Water Right Conditions Tracking Slip

Groundwater/Hydrology Section

FILE # # G-17011

ROUTED TO: Water Rights - J. Eastman

TOWNSHIP/
RANGE-SECTION: 8S/1W - 7

CONDITIONS ATTACHED?: [✓] yes [ ] no

REMARKS OR FURTHER INSTRUCTIONS:
See conditions on pages 2 & 3.

Reviewer: Karl Woznick

WATER RESOURCES DEPARTMENT

MEMO Oct. 8, 2008

TO: **Application G-** 17011

FROM: **GW:** Karl Wozniak
(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 Ground Water 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 Ground Water 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 GROUND WATER APPLICATIONS

TO: Water Rights Section Date **October 8, 2008**

FROM: Ground Water/Hydrology Section Karl Wozniak
Reviewer's Name

SUBJECT: Application G- 17011 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 ground water 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:** WIIPLG1, LLC **County:** Marion

A1. Applicant(s) seek(s) 0.624 cfs from 3 well(s) in the Pudding and Mill Creek Basins, **Willamette River** subbasin Quad Map: Stayton NE

A2. Proposed use: Irrigation Seasonality: March 1 – October 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	Proposed	1 (D)	CRB	0.624	08S/01W-07 SE/SW	425' N, 1450' E fr SW cor S 7
2	Proposed	2 (E)	CRB	0.624	08S/01W-07 SE/NW	2100' N, 2460' E fr SW cor S 7
3	Proposed	3 (F)	CRB	0.624	08S/01W-07 SE/SW	425' N, 2500' E fr SW cor S 7

* 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	**520**				**350-400**	**0-100**	**0-130**					
2	**553**				**350-400**	**0-100**	**0-130**					
3	**535**				**350-400**	**0-100**	**0-130**					

Use data from application for proposed wells.

A4. **Comments:** The same wells and acreage, are listed on LL-1154. The letter designations after the applicant's well numbers in Table A3 represent the corresponding well names on LL-1154. Well locations in Table A3 are based on a revised application map received September 18, 2008.

A5. ☒ **Provisions of the** Willamette Basin rules relative to the development, classification and/or management of ground water hydraulically connected to surface water ☐ **are**, *or* ☒ **are not**, activated by this application. (Not all basin rules contain such provisions.)
Comments: The wells produce from a confined aquifer so the pertinent basin rules do not apply.

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

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

Proposed Well 3 (F)

B1. **Based upon available data**, I have determined that ground water* 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 ground water 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 ground water 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 ground water resource; or

d. ☐ **will, if properly conditioned**, avoid injury to existing ground water rights or to the ground water resource:
   i. ☐ The permit should contain condition #(s) _____;
   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;

Proposed Wells 1 (D), and 2 (E)

B1. **Based upon available data**, I have determined that ground water* 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 ground water 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 ground water 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 ground water resource; or

d. ☒ **will, if properly conditioned**, avoid injury to existing ground water rights or to the ground water resource:
   i. ☒ The permit should contain condition #(s) **7B, 7I (with totalizing flowmeter on each well)**;
   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;

All Wells

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

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

c. ☐ **Condition** to allow ground water production only from the _____ ground water 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 Ground Water 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. **Ground water availability remarks:**

Special Conditions:

1) Production from Well 1 (D) or any replacement well shall be limited to no more than 200 gallons per minute.

2) Well 1 (D) shall be cased and sealed to at least 250 feet below land surface.

3) Well 2 (E) shall be cased and sealed into hard basalt below an elevation of 340 feet or to a sufficient depth to ensure that the open interval is no shallower than the basal portion of the Sentinel Bluffs Member of the Columbia River Basalt Group.

4) Ground-water production in each well shall be limited to a single aquifer in the Columbia River Basalt Group lavas. The open interval in each well shall be no greater than 100 feet except as noted below. Open interval means the total length of borehole that is not behind sealed casing. The borehole above the open interval shall be continuously cased and continuously sealed to land surface. A larger open interval may be approved by the Department if the applicant can demonstrate, using packer tests or other suitable methods, that the hydraulic heads of water-bearing zones in the proposed open interval are equivalent or if the applicant can demonstrate that the open interval is part of a continuous zone of interconnected porous materials such as a sequence of pillow lavas or an hyaloclastite complex.

