Urling Planning Associates
2366 West Hills Drive
Longview WA 98632

May 20, 2019

Mayor Henry Balensifer and Warrenton City Commissioners
City of Warrenton
PO Box 250
Warrenton OR 97146

Re: Appeal of Clear Lake Preliminary Plat Planning Commission Approval

Mr. Gil Gramson and Sand Works, Inc., the owner of the subject property of the application for preliminary plat approval with associated applications for a variance to the length of the cul-de-sac and a wetland hardship variance to fill a small amount city designated significant wetlands, appeals several conditions of approval imposed by the Planning Commission. We also rebut the arguments submitted on behalf of Mr. Rod Gramson by Mr. Will Caplinger appealing the decision with focus on the approval of the cul-de-sac length variance, the wetland fill authorized by the approval of wetland hardship variance application, and the requirement for a fence along the eastern property border imposed by Condition No. 6.

1. The requirement for a wildlife fence along the eastern property line to protect the property owned by the North Coast Land Conservancy should be deleted. There is neither a municipal code standard to guide the design and construction of such a fence. Nor a comprehensive plan policy to support the condition of approval. On a more practical note, maintenance of this facility would be the responsibility of each property owner with the exception of that portion installed on the commonly owned storm water treatment facility, Tract B, with levels of maintenance likely varying from virtually none to some to superb, depending on the property owners' motivation and skill levels. Additionally, the future property owners may wish to construct a fence to their liking and purposes such as to keep young children contained, keep wildlife out, etc. Installation of the fence would be a significant challenge because of the terrain along the property line varying from the top of the dune to a much lower wetland. Further, while it may curtail domestic pets from traversing into the Conservancy's property, it would have a similar effect on wildlife that have the luxury of roaming the city unimpeded. Additionally, installation of fence would likely result in frequent damage by elk which would present an undue burden on the property owners to regularly make repairs.

   Obviously, Warrenton is an incorporated city. Under Oregon's land use planning laws, the City like all others is intended and designed to promote and accommodate all forms of urban development. While the mission and work of the North Coast Land Conservancy is laudable, it must recognize that acquiring and preserving lands in their natural enhanced conditions within the city comes with the potential effects of being located adjacent to urban development. Moreover, it is typical that if a property owner wishes to augment its buffer or otherwise separate or create a barrier to bolster its preservation goals (or simply keep people and animals off the property) it is incumbent

on that property owner to take such action, not foist that responsibility on the neighbor. The Conservancy has no greater property rights than Sand Works Inc. If the Conservancy is concerned about keeping people and domestic animals off its property, it should bear the obligation of creating and maintaining such a barrier to its standard.

2. Condition No. 4 calls for a landscape plan to be prepared meeting the requirements of Warrenton Municipal Code 16.124.070. We recognize that WMC 16.124.070.B states that a landscape plan is required for any development that requires a permit, and that at least 20 percent of residential sites must be landscaped. However, as one reads through the standards of the rest of this code section, it clearly is oriented toward commercial, industrial and multiple family developments rather than subdivisions. Please see attached design standards that reference common areas, pedestrian paths, parking, screening of mechanical equipment and delivery areas. This condition also calls for following the practices of the Department of State Lands mitigation for preserving the significant trees in the wetland tracts A and B. No trees in those tracts are being considered for removal. We ask that this condition be revised to state that the applicant be allowed to use a mitigation plan approved by the Department of State Lands in lieu of a more typical landscape plan typically required for other commercial and industrial developments.

3. Condition No. 5

   This condition calls for two street trees to be planted on each lot, which the applicant agrees to. However, rather than the developer engaging a landscaping company to monitor the trees' vitality and replacement of trees that fail to survive for two years after planting, we propose the applicant be responsible for such monitoring and replacing the trees as necessary. The applicant will post a performance security with the city to insure this requirement is fulfilled.

4. Condition No. 14

   Condition No. 14 requires the improvement of an existing gravel road to a 20-foot paved surface from the intersection Kalmia Avenue westerly to the subject property line as an emergency turnaround. This paved surface would be approximately 225 feet long and no emergency vehicle would travel that distance only to need to back up the same distance to turn around. Our concern is with the vagueness the way the condition is written.

On behalf of Mr. Rod Gramson, Mr. Will Caplinger submitted an appeal of the Clear Lake Preliminary Plat approval on three primary grounds.

1. The length of the cul-de-sac exceeds the code standard and presents impediments to ingress and egress during emergency events.
2. The proposal includes fill of wetlands and the impacts of development and occupancy of the dwellings that would result from the creation of new lots would indirectly pose threats to the adjacent preserved wetlands.
3. The development of the property and subsequent construction of 16 dwellings would adversely affect the conservation efforts of the adjacent North Coast Land Conservancy property.

Our rebuttal follows.

Included with the application package was a narrative addressing the street length and the variance criteria of WMC 16.272.020. Please refer to pages 39-41 of the application narrative and the staff report. We continue to assert that, because the subject property is landlocked on the east, north and west and that the environmental constraints presented by the proliferation of wetlands, that there are no other options for providing typical access to code standards at this time. We continue to believe that the arguments presented in the narrative fully satisfy the variance criteria for the road and with the alternative emergency access road discussed above and required by Condition No. 14 that the street length should be upheld.

We note that Mr. Caplinger quoted the application narrative states that "Two subdivisions to the south of the subject property were permitted to fill small amounts of wetlands as part of the entitlement approvals...." That response (Narrative Page 31) was directed at the criterion of WMC 16.156.080.C [Wetland] Hardship Variance Procedure and Criteria which are applicable to the wetland variance issue, but have no applicability to the general variance criteria of WMC 16.272. There is no mention of precedent set by previous approvals by the city regarding the street length.

With regard to the other appeal's arguments that the wetland hardship variance criteria were not satisfied, we disagree. The amount of area proposed to be filled is approximately 11.5 prcent of an acre. As presented in the application narrative (page 31) the need to fill is to provide continuity of regularly shaped lots to ensure adequate building footprint areas, and perhaps more importantly, prevent future property owners from filling wetlands without mitigation.

Wetland hardship criterion B is addressed in the application narrative. The two developments south of the subject property as well as the Fort Pointe planned unit development were granted wetland variance. The applicant here merely stated that this property is in a similar situation and wishes being granted similar property rights.

Criterion C requires that the variance is for the minimum relief necessary. On site impacts to wetlands would affect only 11.5 percent of an acre. A reconnaissance delineation of the adjacent properties where the alternative access road would be improved indicates that improvements to that facility would affect another 0.05 acres. These are very small amounts of wetland impacts, and mitigation will be required and provided.

The small amount of wetland impacts does not result in a materially detrimental effect to the public and the other appeal fails to recognize the mitigation requirements of the Department of State Lands will offset the impacts, limited as they are.

The last hardship criterion requires a demonstration of general harmony with the intent and purpose of the wetland code chapter and avoidance of adverse effects to the comprehensive plan. As stated in the application narrative, the fact that the code includes a route to a variance in the regulations provides the opportunity for harmony under appropriate circumstances. In this case, the impacted wetlands are quite small and necessary to facilitate development. Such variance have been granted o other properties in the vicinity. The variance, while allowing a small impact, will actually facilitate greater protection in the long run with mitigation is factored in; it is also consistent on its face with the comprehensive plan policy.

Generally, the other appeal implies that this development will result in significant impacts that will curtail the many functions wetland perform through runoff carrying a multitude of pollutants. What it fails to recognize is that this project has a storm water management plan that includes a treatment facility for removing those pollutants from the storm water runoff prior to discharge from the site to the east. The only storm water runoff from the development would be a small volume associated with the alternative emergency access road which would receive a modicum of treatment from the swales bordering the pavement. Further, the base soil at the site is sand. Any other substances that may run off in the storm water on the soft surfaces—lawn and landscaping—will infiltrate rather than be carried to the biofiltration facility with storm water from the street and driveways. We believe the variance is necessary and just.

We offer the revisions to Conditions of Approval Nos. 4, 5 and to clarify and improve the practicality on the attached sheet. Thank you for your consideration.

Very truly yours,

Skip Urling

Enclosure

Clear Lake Preliminary Plat

Proposed Conditions of Approval Revisions

Condition No. 4.

Any wetland impact mitigation plan approved by the Oregon Department of State Lands shall satisfy the requirements of a landscape plan for the preliminary plat and shall be implemented, less any requirements for long-term monitoring, prior to submitting a request for final plat approval. An interim grading permit on the upland portion of the property can be granted subject to engineering review and a protection plan for existing trees. The mitigation plan shall indicate conservation areas, protection areas and best practices to preserve significant trees in Tracts A and B consistent with Department of State Lands best practices and WMC 16.156.040 Significant Wetland Area Development Standards. Conservation areas shall be clearly marked with orange fencing and other protective measures for the duration of construction activities.

Condition No. 5

Two street trees shall be installed in each building lot, three feet behind the property line in lieu of a planting strip, prior to final plat approval. The developer shall monitor the growth and vibrancy of the trees for two years after planting and replace any trees that may die. The developer shall file a performance financial security with the City in the amount of $1,000.00 for the two years of tree monitoring to insure compliance with this condition.

Condition No. 14

A turnaround shall be constructed on a 25-foot easement between Lots 1 and 2 as originally designed and included in the application submittal. This turn around shall be extended as a 20-foot paved road surface westerly to the property line, then transition to a graveled surface capable of supporting a 60,000 pound emergency vehicle further west through the adjacent properties to Ridge Road for emergency access only in an easement of sufficient width to accommodate it. At the west property line of the Sand Works Inc., property "No Trespassing" signs shall be installed to deter trespassing on the adjacent private property.

"Making a difference through excellence of service"

CITY OF WARRENTON

NOTICE OF PUBLIC HEARING

A public hearing is scheduled before the City of Warrenton City Commission at 6:00 p.m. on June 25, 2019 at the Warrenton City Hall, Commission Chambers, regarding an appeal of an approved 15 lot subdivision application submitted by Skip Urling on behalf of Sandridge Construction. The Planning Commission approved the Clear Lake subdivision, variance, and wetland hardship variance on April 25, 2019. The subject property is located on the north terminus of SW Kalmia Ave also identified on Tax Lot 810170001302.

The application will be reviewed under the procedures, standards and criteria in Warrenton Municipal Code 16.208.050, Type III Procedures (Quasi-Judicial), Warrenton Municipal Code Chapters, 16.216 Land Divisions and Lot Line Adjustments, 16.192 Large Scale Developments, 16.36 R10 Growth Management District, 16.140 Stormwater and Surface Water Management, 16.152 Grading, Excavating and Erosion Control Plans, 16.124 Landscaping & Street Trees, 16.156 Wetland & Riparian Corridor Development Standards, and 16.120 Access and Circulation.

Anyone wishing to participate may testify verbally at the public hearing, or if not able to attend the hearing may submit written testimony, which must be received by the Warrenton Planning and Building Department by 5:00 P.M. on the day of the hearing. Written comments may be mailed to Kevin A. Cronin, Community Development Director, Warrenton Planning and Building Department, P.O. Box 250, Warrenton Oregon, 97146-0250, or hand delivered to City Hall, 225 S Main. Failure to raise an issue on the record in person or by letter before the close of the record at the City's public hearing, or failure to provide statements or evidence sufficient to afford the decision making body an opportunity to respond to the issue, will preclude appeal to the Land Use Board of Appeals based on that issue.

The application and staff report are available for review and/or purchase at the City of Warrenton Planning and Building Department; or by contacting Kevin A. Cronin, Community Development Director at 503-861-0920 – cityplanner@ci.warrenton.or.us. The staff report will be available for review at no cost at least seven (7) days before the hearing.

Notice to mortgagee, lienholder, vendor, or seller: the Warrenton Development Code requires that if you receive this notice it shall be promptly forwarded to the purchaser.

KA. C 6-3-19

Kevin A. Cronin, AICP, Community Development Director — Date

P.O. Box 250 WARRENTON, OR 97146-0250
503/861-2233 FAX: 503/861-2351
www.ci.warrenton.or.us

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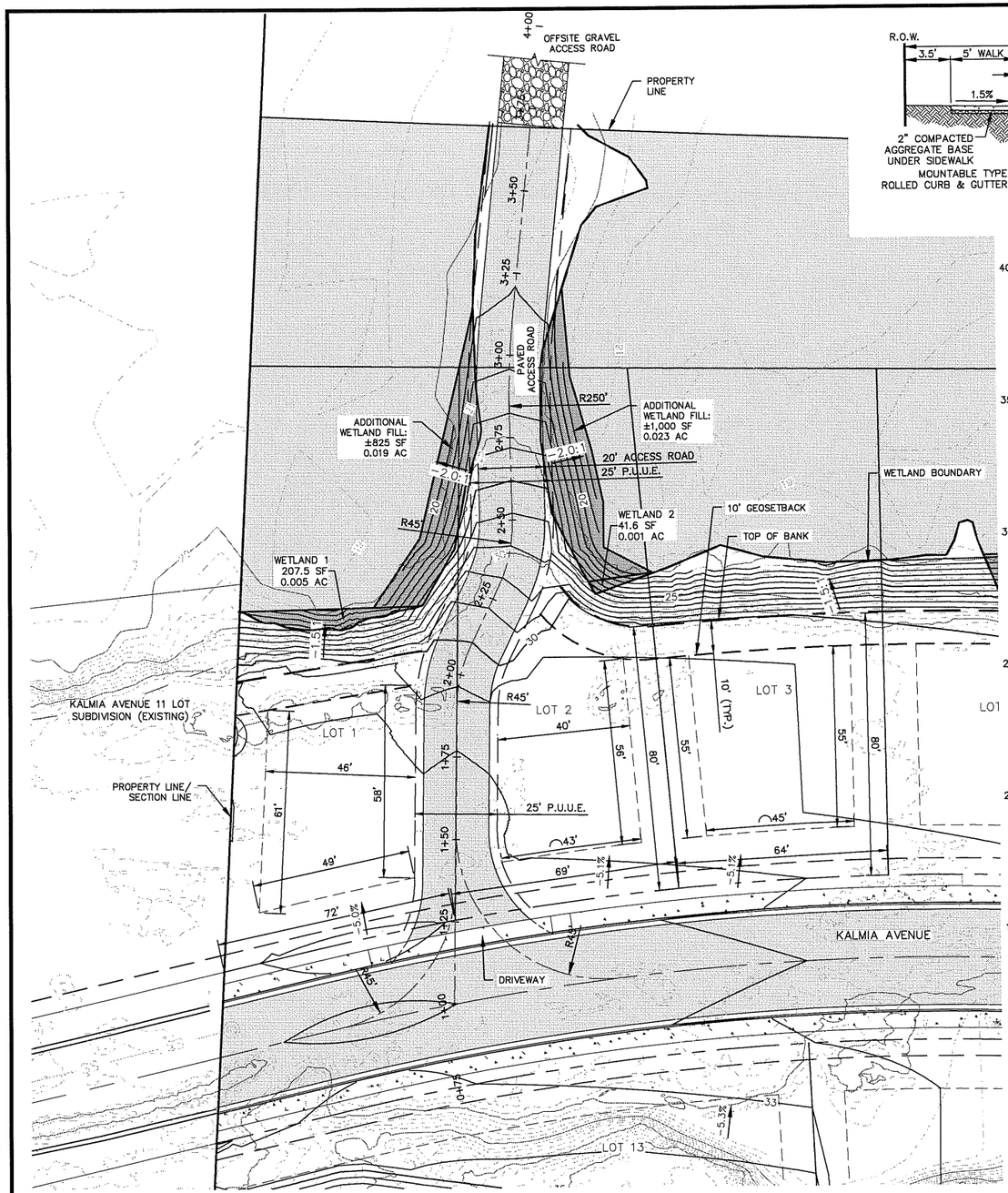
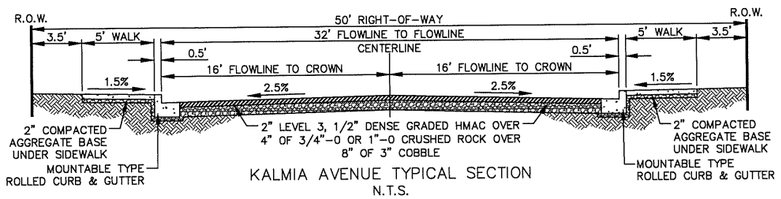
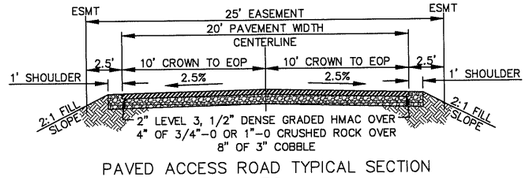
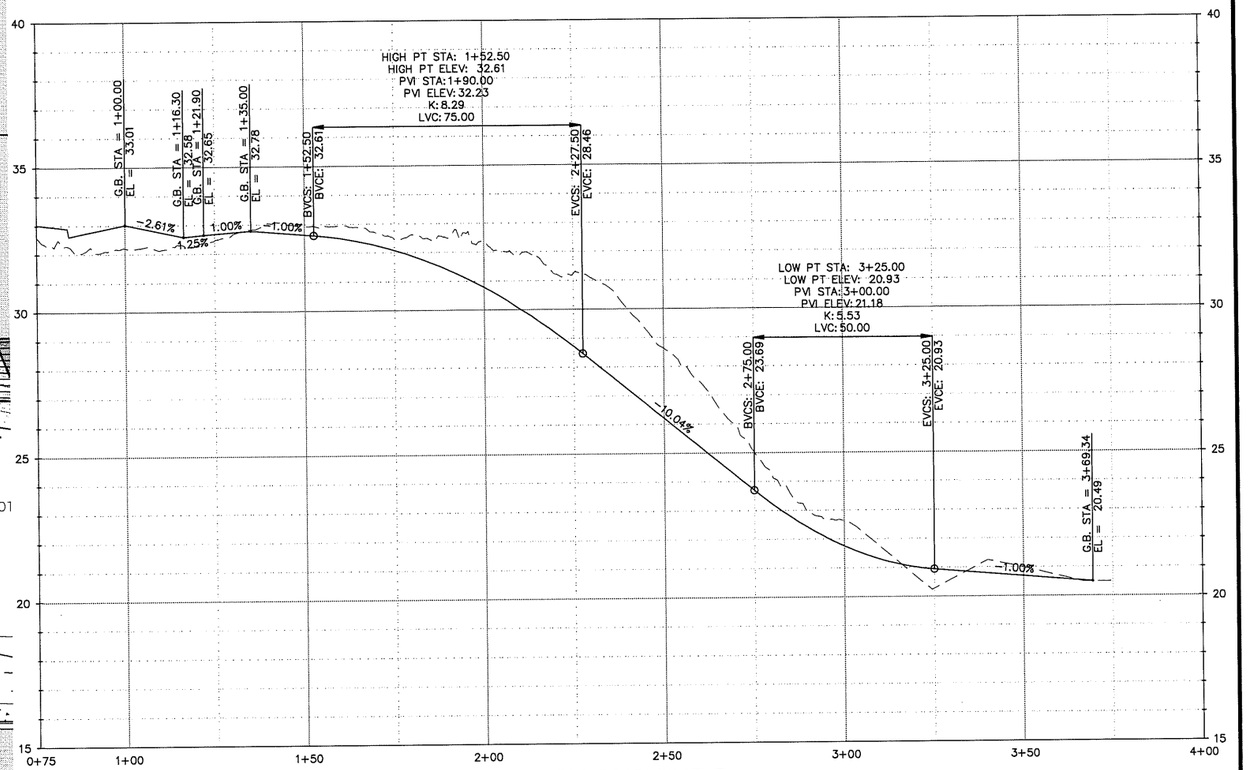




KALMIA AVENUE TYPICAL SECTION
N.T.S.



PAVED ACCESS ROAD TYPICAL SECTION
N.T.S.



ACCESS ROAD PROFILE
HORIZTONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'

GRADING CUT/FILL ESTIMATION		
CUT	FILL	NET
11,340 CY	10,920 CY	420 CY CUT
NOTE: ALL VOLUMES ARE UNADJUSTED ESTIMATES		

ABBREVIATIONS:

R.O.W. = RIGHT OF WAY	TC = TOP OF CURB
P.U.E. = PUBLIC UTILITY EASEMENT	SW = SIDEWALK
P.U.U.E. = PUBLIC UTILITY AND USE EASEMENT	P = PAVEMENT
C&G = CURB AND GUTTER	PC = POINT OF CURVATURE
FL = FLOWLINE	PT = POINT OF TANGENCY
	PCC = POINT OF COMPOUND CURVATURE

LEGEND

	EXISTING	PROPOSED
MAJOR CONTOUR	40	40
MINOR CONTOUR	36	36
SLOPE (ARROW = DOWN)		-2.0:1
SILT FENCE		
EXISTING WETLANDS		
PROPOSED WETLAND REMOVAL		

0 20 40
SCALE IN FEET

NORTH

DATE:	NO.	REVISION

DRAWN: BD | DESIGNED: BD | CHECKED: EH
SCALE: AS SHOWN | DATE: MAY 20, 2019
PROJECT NO. E18-030

FDG
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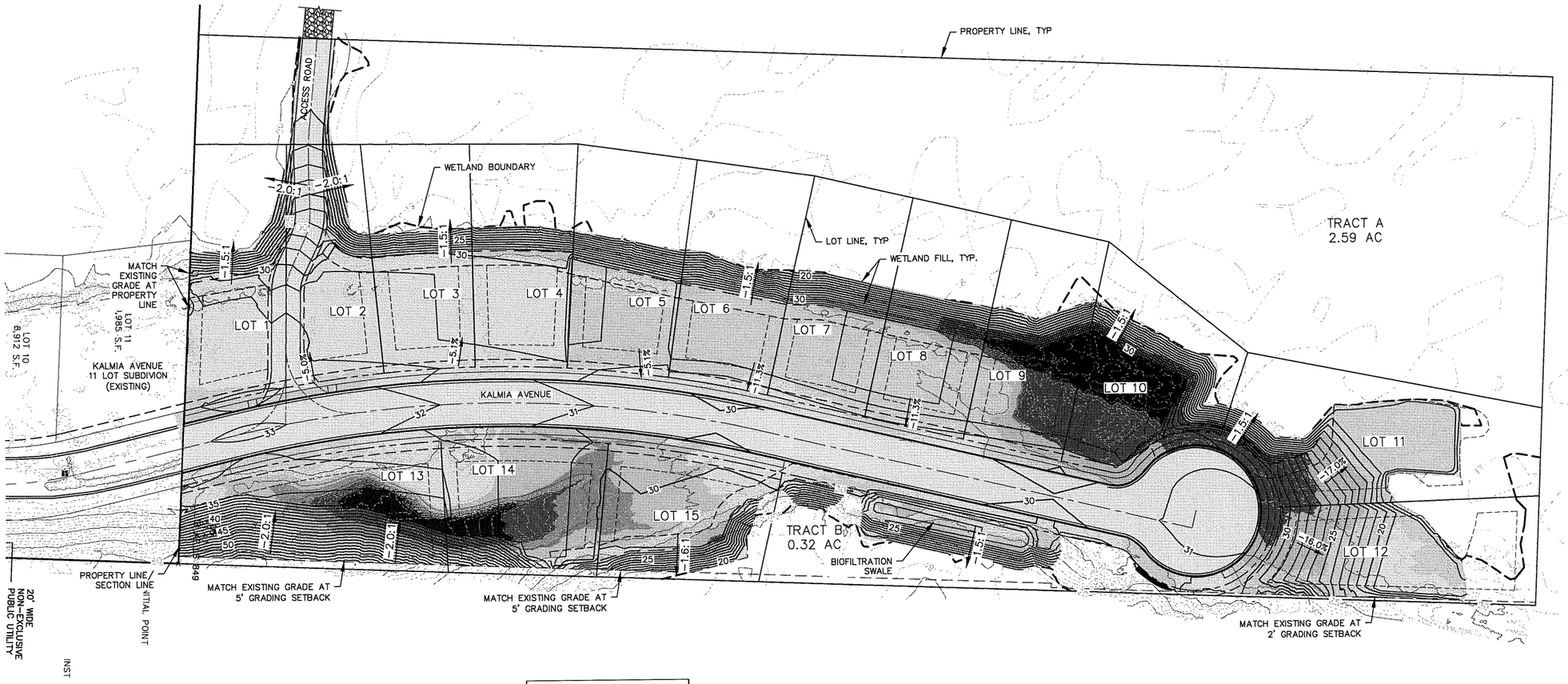
GILL GRAMSON
15 NW 17TH PLACE
WARRENTON, OR 97146

CONCEPT ACCESS ROAD EXHIBIT
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146

1/1



Elevations Table				
Number	Min. Elev.	Max. Elev.	Color	
1	-20.0	-16.0		CUT
2	-16.0	-12.0		
3	-12.0	-8.0		
4	-8.0	-4.0		
5	-4.0	0.0		
6	0.0	4.0		FILL
7	4.0	8.0		
8	8.0	12.0		
9	12.0	16.0		
10	16.0	20.0		

WETLAND IMPACT AREAS		
WETLAND #	AREA (SF)	AREA (AC)
1	207.5	0.005
2	41.6	0.001
3	73.9	0.002
4	18.0	0.000
5	35.1	0.001
6	127.1	0.003
7	290.2	0.007
8	981.6	0.023
9	158.3	0.004
10	1105.2	0.025
11	222.8	0.005
12	5695.4	0.131
13	1356.3	0.031
14	305.3	0.007
TOTAL	10618.3	0.244

WETLAND FILL NOTE:

NO FILLING OF WETLAND AREAS UNTIL COMPLETION OF WETLAND MITIGATION PLAN. PROVIDE INTERIM SILT FENCE PROTECTION TO ALL WETLANDS.

