Approved: 

MEMO

To:	Kristopher Byrd, Well Construction Manager
From:	Tommy Laird, Well Construction Program Coordinator
Subject:	Review of Water Right Application G-19348
Date:	January 9, 2024

The attached application was forwarded to the Well Construction Section by the Groundwater Section. Joe Kemper reviewed the application. Please see Joe's Groundwater Review and the Well Reports.

Applicant's Well #6 (DESC 55853): Based on a review of the Well Report, Applicant's Well #6 seems to protect the groundwater resource.

The construction of Applicant's Well #6 may not satisfy hydraulic connection issues or the Groundwater Application Review Special Conditions.

Applicant's Well #7 (DESC 57788): Based on a review of the Well Report, Applicant's Well #7 seems to protect the groundwater resource.

The construction of Applicant's Well #7 may not satisfy hydraulic connection issues or the Groundwater Application Review Special Conditions.

Applicant's Well #8 (DESC 62721): Based on a review of the Well Report, Applicant's Well #8 seems to protect the groundwater resource.

The construction of Applicant's Well #8 may not satisfy hydraulic connection issues or the Groundwater Application Review Special Conditions.

Applicant's Well #9 (In Progress Well): Well #9 is a in progress well, therefore it cannot be reviewed for construction. Construction of this in progress well shall be completed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240. During construction of this well, specific attention should be paid to ensure sealing requirements are met and that the well does not commingle aquifers.

The construction of applicant's in progress Well #9 may not satisfy hydraulic connection issues.

Applicant's Well #10 (Proposed Well): Well #10 is a proposed well, therefore it cannot be reviewed for construction. Construction of this proposed well shall be completed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240. During construction of this well, specific attention should be paid to ensure sealing requirements are met and that the well does not commingle aquifers.

The construction of proposed Well #10 may not satisfy hydraulic connection issues.

Applicant's Well #11 (Proposed Well): Well #11 is a proposed well, therefore it cannot be reviewed for construction. Construction of this proposed well shall be completed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240. During construction of this well, specific attention should be paid to ensure sealing requirements are met and that the well does not commingle aquifers.

The construction of proposed Well #11 may not satisfy hydraulic connection issues.

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

DESC 55853

Desc 55853

WELL ID # 64895

(START CARD) # 150744

(1) OWNER:

Well Number: #6

Name City of Redmond

Address 875 S.E. Sisters, Ave.

City Redmond State OR Zip 97756

(2) TYPE OF WORK:

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

(3) DRILL METHOD:

[ ] Rotary Air [ ] Rotary Mud [X] Cable [ ] Auger

[ ] Other

(4) PROPOSED USE:

[ ] Domestic [X] Community [ ] Industrial [ ] Irrigation

[ ] Thermal [ ] Injection [ ] Livestock [ ] Other

(5) BORE HOLE CONSTRUCTION:

Special Construction approval [ ] Yes [X] No Depth of Completed Well 855 ft.

Explosives used [ ] Yes [X] No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
26in	0	867	Cement Grout	374	399	88 sacks
			Cement	0	98	12 Cu. Yds.

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

[ ] Other

Backfill placed from 99 ft. to 399 ft. Material Bentonite 31cyd

Gravel placed from 399 ft. to 855 ft. Size of gravel 6x12 RMC

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	16in	+2	550	.375	X		X	
	16in	850	855	.375	X		X	
Liner:								

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:

[ ] Perforations Method Factory

[X] Screens Type Slotted Material SS316L

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
550	850	.070		16in	pipe	X	

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

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

Yield gal/min	Drawdown	Drill stem at	Time
2700	6	400	24 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 Deschutes Latitude Longitude

Township 15S N or S. Range 13E E or W. of WM.

Section 21(D) NW 1/4 SE 1/4

Tax lot 400 Lot Block Subdivision

Street Address of Well (or nearest address) 2551 S.W. 6th St., Redmond, OR

(10) STATIC WATER LEVEL:

336 ft. below land surface. Date 12/22/03

Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:

Depth at which water was first found

From	To	Estimated Flow Rate	SWL
342	697	1500	336
697	811	1000	336
811	867	4000+	336

(12) WELL LOG:

Ground elevation

Material	From	To	SWL
See attached lithology prepared by Mr. Dale Bugenig. Hole sloughed back prior to casing installation in bottom. 857-867.			

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WATER RESOURCES DEPT

SALEM, OR

WESTERN WATER DEVELOPMENT

P.O. Box 1670

REDMOND, OR 97756

Date started 4/2/03 Completed 12/31/03

(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 my best 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 1385

Signed Robert Buckner Date 1/27/04

Robert Buckner

ORIGINAL & FIRST COPY - WATER RESOURCES DEPARTMENT SECOND COPY - CONSTRUCTOR THIRD COPY - CUSTOMER

Desc 55853

DRILLERS'

LOG OF BOREHOLE

BOREHOLE Redmond Well #6 PAGE 1 OF 6

LOC. OR COORDS. SE¼ Sec. 21, T.15S., R.13E. (Willamette Mer)

GROUND ELEV.

TOTAL DEPTH

BOREHOLE DIAM. 26"

DRILLER Western Water Development

RIG Bucyrus-Erie 36L

BIT(S) 26" Star

FLUID Not Applicable

	START	FINISH
DATE	9/02/03	10/31/03
TIME	08:30	16:00

GEOPHYS. LOG X YES NO

HOW LEFT See Geol. log

LOCATION 121° 10'42" W 44° 15'13" N

LOGGED BY Gale Abernathy & Bob Buchner

PROJECT City of Redmond, OR Well #6

DEPTH	PEN. RATE FT/DAY	CIRC. RET.	CIRC. LOSS	AIR LIFT Q(GPM)	MATERIAL	SYMBOL	DESCRIPTION AND COMMENTS
		6.6	4/2				0-1 Brown sand 1-2 Broken brown & grey lava
10		8.5	4/3		Lava Flow		2-14' Grey vesicular lava
		0	4/4				
		2.5	4/5				14-24' Hard grey lava
20		3.5	4/6				
		6	4/8		Rubble Zone		24-28.5' Brown lava w/ red cinders
30		4	4/10				
		1	4/11				31-32 Hard grey lava 32-33 Brown lava 33-35' Dark brown & grey lava, Hard
		2	4/12				35-37 Dark Brown & grey lava rock, broken or caving
		3	4/13				37-38 Brown & grey lava, broken, caving
40		3	4/14				38-40 Hard grey lava
		3	4/15				40-43 Hard grey lava
		2	4/16				43-45 Hard grey rock 43'-43.5' Hard grey rock
		2	4/17				45-47 Hard grey rock
50		3	4/18				47-50 Grey lava rock
		5	4/19				Hard grey lava
		4	4/20				55-59 Hard grey lava
60		2.5	4/21		Lava Flow		Med grey lava
		6	4/22				61-66 Medium grey lava
		5	4/23				
70							66-71 Medium grey lava
		6	4/30				71-77 Medium grey lava
80		5	5/1				Med. grey lava
		4	5/2				Med. hard grey lava
90		6	5/3		Inter Flow Zone		86-88 Med Hard grey lava 88-91 Red & Brown conglomerate 91-92 Harder grey & brown lava
		3	5/6				92-95 Hard dark grey lava
		6	5/7				95-101 Black, grey & brown lava
100		5	5/8				
		4	5/9				107.5'-108.5' Red Cinder conglomerate
110		3	5/10		Cinders Sandstone?		110-113
		2	5/11				113-115 Brown & Grey Lava
		9	5/12				115-119 Brown & Grey Lava
120		2	5/13				119-122 Hard grey lava
		5	5/14		Lava flow		122-127 Grey Lava
		4	5/15				127-131 Med. grey lava
130		3	5/16				131-134 Hard grey lava
		2	5/17				134-136 Hard Grey lava
140		6	5/17				136-142 Med grey lava
		4	5/20				142-146 Med grey lava
							146-147 Med. grey lava
150		9	5/21		Sandstone		147-150 Red & brown sandstone

Added cement to stabilize borehole

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WATER RESOURCES DEPT.

