# Oregon Water Resources Department Memo

Date:	March 20, 2008
To:	Caseworkers, Water Rights Section
From:	Doug Woodcock Manager, Ground Water Section
Subject:	Long-Term Interference in Klamath Basin

The water supply issues in Klamath basin are numerous and complex, as exemplified by the federal interest in resolving Klamath ESA and T&E concerns through the Klamath Water Bank. A very large uncertainty in future water allocation centers on the outcome of the Klamath adjudication. In addition to the current water conflicts in the basin, there will be users whose surface water claims are denied in the adjudication process and, absent a supplemental supply, will be without a water source to continue their historical farming practice and livelihood.

A cooperative ground water investigation of the Upper Klamath Basin (Ground-Water Hydrology of the Upper Klamath Basin, Oregon and California, USGS, 2007) has determined that much of the inflow to Upper Klamath Lake can be attributed to ground water discharge to streams and major spring complexes for some miles around the lake. Ground water wells that develop water from the local and regional flow systems that contribute to the lake and spring complexes will interfere with these over-appropriated surface water supplies and further exacerbate water supply problems in the basin.

<u>Caseworkers:</u> Not all ground water files that are determined to be hydraulically connected to surface water are assumed to have potential for substantial interference (PSI). Those files that do have PSI are then assessed for water availability. *Within the Klamath Basin* the Commission has provided direction on how non-supplemental uses are to be evaluated when the well(s) are hydraulically connected with Klamath Lake or surface waters that contribute to Klamath Lake or the Klamath River. Hydraulic connection with over-appropriated surface water is a sufficient circumstance for denial for uses other than supplemental, even in the absence of PSI.

nserted in file: G-17286	_ Date: 1/13/10	Intials: TW
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ТО		<b>XX</b> 7 (	D' 1 ( G (						0 1	2010			
10:		Water	Rights Secti	on				Date	8 Janu	ary 2010	<u>)                                    </u>		
FROM	<b>M</b> :	Grour	nd Water/Hyd	Irology Section	G	erald H	l. Grondin						
						Reviewer	's Name						
SUBJ	ECT:	Appli	cation <u>G-17</u> 2	286	Supers	edes rev	iew of						
										Date of R	leview(s)		
PUBL	<b>JC INTE</b>	REST	<b>PRESUMP</b>	TION: GROU	<b>NDW</b> A	ATER							
OAR	<b>DAR 690-310-130 (1)</b> The Department shall presume that a proposed groundwater use will ensure the preservation of the public												
welfare	e, safety an	d heal	th as described	d in ORS 537.52.	5. Depar	tment sta	off review grou	nd water	applicatio	ns under (	JAR 690-3	310-140	
to dete	rmine whe	ther th	e presumption	is established. C	DAR 690	)-310-14	0 allows the pr	oposed us	e be mod	ified or co	onditioned	to meet	
the pre	sumption c	riteria.	This review i	is based upon av	vailable	informa	tion and agen	cy policies	s in place	at the tin	ne of evalu	uation.	
A. <u>GE</u>	INERAL	INFO	<u>RMATION</u> :	Applicant	's Name:		The Klam	ath Trib	es	County:	Klamat	t <u>h</u>	
A1.	Applicar	nt(s) se	ek(s) 0.31 (	<b>138 gpm)</b> cfs	s from _	<u>1</u> we	ll(s) in the	Klaı	nath			Basin,	
		U	pper Klamat	h Lake		sub basir	n Quad Ma	p:	Agency	Lake			
	P												
A2.	Proposed	d use:	Irrigation (2	<u>20.4 acres, prim</u>	<u>ary), Co</u>	ommerci	<u>al (primary), a</u>	and Resid	lential (p	rimary &	suppleme	<u>ental)</u>	
	Seasonal	lity:	Residential	& Commercial =	= Year I	Kound (3	65 days), Irri	gation = 1	<u>5 April t</u>	o 15 Octo	<u>ber (184 d</u>	lays)	
Δ3	Well and	l aquifé	er data (attach	and number lo	as for e	victina w	ells, mark nro	nosed we	lle ac cue	h under l	ogid).		
дз.	wen and	i aquito				Aisting w	ens, mark pro	poseu we		ii unuer r	ugiu).		
Wel		_	Applicant'	Proposed	Pr	oposed	Locat	ion	Locat	ion meter	s and boun	nds e g	
1	Logic	t	S	Aquifer*	R	ate(cfs)	(T/R-S (	)0-0)	2250	)' N. 1200' ]	E fr NW co	r S 36	
*			Well #	riquitor								~ ~ ~	
1	Not Dri	lled	2	Basin fill		0.31	35S/7E-sec	e 8 DBC	1890	)' N, 2060'	W fr SE co	or S 8	
2													
3													
4													

PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

\* 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	4265	?	?	N.A.	Prop +/-600	Prop +/-340	Prop +/-500	?	?	?	?	?

Use data from application for proposed wells.

#### A4. Comments:

The proposed water use is for a 55 acre subdivision:

Well 1 is under application G-15844 (permit G-15486), is not constructed, but 600 ft abandoned test hole was, 0.03 cfs (13.5 gpm) was approved for domestic use (25 homes)

This application G-17286 proposes adding Well 2 for:
Irrigation of 20.4 acres (primary) = 114.4 gpm (0.25 cfs), 61.2 ac-ft/yr total
Commercial (primary) for community center = 2.7 gpm (0.006 cfs), 1.42 mil gal / yr (4.4 ac-ft/yr)
Domestic (primary) for 10 homes = 7.2 gpm (0.016 cfs), 3.78 mil gal / yr (11.6 ac-ft/yr)
Domestic (supplemental to Well 1, 25 homes) = 13.46 gpm (0.030 cfs), 7.1 mil gal / yr (21.8 ac-ft/yr)

## Proposed aquifer is basin fill based on application and water well reports submitted (KLAM 57258 & KLAM 1213)

The static water may be about 85 ft blsd on the proposed location and USGS report (Gannett and others, 2007). The report shows the proposed well location on a ground water divide between Agency Lake and the Williamson River.

A5. 🔄	Provisions of	f the	N.A.			Basin ru	iles relativ	ve to the	he develo	opment, clas	sification	and/or
	management of	of ground v	vater hydraulical	ly connecte	ed to surfac	e water	are, a	or 🗌 a	are not, a	activated by	this appl	ication.
	(Not all basin	rules conta	in such provision	ns.)								
	Comments:	No basir	n rule applies.	Only the	Klamath	River	Compact	ORS	542.610	to 542.630	applies	to the
	Klamath Bas	in Howey	er that compa	et annlies t	o surface v	vater on	nlv not gr	hung	water			

A6. 🗌	Well(s) #	<u>N.A.</u> ,,	,,	,	tap(s) an aquifer limited by an administrative restriction.
	Name of admi	inistrative 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:
  - $\Box$  is over appropriated,  $\Box$  is not over appropriated, or  $\boxtimes$  cannot be determined to be over appropriated during any a. 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;
  - will not or will likely be available in the amounts requested without injury to prior water rights. \* This finding b. is limited to the ground water portion of the injury determination as prescribed in OAR 690-310-130;
  - will not or will likely to be available within the capacity of the ground water resource; or c.
  - 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, 7F, 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;
- **Condition** to allow ground water production from no deeper than ft. below land surface; B2. a.
  - Condition to allow ground water production from no shallower than \_\_\_\_\_\_ ft. below land surface; b.
  - \_\_\_\_\_ ground c.
  - Well reconstruction is necessary to accomplish one or more of the above conditions. The problems that are likely d. 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):

Ground water availability remarks: Recommend conditions 7B, 7F and 7N. B3.

