Well1		WASH 11594
	Deepening	WASH 11593
	Reconditioning	WASH 58004
Well 2		WASH 11592
ASR 1		WASH 58003
ASR 2		WASH 61622
ASR 3		WASH 66115

Attachment 3
Well Logs

Application for a Groundwater Registration Modification – GR 616

T 10802

STATE ENGINEER
Salem, Oregon

WASH 011594

OBSERVATION WELL

Well-Record

STATE WELL NO. 3/1W-4 E(2)
COUNTY Washington
APPLICATION NO. GR-616

OWNER: Tigard Water District

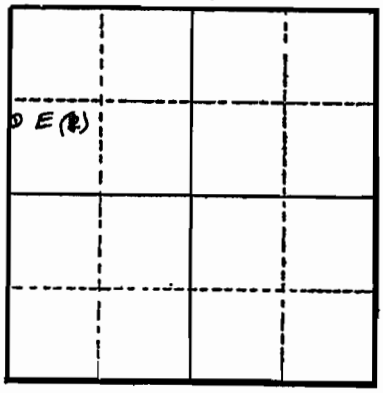
MAILING ADDRESS: % C.E. Janoe 8900 Burnham Ave. (97223)

LOCATION OF WELL: Owner's No. #1

CITY AND STATE: Tigard, Oregon

SW ¼ NW ¼ Sec. 11 T. 2 S., R. 1 W., W.M.

Bearing and distance from section or subdivision corner S. 1625 ft. & E. 30 ft. from N.W. cor. sec. 11



Section 11

Altitude at well 409

TYPE OF WELL: drilled Date Constructed April 25, '47

Depth drilled 381 DEEPENED 4-2-66 Depth cased

CASING RECORD:
12 inch

FINISH:

AQUIFERS:

WATER LEVEL:
185

PUMPING EQUIPMENT: Type Peerless Turbine H.P. 15
Capacity 250 G.P.M.

WELL TESTS:
Drawdown 96 ft. after hours 170 G.P.M.
Drawdown 97 ft. after hours 210 G.P.M.

USE OF WATER municipal Temp. °F., 19
SOURCE OF INFORMATION GR-616
DRILLER or DIGGER
ADDITIONAL DATA:
Log — Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

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State Printing 89316

2/1W-11E(9)

WELL #1
November 18, 1947 Sounded

R. J. STRASSER DRILLING CO.

R 3, Box 594
Portland 6, Oregon

Log of 12" well drilled for Tigard Water District, Completed April 25, 1947 by R. J. Strasser Drilling Company.

Surface	to	2 ft.	Top soil
2 ft.	"	11 "	Yellow clay
11 "	"	22 "	Hard pan with some sand
22 "	#	47 "	Silt and yellow clay
47 "	"	64 "	Soft lava rock
64 "	"	84 "	Gray and green lava rock
84 "	"	168 "	Black, gray, red rock medium hard
168 "	"	192 "	Black and red rock medium hard
192 "	"	202 "	Black hard rock
202 "	"	212 "	Red and black soft porous rock with some water
212 "	"	220 "	Hard black rock
220 "	"	230 "	Hard black rock
230 "	"	260 "	Gray and black medium hard rock
260 "	"	272 "	Gray porous rock with water
272 "	"	309 "	Hard black rock some crevices
309 "	"	315 "	Red rock not so hard
315 "	"	325 "	Yellow and gray soft rock showing water
325 "	"	345 "	Gray hard rock
345 "	"	370 "	Medium hard gray rock
270 "	"	381 "	Hard gray rock

Well cased with 12" pipe to a depth of 71 feet and a cement grout placed to prevent surface water from entering the well.

Static water level 168feet from the surface.

Pump	test	showed	60	G.P.M.	with	20	feet	draw	down.
"	"	"	120	"	"	30	"	"	"
"	"	"	170	"	"	46	"	"	"
"	"	"	210	"	"	97	"	"	"

Would recommend pump setting of 250 feet column, bowls and 35 feet of suction capacity 176 G.P.M. Your pumping level would be 240 feet which would be the most practicable level to pump from as the next 40 feet of draw down only adds 40 G.P.M. of water and all of your water would need to be pumped that extra depth.

See Deepening 4-2-66

T 10802

TIGARD WATER DISTRICT

Washington County, Oregon

WELL TEST DATA

WELL NO. 1

Diameter 12"
Depth 381 ft.
Cased 71 ft.

Pump Pearless 15 HP.
Bowl setting 335 ft. (1963)

Elden W. Carter
Consulting Engineer

Test Date	Duration Min.	Rate gpm	Static Level - Ft.	Pumping Level-Ft.	Draw-down Ft.	Remarks
11/[illegible]/47		170	188	234	46	When drilled
10/11/58	8	150±	214	266	52	In service - throttled
3/8/61	30	150±	223	275	52	" " "
2/13/62	45	150 ±	221	274	53	" " "
7/[illegible]/62	30	150 ±	225	275	50	" " "
2/5/63	50	150±	223	291	68	" " "
6/29/63	45	150±	235	305	70	" " "
12/31/63	45	150±	225	325	100	" " "

T 10802

TIGARD WATER DISTRICT

Washington County, Oregon

WELL TEST DATA

WELL NO. 2

Diameter 12" Pump Pearless 50 HP.
Depth 453 ft. Bowl setting 350 ft.
Cased 342 ft-10" dia.

Elden W. Carter
Consulting Engineer

Test Date	Duration Min.	Rate gpm	Static Level - Ft.	Pumping Level-Ft.	Draw-down Ft.	Remarks
7/[illegible]/49	24 hr.	700	190	280	90	When drilled
10/11/58	8 min.	400	212	265	53	In service
3/8/61	30	400	260	295	35	" "
2/13/62	45	400	280	314	34	" "
7/[illegible]/62	30	400	285	285	—	" "
2/5/63	50	400	227	309	82	Out of service before test
6/29/63	45	400	229	336	107	In service
12/31/63	40	400	228	265	37	" "

T 10802

3/1W-10E(1)
WASH
Well #1

ELDEN W. CARTER
CONSULTING CIVIL ENGINEER
PORTLAND TRUST BLDG.
519 S. W. WASHINGTON ST.
PORTLAND 4, OREGON

October 13, 1958

Board of Commissioners,
Tigard Water District,
8841 S.W. Commercial St.,
Tigard 23, Oregon.

Gentlemen:

On October 11, 1958 tests were made on your three wells to determine, primarily, the present static water levels and to observe the drawdown and pumping levels if possible.

At the time of test, both Well No. 1 and No. 2 were in service and under automatic control. The pump in Well No. 1 was running just prior to the test and at No. 2 the pump had been off an undetermined length of time. Well No. 3 had not been in service for at least two weeks.