DESC 55853

DRILLERS'

LOG OF BOREHOLE

BOREHOLE REDMOND WELL 4 PAGE 2 OF 6

LOC. OR COORDS. SE¼ Sec. 21 T. 15S., R. 13E. (Willamette Meridian)

GROUND ELEV.

TOTAL DEPTH 872 FT

BOREHOLE DIAM. 26"

DRILLER WESTERN WATER DEVELOPMENT

RIG Bucyrus-Erie 36L

BIT(S) 26" STAR

FLUID Not Applicable

	START	FINISH
DATE	4/02/03	10/30/03
TIME	08:30	16:00

GEOPHYS. LOG X YES NO

HOW LEFT See Constr Log

LOCATION 121° 10.428' W 44° 15.173'

LOGGED BY Gale Abernathy & Bob Bucklin

PROJECT City of Redmond, OR Well #4

DEPTH	PEN. RATE	CIRC. RET.	CIRC. LOSS	AIR LIFT Q(GPM)	MATERIAL	SYMBOL	DESCRIPTION AND COMMENTS
		9	5/21				150-153 Red & brown sandstone
		7	5/22				153-162 Medium brown sandstone
160							missing reports
170		6	5/27				170-172 Brown & grey sandstone
					sandstone		172-176 Brown & grey - Broken water loss 178' ±
180		8	5/28				176-184 Brown & black sandstone
		5	5/29				184-189 Brown & black sandstone
190		3	5/30				189-192 Grey & black sandstone
		4	6/2				192-196 Grey & brown lava
		2.5	6/3				196-198.5' Broken brown & grey lava
200		7.5					198.5-203 Hard grey basalt, broken
		3	6/5		Basalt Lava Flow		203-206 Hard grey basalt, broken
210		5	6/6				206-211 Hard grey basalt, broken
		2	6/7				211-213 Grey basalt
		3	6/9				213-216 Grey basalt
		4	6/10				216-220 Hard grey basalt
220		4	6/11				220-224 Hard grey basalt
		4	6/12		rubble zone		224-228 Hard grey basalt. Loss zone @ 224.5' Broken 224'-226'. Harder 226-228'
230		2	6/13				228-230 Broken grey lava Run 2nd Plumbgrass Test
		5	6/16				230-235 Broken black & brown lava
		3	6/17				235-238 Hard dark grey-black lava - Caving ?
240		7	6/18				238-242 Black & Brown lava - Sloughing @ 226'
		5	6/19		Basalt Lava Flow		242-247 Black & brown lava, softer & broken
250		6	6/20				247-253 Black & brown lava
		4	6/23				253-257 Hard grey basalt
		5	6/24				257-260 Hard grey basalt
260							260-262 Broken grey lava
							262-264 Broken grey
		8	6/25				264-270 Brown volcanic conglomerate
270					Volcanic Conglomerate		270-278 Brown volcanic conglomerate
		8	6/26				
			6/27				278-292 Brown volcanic conglomerate
280		14					
							292-295 Brown volcanic conglomerate Rig down for repairs thru 9/10
290		2	6/28				
		7	7/6				293-300 Dark grey volcanic conglomerate

DRILLERS'

LOG OF BOREHOLE

BOREHOLE Redmond Well 6 PAGE 3 OF 6

LOC. OR COORDS. SE¼ Sec 21 T.15N, R.13E. (Willamette Meridian)
GROUND ELEV.
TOTAL DEPTH 877 FT
BOREHOLE DIAM. 26"

DRILLER Western Water Development
RIG Bucyrus Erie 36L
BIT(S) 26" STAB.
FLUID N/A

	START	FINISH
DATE	9/02/03	10/30/03
TIME	08:30	16:00

GEOPHYS. LOG X YES NO
HOW LEFT See Cement. Log

LOCATION 121° 10.428' W 44° 16.178' N
LOGGED BY G. Eisenhour & Bob Buckner
PROJECT City of Redmond, OR Well #6

DEPTH	PEN. RATE	CIRC. RET.	CIRC. LOSS	AIR LIFT Q(GPM)	MATERIAL	SYM-BOL	DESCRIPTION AND COMMENTS
310		7	7/8		Volcanic Conglomerate		300-307
		5	7/9				307-312 Dark grey volcanic conglomerate
		6	7/10				312-316 Dark grey volcanic conglomerate 316-318 Brown hard sandstone
320		7	7/11		Sandstone		318-325 Brown sandstone
							325-327 Brown sandstone
		7	7/14				327-332 Brown sandstone
330							332-334 Dark grey sandstone
		6	7/15	SWL 335'-340'			336-338 Brown sandstone
340		9	7/16		Sandstone w/ gravel		338-347 Brown sandstone w/ gravel
350		11	7/17				347-358 Brown sandstone w/ gravel + silt — Water @ 355' SWL = 335'-340'
360		12	7/18				358-370 Brown sandstone w/ gravel
370					Sandstone		370-380 Grey sandstone
		10	7/21				Note: problems with casing, lost 9' 7/22, Drilled 380 to 371'
380		1	7/25				380-381 gravelly sandstone
		10	7/21				381-391 Light grey sandstone
390		6	7/25				391-397 grey sandstone
400		8	7/28				397-402 Brown & grey sandstone
410		13	7/29				402-418 Brown sandstone
420		10	7/30				418-428 Brown & grey sandstone
430		10	7/31				428-438 Brown & grey sandstone
440		8	8/1				436-446 Brown & grey sandstone
450		6	9/4				446-451 Red-brown Sandstone — Plumbness & Alignment test, perforated 446'

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DRILLERS'

LOG OF BOREHOLE

BOREHOLE Redmond Well 6 PAGE 4 OF 6

LOC. OR COORDS. SE¼ Sec 21, T. 15S, R. 13E. (W.Hammond.) DRILLER WESTERN WATER DEVELOPMENT

GROUND ELEV.