The understanding of the Upper Klamath Basin hydrogeology has improved since the review of previous application G-15844 (permit G-15486)

Data from the eastern Lost River sub-basin ground water investigation (Grondin, 2004) and the current USGS-OWRD cooperative Upper Klamath Basin ground water investigation (Gannett and others, 2007) indicate basin longterm 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. The declines are greater than typically observed during drought periods. They appear related to the USBOR Klamath Project Water Bank.

<u>Further, the current USGS-OWRD cooperative Upper Klamath Basin ground water investigation (Gannett and others, 2007) has also found an exception to the basin-wide ground water level trends at wells in the vicinity of Upper Klamath Lake.</u> Ground water levels at these wells are highly influenced by lake levels.

The closest state observation well to the applicant's area is state observation well 274 (KLAM 1362) located about 4.5 miles southeast of the proposed well site. It is 500 feet deep, completed in basin fill. The hydrograph is from 1965 to 2009. It shows the ground water level is influenced by lake levels. The hydrograph for the applicant's well is expected to be similar given its proximity to surface water (Agency Lake).

Another state observation well 273 (KLAM 11796) is located at Collier State Park, close to the Williamson River, about 6.5 miles northeast of the proposed well site. It is 221 feet deep, completed in rock (most likely basalt). The hydrograph is from the 1950s to 2009. It shows seasonal variations generally less than 1 foot, and the long term trend appears to be climate influenced. No net long term decline is apparent.

## 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	Basin fill		$\boxtimes$

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 submitted with the application and for other wells in the same section (section) as the proposed well indicate the basin fill thickness exceeds 600 feet. None of the wells penetrated the basin fill to reach basalt.

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 <sup>1</sup>/<sub>4</sub> 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)	Hydra Conn YES NO	ulically nected? ASSUMED	Potentia Subst. Int Assum <b>YES</b>	l for terfer. ed? <b>NO</b>
1	1	Williamson River	4180	4145	6600	$\square$			$\boxtimes$
1	2	Agency Lake	4180	4141	7000				

Basis for aquifer hydraulic connection evaluation: Ground water elevation based on Gannett and others (2007)

<u>A hydraulic connection to Agency Lake and the Williamson River is very likely given Gannett and others (2007) show</u> the proposed well location on a ground water divide with ground water flow to both the lake and river and given the discussion below.

The eastern Lost River sub-basin ground water investigation data (Grondin, 2004) and the current USGS-OWRD cooperative Upper Klamath Basin ground water investigation (Gannett and others, 2007) indicate low yield (low hydraulic conductivity) sediments overlie higher yield (high conductivity) basalt. Many domestic wells produce from the sediments and most irrigation wells produce from the basalt. Ground water in the sediments and the basalt appear hydraulically connected. The data include similar or small differences between basalt and sedimentary ground water levels at wells completed in the sediments responding to pumping ground water from basalt.

In addition to the hydraulic connection between basalt and the overlying sediments, the USGS-OWRD cooperative Upper Klamath Basin ground water investigation (Gannett and others, 2007) found ground water level trends at wells in the vicinity of Upper Klamath Lake are highly influenced by lake levels. Lake influenced ground water should include the applicant's area also as evidenced by state observation well 274 (KLAM 1362) located about 4.5 miles southeast of the proposed well site. The hydrograph shows the ground water level is highly influenced by lake levels. The hydrograph for the applicant's well is expected to be similar.

# Water Availability Basin the well(s) are located within: LINK R> KLAMATH R- AB UNN STR WILLIAMSON R > UPPER KLAMATH L – AT MOUTH

C3a. **690-09-040** (4): Evaluation of stream impacts for <u>each well</u> 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  $\boxtimes$  box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < <sup>1</sup> / <sub>4</sub> 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:

The proposed well is more than one-mile from the Williamson River and Agency Lake.

#### Application: G-17286 continued

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.

Williamson River (same well: 184 days irrigation calculated separate from 365 days domestic and commercial)

Non-D	istributed	Wells											
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q	as CFS												
Interfere	ence CFS												
Distrib	outed Well	s											
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1	4.3%	3.9%	3.7%	2.2%	3.7%	4.9%	5.9%	6.8%	7.5%	6.3%	5.3%	4.7%
Well Q	as CFS	0.00	0.00	0.00	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.00	0.00
Interfere	ence CFS	0.007	0.007	0.006	0.004	0.006	0.008	0.010	0.012	0.013	0.011	0.009	0.008
1	1	2.2%	3.7%	4.9%	5.9%	6.8%	7.5%	8.2%	8.9%	9.5%	10.1%	10.6%	11.1%
Well Q	as CFS	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
Interfere	ence CFS	0.001	0.002	0.003	0.003	0.004	0.004	0.004	0.005	0.005	0.005	0.006	0.006
$(\mathbf{A}) = \mathbf{To}$	tal Interf.	0.008	0.009	0.009	0.007	0.010	0.012	0.014	0.017	0.018	0.016	0.015	0.014
( <b>B</b> ) = 80	% Nat. Q	816	924	1210	1320	1280	915	639	553	589	651	677	818
(C) = 1	% Nat. Q	8.16	9.24	12.10	13.20	12.80	9.15	6.39	5.53	5.89	6.51	6.77	8.18
$(\mathbf{D}) = (\mathbf{A}$	(C) > (C)	No											
$(\mathbf{E}) = (\mathbf{A})$	/ B) x 100	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.003	0.003	0.002	0.002	0.002

(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.

Age	ncv	Lake (same well:	184 days irrigation	calculated set	parate from 365 d	lavs domestic and	l commercial)
- <b>O</b>	- <b>.</b>						

Non-D	istributed	Wells											
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q	as CFS												
Interfere	ence CFS												
Distrib	outed Well	s											
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	12.3%	9.9%	8.2%	40.4%	54.1%	61.2%	65.8%	69.1%	71.5%	36.1%	22.3%	16.0%
Well Q	as CFS	0.00	0.00	0.00	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.00	0.00
Interfere	ence CFS	0.021	0.017	0.014	0.069	0.092	0.104	0.112	0.117	0.122	0.061	0.038	0.027
1	2	40.4%	54.1%	61.2%	65.8%	69.1%	71.5%	73.5%	75.1%	76.5%	77.6%	78.6%	79.4%
Well Q	as CFS	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
Interfere	ence CFS	0.021	0.028	0.032	0.034	0.036	0.037	0.038	0.039	0.040	0.040	0.041	0.041
			1	1	1		1	1	1	1	1	l	
$(\mathbf{A}) = \mathbf{T}0$	tal Interf.	0.042	0.045	0.046	0.103	0.128	0.141	0.150	0.156	0.162	0.101	0.079	0.068
(B) = 80	% Nat. Q	1470	1520	1690	2220	2100	1670	1180	914	830	808	952	1240
(C) = 1 %	% Nat. Q	14.70	15.20	16.90	22.20	21.00	16.70	11.80	9.14	8.30	8.08	9.52	12.40
$(\mathbf{D}) = (\mathbf{A}$	(C) > (C)	No											
(E) = (A	/ B) x 100	0.003	0.003	0.003	0.005	0.006	0.008	0.013	0.017	0.020	0.013	0.008	0.005

(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:

Hunt (1999) was used to calculate the interference at Williamson. The 1999 version was used given the well does not penetrate the sediments to the basalt below. The values used for the calculations are conservative and appropriate until better values become available. The transmissivity and hydraulic conductivity value used for the sediments is the derived from specific capacity data from 13 wells in T35S/R7E-sec 7 and 12 wells in T35S/R7E-sec 8. The hydraulic conductivity assigned to the river bed is 1/100 of the sediment hydraulic conductivity. The assigned aquifer thickness for the basin fill is a conservative 500 feet. The river bed thickness is a conservative 500 feet; it may be less than 100 feet. The 175 foot river width used is an average. A pro-rated pumping rate was used (total volume / total time).

