

Groundwater Application Review Summary Form

Application # G- 19363

GW Reviewer Darrick E. Boschmann Date Review Completed: 12/07/2023

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

12/07/2023

TO: Application G- 19363

FROM: GW: Darrick E. Boschmann
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ YES The source of appropriation is hydraulically connected to a State Scenic
☒ NO 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 12/07/2023
 FROM: Groundwater Section Darrick E. Boschmann
 Reviewer's Name
 SUBJECT: Application G- 19363 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: Barry Family Trust County: Lake

A1. Applicant(s) seek(s) 0.785 cfs from 1 well(s) in the Goose & Summer Lakes Basin Basin,
Goose Lake subbasin

A2. Proposed use Supplemental Irrigation of 62.83 acres Seasonality: 03/01 – 10/31

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	proposed	Well 1	Basin fill	0.785	40.00S-20.00E-2-SW SE	*1298 FEET NORTH AND 2983 FEET EAST FROM SW CORNER, SECTION 2
2						
3						
4						

* 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	600	0-40	0-300	None	40-300	NA	NA	NA
2								
3								
4								

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	4775	NA	NA	NA	-	-
2						
3						
4						

Use data from application for proposed wells.

A4. **Comments:** _____

The proposed wells is located in the Goose Lake subbasin, on the alluvial fan of Crane Creek, approximately 3 miles southeast of Lakeview. The area underlying the proposed well location is mapped by Peterson and others (1980) as Qf (alluvial fan deposits), which is underlain at this location by Qal/Qs (undifferentiated alluvium and sediments).

*Note: The metes and bounds provided on the application map and the well location depicted on the application map are inconsistent. It seems the metes and bounds provided on the application map have switched the north and east values. It is assumed the location depicted on the application map is the intended location, and the corresponding metes and bounds are 1298 feet north and 2983 feet east of the SW corner of section 2.

A5. ☐ **Provisions of the** Goose & Summer Lakes 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: _____

OAR 690-513-0030 (Goose Lake Subbasin) does not apply.

A6. ☐ **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: _____
Comments: Currently no 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) **7RLN (25 feet, 25 feet, period=March); large WUR;**
 - 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:** _____

The nearest active State Observation Well is LAKE 2320 (SOW 380) which is located nearly 7 miles to the northwest of the proposed well. LAKE 2320 shows no indication of a long-term year-to-year decline trend over the period of record, but does show an overall downward trend since the early 2000's. Nearly 6 miles to the northwest LAKE 2424 (SOW 381) indicates no overall decline over the period of record, but does show a downward trend since the late 1990's.

The available water level record does not meet the Division 8 definition of excessively declining or declined excessively (for the storage portion of the source of water to wells).

The nearest authorized groundwater POD to the proposed wells is POD 2 under permit G-10899, which is located ~1,850 feet to the northwest. The potential increase in seasonal interference was calculated using the Theis equation (see attachment). The transmissivity used in the calculation (9,080 ft²/day) is the mean transmissivity of model layer 2 of Morgan, 1988. The storage coefficient used (0.0007) is the value used by Morgan (1988) for model layer 2. At the maximum pumping rate (0.785 cfs) the results indicate an increase in seasonal drawdown of ~4.5 ft.

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	Basin fill	☐	☒
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: _____

The system is identified as generally unconfined with discontinuous low permeability layers causing local (discontinuous, limited) confinement.

Morgan (1988) describes unconfined conditions in the shallow basin fill, with confined groundwater increasing with depth. The confined-like conditions at depth appear to be due to the considerable anisotropy resulting from the layered heterogeneity of the deposits – with vertical anisotropy ratios from 2:1 to 170:1. There is no indication of shallower groundwater being separated from deeper groundwater by a continuous regional confining layer.

Regional hydraulic gradients are from the upland recharge areas toward the axis of the basin and principal discharge area underlying and adjacent to Goose Lake where groundwater moves upward and is discharged via evapotranspiration, seepage to Goose Lake, streams and wells. This regional pattern describes groundwater movement in both the shallow and deeper parts of the groundwater flow system, with upward vertical gradients at the discharge area underlying and surrounding Goose Lake. Local subsystems also discharge to lakes, reservoirs, meadows and streams.