GRADING CUT/FILL ESTIMATION		
CUT	FILL	NET
11,340 CY	10,920 CY	420 CY CUT
NOTE: ALL VOLUMES ARE UNADJUSTED ESTIMATES		

LEGEND

	EXISTING	PROPOSED
MINOR CONTOUR	40	40
MAJOR CONTOUR	36	36
SLOPE GRADE (ARROW DENOTES DOWNSLOPE)		-2.0:1

NORTH

0 30 60
SCALE IN FEET

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CUT-FILL DIAGRAM - EX. TO FINISH GRADE
CLEAR LAKE SUBDIVISION - PRELIM. EXHIBITS
KALMIA AVE, WARRENTON, OR 97146

SANITARY SERVICE NOTE:

IT IS ANTICIPATED THAT LOTS 11 AND 12 WILL BE SERVICED BY GRINDER PUMPS.

TRACT A
2.59 ACRES

KALMIA AVENUE 11 LOT SUBDIVISION (EXISTING)

LOT 1 | LOT 2 | LOT 3 | LOT 4 | LOT 5 | LOT 6 | LOT 7 | LOT 8 | LOT 9 | LOT 10 | LOT 11 | LOT 12 | LOT 13 | LOT 14 | LOT 15

LOT 11
10,985 S.F.

KALMIA AVENUE

140.93 LF 8" PVC SAN LINE @ 0.40%
EX CLEANOUT (REMOVE)
STA: 1+02.04 OFF: -7.56LT
RIM: 32.51
INV IN: 25.18 8" PVC
INV OUT: 25.18 8" PVC

SAN MH 1
STA: 2+41.66 OFF: -12.00LT
RIM: 32.07
INV IN: 25.94 8" PVC
INV OUT: 25.74 8" PVC

122.40 LF 8" PVC SAN LINE @ 0.40%

SAN MH 2
STA: 3+62.52 OFF: -9.75LT
RIM: 31.00
INV IN: 26.63 8" PVC
INV OUT: 26.43 8" PVC

FIRE HDYRANT
WATER SERVICE (TYPICAL)
SANITARY SEWER SERVICE (TYPICAL)
8" WATER LINE
465.00 LF 8" PVC SAN LINE @ 0.40%
FIRE HDYRANT
FIRE HDYRANT
8" WATER LINE
8" PVC EXISTING SAN LINE @ 0.40%
STORM SEWER SEE SHEET 5
STORM SEWER SEE SHEET 5
SANITARY SEWER SERVICE (TYPICAL)

TRACT B
0.32 ACRES

BIOFILTRATION SWALE & STORM OUTFALL SEE SHEET 6

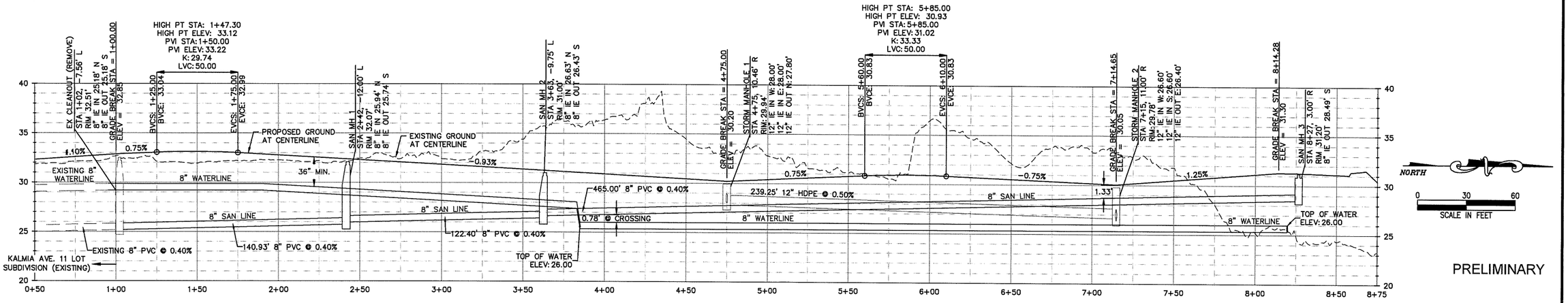
SAN MH 3
STA: 8+26.54 OFF: 3.00RT
RIM: 31.20
INV OUT: 28.49 8" PVC

INITIAL POINT

105 51.4Z IB KF LS 849

HIGH PT STA: 1+47.30
HIGH PT ELEV: 33.12
PVI STA: 1+50.00
PVI ELEV: 33.22
K: 29.74
LVC: 50.00

HIGH PT STA: 5+85.00
HIGH PT ELEV: 30.93
PVI STA: 5+85.00
PVI ELEV: 31.02
K: 33.33
LVC: 50.00



KALMIA AVENUE PROFILE
VERTICAL SCALE: 1" = 5'

NORTH
0 30 60
SCALE IN FEET

PRELIMINARY

DATE:	NO.	REVISION

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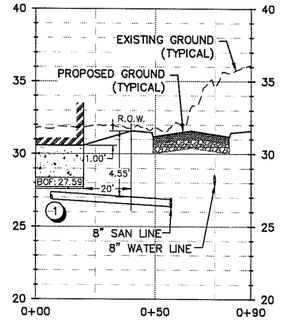
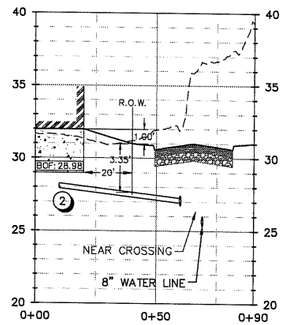
WATER AND SANITARY SEWER PLAN
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146



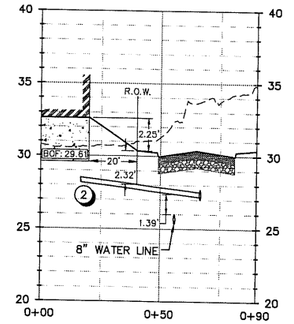
SANITARY SERVICE LOT 4 PROFILE

VERTICAL SCALE: 1" = 5'



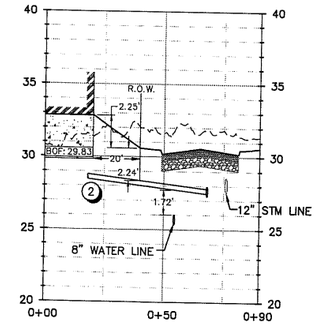
SANITARY SERVICE LOT 5 PROFILE

VERTICAL SCALE: 1" = 5'



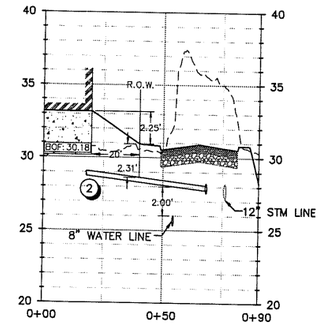
SANITARY SERVICE LOT 6 PROFILE

VERTICAL SCALE: 1" = 5'



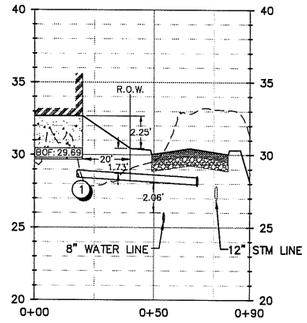
SANITARY SERVICE LOT 7 PROFILE

VERTICAL SCALE: 1" = 5'



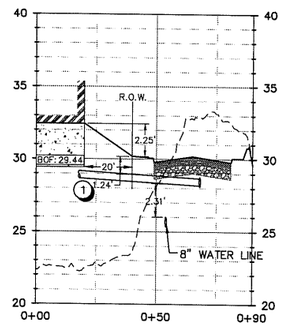
SANITARY SERVICE LOT 8 PROFILE

VERTICAL SCALE: 1" = 5'



SANITARY SERVICE LOT 9 PROFILE

VERTICAL SCALE: 1" = 5'



SANITARY SERVICE LOT 10 PROFILE

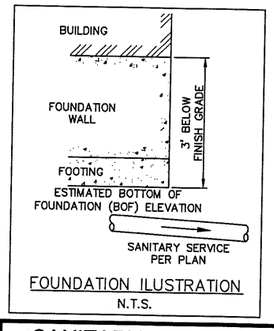
VERTICAL SCALE: 1" = 5'

KEY NOTES

1. 6" C900 PVC SANITARY SEWER SERVICE SLOPED AT 1%
2. 4" C900 PVC SANITARY SEWER SERVICE SLOPED AT 2%

SANITARY SERVICE NOTE:

IT IS ANTICIPATED THAT LOTS 11 AND 12 WILL BE SERVICED BY GRINDER PUMPS.



FOUNDATION ILUSTRATION

N.T.S.

NORTH

0 30 60

SCALE IN FEET

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GILL GRAMSON
15 NW 17TH PLACE
WARRENTON, OR 97146

SANITARY SEWER SERVICE PROFILES
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146

Kevin Cronin

From: Kevin Cronin
Sent: Thursday, February 14, 2019 5:31 PM
To: Alisa Dunlap; Dan Cary; gkobes@portofastoria.com; Hannah Dankbar; jeff@ridethebus.org; John Wickersham; Justin Parker; Ken Shonkwiler ; Lisa Phipps; Michael Summers (msummers@co.clatsop.or.us); Mike Moha ; ODOT Region 2; Virginia Williams (virginia.l.williams@odot.state.or.us)
Subject: RE: Affected Agency Notice | Clear Lake Subdivision | Public Hearing: March 14, 2019
Attachments: Clear Lake Prelim Plat APO Notice 021419.docx

Hello Agency Partners:

This is a public notice for a 15 lot subdivision that would extend SW Kalmia Avenue to Clear Lake.

Please provide comments by March 7 so I can include them in the Planning Commission packet.

If you have any questions, please let me know.

Thanks - Kevin

Kevin A. Cronin, AICP
Community Development Director
Community & Economic Development Department
City of Warrenton
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NOTICE OF PUBLIC HEARING

A public hearing is scheduled before the City of Warrenton City Commission at 6:00 p.m. on June 25, 2019 at the Warrenton City Hall, Commission Chambers, regarding an appeal of an approved 15 lot subdivision application submitted by Skip Urling on behalf of Sandridge Construction. The Planning Commission approved the Clear Lake subdivision, variance, and wetland hardship variance on April 25, 2019. The subject property is located on the north terminus of SW Kalmia Ave also identified on Tax Lot 810170001302.

The application will be reviewed under the procedures, standards and criteria in Warrenton Municipal Code 16.208.050, Type III Procedures (Quasi-Judicial), Warrenton Municipal Code Chapters, 16.216 Land Divisions and Lot Line Adjustments, 16.192 Large Scale Developments, 16.36 R10 Growth Management District, 16.140 Stormwater and Surface Water Management, 16.152 Grading, Excavating and Erosion Control Plans, 16.124 Landscaping & Street Trees, 16.156 Wetland & Riparian Corridor Development Standards, and 16.120 Access and Circulation.

Anyone wishing to participate may testify verbally at the public hearing, or if not able to attend the hearing may submit written testimony, which must be received by the Warrenton Planning and Building Department by 5:00 P.M. on the day of the hearing. Written comments may be mailed to Kevin A. Cronin, Community Development Director, Warrenton Planning and Building Department, P.O. Box 250, Warrenton Oregon, 97146-0250, or hand delivered to City Hall, 225 S Main. Failure to raise an issue on the record in person or by letter before the close of the record at the City's public hearing, or failure to provide statements or evidence sufficient to afford the decision making body an opportunity to respond to the issue, will preclude appeal to the Land Use Board of Appeals based on that issue.

The application and staff report are available for review and/or purchase at the City of Warrenton Planning and Building Department; or by contacting Kevin A. Cronin, Community Development Director at 503-861-0920 – cityplanner@ci.warrenton.or.us. The staff report will be available for review at no cost at least seven (7) days before the hearing.

Notice to mortgagee, lienholder, vendor, or seller: the Warrenton Development Code requires that if you receive this notice it shall be promptly forwarded to the purchaser.

Kevin A. Cronin, AICP, Community Development Director Date

March 7, 2019 (Addendum: April 4, 2019)

To: Warrenton Planning Commission

From: Kevin A. Cronin, AICP, Community Development Director

Re: Clear Lake Subdivision Application SUB 19-1, Wetland Hardship Variance WHV 19-1, & Variance VAR 19-1

Background

Gil Gramson of Sandridge Construction has applied for preliminary plat approval of a 15-lot subdivision north of the current terminus of SW Kalmia Avenue together with a hardship wetland variance application and a standard variance application to exceed the 200-foot standard for a dead end/cul-de-sac street. The subject property is about 8 acres identified as Tax Lot 81017B001302. The subject property is about 8 acres zoned RGM Growth Management Overlay with R-10 urban densities for new subdivisions. The proposed lots range in size from 10,070 to 13,848 square feet with an average of 11,271 SF with two additional unbuildable tracts equal to approximately 2.9 acres. The proposal includes the extension of SW Kalmia Ave terminating in a cul-de-sac at the north end. This is the third and final phase of multiple subdivisions that created SW Kalmia and multiple, single family detached lots over the last decade.

Existing Conditions & Previous Applications

Staff conducted a site visit on March 5 to verify site conditions and photo document. The site is bordered by wetlands on three sides with Clear Lake to the south, Fort Pointe to the north, and a gravel access road leading to Ridge Road to the west. The geology is mostly sandy and a small, thin layer of top soil with invasive plants as the dominant vegetation. Mature, native trees, such as Stika Spruce, surround the site along with ubiquitous, non-native Scotch Broom.

Unfortunately, significant clearing and grading of the site occurred last year prior to any approvals for such activity. The property owner/applicant was warned and notified of the violation and the activity ceased until the applicant's engineer worked on a grading permit for review. In lieu of a solitary grading permit, the applicant has submitted a full subdivision application with a grading plan. Staff has actively worked with North Coast Land Conservancy (NCLC) on a limited access plan to the Clear Lake property which has been preserved for open

space and wildlife habitat. A "pilot" wildlife fence is being explored to allow deer and other wildlife to pass, migrate, and graze unharmed.

Previous applications for subdivision include:

- G Gramson Estates - 17 lots, (SUB 13-1, VAR 13-2)
- North Kalmia – 11 lots (SUB 16-1/VAR 16-4)

In both cases, a variance was granted that exceeded the 200-foot block and street length without creating a secondary access or public street connection.

Type 3 Application Timeline & Process

A pre-application conference was held on January 23, 2019. Pre-application notes were provided to the applicant the following week with a request for responses. The full application was submitted on February 7 and deemed complete on February 14, 2019. Public notice to adjacent property owners was mailed on February 14, 2019. No comments have been received to date. Notice of the public hearing on March 14, 2019 was published in *The Columbia Press* on February 22, 2019. The applicant requested a continuance to April 11, 2019.

Staff also provided notice to affected agencies on February 14. Based on these facts, the application meets the Type 3 notice requirements per WMC 16.208.50. Comments were submitted by the NCLC, Port of Astoria, Fire Chief, and City Engineer, and are attached. One public comment from Rod Gramson was received on April 2 and is enclosed.

Applicable Codes

Applicable portions of the Warrenton Municipal Code are:

Chapter 16.112	Growth Management Zone Standards
Chapter 16.120	Access & Circulation
Chapter 16.124	Design Standards For Landscaping, Street Trees, Fences, & Walls,
Chapter 16.136	Public Facilities Standards
Chapter 16.140	Stormwater and Surface Water Management
Chapter 16.144	Signs
Chapter 16.152	Grading, Excavating, & Erosion Control Plans
Chapter 16.156	Wetlands and Riparian Corridor Development Standards
Chapter 16.272	Variances
Chapter 16.192	Large Scale Developments

Chapter 16.216 Land Divisions and Lot Line Adjustments
Section 16.208.050 Type III Procedure (Quasi-Judicial)

The City Commission recently approved a new Transportation System Plan (TSP) and changes to the Development Code to implement new policies. The application was submitted (February 7) prior to the effective date (February 22) of these Code changes therefore, previous Codes still apply.

Findings of Fact

Below are the applicable code sections followed by the applicant's response (annotated) to the criteria or standard, followed by the staff findings.

Chapter 16.112 GROWTH MANAGEMENT (GM) ZONE STANDARDS

16.112.010 Purpose.

The purpose of this chapter is to set forth growth management standards to insure the orderly conversion of the large amount of urbanizable residential land within the City to urban uses. The standards will apply to outlying areas of the City which are largely vacant and currently have a low level of urban services. These areas are projected to develop over time to a density of at least four units per acre. This chapter is intended to insure that public facilities adequate to serve development at this density are provided, either before or concurrent with development.

Applicant Response: See enclosed density table

Staff Finding: Staff requested a density calculation as part of the submittal. The enclosed table illustrates the lots, lot sizes, and open space tracts. Based on the net buildable land (344,946 – 126,481 SF = 218,465 SF) and the minimum four units per acre cited above, the minimum density is 20 units per acre. (218,465 X 4 units/43,560 SF = 20 units per acre). The applicant has proposed only 15 lots. See condition of approval to meet the minimum density required for this zone.

16.112.030 Growth Management Standards.

The following standards shall apply to development within growth management areas:

A. All development shall provide the following primary urban services: water, sanitary sewer facilities connecting to the City sewer system, local streets, fire protection and drainage. An inability to provide an acceptable level of all primary services shall result in the denial of a land use application.

B. All development shall be reviewed to ascertain whether an adequate level of the following secondary urban services exists: collector and arterial streets, school, police protection and parks. Where the City determines and supports with findings that an unacceptable level of secondary urban services exist, the City may deny the land-use application unless the developer insures the availability of an acceptable level of the services within five years from occupancy.

C. City specifications shall be the standard used as measurement of acceptability of a service.

D. Encourage the development within urban areas before the conversion of urbanizable areas.

Applicant Response: Included with the preliminary plat are plans for a local street designed to provide access to all of the proposed lots together with preliminary plans for the extension of sanitary sewer and potable water for domestic use and fire flow.

Staff Finding: Staff concurs. All utilities are available and will be engineered adequately to provide urban services. Affected agencies have not commented on unavailability of services. A pedestrian trail easement and path was requested at the pre-application stage and is shown on the proposed plat. Standard is met.

16.112.050 Land Divisions.

A. All land divisions which would create a parcel under five acres in size shall be subject to approval under the appropriate procedures in this Code (Chapter 16.216). Land divisions which would create a parcel under five acres in size in growth management areas shall be approved only if:

1. *The lots created are at R-10 urban densities;*
2. *Primary and secondary urban services are supplied in accordance with Section 16.28.050;*
3. *An exception is approved as provided in Section 16.112.040.*

Applicant Response: The preliminary plat application has been prepared and submitted consistent with the standards for land divisions set forth by WMC 16.216 and designed to meet the standards of WMC 16.28.040.

Staff Finding: Staff concurs that the development can be served with utilities. However, the R-10 urban density standard is not met. Based on the R-10 standard and net buildable acreage, the minimum number of units (lots) is 20 lots. The proposal has 15 lots. See condition of approval to meet this standard.

16.28.020 Permitted Uses.

The following uses and their accessory uses are permitted in the R-10 zone if the Community Development Director determines that the uses conform to the standards in Sections 16.28.040 through 16.28.050, applicable Zoning Ordinance standards, and other City laws:

A. Single-family detached dwelling.

16.28.040 Development Standards.

The following development standards are applicable in the R-10 zone:

A. Density Provisions.

1. Minimum lot area for residences: 10,000 square feet.

2. Minimum lot width at the front building line: 50 feet.

3. Minimum lot depth: 70 feet.

4. Not more than 35% of the lot area shall be covered by buildings except as may be permitted by conditional use permit or variance.

5. Maximum building height: 30 feet.

6. Maximum building height for agricultural buildings: 40 feet.

B. Setback Requirements.

1. Minimum front yard setback: 15 feet.

2. Minimum side yard setback: 10 feet.

3. Corner lot minimum street side yard setback: 10 feet.

4. Minimum rear yard setback: 15 feet, except accessory structures that meet the criteria of Section 16.280.020, may extend to within five feet of a rear property line.

5. Corner lot minimum rear yard setback: 10 feet.

Applicant Response: All lots have been designed to comply with the areal and dimension standards of WMC 16.28.040 above, and have sufficient area to meet the setback standards of WMC 16.28.040.B; the application satisfies these standards.