In each case the pumping level was observed after running the pump 5 to 8 minutes which, except for No. 1, probably did not give the level which might be expected after prolonged continuous operation. This is particularly true of Well No. 3.

A tabulation of the test data and comparative data from the original well tests are shown below.

	Oct. 11, 1958	When Drilled
Well No. 1		11-18-47
Static level (below surface)	214 ft.	188 ft.
Pumping level	266 ft.	234 ft.
Rate	(#)	150 gpm
Drawdown	52 ft.	46 ft.

- Pump runs throttled - exact flow not known.

Well No. 2		7-30-48
Static level	212 ft.	190 ft.
Pumping level	265 ft.	280 ft.
Rate	400 gpm	400 gpm
Drawdown	53 ft.	90 ft.
Well No. 3		8-11-58
Static level	210 ft.	215 ft.
Pumping level	257 ft.	343 ft.
Rate	550 gpm	550 gpm
Drawdown	47 ft.	128 ft.

Very truly yours,
ELDEN W. CARTER
Elden W. Carter, Engineer
Tigard Water District

ELDEN W. CARTER
CONSULTING CIVIL ENGINEER
OREGON BANK BLDG.
319 S. W. WASHINGTON ST.
PORTLAND 4, OREGON

March 17, 1961

Board of Commissioners
Tigard Water District
8841 S.W. Commercial St.
Tigard 23, Oregon

Gentlemen:

Pumping tests were run on the district's three wells on March 8, 1961 to determine the present static water levels, draw down, and pumping levels.

The draw down was measured after pumping 30 minutes on each well.

A tabulation of the test data and comparative data from previous tests are shown below.

	3/8/61	10/11/58	When drilled 11/18/47
Well No. 1			
Static level	223 ft.	214 ft.	188 ft.
Pumping level	275 ft.	266 ft.	234 ft.
Rate (throttled - est.)	(150 gpm)	(?)	170 gpm
Draw down	52 ft.	52 ft.	46 ft.
Well No. 2			7/30/49
Static level	260 ft.	212 ft.	190 ft.
Pumping level	285 ft.	265 ft.	280 ft.
Rate	400 gpm	400 gpm	400 gpm
Draw down	25 ft.	53 ft.	90 ft.
Well No. 3			2/11/58
Static level	293 ft.	210 ft.	215 ft.
Pumping level	360 ft.	257 ft.	343 ft.
Rate	350 gpm	350 gpm	350 gpm
Draw down	67 ft.	47 ft.	128 ft.

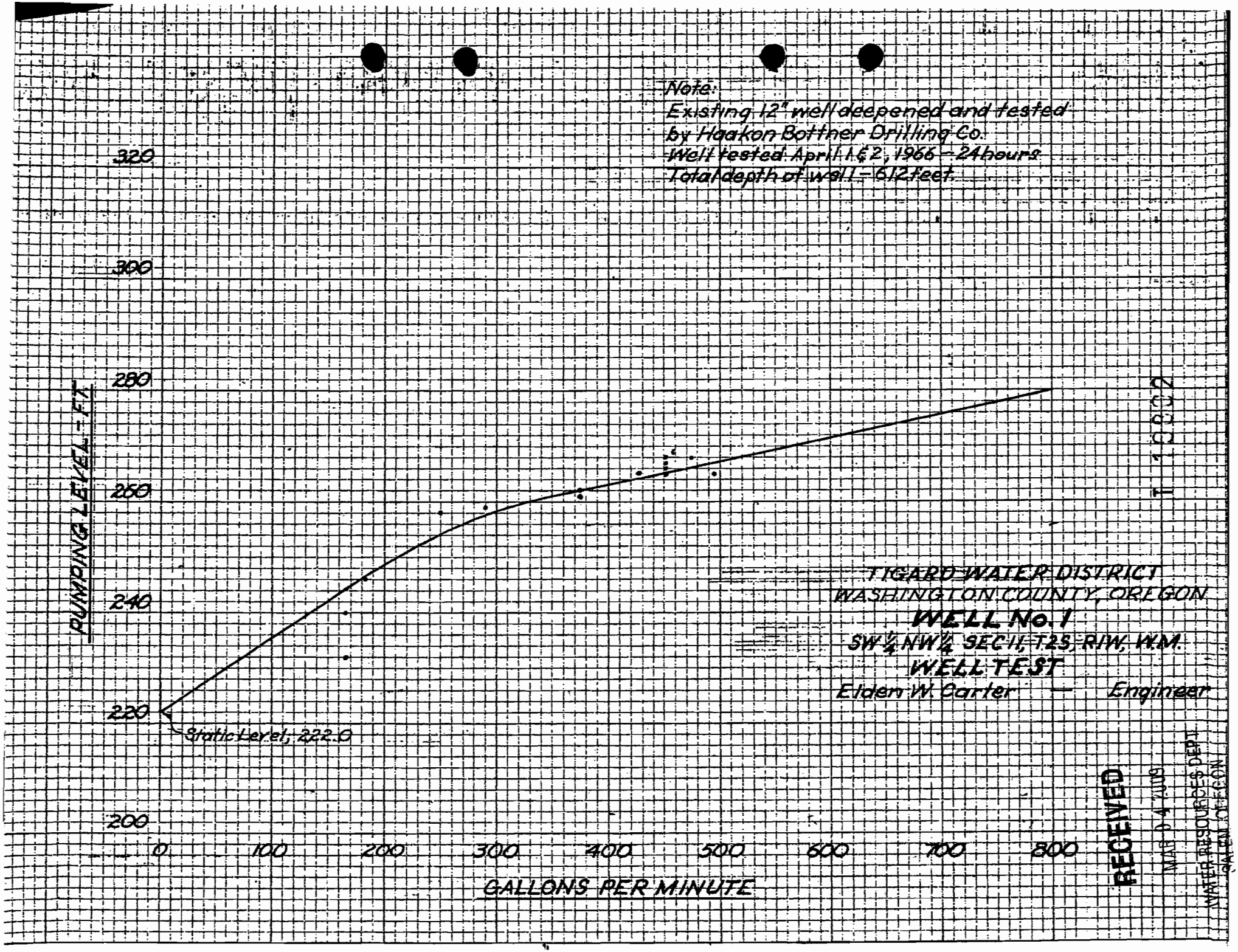
T 10992

Very truly yours,

ELDEN W. CARTER

Elden W. Carter, Engineer
Tigard Water District

cc- State Engineer


Note:
Existing 12" well deepened and tested
by Haakon Bottner Drilling Co.
Well tested April 1 & 2, 1966 – 24 hours
Total depth of well – 612 feet.
320
300
280
260
240
220
200
PUMPING LEVEL - FT.
Static Level, 222.0
0
100
200
300
400
500
600
700
800
GALLONS PER MINUTE
TIGARD WATER DISTRICT
WASHINGTON COUNTY, OREGON
WELL No. 1
SW¼ NW¼ SEC 11, T2S, R1W, W.M.
WELL TEST
Elden W. Carter — Engineer
RECEIVED
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WATER RESOURCES DEPT.
SALEM, OREGON

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

WASH 011593

WATER WELL REPORT

STATE OF OREGON (Please type or print) Deepening

Jan. 27, 1966

State Well No. 2S/1W-11 E(1)

State Permit No. .....