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?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Crane Creek	4740	4790	1890	☒	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: _____

The USGS National Hydrography Dataset (NHD) dataset was used to identify surface water features. Morgan (1988) reports that flow in perennial streams is sustained during summer and fall by groundwater discharge. The perennial reach of Crane Creek is located within one mile of the proposed well.

It is unknown precisely what the static water level in the proposed well will be. Wells in this section and surrounding sections in the depth range of the proposed wells have static water levels ~35 feet below land surface. The groundwater elevation cited above is based on an assumed 35 feet depth to water.

Given the likely static water level, the hydrogeologic setting of this well on the alluvial fan of Crane Creek, and the location of the perennial reach of Crane Creek, it is very likely that hydraulic connection occurs within one mile of the proposed well.

Water Availability Basin the well(s) are located within: No WAB data available for the exact well location, however the well is located within 500 feet of THOMAS CR > GOOSE L - AT MOUTH. This WAB is used for the following evaluations.

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?	Q _w > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Q _w > 1% ISWR?	80% Natural Flow (cfs)	Q _w > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
1	1	☐	☐	-	-	☐	8.24	☒	*	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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

Comments: _____

C3a. Q_w is greater than 1% of 80% natural flow for Well 1 and SW 1. *Interference at 30 days not calculated due to triggering of PSI under other criteria.

C3b. No distributed rate requested.

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:

No analysis here. PSI is already triggered under other criteria.

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:
- ☐ The permit should contain condition #(s) _____;
 - ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. SW / GW Remarks and Conditions:**C1. 690-09-040 (1)**

It is determined that the proposed well will produce groundwater from an unconfined aquifer.

C2. 690-09-040 (2) (3)

It is determined that the proposed well is hydraulically connected to Crane Creek.

C3a./C3b. 690-09-040 (4)

PSI is assumed for Well 1 to Crane Creek.

C4a. 690-09-040 (5)

No analysis here. PSI is already triggered under other criteria.

References Used:

Walker, G.W., 1963. Reconnaissance geologic map of the eastern half of the Klamath Falls (AMS) quadrangle, Lake and Klamath Counties, Oregon. U.S. Geological Survey Mineral Investigations Field Studies Map MF-260. Scale: 1:250,000.

Morgan, D.S., 1988. Geohydrology and numerical model analysis of ground-water flow in the Goose Lake Basin, Oregon and California. U.S. Geological Survey Water-Resources Investigations Report 87-4058.

Peterson, N.V., Brown, D.E., McLean, G.D., 1980. Preliminary geology and geothermal resource potential of the Lakeview area, Oregon. Oregon Department of Geology and Mineral Industries Open-File-Report 80-9. Scale: 1:62,500.