Staff Finding: Staff concurs that the proposed lots meet the standards for lot size. Other standards will be checked for compliance as single-family detached units are applied at building permit stage.

16.120.020 Vehicular Access and Circulation.

F. Access Options. When vehicle access is required for development (i.e., for off-street parking, delivery, service, drive-through facilities, etc.), access shall be provided by one of the following methods (a minimum of 10 feet per lane is required). These methods are "options" to the developer/subdivider, unless one method is specifically required under Division 2, or through conditions required by the hearings body.

1. Option 1. Access is from an existing or proposed alley or mid-block lane. If a property has access to an alley or lane, direct access to a public street is not permitted.

2. Option 2. Access is from a private street or driveway connected to an adjoining property that has direct access to a public street (i.e., "shared driveway"). A public access easement covering the driveway shall be recorded in this case to assure access to the closest public street for all users of the private street/drive.

3. Option 3. Access is from a public street adjacent to the development parcel. If practicable, the owner/developer may be required to close or consolidate an existing access point as a condition of approving a new access. Street accesses shall comply with the access spacing standards in subsection G of this section, and require an access permit in accordance with subsection C of this section.

Applicant Response: No response

Staff finding: The proposal is using Option 3 by connecting to and extending a public street in SW Kalmia Avenue. Standard is met.

6. Important Cross-References to Other Code Sections. Divisions 2 and 3 may require buildings placed at or near the front property line and driveways and parking areas oriented to the side or rear yard. The City may require the dedication of public right-of-way and construction of a street (e.g., frontage road, alley or other street) when the development impact is proportionate to the need for such a street, and the street is identified by the Comprehensive Plan or Transportation System Plan. (Please refer to Chapter 16.136, Public Facilities Standards.)

Applicant Response: No response.

Staff Finding: Staff supports the right-of-way dedication.

G. Access Spacing. Driveway accesses shall be separated from other driveways and street intersections in accordance with the following standards and procedures:

1. Local Streets. A minimum of 25 feet separation (as measured from the sides of the driveway/street) shall be required on local streets (i.e., streets not designated as collectors or arterials) for all single-family detached dwellings, except as provided in paragraph 3 of this subsection. A minimum of 20 feet separation shall be required on local streets for all single-family attached dwellings, duplexes, and triplexes, except as provided in paragraph 3 of this subsection.

3. Special Provisions for All Streets. Direct street access may be restricted for some land uses, in conformance with the provisions of Division 2, Land Use Districts. For example, access consolidation, shared access, and/or access separation greater than that specified by paragraphs 1 and 2 of this subsection, may be required by the City, County or ODOT for the purpose of protecting the function, safety and operation of the street for all users. (See subsection I of this section.) Where no other alternatives exist, the permitting agency may allow construction of an access connection along the property line farthest from an intersection. In such cases, directional connections (i.e., right in/out, right in only, or right out only) may be required.

4. Corner Clearance. The distance from a street intersection to a driveway or other street access shall meet or exceed the minimum spacing requirements for the street classification in the Warrenton TSP.

Applicant Response: No response

Staff finding: There is only one access into the development and it is an extension of an existing public street. Individual driveways will be installed per City codes by the home builders. At this time, there appears to be no conflicts with access due to the size of lots fronting onto the proposed street. Standard is met.

H. Number of Access Points. For single-family (detached and attached), two-family, and three-family housing types, one street access point is permitted per dwelling unit, when alley access or shared driveways cannot otherwise be provided; except that one additional access point may be permitted for one-family, two-family and three-family housing types on corner lots (i.e., no more than one access per street), subject to the access spacing standards in subsection G of this section. The number of street access points for multiple family, commercial, industrial, and public/institutional developments shall be minimized to protect the function, safety and operation of the street(s) and sidewalk(s) for all users. Shared access may be required, in conformance with subsection I of this section, in order to maintain the required access spacing, and minimize the number of access points.

Applicant Response: No response

Staff finding: Driveways will be reviewed at the time of building permit applications.

L. Fire Access and Circulation. The City of Warrenton adopts the Uniform Fire Code, as amended, including administrative sections and all appendices and all the State of Oregon revisions. All development in the City of Warrenton is required to meet these minimum adopted standards.

1. Required Access. A fire equipment access drive that meets City construction standards shall be provided for any portion of an exterior wall of the first story of a building that is located more than 150 feet from an improved public street or approved fire equipment access drive. Plans for fire apparatus access roads shall be submitted to the Warrenton Fire Department and Warrenton City-appointed engineer for review and approval prior to issuance of building permits, grading permits, or start of construction. When fire apparatus access road(s) are required, the road(s) shall be installed and made serviceable prior to and during time of construction. Fire department access roads shall be provided and maintained in

accordance with the fire department access requirements of the Uniform Fire Code, as amended.

2. Dimensions. Fire apparatus roads shall have an unobstructed width of not less than 20 feet and unobstructed vertical clearance of not less than 13 feet 6 inches. Fire apparatus roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be provided with a surface so as to provide all-weather driving capabilities.

3. Turnaround Required. Dead-end fire apparatus roads in excess of 150 feet shall be provided with approved provisions for the turning around of fire apparatus. See Table 16.136.010 for minimum standards.

4. Grade. The gradient for a fire apparatus access road shall not exceed 12% except that isolated segments no longer than 250 feet may have grades up to 15% upon approval by the Warrenton Fire Chief. Non-fire apparatus access roads (driveways and private streets) shall maintain a maximum grade of 15% unless otherwise approved by the Warrenton City-appointed engineer. See Table 16.136.010 for other applicable standards.

5. Parking Areas. Parking areas shall provide adequate aisles or turn-around areas for service and delivery vehicles so that all vehicles may enter the street in a forward manner. See also Chapter 16.136, Public Facilities Standards.

Applicant Response: No response.

Staff Finding: Fire Chief Tim Demers provided comments. See conditions of approval.

16.120.030 Pedestrian Access and Circulation.

A. Pedestrian Access and Circulation. To ensure safe, direct and convenient pedestrian circulation, all developments, except single-family detached housing, duplexes, or triplexes on individual lots, shall provide a continuous pedestrian and/or multi-use pathway system. (Pathways only provide for pedestrian circulation. Multi-use pathways accommodate pedestrians and bicycles.) The system of pathways shall be designed based on the standards in paragraphs 1 through 3 of this subsection:

1. Continuous Pathways. The pathway system shall extend throughout the development site, and connect to all future phases of development, adjacent trails, public parks and open space areas whenever possible. The developer may also be required to connect or stub pathway(s) to adjacent streets and private property, in accordance with the provisions of Section 16.120.020, Vehicular Access and Circulation, and Chapter 16.136, Public Facilities Standards.

Applicant Response: The applicant understands the concept of providing connectivity and continuity of streets and pedestrian paths as required by code above.

Staff finding: Staff concurs with the proposed pedestrian easement and path between Lots 1 & 2. Staff also requested another pedestrian easement and path between additional lots as a result of the dead-end street and to mitigate the variance request to the street length standard. If Lot 11 & 12 are not suitable as a result of wetland constraints, then the applicant shall propose an alternative to meet the standard. See conditions of approval.

B. Design and Construction. Pathways shall conform to all of the standards in paragraphs 1 through 5 of this subsection:

1. Vehicle/Pathway Separation. Where pathways are parallel and adjacent to a driveway or street (public or private), they shall be raised six inches and curbed, or separated from the driveway/street by a five-foot minimum strip with bollards, a landscape berm, or other physical barrier. If a raised path is used, the ends of the raised portions must be equipped with curb ramps.

2. Housing/Pathway Separation. Pedestrian pathways shall be separated a minimum of five feet from all residential living areas on the ground floor, except at building entrances. Separation is measured as measured from the pathway edge to the closest dwelling unit. The separation area shall be landscaped in conformance with the provisions of Chapter 16.128. No pathway/building separation is required for commercial, industrial, public, or institutional uses.

3. Crosswalks. Where pathways cross a parking area, driveway, or street ("crosswalk"), they shall be clearly marked with contrasting paving materials, humps/raised crossings, or painted striping. An example of contrasting paving material is the use of a concrete crosswalk through an asphalt driveway. If painted striping is used, it shall consist of thermo-plastic striping or similar type of durable application.

4. Pathway Surface. Pathway surfaces shall be concrete, asphalt, brick/masonry pavers, or other durable surface, at least six feet wide, and shall conform to ADA requirements. Multi-use paths (i.e., for bicycles and pedestrians) shall be the same materials, at least six feet wide. (See also Chapter 16.136, Public Facilities Standards, for public multi-use pathway standards.)

5. Accessible Routes. Pathways shall comply with the Americans with Disabilities Act, which requires accessible routes of travel.

Applicant Response: No response

Staff finding: The applicant did not include a detail for the proposed pathway. The above standards have not been met. See conditions of approval.

CHAPTER 16.124 DESIGN STANDARDS FOR LANDSCAPING, STREET TREES, FENCES, AND WALLS

16.124.060 Landscape Conservation.

A. Applicability. All development sites containing significant vegetation, as defined below, shall comply with the standards of this section. The purpose of this section is to incorporate significant native vegetation into the landscapes of development. The use of mature, native vegetation within developments is a preferred alternative to removal of vegetation and re-planting. Mature landscaping provides summer shade and wind breaks, and allows for water conservation due to larger plants having established root systems.

B. Significant Vegetation. "Significant vegetation" means:

1. Significant Trees and Shrubs. Individual trees located within a mapped wetland area as depicted on the 1" = 400' maps entitled City of Warrenton Wetland Conservation Plan Inventory dated October 17, 1997 with a trunk diameter of 18 inches or greater, as measured four feet above the ground (DBH), and all plants within the drip line of such trees and shrubs, shall be protected. Other trees may be deemed significant, when nominated by the property owner and designated by the City Commission as "Heritage Trees" (i.e., by virtue of site, rarity, historical significance, etc.).

2. Exceptions. Protection shall not be required for (a) plants listed as non-native, invasive plants by the Oregon State University Extension Service in the applicable OSU bulletins for

Clatsop County, or (b) as otherwise excepted by Chapter 16.156, Wetland and Riparian Corridor Development Standards.

C. Mapping and Protection Required. All mapped wetland and riparian areas shall be protected in accordance with Chapter 16.156 and other applicable sections of this Code.

D. Protection Standards. All of the following protection standards shall apply to significant vegetation areas:

1. Protection of Significant Trees. Significant trees identified as meeting the criteria in subsection (B)(1) of this section shall be retained whenever practicable. Preservation may become impracticable when it would prevent reasonable development of public streets, utilities, or land uses permitted by the applicable land use district.

2. Conservation Easements and Dedications. When necessary to implement the Comprehensive Plan, the City may require dedication of land or recordation of a conservation easement to protect sensitive lands, including groves of significant trees and mapped wetland and/or riparian areas.

E. Construction. All areas of significant vegetation and mapped wetland and riparian areas shall be protected prior to, during, and after construction. Grading and operation of vehicles and heavy equipment is prohibited within significant vegetation areas, wetlands, and riparian areas, except as approved by the City for installation of utilities or streets, or in accordance with other approved plans.

Applicant Response: No response

Staff Finding: A landscape conservation plan was not submitted for review. See conditions of approval.

16.124.050 Fences and Walls.

B. Dimensions.

1. The maximum allowable height for fences and walls in the City of Warrenton is six feet, as measured from the lowest grade at the base of the wall or fence, except that retaining walls and terraced walls may exceed six feet when permitted as part of a site development approval, or as necessary to construct streets and sidewalks. Refer to paragraph 4 of this subsection for additional fence standards for residential uses.

3. A building permit is required for walls exceeding four feet in height and fences exceeding six feet in height, in conformance with the Uniform Building Code.

4. The height of fences and walls within a required front yard setback area for residential uses shall not exceed four feet (except decorative arbors, gates, etc.), as measured from the grade closest to the street right-of-way. Walls may exceed this height in accordance with paragraph 1 of this subsection. Chain-link fences and other open-style fences with at least 50% transparency or open space are allowed a maximum height of six feet within a required front yard setback area.

5. Walls and fences to be built for required buffers shall comply with Section 16.124.030.

6. Fences and walls shall comply with the vision clearance standards of Section 16.120.020.

Applicant Response: No response

Staff finding: The applicant has not indicated location of retaining walls. Engineering review will be required. A wildlife fence is proposed to the south that will need to comply with the above standards. See conditions of approval.

B. Landscaping Plan Required. For every new development in the City of Warrenton requiring a City permit, a landscape plan is required. All landscape plans shall include the following minimum required details (see Section 16.212.040 for additional landscape plan requirements for projects requiring site design review):

1. Legal description (e.g., assessor parcel number, copy of warranty deed, etc.) for the subject property;

2. Property lines with the location and general description (height and type of material) of existing and proposed fences and other buffering or screening materials;

3. The location of existing and proposed terraces or retaining walls;

4. The location of existing and proposed plant materials;

5. Wetland and/or riparian area boundaries on the property, if any;

6. Existing and proposed structures;

7. Driveway and adjoining roadway widths, descriptions, and locations; and

8. Prevailing drainage patterns for the property.

9. Other information as deemed appropriate by the Community Development Director. An arborist's report may be required for sites with mature trees that are protected under this chapter and/or Chapter 16.156 of this Code.

Applicant Response: No response

Staff finding: A landscape plan was not submitted. There are significant existing trees on site that can be preserved that are outside of the building envelope. See conditions of approval.

C. Landscape Area Standards. The minimum percentage of required landscaping equals:

1. Residential districts: 20% of the site.

2. Commercial districts: 15% of the site shall be landscaped according to the requirements of this section.

3. General industrial districts: a minimum of 20% of the site shall be landscaped.

The use of mature, native vegetation within developments is a preferred alternative to removal of vegetation and re-planting.

Applicant Response: No response

Staff finding: A significant portion (36%) of the lot is wetlands, which exceeds the minimum 20% for residential districts. In addition, individual lots will probably be landscaped, but is not a requirement on single family lots within the City. However, restoration of the remaining wetlands not impacted through a wetland hardship is a condition of approval.

16.124.080 Street Trees.

Street trees shall be planted for all developments that are subject to land division or site design review. Requirements for street tree planting strips are provided in Chapter 16.136, Public Facilities Standards. Planting of unimproved streets shall be deferred until the construction of curbs and sidewalks. Street trees shall conform to the following standards and guidelines:

A. Growth Characteristics. Trees shall be selected based on growth characteristics and site conditions, including available space, overhead clearance, soil conditions, exposure, and desired color and appearance. The following should guide tree selection:

1. Provide a broad canopy where shade is desired.

2. Use low-growing trees for spaces under utility wires.

3. Select trees which can be "limbed-up" where vision clearance is a concern.

4. Use narrow or "columnar" trees where awnings or other building features limit growth, or where greater visibility is desired between buildings and the street.

5. Use species with similar growth characteristics on the same block for design continuity.

6. Avoid using trees that are susceptible to insect damage, and avoid using trees that produce excessive seeds or fruit.

7. Select trees that are well-adapted to the environment, including soil, wind, sun exposure, and exhaust. Drought-resistant trees should be used in areas with sandy or rocky soil.

8. Select trees for their seasonal color, as desired.

9. Use deciduous trees for summer shade and winter sun.

Applicant Response: No response.

Staff finding: There is no street tree plan submitted. Standard is not met. See conditions of approval.

CHAPTER 16.136 PUBLIC FACILITIES STANDARDS

16.136.020 Transportation Standards.

A. Development Standards. No development shall occur unless the lot or parcel abuts a public or private street, other than an alley, for at least 25 feet and is in conformance with the provisions of Chapter 16.120, Access and Circulation, and the following standards are met:

1. Streets within or adjacent to a development shall be improved in accordance with the Comprehensive Plan, Transportation System Plan, and the provisions of this chapter;

2. Development of new streets (public or private), and additional street width or improvements planned as a portion of an existing street, shall be improved in accordance with this section, and public streets shall be dedicated to the applicable City, county or state jurisdiction;

3. New streets and drives connected to a City collector or arterial street shall be paved; and

Applicant Response: The proposed Kalmia Avenue extension for the Clear Lake subdivision will meet these standards. Curb to curb width is proposed at 32 feet, 4 feet wider than the existing 28 foot wide street segment it will be extended from.

Staff finding: As mentioned above, the preexisting standards will apply to the street standards which includes 36 feet wide curb to curb pavement unless findings can be made to support a local alternative road standard. The proposed street is 32 feet wide with 5 foot sidewalks on both sides. A planting strip is not proposed. See findings below.

B. Variances. Variances to the transportation design standards in this section may be granted by means of a Class 2 variance, as governed by Chapter 16.272, Variances. A variance may be granted under this provision only if a required improvement is not feasible due to topographic constraints or constraints posed by sensitive lands (see Chapter 16.156).

Applicant Response: A variance to the cul-de-sac length of 200 feet per WMC 16.130.020 is requested and the criteria is discussed below. The subject property is bounded by wetlands to the west, north, and partially to the east.

Staff finding: The road length variance is addressed below in the variance section.

D. Creation of Access Easements. The City may approve an access easement established by deed when the easement is necessary to provide for access and circulation in conformance with Chapter 16.120, Access and Circulation. Access easements shall be created and maintained in accordance with the Uniform Fire Code, as amended.

E. Street Location, Width and Grade. Except as noted below, the location, width and grade of all streets shall conform to the Transportation System Plan and Comprehensive Plan, as applicable; and an approved street plan or subdivision plat. Street location, width and grade shall be determined in relation to existing and planned streets, topographic conditions, public convenience and safety, and in appropriate relation to the proposed use of the land to be served by such streets:

1. Street grades shall be approved by the City-appointed engineer in accordance with the design standards in subsection N of this section; and

2. Where the location of a street is not shown in an existing street plan (see subsection H of this section), the location of streets in a development shall either:

a. Provide for the continuation and connection of existing streets in the surrounding areas, conforming to the street standards of this chapter, or

b. Conform to a street plan adopted by the City, if it is impractical to connect with existing street patterns because of particular topographical or other existing conditions of the land. Such a plan shall be based on the type of land use to be served, the volume of traffic, the capacity of adjoining streets and the need for public convenience and safety.

F. Minimum Rights-of-Way and Street Sections. Street rights-of-way and improvements shall conform to the design standards in Table 16.136.010. A variance shall be required in accordance with Chapter 16.272 of this Code to vary the standards in Table 16.136.010. Where a range of width is indicated, the width shall be determined by the decision-making authority based upon the following factors:

1. Street classification in the Transportation System Plan or Comprehensive Plan;

2. Anticipated traffic generation;

3. On-street parking needs;

4. Sidewalk and bikeway requirements based on anticipated level of use;

5. Requirements for placement of utilities;

6. Street lighting;

7. Street tree location, as provided for in Chapter 16.124;

8. Protection of significant vegetation and wetland and riparian areas, as provided for in Chapters 16.124 and 16.156;

9. Safety and comfort for motorists, bicyclists, and pedestrians;

10. Street furnishings (e.g., benches, lighting, bus shelters, etc.), when provided;

11. Access needs for emergency vehicles; and

12. Transition between different street widths (i.e., existing streets and new streets), as applicable.

Applicant Response: The proposed Kalmia Avenue extension as a local alternative street is consistent with these criteria. The right-of-way is 50 feet which includes sufficient space for a new street to accommodate anticipated traffic generation of 150 average daily traffic, on street parking, sidewalks, utilities, street lighting, street trees, protection of sensitive lands, safety and comfort for motorists, bicyclists, and pedestrians, emergency vehicle access, and the transition for the right-of-way and existing 28 foot pavement width of Kalmia Avenue.

Staff finding: See findings below.

Applicant Response: The proposed 32 foot street width exceeds the upper range width of 28 feet identified in the table above; it also includes sidewalks.

Staff Finding: As discussed above, the minimum density is 20 units, just above the 18 or fewer standard. The proposal does meet the ADT standard. The presence of wetlands does not materially affect the location of the proposed roadway, but additional right-of-way dedication does impact the size of the lots. If an additional pedestrian path can be located, and a secondary access stubbed within the existing gravel road, then the connectivity standard can be met. The Fire Chief and City Engineer have commented as well. Standard is not met. See conditions of approval.

H. Future Street Plan and Extension of Streets.

1. A future street plan shall be filed by the applicant in conjunction with an application for a subdivision in order to facilitate orderly development of the street

system. The plan shall show the pattern of existing and proposed future streets from the boundaries of the proposed land division and shall include other parcels within 500 feet surrounding and adjacent to the proposed land division. The street plan is not binding; rather it is intended to show potential future street extensions with future development.

Applicant Response: Environmental conditions make the likelihood of extending the street to adjacent properties nil, therefore it is appropriate to develop the cul-de-sac to city standards rather than extend the road to the north property line.

Staff Finding: The City Engineer has requested a public street stubbed to the north that would formalize the use of an existing gravel road. As Ridge Road redevelops a secondary access will be required. Standard is not met. See City Engineer's comments.

2. Spacing between local street intersections shall have a minimum separation of 125 feet, except where more closely spaced intersections are designed to provide an open space, pocket park, common area or similar neighborhood amenity. This standard applies to four-way and three-way (off-set) intersections.

3. All local and collector streets which abut a development site shall be extended within the site to provide through circulation unless prevented by environmental or topographical constraints, existing development patterns or compliance with other standards in this Code. This exception applies when it is not possible to redesign or reconfigure the street pattern to provide required extensions. Land is considered topographically constrained if the slope is greater than 15% for a distance of 250 feet or more. In the case of environmental or topographical constraints, the mere presence of a constraint is not sufficient to show that a street connection is not possible. The applicant must show why the environmental or topographic constraint precludes some reasonable street connection.

5. In order to promote efficient vehicular and pedestrian circulation throughout the City, the design of subdivisions and alignment of new streets shall conform to the following standards in Chapter 16.120, Access and Circulation: The maximum block length shall not exceed 1,000 feet between street corner lines unless it is adjacent to an arterial street or unless the topography or the location of adjoining streets justifies an exception. The maximum length of blocks along an arterial is 1,800 feet. A block shall have sufficient width to provide for two tiers of building sites unless topography or location of adjoining streets justifies an exception. Exceptions to the above

standards may be granted when an accessway is provided at or near mid-block, in conformance with the provisions of Section 16.120.030.

Applicant Response: This section does not apply.

Staff Finding: Staff disagrees. Although there are no intersections proposed that would violate the spacing standard, there is no alternative access being proposed. There are no other local street connections available. However, the block length is being exceeded. See conditions of approval.

J. Sidewalks, Planter Strips, Bicycle Lanes. Sidewalks, planter strips, and bicycle lanes shall be installed in conformance with the standards in Table 16.136.010, applicable provisions of the Transportation System Plan, the Comprehensive Plan, and adopted street plans. Maintenance of sidewalks, curbs, and planter strips is the continuing obligation of the adjacent property owner.

Applicant Response: The right-of-way extends 3 feet beyond the standard 5 foot sidewalk and is available as a planting strip. Bicycle lanes are not warranted.

