knowledge.

Bonded Constructor Signature: _____

[Handwritten Signature] 10067

VERBAL APPROVAL ROS CARTER VIA CHEZMILL

For Water Resources Department Use Only

Date: 7-9-96

Approved by: *[Handwritten Signature]* Denied by: _____

Remarks: _____

revised: 4-95

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JAN 23 1997

WATER RESOURCES DEPT.
SALEM, OREGON

(1) OWNER/PROJECT: WELL NO. MW27-176
 Name REYNOLDS METALS COMPANY
 Address 5100 SUNDIAL ROAD
 City TROUTDALE State OR Zip 97060

(6) LOCATION OF WELL By legal description.
 Well Location: County MULTNOMAH
 Township 1 (N or S) Range 3 (E or W) Section 23
 1. NW 1/4 of NW 1/4 of above section.
 2. Either Street address of well location 5100 SUNDIAL ROAD, TROUTDALE, OR
 or Tax lot number of well location _____
 3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(2) TYPE OF WORK:
 New construction Alteration (Repair/Recondition)
 Conversion Deepening Abandonment

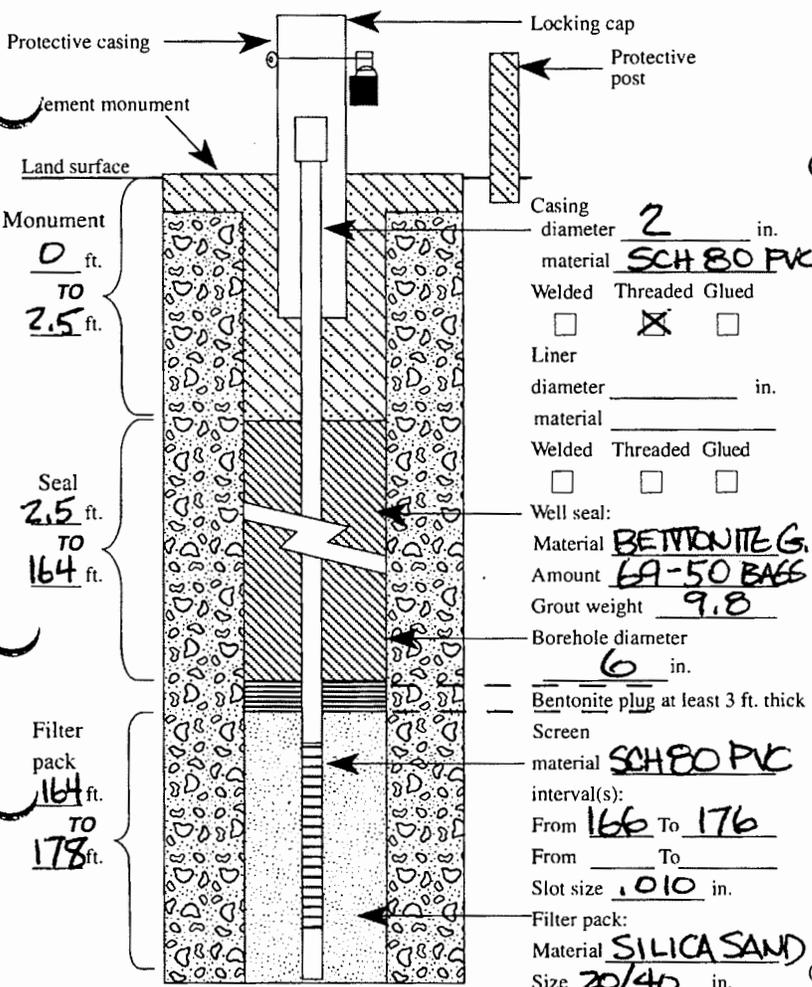
(3) DRILLING METHOD
 Rotary Air Rotary Mud Cable
 Hollow Stem Auger Other _____

(7) STATIC WATER LEVEL:
12 Ft. below land surface. Date 8-16-96
 Artesian Pressure _____ lb/sq. in. Date _____

(4) BORE HOLE CONSTRUCTION
 Special Standards Yes No
 Depth of completed well 176 ft.

(8) WATER BEARING ZONES:
 Depth at which water was first found 20"

From	To	Est. Flow Rate	SWL
<u>20</u>	<u>222</u>	<u>5-150 GPM</u>	<u>20"</u>



(9) WELL LOG: Ground elevation ± 38'

Material	From	To	SWL
<u>FILL</u>	<u>0</u>	<u>1</u>	
<u>SILT W/SAND BR.</u>	<u>1</u>	<u>11</u>	
<u>SAND, F-M</u>	<u>11</u>	<u>15</u>	
<u>SAND W/SILT BR</u>	<u>15</u>	<u>20</u>	
<u>SAND, F-M, BROWN</u>			
<u>GRAY WET</u>	<u>20</u>	<u>60</u>	
<u>SAND, DARK GRAY</u>			
<u>SOME VEGETATION</u>	<u>60</u>	<u>100</u>	
<u>GRAVEL, GRAY VERY</u>			
<u>DENSE, WOOD</u>	<u>100</u>	<u>132</u>	
<u>GRAVEL, BROWN</u>			
<u>SOME CEMENTATION</u>	<u>132</u>	<u>175</u>	
<u>GRAVEL, GRAY, SILT</u>	<u>175</u>	<u>178</u>	
<u>SAND, F-M, BROWN</u>	<u>178</u>	<u>195</u>	
<u>GRAVEL, BLACK</u>	<u>195</u>	<u>197</u>	
<u>SAND, GRAY, F-C</u>	<u>197</u>	<u>203</u>	
<u>GRAVEL, BLACK</u>	<u>203</u>	<u>222</u>	
<u>BASALT, WEATHERED</u>	<u>222</u>	<u>247</u>	
<u>BASALT, BLACK</u>	<u>247</u>	<u>260</u>	

BOREHOLE BELOW 178' ABAND W/BENTONITE
 Date started 7-8-96 Completed 8-16-96

(5) WELL TEST:
 Pump Bailer Air Flowing Artesian
 Permeability _____ Yield _____ GPM
 Conductivity _____ PH _____
 Temperature of water 50 °C Depth artesian flow found _____ ft.
 Was water analysis done? Yes No
 By whom? CH2MHILL-RMC
 Depth of strata to be analyzed. From _____ ft. to _____ ft.
 Remarks: _____

(unbonded) Monitor Well Constructor Certification:
 I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.
 Signed [Signature] MWC Number 10102
 Date JAN 15, 97

(bonded) Monitor Well Constructor Certification:
 I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
 Signed [Signature] MWC Number 10067
 Date 1-15-97

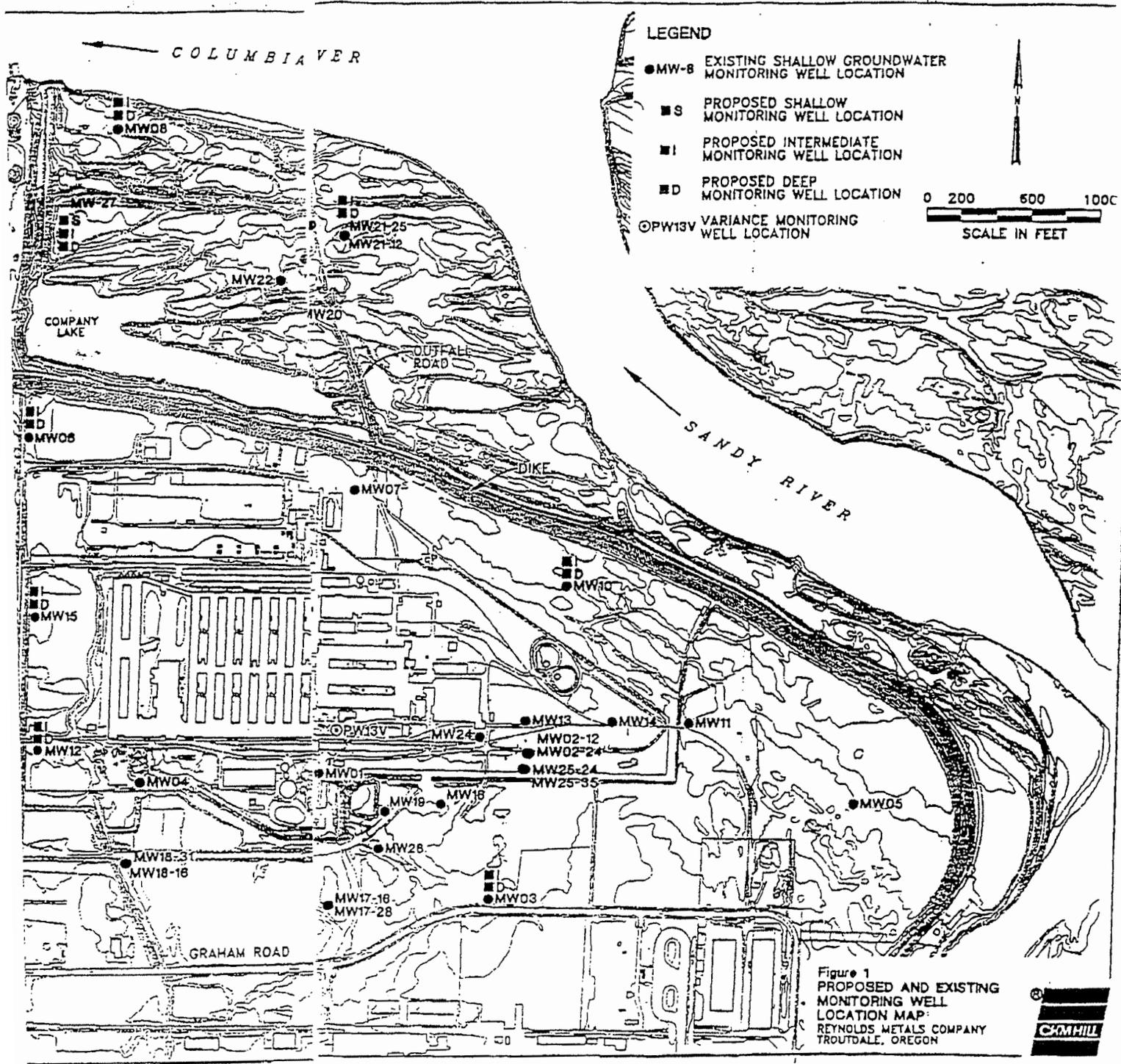


Figure 1
PROPOSED AND EXISTING
MONITORING WELL
LOCATION MAP
REYNOLDS METALS COMPANY
TROUTDALE, OREGON



JAN 26 1987

27-176

Oregon Water Resources Department

REQUEST FOR WRITTEN APPROVAL TO USE CONSTRUCTION METHODS NOT INCLUDED IN OREGON ADMINISTRATIVE RULES 690-200 THROUGH 690-240

Before request can be considered, the following must be answered. Requests shall be submitted to the Well Construction Specialist, Water Resources Department. Requests may also be considered by the appropriate Regional Manager.

Date of request JUNE 26, 1996

Bonded Well Constructor (name, license and mailing address): ERIC HANSEN
30316 MOUNTAIN HWY GRAHAM WA 98338 LIC # 10067

(1) Location of Well: 1/4 1/4 of Section 23, Township 1N
Range 3E MULTNOMAH County.

Address at well site: 5100 SUNDIAL ROAD
TROUTDALE, OR.

(2) Start Card Number(s): MW 10, 08, 21, 27 (W85671, W85712, W79939, W85715)

(3) Name and Address of Land Owner: REYNOLDS METALS COMPANY

(4) The distance to the nearest well, septic tank or drainfield (if water supply well):
OVER 500 FT.

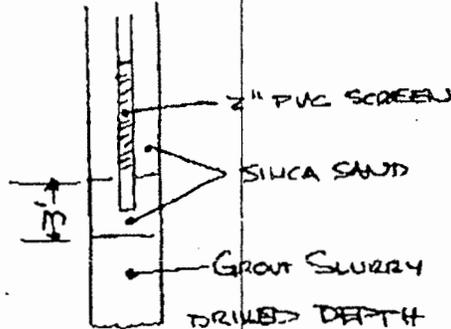
(5) The unusual conditions which necessitate this request: FORMATION MATERIAL
COMPOSED OF LOOSE SANDS WHICH HEAVES BADLY, GEOLOGIST WANTS
TO ENSURE ADEQUATE SILICA SAND THICKNESS BETWEEN BASE OF
WELL SCREEN & TOP OF BENTONITE SLURRY SEAL BELOW IT.

(6) The proposed construction methods that the well constructor believes will be adequate for this well (attach additional pages if needed)
PER DIAGRAM

JAN 28 1997

CONFIDENTIAL

(7) Diagram showing the pertinent features of the proposed well design and construction (attach additional pages if needed):



PLEASE NOTE:

- (1) If approved, all other phases of well construction must comply with the appropriate standards described in OAR 690-200 through 690-240.
- (2) If it should be determined at some future date that the well, due to its construction, is allowing groundwater contamination, waste or loss of artesian pressure, the undersigned shall return to the site and rectify the problem.
- (3) If verbal approval was granted, a written request must be submitted to the Department either within three (3) working days of the date of verbal approval or prior to the completion of the associated well work. Failure to submit a written request as described above may void prior approval.

I have read and understand the above information. I further attest that the information provided is accurate to the best of my knowledge.

Bonded Constructor Signature: [Signature] 10067

VERBAL APPROVAL ROS CARTER VIA CHZMHILL

For Water Resources Department Use Only

Date: 7-9-96

Approved by: [Signature] Denied by: _____

Remarks: _____

JAN 28 1997

Mult 52266

STATE OF OREGON

MONITORING WELL REPORT

(as required by ORS 537.765 & OAR 690-240-095)

WELL I.D.# 5513

Start Card # 93714

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT: Name Reynolds metals, Address 5100 Sundaal Ad, City Troutdale, State OR, Zip 97060

(6) LOCATION OF WELL By legal description: Well Location: County Multnomah, Township IN, Range 3E, Section 14

(2) TYPE OF WORK: [X] New construction, [] Alteration (Repair/Recondition), [] Conversion, [] Deepening, [] Abandonment

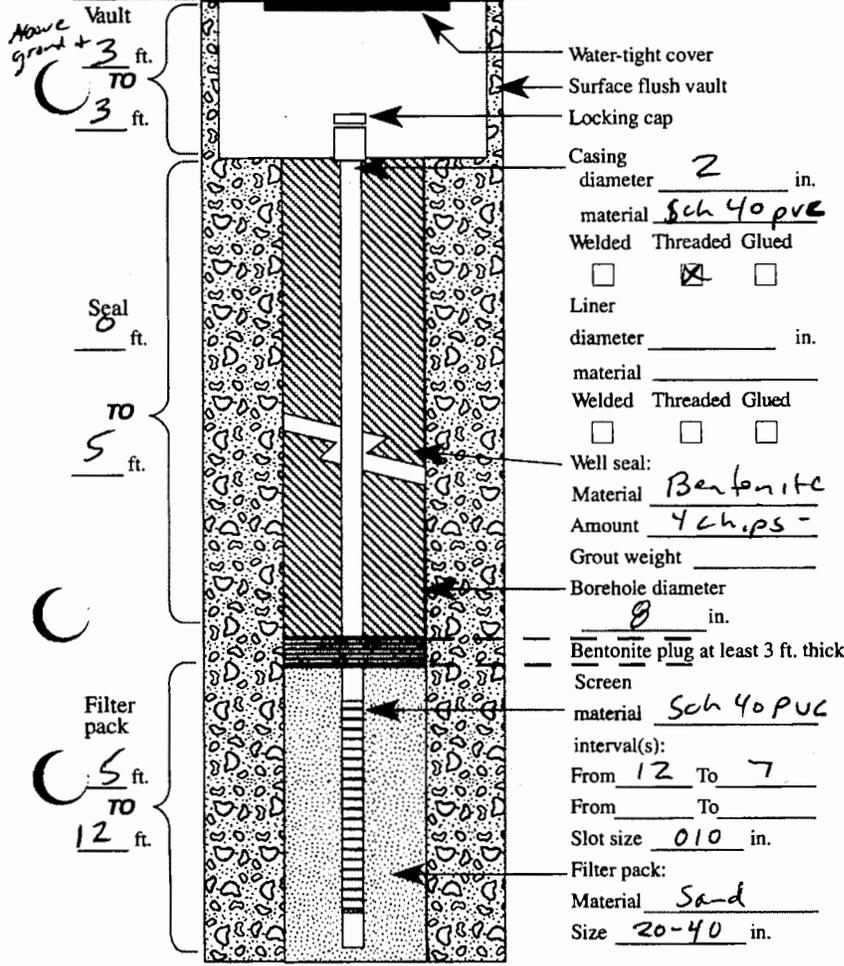
(7) STATIC WATER LEVEL: 4 Ft. below land surface, Date 10-23-96

(3) DRILLING METHOD: [X] Hollow Stem Auger, [] Rotary Air, [] Rotary Mud, [] Cable, [] Other

(8) WATER BEARING ZONES: Depth at which water was first found 12

(4) BORE HOLE CONSTRUCTION: Special Standards [] Yes [X] No, Depth of completed well 12 ft.

