

Groundwater Application Review Summary Form

Application # ~~6~~- LL-1747

GW Reviewer DENNIS ORLOWSKI

Date Review Completed: 5/10/2018

Summary of GW Availability and Injury Review:

Groundwater for the proposed use is either over appropriated, will not likely be available in the amounts requested without injury to prior water rights, OR will not likely be available within the capacity of the groundwater resource per Section B of the attached review form.

Summary of Potential for Substantial Interference Review:

There is the potential for substantial interference per Section C of the attached review form.

Summary of Well Construction Assessment:

The well does not appear to meet current well construction standards per Section D of the attached review form. Route through Well Construction and Compliance Section.

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations and for conditions that may be necessary for a permit (if one is issued).

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 5/10/2018
 FROM: Groundwater Section Dennis Orlowski
 Reviewer's Name
 SUBJECT: Application LL- 1747 Supersedes review of _____
 Date of Review(s)

PUBLIC INTEREST PRESUMPTION; GROUNDWATER

OAR 690-310-130 (1) *The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525.* Department staff review groundwater applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. **This review is based upon available information and agency policies in place at the time of evaluation.**

A. GENERAL INFORMATION: Applicant's Name: Hillsboro Landfill, Inc. County: Washington

A1. Applicant(s) seek(s) 0.37 cfs from three well(s) in the Willamette Basin,
Tualatin River subbasin

A2. Proposed use Establish vegetation (Irrigation) Seasonality: March - October

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	WASH 1130	NW-3	Alluvium	0.19	T1S/R2W-7 NE-SE	1870'N, 360' W fr SW cor S 8
2	WASH 9603	NW-5	Alluvium	0.17	T1S/R2W-7 NE-SE	2440'N, 330' W fr SW cor S 8
3	WASH 9628**	NW-6	Alluvium	0.22	T1S/R2W-8 NW-SW	1680'N, 120' E fr SW cor S 8

* 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	163	109	23	4/25/1989	182	0-65	+1-109		109-129, 140-145, 159-179	103		Air
2	163	92	17	4/17/1989	170	0-62	+1-95		95-135, 146-156, 161-166	90		Air
3	171	111	33	8/21/1990	170	0-90	+1-111		111-136, 148-164	75		Air

Use data from application for proposed wells.

A4. **Comments:** ** The applicant submitted WASH 118 as the log for their well NW-6. WASH 118 and WASH 9628 are duplicate well logs, and OWRD has historically used WASH 9628 as the log for NW-6. Also, WASH 119 is a recondition log for WASH 118/9628.

Note: these same three proposed POA/wells were previously authorized for industrial/manufacturing use under LL-1394, issued April 12, 2012.

*** Although WRIS indicates 0.37 cfs for each well, the application instead requests these specific pumping rates, which are based on the existing well performance.

A5. **Provisions of the** Willamette Basin rules relative to the development, classification and/or management of groundwater hydraulically connected to surface water **are, or** **are not,** activated by this application. (Not all basin rules contain such provisions.)

Comments: The proposed POAs are greater than ¼ mile from the nearest surface water source and produce groundwater from a confined aquifer. Therefore, the pertinent basin rules (OAR 690-502-0240) do not apply.

A6. **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction. Name of administrative area: _____
 Comments: Not applicable.

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

B1. **Based upon available data**, I have determined that groundwater* for the proposed use:

- a. is over appropriated, is not over appropriated, or **cannot be determined to be** over appropriated during any period of the proposed use. * This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;
- b. **will not** or **will** likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;
- c. **will not** or **will** likely to be available within the capacity of the groundwater resource; or
- d. **will, if properly conditioned**, avoid injury to existing groundwater rights or to the groundwater resource:
 - i. The permit should contain condition #(s) Large water-use reporting; 7N (annual measurements);
 - ii. The permit should be conditioned as indicated in item 2 below.
 - iii. The permit should contain special condition(s) as indicated in item 3 below;

- B2. a. **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;
- b. **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;
- c. **Condition** to allow groundwater production only from the _____ groundwater reservoir between approximately _____ ft. and _____ ft. below land surface;
- d. **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): _____

B3. **Groundwater availability remarks:** The proposed POAs are in the Tualatin Valley lowlands, more specifically immediately adjacent to the Jackson Bottom area due south of Hillsboro. The existing wells produce groundwater from relatively-thin (5-20 ft thick) sand and gravel beds encased in lower-permeability silts and clays that extend from ground surface to a depth of about 1200 feet (Conlon and others, 2005; Gannett and Caldwell, 1998; Woodward and others, 1998).