Hunt (1999) was also used to calculate the interference at Agency Lake. The 1999 version was used given the well does not penetrate the sediments to the basalt below. The values used for the calculations are conservative and appropriate until better values become available. The transmissivity and hydraulic conductivity value used for the sediments is the derived from specific capacity data from 13 wells in T35S/R7E-sec 7 and 12 wells in T35S/R7E-sec 8. The hydraulic conductivity assigned to the Agency Lake bed is 1/100 of the sediment hydraulic conductivity. The assigned aquifer thickness for the basin fill is a conservative 500 feet; the thickness may reach or exceed 1,000 feet. The assigned lake bed thickness is a conservative 500 feet; it may be less than 100 feet. The 7,500 foot lake width is conservative; the shortest width is more than 10,000 feet. A pro-rated pumping rate was used (total volume / total time).

# 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.  $\Box$  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

If a permit is issued, include conditions 7B, 7F, 7N, 7J

A hydraulic connection to Agency Lake and the Williamson River exists.

A hydraulic connection to Agency Lake and the Williamson River is very likely given Gannett and others (2007) show the proposed well location on a ground water divide with ground water flow to both the lake and river and given the discussion below.

The eastern Lost River sub-basin ground water investigation data (Grondin, 2004) and the current USGS-OWRD cooperative Upper Klamath Basin ground water investigation (Gannett and others, 2007) indicate low yield (low hydraulic conductivity) sediments overlie higher yield (high conductivity) basalt. Many domestic wells produce from the sediments and most irrigation wells produce from the basalt. Ground water in the sediments and the basalt appear hydraulically connected. The data include similar or small differences between basalt and sedimentary ground water levels at wells completed in the sediments responding to pumping ground water from basalt.

In addition to the hydraulic connection between basalt and the overlying sediments, the USGS-OWRD cooperative Upper Klamath Basin ground water investigation (Gannett and others, 2007) found ground water level trends at wells in the vicinity of Upper Klamath Lake are highly influenced by lake levels. Lake influenced ground water should include the applicant's area also as evidenced by state observation well 274 (KLAM 1362) located about 4.5 miles southeast of the proposed well site. The hydrograph shows the ground water level is highly influenced by lake levels. The hydrograph for the applicant's well is expected to be similar.

References Used:

<u>Grondin, G.H., 2004.</u> 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.

Hunt, B., 1999, Unsteady stream depletion from ground water pumping: Ground Water, v. 37, no. 1, p. 98-102.

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

State Observation Well 274 (KLAM 1362)

Specific capacity data from 15 water well reports for wells in T35S/R7E-sec 7 and sec 8

USGS Agency Lake, Oregon quadrangle map (1:24,000 scale)

# D. WELL CONSTRUCTION, OAR 690-200

D1.	Well #:   1   Logid:   Not Drilled Yet	
D2.	THE WELL does not meet current well construction standards based upon:         a.       review of the well log;         b.       field inspection by	; ;
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.	<ul> <li>THE WELL a. was, or was not constructed according to the standards in effect at original construction or most recent modification.</li> <li>b J don't know if it met standards at the time of construction</li> </ul>	the time of
D6. 🗌	<b>Route to the Enforcement Section.</b> I recommend withholding issuance of the permit until evide is filed with the Department and approved by the Enforcement Section and the Ground Water Sec	nce of well reconstruction ion.
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).