Table with 4 columns: From, To, Est. Flow Rate, SWL. Row 1: 12, 4, ,



(9) WELL LOG: Table with 4 columns: Material, From, To, SWL. Rows: Sand (0-4), Silty sand (4-10), gray silt (10-12)

Date started 10-23-96 Completed 10-23-96

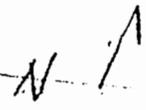
(5) WELL TEST: [] Pump, [] Bailer, [] Air, [] Flowing Artesian. Permeability, Yield, Conductivity, PH, Temperature of water 58, Depth artesian flow found

(unbonded) Monitor Well Constructor Certification: I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards.

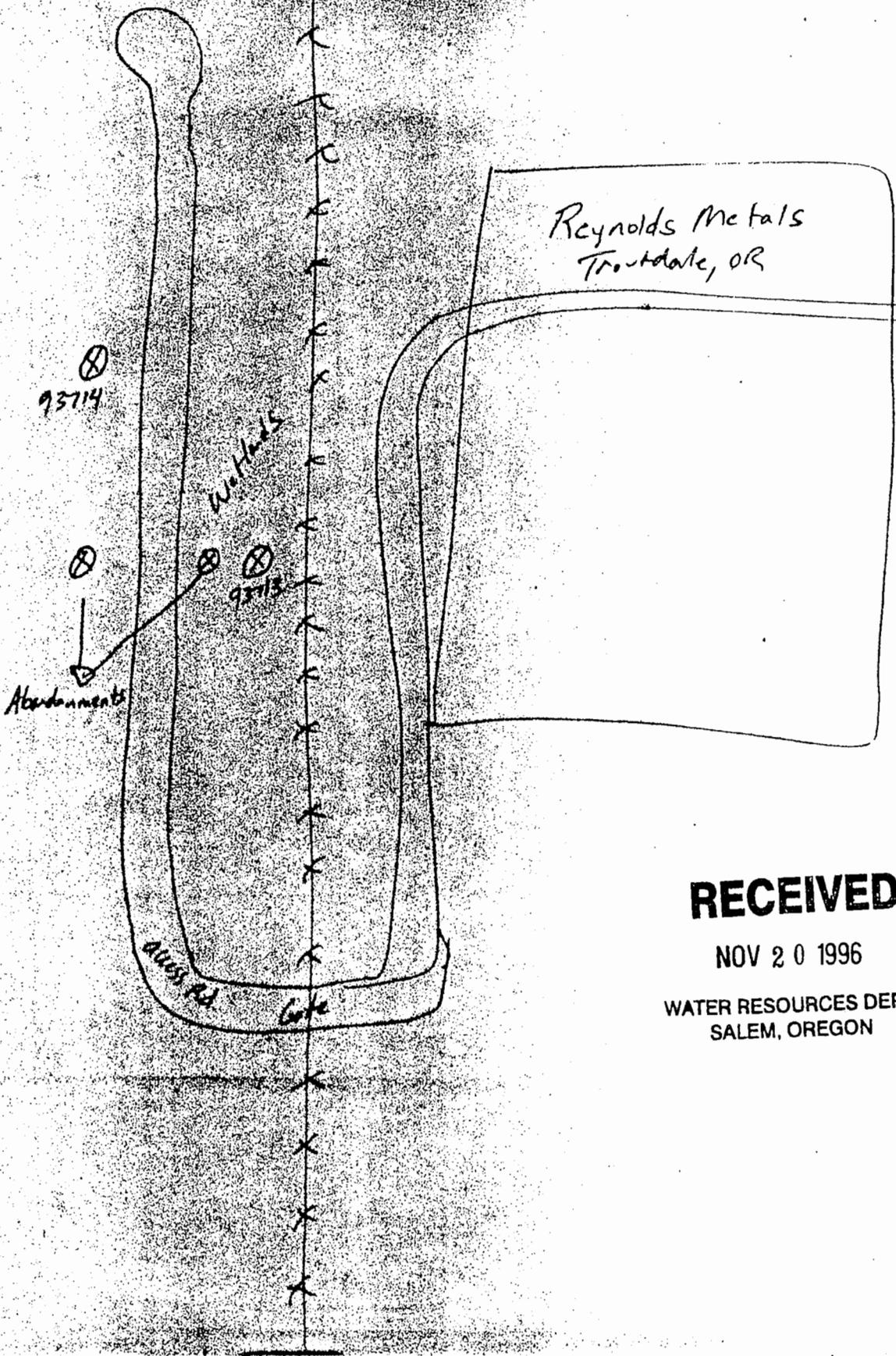
(bonded) Monitor Well Constructor Certification: I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above.

Reynolds Metals

SITE MAP



Wetlands



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WATER RESOURCES DEPT.
SALEM, OREGON

1" = 50'

MONITORING WELL REPORT

MULT 52473

Received Date 12/23/1996

Well ID Tag# L 5576

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

Start Card # 93803

(1) OWNER/PROJECT

Name **REYNOLDS METALS**
 Street **5100 SUNDIAL RD**
 City **TROUTDALE** State **OR** Zip **97060**

Well No. **NW 37-030**
 Co Job No.

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**
 1. **SW 1/4 of SE 1/4 of above section.**
 Legal Desc:

(2) TYPE OF WORK

- New Construction Alter (Recondition) Alter (Repair)
 Conversion Deepening Abandonment

2. Either Street address of well location

SAME

or Tax lot number of well location **100**

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow

(3) DRILLING METHOD

- Rotary Air Rotary Mud Cable
 Hollow Stem Auger Other *****

(7) STATIC WATER LEVEL

11.0 Ft. below land surface
 Artesian Pressure **lb/sq. in.** Date **12/09/1996**

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well **30** ft.

Diameter	From	To	Material	Begin Depth	End Depth	Material	Units
8.00	0.00	30	Bentonite	0.00	22.00	9.00	B

Vault
 ft. Casing Diameter **Liner**

ft.	Casing or Liner	Diameter	Begin Depth	End Depth	Gauge	Material	Construction	Location
2 ft.	<input checked="" type="checkbox"/>	2.00				Plast	<input checked="" type="checkbox"/>	
4 ft.								

ft.	TO	From	To	Material	Amount	Seal Grout Weight	Units
		0.00	22.00	Bentonite	9.00		B

Filter Pack **Screen**

ft.	TO	From	To	Material	Amount	Seal Grout Weight	Units
22 ft.							
30 ft.							

Filter Pack
 Material **SA**
 Size **20.00 in.**

(8) WATER BEARING ZONES

Depth at which water was first found **12** ft.

(9) WELL LOG

Material	From	To	SWL
FILL	0	4	
SILT	4	22	
SAND	22	30	

(5) WELL TEST

Permeability Yield
 Conductivity PH
 Temperature of water **54** °F/C Depth artesian flow found ft.
 Was water analysis done?
 By Whom? **CH2M**
 Depth of strata to be analyzed. From ft. to ft.
 Remarks
 Name of supervising Geologist/Engineer

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used at information reported above are true to the best knowledge and belief.

MWC Number **10076**

Signed By **BRADLEY J WIEBERDINK** Date

(bonded) Monitor Well Constructor Certification:

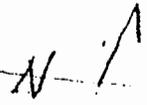
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number **10011**

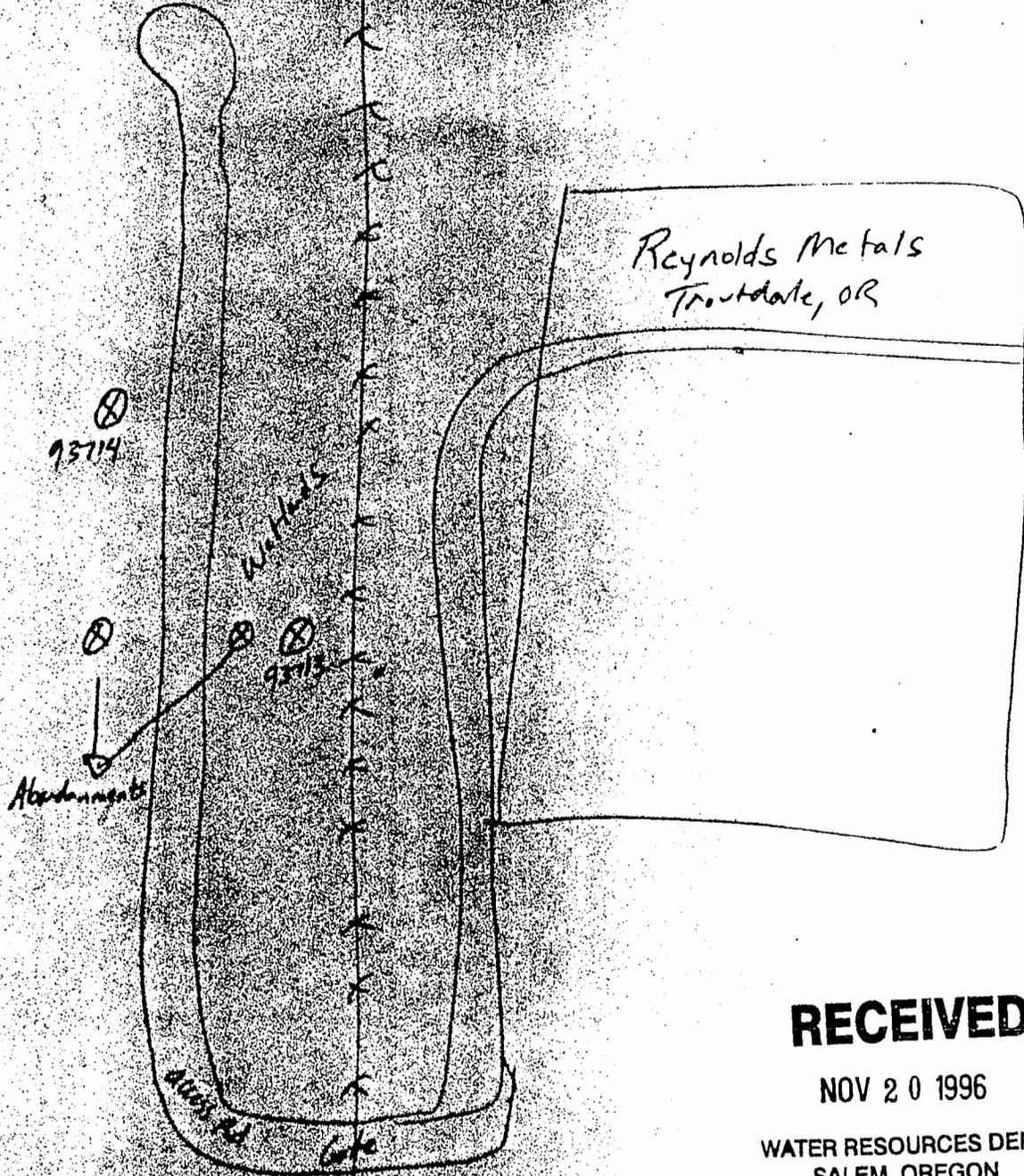
Signed By **GREG MCINNIS** Date

Reynolds Metals

SUBMAP



Wetlands



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NOV 20 1996

WATER RESOURCES DEPT.
SALEM, OREGON

1" = 50'

STATE OF OREGON
MONITORING WELL REPORT

MULT 52476

Received Date **12/23/1996**

Well ID Tag# **L**

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

Start Card #

93798

(1) OWNER/PROJECT

Well No. **5578**
 Co Job No. **MW38-039**

Name **REYNOLDS METALS**
 Street **5100 SUNDIAL RD**
 City **TROUTDALE** State **OR** Zip **97060**

(2) TYPE OF WORK

- New Construction Alter (Recondition) Alter (Repair)
 Conversion Deepening Abandonment

(3) DRILLING METHOD

- Rotary Air Rotary Mud Cable
 Hollow Stem Auger Other *****

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well **36** ft.

Diameter	From	To	Material	Begin Depth	End Depth	Material Amount	Units
10.00	0.00	36	Bentonite	0.00	28.00	17.00	B

Vault
 ft. Casing Diameter _____ Liner
 TO
 ft. Casing or Liner Diameter _____ Begin Depth _____ End Depth _____ Gauge _____ Material _____ Construction _____ Location _____
 Monument **1** ft. **C** **2.00** _____ _____ _____ **Plastic** _____ _____ _____
 TO
3 ft.

Seal

From	To	Material	Amount	Seal Grout Weight	Units
0.00	28.00	Bentonite	17.00		B

Filter Pack

Screen

Diameter	From	To	Gauge	Material	Type	Slot Size
	33	36		PL		.01

Filter Pack
 Material **SA**
 Size **40.00** in.

(5) WELL TEST

Permeability _____ Yield _____
 Conductivity _____ PH _____
 Temperature of water **54** °F/C Depth artesian flow found _____ ft.
 Was water analysis done?
 By Whom? **CH2M**
 Depth of strata to be analyzed. From _____ ft. to _____ ft.
 Remarks _____
 Name of supervising Geologist/Engineer _____

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**
 1. **SW** 1/4 of **SE** 1/4 of above section.
 Legal Desc:

2. Either Street address of well location

SAME

or Tax lot number of well location **100**

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL

7.0 Ft. below land surface. Date **12/02/1996**
 Artesian Pressure _____ lb/sq. in. Date _____

(8) WATER BEARING ZONES

Depth at which water was first found **7** ft.

(9) WELL LOG

Ground elevation **0** ft.