TOTAL DEPTH 871 FT RIG Bucyrus ERIE 36L

BOREHOLE DIAM. 26" BIT(S) 26" STMR

FLUID N/A

	START	FINISH
DATE	9/02/03	10/30/03
TIME	08:30	16:00

GEOPHYS. LOG x YES NO

HOW LEFT See Constn Log

LOCATION 121° 10' 42.8" W 44° 15' 23.3" N

LOGGED BY GAYLE ABERNATHY & BOB BUCKNER

PROJECT CITY OF REDMOND WELL #6

DEPTH	PEN. RATE	CIRC. REC.	CIRC. LOSS	AIR LIFT Q(GPM)	MATERIAL	SYMBOL	DESCRIPTION AND COMMENTS
460		11	8/5		sandstone		457-475 Red brown sandstone
							475-482 Brown-tan sandstone
470		14	8/6				482-490 Brown-Tan sandstone
							490-497 Grey sandstone
480		11	8/7				496-507 Grey sandstone
490		8	8/5				507-515 Grey sandstone - possibly broken. Added 1 sack cement
							515-520 Brown & grey sandstone
500		13	8/11				500-508 Grey sandstone, softer
510							508-520 Grey sandstone w/ black sand streaks
		12	8/12				
520							520-530 Brown & grey sandstone
		10	8/13				
530		12	8/14		sandstone w/ gravel		530-542 Brown sandstone w/ pea gravel
540							
		12	8/15				542-554 Dark grey sandstone w/ gravel
550							
		13	8/18				554-567 Dark grey sandstone w/ gravels
560							
		10	8/19				567-577 Dark grey sandstone w/ gravels Possibly sloughing
570							
		13	8/20				577-590 Dark grey sandstone w/ gravel
580							
		15	8/20				590-597 Dark grey sandstone w/ gravels
590							597-607 Tan-brown sandstone w/ gravels
600							

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DRILLERS'

LOG OF BOREHOLE

BOREHOLE Redmond well 6 PAGE 5 OF 6

LOCATION 121°10'42.8"W 44°15'17.5"N LOGGED BY GALE ABERNATHY & BOB BUCKNER

PROJECT City of Redmond WELL #6

LOC. OR COORDS. SE¼ Sec 21, T. 15S, R 13E (Willamette)

GROUND ELEV.

TOTAL DEPTH 872 FT

BOREHOLE DIAM. 26"

DRILLER WESTERN WATER DEVELOPMENT

RIG Bucyrus-Erie 36L

BIT(S) 26" STAR

FLUID N/A

	START	FINISH
DATE	4/02/03	10/30/03
TIME	08:30	16:00

GEOPHYS. LOG X YES NO

HOW LEFT See Constr. Log

F7/ Diff part e

DEPTH	PEN. RATE	CORE Feet	CORE Blows	AIR LIFT Q(GPM)	MATERIAL	SYM-BOL	DESCRIPTION AND COMMENTS
610		15"	8/11		sandstone w/gravel		597-605 Tan-brown sandstone w/ gravels
		12	8/22				605-618 Brown sandstone w/ gravel
620		14	8/25				618-632 Brown sandstone w/ gravel
630		19	8/32				632-650 Dark brown sandstone w/ cinders & gravels
650							
660		9	8/27				650-670 Dark brown sandstone w/ gravels
670							
680		16	8/28				670-686 Dark brown sandstone w/ gravels
690		12½	8/29				686-697 Dark brown sandstone w/ gravels & cinders
							697-699 Hard grey lava
700		5"	9/2				699-723 Hard grey lava
		3"	9/13				703-706 Hard grey basalt
		2.5"	9/14				706-708.5 Hard grey basalt
710		4	9/5				708.5-712.5
		3	9/8		Basalt Lava Flow		712-715 Hard grey basalt
		1.5"	9/7				715-716.5 Hard grey basalt
720		3.5	9/10				720-724.5 Hard lt grey basalt
		4.5"	9/11				724.5-729 Hard grey basalt
730		4.5"	9/12				729-733 Hard grey basalt
		4	9/15				733-735.5 Hard grey basalt
		8	9/16				735.5-741 Brown sandstone w/ small gravel
740					sandstone w/gravel		741-746 Brown sandstone w/ gravel
		12	7/17				746-753 grey sandstone w/ gravel
750							

DRILLERS'

LOG OF BOREHOLE

BOREHOLE Redmond Well 6 **PAGE** 6 OF 6

LOC. OR COORDS. SE¼ Sec 21 T. 15S., 12.13E (Willamette)
GROUND ELEV.
TOTAL DEPTH 872 ft
BOREHOLE DIAM. 26"

DRILLER WESTER WATER DEVELOPMENT
RIG BUCYRUS-ERIE 36L
BIT(S) 26" STR.
FLUID NONE

	START	FINISH
DATE	9/02/03	10/30/03
TIME	08:30	18:00

GEOPHYS. LOG X YES NO
HOW LEFT SRE Constr. Log

LOCATION 121°10.428'W 44°15.173'N
LOGGED BY Gale Abernathy for Boreal
PROJECT City of Redmond Well #6

DEPTH	PEN. RATE	AIR LIFT Q(GPM)	MATERIAL	SYM-BOL	DESCRIPTION AND COMMENTS
740	12 9/13		Sand stone		746-753 Grey sandstone w/ gravel
	8 9/18				753-757 Hard grey vesicular lava
	3 9/19		Basalt		757-760 Hard grey basalt
	3 9/22				760-763 Hard grey basalt
	4 9/23				763-765 Hard grey basalt
770			flow boundary ?		765-767 Dark grey lava (softer)
	7 9/24				767-774 Dark grey lava
	6 9/25				774-780 Grey vesicular lava
790	4 9/26				780-784 Grey Vesicular Basalt, Harder
	4 9/29				784-788
	4 9/30				788-792 Hard grey basalt
	2 10/1				792-794 Hard grey basalt
	3 10/2				794-797 Hard grey basalt
800			Flow boundary ?		797-803 Grey vesicular lava Broken ?
	7 10/6				803-806 Hard grey basalt
	2				806-807 Hard grey basalt
810	5 10/8				807-811 Dark grey vesicular lava Note - Driller remarked the water in the bailer was clean.
	5 10/9				811-816 Dark grey Vesicular lava
	1 10/10		Flow boundary		816-817 Grey vesicular lava
820	5 10/13				817-822 Grey Vesicular Lava ? NO SAMPLE AFTER 818 FT "LIVE WATER" Abe
	3 10/14				822-825 Grey Vesicular Lava ? NO SAMPLE COLLECTED IN BAILER
	5 10/15		NO CUTTINGS		w/ cinder seams
830	5 10/16				825-830 Fractured Lava ? NO SAMPLE
	7 10/20				830-835 Fractured Lava ? NO SAMPLE
840	3 10/21				835-842 Fractured Lava ? NO SAMPLE
	2 10/22				842 341' Fractured Lava ? Hard. Hole cored 3-4'. NO SAMPLE
	2 10/23				cuttings returned 843'
850	4 10/24		NO CUTTINGS		843-848 Dark grey basalt
	12 10/27				848-850 Hard grey basalt. Coring (from above)
860			Cinders, Sand & gravel		850-851 Hard grey lava
	5 10/28				851-854 Broken grey lava? No cuttings
870	1 10/29				854-860 Broken lava ? No cuttings
					860-866 Dark red-brown cinders with sand & small gravel Good hole
					866-868 Brown red cinders & gravels, Note: 4" of fine fine stray obsidian cuttings
					868-871 Brown & grey vesicular lava.
880					871-872 [Terminate drilling on 10/29 due to formation instability. Bail the hole on 10/30
					E-Logged 11/2/03 - stopped in to 862'

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JAN 28 2004

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

DESC 57788

Desc 57188

WELL ID # L 84243

(START CARD) # 187111

(1) OWNER:

Well Number: 7

Name City of Redmond

Address P.O. Box 726

City Redmond State OR Zip 97756

(2) TYPE OF WORK:

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

(3) DRILL METHOD:

[ ] Rotary Air [ ] Rotary Mud [X] Cable [ ] Auger

[ ] Other

(4) PROPOSED USE:

[ ] Domestic [X] Community [ ] Industrial [ ] Irrigation

[ ] Thermal [ ] Injection [ ] Livestock [ ] Other

(5) BORE HOLE CONSTRUCTION:

Special Construction approval [ ] Yes [X] No Depth of Completed Well 862' 862 ft.