Staff Finding: Staff agrees with the addition of sidewalks on both sides and the omission of a bicycle lane for a local street; However, the applicant has noted the absence of a planting strip. See conditions of approval.

M. Cul-de-Sacs. A dead-end street shall be no more than 200 feet long, shall not provide access to greater than 18 dwelling units, and shall only be used when environmental or topographical constraints, existing development patterns, or compliance with other standards in this Code preclude street extension and through circulation.

1. All cul-de-sacs shall terminate with a circular turnaround. Circular turnarounds shall have a radius of no less than 40 feet from center to edge of pavement except that turnarounds that contain a landscaped island or parking bay in their center shall have a minimum radius of 45 feet. When an island or parking bay is provided, there shall be a fire apparatus lane of at least 20 feet in width; and

2. The length of the cul-de-sac shall be measured along the centerline of the roadway from the near side of the intersecting street to the farthest point of the cul-de-sac.

See Section 16.120.020 for fire access and parking area turnaround requirements based on Uniform Fire Code standards, as amended.

Applicant Response: The cul-de-sac has been designed to these standards. A variance to length standard is requested and discussed below.

Staff finding: Staff concurs. Fire Chief has reviewed and approved subject to conditions of approval.

N. Grades and Curves. Grades shall not exceed 10% on arterials, 12% on collector streets, or 12% on any other street (except that local or residential access streets may have segments with grades up to 15% for distances of no greater than 250 feet), and:

1. Centerline curve radii shall not be less than 700 feet on arterials, 500 feet on major collectors, 350 feet on minor collectors, or 100 feet on other streets; and

Applicant Response: The street design adheres to these standards.

Staff finding: Staff concurs.

T. Street Names. Street naming and numbering in the City of Warrenton (and Hammond) shall follow the uniform system of the City's addressing ordinance (Ord. No. 359-A). Street names, signs and numbers shall conform to the City's addressing ordinance.

Applicant Response: The applicant's intent is to continue the street name Kalmia Avenue.

Staff finding: Agreed

X. Street Light Standards. Street lights shall be installed in accordance with City standards.

Applicant Response: Acknowledged

Staff finding: Street light locations will be reviewed for compliance review and approval of the engineering construction plans.

16.136.030 Public Use Areas.

A. Dedication Requirements.

1. Where a proposed park, playground or other public use shown in a plan adopted by the City is located in whole or in part in a subdivision, the City may require the dedication or reservation of this area on the final plat for the subdivision.

2. If determined by the Planning Commission to be in the public interest in accordance with adopted Comprehensive Plan policies, and where an adopted plan of the City does not indicate proposed public use areas, the City may require the dedication or reservation of areas within the subdivision of a character, extent and location suitable for the development of parks and other public uses.

3. All required dedications of public use areas shall conform to Section 16.136.010(D) (Conditions of Development Approval).

B. Acquisition by Public Agency. If the developer is required to reserve land area for a park, playground, or other public use, the land shall be acquired by the appropriate public agency within 12 months following final plat approval, at a price agreed upon prior to approval of the plat, or the reservation shall be released to the property owner.

C. System Development Charge Credit. Dedication of land to the City for public use areas shall be eligible as a credit toward any required system development charge for parks.

Applicant Response: No park or recreational facility is shown in a city approved plan to be located wholly or partially within the boundaries of the subject property. We also note that WMC 16.216.020.I sets the threshold for requiring neighborhood parks to developments of 20 units or more. This proposal has 15 lots. However, in the spirit of cooperation, the application includes a 20 foot easement between Lots 1 and 2 to the subject property western boundary for utilities and to facilitate the development of a pedestrian trail toward recreation facilities along Ridge Road.

Staff Finding: Staff concurs.

16.136.040 Sanitary Sewer and Water Service Improvements.

A. Sewers and Water Mains Required. Sanitary sewers and water mains shall be installed to serve each new development and to connect developments to existing mains in accordance with the City's construction specifications and the applicable Comprehensive Plan policies. Where City sanitary sewers are not physically or legally available to service the site, the applicant must demonstrate provisions for a suitable on-site disposal system permitted by DEQ prior to issuance of City permits. All development within a growth management (GM) zone, as identified on the official Warrenton Zoning Map, shall comply with the growth management zone standards of Chapter 16.112.

Applicant Response: Included with the applications plan set are preliminary designs for the extension of both potable water and sanitary sewer lines from their present terminus at the

southern property line of the subject property. The plans call for an extension of 8 inch pipes for both utilities, with manholes as appropriate and necessary for the sanitary sewer pipe system.

Staff finding: The applicant's response satisfies this criterion. City staff and City Engineer will ensure compliance with the review of the engineering construction plans. See condition of approval.

16.136.050 Storm Drainage Improvements.

> *B. Accommodation of Upstream Drainage. Culverts and other drainage facilities shall be large enough to accommodate potential runoff from the entire upstream drainage area, whether inside or outside the development. Such facilities shall be subject to review and approval by the City-appointed engineer.*

Applicant Response: The project design for stormwater management shows a series of catch basins, manholes and a stormwater quality treatment biofiltration facility located east of the planned Kalmia Avenue extension north of Lot 15. All storm water runoff from the new pavement, driveways, and sidewalks would be directed to this facility where it would be treated as it partially infiltrates and flows through the vegetated swale before discharging to the adjacent wetland.

Staff finding: The preliminary stormwater plan meets this standard; note that the city engineer has requested additional information in the final plan.

16.136.060 Utilities.

> *A. Underground Utilities. All utility lines including, but not limited to, those required for electric, communication, lighting and cable television services and related facilities shall be placed underground, except for surface mounted transformers, surface mounted connection boxes and meter cabinets which may be placed above ground, temporary utility service facilities during construction, and high capacity electric lines operating at 50,000 volts or above. The following additional standards apply to all new land divisions, in order to facilitate underground placement of utilities:*
>
> > *1. The developer shall make all necessary arrangements with the serving utility to provide the underground services. Care shall be taken to ensure that all above ground equipment does not obstruct circulation and access aisles or impede vision clearance areas for vehicular traffic (Chapters 16.120 and 16.132);*

2. The City reserves the right to approve the location of all surface mounted facilities;

3. All underground utilities, including sanitary sewers and storm drains installed in streets by the developer, shall be constructed prior to the surfacing of the streets; and

4. Stubs for service connections shall be long enough to avoid disturbing the street improvements when service connections are made.

Applicant Response: All utilities will be placed underground.

Staff finding: The application meets this requirement.

B. Easements. Easements shall be provided for all underground utility facilities.

Applicant Response: The applicant will provide easements as necessary.

Staff finding: Easements are shown on the preliminary plat.

16.136.070 Easements.
Easements for sewers, storm drainage and water quality facilities, water mains, electric lines or other public utilities shall be dedicated on a final plat, or provided for in the deed restrictions. See also Chapter 16.212, Site Design Review, and Chapter 16.216, Land Divisions and Lot Line Adjustments. The developer or applicant shall make arrangements with the City, the applicable district, and each utility franchise for the provision and dedication of utility easements necessary to provide full services to the development. The City's standard width for public main line utility easements shall be 20 feet unless otherwise specified by the utility company, applicable district, or City-appointed engineer.

Applicant Response: The applicant has easements shown on the proposed plans.

Staff finding: Noted.

CHAPTER 16.140 STORMWATER AND SURFACE WATER MANAGEMENT

16.140.010 Natural Drainage System Maintained to Extent Feasible.

A. To the extent practicable, all development must conform to the natural contours of the land and natural and pre-existing man-made drainage ways must remain undisturbed.

B. To the extent practicable, lot boundaries created by partition or subdivision must coincide with natural and pre-existing man-made drainage ways to avoid the creation of lots that can be built upon only by altering such drainage ways.

Applicant Response: There are no apparent or pre-existing man-made drainage ways on the subject property. proposed project will not change any pre-existing drainage ways.

Staff finding: Staff concurs. This is a greenfield development that will use existing wetlands to the extent possible for natural storm drainage.

16.140.020 Developments Must Drain Properly.

A. All developments must provide an adequate drainage system to prevent the undue detention or retention of stormwater or surface water on the development site. Stormwater or surface water will not be regarded as unduly detained or retained if:

1. The detention or retention results from a technique, practice or device deliberately installed as part of an approved sedimentation or stormwater runoff control plan prepared by an engineer; or

2. The detention or retention is not substantially different in location or degree than that experienced by the development site in its predevelopment state, unless such detention or retention presents a danger to health or safety.

B. No stormwater may be channeled and directed into a sewer line.

C. Whenever practicable, the drainage system of a development must coordinate with and connect to the drainage systems or drainage ways on surrounding properties or streets.

D. All developments must be constructed and maintained so that adjacent properties are not unreasonably burdened with stormwater runoff as a result of the developments.

16.140.030 Surface Water Management.

All developments must be constructed and maintained so that impacts to natural and man-made drainage ways do not unreasonably burdened upstream or downstream properties with surface water flooding as a result of the developments. More specifically:

A. No development may be constructed or maintained so that the development unreasonably impedes the natural flow of water from higher adjacent properties across the development, resulting in substantial damage to the higher adjacent properties; and

B. No development may be constructed or maintained so that stormwater from the development is collected and channeled into natural or man-made drainage ways, such that the volume and/or rate of flow is substantially greater than the pre-development volume and/or rate.

C. No development may be constructed such that the flow of water through natural or existing man-made drainage ways is obstructed. Bridges and culverts constructed to allow the flow of water through a development must be designed to pass flow during a 100-year storm event.

Applicant Response: The engineered stormwater system is designed to satisfy all these criteria. A preliminary stormwater report is included with this application.

Staff finding: As mentioned elsewhere, the City Engineer has requested additional information in the final stormwater report.

16.140.040 Erosion and Sediment Control.

A. For projects that disturb over one acre, applicants must apply to Oregon Department of Environmental Quality (DEQ) for a National Pollutant Discharge Elimination Control System (NPDES) 1200(C) permit.

B. Erosion and sediment control plans are required by the City as a component of the site plan for all plats and all projects which require site plan review. Erosion control plans must be designed to the specifications as outlined in this chapter.

C. Development of the land may not begin (and no building permits may be issued) until the City-appointed engineer approves the erosion control plan.

D. For purposes of this section, "disturb" means any use of the land by any person in any development, and/or road construction and maintenance that results in a change in the natural cover or topography that may cause or contribute to sedimentation. Sedimentation occurs whenever solid particulate matter, mineral or organic, is transported by water, air, gravity or ice from the site of its origin.

Applicant Response: The applicant fully intends to submit application to ODEQ for a 1200(c) erosion control permit and will submit that plan to the City for review and approval as well as Land Use Compatibility Statement. See conditions of approval.

16.140.050 Stormwater System Design.

A. Storm sewers constructed within the street will be sized by the developer's engineer and will consider all potential runoff requirements within the site and upstream of the site.

1. The storm sewer will be sized for a 100-year design recurrence criteria for storm drainage facilities.

2. The minimum size of storm sewers is eight inches in diameter.

3. Spacing of catch basins along the street must conform to published engineering recommendations, which consider profile of the street and street width.

B. On-site detention shall be required for new development where downstream deficiencies exist or are anticipated to exist. The square footage considers the total development of the property including the future potential impervious surface. Required design recurrence criteria for a commercial or residential storm drainage detention facility is a 10-year interval. Development that has less than 5,000 square feet of impervious surface is exempt from detention requirements.

C. Pervious pavement, and pavement and roofs that drain to an infiltration facility will not be counted when sizing a detention facility to handle the stormwater design.

Applicant Response: The storm system will be designed using industry standards and reviewed by the City.

Staff finding: The City Engineer will review the engineering construction plans to ensure compliance. See conditions of approval.

CHAPTER 16.152 GRADING, EXCAVATING, AND EROSION CONTROL PLANS

C. Grading Designation. Grading in excess of 5,000 cubic yards shall be permitted in accordance with the approved grading plan prepared by a civil engineer, and shall be designated as "engineered grading." Grading involving less than 5,000 cubic yards shall be designated as "regular grading" unless the permittee chooses to have the grading performed as engineered grading, or the building official determines that special conditions or unusual hazards exist, in which case grading shall conform to the requirements of engineered grading.

Applicant Response: The proposed site grading is less than 5,000 cubic yards. The grading plan was designed by a Professional Engineer. The slopes along the eastern side of the project, Tract "A" will be stabilized to prevent sand migration onto the public roadway. Stabilization measures will include placement of topsoil mulch and seeding. Placement of jute mat type of material on the slope may also be locally needed.

Staff finding: See comments from City Engineer. See conditions of approval.

16.152.100 Cuts.

A. General. Unless otherwise recommended in the approved soils engineering or engineering geology report, cuts shall conform to the provisions of this section. In the absence of an approved soils engineering report, these provisions may be waived for minor cuts not intended to support structures.

B. Slope. The slope of cut surfaces shall be no steeper than is safe for the intended use and shall be no steeper than one unit vertical in two units horizontal (50% slope) unless the permittee furnishes a soils engineering or engineering geology report, or both, stating that the site has been investigated and given an opinion that a cut at a steeper slope will be stable and not create a hazard to public or private property.

Applicant Response: There will be no slopes greater than 2:1.

Staff finding: Staff notes that the slope on the eastern portion of the subject property is at least 2:1, hence the city engineers comment regarding a geotechnical report detailing the stabilization measures to be uses.

16.152.110 Fills.

B. Preparation of Ground. Fill slopes shall not be constructed on natural slopes steeper than one unit vertical in two units horizontal (50% slope). The ground surface shall be prepared to receive fill by removing vegetation, noncomplying fill, topsoil, and other unsuitable materials scarifying to provide a bond with the new fill and, where slopes are steeper than one unit vertical in five units horizontal (20% slope) and the height is greater than five feet, by benching into sound bedrock or other competent material as determined by the soils engineer. The bench under the toe of a fill on a slope steeper than one unit vertical in five units horizontal (20% slope) shall be at least 10 feet wide. The area beyond the toe of the fill shall be sloped for sheet overflow or a paved drain shall be provided. When fill is to be placed over a cut, the bench under the toe of the fill shall be at least 10 feet wide but the cut shall be made before placing the fill and acceptance by the soils engineer or engineering geologist or both as a suitable foundation for fill.

Applicant Response: There will be no fills greater than 2:1.

Staff finding: Noted.

C. Fill Material. Detrimental amounts of organic material shall not be permitted in fills. Except as permitted by the building official, no rock or similar irreducible material with a maximum dimension of greater than 12 inches shall be buried or placed in fills. The building official may permit the placement of larger rock when the soils engineer properly devises a method of placement and continuously inspects its placement and approves the fill stability. The following conditions shall also apply: (1) prior to issuance of a grading permit, potential rock disposal areas shall be delineated on the grading plan; (2) rock sizes greater than 12 inches in maximum dimension shall be 10 feet or more below grade, measured vertically; and (3) rocks shall be placed so as to assure filling of all voids with well-graded soil.

Applicant Response: There will be no organics allowed in the fill material. All fill material is proposed to be crushed aggregate or sand.

Staff finding: Staff acknowledges this response as sufficient to satisfy the criterion.

16.152.140 Erosion Control.

A. Slopes. The faces of cut and fill slopes shall be prepared and maintained to control against erosion. This control may consist of effective planting. The protection of the slopes shall be installed as soon as practicable and prior to calling for final approval. Where cut slopes are not subject to erosion due to the erosion-resistant character of the material, such protection may be omitted.

Applicant Response: All slopes will be prepared and maintained in accordance with this section.

B. Other Devices. Where necessary, check dams, cribbing, riprap, or other devices or methods shall be employed to control erosion and provide safety.

Applicant Response: No other devices are necessary for this project.

Staff Finding: See City Engineer comments. See conditions of approval.

16.152.150 Completion of Work.

Upon completion of the rough grading work and at the completion of the work, the following reports and drawings and supplements thereto are required for engineered grading or when professional inspection is performed for regular grading, as applicable:

A. An as-built grading plan prepared by the civil engineer retained to provide such services in accordance with Section 16.152.070 showing original ground surface elevations, as-graded ground surface elevations, lot drainage patterns, and the locations and elevations of surface drainage facilities and of the outlets of subsurface drains. As-constructed locations, elevations, and details of subsurface drains shall be shown as reported by the soils engineer.

Civil engineers shall state that to the best of their knowledge the work within the specified area of responsibility was done in accordance with the final approved grading plan.

B. A report prepared by a soils engineer retained to provide such services in accordance with Section 16.152.070, including locations and elevations of field density tests, summaries of field and laboratory tests, other substantiating data, and comments on any changes made during grading and their effect on recommendations made in the approved soils engineering investigation report. Soils engineers shall submit a statement that, to the best of their knowledge, the work within their area of responsibilities is in

accordance with the approved soils engineering report and applicable provisions of this chapter.

Applicant Response: The proposed site does not require engineered grading so an as built grading plan and professional inspection are not required.

Wetland Hardship Variance Criteria WMC 16.156.080

16.156.080(A): *For any lands demonstrated to have been rendered not buildable by application of this chapter, the property owner may apply for a hardship variance for relief from the restrictions of this chapter.*

16.156.080(B)(1): *The proposed development represents a reasonable and legal use of the lot or parcel, considering the zoning;*

Applicant Response: The subject property is zoned growth Manager and permitted uses defaults of the R-10 Intermediate District standards which allow single family dwellings outright. The proposal is to subdivide and develop the property for lots for single-family dwellings. This criterion is met.

Staff finding: Staff concurs. The hardship variance for the subject property is for a very small portion of the overall property. The variance is necessary to make the portion developable and is an allowed use for the zone. Standard is met.

16.156.080(B)(2): *Strict adherence to this chapter and other applicable standards would effectively preclude a use of the parcel that could be reasonably expected to occur in similarly zoned parcels;*

Applicant response. The proposal includes plans to fill approximately 11.5 percent of an acre of wetlands. By doing so, the lots and tract to filled will result in the continuity of a more regular shaped buildable area for each of the affected lots and certainty that the impacted wetland areas would be mitigated for. Criterion is met.

Staff finding: Staff agrees with the applicant's assessment of the Code. This project already has Oregon DSL Wetland Removal-Fill Authorization. The approval of this hardship variance is required at the local level to allow development to continue and in this case for residential use

which is a reasonably expected use in similarly zoned parcels based on the scope of the impact relative to the size of the property and the existing uses located in the neighborhood.

16.156.080(B)(3): *The property owner would be precluded a substantial property right enjoyed by the majority of landowners in the vicinity.*

Applicant response: The two subdivisions to the south of the subject property were permitted to fill small amounts of wetlands as part of entitlement approvals as was the Fort Pointe application along Ridge Road.

Staff finding: Staff concurs. The neighborhood to the south has been already developed with other residential units. The proposed land use would be consistent with previous allowed development. Although greenspace offers intrinsic value in its natural state, the City has no way to calculate the environmental value or provide compensation for the value to the public. In addition, the NCLC Clear Lake property offers open space to effectively mitigate the new development that has occurred and as part of this proposal. The property right in this case would be to develop limited amount of residential uses based on local zoning. The wetland designation precludes the residential use. The majority of landowners are homeowners who have benefited from the same property right.

16.156.080(B)(4): *The variance is the minimum necessary to retain use of the property.*

Applicant response: As described above, the proposed wetland fill encompasses approximately 11.5 percent ac acre via 15 separate fills ranging in size from approximately 35 to 1105 SF. Criterion is met

Staff finding: Staff concurs. The application includes a delineation report from a wetland consultant. The variance is necessary for development to continue on a small portion of the property. The applicant submitted a site plan illustrating the proposed development relative to the total size of the property and the open space that will remain. Therefore, the standard is met.

3.10.400(B)(5): *Granting of the variance will not be materially detrimental to the public welfare or be injurious to property or improvements in the neighborhood of the premises.*

Applicant response: The proposed fills are entirely within the interior of the subject property and separated from adjacent properties and improvements in the neighborhood; granting the variance for the fills will not be injurious to neighboring man-made or natural features and as stated above the impact of the fill will be mitigated.

Staff finding: Staff generally agrees with the applicant's response. Assuming the application complies with all public works improvements and building permits, the proposed development would not be detrimental to public improvements or adjacent private property. The City Engineer will require an engineered stormwater water plan to address the existing drainage capacity issues.

16.156.080(B)(6): *The variance will be in general harmony with the intent and purpose of this chapter, and will not adversely affect any officially adopted Comprehensive Plan policy.*

Applicant response: The fact that the wetland code includes a route to a variance to the regulations provides the opportunity of harmony under appropriate circumstances. In this case, the impacted wetland area is quite small and necessary to facilitate the development. Such variances have been granted to other properties in the vicinity. This criterion is satisfied.

Staff finding: Staff generally agrees that the proposal is consistent with the Comprehensive Plan. It is proverbial balancing act of competing policies. In this case, housing (Goal 10) is an elevated value above the impacted wetlands (Goal 5). Granting variances are a case by case review so previous approvals have no bearing on this request. However, the standard is still met.

Variances - Criteria WMC 16.272.020

Variances to a quantitative requirement of this Code may be granted only if, on the basis of the written application, investigation, and evidence submitted by the applicant, findings of fact are made by the zoning administrator (for Class 1 applications) or Planning Commission (for Class 2 applications) that satisfy the criteria of subsections A through F of this section. Prior variances allowed in the neighborhood shall not be considered by the granting authority in reaching its decision. A determination of whether the standards set forth in this section are satisfied necessarily involves the balancing of competing and conflicting interests. Each request shall be considered on its own merits.

A. *The hardship was not created by the person requesting the variance;*

Applicant Response: The subject property is abutted on the west, north, and partially the east by wetlands deemed significant by the city's wetland inventory. Where the wetlands terminate on the east, the topography is such that building a road is not practicable. this is

further complicated by the NCLC ownership of the parcel to the east and it goal preserving the Clear Lake tract from development. The applicant did not create the hardship.

Staff Finding: Staff concurs.

B. The request is necessary to make reasonable use of the property. There will be an unreasonable economic impact upon the person requesting the variance if the request is denied;

Applicant Response: Denial of the variance would prohibit access to the subject property which is absolutely essential to its development as urban facilities become available. There is no other option for either providing access or connecting the proposed road to the City's street network.

Staff Finding: Staff generally agrees with the alternatives analysis. However, there is a potential opportunity to mitigate the loss of a street connection by adding a second pedestrian access to the south. See conditions of approval.

C. The request will not substantially be injurious to the neighborhood in which the property is located. The variance will not result in physical impacts, such as visual, noise, traffic or increased potential for drainage, erosion and landslide hazards, beyond those impacts that would typically occur with development in the subject zone;

Applicant Response: Extending the road as proposed would not result in visual or noise impacts because the proposed development is exactly the same to the existing development in the immediate facility.

Staff Finding: Staff agrees that the impacts of extending the street to a cul-de-sac will not negatively impact traffic. The other potential impacts can be mitigated through the engineering review phase. A geotechnical report was submitted and will be reviewed by the City Engineer. The remaining wetlands and their ecological function can be improved through restoration and removal of non-native species.

