Approved: 

MEMO

To:	Kristopher Byrd, Well Construction and Compliance Section Manager
From:	Travis Kelly, Well Construction Compliance Coordinator
Subject:	Review of Water Right Application G-19038
Date:	February 16, 2022

The attached application was forwarded to the Well Construction and Compliance Section by the Groundwater Section. Stacey Garrison and Travis Brown reviewed the application. Please see Stacey and Travis' Groundwater Review and the Well Report.

Applicant's Well #1 (Proposed Well): Applicant's Well #1 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 applicant's proposed Well #1 may not satisfy hydraulic connection issues.

Applicant's Well #2 (CLAC 70813): Based on a review of the Well Report, Applicant's Well #2 seems to protect the groundwater resource.

The construction of Applicant's Well #2 may not satisfy hydraulic connection issues

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

CLAC 70813

10/30/2014

WELL I.D. LABEL# L 112817
START CARD # 1021423
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name RICK Last Name GRUEN
Company CLACKAMAS COUNTY PARKS
Address 150 BEAVERCREEK RD
City OREGONCITY State OR Zip 97045

(2) TYPE OF WORK

☒ 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

☒ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger ☐ Cable Mud
☐ Reverse Rotary ☐ Other

(4) PROPOSED USE

☒ Domestic ☐ Irrigation ☐ Community
☐ Industrial/ Commericial ☐ Livestock ☐ Dewatering
☐ Thermal ☐ Injection ☐ Other

(5) BORE HOLE CONSTRUCTION

Special Standard ☐ (Attach copy)
Depth of Completed Well 762.00 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/lbs
10	0	20	Cement	0	680	5400	P
8	20	701	Cement	680	701	600	P
5.5	701	762					

How was seal placed: Method ☐ A ☐ B ☒ C ☒ D ☐ E
☐ Other
Backfill placed from 20 ft. to 701 ft. Material CEMENT
Filter pack from ft. to ft. Material Size
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
●	○	6	☒	2.5	701	250	●	○	☒	☐
○	○		☐				○	○	☐	☐
○	○		☐				○	○	☐	☐
○	○		☐				○	○	☐	☐
○	○		☐				○	○	☐	☐

Shoe ☒ Inside ☐ Outside ☐ Other Location of shoe(s) 701
Temp casing ☒ Yes Dia 10 From 0 To 20

(7) PERFORATIONS/SCREENS

Perforations Method
Screens Type Material

Perf/ Screen	Casing/ Screen Liner	Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size

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

○ Pump ○ Bailer ◉ Air ○ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
100		760	1.5
80		600	0.5
72		500	

Temperature 56 °F Lab analysis ☐ Yes By
Water quality concerns? ☐ Yes (describe below) TDS amount

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County CLACKAMAS Twp 2.00 S N/S Range 3.00 E E/W WM
Sec 23 NE 1/4 of the SW 1/4 Tax Lot 500
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
◉ Street address of well ○ Nearest address
19009SE BARTON PARK RD

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	11/8/2013			100

Flowing Artesian? ☐ Dry Hole? ☐

WATER BEARING ZONES Depth water was first found 707.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
11/8/2013	707	762	100			100

(11) WELL LOG

Ground Elevation

Material	From	To
brown clay	0	8
brown clay w/ cobbles	8	14
gray clay	14	28
blue clay	28	72
gritty blue clay	72	132
blue & gray clay	132	280
multi colored sandstone	280	283
gray clay	283	289
rhododendron rock	289	370
gray rock	370	420
blue & brown claystone	420	425
brown claystone	425	430
red rock	430	436
black & gray rock	436	515
red clay	515	520
rhododendron rock	520	605
brown claystone	605	655
gray clay stone	655	682
black basalt	682	707

Date Started 10/17/2013 Complete 11/8/2013

(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 1771 Date 10/30/2014

Signed GEORGE YOUNGBERG (E-filed)

Contact Info (optional) Youngberg pump & well drilling ph. 503-630-3970

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

CLAC 70813

10/30/2014

WELL I.D. LABEL# L 112817

START CARD # 1021423

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

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)
50		400	0.5

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
gray basalt W/B	707	762

Comments/Remarks

Groundwater Application Review Summary Form

Application # G- 19038

GW Reviewer Stacey Garrison/Travis Brown Date Review Completed: 1/18/2022

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 **_January 18 2022_**

TO: **Application** G-**_19038_**

FROM: **GW:** **_Stacey Garrison/Travis Brown_**
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ **YES**
☒ **NO** The source of appropriation is hydraulically connected to a State Scenic Waterway or its tributaries