5) During any pump test required by this permit, observation water-level measurements shall also be made in at least one of the nearest existing wells on the permit. The observation wells shall be idle prior to and during the test. Measurements shall be made at the same times as in the pumped well, shall be accurate to at least 0.1 of a foot, and shall be recorded on the Department's Pump Test Data Sheets or an acceptable substitute. The pump test report shall identify each well by its corresponding Well ID (well tag number) or OWRD Well Log ID and shall include a map or aerial photo showing the well locations to an accuracy of at least 50 feet.

6) The permittee shall instruct the well constructor to contact the Ground Water Section of the Water Resources Department prior to drilling each well to arrange for the collection of drill cuttings.

The applicant has proposed 3 wells that will produce from water-bearing zones in the Columbia River Basalt Group (CRBG). The CRBG consists of a series of lava flows that range up to 500 feet thick in the vicinity of the proposed wells. Although unconfined ground water occurs near the surface of the basalts, most water occurs in confined aquifers that occupy thin rubble zones (interflow zones) that occur at the contacts between lava flows. The interiors of the basalt flows generally have low porosity and permeability and act as confining beds. This physical geometry generally produces a stack of thin aquifers (interflow zones) separated by thick confining beds (flow interiors). In the area of the proposed wells, the basalt aquifers are truncated by local stream drainages which have eroded to various levels through the basalt column. Because the aquifers are confined (storativity is estimated to be 0.0001), pumping impacts will propagate outward at rapid rates and reach aquifer boundaries (streams, faults, and truncated basalt flow margins) within a matter of minutes. Using aquifer parameters appropriate for the basalts, it can be shown that the cone of depression from a pumped well will produce measureable impacts at a distance of 1 mile within 1 hour. Therefore, hydraulic interference with nearby wells, springs, and streams will occur rapidly once pumping begins. The presence of local aquifer boundaries will increase the degree of interference with nearby wells. USGS geologic maps show that the basalts are broken into a many fault-bounded blocks in the area. The degree to which these faults impede horizontal flow or enhance vertical flow of ground-water is unknown. However, any significant vertical offset of thin permeable zones is likely to produce some degree of isolation between equivalent water-bearing zones in different fault blocks. The occurrence of significantly different water levels in nearby wells of different depths suggests that there is a poor natural connection between overlying aquifers in the CRBG, consistent with a low vertical permeability in the interior of the flows. These factors indicate that individual water-bearing zone in the basalts are likely to have sufficiently different pressures such that wells open to multiple zones will waste natural reservoir pressure through cross borehole flow. This indicates a need for a special condition to limit the open interval in each well to a single basalt aquifer.

Proposed wells 1 (D) and 3 (F) and proposed well A on LL-1154 fall on the same side of a northwest-trending geologic fault as permitted irrigation wells MARI 22 and MARI 56786. Water level data in a nearby observation well, MARI 56199, indicate a seasonal fluctuation of at least 80 feet (see attached plot). Most of this seasonal variation is probably caused by hydraulic interference from MARI 22 and MARI 56786 which are the nearest irrigation wells in the same fault block. The long-term water-level trend in MARI 22 suggests that water levels have declined about 6-8 feet from the early 1990s through 2007 although much of this may be related to precipitation trends over the same period of time. This hint of instability and the large hydraulic interference that occurs seasonally on the south side of the fault suggest that excessive hydraulic interference is likely in existing wells if three additional large-capacity irrigation wells are permitted in the same area on the south side of the fault. (If the fault is a barrier to horizontal flow, as seems likely, it will increase the mutual interference between wells on the same side of the fault). The presence of the fault is also likely to result in greater impacts within the Stayton-Sublimity Ground Water Limited Area which is less than 1 mile to the south of proposed wells 1 (D) and 3(F) and well A on LL-1154.

Therefore, it is recommended that only one of the three wells be allowed with a production limit of 200 gallons per minute. Phone conversations with the applicants' agent, Ken Johnston, indicate that the applicants would prefer to drill proposed Well 1 (D) if only one of the three wells is allowed. Therefore, it was determined in Section B1 that water is not likely to be available from proposed well 3 (F) without injury to prior water rights and a condition was added to limit production to 200 gallons per minute from well 1 (D) to limit interference with existing wells.