D. The request is not in conflict with the Comprehensive Plan;

Applicant Response: The comprehensive plan is silent on cul-de-sac lengths.

Staff Finding: Although the new TSP addresses cul-de-sacs, the existing TSP does not. Standard is met.

E. The request is not in conflict with the Development Code. No variance may be granted which will result in a use not permitted in the applicable zone or which will increase the allowable residential density in any zone with the exception of individual lot size reduction; and

Applicant Response: The development of the subdivision is for lots for single family residences which requires access via the propose street and which are permitted outright in the GM- R-10 zoning district. There is no intent or request for other uses which are not explicitly permitted.

Staff Finding: Staff agrees subject to conditions of approval for cul-de-sac design and alternative local road design.

F. Physical circumstance(s) related to the property involved preclude conformance with the standard to be varied.

Applicant Response: The environmental constraints presented by surrounding wetland and steep dune hills make the cul-de-sac the only option for accessing the subject property and future lots. There is no other option.

Staff Finding: Staff agrees subject to the conditions of approval for a secondary pedestrian access.

Chapter 16.192 - Large Scale Developments

The proposed development triggers the above standard due to its extension of sewer and water mains. The criteria includes the review of a stormwater report, school impact report, soils report, and utility plan, all of which was submitted. The City Engineer has reviewed the development and has provided comments.

Staff Finding: Standard is met.

In addition, the Warrenton School District responded to the school impact criteria. The projected number of households and students expected can be serviced by the school district.

Staff Finding: Standard is met.

WMC 16.216.020 Land Division & Lot Line Adjustment - General Requirements.

A. Subdivision and Partition Approval Through Two-step Process. Applications for subdivision or partition approval shall be processed through a two-step process: the preliminary plat and the final plat.

1. The preliminary plat shall be approved before the final plat can be submitted for approval consideration; and

2. The final plat shall include all conditions of approval of the preliminary plat.

B. Compliance with ORS Chapter 92. All subdivision and partition proposals shall be in conformance to state regulations set forth in Oregon Revised Statutes (ORS) Chapter 92, Subdivisions and Partitions.

Applicant Response: The applicant understands this process.

Staff Finding: Concur

C. Lot Size Averaging. Single-family residential lot size may be averaged to allow lots less than the minimum lot size in the residential district, as long as the average area for all lots is not less than allowed by the district. No lot created under this provision shall be less than 80% of the minimum lot size allowed in the underlying district. For example, if the minimum lot size is 5,000 square feet, the following three lots could be created: 4,000 square feet, 5,000 square feet, and 6,000 square feet.

Applicant Response: Lot size averaging is not being used.

Staff Finding: Agreed

D. Temporary Sales Office. A temporary sales office in conjunction with a subdivision may be approved as set forth in Section 16.240.010, Temporary Use Permits.

Applicant Response: If and when the applicant decides to erect a temporary sales office, he will apply for the applicable permits.

Staff Finding: Concur. A Type 2 permit is required. See conditions of approval.

E. Minimize Flood Damage. All subdivisions and partitions shall be designed based on the need to minimize the risk of flood damage. Development in a flood hazard designation shall comply with the standards of Chapter 16.88, Flood Hazard Overlay (FHO) District, and Federal Emergency Management Agency requirements, including fill to elevate structures above the base flood elevation.

F. Determination of Base Flood Elevation. Shall comply with Chapter 16.88 of the Warrenton Development Code.

Applicant Response: Based on a review of Clatsop Webmaps, the subject property is not within a flood hazard overlay zone.

Staff Finding: Staff reviewed the most recent 2018 FIRM maps that were adopted in 2018 to verify the subject property is outside the 100-year floodplain. A portion of the floodplain extends south of Clear Lake but does not impact the subject property. Standard is met.

G. Need for Adequate Utilities. Shall comply with Chapters 16.136 and 16.216.

H. Need for Adequate Drainage. All subdivision and partition proposals shall comply with Chapter 16.140.

Applicant Response: As discussed above, the proposal includes plans to provide water, sanitary sewer and stormwater management facilities that meet the need of the proposed development.

Staff Finding: Agreed. Impact analysis and preliminary utility plan was reviewed by City Engineer. See comments from the City Engineer.

I. Open space shall provide opportunities for active and/or passive recreation and may include existing stands of trees, resource areas, and storm water facilities as outlined in this section. Active open space shall allow human activities including recreational and social opportunities such as play fields, playgrounds, swimming pools, plazas and other recreational facilities. Open space may also be passive and include human activities limited to walking, running, and cycling, seating areas and wildlife viewing or natural areas such as a wetland.

Applicant Response: At 15 lots, the proposal is below the threshold for requiring the development of open space or recreation facilities. However, the application includes plans to grant an easement to the city for future utility extensions and pedestrian access to its western property line to facilitate the city's development of a trail to public and private recreation facilities along Ridge Road.

Staff Finding: There is no active recreation proposed outside of a pedestrian path. Wetlands do provide open space but no opportunities for active recreation. There is a clear lack of park space in this part of Warrenton. However, secondary access would allow direct connection to a playground recently constructed at the LCYSA Soccer Complex. Standard is met subject to the secondary access requirement.

J. Street Names.

Applicant Response: The applicant intends to continue the street name Kalmia Avenue for the street extension into the subdivision.

Staff Finding: Agreed.

16.216.040 Preliminary Plat Submission Requirements.

A. General Submission Requirements. For partitions (three lots or fewer), the applicant shall submit an application containing all of the information required under Section 16.208.040. For subdivisions (greater than three lots), the application shall contain all of the information required under Section 16.208.050.

B. Preliminary Plat Information. In addition to the general information described in subsection A of this section, the preliminary plat application shall consist of drawings and

supplementary written material (i.e., on forms and/or in a written narrative) adequate to provide the following information:

Applicant Response: All the required information is included in the preliminary plat plan set.

Staff Finding: Staff checked submission during completeness phase. Standard is met.

Conclusion & Recommendations

The application and findings above demonstrate that the proposed 15 lot subdivision satisfies a majority of the applicable criteria in the Development Code. Some of the criteria has not been met but can be through conditions of approval. By conducting the public hearing on the application, the Planning Commission satisfies 16.208.050. The applicable agencies have not objected to the proposal but have requested conditions. Therefore, staff recommends approval of SUB 19-1, VAR 19-1, WHV 19-1, submitted by Gil Gramson of Sandworks Construction, subject to the following conditions.

1. The Commission must determine if the density standard has been met, and if not, how it can be met. The proposal is 5 lots or units shy of the minimum required. Staff recommends requiring accessory dwelling units be built over the garages of five units to meet the minimum thereby meeting the standard without creating new lots. The developer can identify and select which lots can meet this standard.
2. A pedestrian path shall be built to WMC 16.120.030 Pedestrian Access and Circulation design and construction standards between Lots 1 & 2. A secondary pedestrian access shall be considered for Lots 14 & 15. Design shall be submitted as part of engineering review. Construction shall be inspected and approved prior to a certificate of occupancy for the first single family detached unit.
3. Address all comments from Fire Chief Tim Demers herein referenced by letter dated March 5, 2019.
4. A landscape plan designed to WMC 16.124.070 shall be submitted as part of the engineering review phase. No grading permits will be issued until a landscape plan is reviewed and approved by the Community Development Director. Landscape plan shall indicate conservation areas, protection areas and best practices to preserve significant trees, restoration of existing wetlands to remove invasive species, and new native plantings in Tract A & B consistent with Department of State Lands best practices and WMC 16.156.040 Significant Wetland Area Development Standards. Conservation areas

shall be clearly marked with orange fencing and other protective measures for the duration of construction activities.

5. Two street trees shall be installed per each issued single family permit on individual lots in the front yard in lieu of a planting strip. A certificate of occupancy shall not be issued until the trees are properly installed. A two year maintenance agreement with a local landscaping company shall be required prior to final plat or recorded with each lot.
6. All retaining walls shall be reviewed and approved by the City Engineer and Building Official. Developer shall work with NCLC on a design for a wildlife fence to the adjacent Clear Lake property. Said fence shall be installed prior to final plat acceptance.
7. An alternative road standard of 50 ft right-of-way, 32 feet curb to curb, 5 foot sidewalks both sides; is approved subject to the alternative street tree plan cited above.
8. Address all comments in City Engineer's letter herein referenced and dated April 4, 2019.
9. Developer shall submit a DEQ 1200C permit for stormwater management and erosion control.
10. Prior to a final plat, all public improvements shall be installed to the specifications of the City Engineer and Public Works Department. For any improvements not completed prior to final plat, a performance bond shall be required and approved.
11. A construction and/or sales trailer can be permitted under a Type 2 temporary use permit. The applicant shall submit an application for review prior to any placement.
12. A final plat for review by the Community Development Director shall be submitted for review and approval and recorded with the County.
13. The developer shall establish a homeowner's association and submit and record with the County Codes, Covenants, & Restrictions that will be deeded to each lot. The HOA or another entity will be required to maintain the private stormwater facility.
14. A secondary access at the existing gravel road shall be stubbed for future connection. This can replace Condition No. 2 for the first of two pedestrian paths.

Recommended Motion: Based on the findings and conclusions of the March 7, 2019 staff report and Addendum dated April 4, the application, the applicant's narrative and findings, evidence in the record, and the applicant's testimony, I move to approve application SUB 19-1, VAR 19-1, and WHV 19-1 submitted by Gil Gramson for a 15-lot subdivision, subject to the conditions of approval.

Alternative Motion: Based on the public interest and need for more evidence and testimony from the applicant, I move to continue the hearing until May 9, 2019.

Attachments

- Application

- Narrative
- Preliminary Plat & Supporting Documents
- Comments from Tim Demers, Fire Chief – March 5, 2019
- Comments from Rob Vanderzanden, HHPR (City Engineer) – April 4, 2019
- Comments from Gary Kobes, Port of Astoria – February 15, 2019
- Comments from Jon Wickersham, NCLC – February 15, 2019
- Public Comment from Rod Gramson – April 2, 2019

Job No.: WTN-01-006

Date: April 4, 2019 (rev)

To: Kevin Cronin, Community Development Director, City of Warrenton

Harper Houf Peterson Righellis Inc.
ENGINEERS ◆ PLANNERS
LANDSCAPE ARCHITECTS ◆ SURVEYORS

From: Rob VanderZanden, P.E., Development Review Consultant

Project/Subject: Clear Lake Subdivision – Preliminary Plat Submittal: File SUB 19-1

☐ Fax - Number:_____; Number of pages 2
(If you did not receive the correct number of pages, please call 360-750-1131)
☒ E-mail ☐ Mail ☐ Hand Deliver ☐ Interoffice

This memo constitutes the review of the preliminary plat application and recommendations for development conditions for the plat of Clear Lake Subdivision. This review was for conditioning of a preliminary plat and does not constitute a construction drawing comment review. The following documents were reviewed in conjunction with the municipal code and development standards:

Clear Lake Subdivision Land Use Submittal Drawing (Preliminary Plat) including preliminary civil design drawings. Submittal set includes a total of 9 sheets prepared by Firwood Design Group and dated February 5, 2019.
Preliminary plat narrative including application for variances, length of dead end street – 41 pages, undated.

Comments and Recommended Conditions:

1. Detailed construction drawings for the proposed grading, road, drainage and utility facilities shall be submitted to the City for review by the Public Works Department prior to approval for construction of project improvements.
2. Construction documents shall meet all requirements of federal, state and local standards, codes, ordinances, guidelines and other legal requirements.
3. A final Stormwater Report is required to be submitted with the final construction documents. Stormwater design shall comply with Warrenton development regulations.
4. Ownership and maintenance responsibility for the stormwater facilities and Tract B will not be accepted by City of Warrenton. The plat should clarify the use and intended ownership of the stormwater tract. Applicant should clarify if the stormwater facilities will be owned and maintained by a home owner association. If so, a plat condition should be included requiring HOA formation documents be submitted for review and approval by the city prior to final plat.
5. The developer shall agree to make all necessary offsite stormwater improvements if downstream deficiencies are created by the development of this property.
6. Sidewalks are required on both sides of the street including the frontage on Tract B.
7. Standard vertical curb and gutter shall be constructed to match the existing connecting street. Roll curb shall not be used.
8. Prepare and submit a final design for erosion control associated with site construction. Demonstrate compliance with Oregon Department of Environmental Quality 1200 C Stormwater General Permit requirements. Provisions shall be made to minimize tracking

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Vancouver, WA 98660
PHONE 360.750.1131

of sediment onto public streets and address the migration of site soils into drainage ways.

9. Street lighting shall be installed for all public streets in accordance with the criteria contained in the City of Warrenton development standards.
10. To address the need for future street extensions and to promote circulation, a stub street shall be constructed to the west property boundary. The street shall be at the location of the existing informal access road which connects the property to NW Ridge Road at the vicinity of proposed Lot 2. The street extension should meet Alternative Local Road standards with not less than 50 feet of right of way width and not less than 20 feet of paved travel surface.
11. The project contractor shall secure a permit for work in the public right of way in accordance with Warrenton Municipal Code.
12. Applicant shall provide as-built drawings and certification by a registered engineer in accordance with adopted criteria for all improvements, prior to acceptance by the City.

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CITY OF WARRENTON

NOTICE OF PUBLIC HEARING

A public hearing is scheduled before the City of Warrenton Planning Commission at 6:00 p.m. on Thursday, March 14, 2019 at the Warrenton City Hall Commission Chambers, 225 S Main Avenue, Warrenton, regarding a land use application submitted by Gil Gramson for preliminary plat approval for 15 lots for detached single-family homes on Tax Lot 810170001302. The project area is north of the northern terminus of SW Kalmia Avenue and south of Clear Lake.

This application will be reviewed under the applicable standards and criteria in Warrenton Municipal Code Chapters, 16.216 Land Divisions and Lot Line Adjustments, 16.192 Large Scale Developments, 16.36 R10 Growth Management District, 16.140 Stormwater and Surface Water Management, 16.152 Grading, Excavating and Erosion Control Plans, 16.124 Landscaping & Street Trees, 16.156 Wetland & Riparian Corridor Development Standards, and 16.120 Access and Circulation. The review will follow WMC 16.208.050 Type III Procedure (Quasi-Judicial).

Anyone wishing to participate in the above-noted public hearing may present testimony orally at the public hearing, or submit written testimony, which must be received by the Warrenton Planning and Building Department no later than 5:00 P.M. on the day of the hearing. Written comments may be mailed to Kevin A. Cronin, Community Development Director, Community & Economic Development Department, P.O. Box 250, Warrenton Oregon, 97146-0250. Failure to raise an issue on the record in person or by letter before the close of the record at the public hearing, or failure to provide statements or evidence sufficient to afford the decision making body an opportunity to respond to the issue, will preclude appeal to the Land Use Board of Appeals based on that issue.

Anyone wishing to review and/or purchase copies of the application and/or staff report may do so at the City of Warrenton Planning and Building Department, Warrenton City Hall, 225 South Main, Warrenton. The staff report will be available for review at no cost at least seven days before the hearing. For more information call Kevin A. Cronin at 503.861.0920 – cityplanner@ci.warrenton.or.us.

Notice to mortgagee, lienholder, vendor, or seller: the Warrenton Development Code requires that if you receive this notice it shall be promptly forwarded to the purchaser.

K L C — 3-14-19

Kevin A. Cronin, AICP, Community Development Director — Date

P.O. Box 250 WARRENTON, OR 97146-0250
503/861-2233 FAX: 503/861-2351
www.ci.warrenton.or.us

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The Columbia Press February 22, 2019

Kevin Cronin

From: Skip Urling <skip@urlingplanning.com>
Sent: Tuesday, March 5, 2019 3:05 PM
To: Kevin Cronin
Subject: FW: NCLC Clear Lake

Skip Urling
Urling Planning Associates
360.431.5117

From: Jon Wickersham [mailto:jonw@nclctrust.org]
Sent: Tuesday, February 12, 2019 2:39 PM
To: skip@urlingplanning.com
Subject: NCLC Clear Lake

Hi Skip,

NCLC will not allow public access on to NCLC's Clear Lake property to benefit Gil's development.

Thanks,

Jon

Jon Wickersham
Associate Director
North Coast Land Conservancy
(503) 738-9126
Jonw@nclctrust.org
nclctrust.org

Mr. Rod Gramson
75 SW Juniper
Warrenton, OR 97146

02 April 2019

Warrenton Planning Commission
225 South Main Avenue
Warrenton, OR 97146

Gentlemen:

I am writing in express my objection to the proposed northward extension of SW Kalmia Avenue in Warrenton. I ask that you consider the following issues in your deliberations.

First and most important, the proposed extension violates the current policies which limit the length of a dead end road. Current code requires that any such road with a single point of access may not exceed 200 feet in length from the point of entry. The existing extension already exceeds 200 feet beyond SW 2nd Street. It was granted a waiver of the 200 foot requirement, which makes it dangerous in its own right without approval of this request for waiver currently under consideration.

A long, dead end road is dangerous in any kind of emergency situation. Access, and more importantly, egress, will be severely limited in the event of fire, flood, earthquake, tsumami, medical, or other unexpected emergency event. If the road is damaged and rendered impassable by earthquake or some other unexpected event, there is also the potential for panic and other unreasoned responses by inhabitants and others trying to escape, and the picture becomes increasingly grim.

Please also consider the following additional concerns:

a. If approved, the proposed lots will have a lack of upland to accommodate construction without encroaching on surrounding wetlands.
b. If approved, a wildlife fence would become necessary to protect the wildlife living in the sensitive wetlands area immediately surrounding the proposed sites.
c. If approved, construction will cause water run-off into the surrounding wetlands or Clear Lake which will severely impact the natural area surrounding the project.
d. In order to provide a paved secondary access to this area, a significant destruction of nearby wetlands would be required. The existing rock road is built on logs laid side-by-side and covered with rock topping. Removal of any or all of that trail will have an unrecoverable negative impact on the surrounding wetlands.
e. All of these considerations have one other major potential impact in the threat they pose to the health of Clear Lake which is home to a considerable population of aquatic birds as well as native fish.

In light of these considerations, I ask that you review carefully your decision, and deny approval of the request. To do so will protect and preserve Clear Lake, the surrounding wetlands, and the existing population of natural inhabitants.

Sincerely,

Rod Gramson

Job No.: WTN-01-006

Date: March 6, 2019

To: Kevin Cronin, Community Development Director, City of Warrenton

From: Rob VanderZanden, P.E., Development Review Consultant

Harper Houf Peterson Righellis Inc.
ENGINEERS ◆ PLANNERS
LANDSCAPE ARCHITECTS ◆ SURVEYORS

Project/Subject: Clear Lake Subdivision – Preliminary Plat Submittal: File SUBXX-X

☐ Fax - Number:_____; Number of pages 2
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☒ E-mail ☐ Mail ☐ Hand Deliver ☐ Interoffice

This memo constitutes the review of the preliminary plat application and recommendations for development conditions for the plat of Clear Lake Subdivision. The following documents were reviewed in conjunction with the municipal code and development standards:

- Preliminary Plat including preliminary civil design drawings consisting a Preliminary Grading and Erosion Control, and Preliminary Utility plan sheets, prepared by Firwood Design Group and dated January 2019.
- Preliminary plat narrative including application for variances, length of dead end street.

Comments and Recommended Conditions:

1. Detailed construction drawings for the proposed grading, road, drainage and utility facilities shall be submitted to the City for review by the Public Works Department prior to approval for construction of project improvements.
2. Construction documents shall meet all requirements of federal, state and local standards, codes, ordinances, guidelines and other legal requirements.
3. A final Stormwater Report is required to be submitted with the final construction documents. Stormwater design shall comply with Warrenton development regulations.
4. The purpose and ownership of the stormwater tract (Tract B) should be shown on the face of the plat. If the stormwater facilities are to be maintained by the city, the plat should provide for ownership and access for the city. If the stormwater facilities will be owned and maintained by a home owner association, formation documents for the HOA should be a requirement of the final plat. The option of city ownership of the proposed stormwater facility should be addressed prior to final engineering.
5. The developer shall agree to make all necessary offsite stormwater improvements if downstream deficiencies are created by the development of this property.
6. Sidewalks are required on both sides of the street including the frontage on Tract B.
7. Standard vertical curb and gutter shall be constructed to match the existing connecting street. Roll curb shall not be used.
8. Prepare and submit a final design for erosion control associated with site construction. Demonstrate compliance with Oregon Department of Environmental Quality 1200 C Stormwater General Permit requirements. Provisions shall be made to minimize tracking of sediment onto public streets and for the flow of site soils into drainage ways.
9. Street lighting shall be installed for all public streets in accordance with the criteria contained in the City of Warrenton design standards.

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10. The variance to the criteria for maximum length of dead end street should be approved subject to the requirement that a stub street shall be constructed to the west at the location of the existing informal access road which connects the property to NW Ridge Road at the vicinity of proposed Lot 2.
11. The project contractor shall secure a permit for work in the public right of way in accordance with Warrenton Municipal Code.
12. Applicant shall provide as-built drawings and certification by a registered engineer in accordance with adopted criteria for all improvements, prior to acceptance by the City.

Also Note: The plan (sheet 3 of 4) shows the typical section for Kalmia Avenue being in a "Tract" which implies private ownership. I believe all of the documents state that this will be a public street. This label should be removed or clarified.

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CITY OF WARRENTON

Minutes
Warrenton Planning Commission
April 11, 2019
Gil Gramson 15 Lot Subdivision (Clear Lake Subdivision)
SUB-19-1/VAR-19-1/WHV-19-1

Commissioners Present: Chair Paul Mitchell, Vice-chair Chris Hayward; Commissioners Mike Moha, Ryan Lampi, Christine Bridgens. Excused Absence; Ken Yuill & Tommy Smith

Staff Present: Community Planning Development Director Kevin Cronin; Building Clerk Janice Weese.

Flag Salute

Approval of Minutes:

Public Comments on Non-Agenda Items: No-one spoke

Public Hearing Open

Disclosure by the Commissioners: Commissioners answered no all questions or conflicts.

Staff Report: This is a continuance from the March Planning Commission Meeting to give time for the applicant and staff to go over a few things.
For condition number one; the applicant will provide a revised density report to support 16 units and add an ADU to one of those lots to achieve that. If in the future they want to add any ADU's they will be able to do that.
For condition number two; will strike the second pedestrian path for lots 14 & 15. After speaking with the North Coast Land Conservatory, they do not want access to the property.
For condition number four, delete line five; restoration of existing wetlands to remove invasive species, and new native plantings and leave the rest of the condition.
For condition number five, agree to have a template of a purchase and sell agreement that will verify a maintenance agreement of street trees.
For condition number fourteen, the applicant has an idea of a compromise between the secondary street access and what the city wants.