Material	From	To	SWL
SILT	0	10	
SILT WITH SAND	10	25	
SAND WITH SILT	25	30	
SAND	30	36	

Date started **12/02/1996** Completed **12/02/1996**

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number **10189**

Signed By **MICKEY A SCOTT** Date _____

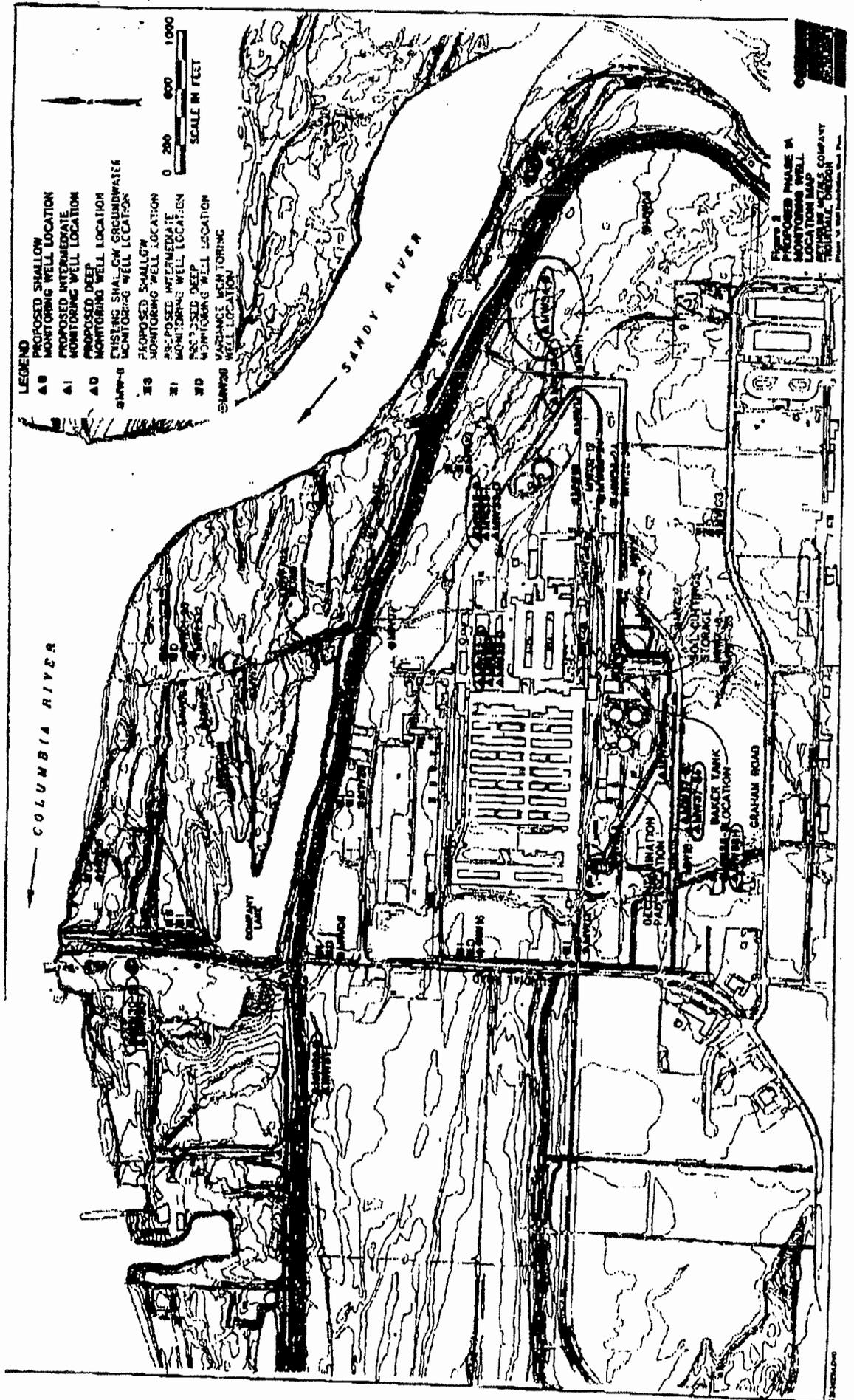
(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number **10011**

Signed By **GREG MCINNIS** Date _____

Mult Co-5268A
52473-4, 52476
52479-88



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SEP 24 1997

WATER RESOURCES DE
SALEM, OREGON

MULTNOMAH
COUNTY



STATE OF OREGON
MONITORING WELL REPORT

MULT 53786

Received Date
 Well Tag# L 1
 Start Card # 100165

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT

Name **METALS REYNOLDS**
REYNOLDS METALS
 Street **5100 SUNDIAL RD**
 City **TROUTDALE** State **OR** Zip **97060**

Well No. **5781**
 Co Job No. **400 41-020**

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**
 1. **NE** 1/4 of **NW** 1/4 of above section.
 Legal Desc:

(2) TYPE OF WORK

- New Construction** **Alter (Recondition)** **Alter (Repair)**
 Conversion **Deepening** **Abandonmen**

2. Either Street address of well location

SAME

or Tax lot number of well location

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(3) DRILLING METHOD

- Rotary Air** **Rotary Mud** **Cable**
 Hollow Stem Auger **Other**

(7) STATIC WATER LEVEL

8.0 Ft. below land surface. Date **6/13/1997**
 Artesian Pressure lb/sq. in. Date

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well **20** ft.

		Diameter		From	To				
Vault	0 ft.	11.00	0	20					
	TO								
Monument	1 ft.	2.00			Gauge	Material	Welded	Glued	Threaded
	TO								

(8) WATER BEARING ZONES

Depth at which water was first found **8** ft.

From	To	Est. Flow Rate	SWL
8	20		8

Seal

ft.	From	To	Material	Amount	Seal Grout Weight	Units
TO	0	1	CO	2		S
ft.	1	20	BE	8		S

(9) WELL LOG

Ground elevation **0** ft.

Material	From	To	SWL
SILT	0	12	8
SILTY SAND	12	20	

Screen

Filter Pack	Diameter	From	To	Gauge	Material	Type	Slot Size
1 ft.		15	20		PL		.01

TO

15 ft.

Filter Pack
 Material **SA**
 Size **20.00** in.

Date started **6/13/1997** Completed **6/13/1997**

(5) WELL TEST

Permeability Yield
 Conductivity PH
 Temperature of water **57** °F/C Depth artesian flow found ft.

Was water analysis done?

By Whom? **CH2M HILL**

Depth of strata to be analyzed. From ft. to ft.

Remarks

Name of supervising Geologist/Engineer

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number **10189**

Signed By **MICKEY A SCOTT**

Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

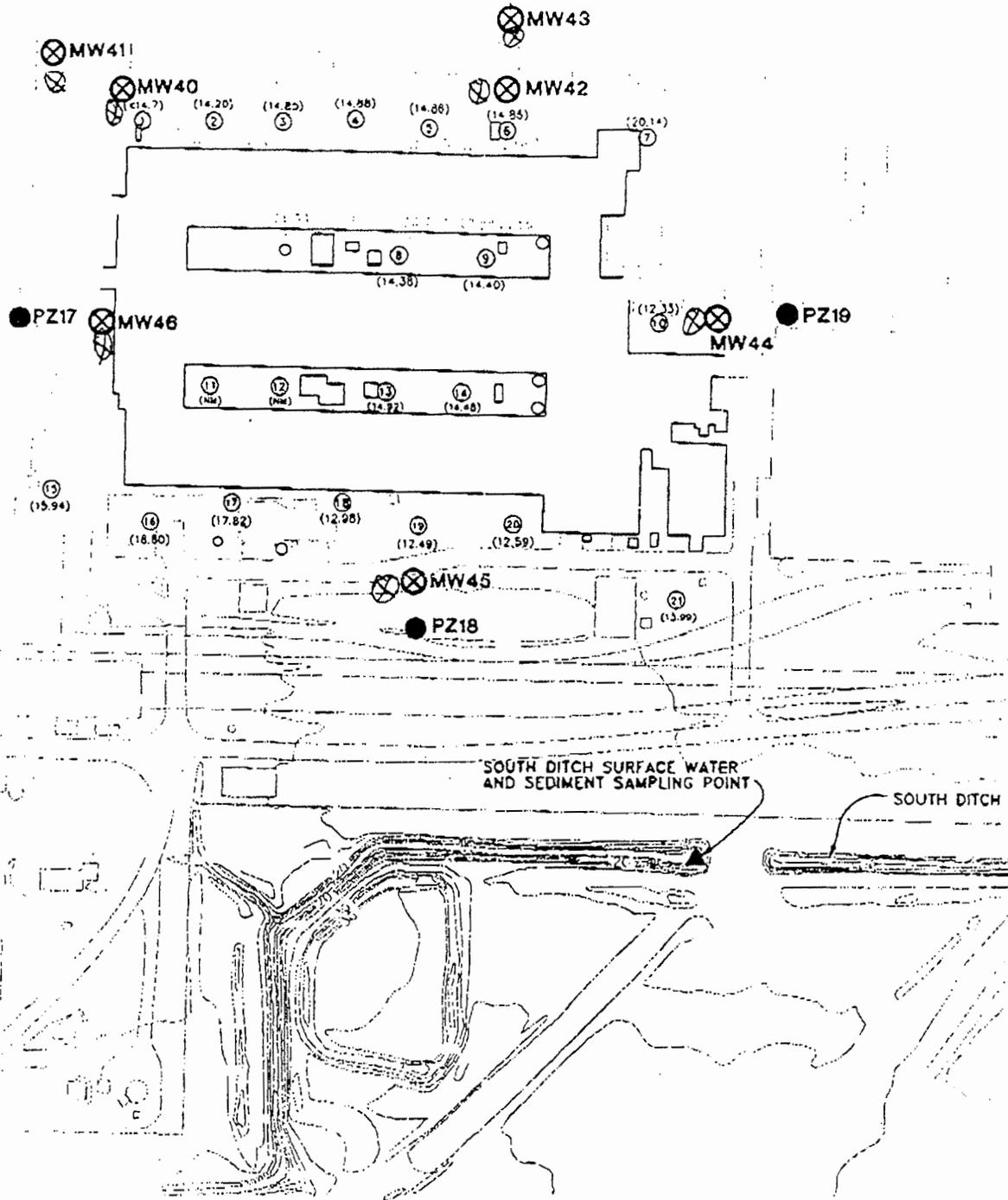
MWC Number **10011**

Signed By

Date

MWH Co. Start # 100158-100171

1.35793VCAU1923.20234 D <
MA-1997



Bakehouse Area
Reynolds Metals
N
↑

STATE OF OREGON
MONITORING WELL REPORT

MULT 53785

Received Date
 Well Tag# L
 Start Card # 100164

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT MW41-033
 Name METALS REYNOLDS
 REYNOLDS METALS
 Street 5100 SUNDIAL RD
 City TROUTDALE State OR Zip 97060
 Well No. 57RD
 Co Job No. 400

(6) LOCATION OF WELL By legal description
 County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**
 1. **NE** 1/4 of **NW** 1/4 of above section.
 Legal Desc:
 2. Either Street address of well location
SAME
 or Tax lot number of well location
 3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(2) TYPE OF WORK
 New Construction **Alter (Recondition)** **Alter (Repair)**
 Conversion **Deepening** **Abandonment**

(3) DRILLING METHOD
 Rotary Air Rotary Mud Cable
 Hollow Stem Auger Other

(7) STATIC WATER LEVEL
 8.0 Ft. below land surface. Date 6/12/1997
 Artesian Pressure lb/sq. in. Date

(4) BORE HOLE CONSTRUCTION
 Special Standards Depth of completed well **35** ft.
 Diameter From To
 Vault 0 ft. 11.00 0 35
 TO
 1 ft. Diameter From To Gauge Material Welded Glued Threaded
 Monument 2.00 PL

(8) WATER BEARING ZONES
 Depth at which water was first found **8** ft.

From	To	Est. Flow Rate	SWL
8	35		8

TO
 Seal
 ft. From To Material Amount Seal Grout Weight Units
 TO 0 1 CO 3 S
 ft. 1 35 BE 14 S

(9) WELL LOG Ground elevation **0** ft.

Material	From	To	SWL
SILT	0	12	8
SILTY SAND	12	35	

Screen
 Filter Pack
 1 ft. Diameter From To Gauge Material Type Slot Size
 TO 28 35 PL .01
 28 ft.
 Filter Pack
 Material SA
 Size 20.00 in.

Date started **6/12/1997** Completed **6/12/1997**
(unbonded) Monitor Well Constructor Certification:
 I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.
 MWC Number 10189
 Signed By **MICKEY A SCOTT** Date

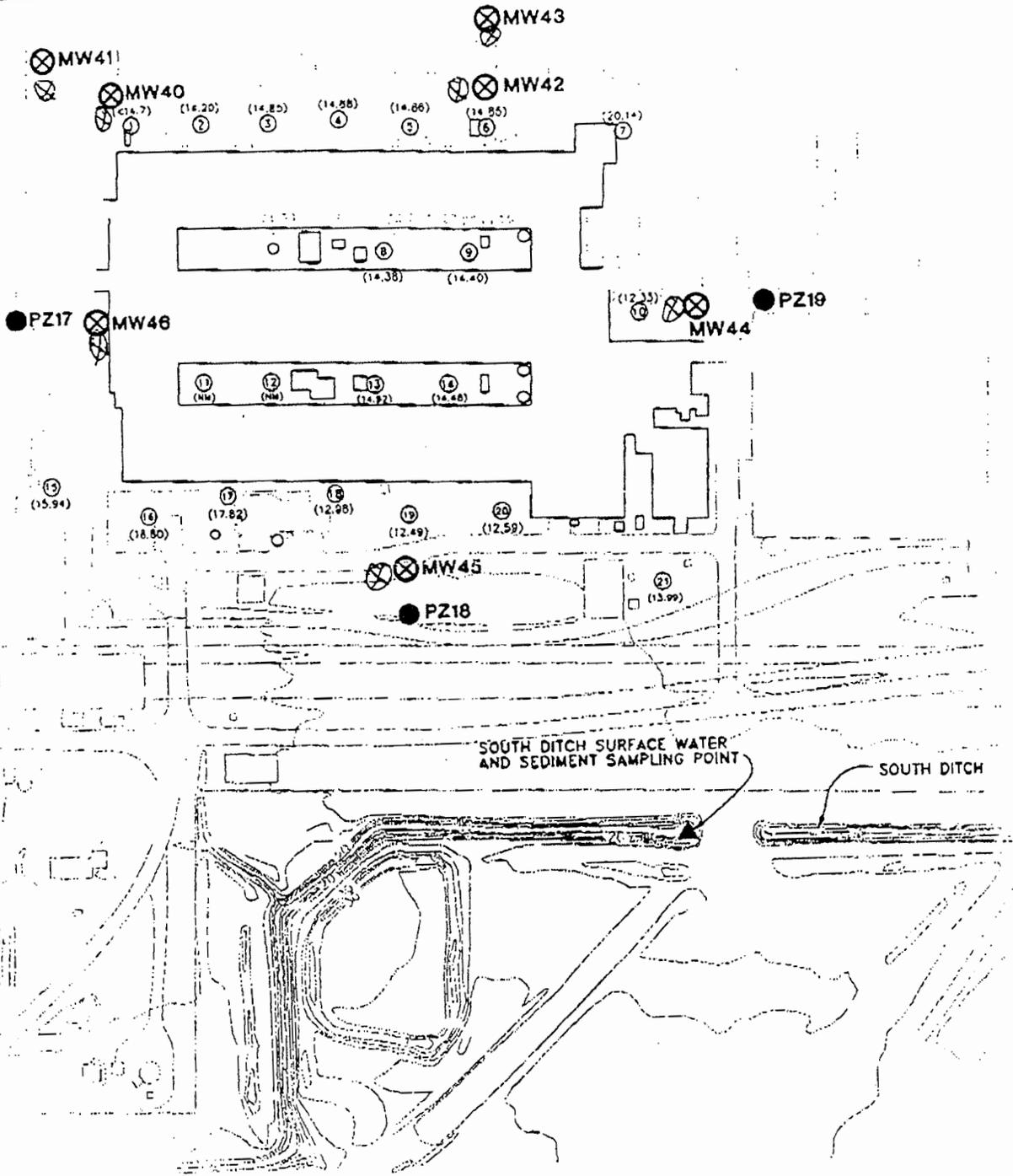
(5) WELL TEST
 Permeability Yield
 Conductivity PH
 Temperature of water **57** °F/C Depth artesian flow found ft.
 Was water analysis done?
 By Whom? **CH2M HILL**
 Depth of strata to be analyzed. From ft. to ft.
 Remarks
 Name of supervising Geologist/Engineer

(bonded) Monitor Well Constructor Certification:
 I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
 MWC Number 10011
 Signed By Date

MUH (B) Start # 100153-100171

139703VC010293023A.DWG

100153-1997



Bakehouse Area
Reynolds Metals



STATE OF OREGON
MONITORING WELL REPORT

MULT 53788

Received Date
 Well Tag# L
 Start Card # 100167

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT

Name **METALS REYNOLDS
 REYNOLDS METALS**
 Street **5100 SUNDIAL RD**
 City **TROUTDALE** State **OR** Zip **97060**

Well No. **5783**
 Co Job No. **400**
MW 43-15

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**
 1. **NE** 1/4 of **NW** 1/4 of above section.
 Legal Desc:

(2) TYPE OF WORK

New Construction **Alter (Recondition)** **Alter (Repair)**
 Conversion **Deepening** **Abandonment**

2. Either Street address of well location

SAME

or Tax lot number of well location

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(3) DRILLING METHOD

Rotary Air **Rotary Mud** **Cable**
 Hollow Stem Auger **Other**

(7) STATIC WATER LEVEL

8.0 Ft. below land surface. Date **6/13/1997**

Artesian Pressure lb/sq. in. Date

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well **15 ft.**

Diameter From To

Vault	ft.	11.00	0	15				
TO	ft.							
Monument	ft.	2.00			PL			<input checked="" type="checkbox"/>

-1	TO	3
----	----	---

Seal	ft.	From	To	Material	Amount	Seal Grout Weight	Units
TO	ft.	0	1	CO	4		S
ft.	ft.	1	15	BE	6		S

Screen

Filter Pack	Diameter	From	To	Gauge	Material	Type	Slot Size
ft.		10	15		PL		.01

1 ft.