(1) OWNER:

Name Tigard Water District

Address 8841 S.W.COMMERCIAL St.
Tigard Oregon

(2) LOCATION OF WELL: Near S.W.103rd.Ave. and Highway U.S. 99W

County Washington Driller's well number

S.W ¼ N.W. ¼ Section 11 T. 2S R. 1W W.M.

Bearing and distance from section or subdivision corner

Well #1

(3) TYPE OF WORK (check):

New Well ☐ Deepening ☒ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 12.

(4) PROPOSED USE (check):

Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) TYPE OF WELL:

Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(6) CASING INSTALLED:

Threaded ☐ Welded ☐

..... " Diam. from ..... ft. to ..... ft. Gage .....
..... " Diam. from ..... ft. to ..... ft. Gage .....
..... " Diam. from ..... ft. to ..... ft. Gage .....

(7) PERFORATIONS:

Perforated? ☐ Yes ☐ No

Type of perforator used

Size of perforations in. by in.

..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

(8) SCREENS:

Well screen installed? ☐ Yes ☒ No

Manufacturer's Name .....

..... Model No. .....

Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.
Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.

(9) CONSTRUCTION:

Well seal—Material used in seal .....
Depth of seal ..... ft. Was a packer used?
Diameter of well bore to bottom of seal ..... in.
Were any loose strata cemented off? ☐ Yes ☐ No Depth .....
Was a drive shoe used? ☐ Yes ☐ No
Was well gravel packed? ☐ Yes ☐ No Size of gravel .....
Gravel placed from ..... ft. to ..... ft.
Did any strata contain unusable water? ☐ Yes ☐ No
Type of water? depth of strata
Method of sealing strata off

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SALEM, OREGON

(10) WATER LEVELS:

Static level 228 ft. below land surface Date 4/1/66

Artesian pressure lbs. per square inch Date

(11) WELL TESTS:

Drawdown is amount water level is lowered below static level

Was a pump test made? ☒ Yes ☐ No If yes, by whom? Bottner Drilling Co.

Yield: 165 gal./min. with 17 ft. drawdown after hrs.
" 374 " 40 " "
" 452 " 46 " combined 12"
Bailer test # 495 gal./min. with 43 ft. drawdown after 12 hrs.*

Artesian flow g.p.m. Date

Temperature of water 53 Was a chemical analysis made? ☐ Yes ☐ No

(12) WELL LOG:

Diameter of well below casing 12 "

Depth drilled 229 ft. Depth of completed well 612 ft.

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Rock , black	381	410
Rock , red	410	426
Clay , brown	426	449
Rock , black	449	491
Clay , w/ embeded rock	491	496
Rock , red	496	500
Rock , black	500	525
Cuttings washed away, water bearing	525	532
Rock, black hard	532	560
Rock , black (crevis)	560	562
Rock ,brownish red, soft	562	579
Rock ,red soft , coarse water bearing	579	597
Rock , black , mdm hard	597	610

Note :
To Straighten well, back filled with boulders & gravel from 383 ft.to 368 ft,redrilled and back filled the 2nd. time .
* After pumping 12 hrs. gained 3 ft.

Work started Jan.27 1966 Completed April 2 1966

Date well drilling machine moved off of well April 6 1966

(13) PUMP:

T 10802

Manufacturer's Name .....

Type: ..... H.P. .....

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME HAAKON BOTTNER DRILLING COMPANY
(Person, firm or corporation) (Type or print)

Address 3424 S.E. 17th Street Portland Ore.

Drilling Machine Operator's License No. 380 & 246

[Signed] H. Bottner
(Water Well Contractor)

Contractor's License No. 109 Date April 9, 1966

(USE ADDITIONAL SHEETS IF NECESSARY)

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WATER RESOURCES DEPT
SALEM, OREGON

WATER SUPPLY WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the last page of this form.

WELL I.D. # L 48801
START CARD # 141227

(1) LAND OWNER Well Number
Name CITY OF TIGARD
Address 13125 S.W. HALL BLVD.
City TIGARD State ORE. Zip 97223

(2) TYPE OF WORK
☐ New Well ☐ Deepening ☑ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD:
☐ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger
☐ Other

(4) PROPOSED USE:
☐ Domestic ☐ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☑ Injection ☐ Livestock ☑ Other Municipal

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☑ No Depth of Completed Well 600 ft.
Explosives used ☐ Yes ☑ No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
12"	0	600'	CEMENT	0'	300'	168 SACKS or 8 yards

How was seal placed: Method ☐ A ☐ B ☑ C ☐ D ☐ E
☐ Other
Backfill placed from ft. to ft. Material
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	8	12'	300'	.322"	☑	☐	☑	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☑ None
Final location of shoe(s)

(7) PERFORATIONS/SCREENS: NONE
☐ Perforations Method
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☑ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
1.5 gpm	0		1 hr.

Temperature of water 54° Depth Artesian Flow Found
Was a water analysis done? ☐ Yes By whom
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata:

(9) LOCATION OF WELL by legal description:
County WASHINGTON Latitude Longitude
Township 2S N or S Range 1W E or W. WM.
Section 11 SW 1/4 NW 1/4
Tax Lot 2600 Lot Block Subdivision
Street Address of Well (or nearest address) 10490 S.W. CANTERBURY LANE, TIGARD

(10) STATIC WATER LEVEL:
255 ft. below land surface. Date NOV. 28, 2001
Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES:
Depth at which water was first found

From	To	Estimated Flow Rate	SWL

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
REPAIR - RECONDITION PROCEDURE:			
- Pour clean, washed, chlorinated 3/8 pea gravel from	600' -	300'	
- Set in 300' of 8" x .322" wall casing with centering guides			
- insert 1" tremie pipe to 295', then pump in cement mixed at a ratio of 5 to 5.2 gallons of water per 94 pound sack of cement; total of 8 yards or 168 sacks used to fill annulus from	300'	to surface	
- After approximately 36-40 hours, the gravel removal was started, then completely bailed out to	600'		
- 12"x70' original casing: Perf. w/Mill's Knife - 6/99 - 2'	168'		
LOG of original well: WASH	011594		
LOG of deepening of original well: WASH	011593		

Date started November 8, 2001 Completed November 28, 2001

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
WWC Number
Signed Date

(bonded) Water 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 water supply well construction standards. This report is true to the best of my knowledge and belief.
Signed Michael Waldroop WWC Number 633 Date December 13, 2001

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STATE OF OREGON WATER SUPPLY WELL REPORT

(as required by ORS 537.765)

Instructions for completing this report on the reverse side of this form.