Representative for the Applicant
Skip Urling
2366 West Hills Dr.
Longview, WA 98632

Very close on all the conditions. Would like to have condition number one state that the ADU does not have to be above the garage. Would like to have that ADU somewhere on the property whether

it is attached to the primary dwelling or detached from the primary dwelling as long as it meets the development standards. Has 15 lots with 1 additional dwelling unit as an ADU to make 16. Would like to do a preliminary grading in areas that are clearly uplands to get a jump start this summer and not wait for DSL.
DSL HAS a 120-day statutory requirement for taking action and our experience is that they take every one of 119 days from the date of submittal. We will clearly mark them and have the equipment operators stay in bounds. They would like to do the preliminary stuff while DSL is reviewing and considering this application for the removal fill permit.
Two street trees will be installed by the contractor on each of the lots. There is a concern that they will only survive for 2 years. Offering to put in a template in the sales contract that they have provided to the city as a model to make sure that homeowners are aware that they have to take care of the trees and maintain them or they will have to replace them so public works does not have to be responsible for maintaining the trees.
The city's consulting engineer, as they were reviewing the application, got a preliminary set of plans that did not include a fire truck emergency vehicle turn around between lots 1 & 2. The secondary access is an existing gravel road that extends from the top of the embankment on Mr. Gramsons property and snakes through and over on Ridge Road. There is a wire cable with some flagging on it that keeps people out. It varies in width from 10 to 12 ft. It crosses 2 sets of property owners and 3 sets of properties. Building a road to the city's standards would be in the ball park of a half a million dollars. That would be the responsibility of those property owners. Also, might require a sewer pump lift station which might cost a quarter of a million for that. Bringing water to the site, if developed for residential use, you are looking at $900,000 for that to develop a handful of properties; that does not pencil out financially. The likely hood of developing that area is pretty small if you have to go through all that.
Their proposal is to provide a secondary access to this project and they would include on the plat statement, a non-remonstrance statement and also include documents that have to be recorded so that the future property owners of the Clear Lake Subdivision would be responsible get together and find the financing through the city's LID process and fill that portion of the road at a 20ft width, which would satisfy the fire code; from where Kalmia would cross and run north to the end and to the western property line of Mr. Gramson's property.
Building that portion of the road, when something is authorized to be built coming from the west side, so that Mr. Gramson doesn't have to build a road to nowhere with the likely hood that there will never be a development west of his property because of the environmental constraints. That way the city is assured that road has continuity but not now, only when it becomes right.

No Questions for Applicant

Open Testimony of Public Hearing

Erik Hoovestol, Civil Engineer on Project
Firwood Design Group
Troutdale, OR 97060

Will speak after public testimony. Will provide additional comments at that time.

Testimony in Opposition

Rod Gramson
75 SW Juniper Avenue
Warrenton, OR 97146

Mr. Cronin stated that a letter came from Mr. Gramson that was put in their planning
Disappointed in the city to get this far along prior to securing multiple approvals. A lot of work has been done out there, but haven't seen any approvals.
Understands that the secondary access costs are going to be deferred and dumped onto the future landowners and thinks that is ridiculous. Doesn't think that the planning commission should approve.
Is bothered by runoffs on the west side that flows into the Columbia River. Any runoffs from yards and use of fertilizers are going to go right into a wetland that drains directly into the Columbia River. It is a valuable wetland for the ecology.
Very concerned about the density.
There will be too many vehicles and will have traffic flow through the existing subdivision. This project should be downsized to a more reasonable size.
Doesn't see any area for children. No green spaces except for wetlands and swamps.
This project has gone too far too fast. Doesn't think anything should be done until all permits are in place. If it takes 120 days then it takes 120 days.
Doesn't see a need for this project in that area and it jeopardizes Clear Lake which is probably the last pristine coast lake left around that hasn't been affected by human use.
Thinks it is time to slow down and decide if this is what Warrenton needs. There are a lot of housing projects coming up in this area and this is not a low-income housing project.

Representative for Opposition
Will Caplinger
1566 Irving #10
Astoria, OR 97103

Rod Gramson asked him a few days ago to review the variance criteria and the conditions of approval. Went out and looked at the property this morning and expected to see an undisturbed site and was surprised to see all the acres that was being developed already. A road appeared to be cut into the property in the back. Fill is not the only question when it comes to consideration and preservation of protection of wetlands. In the city ordinance that concerns significate wetlands, 6 acres were mapped as significant wetlands on the city map as well as all the parcel to the west of where the proposed stub road is intended to go through. This ordinance requires that any alteration by grading excavating on placement of fill placing structures or newly vegetation requires a variance. He doubts that the city would be doing its due diligence if it authorized a grading permit without a specific variance for that absence of getting a determination from the Department of State Lands.
The road lengths on the previous 2 subdivisions are in clearly in violation on how variances are granted. The maximum distance for a dead-in road is 200ft and its not supposed to serve more than 18 units. There is fully a quarter of a mile of 1500ft or more of dead in street out there now. Serves at least 20 house lots. If this subdivision is built out that would max 700 more feet to a dead-end street as well as another 15 or so residences.
Safety is a big issue of public welfare. Fire is not a general danger here but should be protected.
The project should have a redesign.
The idea of the stub road would satisfy the city's due diligence to make sure you have a safe access on the plan.

Applicant Rebuttal

Erik Hoovestol, Civil Engineer on Project
Firwood Design Group
Troutdale, OR 97060

Only purposing to fill .25 percent of an acre to make the best use of that land over the entire site.
In contrast to other developments in the City of Warrenton where stormwater runoff treatment is not required for the treatment or retention; they are providing stormwater treatment before the water will enter the surrounding wetlands. That is also a requirement of the wetland mitigation plan that will be reviewed by DEQ on our stormwater treatment system. This development will be one of the very few in the City of Warrenton that has stormwater treatment. Feels they are doing everything right.
Has Cascading Environmental on board in working with the Department of State Lands.
They also came back out and mapped some additional wetlands, not wetlands that they filled in, but discovered some more. These wetlands are still a part of the .25 percent.
The Fire Chief has reviewed the plans. They have provided an additional turn-around besides the full radius cul-de-sac at the end for the fire department. From a safety standpoint and speaking with the Fire Chief, feels that is a safe arrangement. Also, a 28-foot-wide road was put in the adjoining subdivision to the south. They will widen the new road out to 32 feet. That is a partial mitigation for major access for having a long road.
Remarked and agreed on Mr. Urlings concerns of wanting to take advantage of the construction season to get grading done and clearly mark all the wetlands with orange fencing since the wetland mitigation is up to 4 to 6 months out after they submit.
A 1200c permit will be required and reviewed by the DEQ office and then once they get the wetland mitigation plan approved, they would complete any other measures which would include removing invasive species, silt control and road control measures. That would be the condition of the final plat at the end of the project.

Questions for Applicant

Mr. Lampi asked if the bio-swale would require any maintenance or upkeep. The reply was that in previous meetings with the city staff and public works, staff said they did not want to maintain it. Should be the responsibility of the Home Owners Association. The maintenance would include mowing and picking up garbage. This is a bio-filtration swale.
Mr. Hayward asked what would trigger the development for an access road.
The response was that a secondary access road is extremely problematic. It would be an engineering and master planning project all in itself. There is a little upland there, but they don't think it would ever be developed by private developers. The cost of the road and to put in a sewer pump station for maybe 4 to 8 lots would be expensive. If the city was to do that it might be in the ball park of $400-600 thousand dollars.
The stub road if built to city standards; is not identified as a future potential access in the city's current Transportation Plan. If the road was ever built through there as a primary street road access not just a fire access, the it would have to be looked at it from a Transportation System Plan. You would also have to get permission from the people who own the property that the road would be going through.
They addressed the secondary access in their variance request. The City Engineer was looking at the preapplication drawings that did not show the turn-a-round that they included in that area and the easement and water line easement that they added going along that route. The City Engineer has now viewed the turn-around.

Me. Cronin spoke up and stated that they are not asking the applicant to build the entire access road. There is a compromise.

Closed Public Testimony

Discussion Among Commissioners

Mr. Lampi spoke up and said that there is a lot going for this project.
Mr. Cronin clarified some confusion about the gravel road. Said that there is an existing one out there. The only responsibility for the applicant is to stub it so when this does develop down the road. Only talking less than 200ft. The applicant is extending the fire turn around for that future access road; it gives the fire truck the opportunity to go in and out. This development does not require a full road to be placed. It will however if it gets developed after this development. There are two property owners that own the majority of the land there. They can either go in together or separately to pay for the road. The non-remonstrance and LID are a compromise for this application.
There was discussion on the distance of the length of the dead-end road in the new development and how people will be parking and getting in and out of the area

Motion by the Commissioners

Mr. Lampi said that there is a lot of information that needs to be revisited. Wants to table this and clean up some of the conditions.
Mr. Cronin suggested that he could bring back a draft notice of decision for them to review at the next meeting in May.
Ms. Bridgens agreed with Mr. Lampi. The safety issue and second access are very concerning.

Reopened the Public Meeting

Mr. Hayward made a motion to continue the meeting to April 25, 2019 at 6:00pm for additional written or verbal testimony. Ms. Bridgens seconded. All in favor

Staff Announcements

Mr. Cronin announced that Mr. Smith was not at the Planning Commission meeting tonight because he was getting Cedar award for outstanding service to the community.
Also, the City of Warrenton received one for the 2019 Business and Community Building Award.
Joint work session on the 23rd of April and the Housing Needs Assessment is before the commission meeting at 5:15pm.
A reminder for the May 7-9 Spur 104 Charette Presentation

Meeting Adjourned

Janice Weese, Building Clerk

Approved

Chris Hayward, Planning Commission Vice-Chair

"Making a difference through excellence of service"

CITY OF WARRENTON

Minutes
Warrenton Planning Commission
April 25, 2019
Continuation of Gil Gramson 15 Lot Subdivision
SUB-19-1 / VAR-19-1 / WHV-19-1

Commissioners Present: Chair Paul Mitchell, Commissioners; Ryan Lampi, Mike Moha, Christine Bridgens. Excused absences; Chris Hayward, Ken Yuill, Tommy Small

Staff Present: Community Planning Director Kevin Cronin; Building Clerk Janice Weese

Flag Salute

Continuance from the April 11, 2019 Clear Water Subdivision to allow additional testimony

Mr. Cronin stated that the applicant agreed on most of the points except the secondary access and the wildlife fence. The rest has fallen into place.

Representative for the Applicant
Skip Urling – Urling Planning Associates
2366 West Hills Dr.
Longview, WA 98632

Just a few things to change on the conditions of approval. One is condition number six regarding the fence along the eastern property line. Thinks that there is enough barrier between the street and the property east of the North Coast Land Conservancy property. By the private property three houses will be built. By the filtration swale that is north of those three lots of the project, people will not be able to trespass through private property to get on to the North Coast Land Conservancy property. There is not a code or a design practice for it. The Land Conservancy does a lot of good things but does not give them any right as the property owner that any other property owner doesn't have. If you want to put a fence up on your property to keep people out it is your responsibility to do that, it can't be forced on a neighboring development to put one up. It's tuff terrain to put one up. It's on top of a hill and would have to go through wetlands.
The other item is condition number fourteen that a secondary access road at the existing gravel road shall be stubbed for future connection to Ridge Road and a 20foot wide section of pavement shall be installed for emergency vehicle turn arounds. Included in the application there was a proposal to build a turnaround between lots one and two and to grant a 20foot easement to the city for a future pedestrian path and utilities if necessary. There is around 250ft from where the proposed road would go to the back of Mr. Gramsons property line. Does not make sense to build a turnaround that is 250ft long because you are not going to have emergency vehicles driving all the way to the end of the road and then backing up 250ft to be able to turn the vehicles around.

Mr. Mitchell expressed concerns about the 250ft length of the street and how people would get out in an emergency.
Mr. Urling stated that they are not going to use rolled curbs they will be straight to eliminate people parking on the sidewalk. The road would be 32ft wide and not 28ft wide as the development to the south is. There is no parking on the east side of that development. In the fire chief's comment, he is ok with 32ft without restricted parking because that gives enough room to park on both sides as well as 2, twelve foot, lanes down the street.
Ms. Bridgens brought up the traffic study that was recently done regarding avoiding traffic issues, congestion and access for emergency vehicles. Thinks that the second access is important for those reasons.
Mr. Urling stated that he does not disagree with that. Is suggesting that it is not time to build the portion on Mr. Gramsons property now because it would be a road to nowhere due to the undeveloped property to the west. Doesn't think it's appropriate to build a road to the edge of the property line and then let it sit for years. It will happen when the approval is given to the property owners to the west to build their road eastward so the road will be built in both direction at the same time.
Ms. Bridgens expressed that no one knows when that time would be so the project with the 15 homes would be built without that emergency access.
Mr. Urling replied that it doesn't provide any access because it is a dead-end road that is only 250ft long.
Ms. Bridgens said she was talking about the rock road that is there now that is owned by Frank James and Fort Pointe.
Mr. Urling expressed that Mr. Gramson should not have to build a road on someone else's property nor does he think that the city can make Mr. Gramson build improvements on someone else's property.
There is an easement following that rock road that is between Mr. Gramsons and those property owners; no one else has the right to use that legally.

Representative for the Applicant
Erik Hoovestol, Civil Engineer for project
Firwood Design Group
Troutdale, OR 97060

The access road and the terrain out there is not flat. Connecting to the stub road would not be an easy thing to do. Very engineering challenged. Not an easy connection for anyone to do. From the back of the property you would have to drop down, have a lot of fill and fill a lot of wetlands to do it. It would also have to go across two properties. Willing to make conceptions that if the chance the rest is developed, then the subdivision would be responsible to put it in at that time. Doesn't want to spend a lot of money to build something out to the edge of the property now with the likelihood it may never have anything to connect to.
Mr. Hoovestol addressed the safety concerns that was brought up. Stated that they are providing pedestrian and waterline easements through there. In case no one can get down the road, people would have to trespass through private property, but they could use that access road to hike out over to Ridge Road in an emergency if needed. They would not have to swim through wetlands. The subdivision was presented with a dead-end road with a cul-de-sac at the end and was approved by the fire chief. After the chief approved this, they provided a courtesy turn around halfway up from the start of Kalmia to the end. Thinks they more than adequately addressed the safety issues.

Terry Fergerson
354 Pacific Dr.
Hammond, OR 91746

Have done most of the work in the whole subdivision including Juniper. Is pretty crowded out there right now due to all the work being done. Once it is built there will be plenty of room to get through. People were looking at the new houses being built there and had no trouble getting in and out. The road there is wider than any part of that subdivision. The road goes back into a 90foot cul-de-sac which is plenty big enough to turn around. On Juniper there is no cul-de-sac at the end of the road to turn around; you have to back up.

Testimony in Opposition
Rod Gramson
755 W Juniper Avenue
Warrenton, OR 97146

Subdivision should never have been allowed to get this far along. There is no back access and the place is too crowded. There is no extra parking with all the extra traffic with all the new houses and apartments. No children's play area. The planning commission is not here just to give approvals; they are here to enforce the codes and the rules. The applicant didn't consider the fill that was needed or the wetland. According the to city, that area has important wetlands. Thinks that a game fence is necessary to keep people's dogs from running back where the wetland and wildlife areas are.

Will Caplingler
1566 Irving Ave. #10
Astoria, OR 97103

A couple of new things. At the last meeting Ms. Bridgens asked what his definition was on local significant wetlands. That is the city's adoption. The city has applied that to most of the property in that area. What is important about that is it is not just a jurisdictional wetland. You cannot just go out there and fill with a wetland fill authorization from the Department of State Lands; it does require a wetland hardship variance also. The applicant does have a wetland fill authorization but that does not mean they can move forward without variance approval. You cannot grade vegetation next to a local wetland without variance approval. Mentioned from the Development Code it says for any lands demonstrated to have been rendered not buildable, the property owner may apply for a hardship variance for relief. Not just hardship; but rendered not buildable. Without granting a variance, the property would be unbuildable.
The fire chief's approval of the subdivision, the cul-de-sac and road is not the same as land use approval. The city's code says a dead-end street cannot serve more than 200 foot of road.
There is already more than a quarter of a mile of a dead-end street.
There should also be a discussion with the Department Fish and Wildlife regarding the fence.

Applicant Rebuttal
Mr. Urling
Talked about most of these issues. Each lot will have a least two parking places and will have a two car garage and parking in driveways. The subdivision is below the requirement of a park which is twenty dwellings and they are at fifteen. The area is not too crowded when the lots are approximately ten thousand square feet; that is approximately ¼ of an acre. The development is

not too expensive to do. The occurring expensive of the alterative access road going to nowhere is the expensive until a time where there is a real need for it.
There is a market for housing in Warrenton and the west coast. This project will be filling a small need for people looking for nice homes.
Does not have a fill permit at this time. The application is with the Department of State Lands.
Not asking for a grading permit to fill the significant wetlands, asking for a preliminary to do the rough grading in the uplands where there won't be environmental traumas. The rest of the grading will wait for DSL to act on the application.
A hardship variance permit for the wetlands that will be filled has been submitted under the DSL permit; so, this should be granted.

Public Testimony Closed

Questions for Staff

There was discussion with staff on what the difference is between a LID verses Advanced Financing. Creating an Advanced Financing District is when the developer would put in the infrastructure that is over and above what is needed for that development. In this project that would mean going pass the 250ft and had permission from the property owners to be able to extend the road pass that. As the other properties come on board, they would pay back the developer with interest.
The LID is shared by all the property owners. A loan is taken out of what the infrastructure costs are. It then gets assessed to the property owners within that district.
Staff is not suggesting full street infrastructure for this project. Is suggesting 20ft of pavement up to the property line.
The threshold to meet open space or a park is 20 lots and this project is under that. There was conversation on where parks are located around this development.
Mr. Mitchell spoke up and stated that they cannot make Mr. Gramson pave pass his property line; but because of this there is now an issue with the length of the dead-end street.
In an emergency all the people in the new development will have to get out the same way as the Juniper Ridge people have to get out. This is a risk and safety issue for the families.
Ms. Bridgens voiced her concerns that if Mr. Gramson doesn't have to have a secondary access for emergencies then it isn't a good idea to give the variance or this should not be developed. Feels that there is a need to build the road right now and not wait until later when there is a real need for one.
Mr. Cronin chimed in and added that if there was an emergency response that was needed than a secondary road would be great, but the area is not development ready.
Mr. Lampi feels that this is a variance on top of a previous variance for this area. Is in favor for development and it is needed; but there is only so much you can sacrifice.
Feels the comment on the fence should stay as a condition.
Regarding the hammerhead between lots 1 and 2 would like to stay with the original staff recommendation knowing that it is not a fully developed street that it is just asphalt to that point.
Realizes that in order to have a through road you would have to develop on someone else's property which maybe unfair to the developer in this case. If the road was there, would be all for it. It's a lot of money to put it in.
Mr. Cronin suggested to get an easement from the neighboring property owner as a condition of approval. It would solve the issue of allowing people to get to Ridge Road.
After a brief recess, Mr. Cronin added a new clause under condition number 14 to read in addition; the developer shall secure a public access easement to Ridge Road.
Ms. Bridgens spoke up and stated that The Warrenton Transportation Systems Plan does not want a gravel road for any type of access to Ridge Road.

Warrenton Planning Commission
AGENDA
May 30, 2019 | 5 PM | City Hall - Commission Chambers

1. Attendance

2. Flag Salute

3. Public Comment Period on *Non-Agenda* Items

4. Approval of minutes of April 25, 2019
   - *Action Item: Motion to Adopt*

5. **Work Session:** Housing Strategies Report (Angelo Planning Group)

6. Dober | Non-Conforming Use Application (NCU 19-1)
   - Applicant: Molly Dober | Hammond
   - Proposal: Replacement of single family detached on non-conforming lot
   - Action Item: Decide on replacement

7. Staff Announcements & Project Updates

8. Next Meeting: July 11, 2019

9. Adjourn

REMINDER: SPUR 104 Master Plan Charrette Presentation
May 9 - 5 pm @ Historic Fenton Grocery Building

Discussion was made on what kind of road would it be past Mr. Gramson's property line. What was mentioned was a compacted drivable surface or some other kind; or only be restricted to emergency vehicles.
Mr. Mitchell spoke up and stated how far can we stretch the property owner who isn't even involved in any of this and pave through their property. He agrees with the impacted gravel and the 20ft paved road to Mr. Gramson's property line but is pushing this on beyond what is reasonable when talking about paved roads. When and if the other property gets developed then the roads will be brought up to where they need to be.
Mr. Moha spoke up and said that he didn't think it should be public through access until it does get developed.

Motion by Commissioners

Ms. Bridgens motioned on the findings and conclusions of the March 7th, 2019 staff report and addendum dated April 4th 2019 moved to deny the application SUB 19-1, Variance VAR 19-1 and Wetland Hardship Variance WHV 19-1 submitted by Gil Gramson for a 15 lot subdivision subject to the conditions of approval.
There was no second motion. The motion was not passed.
Motion to approve with conditions.
Ms. Bridgens made another motion based on the findings and conclusions of the March 7th 2019 staff report and addendum dated April 4th 2019 moved to approve the application of SUB 19-1, Variance VAR19-1 and Wetland Hardship Variance WHV 19-1 submitted by Gil Gramson for a 15 lot subdivision subject to the conditions of approval with the addition that the access road to Ridge Road be up to local street standards from Mr. Gramson's property to Ridge Road. There was no second motion.
Mr. Mitchell made a motion based on the findings and conclusions of the March 7th 2019 staff report an addendum dated April 4th 2019 moved to approve the application SUB 19-1, Variance VAR 19-1 and Wetland Hardship Variance WHV 19-1 submitted by Gil Gramson for a 15 lot subdivision subject to the condition of the following that a 20ft compacted emergency only access road be built to Ridge Road. Mr. Moha seconded. Mr. Lampi, aye. Opposed Ms. Bridgens. Motion passed.

Submitted and attested by

Janice Weese, Building Clerk

Approved by

Paul Mitchell, Planning Commission Chair

Meeting Adjourned

Gramson Property – Ridge Road Project Site
Wetland and Other Waters Delineation Report

Prepared for:
Gil Gramson
15 NW 17th Place
Warrenton Oregon 97416
(503) 861-1133

Prepared by:
Cascade Environmental Group, LLC
222 NW Davis Street, Suite 317
Portland, Oregon 97209
(503) 894-8585
Contact: Brent Haddaway

CASCADE
ENVIRONMENTAL GROUP

August 2017

Cascade Environmental Group, LLC. Gramson Property – Ridge Road Project Site Wetland and Other Waters Delineation Report. August 2017. Portland, OR. Prepared for Gil Gramson, Warrenton, OR

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Acronyms and Abbreviations

Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DSL	Department of State Lands
EPA	Environmental Protection Agency
FAC	facultative
FACU	facultative upland
FACW	facultative wetland
GPS	global positioning system
HGM	hydrogeomorphic
HUC	Hydrologic Unit Code
LWI	Local Wetland Inventory
NAVD88	North American Vertical Datum of 1988
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resource Conservation Service
NWI	National Wetland Inventory
NWS	National Weather Service
OAR	Oregon Administrative Rules
OBL	obligate
ODF	Oregon Department of Forestry
PEM/SSC	palustrine emergent/palustrine scrub-shrub, seasonally flooded
PEM/SSF	palustrine emergent/palustrine scrub-shrub, semi-permanently flooded
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey

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1. Landscape Setting and Land Use

1.1. Introduction

This report has been prepared to document existing wetlands and other waters within a portion of the property owned by Gil Gramson (client) located in Warrenton, Oregon (Figure 1) regulated under the Clean Water Act (CWA) by the U.S. Army Corps of Engineers (Corps) and under the Removal-Fill Law by the Oregon Department of State Lands (DSL). This report complies with all standards and requirements set forth in Oregon Administrative Rules (OAR) 141-090-0035 (1-22) for wetland delineation reports and jurisdictional determinations for the purpose of regulating fill and removal within waters of the state. This report will be used to fulfill federal and state regulatory requirements for project permitting.

