PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: Water Rights Section **Date** **28 February 2008**

FROM: Ground Water/Hydrology Section **Gerald H. Grondin**
Reviewer's Name

SUBJECT: Application **G-16989** 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: **City of Merrill** County: **Klamath**

A1. Applicant(s) seek(s) **2.90 (1300 gpm)** cfs from **1** well(s) in the **Klamath** Basin, **Lost River** sub basin Quad Map: **Merrill**

A2. Proposed use: **Municipal** Seasonality: **Year-round (365 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						
2	**KLAM 14959**	**2**	**Basalt**	**2.90**	**41S/10E-sec 11 AAA**	**414' W, 190' S fr NE cor S 11**
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												
2	**4068**	**975**	**33**	**06/??/62**	**1012**	**0-760**	**0-760**	**None**	**None**	**2450**	**19**	**P**
3												
4												

Use data from application for proposed wells.

A4. **Comments:**

KLAM 14959 was drilled in 1962 and is called Well #1 in the application and is called Owner Well #2 on the water well report (well log). The other city well (KLAM 14918) was drilled in 1939 and is called Well #2 on the application map, but it is not part of this application.

The reported casing and seal in well KLAM 14959 leaves exposed 140 feet of basin fill above the basalt.. Ground water occurrence was not identified abpve 970 feet. Ground water occurs in both the basin fill and the basalt.

On the application map, the well location described and location shown do not match. One is the transposition of the other. The location dot shown on the application map appears to match information elsewhere in the application and is used in this review.

A5. ☐ **Provisions of the N.A.** 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: **No basin rule applies. Only the Klamath River Compact ORS 542.610 to 542.630 applies to the Klamath Basin. However, that compact applies to surface water only, not ground water**

A6. ☐ **Well(s) # N.A.** , _____ , _____ , _____ , _____ , tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: _____
Comments: **Currently, no administrative area.**

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

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 and 7N**
   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 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:**

Recommend conditions 7B and 7N.

Data from the eastern Lost River sub-basin ground water investigation (Grondin, 2004) and the USGS-OWRD cooperative Upper Klamath Basin ground water investigation (Gannett and others, 2007) indicate basin long-term ground water levels are generally controlled by climate and short-term (seasonal) ground water levels are controlled by ground water use.

Additionally, the USGS (2005) has documented annual water level declines in the basin south of Upper Klamath Lake since 2001, including wells in the vicinity of Merrill. The declines are greater than typically observed during drought periods. Gannett and others (2007) noted seasonal declines in 2004 exceeding 10 feet and annual declines from 2001 to 2004 exceeding 15 feet. They appear related to the USBOR Klamath Project Water Bank.

At this time, future ground water use for the USBOR water bank is uncertain, and it is uncertain whether the post-1999 ground water level declines in the Merrill vicinity will continue, stabilize at a lower level, or recover.

Eleven wells in the Merrill vicinity with water level measurements on file at OWRD were found. The data is primarily after the year 2000. The measurements at 5 wells (KLAM 53269, KLAM 53043, KLAM 52795, KLAM 52761, and KLAM 10506) show seasonal and annual ground water level declines since 2000 consistent with the USGS (2005) and Gannett and others (2007) observations noted above. The measurements at 3 more wells (KLAM 53201, KLAM 53758, and KLAM 52972) also indicate decline, but the data is sparse. The measurements at the last 3 wells (KLAM 53045, KLAM 14925, and KLAM 52646) show rising ground water levels. However, the ground water at the well sites appears locally influenced by canal leakage.

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	**Basalt**	☐	☒
2		☐	☐
3		☐	☐
4		☐	☐
5		☐	☐

Basis for aquifer confinement evaluation:

System is identified as generally unconfined with discontinuous low permeability layers causing local (discontinuous, limited) confinement. Generally, low transmissivity (low permeability) sediment of varying thickness overlies high transmissivity (high permeability) basalt. Ground water occurs in both the sediment and basalt.

Water well reports (well logs) for wells in the general area indicate the sediment thickness varies from less than 50 feet to more than 900 feet.

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**	**Lost River**	**4035**	**4060**	**400**	☐	☒	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation:

Gannett and others (2007) show ground water flow from the uplands north, west, and east of Merrill toward the Lost River and Tule Lake. This includes flow across the proposed well site. Generally in the Upper Klamath Basin, ground water and surface water are hydraulically connected.