Wash 58003

WELL I.D. # L 48800

START CARD # 141224

(1) OWNER: Well Number

Name City of Tigard

Address 13125 S.W. Hall Blvd.

City Tigard State Ore. Zip 97223

(2) TYPE OF WORK

☑ New Well ☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD:

☑ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger

☐ Other

(4) PROPOSED USE:

☐ Domestic ☐ Community ☐ Industrial ☐ Irrigation

☐ Thermal ☑ Injection ☐ Livestock ☑ Other Municipal

(5) BORE HOLE CONSTRUCTION:

Special Construction approval ☐ Yes ☑ No Depth of Completed Well 606 ft.

Explosives used ☐ Yes ☑ No Type _____ Amount _____

HOLE Diameter	From	To	Material	SEAL From	To	Sacks or pounds
16"	0	300'		0'	300'	189 SACKS or 9 YARDS
12"	300'	606'				

How was seal placed: Method ☐ A ☐ B ☑ C ☐ D ☐ E

☐ Other

Backfill placed from _____ ft. to _____ ft. Material _____

Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	12"	+3'	300'	.375	☑	☐	☑	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS: NONE

☐ Perforations Method _____

☐ Screens Type _____ Material _____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour

☑ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
			1 hr.
800 GPM	79'		26 HRS.

Temperature of water 54° Depth Artesian Flow Found _____

Was a water analysis done? ☐ Yes By whom _____

Did any strata contain water not suitable for intended use? ☐ Too little

☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other _____

Depth of strata: _____

(9) LOCATION OF WELL by legal description:

County Washington Latitude _____ Longitude _____

Township 2S N or S Range 1W E or W. WM.

Section 11 SW 1/4 NW 1/4

Tax Lot 2600 Lot _____ Block _____ Subdivision _____

Street Address of Well (or nearest address) 10490 Canterbury Lane SW, Tigard

(10) STATIC WATER LEVEL:

256 ft. below land surface. Date Nov. 29, 2001

Artesian pressure _____ lb. per square inch. Date _____

(11) WATER BEARING ZONES:

Depth at which water was first found 323'

From	To	Estimated Flow Rate	SWL
437'	463'	150 GPM	256'
323'	350'	50 GPM	256'
491-512'/518-528'		100 GPM	256'
564'	582'	150 GPM	256'
594'	599'	50 GPM	256'

(12) WELL LOG:

Ground Elevation _____

Material	From	To	SWL
Asphalt	0'	1'	
Brown, sandy clay	1'	47'	
Decomposed basalt, brown	47'	59'	
Weathered basalt, brown	59'	142'	
Black basalt, broken	142'	175'	
Black basalt	175'	190'	
Black basalt, broken	190'	205'	
Black basalt	205'	218'	
Black + brown broken basalt	218'	265'	
Gray basalt	265'	295'	
Brown, broken basalt	295'	310'	
Weathered basalt-multi colored	310	328'	256'
Brown + black basalt	328	349'	256'
Gray basalt	349'	405'	
Weathered basalt - brown	405	410'	
Gray basalt - hard	410	437'	
Weathered basalt-multi colored	437'	463'	256'
Gray basalt, hard	463'	491'	
Weathered basalt, brown-black-tan colored	491'	512'	256'

Date started SEPT. 26, 2001 Completed November 8, 2001

(unbonded) Water Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

WWC Number _____

Signed _____ Date _____

(bonded) Water 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 water supply well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 633

Signed Michael Waldrop Date Dec. 12, 2001

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SALEM, OREGON

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

Instructions for completing this report are on the last page of this form.

Wash 58003

WELL I.D. # L 48800
START CARD # 141224

(1) LAND OWNER Well Number
Name c/o TIGARD PAGE 2
Address
City State Zip

(2) TYPE OF WORK
☐ New Well ☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD:
☐ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger
☐ Other

(4) PROPOSED USE:
☐ Domestic ☐ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☐ No Depth of Completed Well ____ ft.
Explosives used ☐ Yes ☐ No Type ____ Amount ____

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds

How was seal placed: Method ☐A ☐B ☐C ☐D ☐E
☐ Other
Backfill placed from ____ ft. to ____ ft. Material
Gravel placed from ____ ft. to ____ ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☐ None
Final location of shoe(s)

(7) PERFORATIONS/SCREENS:
☐ Perforations Method
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
			1 hr.

Temperature of water Depth Artesian Flow Found
Was a water analysis done? ☐ Yes By whom
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata:

(9) LOCATION OF WELL by legal description:
County Latitude Longitude
Township N or S Range E or W. WM.
Section 1/4 1/4
Tax Lot Lot Block Subdivision
Street Address of Well (or nearest address)

(10) STATIC WATER LEVEL:
ft. below land surface. Date
Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES:
Depth at which water was first found

From	To	Estimated Flow Rate	SWL
			256'
			256'
			256'

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
Gray basalt, hard	512'	518'	
Gray + brown basalt, broken	518'	528'	256'
Gray basalt, hard	528'	561'	
Gray basalt, broken	561'	564'	
Weathered basalt, multi-colored	564'	582'	256'
Gray basalt, hard	582'	594'	
Basalt, broken, multi colored	594'	599'	256'
Gray basalt, very hard	599'	606'	

Date started Completed

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
WWC Number
Signed Date

(bonded) Water 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 water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 635
Signed Michael Waldrop Date Dec. 12, '01

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STATE ENGINEER
Salem, Oregon

WASH
011592

OBSERVATION WELL

Well Record

STATE WELL NO. 2N/1W-10DD
COUNTY Washington
APPLICATION NO. G.P. 615

OWNER: Tigard Water District

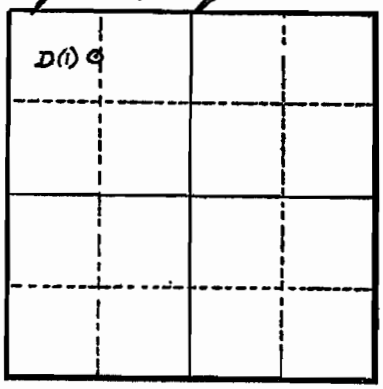
MAILING ADDRESS: % C.E. Janoe Chairman — 8900 SW Burnham Ave.