TO

10 ft.

Filter Pack
 Material **SA**
 Size **20.00 in.**

(8) WATER BEARING ZONES

Depth at which water was first found **8 ft.**

From	To	Est. Flow Rate	SWL
8	15		8

(9) WELL LOG

Ground elevation **0 ft.**

Material	From	To	SWL
SILT	0	12	8
SILTY SAND	12	15	

(5) WELL TEST

Permeability Yield
 Conductivity PH
 Temperature of water **57** °F/C Depth artesian flow found ft.

Was water analysis done?

By Whom? **CH2M HILL**

Depth of strata to be analyzed. From ft. to ft.

Remarks

Name of supervising Geologist/Engineer

Date started **6/13/1997** Completed **6/13/1997**

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number **10189**

Signed By **MICKEY A SCOTT**

Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number **10011**

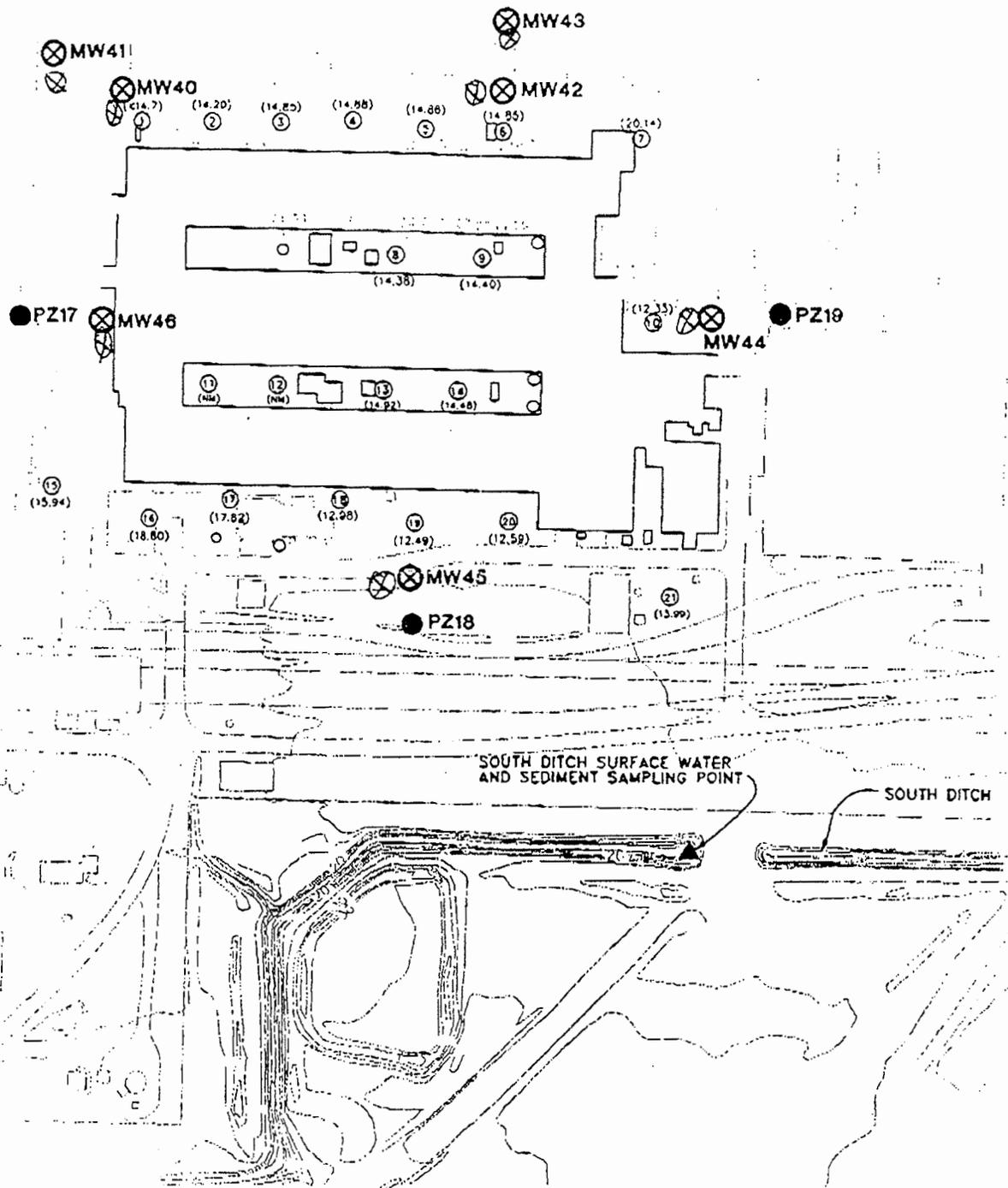
Signed By

Date

Mult C. Start # 100153-100171

1307931C401V28.0034.DWG

8-MAY-1997



Bakehouse Area
Reynolds Metals



STATE OF OREGON
MONITORING WELL REPORT

MULT 53787

Received Date
 Well Tag# L
 Start Card # 100166

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT

Name **METALS REYNOLDS**
REYNOLDS METALS
 Street **5100 SUNDIAL RD**
 City **TROUTDALE** State **OR** Zip **97060**

Well No. **5782**
 Co Job No. **400 43-027**

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**
 1. **NE** 1/4 of **NW** 1/4 of above section.
 Legal Desc:

(2) TYPE OF WORK

New Construction **Alter (Recondition)** **Alter (Repair)**
 Conversion **Deepening** **Abandonment**

2. Either Street address of well location

SAME

or Tax lot number of well location

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(3) DRILLING METHOD

Rotary Air Rotary Mud Cable
 Hollow Stem Auger Other

(7) STATIC WATER LEVEL

8.0 Ft. below land surface. Date **6/13/1997**
 Artesian Pressure lb/sq. in. Date

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well **29** ft.

Vault	ft.	Diameter		From	To	Gauge	Material	Welded	Glued	Threaded
		From	To							
		11.00	0		29					
TO										
Monument	ft.	2.00					PL			<input checked="" type="checkbox"/>

-1 TO **3**

Seal	ft.	From	To	Material	Amount	Seal Grout Weight	Units
		0	1	CO	3		S
		1	29	BE	11		S

Screen

Filter Pack	ft.	Diameter	From	To	Gauge	Material	Type	Slot Size
			22	29		PL		.01

1 ft.

TO

22 ft.

Filter Pack
 Material **SA**
 Size **20.00 in.**

(8) WATER BEARING ZONES

Depth at which water was first found **8** ft.

From	To	Est. Flow Rate	SWL
8	29		8

(9) WELL LOG

Ground elevation **0** ft.

Material	From	To	SWL
SILT	0	12	8
SILTY SAND	12	29	

Date started **6/13/1997** Completed **6/13/1997**

(5) WELL TEST

Permeability Yield
 Conductivity PH
 Temperature of water **57** °F/C Depth artesian flow found ft.

Was water analysis done?

By Whom? **CH2M HILL**

Depth of strata to be analyzed. From ft. to ft.

Remarks

Name of supervising Geologist/Engineer

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number **10189**

Signed By **MICKEY A SCOTT**

Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number **10011**

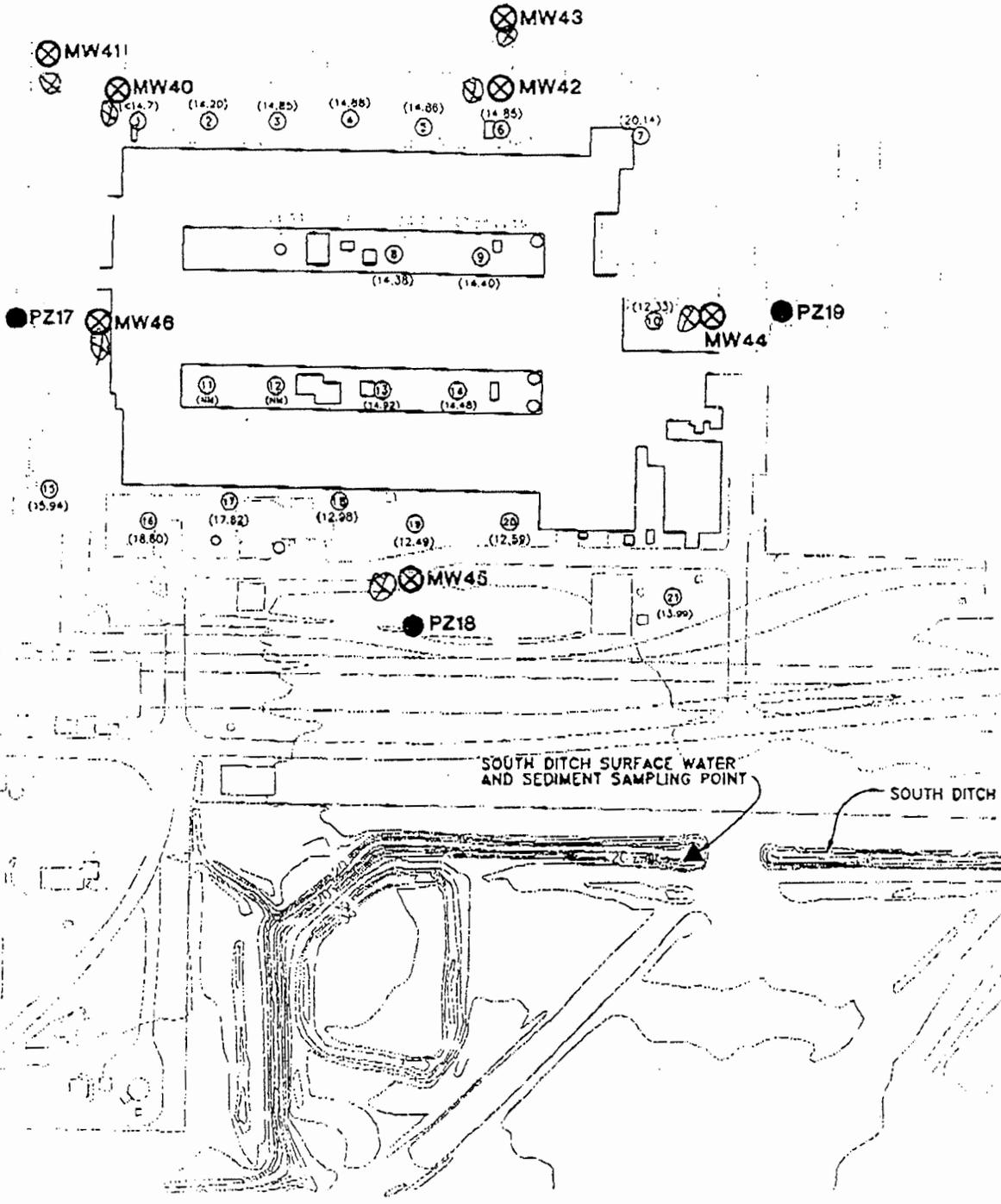
Signed By

Date

Mult Co. Start # 100158-100171

M:\30793\CAD\19282013A.DWG

6-26-1997



Bakerhouse Area
Reynolds Metals



STATE OF OREGON
MONITORING WELL REPORT

MULT 53791

Received Date
 Well Tag# L
 Start Card # 100170

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT

MW45-017

Well No. 5786
 Co Job No. 400

Name **METALS REYNOLDS**
REYNOLDS METALS
 Street **5100 SUNDIAL RD**
 City **TROUTDALE** State **OR** Zip **97060**

(2) TYPE OF WORK

- New Construction** **Alter (Recondition)** **Alter (Repair)**
 Conversion **Deepening** **Abandonment**

(3) DRILLING METHOD

- Rotary Air Rotary Mud Cable
 Hollow Stem Auger Other

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well **18** ft.

Vault	ft.	Diameter			From	To	Gauge	Material	Welded	Glued	Threaded
		From	To								
		11.00	0		18						
TO											
Monument		2.00					PL				<input checked="" type="checkbox"/>

-1 TO **3** ft.

Seal	ft.	From	To	Material	Amount	Seal Grout Weight	Units
		0	1	CO	3		S
TO		1	18	BE	7		S

Screen

Filter Pack	ft.	Diameter	From	To	Gauge	Material	Type	Slot Size
	1		12	18		PL		.01
TO								
	12							

Filter Pack
 Material **SA**
 Size **20.00** in.

(5) WELL TEST

Permeability Yield
 Conductivity PH
 Temperature of water **57** °F/C Depth artesian flow found ft.
 Was water analysis done?
 By Whom? **CH2M HILL**
 Depth of strata to be analyzed. From ft. to ft.
 Remarks
 Name of supervising Geologist/Engineer

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**

1. **NE** 1/4 of **NW** 1/4 of above section.

Legal Desc:

2. Either Street address of well location

SAME

or Tax lot number of well location

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL

8.0 Ft. below land surface. Date **6/17/1997**
 Artesian Pressure lb/sq. in. Date

(8) WATER BEARING ZONES

Depth at which water was first found **8** ft.

From	To	Est. Flow Rate	SWL
8	18		8

(9) WELL LOG

Ground elevation **0** ft.

Material	From	To	SWL
SILT	0	12	8
SILTY SAND	12	18	

Date started **6/17/1997** Completed **6/17/1997**

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number **10189**

Signed By **MICKEY A SCOTT**

Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number **10011**

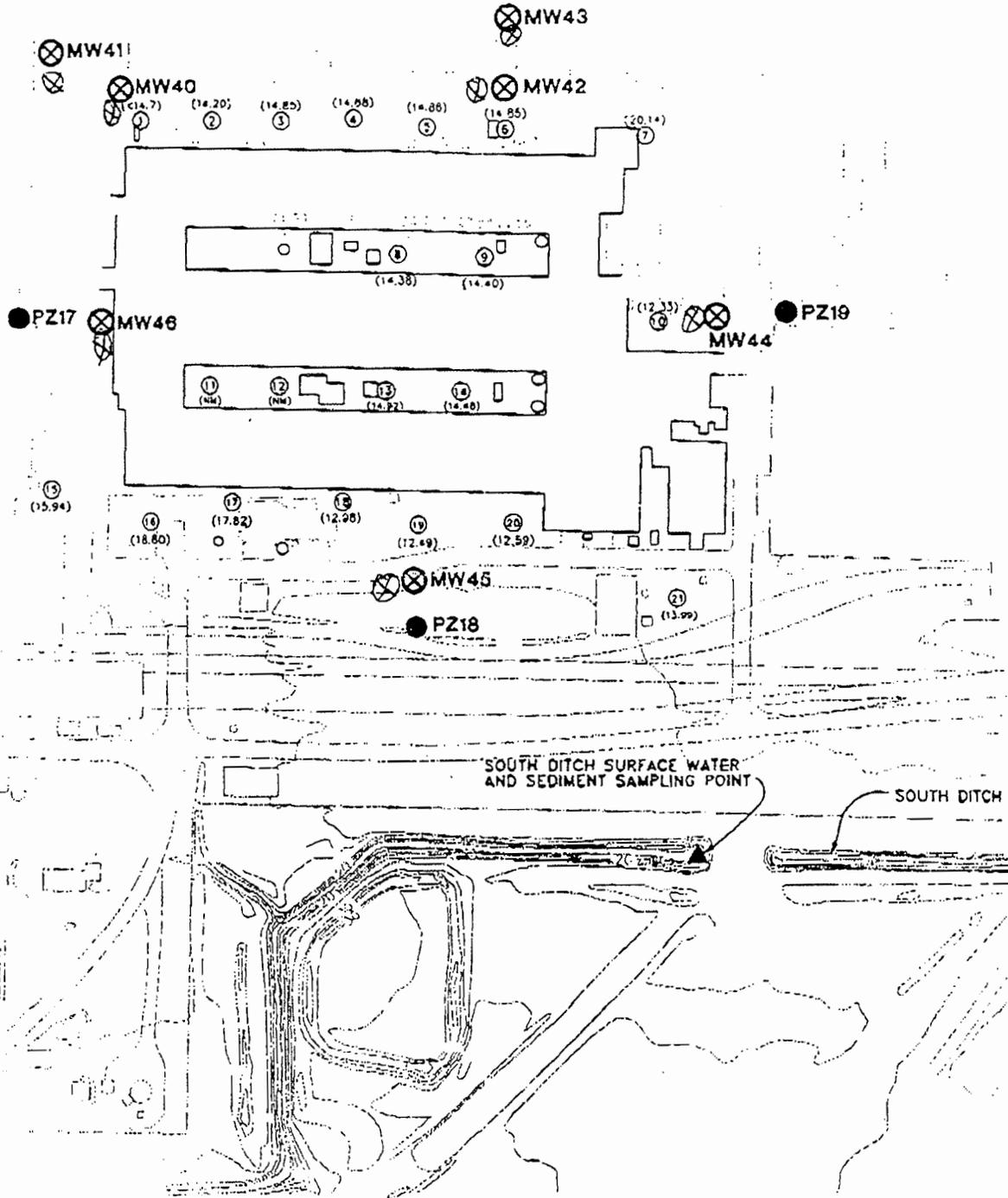
Signed By

Date

Mult Co. Start # 100153-100171

13973/C40/923023A D-C

8-23-1997



Bakehouse Area
Reynolds Metals

N
↑

STATE OF OREGON
MONITORING WELL REPORT

MULT 53792

Received Date
 Well Tag# L
 Start Card # 100171

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT

Name **METALS REYNOLDS**
REYNOLDS METALS
 Street **5100 SUNDIAL RD**
 City **TROUTDALE** State **OR** Zip **97060**

MW45-042 Well No. 5787
 Co Job No. 400 MW45-011

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**
 1. **NE** 1/4 of **NW** 1/4 of above section.
 Legal Desc:

(2) TYPE OF WORK

- New Construction** **Alter (Recondition)** **Alter (Repair)**
 Conversion **Deepening** **Abandonmen**

2. Either Street address of well location

SAME

or Tax lot number of well location

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(3) DRILLING METHOD

- Rotary Air** **Rotary Mud** **Cable**
 Hollow Stem Auger **Other**

(7) STATIC WATER LEVEL

8.0 Ft. below land surface. Date **6/16/1997**
 Artesian Pressure lb/sq. in. Date

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well **43** ft.