Groundwater development in this area is relatively low, and thus water-level data is likewise sparse. However, reported groundwater levels from the three POAs proposed for this application – WASH 1130, WASH 9603 and WASH 9628 – show declines beginning about 2014-2015 and continuing through 2017. Over that period groundwater levels declined by the following amounts: WASH 1130: ~ 12 ft; WASH 9603: ~ 7 ft; WASH 9628: ~ 5 ft. It is possible that these declining trends were climate related, corresponding to a relatively-dry 2015 water year. However, the lack of recent additional data for this area precludes being able to conclusively determine the areal and temporal extent of the declining trends exhibited in the three proposed POAs. Therefore, if a LL permit is granted it should include the reporting requirements noted in B1(d) to provide additional data for more effective future management of the groundwater resource.

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

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

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	Alluvium	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Alluvium	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Alluvium	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: In each of the three proposed wells, the uppermost water-bearing sand and gravel layers are overlain by approximately 90-100 ft of low-permeability silt and clay deposits. Groundwater levels rise above these primary water-bearing zones in each well. Furthermore, Conlon and others (2005) report that fine-grained deposits (silt and clay) of 'more than 40 ft' thickness typically create confined conditions in the underlying water-bearing sand/gravel deposits. These factors suggest that the proposed wells obtain groundwater from a confined alluvial aquifer.

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Tualatin River	140-150	120-130	2480	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Tualatin River	140-150	120-130	2300	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	1	Tualatin River	150-160	120-130	2950	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: The estimated ranges of groundwater elevations are somewhat higher than the estimate elevation of SW 1 within ~1 mile of the wells. Furthermore, groundwater maps for the area indicate that groundwater in the alluvial aquifer system flows towards and discharges into local streams (Conlon and others, 2003, 2005; Gannett and Caldwell, 1998). These facts indicate that the alluvial aquifer system and local streams are hydraulically connected.

The depletion of local streams by the proposed POAs will be attenuated, but not eliminated, by the low vertical hydraulic conductivity (permeability) of the silts and clays that overlie the deeper sands and gravels. Net impacts will be small at the onset of pumping, but will increase with time until a new equilibrium between local recharge and discharge is reached. After that time stream depletion is expected to be relatively constant throughout the year.

Water Availability Basin the well(s) are located within: WID 30201013: Tualatin River > Willamette River – at gage 14206500

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?
1	1	<input type="checkbox"/>	<input type="checkbox"/>	IS73538C	94.50	<input type="checkbox"/>	44.30	<input type="checkbox"/>	<<25%	<input type="checkbox"/>
2	1	<input type="checkbox"/>	<input type="checkbox"/>	IS73538C	94.50	<input type="checkbox"/>	44.30	<input type="checkbox"/>	<<25%	<input type="checkbox"/>
3	1	<input type="checkbox"/>	<input type="checkbox"/>	IS73538C	94.50	<input type="checkbox"/>	44.30	<input type="checkbox"/>	<<25%	<input type="checkbox"/>

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.

Well	SW #	Total Q (cfs)	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?
1,2,3	1	0.37	<input type="checkbox"/>	IS73538C	94.50	<input type="checkbox"/>	44.30	<input type="checkbox"/>	<<25%	<input type="checkbox"/>

Comments: C3a: Analytical stream depletion modeling completed in similar conditions indicates that due to low permeability sediments in the streambed of the Tualatin River, along with thick sequences of fine-grained sediments overlying water-bearing zones in the wells, pumping impacts after 30 days will be much less than 25% of the pumping rate.

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													
(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: Not applicable.

C4b. **690-09-040 (5) (b)** The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.

- C5. **If properly conditioned**, the surface water source(s) can be adequately protected from interference, and/or groundwater use under this permit can be regulated if it is found to substantially interfere with surface water:
- i. The permit should contain condition #(s) _____;
 - ii. The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:** None

D. WELL CONSTRUCTION, OAR 690-200

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

D2. **THE WELL does not appear to meet current well construction standards based upon:**

- a. review of the well log;
- b. field inspection by _____ ;
- c. report of CWRE _____ ;
- d. other: (specify) _____

D3. **THE WELL construction deficiency or other comment is described as follows:** _____

D4. **Route to the Well Construction and Compliance Section for a review of existing well construction.**

References Used:

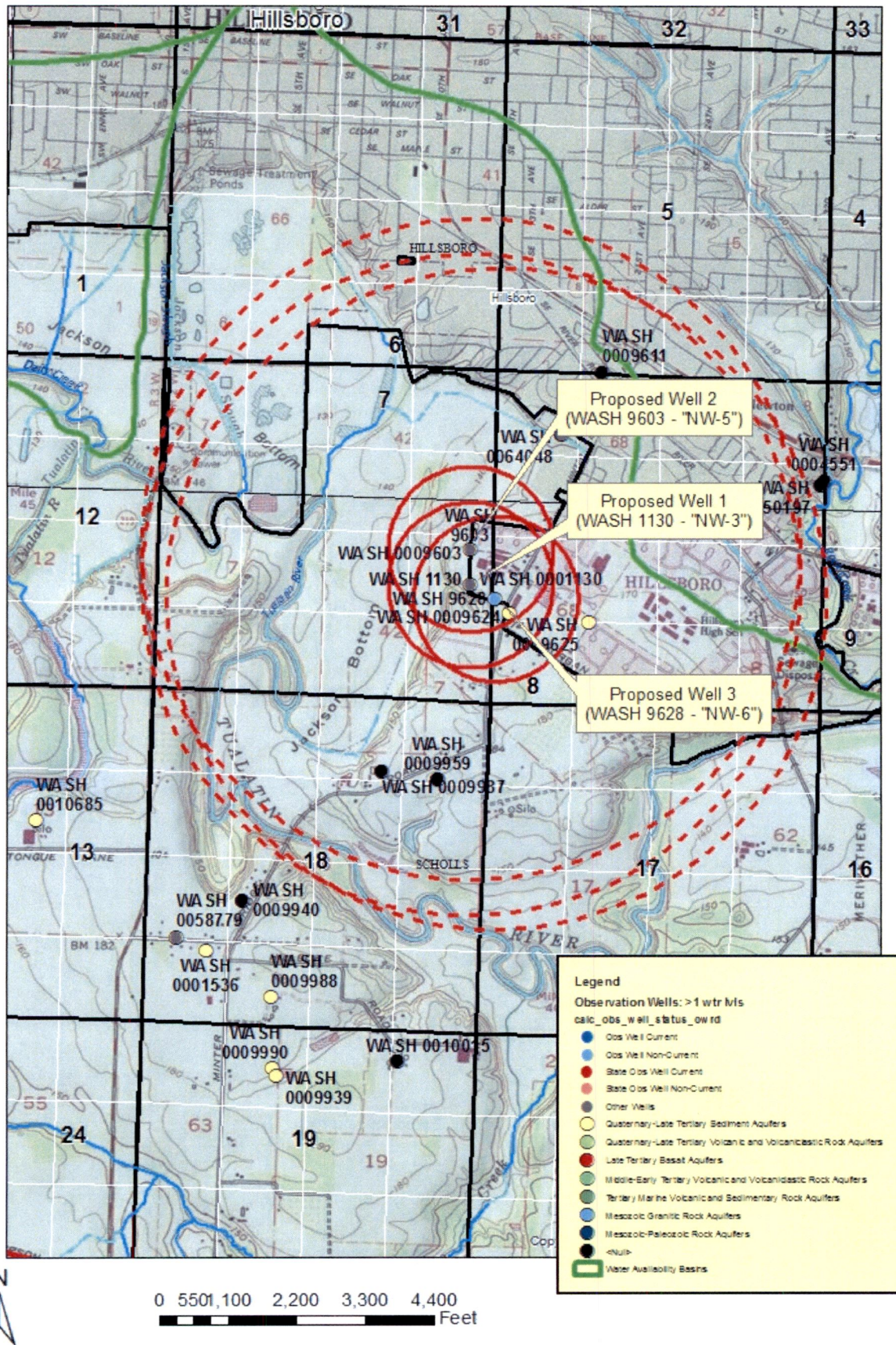
Application LL-1747 file.

Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005. Ground-water hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

Gannett, M.W. and Caldwell, R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A, 32 p.

Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82 p.

LL-1747 Hillsboro Landfill, Inc. T1S, R2W, Sections 7 and 8



Water Availability Table

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Water Availability Analysis

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Water Availability Analysis

Detailed Reports

TUALATIN R - WILLAMETTE R - AT GAGE 14206500
WILLAMETTE BASIN

Water Availability as of 5/10/2018

Watershed ID # 30201013 (Map)
Exceedance Level 80%

Date 5/10/2018
Time: 11:43 AM

Water Availability Calculation
Consumptive Uses and Storages
Instream Flow Requirements
Reservations

Water Rights
Watershed Characteristics

Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	1,090.00	474.00	616.00	0.00	100.00	516.00
FEB	1,420.00	537.00	883.00	0.00	100.00	783.00
MAR	1,140.00	396.00	742.00	0.00	100.00	642.00
APR	676.00	297.00	379.00	0.00	100.00	279.00
MAY	332.00	174.00	156.00	0.00	100.00	58.10
JUN	179.00	151.00	27.90	0.00	100.00	-72.10
JUL	90.90	183.00	-102.00	0.00	100.00	-202.00
AUG	44.30	141.00	-97.10	0.00	100.00	-197.00
SEP	54.20	121.00	-66.90	0.00	94.50	-161.00
OCT	69.40	58.10	11.30	0.00	100.00	-88.70
NOV	160.00	232.00	-72.10	0.00	100.00	-172.00
DEC	753.00	457.00	301.00	0.00	100.00	201.00
ANN	751,000.00	194,000.00	567,000.00	0.00	72,100.00	517,000.00

Water-Level Trends in Nearby Wells

Observation Well Data