LOCATION OF WELL: Owner's No. #2

CITY AND STATE: Tigard, Oregon

NW ¼ NW ¼ Sec. 10 T. 2 S., R. 1 W., W.M.

Bearing and distance from section or subdivision corner S. 610 ft. & E. 1270 ft. from N.W. cor. sec. 10



Altitude at well 375 ft.

TYPE OF WELL: drilled Date Constructed July 30, '49

Depth drilled 459 Depth cased 342

Section 10

CASING RECORD:
12 inch

FINISH:

AQUIFERS:

WATER LEVEL:
190 Feet

PUMPING EQUIPMENT: Type Peerless Turbine H.P. 15
Capacity 500 + G.P.M.

WELL TESTS:
Drawdown 72 ft. after ____ hours 325 G.P.M.
Drawdown 90 ft. after ____ hours 400 G.P.M.

USE OF WATER municipal Temp. ____ °F. ____, 19____
SOURCE OF INFORMATION GR-615
DRILLER or DIGGER ____
ADDITIONAL DATA:
Log — Water Level Measurements ____ Chemical Analysis ____ Aquifer Test ____

REMARKS:

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State Printing 89316

WELL # 2

R. J. STRASSER DRILLING COMPANY
8110 S.E. Sunset Lane
Portland 6, Oregon

Log of well # 2 for the Tigard Water District 12 inch well cased with 10 inch to 342 feet deep. Comleted 7/30/49.

Surface	to	2	Ft	Top soil	
2 ft	"	29	"	Yellow and red clay	
29 "	"	47	"	Decomposed rock	
47 "	"	83	"	Hard gray rock	
83 "	"	97	"	Brownish red medium rock	
97 "	"	192	"	Hard gray rock	
192 "	"	201	"	Soft brownish red rock with around 100 G.P.M.	
209 "	"	209	"	Hard gray rock	
209 "	"	224	"	Porous brown rock with a little water	
224 "	"	265	"	Gray and brown rock	
265 "	"	274	"	Porous brown rock a little water	
274 "	"	319	"	Hard gray rock Well was tested at 342 feet and furnished 220 G.P.M.a draw down of 140 feet.	
335 "	"	362	"	Hard gray rock	
362 "	"	368	"	Brown porous rock	
368 "	"	395	"	Hard clay	
395 "	"	400	"	Soft red rock should have some water	
400 "	"	438	"	Gray rock	
438 "	"	447	"	Very soft yellow rock with water	
447 "	"	453	"	Gray rock	

Static water levil 190 feet from the surface.

Pump test showed 325 G.P.M. with 72 feet draw down
400 " " 90 " " "

A cement seal was made around the casing at a depth of 60 to 70 feet to prevent any water from entering the well above the 70 ft. level.

T 10802

2/1W-10 D(1)
Wash. Co.

Well #2

ELDEN W. CARTER
CONSULTING CIVIL ENGINEER
PORTLAND TRUST BLDG.
319 S. W. WASHINGTON ST.
PORTLAND 4, OREGON

October 15, 1958

Board of Commissioners,
Tigard Water District,
6661 S.W. Commercial St.,
Tigard 23, Oregon.

Gentlemen:

On October 11, 1958 tests were made on your three wells to determine, primarily, the present static water levels and to observe the drawdown and pumping levels if possible.

At the time of test, both Well No. 1 and No. 2 were in service and under automatic control. The pump in Well No. 1 was running just prior to the test and at No. 2 the pump had been off an undetermined length of time. Well No. 3 had not been in service for at least two weeks.

In each case the pumping level was observed after running the pump 5 to 8 minutes which, except for No. 1, probably did not give the level which might be expected after prolonged continuous operation. This is particularly true of Well No. 3.

A tabulation of the test data and comparative data from the original well tests are shown below.

	Oct. 11, 1958	When Drilled
Well No. 1		11-18-47
Static level (below surface)	214 ft.	188 ft.
Pumping level	266 ft.	234 ft.
Rate	(#)	170 gpm
Drawdown	52 ft.	46 ft.

- Pump runs throttled - exact flow not known.

10 D(1)

Well No. 2		7-30-49
Static level	212 ft.	190 ft.
Pumping level	265 ft.	280 ft.
Rate	400 gpm	400 gpm
Drawdown	53 ft.	90 ft.
Well No. 3		2-11-58
Static level	210 ft.	215 ft.
Pumping level	257 ft.	343 ft.
Rate	350 gpm	350 gpm
Drawdown	47 ft.	128 ft.

T 10802

Very truly yours,
ELDEN W. CARTER
Elden W. Carter, Engineer
Tigard Water District

ELDEN W. CARTER
CONSULTING CIVIL ENGINEER
OREGON BANK BLDG.
319 S W. WASHINGTON ST.
PORTLAND 4 OREGON

March 17, 1961

Board of Commissioners
Tigard Water District
8841 S.W. Commercial St.
Tigard 22, Oregon

Gentlemen:

Pumping tests were run on the district's three wells on March 8, 1961 to determine the present static water levels, draw down, and pumping levels.

The draw down was measured after pumping 30 minutes on each well.

A tabulation of the test data and comparative data from previous tests are shown below.

	3/8/61	10/11/58	When drilled 11/18/47
Well No. 1			
Static level	223 ft.	214 ft.	188 ft.
Pumping level	275 ft.	266 ft.	234 ft.
Rate (throttled - est.)	(150 gpm)	(?)	170 gpm
Draw down	52 ft.	52 ft.	46 ft.
Well No. 2			7/30/49
Static level	260 ft.	212 ft.	190 ft.
Pumping level	295 ft.	265 ft.	280 ft.
Rate	400 gpm	400 gpm	400 gpm
Draw down	35 ft.	53 ft.	90 ft.
Well No. 3			2/11/58
Static level	293 ft.	210 ft.	215 ft.
Pumping level	360 ft.	257 ft.	343 ft.
Rate	350 gpm	350 gpm	350 gpm
Draw down	67 ft.	47 ft.	128 ft.

Very truly yours,

ELDEN W. CARTER

Elden W. Carter, Engineer
Tigard Water District

T 10802

cc- State Engineer

WASH 61622

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the last page of this form.