Explosives used [ ] Yes [X] No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
26	0	862	Cement Slurry	0	68	210 sacks
			Cement Slurry	282	322	242 sacks

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

[ ] Other

Backfill placed from 68 ft. to 275 ft. Material Bentonite Chips

Gravel placed from 322 ft. to 862 ft. Size of gravel 6x12 & 1/4-

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	16	+2	525	.375	[X]	[ ]	[X]	[ ]
	16in	625	700	.375	[X]	[ ]	[X]	[ ]
	16in	750	780	.375	[X]	[ ]	[X]	[ ]
	16in	860	862.5	.375	[X]	[ ]	[X]	[ ]
Liner:					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:

[ ] Perforations Method Factory

[X] Screens Type Slotted Material 316L

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
525	625	.100		16in	pipe	[X]	[ ]
700	750	.100		16in	pipe	[X]	[ ]
780	860	.060		16in	pipe	[X]	[ ]
						[ ]	[ ]
						[ ]	[ ]

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

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

Yield gal/min	Drawdown	Drill stem at	Time
2700	3	370	24 hr.

Temperature of Water 54-58 Depth Artesian Flow found

Was a water analysis done? [X] Yes By whom Umpqua Labs

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 Deschutes Latitude Longitude

Township 15S N or S. Range 13E E or W. of WM.

Section 10(D) NW 1/4 SE 1/4

Tax lot 1100 Lot Block Subdivision

Street Address of Well (or nearest address) 450 NE 11th St., Redmond, OR 97756

(10) STATIC WATER LEVEL:

326 ft. below land surface. Date 12/13/2006

Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:

Depth at which water was first found 335

From	To	Estimated Flow Rate	SWL
335	850	5000+	326

(12) WELL LOG:

Ground elevation 3040'

Material	From	To	SWL
See Attached Borehole Lithology			

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JAN 17 2007

WATER RESOURCES DEPT
SALEM, OREGON

Western Water Development
P.O. Box 1670
Redmond, OR 97756

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FEB 07 2007

WATER RESOURCES DEPT
SALEM, OREGON

Date started 6/7/2006 Completed 12/14/2006

(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 my best 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 1385

Signed Robert Buckner Date 12/24/2006

Robert Buckner

ORIGINAL - WATER RESOURCES DEPARTMENT FIRST COPY - CONSTRUCTOR SECOND COPY - CUSTOMER

DESC 57788

CITY OF REDMOND
WELL #7 DRILLERS FROMATION LOG

Description		From	To	
3/4" Crushed Rock		0	1	
Broken Gray Lava		1	15	
Gray Basalt		15	31	
Red Cinders		31	34	
Broken Black/Red Rock		34	53	
Brown Rock		53	61	
Black Lava		61	77	
Brown Sandstone		77	84	
Brown Conglomerate		84	88	
Black Lava		88	107	
Brown Sandstone		107	121	
Redish & Black Lava		121	130	
Brown Sandstone		130	133	
Black Lava		133	144	
Gray Lava		144	158	
Reddish Brown Rock		158	159	
Brown Rock		159	172	
Brown Sandstone		172	176	
Red and Black Lava		176	181	
Redish & Brown Sandstone		181	191	
Black Lava		191	206	
Brown Sandstone		206	209	
Coarse Black Sand		209	221	
Black Lava		221	243	
Brown Sandstone		243	249	
Black Lava & with Brown Ash		249	273	
Hard Black Basalt		273	283	
Red Sandstone		283	306	
Brown Sandstone		306	325	
Light Brown Sandstone		325	335	
Dark Brown Sandstone	WB	335	391	330
Black Sandstone	WB	391	423	328
Fine Black Sand	WB	423	458	328
Brown Sandstone	WB	458	526	328
Broken Blue & Gray Basalt	WB	526	529	328
Blue & Gray Basalt	WB	529	537	328
Gray Basalt	WB	537	553	328
No Cuttings Semi Soft	WB	553	565	328
No Cuttings Harder	WB	565	580	328
Red & Black Basalt	WB	580	600	328
No Cuttings Broken & Hard	WB	600	610	328
Black Basalt	WB	610	613	328
Black Sandstone	WB	613	625	328
Brown Sandstone	WB	625	632	328
Reddish Brown Sandstone	WB	632	641	328
Multi Colored Coarse Sand	WB	641	658	328

Dark Brown Sandstone	WB	658	690	328
Brown Sandstone	WB	690	706	328
Blue & Gray Basalt	WB	706	711	328
Gray Basalt	WB	711	731	328
No Cuttings Soft	WB	731	734	328
No Cuttings Harder	WB	734	741	328
No Cuttings Soft	WB	741	745	328
No Cuttings Harder	WB	745	750	328
Broken Vesicular Basalt	WB	750	754	327
Black Sandstone	WB	754	770	327
Black & Brown Sandstone	WB	770	785	327
Vesicular Black Basalt	WB	785	790	327
Vesicular Red & Black Basalt	WB	790	800	327
Hard & Broken No Cuttings	WB	800	810	327
Brown Sandstone with Multi				327
Colored Sand Lenses	WB	810	818	327
Vesicular Red & Black Basalt	WB	818	826	327
Black Sandstone	WB	826	831	327
Black & Gray Basalt	WB	831	838	327
Red & Black Basalt	WB	838	843	327
Vesicular Black Basalt	WB	843	847	327
Hard Black & Gray Basalt	WB	847	850	327
Very Hard Gray Basalt		850	960	327