Diameter From To

Vault ft. Casing diameter **11.00** 0 **43**

Diameter	From	To	Gauge	Material	Welded	Glued	Threaded
2.00				PL	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Monument **-1**
 TO **3**

Seal	From	To	Material	Amount	Seal Grout Weight	Units
ft.	0	1	CO	3		S
TO	1	43	BE	19		S

Screen

Filter Pack	Diameter	From	To	Gauge	Material	Type	Slot Size
1 ft.		37	43		PL		.01

TO

37 ft.

Filter Pack
 Material **SA**
 Size **20.00** in.

(8) WATER BEARING ZONES

Depth at which water was first found **8** ft.

From	To	Est. Flow Rate	SWL
8	43		8

(9) WELL LOG

Ground elevation **0** ft.

Material	From	To	SWL
SILT	0	12	8
SILTY SAND	12	43	

(5) WELL TEST

Permeability Yield
 Conductivity PH
 Temperature of water **57** °F/C Depth artesian flow found ft.

Was water analysis done?

By Whom? **CH2M HILL**

Depth of strata to be analyzed. From ft. to ft.

Remarks

Name of supervising Geologist/Engineer

Date started **6/16/1997** Completed **6/16/1997**

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number 10189

Signed By **MICKEY A SCOTT**

Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number 10011

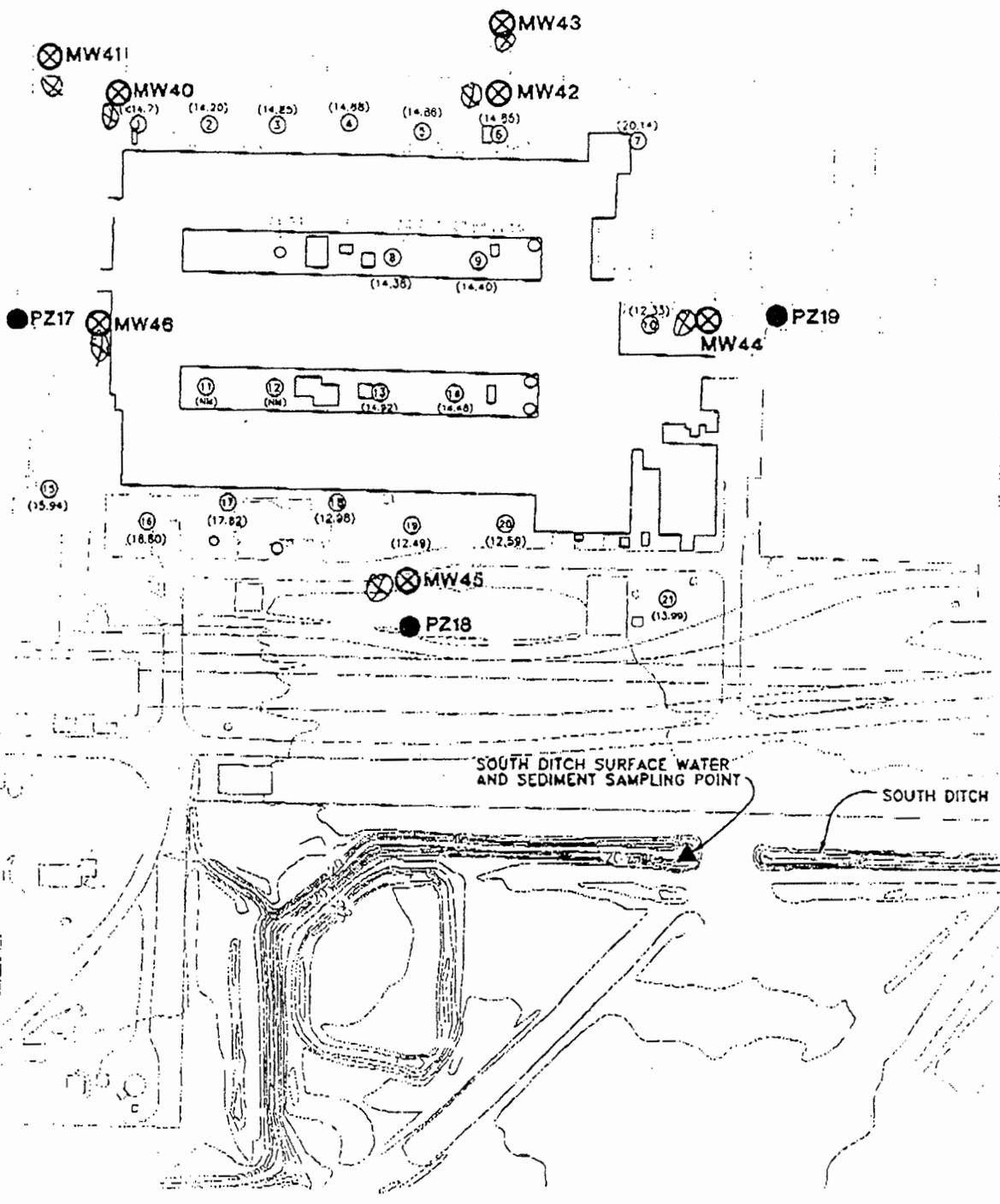
Signed By

Date

Mult C. Start # 100153-100171

43979JNCAGV23.003A D-C

6-8-81-19971



Bakehouse Area
Reynolds Metals

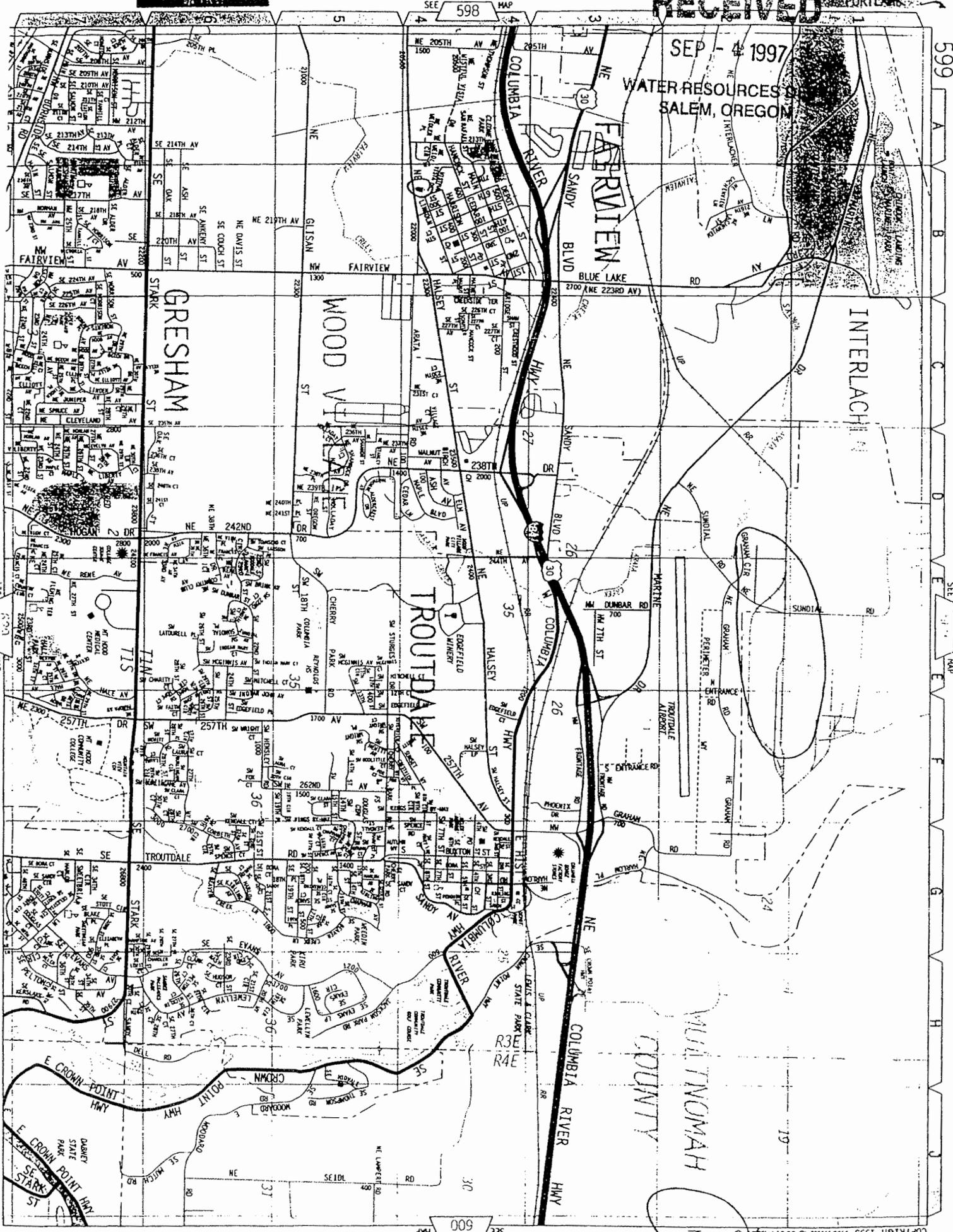


RECEIVED

PORTLAND

SEP - 4 1997

WATER RESOURCES
SALEM, OREGON



599

A

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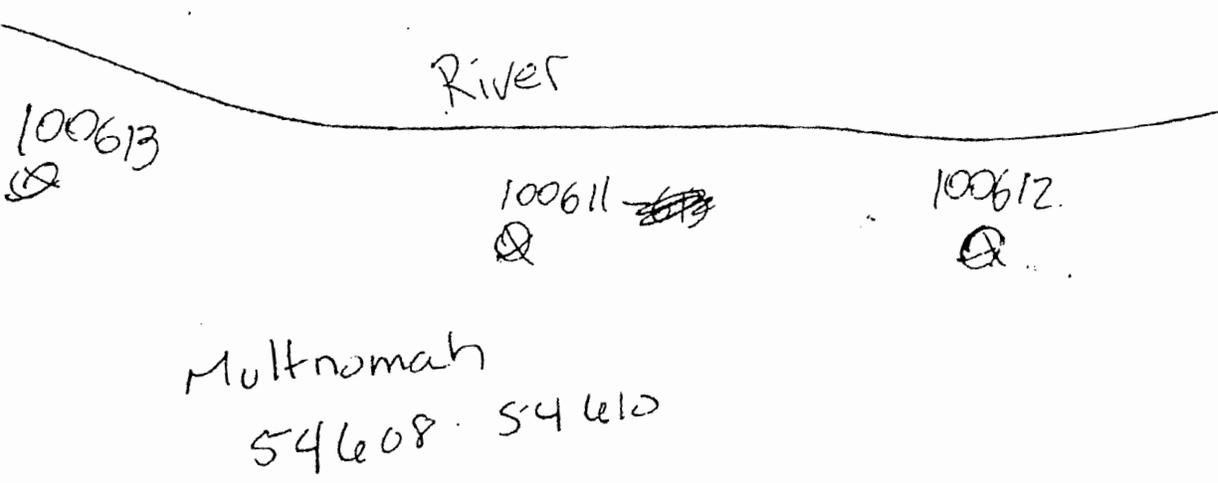
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600

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SITE MAP

River



100613
⊗

100611 ~~100611~~
⊗

100612
⊗

Multnomah

54608 54610

MONITORING WELL REPORT

(as required by ORS 537.765 & OAR 690-240-095)

Start Card # 132598

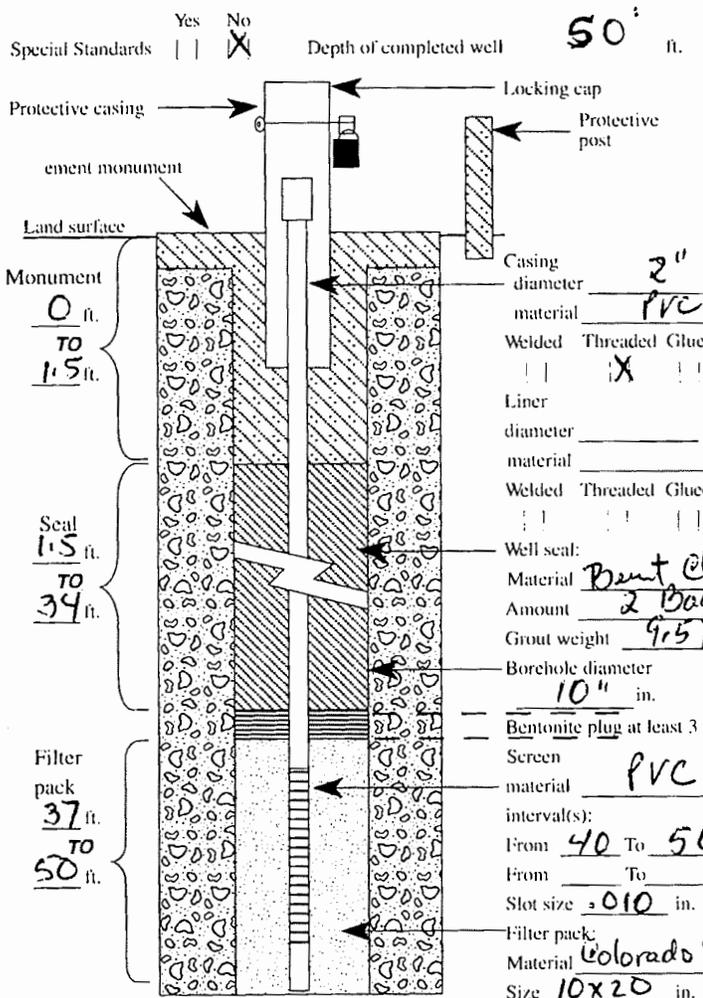
Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT: Name Reynolds Metal Corporation, Address 5100 NE Suncliff Rd, City Troutdale, State OR, Zip 97060

(2) TYPE OF WORK: [X] New construction, [] Conversion, [] Alteration (Repair/Recondition), [] Deepening, [] Abandonment

(3) DRILLING METHOD: [X] Hollow Stem Auger, [] Rotary Air, [] Rotary Mud, [] Cable, [] Other

(4) BORE HOLE CONSTRUCTION



(5) WELLTEST: [] Pump, [] Bailer, [] Air, [] Flowing Artesian, Permeability, Conductivity, Temperature of water 53°C, Depth artesian flow found

By whom?, Depth of strata to be analyzed, Remarks, Name of supervising Geologist/Engineer

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT

(6) LOCATION OF WELL: County Multnomah, Township 1, Range 3, Section 24, NW 1/4 of SW 1/4 of above section, Street address of well location Same, Tax lot number of well location 400

(7) STATIC WATER LEVEL: 12 Ft. below land surface, Date 9-18-00

(8) WATER BEARING ZONES: Table with columns From, To, Est. Flow Rate, SWL. Data: 0' to 12', N/A, 12'

(9) WELL LOG: Ground elevation

Table with columns Material, From, To, SWL. Data: fill material (0-3'), Dark Gray silt (3-20'), Saturated fine sand (20-35'), Saturated silt fine sand (35-45'), fine sand (45-50'). Includes 'RECEIVED' stamp and 'OCT 12 2000' date.