\_\_\_\_\_





STATE OF CREGON Watter WeLL REPORT (as acquired by CRS 637766)       WELL Ds L48056       ////////////////////////////////////		KLAM	57258	ICN
WATER WELL REPORT         (START CARD )#         1560! 2           (1) OWNER         03 23         (SLOCATION OF WELL by legal description           (2) DVNER         03 23         (SLOCATION OF WELL by legal description           (3) DVNER         03 23         (SLOCATION OF WELL by legal description           (4) POPOSED USE:         Community         Employed in the construct of construct o	STATE OF OREGON		WELL ID # 46058	
(a) Control (a) Control (b) Control (c) Control (c) Press (c) Field (c) Control (c) Press (c) P			(START CARD)# 15608	2
(1) OWNER       03.23         (2) CONNER       03.23         (3) DOLLADNO OV WELL Syngal assertation       Longitude         (3) DOLLADNO OV WELL Syngal assertation       Individual assertation         (3) DRILL METHOP:       NOW WELL         (3) DRILL METHOP:       ROTARY MUD         (4) PROPOSED USE:       Community-TEST HOLE         (5) BORE HOLE CONSTRUCTION:       Stret Address of Well (or nearest address)         (4) PROPOSED USE:       Community-TEST HOLE         (5) BORE HOLE CONSTRUCTION:       The blow land surface       Date         (4) PROPOSED USE:       Community-TEST HOLE       Attential pressure       Date         (1) WATER BEARING ZONES :       Date       Attential Stressure       Date         (1) STATIC WATER LEVEL:       Strest Address of Well (or nearest address)       Molecular         (1) BORE HOLE CONSTRUCTION:       The blow land surface       Date         (1) CLAINER:       AMOUNT       Date       Strest Address of Well (or nearest address)         (1) CLAINER:       Material       Form To State of Gravel       BEOWN SLAX       4         (2) WELL LOG:       Ground Elem tion       Form To Gage       Material       State of Gravel         (2) WELL State of Gravel       BEOWN SLAX       4       9       State				
KLAMATH TRIBES       Doignues       angle Z       angle	(1) OWNER 03	323	(9) LOCATION OF WELL by legal description	Longitudo
P.O. BOX 436       International Subsection B.       Section B.	KLAMATH TRIBES		County KLAMATH Latitude	Longitude
CHILOQUIN       OR 97624         (2) TYPE OF WORK :       NEW WELL         (3) DRILL METHOD :       NEW WELL         (4) PROPOSED USE:       Community- TEST HOLE         (5) BORE HOLE CONSTRUCTION:       Section Pressure         (5) BORE HOLE CONSTRUCTION:       Depth advision term of Sacks         Section Pressure       Date         (11) WATER BEARING ZONES :       Date         (12) WELL CONSTRUCTION:       Sectal MACOUNT         Sectal Conductor Asymptotic Sectal MACOUNT       Amount         (21) WELL LOG:       Greun Elemated Flow 1         (22) WELL LOG:       Greun Elemated Flow 1         (23) CASING / LINER:       Dist fisse of Gravel         (24) MERCE SEAL       AMOUNT         (24) WELL LOG:       Greun Elemated Flow 1         (25) CASING / LINER:       Dist fisse of Gravel         (26) SING / LINER:       Dist fisse of Gravel         (27) WELL LOG:       Greun Elemated Flow 3         (28) CASING / LINER:       Dist fisse of Gravel         (20) WELL SING / LINER:       Dist fisse of Gravel         (24) WELL CLAY WISTERAS OF BROWN       54         (24) WELL CLAY WISTERAS OF BROWN       54         (24) WELL CLAY WISTERAS OF BROWN       54         (24) WELL CLAY WISTERAS OF BROWN	P.O. BOX 436		Township 32	ange "
(2) TYPE OF WORK :       NEW WELL       Block       Bloc	CHILOQUIN OR 9	7624	Section 8	<u>SE</u> 1/4
(2) TYPE OF WORK :       NEW WELL         (3) DRILL METHOD :       ROTARY MUD         (4) PROPOSED USE:       Community-TEST HOLE         (4) PROPOSED USE:       Community-TEST HOLE         (5) BORE HOLE CONSTRUCTION:       Date         (4) PROPOSED USE:       Community-TEST HOLE         (5) BORE HOLE CONSTRUCTION:       Date         (6) BORE HOLE CONSTRUCTION:       Date         (7) WATER BEARING ZONES :       Defined Winkington To         (7) STATIC WATER ADDRESS       Constructores         (7) WELL LOC:       Ground Elements         (7) STATIC WATER ADDRESS       Counces         (7) Statistic from To       Material         (7) PERFORM / LINER:       Defined Winkington Zonge         (7) PERFORATIONS / SCREINS:       Material         (7) PERFORATIONS / SCREI			Tax Lot 1700 Lot Block Sub	vision
(a) DRILL METHOP:       ROTARY MUD         (b) PROPOSED USE:       Community-TEST HOLE         (c) BORE HOLE CONSTRUCTION:       Date         (c) BORE HOLE CONSTRUCTION:       Date         (c) BORE MOLE CONSTRUCTION:       SEAL         (c) CONSTRUCTION:       SEAL CONSTRUCTION:         (c) CONSTRUCTION:       SEAL CONSTRUCTION:         (c) CASING, B^* +1, 19, 250, STEEL       DEVEL CLAY WORE CONSTRUCTOR:         (c) PERFORATIONS / SCREINS:       DEVEL CLAY WORE CONSTRUCT CERTIFICAN	(2) TYPE OF WORK : NEW WELL		SW CORNER OF HWY 62 & S. CHILOQUIN R	OAP
(4) PROPOSED USE:       Community- TEST HOLE         (5) BORE HOLE CONSTRUCTION:       Date         (5) BORE HOLE CONSTRUCTION:       Dupt of computer view information of computer view information of computer view information of computer view information of the view of the view information of the view i	(3) DRILL METHOD : ROTARY MUD		(10) STATIC WATER LEVEL:	. <del>19. 2000 - 201 - 19. 19</del>
(3) BORE HOLE CONSTRUCTION:       Artesian pressure       Use         (5) BORE HOLE CONSTRUCTION:       Dum of Congulatives608	(4) PROPOSED USE: Community- TEST HOLE		ft. below land surface Date	านะสามหมายในการการการการการการการการการการ -
(5) BORE HOLE CONSTRUCTION:         Send Construction Asserved       NO			Artesian pressure Date	Barrier
Special Construction Approval       NO	(5) BORE HOLE CONSTRUCTION:		(11) WATER BEARING ZONES :	
Explosive used       NOTyps       Amount       From To       SEAL       AMOUNT         HOLE       SEAL       AMOUNT       AMOUNT       Construction       Server         Diamater Prom To       Sextex       Sextex       Sextex       Sextex         12       .0       .19       .9       Response       Sextex       Sextex         How was seal Placed from       .6       .1       Material       Sextex       .0       4       .0         Stackfil placed from       .6       .6       .1       .0       .4       .0       .4       .0         Blown SLAND AND CLAY,       .4       .9       .26       .54       .26       .54       .20       .26       .54       .20       .26       .54       .20       .26       .54       .20       .26       .54       .20       .26       .54       .20       .26       .54       .20       .26       .54       .20       .26       .54       .20       .26       .54       .20       .26       .54       .20       .26       .54       .20       .26       .54       .20       .26       .54       .26       .54       .26       .54       .26       .51       .26 </td <td>Special Construction Approval NO. Depth of Completed Wet</td> <td>608 fi</td> <td>Depth at which water was first found</td> <td></td>	Special Construction Approval NO. Depth of Completed Wet	608 fi	Depth at which water was first found	
HOLE       SEAL       AMOUNT         immeter From To       Meterial From To       Sackis         12"	Explosives used NOTypis Amount		From To Estimated Flow	we Svyr
Diameter From To       Material       From To       Sacks         12".       0.       19.       9.         8".       19.       508.         How was seal Placed POURED DRY       ROM TO       SW         Backfli placed from       fit. to       fit. Material         Gravel placed from       fit. to       fit. Material         Backfli placed from       fit. to       fit. Size of Gravel         BROWN SAND AND CLAY       9.       28.         COURSE SAND       26.       54.         Dia. From To Gage Material       COURSE SAND       54.         CASING / LINER:       20.       32.         Dia. From To Gage Material       COURSE SAND       54.         CASING / LINER:       338.       342.         Dia. From To Gage Material       COURSE SAND       54.         CASING / LINER:       338.       342.         BLUE CLAYSTONE       338.       342.         SANDSTONE       58.       578.         Final location of shoe (s)       Fite CLAY MUSTREAKS OF SAND       514.         (7) PERFORATIONS / SCREINS:       SANDSTONE       578.         METHOD       TY PE       MATERIAL       NOV-1.0-2009.         (Wibet L TEST3:	HOLE SEAL A	MOUNT		
Additional and the structure of Value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)         Additional and the structure of Value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)         Additional and the structure of Value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)         Additional and the structure of Value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)         Additional and the structure of Value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)         Additional and the structure of Value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)         Additional and the structure of value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)         Additional and the structure of value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)         Additional and the structure of value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)       Additional and the structure of value (s)         Additional and the s	12" 0 10 PENTONITE 0 10	Sacks		
(12) WELL LOG:       Ground Eler       fion         How was seal Placed pour pour form       fit Material       Course form       fit Material         Gravel placed from       fit to       fit Material       Course form       fit to         Gravel placed from       fit to       fit form       fit form       fit form       fit form         Gravel placed from       fit to       fit form       fit form       fit form       fit form         Gravel placed from       fit to       fit form       fit form       fit form       fit form         Gravel placed from       fit to       fit form       fit form       fit form       fit form         Gravel placed from       fit form       fit form       fit form       fit form       fit form         Gasing / Liner:       Course form       gas       fit form       fit form       fit form         Gasing / Liner:       fit form         Gasing / Liner:       fit form       fit f	8" 19 608		······································	