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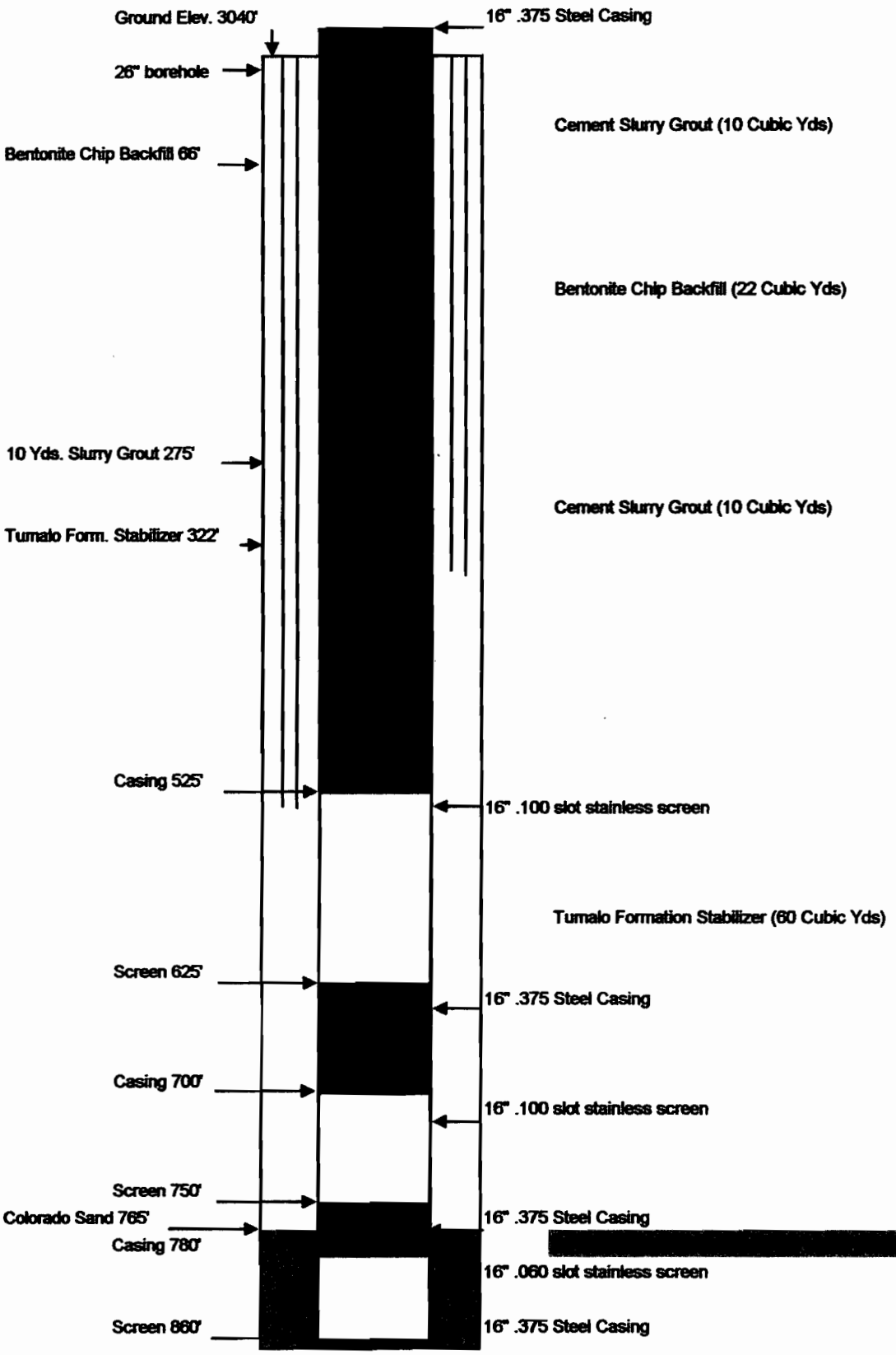
SALEM, OREGON

DESC 57788

CITY OF REDMOND WELL #7 AS BUILT



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JAN 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

Amended 5/2/2022

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

DESC 62721

6/23/2021

WELL I.D. LABEL# L 137714
START CARD # 1048874
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name PUBLIC WORKS Last Name DEPARTMENT
Company CITY OF REDMOND
Address 243 EAST ANTLER AVENUE
City REDMOND State OR Zip 97756

(2) TYPE OF WORK

[X] New Well [ ] Deepening [ ] Conversion [ ] Alteration (complete 2a & 10) [ ] Abandonment(complete 5a)

(2a) PRE-ALTERATION

	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
Casing:									

	Material	From	To	Amt	sacks/lbs
Seal:					

(3) DRILL METHOD

[X] Rotary Air [ ] Rotary Mud [X] 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 985.00 ft.

BORE HOLE

Dia	From	To
28	0	240
26	240	986

SEAL

Material	From	To	Amt	sacks/lbs
Cement	0	275	858	S
		Calculated	405.09	
		Calculated		

How was seal placed: Method [ ] A [ ] B [ ] C [X] D [ ] E
[ ] Other
Backfill placed from 275 ft. to 700 ft. Material 3/8 PEA GRAVEL
Filter pack from 700 ft. to 986 ft. Material COLO SILIC Size 6/9
Explosives used: [ ] Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE

Proposed Amount Actual Amount

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
●	○	20	X	7	743	.375	●	○	X	
●	○	18		974	985	.375	●	○	X	
○	○						○	○		
○	○						○	○		
○	○						○	○		

Shoe [ ] Inside [ ] Outside [ ] Other Location of shoe(s)
Temp casing [ ] Yes Dia From + To

(7) PERFORATIONS/SCREENS

Perforations Method
Screens Type Wire Wrap Slotted Material 304 Stainless

Perf/ Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Screen	Casing	18	744	974	.07			

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

(●) Pump ( ) Bailer ( ) Air ( ) Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
2773	76.6	592	96

Temperature 54 °F Lab analysis [X] Yes By Umpqua
Water quality concerns? [ ] Yes (describe below) TDS amount 122 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 15.00 S N/S Range 13.00 E E/W WM
Sec 19 SE 1/4 of the SW 1/4 Tax Lot 102
Tax Map Number Lot
Lat ° ' " or 44.24869500 DMS or DD
Long ° ' " or -121.22079200 DMS or DD
(●) Street address of well ( ) Nearest address
4365 SW VOLCANO AVENUE, REDMOND, OR 97756

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	5/26/2021			471

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 455.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
12/11/2020	455	505	250			452
2/26/2021	505	742	1500			459
3/4/2021	742	986	3000			471

(11) WELL LOG

Ground Elevation 3177.00

Material	From	To
Crushed Gravel & Loose Boulders	0	3
Brown Ash & Boulders	3	21
Brown Cemented Boulders	21	42
Boulders	42	51
Soft Brown Rock	51	52
Boulder	52	53
Soft Brown Rock	53	58
Hard Brown & Red Basalt	58	60
Brown & Red Rock & Ash	60	86
Hard Gray Basalt	86	137
Brown Conglomerate	137	152
Reddish Brown Conglomerate	152	176
Brown Conglomerate	176	195
Reddish Conglomerate & Red Cinders	195	205
Red & Black Broken Basalt	205	233
Gray Basalt	233	290
Mild Gray Basalt	290	332
Broken Gray Basalt & Cinders	332	339
Gray Basalt	339	345

Date Started 9/4/2020 Completed 5/26/2021

(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 Date

Signed

(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 1385 Date 6/23/2021

Signed ROBERT BUCKNER (E-filed)

Contact Info (optional)

ORIGINAL - WATER RESOURCES DEPARTMENT

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

WATER SUPPLY WELL REPORT - continuation page

DESC 62721

6/23/2021

WELL I.D. LABEL# L 137714

START CARD # 1048874

ORIGINAL LOG #

(2a) PRE-ALTERATION

Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

Material	From	To	Amt	sacks/lbs

(5) BORE HOLE CONSTRUCTION

BORE HOLE Dia	From	To

SEAL Material	From	To	Amt	sacks/lbs
		Calculated		
		Calculated		
		Calculated		
		Calculated		

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

(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

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)