☐ **YES**
☒ **NO** Use the Scenic Waterway Condition (Condition 7J)

☐ Per ORS 390.835, the Groundwater Section is **able** to calculate ground water interference with surface water that contributes to a Scenic Waterway. The calculated interference is distributed below

☐ Per ORS 390.835, the Groundwater Section is **unable** to calculate ground water interference with surface water that contributes to a scenic waterway; **therefore, the Department is unable to find that there is a preponderance of evidence that the proposed use will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway**

DISTRIBUTION OF INTERFERENCE

Calculate the percentage of consumptive use by month and fill in the table below. If interference cannot be calculated, per criteria in 390.835, do not fill in the table but check the "unable" option above, thus informing Water Rights that the Department is *unable to make a Preponderance of Evidence finding.*

Exercise of this permit is calculated to reduce monthly flows in _[Enter]_ Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 1/18/2022
FROM: Groundwater Section Stacey Garrison/Travis Brown
Reviewer's Name
SUBJECT: Application G- **19038** Supersedes review of _____
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: **Clackamas County Parks** County: **Clackamas**

A1. Applicant(s) seek(s) 0.22 cfs from 2 well(s) in the Willamette Basin, Clackamas subbasin

A2. Proposed use Irrigation Seasonality: Mar 1-Oct 31

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

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	NEW	1	CRB[a]	0.22	2S/3E-23 NE-SW	70' N, 2125' W fr NE cor DLC 46
2	CLAC 70813	2	CRB	0.22	2S/3E-23 SE-NW	1075' N, 2915 W fr NE cor DLC 46
3						
4						

* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1	168[b]				780[c]	0-680[c]	0-680[c]		680-780[c]			
2	211[b]	707	100	11/8/2013	762	0-701	0-701			100		Air

Use data from application for proposed wells.

A4. **Comments:** The proposed POAs/POU are ~ 5 miles southeast of Damascus. Applicant proposes to irrigate up to 8.6 acres with the maximum annual volume of 21.5 af, based on the maximum allowed duty of 2.5 af/acre.
[a] In section 3 of the Groundwater Application, the applicant has stated that the proposed well (Applicant Well # 1) will be completed in "a basalt aquifer". This has been assumed to indicate the Columbia River Basalt Group. The completed well must comply with the Oregon water well construction standards (OAR 690-200 and OAR 690-210) for the applicable aquifer type.
[b] Well locations were projected in OWRD's database according to the metes and bounds descriptions provided on the application map. Well elevation data from LiDAR ground surface elevation at the projected locations (Watershed Sciences 2009, USGS 2013).
[c] Proposed well construction, section 3 of Groundwater Application. Per special condition construction standards provided in B3, the open interval of 100 feet is assumed.

A5. ☐ **Provisions of the** Willamette 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: The proposed POA is less than ¼-mile from the nearest surface water source, but will develop a confined aquifer; therefore, per OAR 690-502-0240, the relevant Willamette Basin rules (OAR 690-502-0040 and OAR 690-502-0140) do not apply.

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

Name of administrative area: **Not applicable**

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) **7i (Willamette Basalt Condition), large 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 **Columbia River Basalt** 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. **Special Conditions:**

1. Each basalt well shall be cased and continuously sealed from land surface to a depth of at least 50 feet to preclude hydraulic connection to nearby streams.

2. Any well added to or deepened under this or subsequent permits shall be open to a single aquifer of the Columbia River Basalt Group and shall meet the applicable well construction standards (OAR 690-200 and OAR 690-210). In addition, the open interval in each well shall be no greater than 100 feet. An open interval of greater than 100 feet may be allowed if substantial evidence of a single aquifer completion can be demonstrated to the satisfaction of the Department Hydrogeologists, using information from a video log, downhole flowmeter, water chemistry and temperature, or other downhole geophysical methods. These methods shall characterize the nature of the basalt rock and assess whether water is moving in the borehole. Any discernable movement of water within the well bore when the well is not being pumped shall be assumed as evidence of the presence of multiple aquifers in the open interval. If during well construction, it becomes apparent that the well can be constructed to eliminate interference with hydraulically connected streams in a manner other than specified in this permit, the permittee can contact the Department Hydrogeologist for this permit or the Ground Water/Hydrology Section Manager to request approval of such construction. The request shall be in writing, and shall include a rough well log and a proposed construction design for approval by the Department. The request can be approved only if it is received and reviewed prior to placement of any permanent casing and sealing material. If the request is made after casing and seal are placed, the requested modification will not be approved. If approved, the new well depth and construction specifications will be incorporated into any certificate issued for this permit.