The June 1962 ground water level at the proposed well site and post 2000 ground water levels at Merrill vicinity wells are lower than the Lost River elevation in the Merrill vicinity. The ground water levels closer to the uplands are above the Lost River. OWRD water availability data indicates the river gains water between Olene Gap and the Oregon-California boundary. Given available ground water and surface water elevations, it appears that the river gain occurs to the north beyond the direct influence of KLAM 14959, primarily north of Stukle Mountain.

Water Availability Basin the well(s) are located within: LOST R > TULE L – AT STATE LINE

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:

Well KLAM 14959 is less than 0.25 miles from the Lost River.

No analysis was conducted given the ground water level appears to be below the Lost River elevation in the Merrill vicinity. Where ground water is connected to the river in Oregon appears to be to the north beyond the direct influence of well KLAM 14959, primarily north of Stukle Mountain. The regional ground water flow model under development by the USGS is needed to assess the impact.

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:

Well KLAM 14959 is less than 0.25 miles from the Lost River.

The ground water level appears to be below the Lost River elevation in the Merrill vicinity. Where ground water is connected to the river appears to be more than one-mile to the north beyond the direct influence of KLAM 14959, primarily north of Stukle Mountain.

Interference at the Lost River was not calculated given where ground water is connected to the river is in an area beyond the direct influence of KLAM 14959, primarily north of Stukle Mountain. This hydrogeologic situation exceeds the assumptions of the tool currently used to calculate the interference with surface water. The regional ground water flow model under development by the USGS is needed to assess the impact.

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**

Gannett and others (2007) show ground water flow from the uplands north west, and east of Merrill toward the Lost River and Tule Lake. A ground water connection between the proposed well KLAM 14959 and the Lost River likely exists in Oregon, but in an area beyond the direct influence of KLAM 14959, primarily north of Stukle Mountain.

If a permit is issued, include conditions 7B and 7N

References Used:

Grondin, G.H., 2004. Ground Water in the Eastern Lost River Sub-Basin, Langell, Yonna, Swan Lake, and Poe Valleys of Southeastern Klamath County, Oregon. Ground Water Report 41, Oregon Water Resources Department, Salem, Oregon.

USGS, 2005. Assessment of the Klamath Project pilot water bank: a review from a hydrologic perspective. Prepared by the U.S. Geological Survey Oregon Water Science Center, Portland, Oregon for the U.S. Bureau of Reclamation Klamath Basin Area Office, Klamath Falls, Oregon, May 3, 2005.

Gannett, M.W., Lite, K.E., La Marche, J.L., Fisher, B.J., and Polette, D.J., 2007. Ground-Water Hydrology of the Upper Klamath Basin, Oregon and California. USGS Scientific Investigations Report 2007-5050.

Hydrographs and water well reports for wells KLAM 53269, KLAM 53043, KLAM 52795, KLAM 52761, KLAM 10506, KLAM 53201, KLAM 53758, KLAM 52972, KLAM 53045, KLAM 14925, and KLAM 52646.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #**: **1** **Logid:** **KLAM 14959**

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.**

Well Enforcement: Please review the well construction and note to Water Rights acceptance of well construction or any deficiencies that need correction.

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).**

RECEIVED
JUL 23 1962
STATE ENGINEER
SALEM, OREGON

Klam
14959

(Page 1)

File Original and First Copy with the STATE ENGINEER, SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON

State Well No. 41/10 - 11A

State Permit No. .....

Page #1

(1) OWNER:
Name CITY OF MERRILL

Address Merrill, Oregon

(2) LOCATION OF WELL:
County Klamath Owner's number, if any— 2

NE ¼ NE ¼ Section 11 T. 41 S R. 10 E W.M.

Bearing and distance from section or subdivision corner

Lot 3, 120' SO. Center of Front St.,
Original Map, City of Merrill, Oregon
26' West of East Line

(3) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(6) CASING INSTALLED:
Threaded ☐ Welded ☒

14 " Diam. from 240 ft. to 462 ft. Gage ¼ inch

12 " Diam. from 0 ft. to 760 ft. Gage ¼ inch

" Diam. from ft. to ft. Gage

(7) PERFORATIONS:
Perforated? ☐ Yes ☒ No

Type of perforator used

SIZE of perforations in. by in.

perforations from ft. to ft.

perforations from ft. to ft.

perforations from ft. to ft.

perforations from ft. to ft.

perforations from ft. to ft.

(8) SCREENS:
Well screen installed ☐ Yes ☒ No

Manufacturer's Name

Type Model No.

Diam. Slot size Set from ft. to ft.

Diam. Slot size Set from ft. to ft.