How was seal Placed POURED DRY       ROM TO SW         Backfil placed from       f. to       ft. Material         Gravel placed from       f. to       ft. Size of Gravel         Backfil placed from       ft. to       ft. Size of Gravel         Browns SanD AND CLAY       9       28         Casing / Liner:       26       54         Dia. From To Gage Material       COURSE SAND WisEAMS OF BROWN       54         Casing / Liner:       338       342         Dia. From To Gage Material       GREY CLAY       304         CASING / Liner:       338       342         Gravel / Liner:       338       342         Gravel / Liner:       SanDSTIONE       548         SanDSTIONE       528       578         Blue:       CLAY WIGHTERAKS OF SAND       552         Sand Stone:       Sand Stone:       578       608         C/) PERFORATIONS / SCREI:NS:       NOV-1-0-2009       Contegon       Cortiget mawo	Manufalation (Manufala) (Manufala) (Manufalation (Manufalation) (M		(12) WELL LOG: Ground Ele	tion
Backfil placed from       fit. to       ft. Material       YELLOW CLAYSTONE       0       4       9         Gravel placed from       ft. to       ft. Size of Gravel       BROWN SAND AND CLAY       4       9         3) CASING / LINER:       Dia. From To       Gage       Material       28       54         Dia.       From To       Gage       Material       GREY CLAY       304       334         CASING / LINER:       Dia.       GREY CLAY       304       334       342         CASING / LINER:       Dia.       GREY CLAY       304       338       342         GREY CLAY WISILE CLAY       304       338       342       344       488       514         GREY CLAY WISILE CLAY       SANDSTONE       514       552       578<	How was seal Placed POURED DRY		(	ROM TO SW
Gravel placed from       .1. to       .ft. Size of Gravel         BROWN CLAY       .9       .28         Dia. From To Gage Material	Backfil placed fromfl. toft. Material	APRILITY STEPLES	YELLOW CLAYSTONE	
3) CASING / LINER:       30         Dia. From To Gege Material       26.54.         CASING / LINER:       304.304.         Dia. From To Gege Material       CLAY         CASING / LINER:       304.304.         GREY CLAY W/BLUE CLAY       344.498.         SANDSIONE       552.578.         Final location of shoe (s)       BLUE CLAYSTONE         METHOD       TYPE         MEROUNCECTOR       Certification oreatitable fo	Gravel placed fromfl. toft. Size of Grav	vel	BROWN SAND AND CLAY	
3) CASING / LINER:       Dia. From To Gage Material       Au			BROWN CLAY	26 54
Dia.       From To       Gege       Material       CLAY       304         CASING       8"       +1       19       250       STEEL       304         GREY CLAY       304       338       338       338         BLUE CLAYSTONE       304       304         CREY CLAY       304       338         BLUE CLAYSTONE       304       338         GREY CLAY WIGUE CLAY       342       498         SANDSTONE       552       578         Final location of shoe (s)       BLUE CLAYSTONE       552         METHOD       TYPE       MATERIAL       NOV-10-2009         WETHOD       TYPE       MATERIAL       NOV-10-2009         WETHOD       TYPE       MATERIAL       NOV-10-2009         WETHOD       TYPE       MATERIAL       NOV-10-2009         WETHOD       TYPE       MATERIAL       SANDSTONE         STREE       Statematic September 17, 2003       Complet       October 2, 2003         (0) WELL TESTS:       Minim im testing time is 1 hour       Statematic September 17, 2003       Complet         TESTING METHOD       Alig       Hour       DATE       Statefall seed         Yield GPM       Drawdowr       Dilti	3) CASING / LINER:		COURSE SAND WISEAMS OF BROWN	.49
CASING 8* 41 19 250       STEEL       GREY CLAY       304 338         GREY CLAY       338 342       338 342         GREY CLAY WBUE CLAY       342 498         SANDSTONE       498 514         GREY CLAY WBUE CLAY       342 498         SANDSTONE       514 552         Final location of shoe (s)       514 552         From To Slot size Number Dia. Tele / pipe size       SALE M. OFEGON         SALE EM OFEGON       October 2, 2003         (c) WELL TESTS:       Minim Jm testing time is 1 hour         TESTING METHOD       AR         Yield GPM       Drawdowr         Drawdowr       Drill stem at         Temperature of Water       F'Depth Artesian Flow Found         Was a water analysis done? HQ_ By whom       MO         Did any strata contain water not s attable for Intended use?       MO         Did any strata contain water not s attable for Intended use?       MO	Dia. From To Gage Materia	al	CLAY	
BLUE CLAYSTONE       338       342         GREY CLAY WIGLUE CLAY       342       498         SANDSTONE       514       552         Final location of shoe (s)       578       608         (7) PERFORATIONS / SCREI:NS:       578       608         METHOD       TY <sup>3</sup> E       MATERIAL       NOV-1-0-2009       578       608         From To Slot size Number Dia. Tele / pipe size       SALEM, OREGON       October 2, 2003       Complete       October 2, 2003         (a) WELL TESTS:       Minim Jm testing time is 1 hour       Sand information reported above are true to my be       Conting time is 1 hour       Complete Constructor Certification:       Cortify that the work         Temperature of Water       F'Depth Artesian Flow Found       Will ding the construction alteration or abandonment with Oregon well construction or abandonment with oregon well construction dates reported above are true to my be       All work performed on this         Was a water analysis done?       JQ       By whom       Sanddrifes. This report is fire to the best of my ki       All work performed du         Was a water analysis done?       JQ       By whom       Sanddrifes. This report is fire to the best of my ki       Wedge and bellef.         Old any strata contain water not a sitable for intended use?       No       No       Sanddrifes. This report is fire to the best of my ki       We	CASING 8" +1 19 250 STEE	L	GREY CLAY	304
GREY CLAY WISILUE CLAY       542       498         SANDSTONE       514       562         Final location of shoe (s)       514       552         (7) PERFORATIONS / SCREI:NS:       514       552         METHOD       TY 2E       MATERIAL       SANDSTONE         From To Stot size Number Dia. Tele / pipe size       SANDEROWINGE 6680       SANDSTONE         (8) WELL TESTS:       Minim Jm testing time is 1 hour       CALEM, OFEGON       October 2, 2003         (8) WELL TESTS:       Minim Jm testing time is 1 hour       Sand Method       Calies tarted September 17, 2003       Complete         (8) WELL TESTS:       Minim Jm testing time is 1 hour       Calies tarted September 17, 2003       Complete       October 2, 2003         (Bonded) Water Well Constructor Certification reported above are true to my be       Scale M. OFEGON       Okine       Calies Constructor Certification or abandonmentwick         Yield GPM       Drawdowr       Drill stem at Time       1.HOUR       Conter 17, 2003       Center 17, 2003       Calies Constructor Certification or abandonmentwick       Scape 17, 500, 500, 500, 500, 500, 500, 500, 50	allananan unuu antina Aranka Artanan		BLUE CLAYSTONE	338 342
Final location of shoe (s)       534.02       548.02       548.02         Final location of shoe (s)       552.578       552.578         (7) PERFORATIONS / SCREI:NS:       514.43       552.578         METHOD       TY 2E       MATERIAL       514.24         From To Slot size Number Dia. Tele / pipe size       SALE M. OFEGON       October 2, 2003         (8) WELL TESTS:       Minim Jm testing time is 1 hour       SALE M. OFEGON       October 2, 2003         (8) WELL TESTS:       Minim Jm testing time is 1 hour       SALE       One construction, alteration, or abs         (9) WELL TESTS:       Minim Jm testing time is 1 hour       Sale       One construction alteration or abandoments'       Certify that the work         Temperature of Water       F'Depth Artesian Flow Found       Nov.       Date       Sonded) Water Well Constructor Certification:       Construction alteration or abandoments'       Certify that the work donnent of this well during the construction dates reported above are true to my be         Temperature of Water       F'Depth Artesian Flow Found       Well during the construction dates reported above are true to my be       All work performed on this         Well during the construction alteration or abandomment's to performed on this       All work performed during the construction dates reported above are true to my be       All work performed during the construction dates reported above are true to my be <td>Andrewelling and an and a second seco</td> <td>t</td> <td>GREY CLAY W/BLUE GLAY</td> <td>498 514</td>	Andrewelling and an and a second seco	t	GREY CLAY W/BLUE GLAY	498 514
Final location of shoe (s)       52       578         Final location of shoe (s)       578       608         (7) PERFORATIONS / SCREI:NS:       SANDSTONE       578       608         METHOD       TY °E       MATERIAL       SALEM. OREGON       Solution of shoe (s)       October 2, 2003         From To Slot size Number Dia.       Tele / pipe size       SALEM. OREGON       October 2, 2003         (8) WELL TESTS:       Minim Jm testing time is 1 hour       Sin compliance with Oregon well constructor certification. or abs       certify that the work donment of this well dards. Materials used knowledge and belief         (9) WELL TESTS:       Minim Jm testing time is 1 hour       SALE       Onted Water Well Constructor Certification. or abs       certify that the work donment with Oregon well construction state and information reported above are true to my be       Solution of this well dards. This report is ince on the construction dates reported bove at the test of my kt       VWC # 1752         Temperature of Water       F'Depth Artesian Flow Found       Water Well Constructor Certification: for the construction alteration or abandonment with well during the construction dates reported bove at this time, ent compliance with Oregon well construction atteration with Oregon well construction atteration or abandonment with well during the construction dates reported bove at this time, ent compliance with Oregon well construction at the bove of my kt         MWC # 1752       Solution the construction dates reported bove at my kt       WWC			GREY CLAY W/STREAKS OF SAND	514 552