(WELL I.D.)# L 68044
(START CARD) # 161746

(1) OWNER: Well Number COT-2R
Name City of Tigard
Address 13125 SW Hall Blvd.
City Tigard State OR Zip 97223

(2) TYPE OF WORK
☑ New Well ☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD:
☑ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger
☑ Other Reverse Circulation

(4) PROPOSED USE:
☐ Domestic ☑ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☑ No Depth of Completed Well 1012 ft.
Explosives used ☐ Yes ☑ No Type ____ Amount ____

HOLE				SEAL		
Diameter	From	To	Material	From	To	Sacks or pounds
24"	0	32'	Bentonite	0	32'	18 sacks
20"	32'	343'	Cement	0	351.7	17 yards
16"	343'	1012'				

How was seal placed: Method ☐ A ☐ B ☑ C ☐ D ☐ E
☑ Other poured chips
Backfill placed from ____ ft. to ____ ft. Material ____
Gravel placed from 351.7 ft. to 716 ft. Size of gravel pea

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	***SEE AS	BUILT	****		☑	☐	☑	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s) ____

(7) PERFORATIONS/SCREENS:
☐ Perforations Method wire wrap
☑ Screens Type 304 Material s.s.

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
554.7'	574.7'	.050		16"		☐	☑
679.7'	699.7'	.050		16"		☐	☑
779.7'	819.7'	.050		16"		☐	☑
854.7'	894.7'	.050		16"		☐	☑
964.7'	1004.88'	.050		16"		☐	☑

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☑ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
428 gpm	28'	1010'	1 hr.

Temperature of water 57 Depth Artesian Flow Found ____
Was a water analysis done? ☐ Yes By whom ____
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other ____
Depth of strata: ____

(9) LOCATION OF WELL by legal description:
County Washington Latitude ____ Longitude ____
Township 2 S Range 1 W WM.
Section 10 SW 1/4 MW 1/4
Tax Lot 900 Lot ____ Block ____ Subdivision ____
Street Address of Well (or nearest address) NE corner of SW 125th & SW Bull Mountain Rd.

(10) STATIC WATER LEVEL:
308 ft. below land surface. Date 8/02/04
Artesian pressure ____ lb. per square inch. Date ____

(11) WATER BEARING ZONES:
Depth at which water was first found 312'

From	To	Estimated Flow Rate	SWL
*****COMPLETED ON			
ATTACHED			
SHEET*******			

(12) WELL LOG:
Ground Elevation ____

Material	From	To	SWL
COMPLETED ON ATTACHED SHEET			

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SALEM, OREGON

Date started 3/10/04 Completed 8/25/04

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
WWC Number 1209
Signed ____ Date 9-22-04

(bonded) Water 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 water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 1523
Signed ____ Date 9/30/04

WHITE COPY-WATER RESOURCES DEPARTMENT SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

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T 10502

WASH 61622

Geo-Tech Explorations
A Division of *Boart Longyear*
19700 SW Teton Ave
Tualatin, OR 97062
503-692-6400
503-692-4759 (fax)

Start Card: 161746
Well Label: L68044
Boring # : ASR COT-2R

Water Bearing Zones:

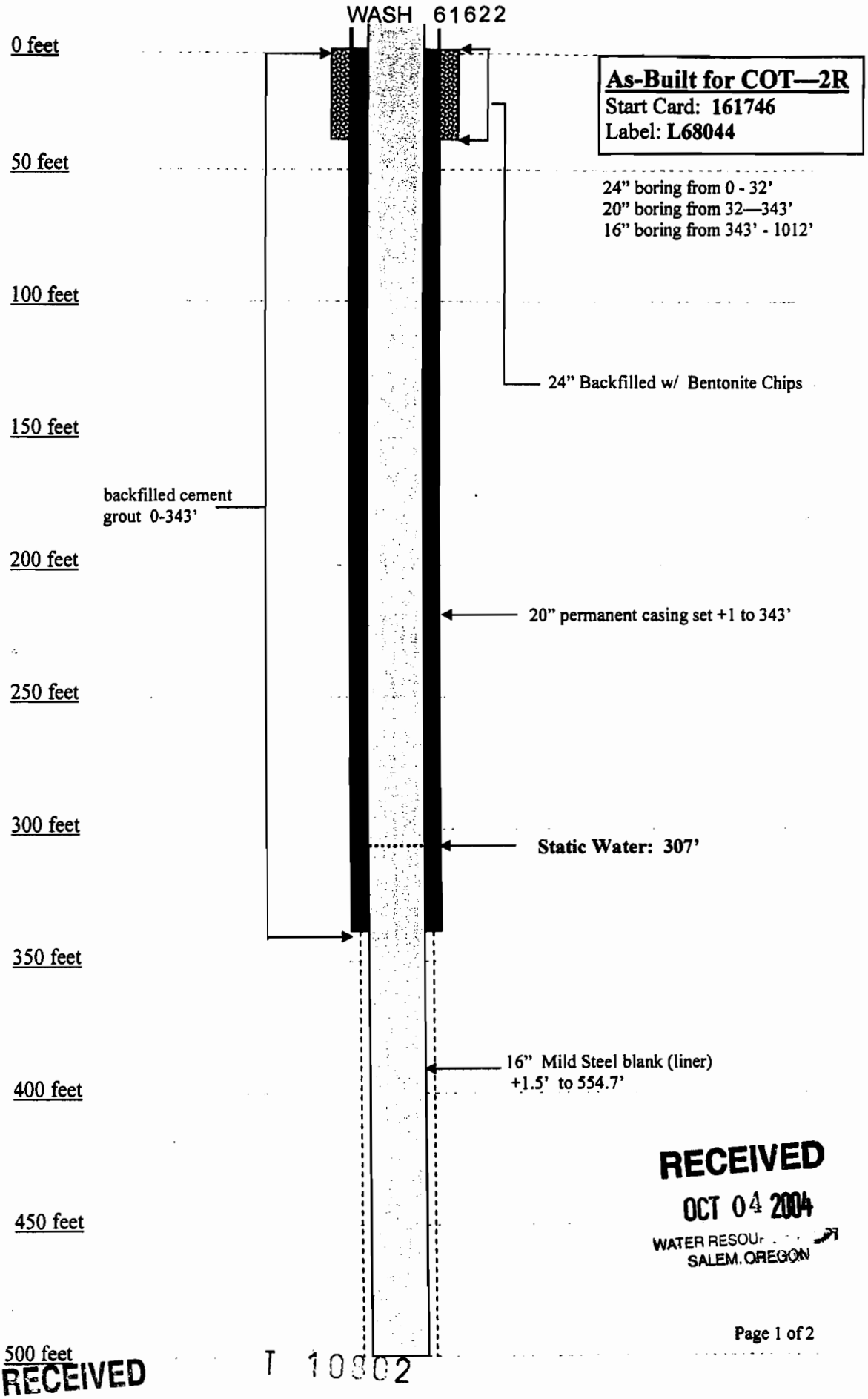
From	To	Estimated Flow Rate	SWL
554	574	↓	307
679	699	↓	307
779	819	↓	307
854	894	↓	307
964	1004	12.2 gpm / ft	307