Date started 9-18-00, Completed 9-19-00

(unbonded) Monitor Well Constructor Certification: I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Signed: [Signature], Date: 10-11-00

(bonded) Monitor Well Constructor Certification: I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. Signed: [Signature], Date: 10/11/00

SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

SITE MAP

Bone Yard



Gate

Fence



⊕ 132598

⊕ Existing MW #14
fenced

⊕ 132599

⊕ Existing MW 20



Big Boulders

Decon Area

RECEIVED

OCT 12 2000

WATER RESOURCES DEPT.
SALEM, OREGON

STATE OF OREGON
MONITORING WELL REPORT

MULT 54670

Received Date 11/25/97

Well Tag# L 17730

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

Start Card # 100606

(1) OWNER/PROJECT

Well No. _____
 Co Job No. **PZ17F-019**
 Name **REYNOLDS METALS**
 Street **5100 SUNDIAL RD**
 City **TROUTDALE** State **OR** Zip **97060**

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**

1. **NE** 1/4 of **NW** 1/4 of above section.

Legal Desc:

(2) TYPE OF WORK

- New Construction** **Alter (Recondition)** **Alter (Repair)**
 Conversion **Deepening** **Abandonmen**

2. Either Street address of well location

SAME

or Tax lot number of well location **100**

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(3) DRILLING METHOD

- Rotary Air** **Rotary Mud** **Cable**
 Hollow Stam Auger Other **PUSH PROBE**

(7) STATIC WATER LEVEL

12.5 Ft. below land surface. Date **0/29/1997**
 Artesian Pressure lb/sq. in. Date

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well **19 ft.**

		Diameter		From	To					
Vault	0 ft.	2.00	0		19					
	TO									
Monument	1 ft.	0.75				PL	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Seal	From	To	Material	Amount	Seal	Units
ft.					Grout Weight	
TO	0	16	BE	8		G
ft.						

Screen

Filter Pack	Diameter	From	To	Gauge	Material	Type	Slot Size
16 ft.		16	19		PL		.010
TO							
19 ft.							

Filter Pack
 Material **SA**
 Size **20.00 in.**

(8) WATER BEARING ZONES

Depth at which water was first found ft.

(9) WELL LOG

Ground elevation ft.

Material	From	To	SWL
SAND	0	8	
SILTS	8	19	

Date started **0/29/1997** Completed **10/29/1997**

(5) WELL TEST

Permeability Yield
 Conductivity PH
 Temperature of water **51** °F/C Depth artesian flow found ft.

Was water analysis done?

By Whom? **CH2M HILL**

Depth of strata to be analyzed. From ft. to ft.

Remarks

Name of supervising Geologist/Engineer

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number **10402**

Signed By **KEITH D VIDOS**

Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number **10011**

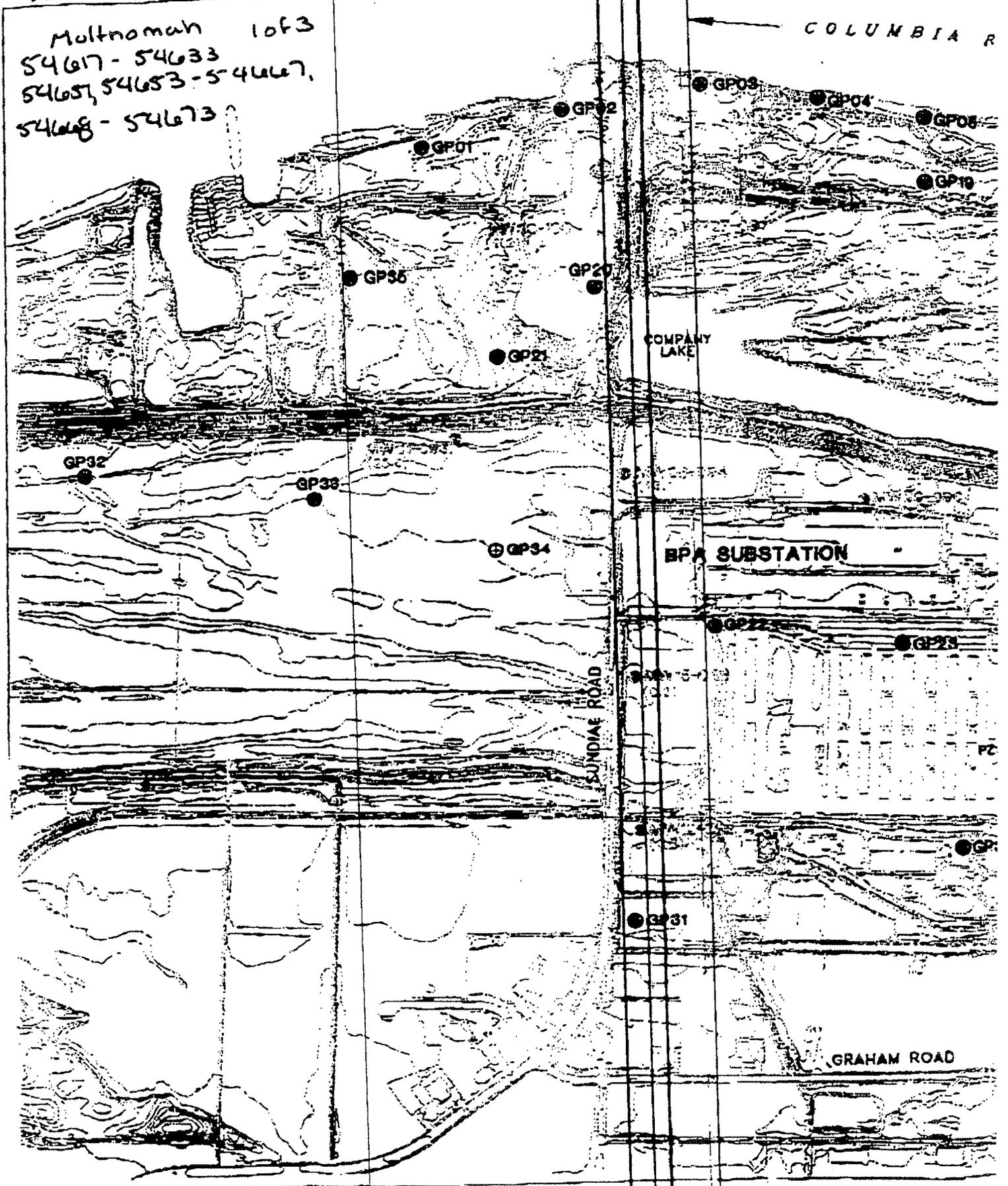
Signed By **GREG MCINNIS**

Date

NEW GEOPHYSICAL

13-MAY-1997

Multnomah 1 of 3
 54617 - 54633
 54651, 54653 - 54667,
 54668 - 54673



MONITORING WELL REPORT

MULT 54669

Received Date 11/25/97

Well Tag# L 17729

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

Start Card # 100605

(1) OWNER/PROJECT

Name **REYNOLDS METALS**
 Street **5100 SUNDIAL RD**
 City **TROUTDALE** State **OR** Zip **97060**
 Well No. _____
 Co Job No. **PZ17D**
PZ17-D 39

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**
 1. **NE** 1/4 of **NW** 1/4 of above section.
 Legal Desc:

(2) TYPE OF WORK

New Construction **Alter (Recondition)** **Alter (Repair)**
 Conversion **Deepening** **Abandonmen**

2. Either Street address of well location

SAME

or Tax lot number of well location **100**

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(3) DRILLING METHOD

Rotary Air **Rotary Mud** **Cable**
 Hollow Stem Auger Other **PUSH PROBE**

(7) STATIC WATER LEVEL

12.5 Ft. below land surface. Date **0/29/1997**
 Artesian Pressure lb/sq. in. Date

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well **39 ft.**

(8) WATER BEARING ZONES

Depth at which water was first found ft.

Diameter From To

Vault	0 ft.	2.00	0	39				
TO	1 ft.	0.75			PL			<input checked="" type="checkbox"/>

(9) WELL LOG

Ground elevation ft.

Material	From	To	SWL
SANDS	0	8	
SILTS	8	28	
SANDS	28	39	

Seal	From	To	Material	Amount	Seal Grout Weight	Units
ft.	0	36	BE	12		G

Screen

Filter Pack	Diameter	From	To	Gauge	Material	Type	Slot Size
36 ft.		36	39		PL		.010

TO
39 ft.

Filter Pack
 Material **SA**
 Size **20.00 in.**

Date started **0/29/1997** Completed **10/29/1997**

(5) WELL TEST

Permeability Yield
 Conductivity PH
 Temperature of water **51** °F/C Depth artesian flow found ft.

Was water analysis done?

By Whom? **CH2M HILL**

Depth of strata to be analyzed. From ft. to ft.

Remarks

Name of supervising Geologist/Engineer

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number **10402**

Signed By **KEITH D VIDOS**

Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number **10011**

Signed By **GREG MCINNIS**

Date

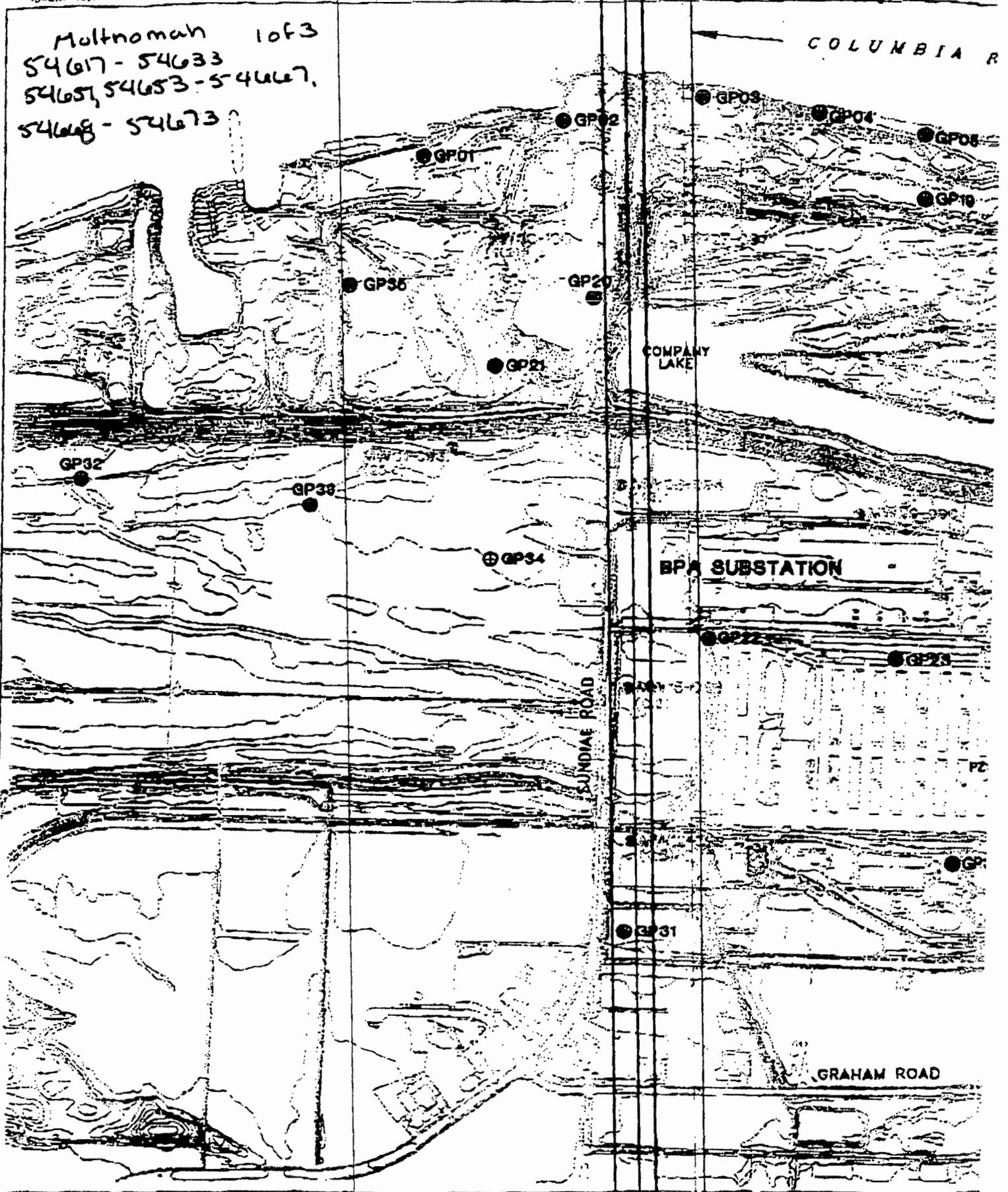
NOV-24-1997 09:01 FROM REYNOLDS METALS CO. TO

96924759 P.02

NEW WILKINSON

13-MAY-1997

Multnomah 1 of 3
 54617 - 54633
 54651, 54653 - 54667,
 54668 - 54673



STATE OF OREGON
MONITORING WELL REPORT

MULT 54668

Received Date 11/25/97

Well Tag# L 17728

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

Start Card # 100604

(1) OWNER/PROJECT

Well No. _____
 Co Job No. **PZ18S-023**
 Name **REYNOLDS METALS**
 Street **5100 SUNDIAL RD**
 City **TROUTDALE** State **OR** Zip **97060**

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**

1. **NE** 1/4 of **NW** 1/4 of above section.
 Legal Desc:

(2) TYPE OF WORK

New Construction **Alter (Recondition)** **Alter (Repair)**
 Conversion **Deepening** **Abandonment**

2. Either Street address of well location

SAME

or Tax lot number of well location **100**

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(3) DRILLING METHOD

Rotary Air **Rotary Mud** **Cable**
 Hollow Stem Auger Other **PUSH PROBE**

(7) STATIC WATER LEVEL

13.5 Ft. below land surface. Date **0/31/1997**
 Artesian Pressure lb/sq. in. Date

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well **20** ft.
 Diameter From To
 Vault **0** ft. Casing **2.00** Limer **20**
 TO
1 ft. Diameter From To Gauge Material Welded Glued Threaded
 Monument **0.75** **PL**

(8) WATER BEARING ZONES

Depth at which water was first found ft.

Seal
 ft. From To Material Amount Seal Units
 TO **0** **14** **BE** **10** **G**
 ft.

(9) WELL LOG

Ground elevation ft.

Material	From	To	SWL
SAND	0	8	
SILTS	8	20	

Screen
 Filter Pack
 14 ft. Diameter From To Gauge Material Type Slot Size
 TO **17** **20** **ST** **.010**
 20 ft.
 Filter Pack
 Material **SA**
 Size **20.00** in.