3. For any well constructed under this or subsequent permits, a dedicated water-level measuring tube shall be installed in each well. The measuring tube shall meet the standards described in OAR 690-215-0060. When requested, access to the wells shall be provided to Department staff in order to make water-level measurements.

4. For any wells constructed or deepened under this or subsequent permits, the applicant shall coordinate with the driller to ensure that drill cuttings are collected at 10 ft intervals and at changes in formation in each well. A split of each sampled interval shall be provided to the Department.

5. If any geologic and hydrogeologic reports are completed for the permittee during the development of permitted wells, including geophysical well logs and borehole video logs, then copies of the reports shall be provided to the Department. Except for borehole video logs, two paper copies, or a single electronic copy, shall be provided of each report. Digital tables of any data shall be provided upon request.

Groundwater availability remarks: Well 1, NEW well, is yet to be constructed. Per the applicant, the intent is that the NEW well will utilize a basalt aquifer with the water-bearing zone at an approximate depth of 665 ft bls (elevation of -497 ft msl), and to a maximum depth of 800 ft bls (elevation of -632 ft msl). Based on the data from nearby well logs, this will likely be the Columbia River Basalt Group. Much of the hydrogeology analysis in the following paragraphs is assumed to be similar for both wells, unless otherwise stated.

Groundwater for the proposed use cannot be determined to be over-appropriated due to insufficient available data regarding rates of recharge and the current quantity of groundwater withdrawals from the aquifer system.

The existing POA (CLAC 70813) utilizes a water-bearing zone within the Columbia River Basalt Group (CRBG); aquifers in the CRBG are typically thin interflow zones between lava flows and confined by thicker flow interiors that have low porosity and low permeability (Conlon et al 2005, Gannet and Caldwell 1998, Reidel et al 2002). Comparison of the POA well log with local lithology indicates the POA likely utilizes water from the Frenchman Springs member of the Wanapum Basalt, or the Grand Ronde Basalt given the extent of anticlinal activity in the area (Anderson 1978, Madin and Staub 1994, McFarland 1996, Madin 2004). The POAs are located within the Portland Hills-Clackamas River Fault Zone, which is deformed by predominantly southeast by northwest trending faults, possibly resulting in compartmentalization of aquifers (Anderson 1978, Madin and Staub 1994). There is a northwest trending fault less than a mile to the northwest of CLAC 70813 (Madin 2004). The degree of compartmentalization due to nearby faults, which is unknown at this time, may exacerbate well-to-well interference and longer-term water level declines in the local basalt aquifer.

A review of statistics for nearby well records was completed and compared with the proposed rate of 0.22 cfs (100 gpm) for this application (see Well Statistics 2S/3E). There is some uncertainty regarding the ability of the groundwater resource to sustain the proposed use of 0.22 cfs (100 gpm); median reported well yield is 20 gpm, however, the proposed rate is less than the maximum reported yield of 545 gpm. The proposed rate for this application is 500 percent of the median, and 18 percent of the maximum reported yield. However, few of these wells appear to be in the CRBG. Previous studies have reported yields for wells utilizing the CRBG in the Clackamas River drainage ranging from 20 to 350 gpm (Leonard and Collins 1983).

Water level trends for nearby wells that utilize the CRBG appear to be stable (see Water Level Measurements in Nearby Wells). Two of the wells, CLAC 56352 (~ 9.9 miles to the southwest) and CLAC 20274 (~ 10.3 miles to the southwest) show relatively stable water levels. One of the wells, CLAC 18421 (~8.2 miles to the southwest) shows a steady but moderate decline. The last well, CLAC 59771 (9.8 miles to the southwest), has 3 datapoints, so it is difficult to make any interpretations of trends.