(9) CONSTRUCTION:
Was well gravel packed? ☐ Yes ☒ No Size of gravel:

Gravel placed from ft. to ft.

Was a surface seal provided? ☒ Yes ☐ No To what depth? 760 ft.

Material used in seal— Cement

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? Depth of strata

Method of sealing strata off Cemented off.

(10) WATER LEVELS:
Static level 33 ft. below land surface Date June 1962

Artesian pressure lbs. per square inch Date

Log Accepted by:

[Signed] ..... Date ....., 19.....
(Owner)

(11) WELL TESTS:
Drawdown is amount water level is lowered below static level

Was a pump test made? ☒ Yes ☐ No If yes, by whom? Interstate Pump.

Yield: 2450 gal./min. with 19 ft. drawdown after 8 hrs.

" " " "

" " " "

Bailer test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m. Date

Temperature of water 74 Was a chemical analysis made? ☐ Yes ☒ No

(12) WELL LOG:
Diameter of well 12 inches.

Depth drilled 1012 ft. Depth of completed well 1012 ft.

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Top Soil	0	8
Hard pan (chalk conglomrate)	8	12
Brown Chalk	12	37
Grey Sand	37	40
Green Chalk	40	88
Sand fine	88	90
Grey Chalk	90	130
Green & Brown chalk	130	175
Black Sand fine	175	177
Dark Grey Chalk	177	195
Green Chalk	195	250
Grey Chalk	250	305
Grey Sand	305	306
Grey Chalk	306	350
Sand Grey Black	350	355
Grey Chalk	355	381
Blue Chalk	381	400
Grey Chalk	400	452
Green Chalk	452	480
Grey Chalk	480	495
Green Chalk	495	505
Black lava Rock	505	507
Semi hard grey sand	507	509
Grey Chalk	509	523
Green Chalk	523	540

Work started 19 . Completed 19

(13) PUMP:
Manufacturer's Name

Type: H.P.

Well Driller's Statement:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME .....
(Person, firm, or corporation) (Type or print)

Address .....

Driller's well number .....

[Signed] Walter L. Wilson
(Well Driller)

License No. 169 Date ....., 19.....

(USE ADDITIONAL SHEETS IF NECESSARY)

KLAM 14960 (Page 2)

RECEIVED JUL 2 3 1962 STATE ENGINEER SALEM, OREGON

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WATER WELL REPORT
STATE OF OREGON

State Well No. 41/10-11A

State Permit No.

P179-112

(1) OWNER:
Name CITY OF MERRILL
Address Merrill, Oregon

(2) LOCATION OF WELL:
County Owner's number, if any—
¼ ¼ Section T. R. W.M.
Bearing and distance from section or subdivision corner

(3) TYPE OF WORK (check):
New Well ☐ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(6) CASING INSTALLED:
Threaded ☐ Welded ☐
..... " Diam. from ..... ft. to ..... ft. Gage .....
..... " Diam. from ..... ft. to ..... ft. Gage .....
..... " Diam. from ..... ft. to ..... ft. Gage .....

(7) PERFORATIONS:
Perforated? ☐ Yes ☐ No
Type of perforator used
SIZE of perforations in. by in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

(8) SCREENS:
Well screen installed ☐ Yes ☐ No
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.
Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.

(9) CONSTRUCTION:
Was well gravel packed? ☐ Yes ☐ No Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.
Was a surface seal provided? ☐ Yes ☐ No To what depth? ..... ft.
Material used in seal—
Did any strata contain unusable water? ☐ Yes ☐ No
Type of water? Depth of strata
Method of sealing strata off

(10) WATER LEVELS:
Static level ft. below land surface Date
Artesian pressure lbs. per square inch Date

Log Accepted by:
[Signed] ..... Date July 5, 1962
(Signature)
City of Merrill
Recorder - Treasurer
(Owner)

(11) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☐ No If yes, by whom? -
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☐ No

(12) WELL LOG:
Diameter of well 12 inches.
Depth drilled 1012 ft. Depth of completed well 1012 ft.
Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Grey Chalk	540	550
Green Chalk	550	880
Grey Chalk	880	891
Sand semi hard grey	891	900
Red Lava Rock	900	905
Grey Lava rock	905	927
Grey Lava (crevice) (Bit left)	927	932
Grey Lava very hard	932	939
Broken Lava	939	942
Grey Lava	942	947
Grey lava broken (W/sand in it)	947	950
Grey lava & blue lava	950	975
Lava & Black Porous cinders (watr)	975	995
Black Lava	995	1000
Lava Broken porous (water)	1000	1012
(Ten inch bit was drilled by at 932 feet)		
(Casing cemented in at bottom of twelve inch from 763 back up to 752. Five yards of cement put in at 184 to189 feet. The 18 inch hole from 189 to 20 feet was filled with fine gravel around the 12 inch casing. Three yards of cement was put in from 20 feet to ground level.		
A 18 inch hole was drilled from 0 to 390.		
14 inch casing is from 240 to 462. 12 inch is run thru the 14 inch to 760 feet.		