(11) WELL LOG

Material	From	To
Lost Circulation	345	346
Mild Gray Basalt	346	370
Red & Black Cinders	370	375
Red Cinders	375	405
Brown Conglomerate Brn. Sandstone	405	465
Gray & Brown Ash & Gravel	465	505
Brown Sandstone & Basalt	505	540
Red Cinders	540	545
Gray Basalt	545	555
Pink Tuff / Pumice	555	563
Coarse Black Sand & Gravels	563	575
Tan Pumice	575	595
Coarse Black Sand & Gravels	595	633
Multi Color Sand & Gravels	633	742
Broken Dark Gray & Red Basalt	742	783
Broken Gray Basalt	783	795
Broken Red Basalt with Red Tuff	795	817
Red Multi Colored Sand Medium Coarse	817	825
Coarse Black Sand	825	845
Broken Dark Gray Basalt	845	854
Coarse Black Sand	854	856
Medium Hard Gray Basalt	856	864
Red & Black Cinders	864	867
Porous Broken Gray Basalt	867	937
Broken Gray Basalt	937	961
Red Cinders	961	965
Red Sandstone	965	970
Brown Sandstone & White Pumice	970	977
Broken Gray Basalt	977	986

Comments/Remarks

Backfill with bentonite frm_275' to_280': 20"X 18" concentric reducer frm_743' to_744'.

WATER SUPPLY WELL REPORT - Map with location identified must be attached and shall include an approximate scale and north arrow

DESC 62721

6/23/2021

Map of Hole

STATE OF OREGON
WELL LOCATION MAP

This map is supplemental to the WATER SUPPLY WELL REPORT

Oregon Water Resources Department
725 Summer St NE, Salem OR 97301
(503)986-0900

LOCATION OF WELL

Latitude: 44.24869500 Datum: WGS84
Longitude: -121.22079200
Township/Range/Section/Quarter-Quarter Section:
WM15.00S13.00E19SESW
Address of Well:
4365 SW VOLCANO AVENUE, REDMOND, OR 97756

Well Label: 137714

Printed: June 8, 2021

DISCLAIMER: This map is intended to represent the approximate location the well. It is not intended to be construed as survey accurate in any manner.

Provided by well constructor

Groundwater Application Review Summary Form

Application # G- _19348_

GW Reviewer _Joe Kemper_ Date Review Completed: _12/20/2023_

Summary of GW Availability and Injury Review:

☒ Groundwater for the proposed use is either over appropriated, will not likely be available in the amounts requested without injury to prior water rights, OR will not likely be available within the capacity of the groundwater resource per Section B of the attached review form.

Summary of Potential for Substantial Interference Review:

☒ There is the potential for substantial interference per Section C of the attached review form.

Summary of Well Construction Assessment:

☐ The well does not appear to meet current well construction standards per Section D of the attached review form. Route through Well Construction and Compliance Section.

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations and for conditions that may be necessary for a permit (if one is issued).

WATER RESOURCES DEPARTMENT

MEMO **_12/20/2023_**

TO: Application G-_19348_

FROM: GW: _Joe Kemper_
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference & General/Local Surface Water Evaluation for Deschutes Ground Water Study Area

The source of appropriation is within or above the _Deschutes__Scenic Waterway

Use the Scenic Waterway condition (Condition 7J).

PREPONDERANCE OF EVIDENCE FINDING UNDER ORS 390.835:

Department has found that there is a preponderance of evidence that the proposed use of groundwater will measurably reduce the surface water flows necessary to maintain the free-flowing character of the ___**Deschutes**__Scenic Waterway in quantities necessary for recreation, fish and wildlife.

LOCALIZED IMPACT FINDING

☐ The proposed use of groundwater will have a localized impact to surface water in the __[River Name]__ River/Creek Subbasin.

If the localized impact box above is checked, then the water use under any right issued pursuant to this application is presumed to have a localized impact on surface water within the identified subbasin. Mitigation of the impact, originating from within the Local Zone of Impact identified by the Department, will be required before a permit may be issued for the proposed use.

If the localized impact box above is not checked, then the water use under any right issued pursuant to this application is presumed to have a general (regional) impact on surface water. Mitigation of the impact, originating anywhere within the Deschutes Basin above the Madras gage, will be required before a permit may be issued for the proposed use.

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 12/20/2023
FROM: Groundwater Section Joe Kemper
Reviewer's Name
SUBJECT: Application G- **19348** Supersedes review of na
Date of Review(s)

PUBLIC INTEREST PRESUMPTION; GROUNDWATER

OAR 690-310-130 (1) *The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525.* Department staff review groundwater applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. **This review is based upon available information and agency policies in place at the time of evaluation**.

A. GENERAL INFORMATION: Applicant's Name: **City of Redmond** County: **Deschutes**

A1. Applicant(s) seek(s) 5.12 cfs from 6 well(s) in the Deschutes Basin, Upper Deschutes subbasin

A2. Proposed use Municipal (1828 AF/yr) Seasonality: Year Round

A3. Well and aquifer data **(attach and number logs for existing wells; mark proposed wells as such under logid)**:

POA Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	DESC 55853	6	Deschutes Fm	5.12	15S/13E-21 NW-SE	N 35°38'4" W 2444' fr SE cor S 21
2	DESC 57788	7	Deschutes Fm	5.12	15S/13E-10 SW-SE	1210' N, 1640' W fr SE cor S 10
3	DESC 62721	8	Deschutes Fm	5.12	15S/13E-19 SE-SW	513' N, 2807' W fr SE cor S 19
4	**In progress**	9	Deschutes Fm	5.12	15S/13E-9 SW-SW	185' N, 1190' E fr SW cor S 9
5	Proposed	10	Deschutes Fm	5.12	15S/13E-9 NE-NW	1332' S, 2020' E fr NW cor S 9
6	Proposed	11	Deschutes Fm	5.12	15S/13E-9 NE-SW	2530' N, 2160' E fr SW cor S 9

* Alluvium, CRB, Bedrock

POA Well	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Drawdown (ft)	Test Type
1	850	0-98, 374-399	0-550, 850-855	NA	550-850	2700	6	Pump
2	860	0-68, 282-322	0-525, 625-700, 750-780, 860-862	NA	525-625, 700-750, 780-860	2700	3	Pump
3	985	0-275	0-743, 974-985	NA	744-974	2773	76.6	Pump
4	789	0-100	Unknown	NA	Unknown	NA	NA	NA
5	800-1000	0-100	Unknown	NA	Unknown	NA	NA	NA
6	800-1000	0-100	Unknown	NA	Unknown	NA	NA	NA

POA Well	Land Surface Elevation at Well (ft amsl)	Depth of First Water (ft bls)	SWL (ft bls)	SWL Date	Reference Level (ft bls)	Reference Level Date
1	3058	342	336	12/22/2003	340.60	3/8/2007
2	3044	335	326	12/13/2006	330	3/17/2010
3	3168	455	471	5/26/2021	471	5/26/2021
4	2952	-	-	-	-	-
5	2928	-	-	-	-	-
6	2938	-	-	-	-	-

Use data from application for proposed wells.

A4. **Comments:** At the time of this application, well 9 is under construction (SC: 1070567) and well 10 &11 are proposed.