Final location of shoe (s)       578       608         (7) PERFORATIONS / SCREI:NS:       SALEM_OREGON       578       608         METHOD       TY ">E       MATERIAL       NOV-1-0-2009       578       608         From To Slot size Number Dia.       Tele / pipe size       SALEM_OREGON       October 2, 2003       Complete         (8) WELL TESTS:       Minim Jm testing time is 1 hour       SALEM_OREGON       October 2, 2003       Cottober 2, 2003         TESTING METHOD       AllR       SALEM_OREGON       October 2, 2003       Complete       October 2, 2003         Yield GPM       Drawdowr       Drill stem at Time       Time       1HOUR       DATE       WWC # 1756         Yield GPM       Drawdowr       Drill stem at Time       1HOUR       Bonded) Water Well Constructor Certification:       Corbor 2, 2003         Yield GPM       Drawdowr       Drill stem at Time       1HOUR       DATE       WWC # 1756         (Bonded) Water well Constructor Certification:       Scale properties of the construction atteration or abandonment well construction atteration or aba			SANDSTONE	552 578
(7) PERFORATIONS / SCREI:NS:         METHOD       TY <sup>3</sup> E         MATERIAL         From To Slot size Number Dia. Tele / pipe size         SALEM. OREGON         Date started September 17. 2003       Complete         (8) WELL TESTS:       Minim um testing time is 1 hour         TESTING METHOD       AR         Yield GPM       Drawdowr         Drill stem at       Time         1 HOUR.       Bonded) Water Well Constructor Certification:         Water well Constructor Certification:       Materials used         king diamond weiter of Water       F' Depth Artesian Flow Found         Was a water analysis done?       JQ_B whom         Did any strata contain water not s sitable for intended use?       Mo         Mage       Mage         Ming any strata contain water not s sitable for intended use?       Mo	Final location of shoe (s)		BLUE CLAYSTONE	578608
(7) PERFORATIONS / SCREENS:         METHOD       TY °E         MATERIAL         From To Slot size Number Dia.       Tele / pipe size         SALEM, OREGON         SALEM, OREGON         Control of the construction alteration, or abc         (8) WELL TESTS:         Minim Jm testing time is 1 hour         TESTING METHOD         Yield GPM         Drawdowr       Drill stem at         Temperature of Water       F'Depth Artesian Flow Found         Was a water analysis done? 140, By whom         Did any strata contain water not a sitable for intended use?         No.			RECEIVED	
METHOD       TYPE       MATERIAL         From To Slot size Number Dia.       Tele / pipe size         SALEM, OREGON       Complex         CB WELL TESTS:       Minimum testing time is 1 hour         TESTING METHOD       AIR         Yield GPM       Drawdowr         Drawdowr       Drill stem at         Temperature of Water       F'Depth Artesian Flow Found         Was a water analysis done?       NO.         Did any strata contain water not suitable for intended use?       No.	(/) PERFORATIONS / SCREIENS:			
From To Slot size Number Dia. Tele / pipe size       SALEM, OREGON         SALEM, OREGON       Date started September 17, 2003 Complete       October 2, 2003         (8) WELL TESTS:       Minim Jm testing time is 1 hour       Date       SALEM, OREGON       Certification         Yield GPM       Drawdowr       Drill stem at       Time       IHOUR       Date       Constructor Certification:       Certify that the work domment of this well dards. Materials used is in compliance with Oregon well construction ste and information reported above are true to my be       Certify that the work domment of this well dards. Materials used is in compliance with Oregon well construction ste and information reported above are true to my be       Certify that the work domment of this well dards. Materials used is in compliance with Oregon well construction ste and information reported above are true to my be       Certify that the work domment of this well dards. Materials used is in compliance with Oregon well construction ste and information reported above are true to my be       Molect 1752         Was a water analysis done?       No       No       Date to the best of my kr       Sector the best of my kr         Did any strata contain water not a sitable for intended use?       No       No       Molect 1752       Complete       WWC # 693	METHOD TYPE MATE	RIAL		, ,,
From To Slot size Number Dia. Tele / pipe size       SALEM. OnEGON       October 2, 2003         SALEM. OnEGON       Date started September 17, 2003       Complete       October 2, 2003         (a) WELL TESTS:       Minimum testing time is 1 hour       Image: Dial and information reported above are true to my be       Construction alteration, or aba       Certify that the work         (b) WELL TESTS:       Minimum testing time is 1 hour       AIR.       Certify that the work         (c) WELL TESTS:       Minimum testing time is 1 hour       AIR.       Certify that the work         Yield GPM       Drawdowr       Drill stem at       Time       1.HQUR.         Temperature of Water       F'Depth Artesian Flow Found       Well during the construction dates reported above are true to my kt       All environment of this well         Was a water analysis done?       MQ.       By whom       No         Did any strata contain water not s sitable for intended use?       No       No       No			www.waranananananananananananananananananana	
Date started September 17, 2003       Complete Coctober 2, 2003         Construction and the construction construction construction alteration, or abard on the construction, alteration, or abard on the construction, alteration, or abard on the construction, alteration, or abard on the construction alteration or abard on the construction alteration or abard on the construction construction atteration or abard on this well darks. Materials used knowledge and belief.         (8) WELL TESTS:       Minimum testing time is 1 hour         TESTING METHOD       AlR         Yield GPM       Drawdowr         Drawdowr       Drill stem at         1.HQUR.       Date started september 17, 2003         Construction, alteration, or abard on the construction, alteration or abardonment with a construction dates reported above are true to my be         Was a water analysis done?       No         Did any strata contain water not s altable for intended use?       No         Did any strata contain water not s altable for intended use?       No	From To Slot size Number Dia. Tele / pipe size		SALEM, OREGON	October 2 2003
(a) WELL TESTS:       Minimum testing time is 1 hour         TESTING METHOD       AIR         Yield GPM       Drawdowr         Drawdowr       Drill stem at         1.HQUR.       0         (Bonded) Water Well Construction, alteration, or aba         (Bonded) Water Well Construction statement of this well         (Bonded) Water Well Construction statement of this well         (Bonded) Water Well Construction statement of this well         (Bonded) Water Well Constructor Certification:         (Bonded) Water Well Constructor Certification:         (Bonded) Water Well Constructor Certification:         (Wwc # 1758         (Bonded) Water Well Constructor Certification:         (Bonded) Water Well Constructor Certification:         (Bonded) Water Well Constructor certification:         (Bonded) Water Well Constructor dates reported above         (Bonded) Water not s sitable for intended use?         (Did any strata contain water not s sitable for intended use?         (Did any strata contain water not s sitable for intended use?         (Did any strata contain water not s sitable for intended use?         (Did any strata contain water not s sitable fo		•••••	Date started September 17, 2003 Complete	e October 2, 2005
(8) WELL TESTS:       Minimum testing time is 1 hour         TESTING METHOD       AIR         Yield GPM       Drawdowr         Drill stem at       Time         1.HOUR       1.HOUR         Temperature of Water       F'Depth Artesian Flow Found         Was a water analysis done?       NQ         Did any strata contain water not s sitable for intended use?       No			(Unbonded) Water Well Constructor Certification	donment of this well
Alk       Dirawdowr       Drill stem at       Time       Dirawdowr       Drill stem at       Time         Yield GPM       Drawdowr       Drill stem at       Time       1.HQUR.       0A1E       WWC # 175E         Temperature of Water       F'Depth Artesian Flow Found       Image: Construction alteration or abandonment with oregon well construction dates reported above this time en construction dates reported above this time en construction dates reported above this time en compliance with oregon well construction wiedge and belief.       WWC # 175E         Did any strata contain water not s sitable for intended use?       No       No       Wiedge and belief.	(8) WELL TESTS: Minim Jm testing time is 1 hour		is in compliance with Oregon well construction sta and information reported above are true to my be	a dards. Materials used knowledge and belief.
1.HQUR.       1.HQUR.       DATE       WWC # 175E         Temperature of Water F'Depth Artesian Flow Found       (Bonded) Water Well Construction alteration or abandonment w       accept responsibility or performed on this well during the construction dates reported above this time en compliance with Oregon well construction       All work performed du tion well on this standards. This report is true to the best of my kr wiedge and bellef.         Did any strata contain water not s sitable for intended use?       No       Work # 175E	Yield GPM Drawdowr Drill stem at	Time	8	
Temperature of WaterF'Depth Artesian Flow Found		1 HOUR	(Bonded) Water Well Constructor Certification:	accept responsibility
Was a water analysis done? <u>NO</u>	Tomporative of Mater	od	for the construction alteration or abandonment w	c performed on this
standards. This report is true to the best of my kr wiedge and belief.	Was a water cachele dama? U.O. Downton		wen ouring the construction dates reported above this time is in compliance with Oregon well const	r xion
Under Strade Condition Field Field Billion Field History Under 10-3-03 WWC # 693	Did any strate contain water not a stable for interded upo?	N.	standards. This report is proe to the best of my k	wledge and belief.
(10-3-03 WWC # 693	FOR BUT AND A CONDUCT WARE THE STRADE OF MIMINED USE (		11.11 nn	
The second secon				2 12 1414/0 # 593
$\mathcal{V}$			( Marin BATE 1D-	-9-00 WWC # 035
			Apple Aniel Copare 10-	- <u></u>