The adequacy of the ground-water supply for the proposed use from the other proposed wells cannot be assessed with any degree of confidence because of the lack of long-term water level records for wells completed in the same water-bearing zones within the same fault block. The 7I decline condition, as stipulated by OAR 690-502-0250, should provide some protection for the resource and for senior users should declines become evident in the future. One or more pump test with several observation wells should allow the Department to assess the degree of likely interference with nearby wells.

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

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

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**Columbia River Basalt**	☒	☐
2	**Columbia River Basalt**	☒	☐
3	**Columbia River Basalt**	☒	☐

Basis for aquifer confinement evaluation: General experience indicates that most aquifers in the CRBG are confined.

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	**Simpson Creek**	**400-450**	**380-490**	**4100**	☐	☒	☐	☐	☒
2	1	**Simpson Creek**	**400-450**	**490-520**	**4100**	☐	☒	☐	☐	☒
3	1	**Simpson Creek**	**400-450**	**380-490**	**3100**	☐	☒	☐	☐	☒
1	2	**Little Pudding River**	**400-450**	**350-410**	**8100**	☐	☒	☐	☐	☒
2	2	**Little Pudding River**	**400-450**	**350-410**	**6100**	☐	☒	☐	☐	☒
3	2	**Little Pudding River**	**400-450**	**350-410**	**7700**	☐	☒	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: In the vicinity of the proposed wells, the basalt unit is partially eroded by local stream drainages. Aquifers above the level of incision are likely to be hydraulically connected to local streams. However, because of the very low vertical permeability of the basalt flow interiors, wells that are cased and sealed below the depths of local streams should be effectively isolated from those streams. The findings of no hydraulic connection with local streams in table C2 is based on the deep seal requirement specified in special conditions 2 and 3 listed in Section B3. If the applicant does not agree to these conditions, well 2 (E) will be hydraulically connected to the South Fork of the Pudding River and and all of the wells will be hydraulically connected to Simpson Creek.

Water Availability Basin the well(s) are located within: PUDDING R > MOLALLA R - AB HOWELL PRAIRIE and MILL CR > 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 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: ______________________________

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													
		%	%	%	%	%	%	%	%	%	%	%	%
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.												
(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 impact is calculated because the well were determined to have no effective hydraulic connection with local surface water sources if the wells are sealed as required by special conditions 2 and 3.

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 ground water 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:** See special conditions 2 and 3 listed in B3. The South Fork of the Little Pudding River has eroded down to an elevation of about 350 feet within the upper part of the Sentinel Bluffs member of the Columbia River Basalt Group within the fault block that contains proposed well 2 (E). A seal that prevents production from aquifers above this elevation, or above the base of the Sentinel Bluff member, should prevent interference with local stream reaches in this well. Similarly, interference with local reaches of Simpson Creek by well 1 (D) should be precluded by the deep seal required in special condition 2.

References Used:

Conlon and others, 2005, Ground-water hydrology of the Willamette Basin, Oregon: U.S Geological Survey Scientific Investigations Report 2005-5168.

Gannett and Caldwell, 1998, Geologic framework of the Willamette lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A,

Tolan, Terry L. and Beeson, Marvin H., 1999, Geologic Map of the Scotts Mills, Silverton, and Stayton Northeast 7.5 Minute Quadrangles, Oregon, USGS Open File Report 99-141.

Tolan, Terry L., Beeson, Marvin H., and DuRoss, Christopher, 2000, Geologic Map and Database of the Salem East and Turner 7.5 Minute Quadrangles, Marion County, Oregon, A Digital Database: USGS Open File Report 00-351.

Woodward and others, 1998, Hydrogeologic framework of the Willamette lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B,

D. WELL CONSTRUCTION, OAR 690-200

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

D2. **THE WELL does not 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**:
- a. ☐ constitutes a health threat under Division 200 rules;
- b. ☐ commingles water from more than one ground water reservoir;
- c. ☐ permits the loss of artesian head;
- d. ☐ permits the de-watering of one or more ground water reservoirs;
- e. ☐ other: (specify) _____

D4. **THE WELL construction deficiency is described as follows:** _____

D5. **THE WELL**
- a. ☐ **was**, *or* ☐ **was not** constructed according to the standards in effect at the time of original construction or most recent modification.
- b. ☐ I don't know if it met standards at the time of construction.

D6. ☐ **Route to the Enforcement Section.** I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Enforcement Section and the Ground Water Section.