Soil Profile Continued from Log:

Material	From	To	SWL
Gravel base	0	2'	
Brown silt	2'	12'	
Brown silt w/ weathered basalt	12'	15'	
Brown silt – soft	15'	18'	
Brown silt w/ weathered basalt	18'	20'	
Weathered basalt	20'	38'	
Weathered basalt – broken	38'	65'	
Basalt (med) – gray	65'	91'	
Basalt (soft) – red	91'	103'	
Basalt (med) – weathered	103'	139'	
Basalt w/ seams of brown silt	139'	238'	
Basalt conglomerate	238'	279'	
Basalt - gray w/ seams	279'	380'	307
Weathered broken basalt	380'	420'	307
Basalt (med / hard) - gray	420'	470'	307
Basalt (soft) - gray & red	470'	481'	307
Weathered basalt (med) - fractured	481'	497'	307
Basalt - gray	497'	515'	307
Basalt (slightly vesicular) - dark gray	515'	532'	307
Basalt – weathered / broken	532'	537'	307
Basalt (hard) – gray	537'	542'	307
Basalt (med / hard) – gray	542'	549'	307

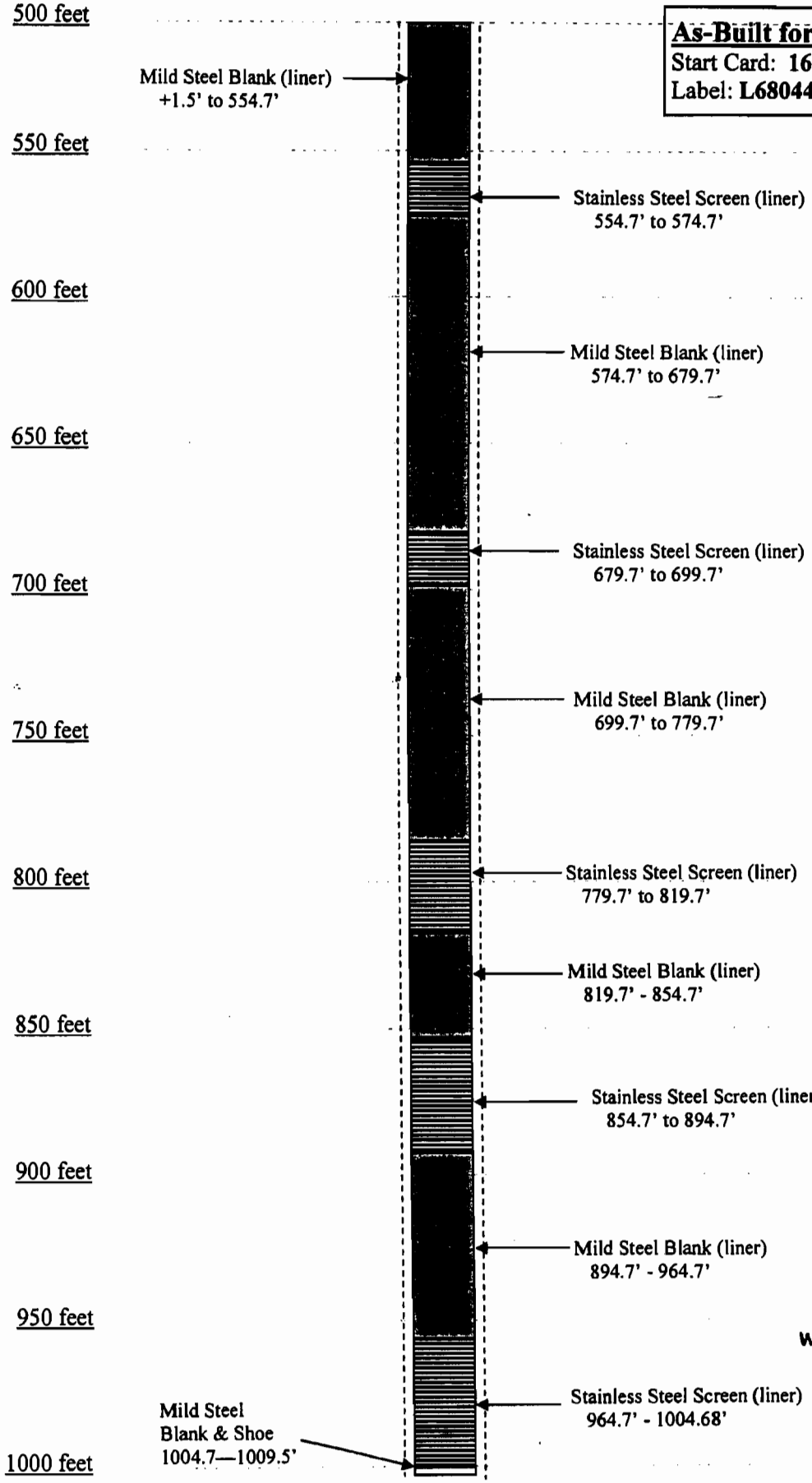
Basalt (hard) – light & dark gray	549'	631'	307
Basalt – brown, green & gray	631'	635'	307
Basalt – gray	635'	640'	307
Basalt (slightly vesicular) – brown & gray	640'	648'	307
Basalt (hard) – gray / some pinholes	648'	661'	307
Weatherered basalt - brown, green & gray	661'	678'	307
Basalt (fractured) - brown, green & gray	678'	680'	307
Vesicular basalt – brown to red	680'	688'	307
Basalt – gray to brown	688'	711'	307
Basalt – gray w/ dark gray seams	711'	718'	307
Basalt – brown to gray	718'	724'	307
Basalt (fractured) – brown to gray	724'	730'	307
Basalt – gray w/ dark gray seams	730'	736'	307
Basalt (fractured) – gray to brown & green	736'	786'	307
Basalt (med) – gray to red	786'	788'	307
Basalt – gray to brown & green	788'	795'	307
Fractured basalt (hard) – gray	795'	810'	307
Basalt (very fractured) – gray w/ brown & green	810'	819'	307
Basalt (slightly fractured) – gray w/ brown	819'	838'	307
Basalt (fractured) – brown to gray	838'	843'	307
Basalt (fractured) – gray to brown	843'	852'	307
Basalt (hard) – gray	852'	859'	307
Basalt (fractured) – gray to brown	859'	870'	307
Vesicular basalt – brown to gray	870'	875'	307
Basalt (med / hard) – gray; slightly vesicular	875'	884'	307
Basalt (fractured / hard) – brown to gray; slightly vesicular	884'	890'	307
Basalt (fractured / med) – brown to gray	890'	939'	307
Basalt (med / hard) – gray	939'	943'	307
Basalt (med / hard) – gray & brown, slightly fractured	943'	1012'	307

