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Vancouver, WA 98663

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May 16, 2017

City of La Center
Attn: Tony Cooper
305 NW Pacific Hwy
La Center, WA 98629

RE: Pump Station Basin

Dear Tony,

This memo is intended to address the contributing basin analysis for the sanitary pump station at the Riverside Estates Subdivision. A basin map showing all of the parcels that could potentially contribute flow to this pump station has been included with this letter. Potential flows have been generated by first analyzing the existing topography to see which parcels could actually gravity flow to the pump station. Those properties have been included in the basin area shown on the attached map.

Next, the total area for each of the parcels was determined. This area was then multiplied by a unit density factor (UDF) depending on the current zoning classification to establish the equivalent residential units (ERU's) for each lot. This UDF accounts for the dedicated right-of-way that reduces the lot yield for a given zoning classification. It should be noted that a UDF of 3.753754 for the Low Density Residential District (LDR-7.5) was established by examining the Highland Terrace Subdivision. Since this subdivision has been preliminarily approved for 100 lots on a total of 26.64 acres, we felt that the density/acre for this subdivision would be representative of the density that could be obtained from the surrounding parcels within this zoning classification.

For properties located in the Medium Density Residential District (MDR-16), a UDF of 14 was utilized. We felt this was conservative given the fact that Table 18.140.030 of the La Center Municipal Code (LCMC) limits the Net Density to a maximum of 14 units/acre. Also, there are two parcels that are designated as Mixed-Use (MX). The area from these properties were multiplied by a UDF of 18 which was established from Table 18.150.040(1) of the LCMC.

Finally, Lot 29, located north of NW Bolen Street, is owned by the La Center School District. The school district has stated that they may construct a 500 student school on the property. Potential flows from this site were established by referring to Table G2-2 in the 2008 Washington State Department of Ecology "Criteria for Sewage Works Design Water Quality Program" Manual. This table recommends that a flow rate of 10 gpd/person for a "school without showers and with a cafeteria" should be used to size new sewage systems. Therefore, multiplying 10 gpd times 500 students yields a flow rate of 5000 gpd or 3.47 gpm. This additional flow was added to the total flow from the residential and commercial properties.

It should be noted that since the Highland Terrace Subdivision has been preliminarily approved for 100 lots, a total of 100 ERU's was utilized for the contributing areas. In addition, the Riverside

Estates Subdivision is proposing 222 multi-family units, 99 single-family lots, and 72 townhouse lots for a total of 393 ERU's.

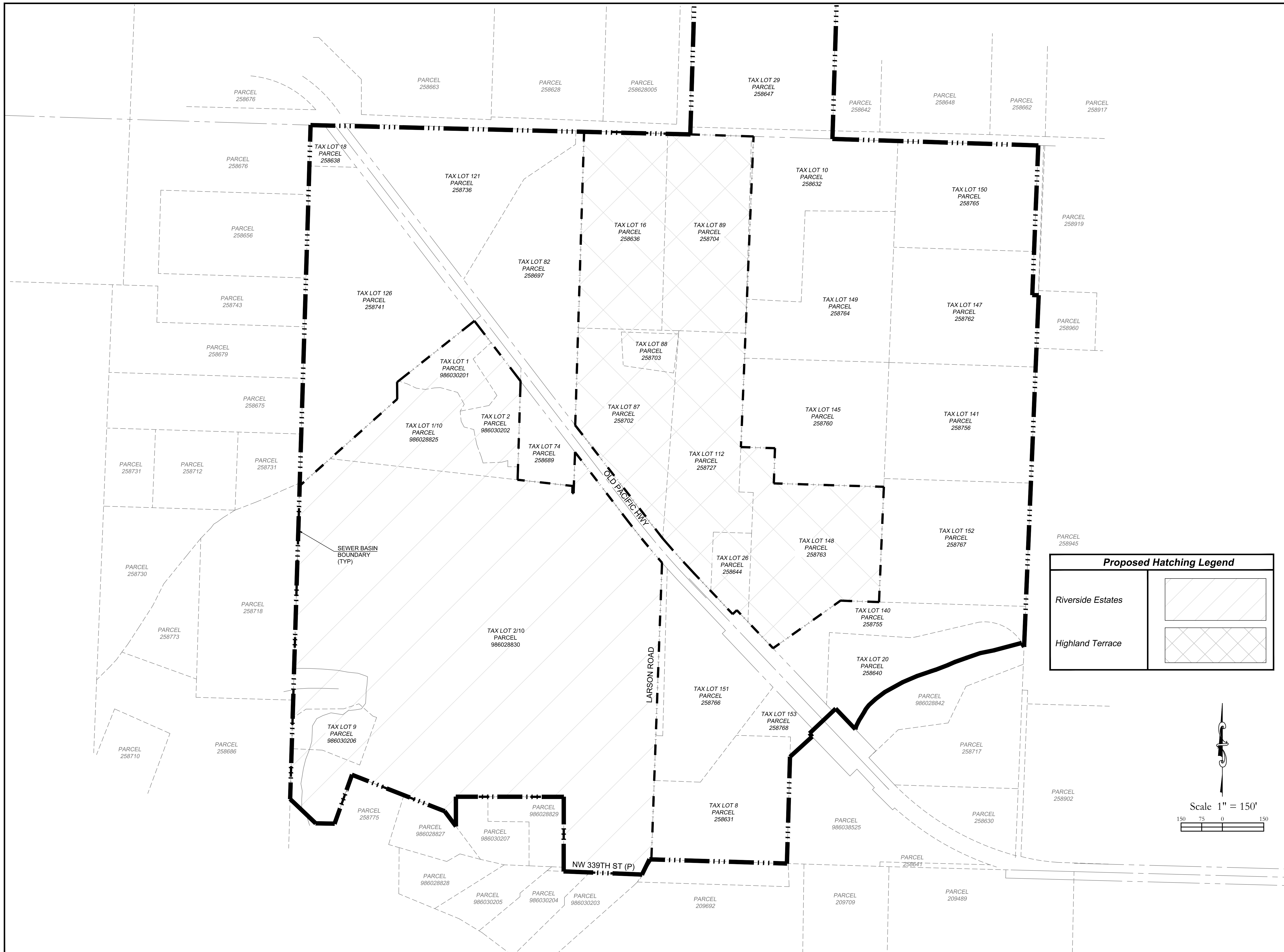
The ERU's from the contributing residential and commercial areas within the basin were then added together which resulted in a total of 1082 ERU's potentially flowing to the proposed pump station. The total EUR's were then multiplied by 2.7 persons/ERU which results in a total of 2,921 people. It was assumed that each person uses approximately 110 gpd of water which results in a flow rate of 321,354 gpd or 223 gpm from these parcels. The additional 3.5 gpm from the school district property was then added to this value for a total basin effluent flow rate of 226.5 gpm. A peaking factor of 3 was then applied to account for a peak hourly flow. This results in a total potential flow rate of 679.5 gpm for the entire basin.