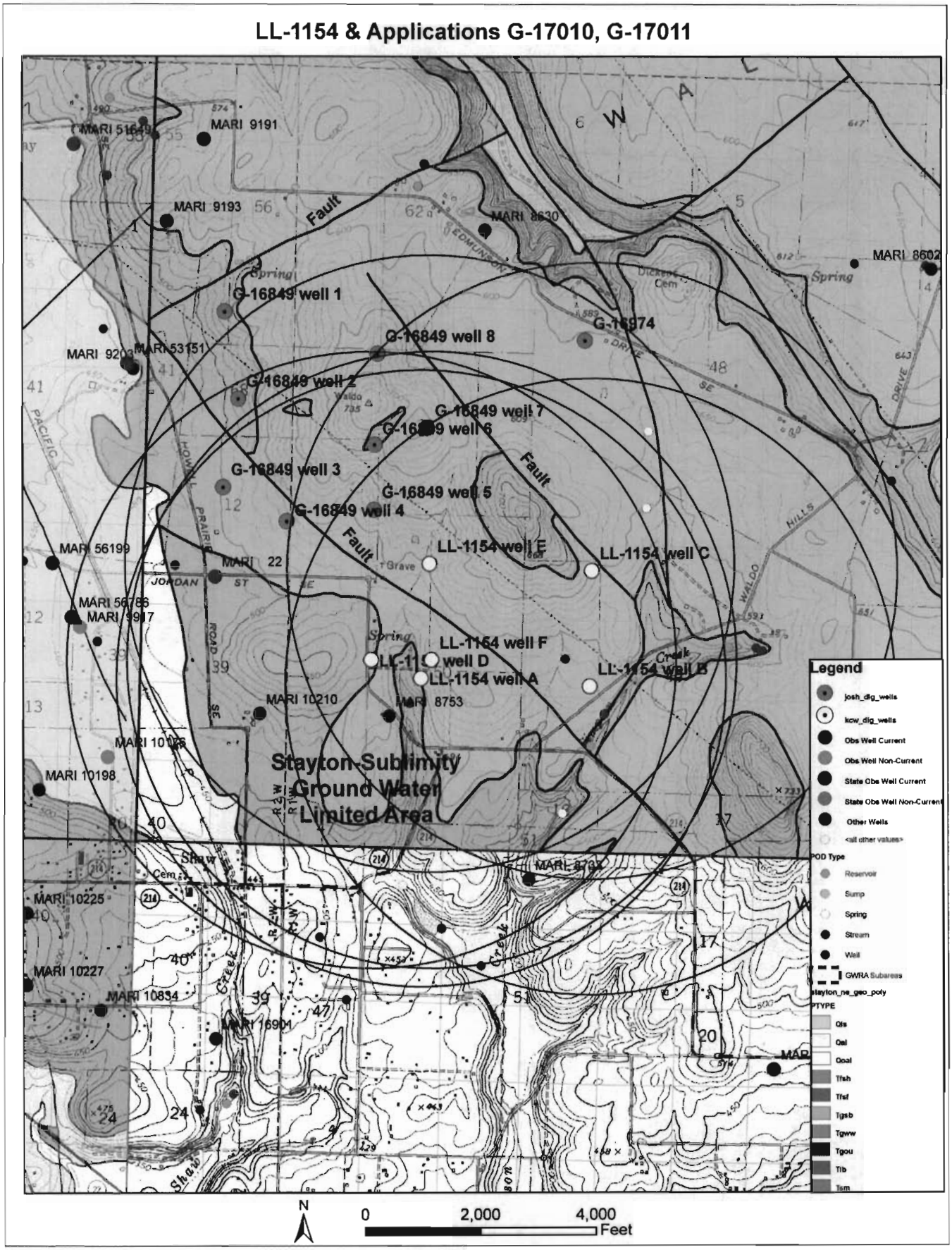
THIS SECTION TO BE COMPLETED BY ENFORCEMENT PERSONNEL

D7. ☐ Well construction deficiency has been corrected by the following actions: _____

_____ _____, 200____.
(Enforcement Section Signature)

D8. ☐ **Route to Water Rights Section (attach well reconstruction logs to this page).**

Well Location Map (Shows only a partial representation of geologic structures. Refer to original USGS maps for details).



Water Levels in Nearby Wells