Date started **0/31/1997** Completed **10/31/1997**

(5) WELL TEST

Permeability Yield
 Conductivity PH
 Temperature of water **51** °F/C Depth artesian flow found ft.
 Was water analysis done?
 By Whom? **CH2M HILL**
 Depth of strata to be analyzed. From ft. to ft.
 Remarks
 Name of supervising Geologist/Engineer

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number **10402**
 Signed By **KEITH D VIDOS** Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number **10011**
 Signed By **GREG MCINNIS** Date

STATE OF OREGON
MONITORING WELL REPORT

MULT 54671

Received Date 11/25/97

Well Tag# L 17731

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

Start Card # 100607

(1) OWNER/PROJECT

Well No. _____
 Co Job No. **PZ18D**
 Name **REYNOLDS METALS**
 Street **5100 SUNDIAL RD**
 City **TROUTDALE** State **OR** Zip **97060**

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**
 1. **NE** 1/4 of **NW** 1/4 of above section.
 Legal Desc:
 2. Either Street address of well location
SAME
 or Tax lot number of well location **100**
 3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(2) TYPE OF WORK

New Construction **Alter (Recondition)** **Alter (Repair)**
 Conversion **Deepening** **Abandonment**

(3) DRILLING METHOD

Rotary Air Rotary Mud Cable
 Hollow Stem Auger Other **PUSH PROBE**

(7) STATIC WATER LEVEL

17.5 Ft. below land surface. Date **0/30/1997**
 Artesian Pressure lb/sq. in. Date

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well **40** ft.
 Diameter From To
 Vault **0** ft. **2.00** **0** **40**
 TO
1 ft. **0.75** **PL**
 Monument

(8) WATER BEARING ZONES

Depth at which water was first found ft.

TO
 Seal
 ft.
 TO
 ft.

From	To	Material	Amount	Seal Grout Weight	Units
0	34	BE	12		G

(9) WELL LOG

Ground elevation ft.

Material	From	To	SWL
SAND	0	20	
SILTS	20	32	
SAND	32	40	

Screen
 Filter Pack
 34 ft.
 TO
 40 ft.

Diameter	From	To	Gauge	Material	Type	Slot Size
	37	40		ST		.010

Filter Pack
 Material **SA**
 Size **20.00** in.

Date started **0/30/1997** Completed **10/30/1997**

(5) WELL TEST

Permeability Yield
 Conductivity PH
 Temperature of water **51** °F/C Depth artesian flow found ft.
Was water analysis done?
 By Whom? **CH2M HILL**
 Depth of strata to be analyzed. From ft. to ft.
 Remarks
 Name of supervising Geologist/Engineer

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number **10402**

Signed By **KEITH D VIDOS** Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number **10011**

Signed By **GREG MCINNIS** Date

NOV-24-1997 09:01 FROM REYNOLDS METALS CO.

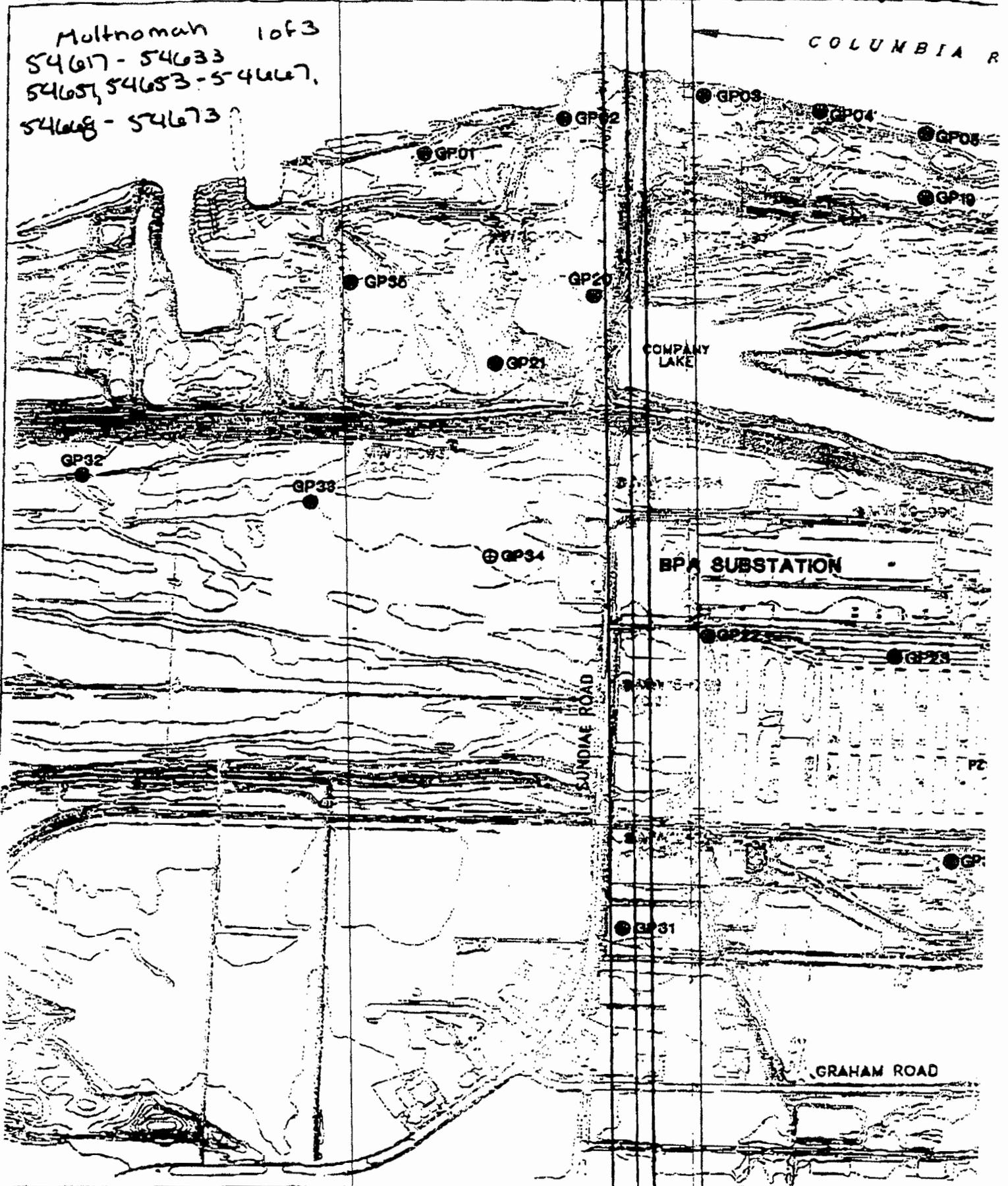
TO

96924759 P.02

NEW GEOTECH

13-MAY-1997

Multnomah 1 of 3
 54617 - 54633
 54651, 54653 - 54667,
 54668 - 54673



STATE OF OREGON
MONITORING WELL REPORT

MULT 54673

Received Date 11/25/97

Well Tag# L 17733

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

Start Card # 100609

(1) OWNER/PROJECT

Well No. _____
 Co Job No. PZ19S -014
 Name REYNOLDS METALS
 Street 5100 SUNDIAL RD
 City TROUTDALE State OR Zip 97060

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**
 1. **NE** 1/4 of **NW** 1/4 of above section.
 Legal Desc:

(2) TYPE OF WORK

New Construction Alter (Recondition) Alter (Repair)
 Conversion Deepening Abandonmen

2. Either Street address of well location

SAME

or Tax lot number of well location 100

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(3) DRILLING METHOD

Rotary Air Rotary Mud Cable
 Hollow Stem Auger Other PUSH PROBE

(7) STATIC WATER LEVEL

9.0 Ft. below land surface. Date 0/31/1997
 Artesian Pressure lb/sq. in. Date

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well 14 ft.

(8) WATER BEARING ZONES

Depth at which water was first found ft.

Vault

Diameter	From	To	Gauge	Material	Welded	Glued	Threaded
0.75				PL	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

(9) WELL LOG

Ground elevation ft.

Material	From	To	SWL
SAND	0	6	
SILTS	6	12	
SAND	12	14	

TO

From	To	Material	Amount	Seal Grout Weight	Units
0	8	BE	4		G

Screen

Diameter	From	To	Gauge	Material	Type	Slot Size
	11	14		ST		.010

Filter Pack
 7 ft.
 TO
 14 ft.
 Filter Pack
 Material SA
 Size 20.00 in.

Date started 0/31/1997 Completed 10/31/1997

(5) WELL TEST

Permeability Yield
 Conductivity PH
 Temperature of water 51 °F/C Depth artesian flow found ft.
 Was water analysis done?
 By Whom? CH2M HILL
 Depth of strata to be analyzed. From ft. to ft.
 Remarks

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number 10402

Signed By KEITH D VIDOS Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number 10011

Signed By GREG MCINNIS Date

Name of supervising Geologist/Engineer

NDU-24-1997 09:01

FROM REYNOLDS METALS CO.

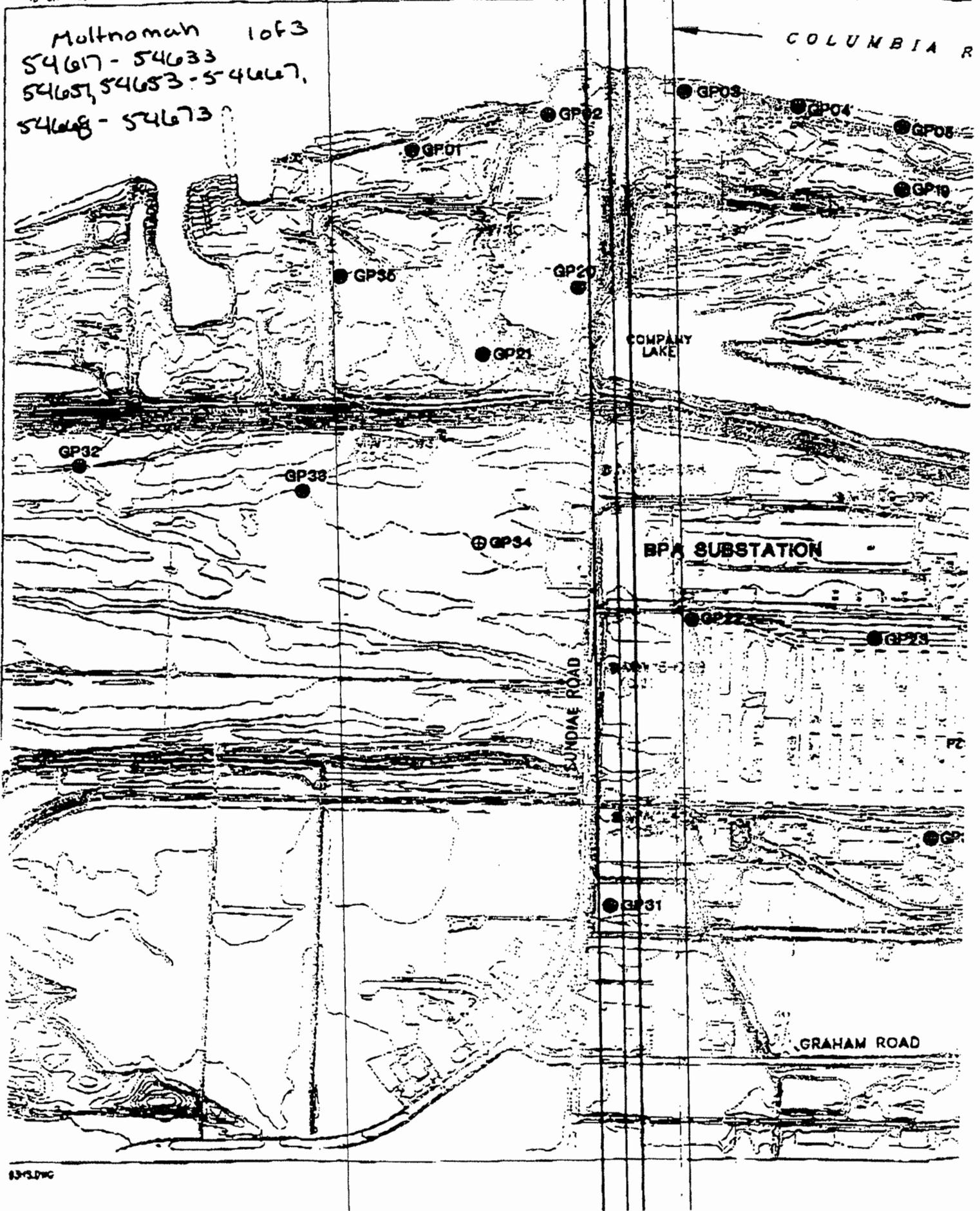
TO

96924759 P.02

NEW GEOTECHNICAL

15-MAY-1997

Multnomah 1063
54617 - 54633
54651, 54653 - 54667,
54668 - 54673



MONITORING WELL REPORT

MULT 54672

Received Date 11/25/87

Well Tag# L 17734

(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

Start Card # 100608

(1) OWNER/PROJECT

Name **REYNOLDS METALS**
 Street **5100 SUNDIAL RD**
 City **TROUTDALE** State **OR** Zip **97060**

Well No. _____
 Co Job No. **PZ19B - 040**

(6) LOCATION OF WELL By legal description

County **Multnomah**
 Township **1.00 N** Range **3.00 E** Section **14**
 1. **NE** 1/4 of **NW** 1/4 of above section.
 Legal Desc:

(2) TYPE OF WORK

- New Construction** **Alter (Recondition)** **Alter (Repair)**
 Conversion **Deepening** **Abandonment**

2. Either Street address of well location

SAME

or Tax lot number of well location **100**

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(3) DRILLING METHOD

- Rotary Air** **Rotary Mud** **Cable**
 Hollow Stem Auger Other **PUSH PROBE**

(7) STATIC WATER LEVEL

17.0 Ft. below land surface.

Date **0/31/1997**

Artesian Pressure

lb/sq. in.

Date

(4) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well **40** ft.

Diameter From To

Vault
0 ft. Casing Diameter **2.00** 0 **40** ft. Liner

Diameter	From	To	Gauge	Material	Welded	Glued	Threaded
0.75				PL	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

TO

Seal

From	To	Material	Amount	Seal Grout Weight	Units
0	34	BE	12		G

Screen

Diameter	From	To	Gauge	Material	Type	Slot Size
	35	40		ST		.010

Filter Pack
34 ft.
 TO
40 ft.

Filter Pack
 Material **SA**
 Size **20.00** in.

(8) WATER BEARING ZONES

Depth at which water was first found _____ ft.

(9) WELL LOG

Ground elevation _____ ft.

Material	From	To	SWL
SAND	0	9	
SILTS	9	21	
SAND	21	40	

(5) WELL TEST

Permeability _____ Yield _____
 Conductivity _____ PH _____
 Temperature of water **51** °F/C Depth artesian flow found _____ ft.

Was water analysis done?

By Whom? **CH2M HILL**

Depth of strata to be analyzed. From _____ ft. to _____ ft.

Remarks

Name of supervising Geologist/Engineer

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number **10402**

Signed By **KEITH D VIDOS**

Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number **10011**

Signed By **GREG MCINNIS**

Date

Date started **0/31/1997** Completed **10/31/1997**

NDU-24-1997 09:01 FROM REYNOLDS METALS CO.

