Groundwater Application Review Summary Form

Application # G- 18499

GW Reviewer Phil Marcy **Date Review Completed:** 6/9/2017

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 June 9, 2017

TO: **Application G-** 18499

FROM: **GW:** Phil Marcy
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ YES
The source of appropriation is within or above a Scenic Waterway

☒ NO

☐ YES
Use the Scenic Waterway condition (Condition 7J)

☒ NO

☐ 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 _____ 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 **06/08/2017**

FROM: Groundwater Section **Phillip I. Marcy**
Reviewer's Name

SUBJECT: Application G- **18499** 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: **Grant 4-D Farms** County: **Malheur**

A1. Applicant(s) seek(s) **2.0** cfs from **1** well(s) in the **Malheur** Basin, **Willow Creek** subbasin

A2. Proposed use **Supplemental Irrigation (321.3 acres)** Seasonality: **March 1st – October 31st (245 days)**

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	MALH 54164	1	Alluvium	2.0	17S/43E-2 SE-NE	1790'S, 120'W fr NE cor S 2
2						
3						
4						
5						

* 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	2492	10	138.55	11/03/2016	610	0-150	0-150	NA	150-310; 331-525	300	180	Pump

Use data from application for proposed wells.

A4. **Comments:** The applicant proposes to use existing well MALH 54164 for supplemental irrigation of lands covered under certificates 74080 and 74081. The proposed POA well was authorized to pump under drought permit G-17866, with special conditions to produce only from the Glenns Ferry Formation, and thus not produce from the overlying valley-fill alluvial sequence.

A5. ☒ **Provisions of the** Malheur (690-510) 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: _____

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

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) **7N; "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 _____ 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:** Groundwater levels in nearby wells have remained reasonably stable (see attached hydrograph) for the past two decades. In recent years, extensive drought in the region has provided data on how local aquifers respond to increased pumping in addition to limited recharge. These data indicate seasonal declines in groundwater levels, followed by rapid recovery as precipitation has increased.

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	**Glenns Ferry Formation**	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: At the time of drilling, the proposed POA well displayed head elevations well above the productive water-bearing zones.

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**	**Willow Creek**	**2481.42**	**~2390**	**10600**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: There are no perennial streams within one mile of the proposed POA location. Both Kern Creek and Mud Creek, located within one mile, are only mapped as perennial streams below the Vale Oregon Main Canal. These stream channels are used as conveyances for irrigation water from the canal, with no natural flow during the arid months. Water Availability Basin tables show 0.00 cfs flow in these drainages for at least two consecutive months of the year. Therefore, PSI will be evaluated for Willow Creek as the nearest perennial stream reach.

Water Availability Basin the well(s) are located within: Kern Creek > Willow Creek – At Mouth (ID # 31011903)

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 source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and 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: This section does not apply, as no perennial surface waters exist within one mile of the proposed POA.

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
1	1	.24 %	.23 %	.33 %	.37 %	.40 %	.43 %	.47 %	.50 %	.52 %	.55 %	.25 %	.25 %
Well Q as CFS				2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Interference CFS		.005	.005	.007	.007	.008	.009	.009	.010	.010	.011	.005	.005
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													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.		.005	.005	.007	.007	.008	.009	.009	.010	.010	.011	.005	.005
(B) = 80 % Nat. Q		13.7	32.5	54.4	71.4	58.7	44.3	15.4	6.52	4.45	6.77	7.26	9.14
(C) = 1 % Nat. Q		.14	.33	.54	.71	.59	.44	.15	.07	.04	.07	.07	.09
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		.04 %	.02 %	.01 %	.01 %	.01 %	.02 %	.06 %	.15 %	.22 %	.16 %	.07 %	.05 %

(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: Impacts to Willow Creek from pumping at the proposed rate, duration, and location were calculated using the model of Hunt (2003). Aquifer parameters were derived from local pump test results, and other physical properties were obtained from the applicant's well log and topographic maps. Results of the calculations project that the effects to Willow Creek are minimal during the first year of pumping.

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:**

Considering the depth of the applicant's well, and the preponderance of fine-grained lithologies in the Glenns Ferry Formation, there is likely an inefficient connection to surface water. The formation itself is not incised by local drainages, but likely provides some recharge to the overlying shallow alluvial aquifer system which pinches out against the uplands. Therefore, impacts to nearby streams are expected to be diffuse in both time and space, spreading impacts throughout the year and over a longer reach of Willow Creek.

Therefore, if a permit is issued, condition 7N and "Large Water Use Reporting" are recommended to track use and possible declines in the aquifer system over a significant span of time.

References Used:

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

Gannett, M.W. 1990, Hydrogeology of the Ontario Area, Malheur County, Oregon: Oregon Water Resources Department Groundwater Report No. 34.

Application file G-18499, application reviews for G-17240, G-17866, OWRD groundwater level database.