<b>Transient Stream</b>	Depletion	(Jenkins,	1970; Hunt, 1999)
	7222223		

Jenkins s2	Hunt s1	Hunt s2
	Hunt s3	

Output for H	unt Strea	m Deplet	tion, Scel	nerio 2 (s	\$2):	Time pui	mp on = ·	184 days				
Days	30	60	90	120	150	180	210	240	270	300	330	360
Hunt SD s2	0.0221	0.0374	0.0492	0.0591	0.0677	0.0754	0.0627	0.0532	0.0471	0.0427	0.0393	0.0365
Qw, cfs	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
H SD s2, cfs	0.004	0.006	0.008	0.010	0.012	0.013	0.011	0.009	0.008	0.007	0.007	0.006

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.17	0.17	0.17	cfs
Distance to stream	а	6600	6600	6600	ft
Aquifer hydraulic conductivity	к	7.5	7.5	7.5	ft/day
Aquifer thickness	b	500	500	500	ft
Aquifer transmissivity	Т	3750	3750	3750	ft*ft/day
Aquifer storage coefficient	S	0.001	0.001	0.001	
Stream width	ws	175	175	175	ft
Streambed hydraulic conductivity	Ks	0.075	0.075	0.075	ft/day
Streambed thickness	bs	500	500	500	ft
Streambed conductance	sbc	0.02625	0.02625	0.02625	ft/day
Stream depletion factor (Jenkins)	sdf	11.616	11.616	11.616	days
Streambed factor (Hunt)	sbf	0.0462	0.0462	0.0462	

G\_17286\_Klamath\_Tribes\_Agency\_Lake\_Hunt\_1999\_depletion\_Williamson\_River.xls



Transient Stream Depletion (Jenkins, 1970; Hunt, 1999)

Jenkins s2	Hunt s1	Hunt s2
	Hunt s3	Hunt s2 residual

Output for H	unt Strea	m Deplet	tion, Sce	nerio 2 (s	s2):	Time pu	mp on = 3	365 days				
Days	30	60	90	120	150	180	210	240	270	300	330	360
Hunt SD s2	0.0221	0.0374	0.0492	0.0591	0.0677	0.0754	0.0824	0.0889	0.0949	0.1005	0.1059	0.1109
Qw, cfs	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
H SD s2, cfs	0.001	0.002	0.003	0.003	0.004	0.004	0.004	0.005	0.005	0.005	0.006	0.006

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.0521	0.0521	0.0521	cfs
Distance to stream	a	6600	6600	6600	ft
Aquifer hydraulic conductivity	К	7.5	7.5	7.5	ft/day
Aquifer thickness	b	500	500	500	ft
Aquifer transmissivity	Т	3750	3750	3750	ft*ft/day
Aquifer storage coefficient	S	0.001	0.001	0.001	
Stream width	ws	175	175	175	ft
Streambed hydraulic conductivity	Ks	0.075	0.075	0.075	ft/day
Streambed thickness	bs	500	500	500	ft
Streambed conductance	sbc	0.02625	0.02625	0.02625	ft/day
Stream depletion factor (Jenkins)	sdf	11.616	11.616	11.616	days
Streambed factor (Hunt)	sbf	0.0462	0.0462	0.0462	

G\_17286\_Klamath\_Tribes\_Agency\_Lake\_Hunt\_1999\_depletion\_Williamson\_River.xls



Transient Stream Depletion (Jenkins, 1970; Hunt, 1999)

	Hunt s1	Hunt s2
Jenkins s2 residual	Hunt s3	Hunt s2 residual

Output for H	unt Strea	m Deplet	tion, Sce	nerio 2 (s	s2):	Time pur	mp on = ·	184 days				
Days	30	60	90	120	150	180	210	240	270	300	330	360
Hunt SD s2	0.4039	0.5406	0.6121	0.6580	0.6906	0.7154	0.3606	0.2233	0.1600	0.1232	0.0993	0.0818
Qw, cfs	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
H SD s2, cfs	0.069	0.092	0.104	0.112	0.117	0.122	0.061	0.038	0.027	0.021	0.017	0.014