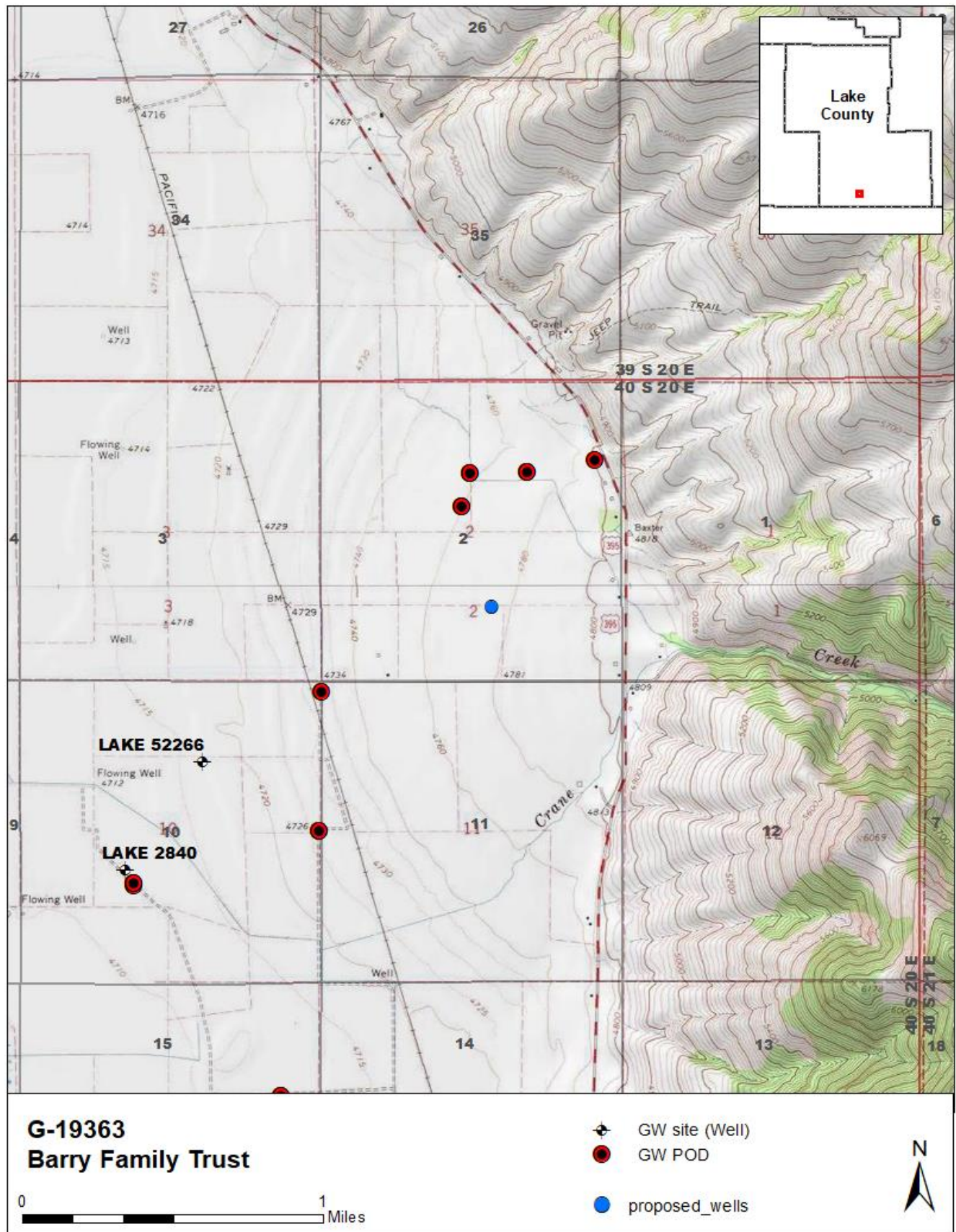
D. WELL CONSTRUCTION, OAR 690-200

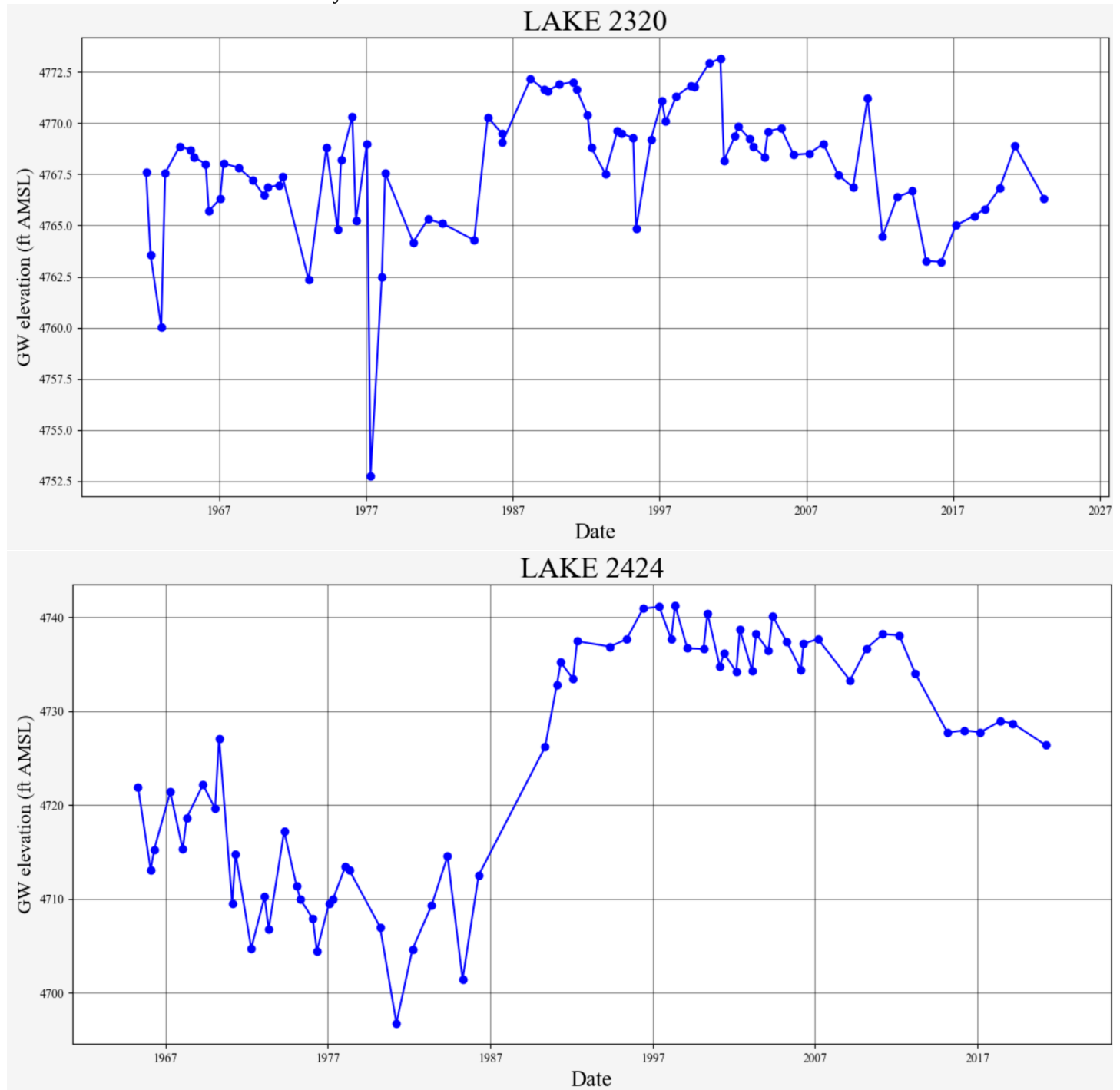
- D1. Well #: _____ Logid: _____
- D2. **THE WELL does not appear to meet current well construction standards based upon:**
- a. ☐ review of the well log;
 - b. ☐ field inspection by _____;
 - c. ☐ report of CWRE _____;
 - d. ☐ other: (specify) _____
- D3. **THE WELL construction deficiency or other comment is described as follows:** _____
- D4. ☐ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION						
Watershed ID #: 31300102		THOMAS CR > GOOSE L - AT MOUTH			Exceedance Level: 80	
Time: 1:07 PM		Basin: GOOSE & SUMMER LAKE			Date: 12/07/2023	
Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.						
JAN	16.70	16.70	0.04	0.00	4.74	-4.70
FEB	38.70	26.90	11.80	0.00	10.00	1.81
MAR	76.60	47.40	29.20	0.00	10.00	19.20
APR	151.00	108.00	43.20	0.00	15.00	28.20
MAY	111.00	191.00	-80.20	0.00	15.00	-95.20
JUN	41.70	143.00	-102.00	0.00	9.42	-111.00
JUL	13.10	44.60	-31.50	0.00	2.49	-34.00
AUG	8.24	24.70	-16.50	0.00	1.18	-17.60
SEP	8.98	21.80	-12.80	0.00	1.13	-14.00