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

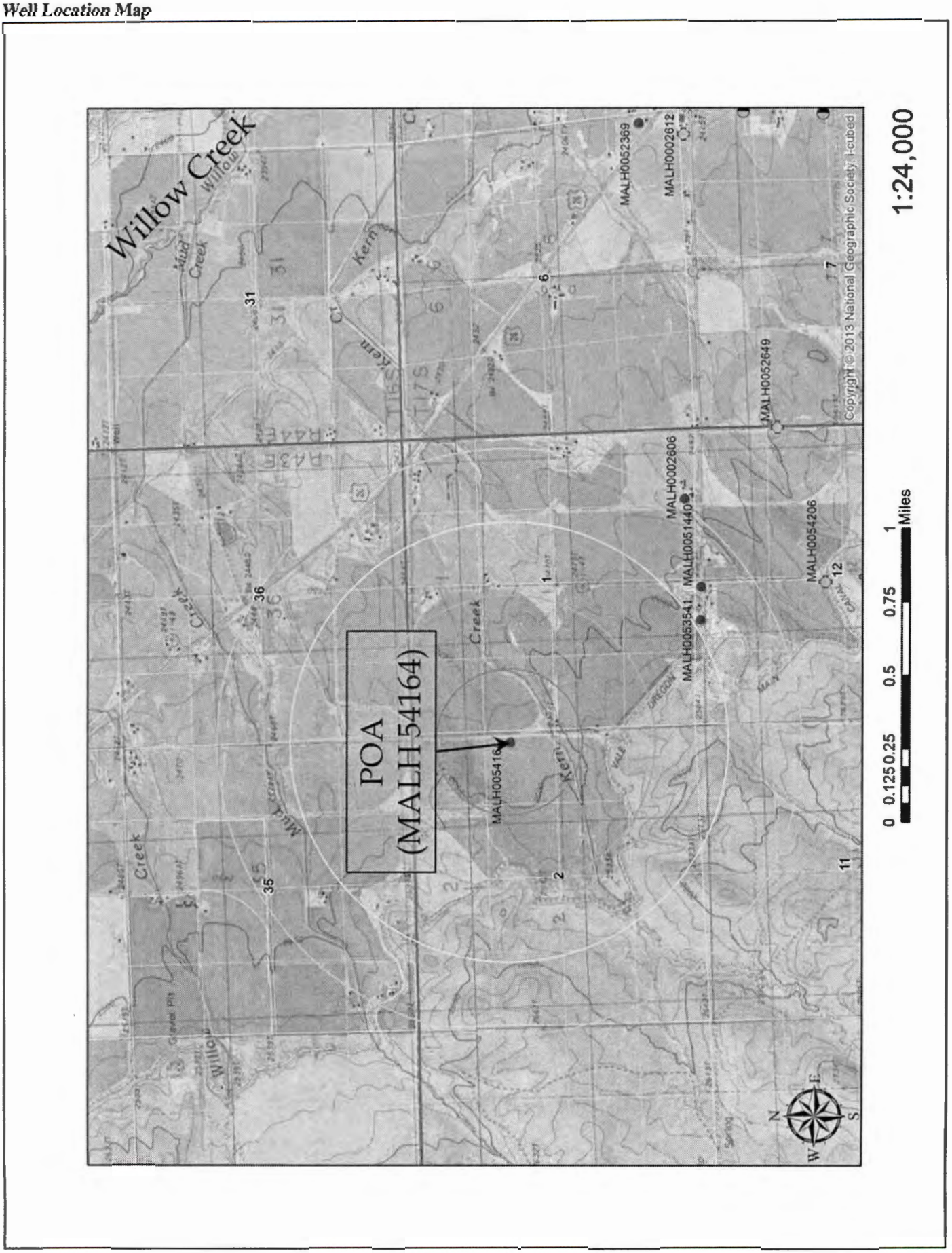
DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

WILLOW CR > MALHEUR R - AT MOUTH
Watershed ID #: 31011901 Basin: MALHEUR Exceedance Level: 80
Time: 11:37 AM Date: 06/09/2017

Monthly values are in cfs.
Storage is the annual amount at 50% exceedance in ac-ft.

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
JAN	13.70	22.00	-8.25	0.00	0.00	-8.25
FEB	32.50	82.60	-50.10	0.00	0.00	-50.10
MAR	54.40	141.00	-86.60	0.00	0.00	-86.60
APR	71.40	181.00	-110.00	0.00	0.00	-110.00
MAY	58.70	215.00	-157.00	0.00	0.00	-157.00
JUN	44.30	182.00	-138.00	0.00	0.00	-138.00
JUL	15.40	96.00	-80.60	0.00	0.00	-80.60
AUG	6.52	60.30	-53.80	0.00	0.00	-53.80
SEP	4.45	40.20	-35.70	0.00	0.00	-35.70
OCT	6.77	7.91	-1.14	0.00	0.00	-1.14
NOV	7.26	11.60	-4.35	0.00	0.00	-4.35
DEC	9.14	14.50	-5.41	0.00	0.00	-5.41
ANN	36,500	63,600	1,790	0	0	1,790

Well Location Map



Water-Level Trends in Nearby Wells