A Theis drawdown analysis was completed to assess well-to-well interference and identify the radius of influence that would experience 15 feet of drawdown. The 15 feet of drawdown represents the threshold for the permit standard condition for basalt aquifers in the Willamette Basin. Results indicate that the 15 feet of drawdown threshold would be exceeded for wells within 5.5 feet of either Well 1 or Well 2, and that this would occur after 244 days of continuous pumping (see Theis Drawdown Analysis Threshold Radius). This minimal impact appears to be largely due to the low pumping rate. The nearest groundwater user to Well 1 (NEW well) and Well 2 (CLAC 70813) that utilizes the CRBG is CLAC 69616, which is 1,278 feet away from Well 1 and 1,1164 feet away from Well 2. In addition, CLACL 69616 is on the same taxlot as Wells 1 and 2, with the applicant (Clackamas County Parks) recorded as the owner on the well log. Results indicate that the proposed use is not likely to cause well-to-well interference with CLAC 69616 that exceeds the standard permit conditions for basalt aquifers in the Willamette Basin. Based on this analysis of the available data and under the assumptions previously identified, groundwater for the proposed use **will likely be available in the amounts requested and within capacity of the resource; however, the conditions specified in B1.d. are strongly recommended to protect senior users and the groundwater resource.**

NOTE: This evaluation considers a conservative scenario for the nearest authorized POA. Other authorized POAs in the area may also experience an increase in interference as a result of this application, although to a lesser extent than the scenario evaluated here.

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

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**CRB**	☒	☐
2	**CRB**	☒	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Well 2, CLAC 70813, has a SWL reported to be 100 ft bls (elevation of 111 ft msl). CLAC 70813 well log reports Black Basalt from 682 to 707 ft bls, indicating at least 25 feet of confining layer reaching up to 682 ft bls (elevation of -471 to -496 ft msl). The SWL is 582 feet above the overlying confining layer. Well 1, the NEW well to be constructed, is anticipated to be of similar construction with a continuous seal to a confining layer.

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**Clackamas River**	**111[a]**	**135-155**	**686**	☐	☒	☐	☐	☒
1	**2**	**Goose Creek**	**111[a]**	**155-181**	**338**	☐	☒	☐	☐	☒
1	**3**	**Deep Creek**	**111[a]**	**234-282**	**3,255**	☐	☒	☐	☐	☒
1	**1**	**Clackamas River**	**111**	**135-155**	**1,089**	☐	☒	☐	☐	☒
2	**2**	**Goose Creek**	**111**	**155-181**	**1,592**	☐	☒	☐	☐	☒
2	**3**	**Deep Creek**	**111**	**234-282**	**2,748**	☐	☒	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: CLAC 70813 is continuously sealed into hard dense basalt to an elevation of around -490 ft msl with a water-bearing zone at -496 ft msl to -551 ft msl, and static water level of 111 ft msl. The local streambeds are around 139 to 257 ft msl in elevation. The nearby surface water sources do not appear to have incised through the confining layer (Black Basalt) overlying the water-bearing zone. Well 1, the NEW well to be constructed, is anticipated to be of similar construction with a continuous seal to a confining layer, with an estimated static water level of 111 ft msl. The aquifer utilized by the POAs should be isolated from overlying local streams.

[a] Calculated based on the land surface elevation of the proposed well location and reported static water levels in nearby wells utilizing the same proposed aquifer.

Water Availability Basin the well(s) are located within: CLACKAMAS R> WILLAMETTE R – AT MOUTH

C3a. **690-09-040 (4):** Evaluation of stream impacts for each well that has been determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water (SW) source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that SW source, not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% *natural* flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked ☒ box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

C3b. **690-09-040 (4):** Evaluation of stream impacts by total appropriation for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells**. Otherwise same evaluation and limitations apply as in C3a above.

	SW #		Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: Not applicable

C4a. **690-09-040 (5):** Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
Distributed Wells Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.													
(B) = 80 % Nat. Q													
(C) = 1 % Nat. Q													
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		%	%	%	%	%	%	%	%	%	%	%	%

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

Basis for impact evaluation: Not applicable

C4b. **690-09-040 (5) (b) The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.**

C5. ☐ **If properly conditioned**, the surface water source(s) can be adequately protected from interference, and/or groundwater use under this permit can be regulated if it is found to substantially interfere with surface water:

i. ☐ The permit should contain condition #(s)_____;

ii. ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:** Not applicable

References Used:

Application File: G-19038

Water Well reports: CLAC 70813, CLAC 69616, CLAC 5052, CLAC 5047, CLAC 4817, CLAC 12303

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Gannett, M.W. and Caldwell, R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A, 32 p.