The proposed project consists of an 8-acre lot division in the southeastern corner of a 262.3-acre tax lot (Figure 2).

1.2. Site Description

The study site consists of an 8- acre portion of tax lot # 810170001300 located west of 75 SW Juniper Avenue, Warrenton, Oregon, in Section 17, Township 8 North, Range 10 West (Figure 2). It is bounded by a largely undeveloped complex of forested-stabilized coastal dune formations and low-lying interdunal lakes and marshes; moderately dense residential development exists to the east and south of the site. The study site straddles a linear dune formation and includes associated dune slacks on either side at the site margins. The features are oriented north-south and create an undulating topography within the site: elevation ranges from 17 feet in the North American Vertical Datum of 1988 (NAVD88) on the slack to 61 feet NAVD88 at the crest of the dune. The study site is densely vegetated with coniferous forest and shrubland; save for a packed dirt access road that bisects the site north-south along the dune, and another that bisects the site east-west near the southern boundary; clearing and grading work has also occurred in the southern portion of the site, no evidence of recent wetland fill was observed.

The study site is situated between the Pacific Ocean and the Columbia River Estuary. It falls within the Skipanon River-Frontal Columbia River watershed (HUC# 170800060208) and is included within the (EPA) Level IV Coastal Lowlands ecoregion (WPN 2001). The Coastal Lowlands occur along the Oregon and Washington Coasts at elevations below 400 feet; they are characterized by low terraces, estuaries, spits, marshes and hyper-maritime coniferous forests bordered by steep upland slopes, which provide sediment and organic material. The marine

influenced climate is temperate and wet, with an average of 60-85 inches of precipitation annually, falling mainly in the winter, and mild temperatures throughout the year. Streams are generally low-gradient and meandering; many are tidally influenced. Soil textures range from sandy-loam to silty-clay-loam.

Once abundant in tidal marsh and swamp, many of the wetlands in this ecoregion have been diked, ditched, and converted to dairy agricultural use. Timber harvest is also a primary economic land use in the region (WPN 2001).

1.3. Land Use—Historical and Current

Historical aerials from the period between 1994 and 2016, available from Google Earth, were reviewed to document land use and site alterations over time. The site is currently located in the Growth Management Zone and is zoned Rural Residential -10 (City of Warrenton Zoning Designation RGM-R10). It is undeveloped, aside from the access roads and clearing and grading work in the southern portion. Surrounding residential development has occurred in recent years, and future development of the site is likely. Historical land use is unknown, though logging likely occurred at some point.

1.3.1. Site Alterations

According to historical aerials, the dirt access roads appear to have been in place by 1994. It is presumed that the site has been logged, based on the age and structure of the forest, and that the roads were constructed during this time. Additional clearing work in the southern portion of the site appears to have occurred in 2012 along with the construction of the residential development to the south of the study site. Recently cleared short road segments protruding off the main north-south road were observed during fieldwork.

1.4. Precipitation Data and Analysis

Precipitation data for the date of fieldwork and the time period preceding it were reviewed to evaluate observed wetland hydrology conditions relative to actual and statistically normal precipitation. Precipitation that deviates from normal ranges can affect site conditions and impact observed wetland hydrology indicators.

Precipitation data were acquired from the National Oceanic and Atmospheric Administration's (NOAA) Online Weather Data (NOWData) for Astoria to provide context for observed hydrological conditions of the study area at the time of the site visit (NOAA 2017). Table 1 provides precipitation data for the date of the site visit, precipitation for the two weeks prior to

the site visit, and a comparison to the normal water year average. Climate data is included in Appendix D.

Table 1. Precipitation Summary for Recent Period Preceding Site Visit

	Observed Precipitation [a]				
Date of Site Visit	**Date of Visit (inches)**	**Two Weeks to Date (inches)**	**Water Year to Date (inches)**	**Normal Water Year to Date (inches)**	**Percent of Normal Water Year to Date**
08/01/2017	0.0	0.08	93.54	63.96	146%

[a] Data provided by NOWData, Astoria Regional Airport, Oregon, 2016-2017

Table 2 provides monthly precipitation totals for the three months preceding the site visit along with the normal monthly ranges of precipitation representing 30% probability as reported in the Natural Resource Conservation Service (NRCS) WETS table for the area (NRCS 2002). WETS tables were developed specifically for application to wetland science and provide data obtained from NOAA NWS climate stations for the purpose of defining a normal range for monthly precipitation and growing seasons (NRCS 1995).

Table 2. Precipitation Summary for Three Months Preceding Site Visit

Month	**Month Weight**	**Total Precipitation (inches) [a]**	**WETS Normal Range of Precipitation [b]**	**Condition Value [c]**	**Condition Score (month weight*condition value)**
July	3	0.1	0.51-1.42	1	3
June	2	2.44	1.70-3.08	2	6
May	1	5.89	2.22-3.91	3	3
					Sum: 12 (Normal) [d]

[a] Data provided by NOWData, Astoria Regional Airport, Oregon; [b] data provided by NRCS WETS Station: Astoria Regional Airport, 1971-2000; [c] 1=dry, 2= normal, 3= wet; [d] where a condition score of 6-9=drier than normal, 10-14=normal, and 15-18=wetter than normal

Each month is weighted according to its temporal relationship to the date of fieldwork (assuming the more recent the time period, the greater the influence the weather conditions exert on the date of fieldwork), as well as a condition value based on the level of precipitation observed relative to normal (as indicated by the WETS range). The weighted month value and condition values are multiplied to produce a condition score, which is summed to produce a single value representative of the overall hydrological condition leading up to the date of fieldwork. As shown in Table 2, precipitation in May (with the least influence) was above the

WETS normal range, precipitation in June was within the WETS normal range, and precipitation in July (with the most influence) was below the WETS normal range, yielding a condition score of 10 (normal). The total observed precipitation for the water year (beginning October 1st) is 146% of normal. Based on these measures, it is expected that ground and surface water levels observed during fieldwork were typical for the season.

2. Methods

This section describes the methods used to estimate the extent of wetlands and/or other regulated waters within the study site. As part of the methodology, both offsite and onsite methods were used.

2.1. Office Methods

Prior to conducting fieldwork, ecologists reviewed the following available data and information:

- USDA (U. S. Department of Agriculture) NRCS Soil Survey of Clatsop County, Oregon
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI)
- City of Warrenton Local Wetland Inventory (LWI) available from DSL
- Oregon Department of Forestry (ODF) stream data
- Clatsop County WebMaps (http://maps.co.clatsop.or.us/applications/index.html) and GIS data layers

2.1.1. Wetland Inventory and Stream Maps

NWI and LWI wetlands are mapped throughout the study site (Figure 3). NWI wetlands include partially drained palustrine scrub-shrub/forested and palustrine emergent Cowardin (1979) classes. No streams have been mapped by ODF within the study site.

2.1.2. USDA/NRCS Soil Survey Maps

Soil survey maps produced by the NRCS Soil Survey for Clatsop County show two soil map units within the study site: Bergsvik mucky peat at slopes of 0-1% and Gearhart fine sandy loam at slopes of 3-15% and 15-30% (Figure 4).

Bergsvik mucky peat is mapped over the western half of the study site, within the dune slack. The series consists of very deep, very poorly drained organic soils that formed in partially decomposed herbaceous plant materials and occurs in interdunal areas at elevations of 5-20 feet. Berksvik mucky peat is rated hydric (all components rated hydric) and is prone to frequent ponding.

Gearhart fine sandy loam is mapped over the eastern half of the site, encompassing the dune formation; the steeper slopes of the series are mapped along the eastern boundary. This series consists of very deep, somewhat excessively drained soils that formed in eolian sand deposits and occurs on stabilized sand dunes at elevations of 15-200 feet. Gearhart sandy loam at slopes of 3-15% is rated predominantly nonhydric (<33% of components rates as hydric); at slopes of

15-30%, it is rated nonhydric (no map components rated as hydric). This series is not prone to either flooding or ponding.

2.2. Site-Specific Methods

Wetlands were delineated according to methodology described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Corps 2010), the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987), and Oregon Administrative Rules (OAR 141-090 et seq).

Fieldwork was performed on August 1, 2017. Wetland boundaries were determined based on the presence or absence of wetland indicators. Formal data plots were established at wetland boundaries where data on vegetation, soils, and hydrology were recorded using standard wetland delineation data forms (Appendix B). Identified wetlands were classified according to the USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979).

For other regulated waters, such as streams, presence of ordinary high water mark (OHWM), surface flow, and flow period are estimated based on field observations and supporting data including ODF stream classification, historical photos, and existing reports.

Ground level color photographs were also taken throughout the site to convey study site conditions (Appendix C).

3. Description of All Wetlands and Other Non-Wetland Waters

3.1. Onsite Wetlands and Waters

Two wetlands were identified within the study site boundary, both of which extend offsite; 4.08 total acres (177,878 ft^2) occur onsite. The mapped wetlands along with data plot and photo point locations are shown in Figure 6. Wetland sample plot data sheets are included in Appendix B. Site photographs of wetland areas are included in Appendix C.

3.1.1. Wetland A

Wetland A covers the western half of the site and extends north, south, and west beyond the study site boundary; 3.91 acres (170,204 ft^2) occurs within the study site. The wetland occupies an interdunal depression, or dune slack, likely formed by the scouring effect of wind erosion removing sediments down to the water table, or may have been an existing wetland encroached upon by dune-forming processes. The wetland is sustained largely by high groundwater along with impounded precipitation.

The wetland is bounded by densely forested stabilized dunes, which bear some areas of moderate-density residential development. The wetland is bisected east-west at the southern portion of the site by a dirt access road; a culvert conveys flows under the road. The wetland is largely impounded with no apparent inlet; the only outlet appears to be a small ditch mapped by ODA to the northeast of the site. According to ODA stream mapping, flows into this ditch eventually reach Alder Creek and the Columbia River Estuary. Areas of standing water were observed during fieldwork. Much of Wetland A occurs offsite, and viewpoints were obstructed by dense vegetation, making it difficult to characterize overall. It is estimated to be a depressional closed, nonpermanently flooded hydrogeomorphic (HGM) class. Multiple Cowardin classifications were observed onsite, including seasonally to semi-permanently flooded palustrine emergent and scrub-shrub classes (PEM/SSC and PEM/SSF).

Wetland hydrology was determined based on presence of surface water (A1), high water table (A2), and soil saturation (A3). Soil data collected met Corps wetland hydric soil indicator criteria for depleted below dark surface (A11) and depleted dark surface (F7) indicating that iron has been removed or transformed by processes of reduction and translocation within or below dark-colored soil layers. Dark soil matrix colors are black (10 YR 2/1 and 5 YR 2.5/1) to very dark gray (5YR 3/1), depleted matrix colors are dark gray (10 YR 4/1) to gray (10 YR 5/1) with few

to common prominent yellow-red redoximorphic concentrations and depletions occurring in the matrix. Soil texture varies from peat, featuring an abundance of partially decomposed fibrous organic matter, to loamy sand and silt loam.

Vegetation occurring in Wetland A within the study site includes both emergent herbaceous and shrub-scrub classes. The herbaceous community is dominated by skunk cabbage (*Lysichiton Americanus*; OBL), slough sedge (*Carex obnupta*; OBL), and water parsley (*Oenanthe sarmentosa*; OBL), along with false lily-of-the-valley (*Maianthemum dilatatum*; FAC), which occurs in the drier areas, and kneeling Angelica (*Angelica genuflexa*; FACW), which occurs in the wetter areas. Scrub-shrub areas feature Douglas' spiraea (*Spiraea douglasii*; FACW), Pacific willow (*Salix lasiandra*; FACW), Hooker's willow (*S. hookeriana*; FACW), and salmonberry (*Rubus spectabilis*; FAC). Sitka spruce (*Picea sitchensis*; FAC) and red alder (*Alnus rubra*; FAC) are scattered throughout drier areas of the wetland.

3.1.2. Wetland B

Wetland B occupies a small area (0.18 acres or 7,675 ft^2) along the eastern site boundary in the central portion of the study site, extending offsite to the east, north, and south. Similar to Wetland A, it also occurs in a dune slack, is largely sustained by high groundwater, and is bound by steeply sloped, forested stabilized dunes bearing some residential development.

The wetland does not appear to have an inlet and is a part of a marsh/interdunal lake (Clear Lake) complex draining into the Columbia River Estuary via Alder Creek. Only a small portion of the wetland occurs onsite and visibility was limited by dense vegetation; therefore, characterization as a whole presents some difficulty. The wetland is estimated to be depressional closed, permanently flooded HGM class due to the presence and size (> 0.25 acre) of the permanent lake. Onsite Cowardin classes include seasonally flooded palustrine emergent and scrub-shrub (PEM/SSC).

Wetland hydrology was determined based on presence of high water table and soil saturation. Soil data collected met Corps wetland hydric soil indicator criteria for depleted below dark surface. Dark soil matrix colors are black to very dark grayish brown (10YR 3/2), depleted matrix colors are dark gray with many prominent yellow-red redoximorphic concentrations occurring in the matrix. Soil texture varies from peat to loamy sand and sandy loam.

Vegetation occurring in Wetland B within the study site includes a herbaceous community dominated by skunk cabbage, slough sedge, and water parsley; and a scrub-shrub community composed of Douglas' spiraea, Pacific willow, Hooker's willow, and salmonberry.

3.1.3. Other Waters of the State

No non-wetland waters occur within the study site.

3.2. Uplands

Upland within the study site is characterized as stabilized dune, densely vegetated by a closed-canopy conifer-dominated forest with a well-developed shrub-layer. The overstory is composed of Sitka spruce interspersed with red alder and western hemlock (*Tsuga heterophylla*; FACU). The brushy understory includes large thickets of salal (*Gaultheria shallon*; FACU) and evergreen huckleberry (*Vaccinium ovatum*; FACU) mixed with red elderberry (*Sambucus racemosa*; FACU) and salmonberry. The herbaceous layer is dominated by western swordfern (*Polystichum munitum*; FACU) and trailing blackberry (*Rubus ursinus*; FACU), with false lily of the valley and deer fern (*Blechnum spicant*; FAC) occurring commonly.

Upland slopes are variable, from very steep on the dune sideslopes to relatively flat at the crest and on the graded road. Soil samples are very dark brown (7.5 YR 2.5/2) to dark brown (7.5 YR 3/2) to dark reddish brown (10 YR 4/4) loamy sand or sand, often topped by a dark O-horizon made of partially decomposed forest litter ranging from a few inches thick up to 10 inches. In some areas, dense root mats and organic material compose the entire soil profile; the presence of root mats prohibited complete excavation of soil sample pits in some locations.

3.3. Deviation from NWI

Results of this investigation verified that Wetland A generally aligns with NWI mapping, taking into account a moderate mapping margin of error. Wetland B was not mapped by the NWI at its verified extent, though Clear Lake and surrounding areas were captured adequately.

3.4. Mapping Method

Data plot and wetland boundaries points were located using TerraSync software on a Trimble GeoXT Global Positioning System (GPS) unit with sub-meter positional accuracy capability. GPS data were post-processed with GPS Pathfinder Office software resulting in an estimated average positional accuracy of within 1 foot. GPS survey data were exported to a GIS format (ESRI shapefile).

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4. Results and Conclusions

Cascade Environmental Group, LLC, identified two wetlands within the study site totaling 4.08 acres (177,878 ft^2). Wetland A is estimated to be a depressional closed, nonpermanently flooded HGM class featuring PEM/SSC and PEM/SSF Cowardin classifications onsite and measures 3.91 acres (170,204 ft^2) in size. Wetland B is estimated to be a depressional closed, permanently flooded HGM class featuring PEM/SSC Cowardin classifications onsite and measures 0.18 acres (7,675 ft^2) in size.

4.1. Disclaimer

This report documents the best professional judgment and conclusions of the investigator. It is correct and complete to the best of our knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at one's own risk unless it has been reviewed and approved in writing by the U.S. Army Corps of Engineers and the Oregon Department of State Lands in accordance with OAR 141-090-0005 through 141-090-0055.

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Appendix A. Maps

Date: 8/9/2017

Scale: 1 inch = 1 mile

Data Source: ESRI, 2017

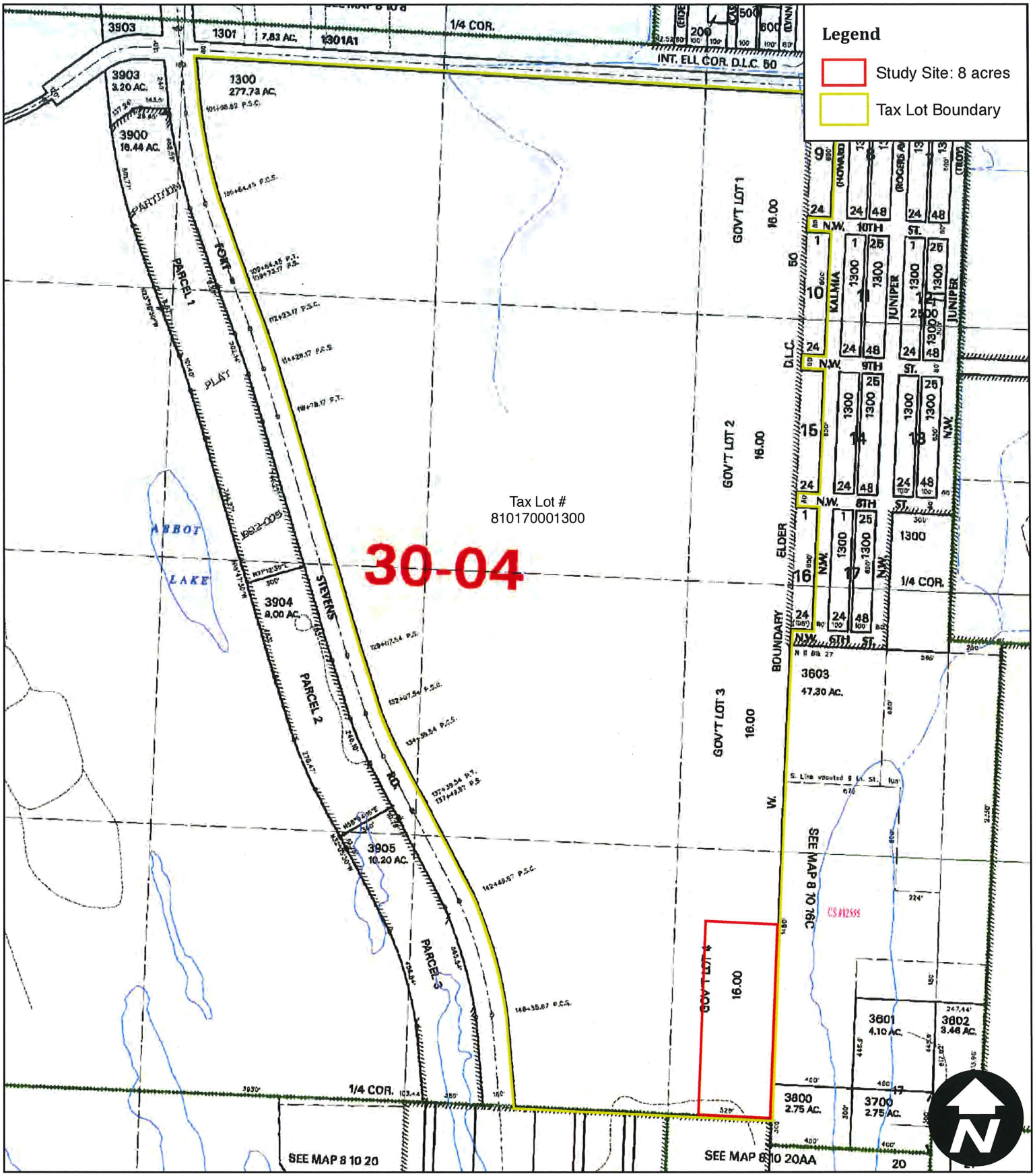
Figure 1. Location Map

CASCADE ENVIRONMENTAL GROUP

0 0.5 1 2 Miles

Gramson Property - Ridge Road Wetland Delineation Report

Z:\GIS\157_GramsonLotAdjustment\Mapfiles\Fig1_Location.mxd



Date: 8/9/2017
Scale: 1 inch = 650 feet
Data Source: ESRI, 2017; Clatsop County GIS, 2012; ORMAP (http://www.ormap.net)