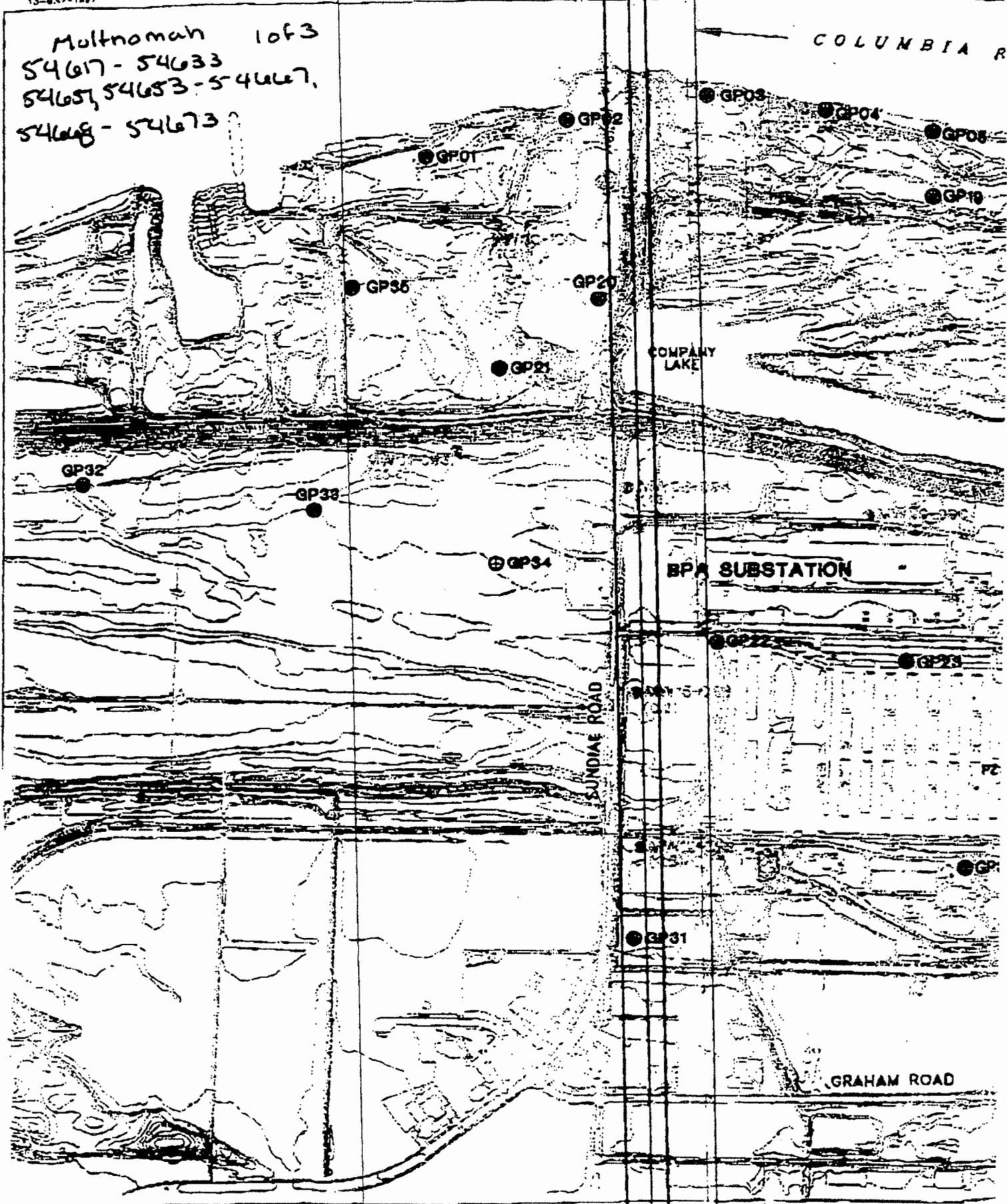
TO

96924759 P.02

NEW GEOTECH

15-MAY-1997

Multnomah 10f3
 54617 - 54633
 54651, 54653 - 54667,
 54668 - 54673



ATTACHMENT 4
OWRD Decommissioning Reports

ATTACHMENT 5
OWRD Special Standards



Oregon

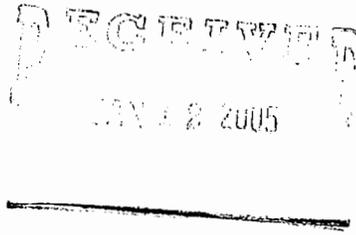
Theodore R. Kulongoski, Governor

Water Resources Department

North Mall Office Building
725 Summer Street NE, Suite A
Salem, OR 97301-1271
503-986-0900
FAX 503-986-0904

January 11, 2005

GEO TECH EXPLORATIONS
BILL KLOSTERMANN #10442
19700 SW TETON
TUALATIN OR 97062



FINAL ORDER

Dear Bill:

The Special Standard request you submitted for owner: Reynolds Metals, Start Card numbers 167943 (MW6-176) and 167944 (MW6-094), is approved for the following: You may abandon these wells in place as described in OAR 690-240-0510 (2).

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions regarding this letter, I may be contacted at (503) 986-0851, or by e-mail at Kristopher.R.Byrd@wrdd.state.or.us.

Sincerely,

Kristopher Byrd
Well Construction Program Coordinator
Enforcement Section

enclosure

cc: Joel Jeffery, NW Region Monitor Well Inspector
File

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

Oregon Water Resources Department

REQUEST FOR WRITTEN APPROVAL TO USE CONSTRUCTION METHODS NOT INCLUDED IN OREGON ADMINISTRATIVE RULES 690-200 THROUGH 690-240

Before the request can be considered, this form must be completed. Requests shall be submitted to the Well Construction Specialist, Water Resources Department, 725 Summer Street NE, Suite "A", Salem OR 97301-1271. Requests may also be considered by the appropriate Regional Manager.

Date of request: 1/3/05 Oral approval date (if applicable): _____

Bonded Well Constructor (name, license #, and mailing address): Bill Klostermann 10442

Geo-Tech 19700 SW Teton Tualatin OR 97062

(1) Location of Well: SW 1/4 SE 1/4 Tax lot 100 Section 14,

Township 1 N, Range 3E X, Multnomah County

Address at well site: 5100 Sundial Road
Troutdale, OR

(2) Start Card Number(s)(for work to be done): 167943 - 167944

(3) Name and Address of Land Owner: Reynolds Metals
5100 Sundial Road Troutdale, OR

(4) Distance to the nearest septic tank, drainfield, closed sewage line (if water supply well)

(5) The unusual site conditions which necessitate this request: Power lines directly overhead that were installed after the wells were drilled.

(6) The proposed construction methods that the bonded well constructor believes will be adequate for this well: (attach additional pages if needed)

bentonite grout wells in place, no overdrill

	old s.c.#	AB CARDS
MW-6-176	79941	167943
MW-6-094	79940	167944

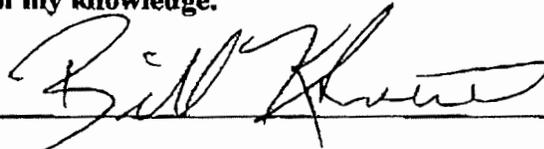
- (7) Diagram showing the pertinent features of the proposed well design and construction:
(attach additional pages if needed)

PLEASE NOTE:

- (1) **The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.**
- (2) **If it should be determined at some future date that the well, due to its construction, is allowing ground water contamination, waste or loss of artesian pressure, the undersigned shall return to the site and rectify the problem.**
- (3) **If oral approval was granted, a written request must be submitted to the Department either within three (3) working days of the date of oral approval or prior to the completion of the associated well work. Failure to submit a written request as described above may void prior oral approval.**

I have read and understand the above information. I further attest that the information provided is accurate to the best of my knowledge.

Bonded Constructor Signature: _____



revised 11/03/2003



Oregon

Theodore R. Kulongoski, Governor

December 3, 2004

GEO TECH EXPLORATIONS
BILL KLOSTERMANN #10442
19700 SW TETON
TUALATIN OR 97062

RECEIVED
DEC 07 2004

Water Resources Department
North Mall Office Building
725 Summer Street NE, Suite A
Salem, OR 97301-1271
503-986-0900
FAX 503-986-0904

COPY

FINAL ORDER

Dear Bill:

The Special Standard request you submitted for owner: Reynolds Metals, Start Card numbers 167833 -167844, is approved for the following: Monitor well numbers 03-017, 03-098, 05-025, 06-024, 12-184, 15-024, 15-086, 15-175, 38-007, 38-035, 39-095 and 48-055 may be abandoned in place. The casings shall then be removed below grade, as compatible with local site conditions and land practices. If bentonite is used then the placement of the bentonite shall conform to the manufacturers specifications and result in a seal that is free of voids or bridges.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions regarding this letter, I may be contacted at (503) 986-0851, or by e-mail at Kristopher.R.Byrd@ wrd.state.or.us.

Sincerely,


Kristopher Byrd
Well Construction Program Coordinator
Enforcement Section

enclosure

cc: Joel Jeffery, NW Region Monitor Well Inspector
File

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137.004-0080 and OAR 690-01-0005 you may either petition for judicial review or petition the Director for reconsideration of this order.

Oregon Water Resources Department

REQUEST FOR WRITTEN APPROVAL TO USE CONSTRUCTION METHODS NOT INCLUDED IN OREGON ADMINISTRATIVE RULES 690-200 THROUGH 690-240

Before the request can be considered, this form must be completed. Requests shall be submitted to the Well Construction Specialist, Water Resources Department, 725 Summer Street NE, Suite "A", Salem OR 97301-1271. Requests may also be considered by the appropriate Regional Manager.

Date of request: Nov. 30, 2004 Oral approval date (if applicable): 12/3/2004

Bonded Well Constructor (name, license #, and mailing address): Bill Klostermann

10442, 19700 SW Teton Avenue, Tualatin, OR 97062

(1) Location of Well: SW 1/4 SE 1/4 Tax lot 100 Section 14,
Township 1 N, Range 3 E, Multnomah County
Address at well site: 5100 Sundial Road

(2) Start Card Number(s)(for work to be done): 167833-167844

(3) Name and Address of Land Owner: Reynolds Metals
5100 Sundail Road

(4) Distance to the nearest septic tank, drainfield, closed sewage line (if water supply well)
N/A

(5) The unusual site conditions which necessitate this request: Laboratory
analytical data shows no contamination for the included wells.

(6) The proposed construction methods that the bonded well constructor believes will be adequate for this well: (attach additional pages if needed)
Abandon wells in place



Oregon

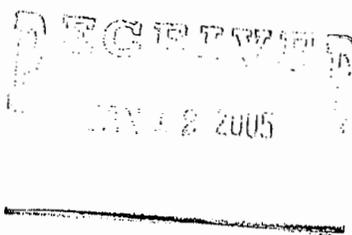
Theodore R. Kulongoski, Governor

Water Resources Department

North Mall Office Building
725 Summer Street NE, Suite A
Salem, OR 97301-1271
503-986-0900
FAX 503-986-0904

January 11, 2005

GEO TECH EXPLORATIONS
BILL KLOSTERMANN #10442
19700 SW TETON
TUALATIN OR 97062



FINAL ORDER

Dear Bill:

The Special Standard request you submitted for owner: Reynolds Metals, Start Card numbers 167943 (MW6-176) and 167944 (MW6-094), is approved for the following: You may abandon these wells in place as described in OAR 690-240-0510 (2).

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions regarding this letter, I may be contacted at (503) 986-0851, or by e-mail at Kristopher.R.Byrd@ wrd.state.or.us.

Sincerely,

Kristopher Byrd
Well Construction Program Coordinator
Enforcement Section

enclosure

cc: Joel Jeffery, NW Region Monitor Well Inspector
File

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

Oregon Water Resources Department

REQUEST FOR WRITTEN APPROVAL TO USE CONSTRUCTION METHODS NOT INCLUDED IN OREGON ADMINISTRATIVE RULES 690-200 THROUGH 690-240

Before the request can be considered, this form must be completed. Requests shall be submitted to the Well Construction Specialist, Water Resources Department, 725 Summer Street NE, Suite "A", Salem OR 97301-1271. Requests may also be considered by the appropriate Regional Manager.

Date of request: 1/3/05 Oral approval date (if applicable): _____

Bonded Well Constructor (name, license #, and mailing address): Bill Klostermann 10442

Geo-Tech 19700 SW Teton Tualatin OR 97062

(1) Location of Well: SW 1/4 SE 1/4 Tax lot 100 Section 14,
Township 1 N, Range 3E X, Multnomah County
Address at well site: 5100 Sundial Road
Troutdale, OR

(2) Start Card Number(s)(for work to be done): 167943 - 167944

(3) Name and Address of Land Owner: Reynolds Metals
5100 Sundial Road Troutdale, OR

(4) Distance to the nearest septic tank, drainfield, closed sewage line (if water supply well)

(5) The unusual site conditions which necessitate this request: power lines directly overhead that were installed after the wells were drilled.

(6) The proposed construction methods that the bonded well constructor believes will be adequate for this well: (attach additional pages if needed)
bentonite grout wells in place, no overdrill

	old s.c.#	AB CARDS
<u>MW-6-176</u>	<u>79941</u>	<u>167943</u>
<u>mw-6-094</u>	<u>79940</u>	<u>167944</u>

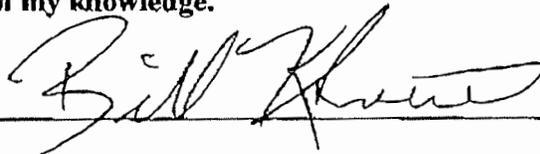
- (7) Diagram showing the pertinent features of the proposed well design and construction:
(attach additional pages if needed)

PLEASE NOTE:

- (1) **The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.**
- (2) **If it should be determined at some future date that the well, due to its construction, is allowing ground water contamination, waste or loss of artesian pressure, the undersigned shall return to the site and rectify the problem.**
- (3) **If oral approval was granted, a written request must be submitted to the Department either within three (3) working days of the date of oral approval or prior to the completion of the associated well work. Failure to submit a written request as described above may void prior oral approval.**

I have read and understand the above information. I further attest that the information provided is accurate to the best of my knowledge.

Bonded Constructor Signature: _____



revised 11/03/2003



Oregon

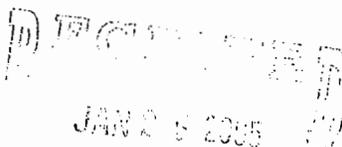
Theodore R. Kulongoski, Governor

Water Resources Department

North Mall Office Building
725 Summer Street NE, Suite A
Salem, OR 97301-1271
503-986-0900
FAX 503-986-0904

January 21, 2005

GEO TECH EXPLORATIONS
BILL KLOSTERMANN #10442
19700 SW TETON
TUALATIN OR 97062



FINAL ORDER

Dear Bill:

The Special Standard request you submitted for owner: Reynolds Metals, Start Card number 167882, is hereby approved for the following: You may abandon this well in place (below a depth of 84 feet bgs) as described in OAR 690-240-0510 (2). The placement of the sealing material shall conform to the manufacturers specifications and result in a seal that is free of voids or bridges.

MW21-17b

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions regarding this letter, I may be contacted at (503) 986-0851, or by e-mail at Kristopher.R.Byrd@ wrd.state.or.us.

Sincerely,

Kristopher Byrd
Well Construction Program Coordinator
Enforcement Section

enclosure

cc: Joel Jeffery, NW Region Monitor Well Inspector
File

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

Oregon Water Resources Department

REQUEST FOR WRITTEN APPROVAL TO USE CONSTRUCTION METHODS NOT INCLUDED IN OREGON ADMINISTRATIVE RULES 690 200 THROUGH 690-240

Before the request can be considered, this form must be completed. Requests shall be submitted to the Well Construction Specialist, Water Resources Department, 725 Summer Street NE, Suite "A", Salem OR 97301-1211. Requests may also be considered by the appropriate Regional Manager.

Date of request: 1/20/05 Oral approval date (if applicable): 1/18/05

Bonded Well Constructor (name, license #, and mailing address): Bill Klusterman

10442 19700 SW Teton Ave Tualatin Or, 97062

(1) Location of Well: SW 1/4 SE 1/4 Tax lot 100 Section 14,
Township 1 N, Range 3 E, Multnomah County
Address at well site: 5100 Sundial Rd Troutdale Or, 97080

(2) Start Card Number(s)(for work to be done): 167882

(3) Name and Address of Land Owner: Reynolds Metals Same as Site address

(4) Distance to the nearest septic tank, drainfield, closed sewage line (if water supply well)
NA

(5) The unusual site conditions which necessitate this request: During overdrill of original borehole with 10" casing well was lost at 75 feet. Hole was advanced to 84 feet to confirm 100% new borehole

(6) The proposed construction methods that the bonded well constructor believes will be adequate for this well: (attach additional pages if needed)
Grout well from 84 feet back to the surface

- WELL TEST EXPLANATION
- PAGE 02
- (7) Diagram showing the pertinent features of the proposed well design and construction:
(attach additional pages if needed)

PLEASE NOTE:

- (1) The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.
- (2) If it should be determined at some future date that the well, due to its construction, is allowing ground water contamination, waste or loss of artesian pressure, the undersigned shall return to the site and rectify the problem.
- (3) If oral approval was granted, a written request must be submitted to the Department either within three (3) working days of the date of oral approval or prior to the completion of the associated well work. Failure to submit a written request as described above may void prior oral approval.

I have read and understand the above information. I further attest that the information provided is accurate to the best of my knowledge.

Bonded Constructor Signature: _____