It should be noted that the Riverside Estates Subdivision accounts for approximately 36% of the peak flows to the proposed pump station. Furthermore, with exception of the Highland Terrace Subdivision and the school, it is not likely that much of the remainder of the basin will be constructed within the next 20 years. As a result, the pump station will be designed to handle the flows from the Riverside Estates Subdivision, the Highland Terrace Subdivision, and the future school. Total flows of 105 gpm for these three projects are based off the 393 ERU's (81 gpm) for the Riverside Estates Subdivision, the 100 ERU's (20.6 gpm) for the Highland Park Subdivision, and the 3.5 gpm generated from the future school. Therefore, applying the peaking factor of 3 yields a total peak hour flow of 315 gpm for the design of the pump station.

If you have any questions please feel free to call me at (360) 431-9988.

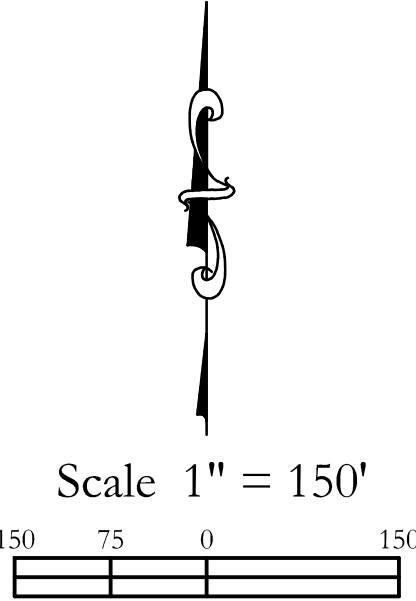
Sincerely,
Precision Land Services, Inc.

Tim Wines, PE



Proposed Hatching Legend

Riverside Estates	
Highland Terrace	



Pump Station Contributing Basin for:

Riverside Estates Subdivision

Located in La Center, Washington

Consulting Engineers & Planners

2008 C Street, Vancouver, WA 98663

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PLS ENGINEERING

Revisions

TSW	For Review
A	5/15/17
B	
C	
D	
E	
F	

Project No.	2641
SCALE:	H: 1" = 150' V: N/A
DESIGNED BY:	TSW
DRAFTED BY:	TSW
REVIEWED BY:	TSW

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Basin Area Calculations

Lot Number	Acreage	Zoning	Unit Density Factor	ERU's
18	0.57	MDR-16	14	7.98
121	5.34	MDR-16	14	74.76
82	5.18	MDR-16	14	72.52
126	7.95	MDR-16	14	111.3
74	0.85	MDR-16	14	11.9
8	4.37	MDR-16	14	61.18
151	4.63	MX	18	83.34
153	0.61	MX	18	10.98
140	3.2	LDR-7.5	3.753754	12.01
20	2.28	LDR-7.5	3.753754	8.56
152	5.45	LDR-7.5	3.753754	20.46
141	5.05	LDR-7.5	3.753754	18.96
147	5.05	LDR-7.5	3.753754	18.96
150	5.05	LDR-7.5	3.753754	18.96
10	5.05	LDR-7.5	3.753754	18.96
149	5.06	LDR-7.5	3.753754	18.99
145	5.04	LDR-7.5	3.753754	18.92
29	17	LDR-7.5	3.753754	63.81
<u>Highland Terrace Subdivision</u>				
148	5.87	LDR-7.5		
26	1	LDR-7.5		
112	5.27	LDR-7.5		
87	3.92	LDR-7.5		
88	0.58	LDR-7.5		
89	5	LDR-7.5		
16	5	LDR-7.5		100
<u>Riverside Estates Subdivision</u>				
Multi-Family				222
Single Family Residential				99
Townhouses				72
Total ERU's =				1146

1146 ERU's x 2.7 persons x 110 gpd = 340225.7 gpd

Total Average Daily Flow = 236.3 gpm

Peaking Factor of 3 = 236 gpm x 3 = 709 gpm