Work started July 29 1960. Completed June 1, 1962

(13) PUMP:
Manufacturer's Name Layne & Bowler
Type: Turbine H.P. 75

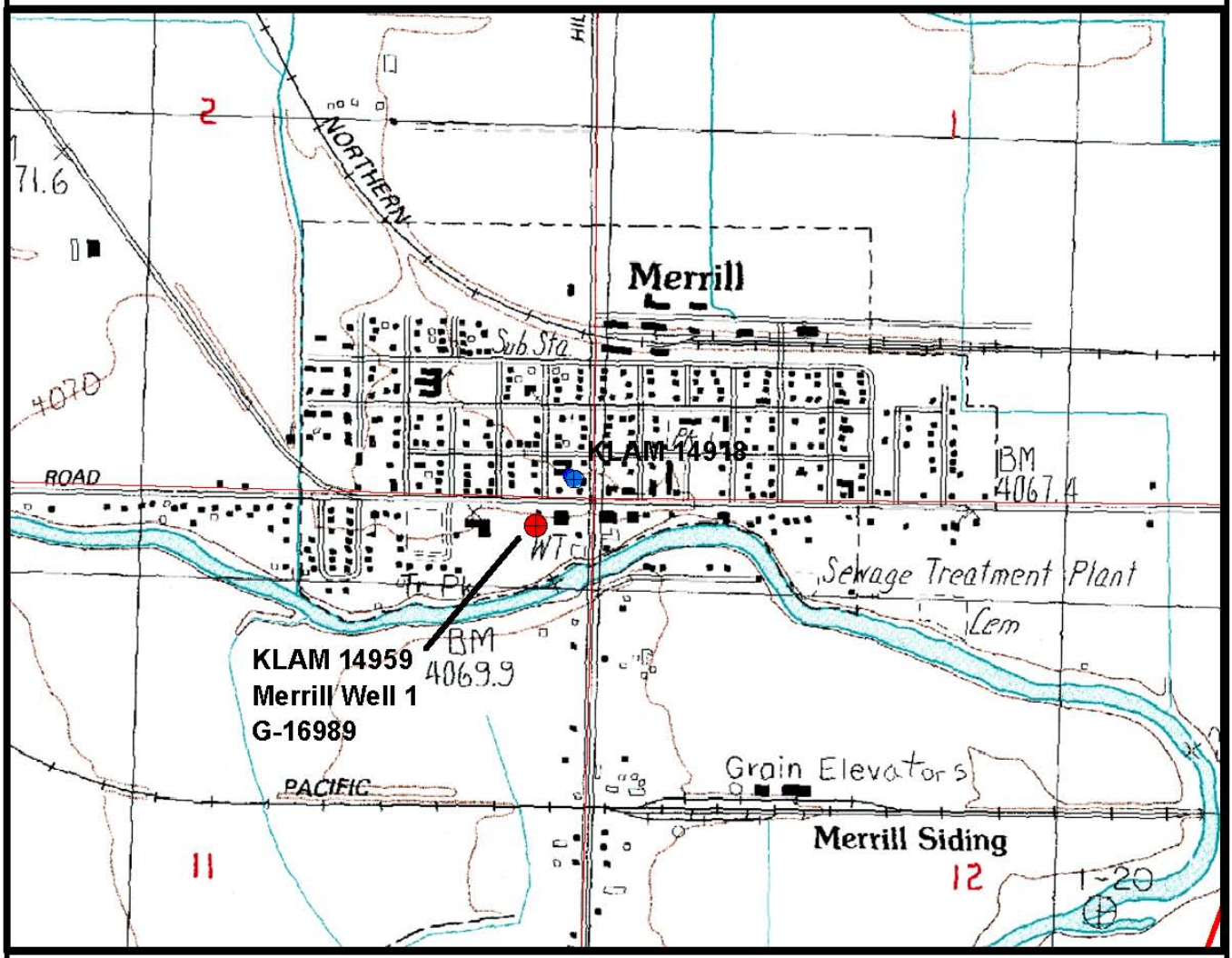
Well Driller's Statement:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME WILSON WILSON DRILLING CONTRACTOR.
(Person, firm, or corporation) (Type or print)
Address Box 136 Merrill, Oregon
Driller's well number
[Signed] Walter L. Wilson
(Well Driller)
License No. 169 Date June 29, 1962