A5. ☒ **Provisions of the** Deschutes (OAR 690-009) Basin rules relative to the development, classification and/or management of groundwater hydraulically connected to surface water ☒ **are**, *or* ☐ **are not**, activated by this application. (Not all basin rules contain such provisions.)
Comments: Impacts to surface water are address by the Deschutes Mitigation as defined in basin rule.

A6. ☐ **Well(s) #** _____ , _____ , _____ , _____ , _____ , tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: _____

B. GROUNDWATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. **Based upon available data**, I have determined that groundwater* for the proposed use:

a. ☐ **is** over appropriated, ☒ **is not** over appropriated, *or* ☐ **cannot be determined to be** over appropriated during any period of the proposed use. * This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;

b. ☐ **will not** *or* ☐ **will** likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;

c. ☒ **will not** *or* ☐ **will** likely to be available within the capacity of the groundwater resource; or

d. ☐ **will, if properly conditioned**, avoid injury to existing groundwater rights or to the groundwater resource:

i. ☒ The permit should contain condition #(s) 7RLS, Municipal water use reporting;

ii. ☐ The permit should be conditioned as indicated in item 2 below.

iii. ☐ The permit should contain special condition(s) as indicated in item 3 below;

B2. a. ☐ **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;

b. ☐ **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;

c. ☐ **Condition** to allow groundwater production only from the _____ groundwater reservoir between approximately _____ ft. and _____ ft. below land surface;

d. ☐ **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): _____

B3. **Groundwater availability remarks:** This application proposes to pump 1828 AF (max rate of 5.12 cfs) from 6 wells. The applicant's wells would access the Deschutes regional groundwater system where it is hosted by the high-permeability mixed volcanics, volcaniclastic sediments, and alluvium of the Deschutes Formation. The Deschutes regional groundwater system is predominately recharged by heavy precipitation in the Cascades, then it transmits groundwater via long flowpaths towards large spring complexes that discharge to the Deschutes and Crooked rivers near their confluence. While there is geologic and hydrologic heterogeneity at local scales, the Deschutes regional groundwater system is considered a single aquifer. Wells close to the recharge pulses from the Cascades (e.g., DESC 3016) continue to track closely with 5–10-year climate trends. Recent declines at DESC 3016 reflect the acute drought since the late 2010s, but water levels are still within the range of historic observations. Wells further from Cascade recharge have declined below historic observations (see Hydrograph 1). Since the mid-1990s, wells in the center of the basin have declined persistently at a rate of ~1 ft/yr despite above average precipitation periods (e.g. late 1990s). DESC 3903 (in west Redmond) has declined 40 feet since 1990, and DESC 5045 (near Bend's Pine Nursey Park) has declined 37.4 feet since 1994. DESC 5045 has already declined more than 50 feet since the highest known water level in the late 1970s, which meets the definition of declined excessively as per OAR 690-008-0001(4)(d). At the current rate of decline, DESC 3903 is expected to pass 50 feet of total decline within 3-5 years.

Many studies have documented that precipitation in the Cascades is the primary driver of groundwater flux and water level change within the Deschutes regional groundwater system. In recent decades, however, groundwater pumpage in the center of the basin has increased while the lining/piping of irrigation canals has reduced recharge via leakage. A USGS report by Gannett, et. al., (2013) estimated that, of groundwater declines in the area between Redmond and Powell Buttes through 2008, 60-65% are caused by climate influences, 25-30% are due to increases in pumping, and 10% are caused by canal

leakage reductions. In other words, pumping does contribute to groundwater decline in this area. The available data indicates that these stressors on the groundwater system have persisted or increased since that report was published.

In summary, observation wells in the targeted aquifer zone have seen persistent year-on-year water level declines since the mid-1990s. There is one well (DESC 5045) located 10 miles to the south, but still within the target aquifer, that has declined excessively. Because groundwater pumping contributes meaningfully to groundwater declines, the requested use would exacerbate declines that are increasingly close to meeting the definition of declined excessively. This additional use would preclude the perpetual use of the resource. As such, the proposed use is determined to be not within the capacity of the resource.

If the application is approved, the permit conditions indicated in B.1.d.i. are recommended. With respect to reference levels indicated in Section A of this review, Wells 6, 7, 8, and 9 are all included in water rights under permit G-12401. Issued in 1996, this water right required the owner to submit a water level measurement plan that would establish reference levels by which evaluate declines. Current records do not indicate that reference levels were established by this plan, but reference levels for existing wells should have been established during the spring of 1997. Reference levels chosen here to reflect the earliest permit condition measurement submitted to the department after the establishment of the water level measurement plan.

C. GROUNDWATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040

C6. **SW / GW Remarks and Conditions:** Impacts to surface water are addressed by the Deschutes Mitigation program as defined in basin rule.

References Used:

Gannett, M. W. and Lite, K. E., 2004, Simulation of Regional Ground-Water Flow in the Upper Deschutes Basin, Oregon, USGS Water Resources Investigation Report 2003-4195, 84 p., https://pubs.er.usgs.gov/publication/wri034195

Gannett, M. W. and Lite, K. E., 2013, Analysis of 1997-2008 Groundwater Level Changes in the Upper Deschutes Basin, Central Oregon, USGS Scientific Investigations Report 2013-5092, 34p., https://pubs.er.usgs.gov/publication/sir20135092

Gannett, M. W., Lite Jr, K. E., Morgan, D. S., and Collins, C. A., 2001, Ground-Water Hydrology of the Upper Deschutes Basin, Oregon, USGS Water-Resources Investigations Report 00-4162, 74 p., https://pubs.usgs.gov/wri/wri004162/pdf/WRIR004162.pdf

Gannett, M.W., Lite, K.E., Jr., Risley, J.C., Pischel, E.M., and La Marche, J.L., 2017, Simulation of groundwater and surface-water flow in the upper Deschutes Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2017–5097, 68 p., https://doi.org/10.3133/sir20175097.

Groundwater Information System (GWIS). Oregon Water Resources Department. https://apps.wrd.state.or.us/apps/gw/gw_info/gw_info_report/gw_search.aspx Accessed 12/19/2023

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D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #**: _____ **Logid:** _____

D2. **THE WELL does not appear to meet current well construction standards based upon:**

a. ☐ review of the well log;

b. ☐ field inspection by _____;