T 10892



T 10802

As-Built for COT—2R
Start Card: **161746**
Label: **L68044**



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WASH 66115

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

WELL LABEL # L 89515

START CARD # 177457

(1) LAND OWNER

Owner Well I.D. L89515

First Name _____ Last Name _____

Company City of Tigard

Address 13125 SW Hall Blvd

City Tigard State OR Zip 97223

(2) TYPE OF WORK

[X] New Well [ ] Deepening [ ] Conversion [ ] Alteration (repair/recondition) [ ] Abandonment

(3) DRILL METHOD

[ ] Rotary Air [ ] Rotary Mud [ ] Cable [ ] Auger [ ] Cable Mud [X] Reverse Rotary [ ] Other _____

(4) PROPOSED USE

[ ] Domestic [ ] Irrigation [X] Community [ ] Industrial/ Commericial [ ] Livestock [ ] Dewatering [ ] Thermal [ ] Injection [ ] Other _____

(5) BORE HOLE CONSTRUCTION

Special Standard [ ] (Attach copy)

Depth of Completed Well 1,100 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/ lbs
24	0	420	Cement	0	417	272	S
19	420	1,100					

How was seal placed: Method [ ] A [ ] B [X] C [ ] D [ ] E

[ ] Other _____

Backfill placed from _____ ft. to _____ ft. Material _____

Filter pack from _____ ft. to _____ ft. Material _____ Size _____

Explosives used: [ ] Yes Type _____ Amount _____

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
[X]	[ ]	20	[X]	.5	417	.375	[X]	[ ]	[X]	[ ]
[X]	[ ]	16	[X]	3	575	.375	[X]	[ ]	[X]	[ ]
[ ]	[ ]		[ ]				[ ]	[ ]	[ ]	[ ]
[ ]	[ ]		[ ]				[ ]	[ ]	[ ]	[ ]
[ ]	[ ]		[ ]				[ ]	[ ]	[ ]	[ ]

Shoe [ ] Inside [X] Outside [ ] Other Location of shoe(s) 420

Temp casing [ ] Yes Dia _____ From _____ To _____

(7) PERFORATIONS/SCREENS

Perforations Method _____

Screens Type V-Wrap Material Stainless Steel

Perf/Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Screen	Casing	16	575	605	.05			
Screen	Liner	16	605	655	.05			
Screen	Casing	16	655	675	.05			
Screen	Liner	16	675	755	.05			
Screen	Casing	16	755	765	.05			

(8) WELL TESTS: Minimum testing time is 1 hour

[X] Pump [ ] Bailer [ ] Air [ ] Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
1,500	173.8	620	120

Temperature 53 °F Lab analysis [ ] Yes By _____

Water quality concerns? [ ] Yes (describe below)

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County WASHINGTON Twp 2 S N/S Range 1 W E/W WM

Sec 9 SW 1/4 of the NW 1/4 Tax Lot 2500

Tax Map Number _____ Lot _____

Lat ° 0 ' " or _____ DMS or DD

Long ° 0 ' " or _____ DMS or DD

(•) Street address of well ( ) Nearest address

13001 SW Bull Mountain Rd, Tigard, OR 97223

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Predeepening				
Completed Well	08-12-2007			348.7

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found _____

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
08-12-2007	370	400				
08-12-2007	436	460				
08-12-2007	480	490				
08-12-2007	510	535				
08-12-2007	575	605				

(11) WELL LOG

Ground Elevation _____

Material	From	To
Soil	0	1
Clay Soft Brown	1	16
Weathered Rock	16	21
Brown with Black Basalt	21	190
Brown Basalt	190	210
Brown wih Black Basalt	210	305
Black Basalt - 3.5 min per ft	305	350
Black with Brown Basalt	350	440
Basalt Gray Brown Red Soft	440	455
Basalt Gray & Brown Hard	455	473
Basalt Brown & Gray Soft	473	490
BasaltGray & Brown Med	490	515
Basalt Brown & Brown Soft	515	530
Basalt Gray & Brown Hard	530	550
Basalt Gray Hard	550	580
Basalt Gray & Brow Broken	580	635
Basalt Gray Hard	635	715
Basalt Gray & Brown Broken	715	740
Basalt Gray Broken	740	775

Date Started 04-27-2007 Completed 09-17-2007

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number 1530 Date 10-08-2007

Password : (if filing electronically)

Signed _____ for Steve Hibbard

(bonded) Water Well Constructor Certification

I accept responsibility for the construction, deepening, 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 water supply well construction standards. This report is true to the best of my knowledge and belief.

License Number 1523 Date 10-08-2007

Password : (if filing electronically)

Signed _____

Contact Info (optional)

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ORIGINAL - WATER RESOURCES DEPARTMENT

THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK

Form Version: 0.89

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OCT 25 2007
WATER RESOURCES DEPT
SALEM OREGON

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MAR 04 2008
WATER RESOURCES DEPT
SALEM, OREGON

T 10902

WASH 66115

WATER SUPPLY WELL REPORT - continuation page

WELL LD. # L 89515

START CARD # 177457

(5) BORE HOLE CONSTRUCTION

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/ lbs

FILTER PACK

From	To	Material	Size

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

(7) PERFORATIONS/SCREENS

Perf/Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Screen	Liner	16	765	850	.05			
Screen	Casing	16	850	890	.05			
Screen	Liner	16	890	975	.05			
Screen	Casing	16	975	1,005	.05			
Screen	Liner	16	1,005	1,050	.05			
Screen	Casing	16	1,050	1,070	.05			
Screen	Liner	16	1,070	1,100	.05			

(8) WELL TESTS: Minimum testing time is 1 hour

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)

Water Quality Concerns

From	To	Description	Amount	Units

(10) STATIC WATER LEVEL

Water Bearing Zones

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
08-12-2007	635	670				
08-12-2007	755	765				
08-12-2007	850	885				
08-12-2007	975	1,005				
08-12-2007	1,030	1,065	1,500			348.7

(11) WELL LOG

Material	From	To
Basalt Gray Hard	775	785
Basalt Gray & Brown Hard	785	825
Basalt Gray Hard	825	860
Basalt Gray & Brown Med.some cinder looking rock	860	865
Basalt Gray & Brown Broken	865	875
Basalt Gray Hard	875	970
Basalt Gray Broken	970	995
Basalt Gray	995	1,020
Basalt Gary Broken	1,020	1,063
Basalt Green & Gray Salt	1,063	1,068
Basalt Gray Hard	1,068	1,070
Basalt Gray Broken	1,070	1,075
Basalt Gray Hard	1,075	1,100

Comments/Remarks

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