OCT	10.40	13.60	-3.21	0.00	1.04	-4.25
NOV	14.50	5.86	8.64	0.00	1.92	6.72
DEC	19.10	13.80	5.27	0.00	3.69	1.58
ANN	62,400	39,700	28,900	0	4,540	25,200

Well Location Map



Water-Level Measurements in Nearby Wells

Theis Interference Analysis

Theis Time-Drawdown Worksheet v.3.00

Calculates Theis nonequilibrium drawdown and recovery at any arbitrary radial distance, r , from a pumping well for 3 different T values and radial distance, r , from a pumping well for 3 different T values and 2 different S values.

Written by Karl C. Wozniak September 1992. Last modified December 30, 2014

Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units
Total pumping time	t		245		d
Radial distance from pumped well:	r		1850.00		ft
Pumping rate	Q		0.8		cfs
Hydraulic conductivity	K	91	91		ft/day
Aquifer thickness	b		100		ft
Storativity	S 1		0.00070		
	S 2		0.00070		
Transmissivity Conversions	T f2pd	9,080	9,080	9,080	ft ² /day
	T ft2pm	6.3056	6.3056	6.3056	ft ² /min
	T_gpd/pft	67,918	67,918	67,918	gpd/ft

Recalculate

Use the Recalculate button if recalculation is set to manual