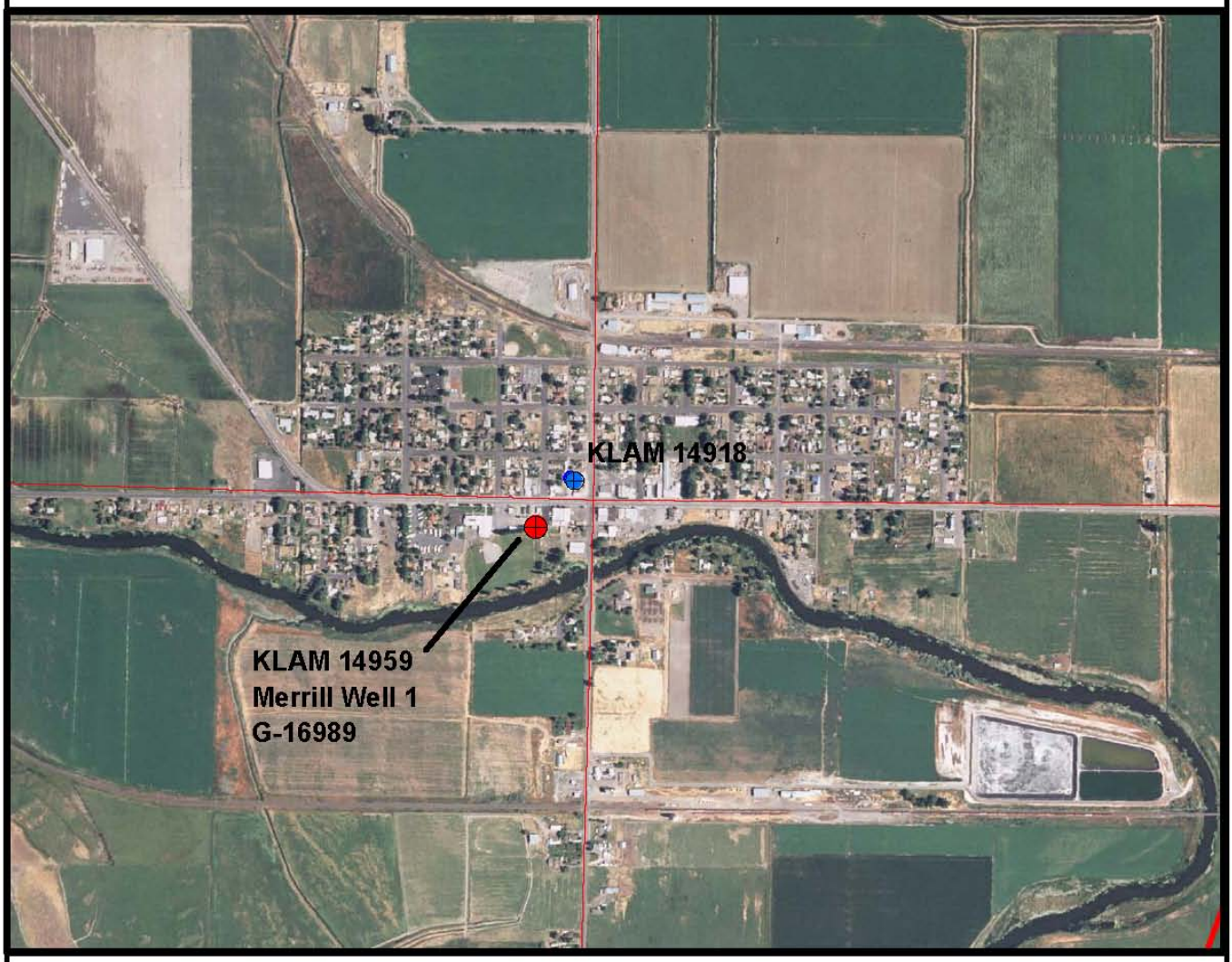
(USE ADDITIONAL SHEETS IF NECESSARY)

Ground Water Application G-16989
City of Merrill



Proposed Well = KLAM 14959

Ground Water Application G-16989
City of Merrill



0 0.125 0.25 0.5 0.75 1 Miles

N

Proposed Well = KLAM 14959