Parameters:	Γ	Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.17	0.17	0.17	cfs
Distance to stream	a	7000	7000	7000	ft
Aquifer hydraulic conductivity	ĸ	7.5	7.5	7.5	ft/day
Aquifer thickness	b	500	500	500	ft
Aquifer transmissivity	т	3750	3750	3750	ft*ft/day
Aquifer storage coefficient	S	0.001	0.001	0.001	
Stream width	ws	7500	7500	7500	ft
Streambed hydraulic conductivity	Ks	0.075	0.075	0.075	ft/day
Streambed thickness	bs	500	500	500	ft
Streambed conductance	sbc	1.125	1.125	1.125	ft/day
Stream depletion factor (Jenkins)	sdf	13.06666667	13.06666667	13.06666667	days
Streambed factor (Hunt)	sbf	2.1	2.1	2.1	

G\_17286\_Klamath\_Tribes\_Agency\_Lake\_Hunt\_1999\_depletion\_Agency\_Lake.xls



Transient Stream Depletion (Jenkins, 1970; Hunt, 1999)

Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 365 days												
Days	30	60	90	120	150	180	210	240	270	300	330	360
Hunt SD s2	0.4039	0.5406	0.6121	0.6580	0.6906	0.7154	0.7350	0.7510	0.7645	0.7760	0.7861	0.7942
Qw, cfs	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
H SD s2, cfs	0.021	0.028	0.032	0.034	0.036	0.037	0.038	0.039	0.040	0.040	0.041	0.041

- - - Hunt s3

Jenkins s2 residual

Hunt s2 residual

Parameters:	Г	Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.0521	0.0521	0.0521	cfs
Distance to stream	а	7000	7000	7000	ft
Aquifer hydraulic conductivity	ĸ	7.5	7.5	7.5	ft/day
Aquifer thickness	b	500	500	500	ft
Aquifer transmissivity	т	3750	3750	3750	ft*ft/day
Aquifer storage coefficient	S	0.001	0.001	0.001	
Stream width	WS	7500	7500	7500	ft
Streambed hydraulic conductivity	Ks	0.075	0.075	0.075	ft/day
Streambed thickness	bs	500	500	500	ft
Streambed conductance	sbc	1.125	1.125	1.125	ft/day
Stream depletion factor (Jenkins)	sdf	13.06666667	13.06666667	13.06666667	days
Streambed factor (Hunt)	sbf	2.1	2.1	2.1	

G\_17286\_Klamath\_Tribes\_Agency\_Lake\_Hunt\_1999\_depletion\_Agency\_Lake.xls



Oregon Water Resources Department

Region	30	Steady st	tate strea	m deple	tion as a	fraction	of pumpi	ing norma	alized to	crop wat	er use co	nsumptio	on.
Month	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Resid
Qw	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.00
Jenkins SD		· · · · · · · · · · · · · · · · · · ·											
yr1	0.065	0.075	0.077	0.078	0.079	0.079	0.079	0.080	0.080	0.080	0.080	0.080	0.068
yrmax-1	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.014
yrmax	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.014
yrmax-yr1	0.017	0.007	0.005	0.004	0.004	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.054
J SD SS	0.086	0.084	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.000
Hunt SD 199	99												
yr 1	0.036	0.054	0.060	0.063	0.065	0.067	0.068	0.069	0.070	0.071	0.071	0.072	0.233
yr max-1	0.077	0.078	0.078	0.079	0.079	0.079	0.079	0.079	0.079	0.079	0.079	0.079	0.056
yr max	0.077	0.078	0.078	0.079	0.079	0.079	0.079	0.079	0.079	0.079	0.079	0.079	0.056
yrmax-yr1	0.041	0.024	0.018	0.015	0.013	0.012	0.011	0.010	0.009	0.008	0.008	0.007	0.177
H99 SD SS	0.090	0.086	0.084	0.083	0.083	0.083	0.082	0.082	0.082	0.082	0.082	0.081	0.000

Parameters:		Values	Units	
Maximum number of years pumped	yrmax	25	years	
Days pumped each month	tpoff	30.4375	days/month	
Perpendicular from well to stream	a	2300	ft	
Well depth	d	125	ft	
Aquifer hydraulic conductivity	к	7.5	ft/day	
Aquifer saturated thickness	b	500	ft	
Aquifer transmissivity	T_ft	3,750	ft*ft/day	= K*b
Aquifer transmissivity	T_gal	28,050	gpd/ft	= K*b
Aquifer storativity or specific yield	S	0.001		
Streambed conductivity (Hunt 1999)	Ks	0.075	ft/day	
Streambed thickness, Hunt 1999	bs	500	ft	
Stream width (Hunt 1999)	WS	7500	ft	
Streambed conductance (lambda)	sbc	1.1250	ft/day	= Ks*ws/bs
Stream depletion factor	sdf	1.4107	days	= (a^2*S)/(T)
Streambed factor	sbf	0.6900		= sbc*a/T

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135S/R7E-s	ec 7						
Well_Co	Well_Num	T (ft2/day)	Well_depth	1st_water	K (ft/day)	Comment	
KLAM	1180	1,311,141.29	64.00	20.00	29,798.67	excluded	
KLAM	1181	120.95	50.00	40.00	12.10		
KLAM	1182	44.05	76.00	72.00	11.01		
KLAM	1183	110.44	82.00	17.00	1.70		
KLAM	1186	77.69	70.00	63.00	11.10		
KLAM	1187	76.47	57.00	50.00	10.92		
KLAM	1188	278.47	65.00	8.00	4.89		
KLAM	1189	408.18	46.00	17.00	14.08		
KLAM	1191	935.96	263.00	29.00	4.00		
KLAM	1192	234.74	110.00	17.00	2.52		
KLAM	1200	702.60	250.00	26.00	3.14		
KLAM	53237	247.81	98.00	66.00	7.74		
KLAM	54508	1.096.12	105.00	13.00	11.91		
KLAM	55065	57.73	143.00	65.00	0.74		
	Minimum	44.05		Minimum	0.74		
	Maximum	1 096 12		Maximum	14.08		-
		337 79		Average	7 37		
	Median	234.74		Median	7.74		
35S/R7E-s	ec 8						
Well_Co	Well_Num	T (ft2/day)	Well_depth	1st_water	Open Interval	K (ft/day)	Commen
KI AM	1201	110 44	65.00	40.00	13.00	8 50	
KLAM	1202	275.06	99.00	64 00	29.00	9.48	
KLAM	1203	1 059 02	325.00	01.00	136.00	7 79	+
KLAM	1204	3 728 96	97.00		20.00	186 45	
KLAM	1205	1 333 35	90.00	89.00	9.00	148 15	+
KLAM	1209	1 333 35	95.00	94.00	1.00	1 333 35	
KLAM	1210	96.29	100.00	91.00	9.00	10 70	-
KI AM	1210	862.19	95.00	70.00	10.00	86.22	
KI AM	121/	1 69/ 21	90.00	86.00	1.00	1 694 21	-
KLAM	1214	131.58	108.00	75.00	8.00	16.45	-
KL AM	1215	204.00	95.00	90.00	5.00	10.40	-
KLAM	11699	2,325.50	105.00	85.00	15.00	155.03	
	R M MELTINGERS DI	00.00				7 70	
	Winimum	96.29		Minimum		7.79	
	Maximum	3,728.96		Maximum		1,694.21	
	Average	1,096.17		Average	-	308.10	-
	Median	960.61		Median		63.52	