Leonard, A.R., and Collins, C.A., 1983, Ground water in the northern part of Clackamas County, Oregon: Oregon Water Resources Department Ground Water Report 29. 85 p.

Madin, I.P. and Staub, P.E. 1994. Geologic Map of the Damascus Quadrangle, Clackamas and Multnomah Counties, Oregon.

Madin, I.P. 2004. Geologic mapping and database for Portland area fault studies: final technical report. Oregon Department of Geology and Mineral Industries. Open file report O-2004-02, 18 p.

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Reidel, S.P., Johnson, V.G., and Spane, F.A., 2002, Natural gas storage in basalt aquifers of the Columbia Basin, Pacific Northwest USA—A guide to site characterization: Richland, Wash., Pacific Northwest National Laboratory, 277 p.

Theis, C.V., 1935. The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage, American Geophysical Union Transactions, vol. 16, p. 519-524.

United States Geological Survey, 2013, National Elevation Dataset (NED) [DEM geospatial data]. 1/9th arc-second, updated 2013.

United States Geological Survey, 2020, Damascus quadrangle, Oregon [map], 1:24,000, 7.5 minute topographic series, U.S. Department of the Interior, Reston, Virginia.

Watershed Sciences, 2009, LIDAR remote sensing data collection, Department of Geology and Mineral Industries, Willamette Valley Phase I, Oregon: Portland, OR, December 21

Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82 p.