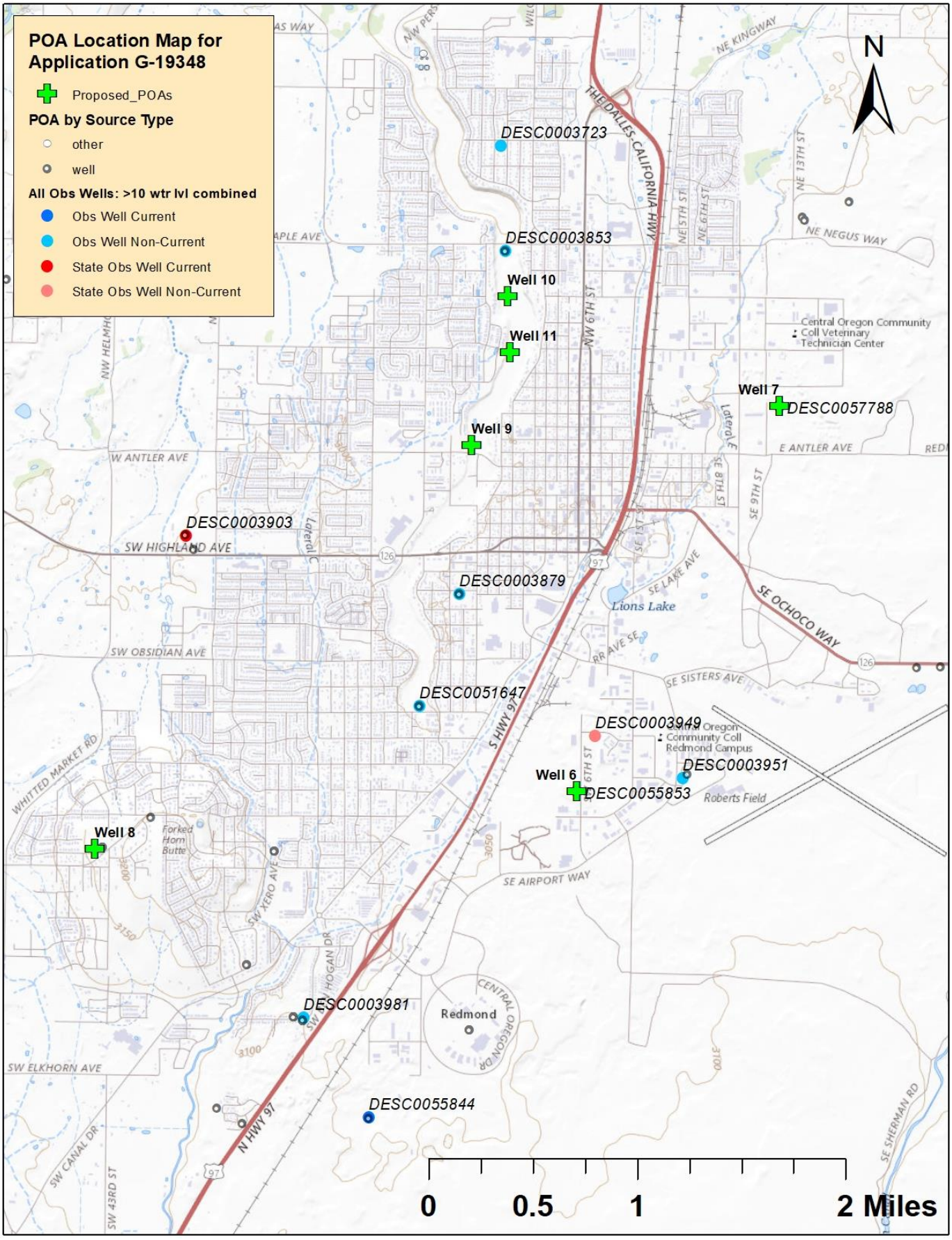
c. ☐ report of CWRE _____;

d. ☐ other: (specify) _____

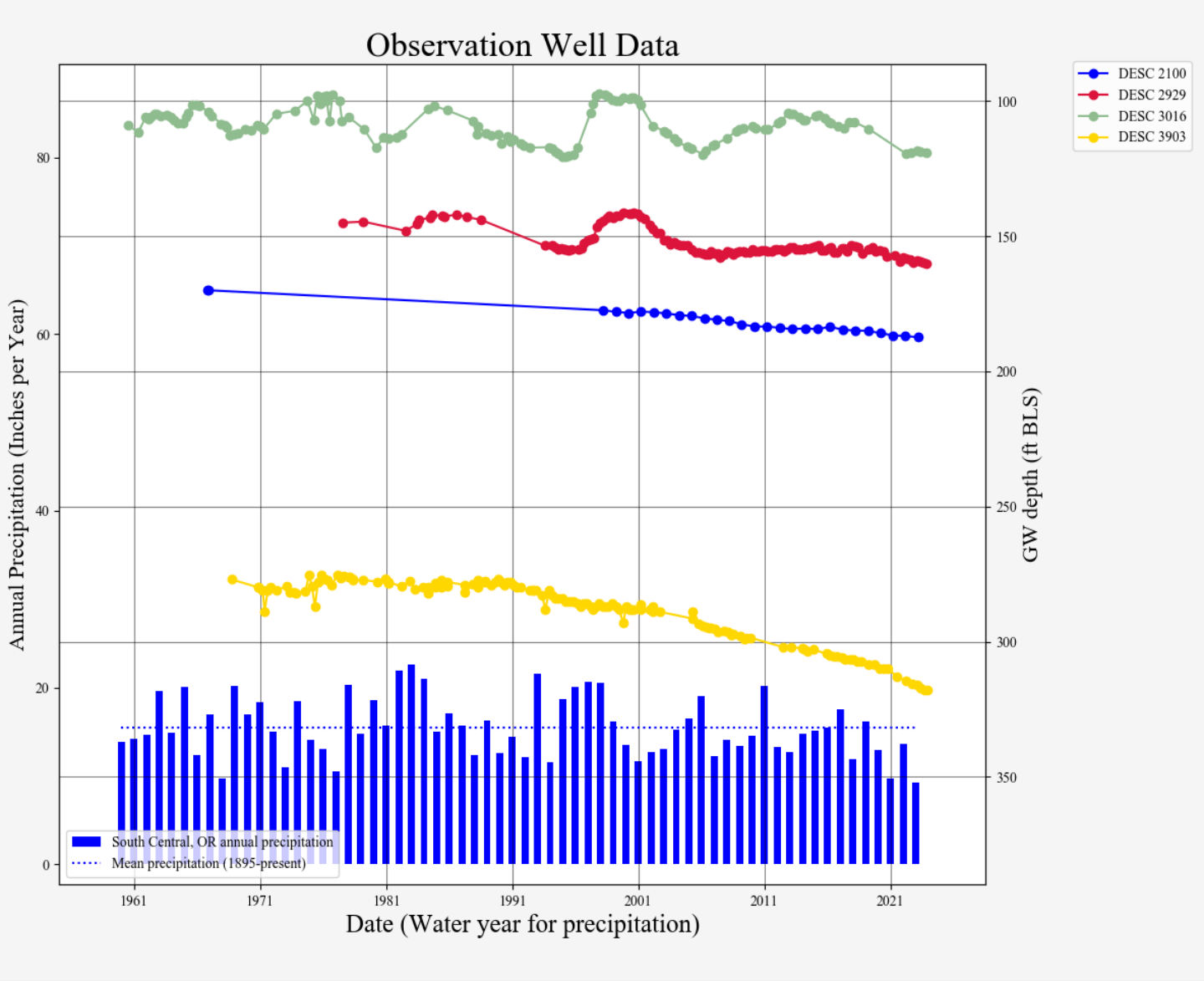
D3. **THE WELL construction deficiency or other comment is described as follows:** _____

D4. ☐ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Well Location Map



Hydrograph 1: DESC 3016 is located on the west side of Sisters, DESC 2929 is located on the east side of Sisters, DESC 2100 is located in the Lower Bridge Area, DESC 3903 is located on the west side of Redmond.



Hydrograph 2: Groundwater level measurements in the Redmond area.