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:** _____

_____

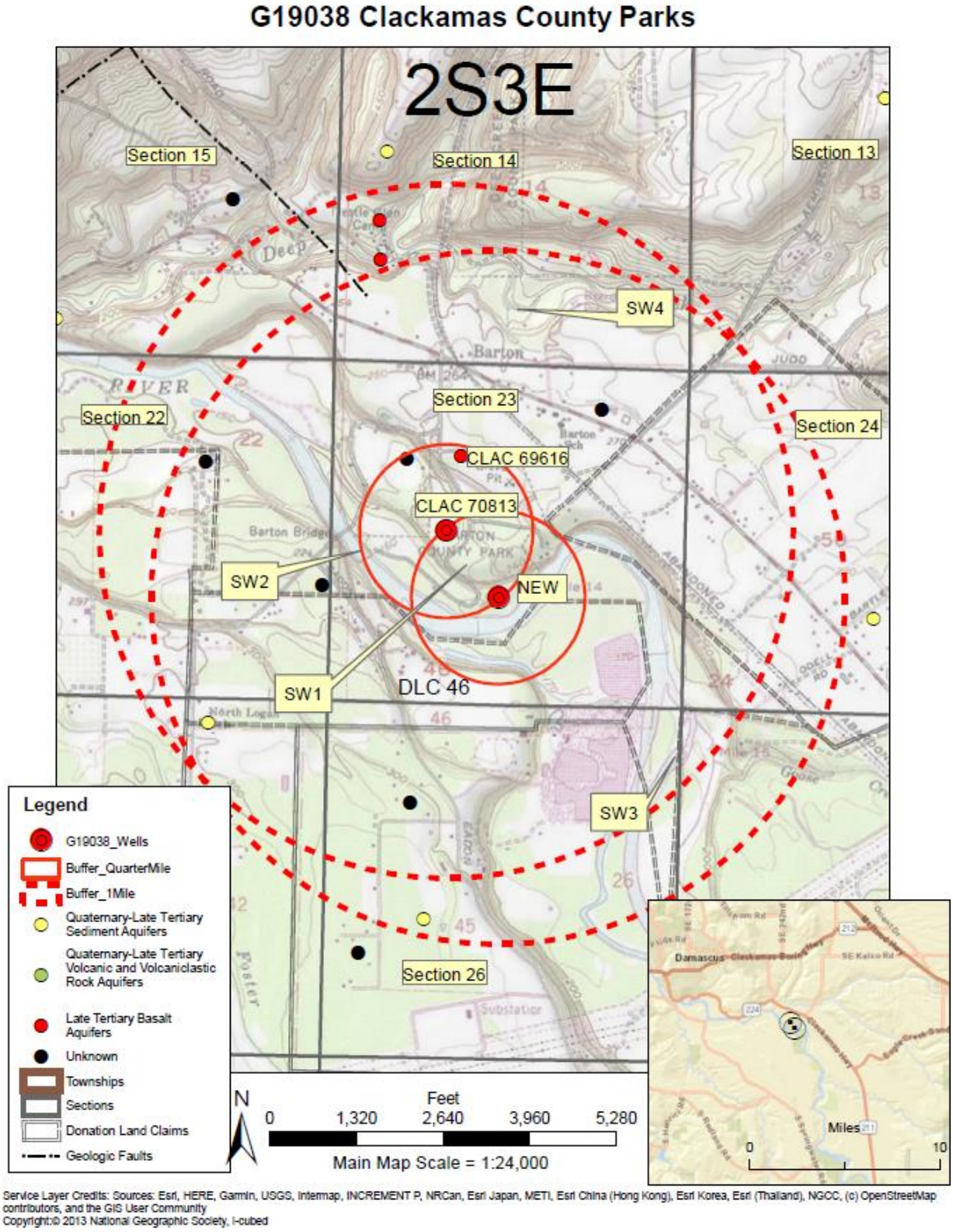
_____

_____

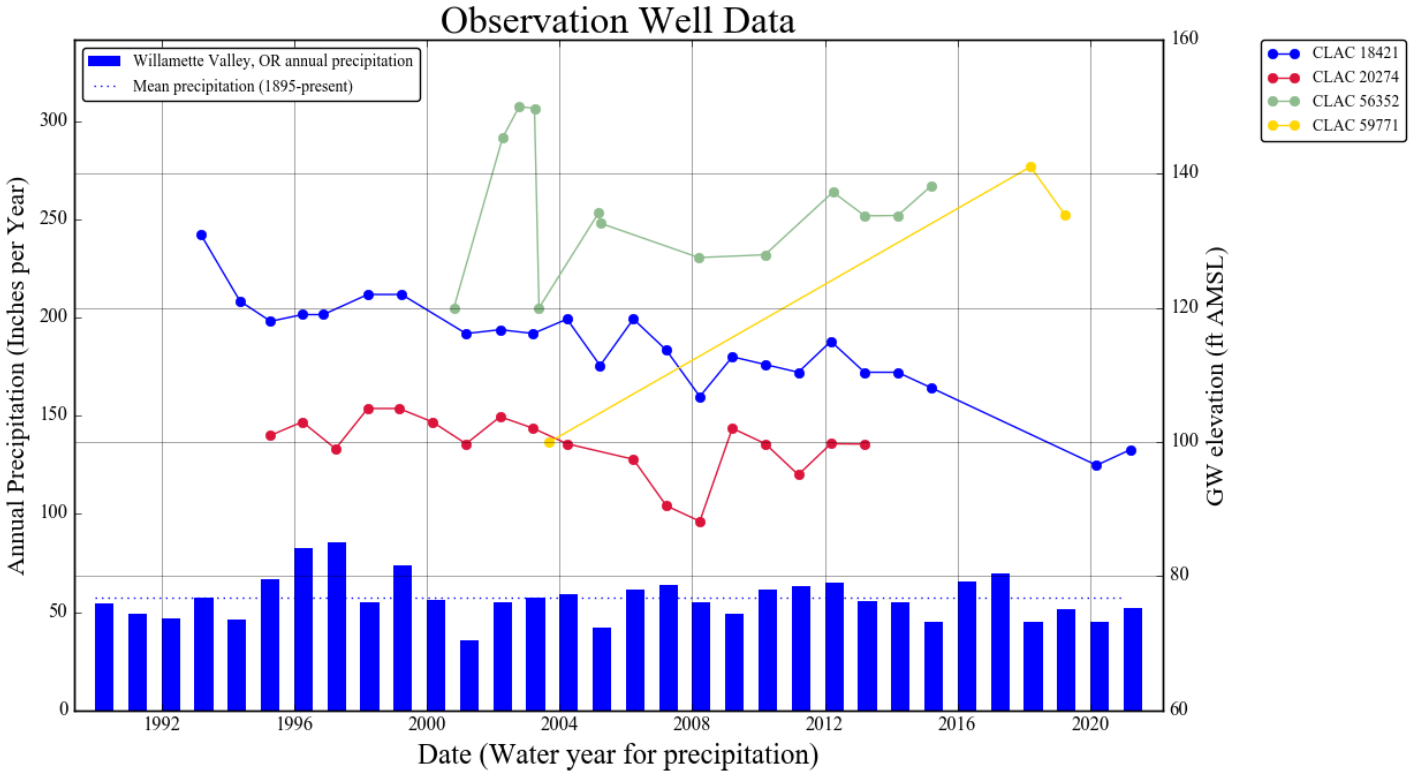
_____

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

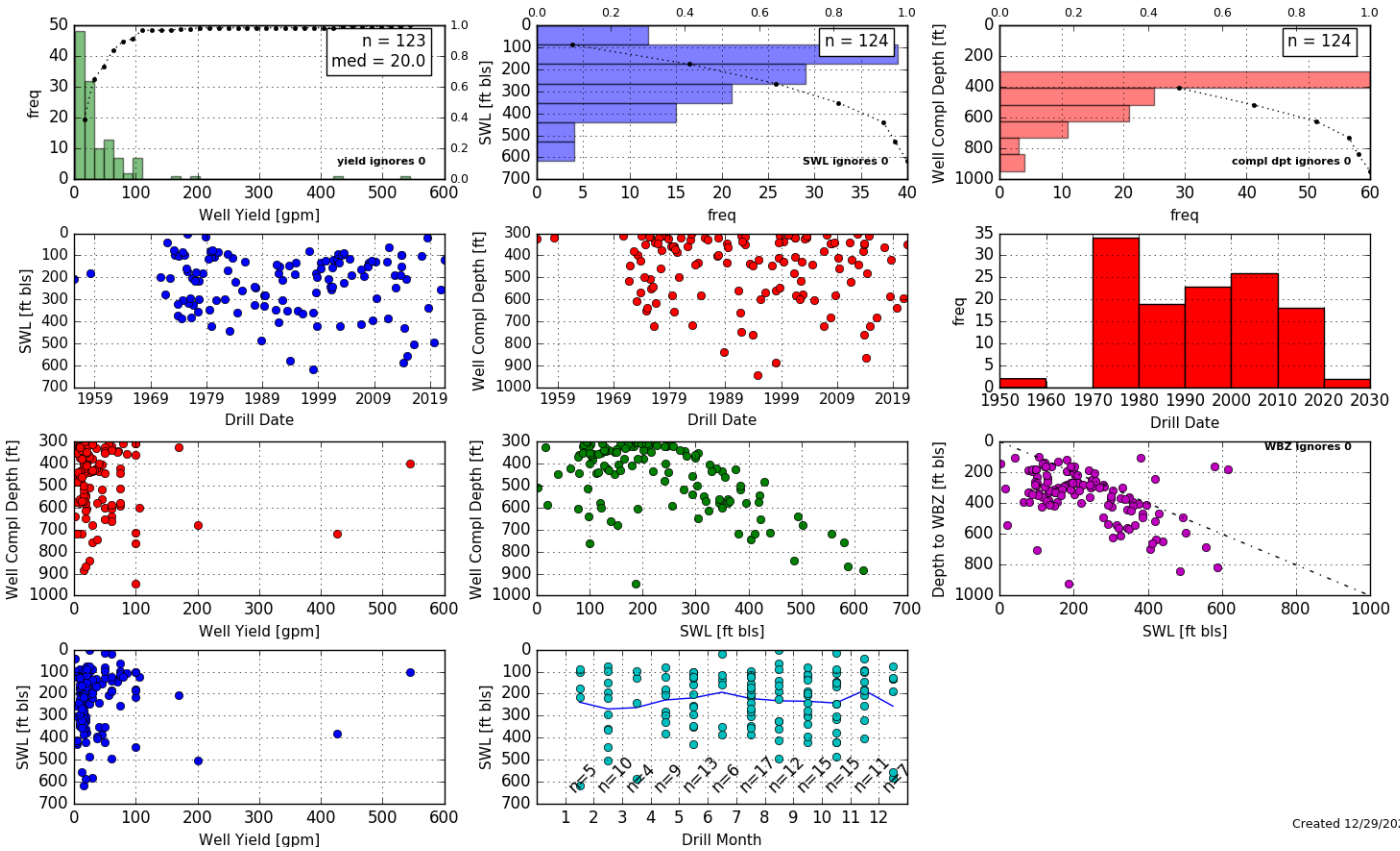
Well Location Map



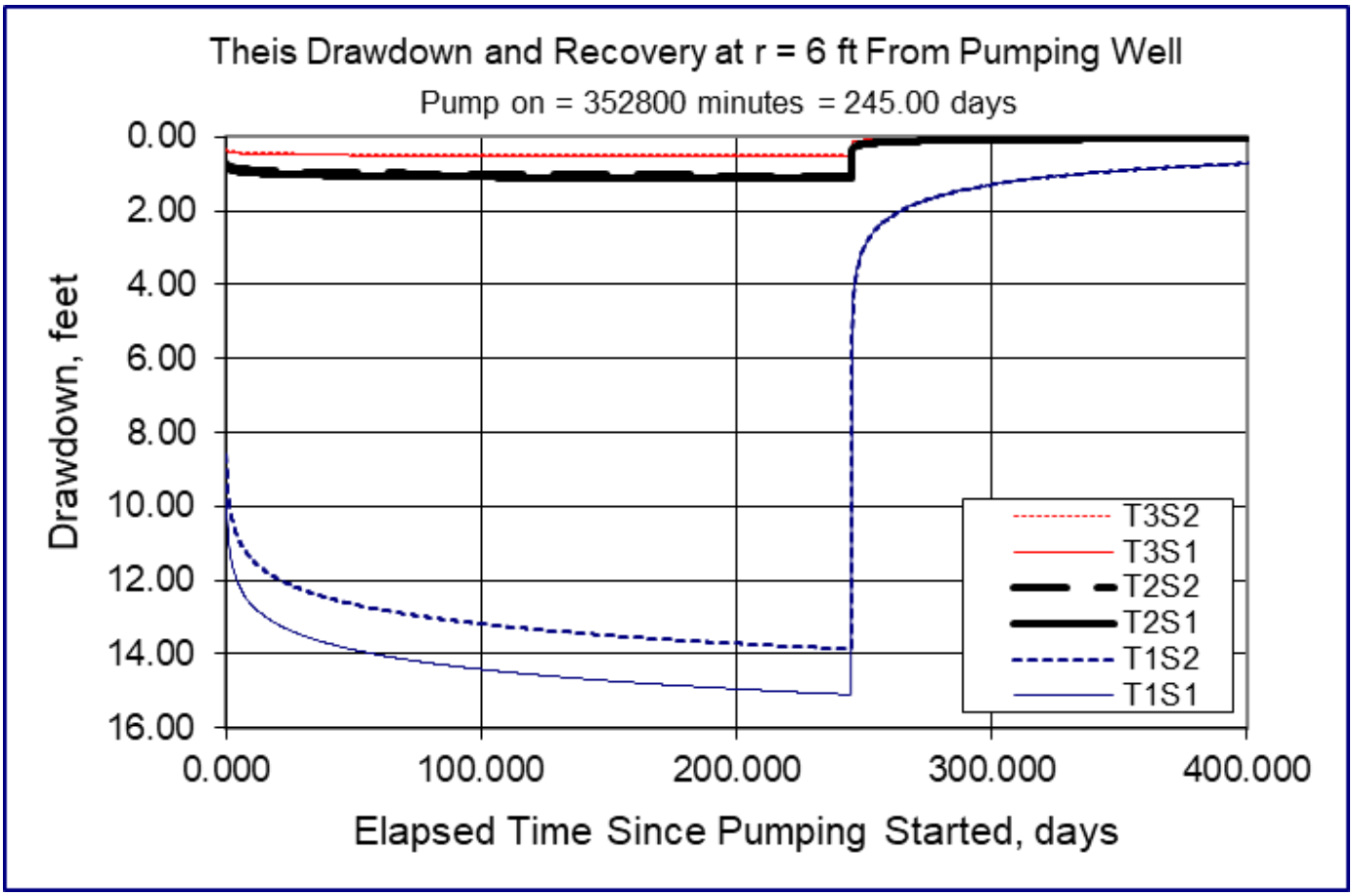
Water-Level Measurements in Nearby Wells



Well Statistics 2S/3E



Theis Drawdown Analysis Threshold Radius



Radial distance from pumping well (r)=5.5 feet [radius of influence for 15 feet of drawdown]

Pumping Rate (Q)= 100 gpm (0.22 cfs) [proposed rate]

Aquifer Transmissivity (T1)= 14,960 gpd/ft (2,000 ft^2/day), (T2)= 225,497 gpd/ft (30,147 ft^2/day), (T3)= 489,940 gpd/ft (65,500 ft^2/day) [Conlon et al 2005, Table 2 values for Central CRB; Leonard and Collins 1983]

Storativity (s1) = 1 X 10^{-4}, (s2) = 5 X 10^{-4} [Conlon et al 2005, Table 2 values for Central CRB]

Total pumping time = 245 days [irrigation season, March 1-October 31]