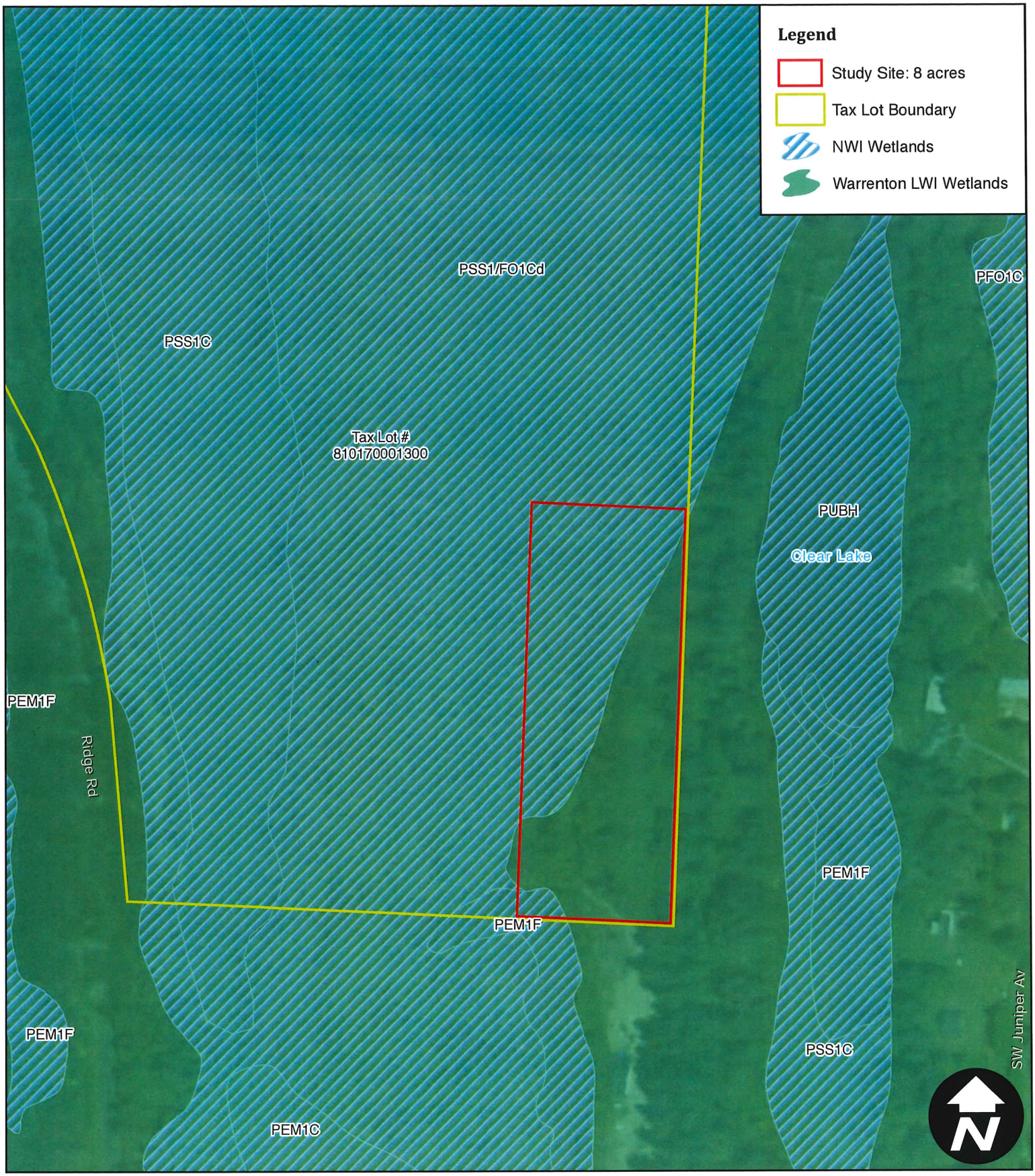
Figure 2. Clatsop County Tax Map: 081017

CASCADE ENVIRONMENTAL GROUP

0 300 600 1,200 Feet

Gramson Property - Ridge Road
Wetland Delineation Report

Z:\GIS\157_GramsonLotAdjustment\Mapfiles\Fig2_TaxMap.mxd



Date: 8/9/2017

Scale: 1 inch = 300 feet

Data Source: ESRI, 2017; Clatsop County GIS, 2012; USFS, NWI, 2016

Figure 3. Wetland Inventory Map

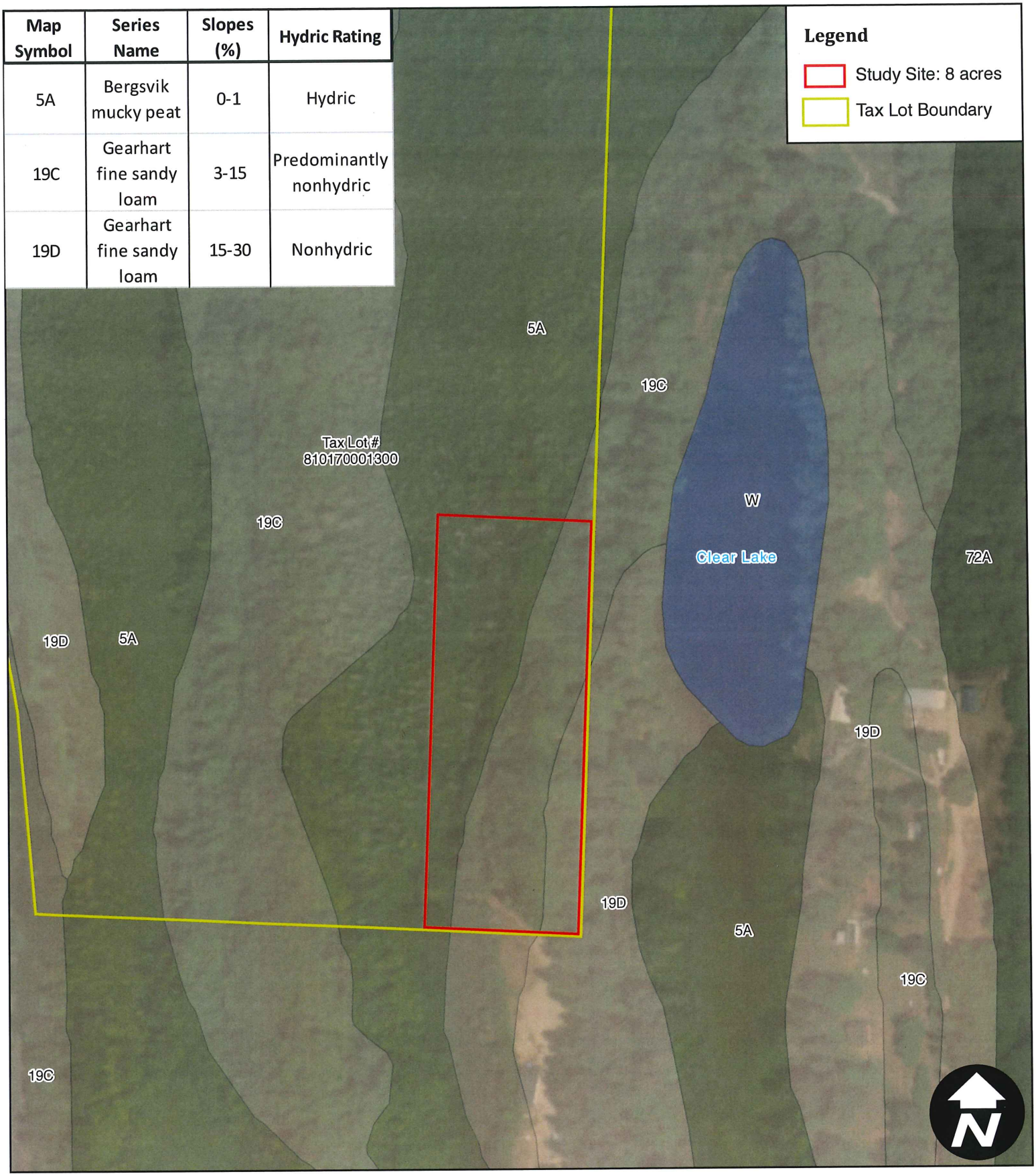
CASCADE ENVIRONMENTAL GROUP

0 200 400 Feet

Gramson Property - Ridge Road Wetland Delineation Report

Z:\GIS\157_GramsonLotAdjustment\Mapfiles\Fig3_NWI.mxd

Map Symbol	Series Name	Slopes (%)	Hydric Rating
5A	Bergsvik mucky peat	0-1	Hydric
19C	Gearhart fine sandy loam	3-15	Predominantly nonhydric
19D	Gearhart fine sandy loam	15-30	Nonhydric



Date: 8/9/2017
Scale: 1 inch = 300 feet
Data Source: ESRI, 2017; Clatsop County GIS, 2012; Soil Survey Staff, USDA, NRCS, 2017

Figure 4. USDA/NRCS Soil Survey Map

CASCADE ENVIRONMENTAL GROUP

0 100 200 400 Feet

Gramson Property - Ridge Road Wetland Delineation Report

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Date: 8/9/2017
Scale: 1 inch = 300 feet
Data Source: ESRI, 2017; Clatsop County GIS, 2012; USDA National Agricultural Imagery Program, 2016

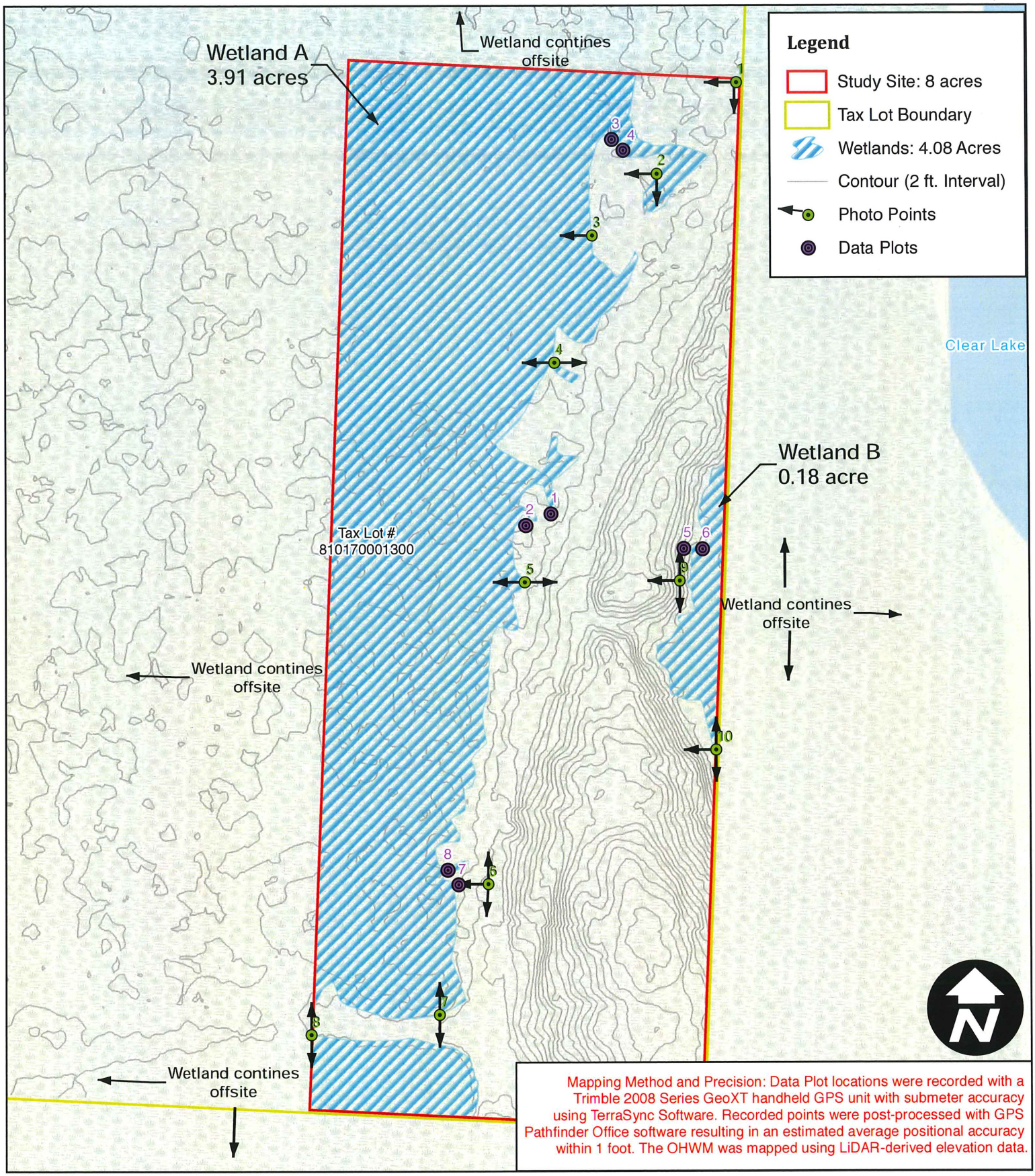
Figure 5. Recent Aerial Image: NAIP - July 2016

CASCADE ENVIRONMENTAL GROUP

0 100 200 400 Feet

Gramson Property - Ridge Road Wetland Delineation Report

Z:\GIS\157_GramsonLotAdjustment\Mapfiles\Fig5_Aerial.mxd



Date: 8/14/2017

Scale: 1 inch = 120 feet

Data Source: ESRI, 2017; Clatsop County GIS, 2012

Figure 6. Wetland Boundary Map

CASCADE ENVIRONMENTAL GROUP

0 100 200 Feet

Gramson Property - Ridge Road
Wetland Delineation Report

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Appendix B. Wetland Data Forms

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Gramson Property - Ridge Road City/County: Clark County Sampling Date: 8/1/2017
Applicant/Owner: Gil Gramson State: WA Sampling Point: 1
Investigator(s): B. Haddaway, K.Biafora Section, Township, Range: S17, T8N, R10W
Landform (hillslope, terrace, etc.): Interdune Local relief (concave, convex, none): concave Slope (%): 0-2%
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 46.170611° Long: -123.944877° Datum: WGS 84
Soil Map Unit Name: Gearhart fine sandy loam NWI Classification: PSS1/FO1Cd
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?**	**Yes** _____ **No X**
Hydric Soil Present?	Yes _____ No X		
Wetland Hydrology Present?	Yes _____ No X		

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Picea sitchensis*	30	Y	FAC
2.			
3.			
4.			
Total Cover:	30		
Shrub Stratum			
1. *Gaultheria shallon*	2		FACU
2. *Sambucus racemosa*	30	Y	FACU
3. *Rubus spectabilis*	30	Y	FAC
4. *Rubus ursinus*	30	Y	FACU
5.			
Total Cover:	92		
Herb Stratum			
1. *Polystichum munitum*	10	Y	FACU
2. *Maianthemum dilatatum*	15	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	25		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **3** (A)
Total Number of Dominant Species Across All Strata: **6** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **50%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	**0**
FACW species		x2 =	**0**
FAC species	**75**	x3 =	**225**
FACU species	**72**	x4 =	**288**
UPL species		x5 =	**0**
Column Totals:	**147** (A)		**513** (B)

Prevalence Index = B/A = **3.5**

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
_____ 2 - Dominance Test is >50%
_____ 3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting
_____ data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No X**

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 4/4	100					LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Gramson Property - Ridge Road City/County: Clark County Sampling Date: 8/1/2017
Applicant/Owner: Gil Gramson State: WA Sampling Point: 2
Investigator(s): B. Haddaway, K.Biafora Section, Township, Range: S17, T8N, R10W
Landform (hillslope, terrace, etc.): Interdune Local relief (concave, convex, none): concave Slope (%): 0-2%
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 46.170611° Long: -123.944877° Datum: WGS 84
Soil Map Unit Name: Bergsvik mucky peat NWI Classification: PSS1/FO1Cd
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1.			
2.			
3.			
4.			
Total Cover:	0		
Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum			
1. *Athyrium cyclosorum*	10		FAC
2. *Maianthemum dilatatum*	10		FAC
3. *Lysichiton americanus*	40	Y	OBL
4. *Carex obnupta*	20	Y	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	80		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 25 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **2** (A)
Total Number of Dominant Species Across All Strata: **2** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	**0**
FACW species	_____	x2 =	**0**
FAC species	_____	x3 =	**0**
FACU species	_____	x4 =	**0**
UPL species	_____	x5 =	**0**
Column Totals:	**0** (A)		**0** (B)

Prevalence Index = B/A = **#DIV/0!**

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting
_____ data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	5 YR 2.5/1	100					PEAT	
4-10	5 YR 4/1	93	5 YR 4/4	2	C	M	LOAMY SAND	
			5 YR 5/1	5	D	M		
10-16	5 YR 5/1	88	5 YR 4/4	5	C	M	LOAMY SAND	
			4/10G	5	D	M		
			5 YR 6/1	2	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches): ___
Water table Present?	Yes	X	No	___	Depth (inches): 11
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches): 10

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Gramson Property - Ridge Road City/County: Clark County Sampling Date: 8/1/2017
Applicant/Owner: Gil Gramson State: WA Sampling Point: 3
Investigator(s): B. Haddaway, K.Biafora Section, Township, Range: S17, T8N, R10W
Landform (hillslope, terrace, etc.): Interdune Local relief (concave, convex, none): concave Slope (%): 0-2%
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 46.170611° Long: -123.944877° Datum: WGS 84
Soil Map Unit Name: Bergsvik mucky peat NWI Classification: PSS1/FO1Cd
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?**	**Yes _____ No X**
Hydric Soil Present?	Yes _____ No X		
Wetland Hydrology Present?	Yes _____ No X		

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Picea sitchensis*	60	Y	FAC
2. *Alnus rubra*	30	Y	FAC
3.			
4.			
Total Cover:	90		
Shrub Stratum			
1. *Gaultheria shallon*	15	Y	FACU
2. *Vaccinium ovatum*	30	Y	FACU
3.			
4.			
5.			
Total Cover:	45		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	0		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **2** (A)
Total Number of Dominant Species Across All Strata: **4** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **50%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	**0**
FACW species		x2 =	**0**
FAC species	**90**	x3 =	**270**
FACU species	**45**	x4 =	**180**
UPL species		x5 =	**0**
Column Totals:	**135** (A)		**450** (B)

Prevalence Index = B/A = **3.3**

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
_____ 2 - Dominance Test is >50%
_____ 3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes _____ No X**

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5 YR 2.5/2	100					Organics	Thick duff layer/O horizon on forest floor

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Shovel refusal - Root mat

Depth (inches): 10

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Gramson Property - Ridge Road City/County: Clark County Sampling Date: 8/1/2017
Applicant/Owner: Gil Gramson State: WA Sampling Point: 4
Investigator(s): B. Haddaway, K.Biafora Section, Township, Range: S17, T8N, R10W
Landform (hillslope, terrace, etc.): Interdune Local relief (concave, convex, none): concave Slope (%): 0-2%
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 46.170611° Long: -123.944877° Datum: WGS 84
Soil Map Unit Name: Bergsvik mucky peat NWI Classification: PSS1/FO1Cd
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?**	**Yes X No _____**
Hydric Soil Present?	Yes X No _____		
Wetland Hydrology Present?	Yes X No _____		

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1.			
2.			
3.			
4.			
Total Cover:	0		
Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum			
1. *Lysichiton americanus*	40	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	40		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	0
FACW species	_____	x2 =	0
FAC species	_____	x3 =	0
FACU species	_____	x4 =	0
UPL species	_____	x5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = #DIV/0!

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting
_____ data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No _____**

Remarks:

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	5 YR 2.5/1	100					PEAT	
7-10	5 YR 3/1	90	5 YR 4/3	5	C	M	SILT LOAM	
			5 YR 4/1	5	D	M		
10-16	5 YR 3/1	85	5 YR 4/1	10	D	M	SILT LOAM	
			5 YR 4/3	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- X Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches): ___
Water table Present?	Yes	X	No	___	Depth (inches): 5
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches): 3

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Gramson Property - Ridge Road City/County: Clark County Sampling Date: 8/1/2017
Applicant/Owner: Gil Gramson State: WA Sampling Point: 5
Investigator(s): B. Haddaway, K.Biafora Section, Township, Range: S17, T8N, R10W
Landform (hillslope, terrace, etc.): Interdune Local relief (concave, convex, none): concave Slope (%): 0-2%
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 46.170611° Long: -123.944877° Datum: WGS 84
Soil Map Unit Name: Gearhart fine sandy loam NWI Classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?**	**Yes _____ No X**
Hydric Soil Present?	Yes _____ No X		
Wetland Hydrology Present?	Yes _____ No X		

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Picea sitchensis*	60	Y	FAC
2. *Alnus rubra*	30	Y	FAC
3.			
4.			
Total Cover:	90		
Shrub Stratum			
1. *Sambucus racemosa*	5	Y	FACU
2. *Vaccinium parvifolium*	10	Y	FACU
3. *Rubus spectabilis*	5	Y	FAC
4.			
5.			
Total Cover:	20		
Herb Stratum			
1. *Polystichum munitum*	60	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	60		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **3** (A)
Total Number of Dominant Species Across All Strata: **6** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **50%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	**0**
FACW species		x2 =	**0**
FAC species	**95**	x3 =	**285**
FACU species	**75**	x4 =	**300**
UPL species		x5 =	**0**
Column Totals:	**170** (A)		**585** (B)

Prevalence Index = B/A = **3.4**

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
_____ 2 - Dominance Test is >50%
_____ 3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes _____ No X**

Remarks:

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR 3/3	100					Organics	Thick duff layer/O horizon on forest floor
2-16	10 YR 3/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Shovel refusal - Root mat
Depth (inches): 10

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Gramson Property - Ridge Road City/County: Clark County Sampling Date: 8/1/2017
Applicant/Owner: Gil Gramson State: WA Sampling Point: 6
Investigator(s): B. Haddaway, K.Biafora Section, Township, Range: S17, T8N, R10W
Landform (hillslope, terrace, etc.): Interdune Local relief (concave, convex, none): concave Slope (%): 0-2%
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 46.170611° Long: -123.944877° Datum: WGS 84
Soil Map Unit Name: Gearhart fine sandy loam NWI Classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1.			
2.			
3.			
4.			
Total Cover:	0		
Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum			
1. *Lysichiton americanus*	15	Y	OBL
2. *Carex obnupta*	15	Y	OBL
3. *Oenanthe sarmentosa*	10	Y	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	40		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	x1 =	0
FACW species	x2 =	0
FAC species	x3 =	0
FACU species	x4 =	0
UPL species	x5 =	0
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A = #DIV/0!

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting
_____ data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR 2/1	100					PEAT	
2-4	10 YR 3/2	95	2.5 YR 3/3	5	C	M	SANDY LOAM	
4-6	10 YR 4/1	100					SAND	
6-16	10 YR 4/1	60	5 YR 3/3	40	C	M	LOAMY SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___	
Water table Present?	Yes X	No ___	Depth (inches): 9	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 7	

Wetland Hydrology Present? **Yes X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Gramson Property - Ridge Road City/County: Clark County Sampling Date: 8/1/2017
Applicant/Owner: Gil Gramson State: WA Sampling Point: 7
Investigator(s): B. Haddaway, K.Biafora Section, Township, Range: S17, T8N, R10W
Landform (hillslope, terrace, etc.): Interdune Local relief (concave, convex, none): concave Slope (%): 0-2%
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 46.170611° Long: -123.944877° Datum: WGS 84
Soil Map Unit Name: Gearhart fine sandy loam NWI Classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?**	**Yes** _____ **No X**
Hydric Soil Present?	Yes _____ No X		
Wetland Hydrology Present?	Yes _____ No X		

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Tsuga heterophylla*	30	Y	FACU
2. *Alnus rubra*	30	Y	FAC
3.			
4.			
Total Cover:	60		
Shrub Stratum			
1. *Gaultheria shallon*	25	Y	FACU
2. *Vaccinium ovatum*	10	Y	FACU
3. *Rubus ursinus*	10	Y	FACU
4.			
5.			
Total Cover:	45		
Herb Stratum			
1. *Polystichum munitum*	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	5		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 17% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	0
FACW species	_____	x2 =	0
FAC species	30	x3 =	90
FACU species	65	x4 =	260
UPL species	_____	x5 =	0
Column Totals:	95 (A)		350 (B)

Prevalence Index = B/A = 3.7

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
_____ 2 - Dominance Test is >50%
_____ 3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No X**

Remarks:

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-3	5 YR 3/2	100					Organics	Thick duff layer/O horizon on forest floor
3-16	7.5 YR 3/1	100					Loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Shovel refusal - Root mat

Depth (inches): 10

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Gramson Property - Ridge Road City/County: Clark County Sampling Date: 8/1/2017
Applicant/Owner: Gil Gramson State: WA Sampling Point: 8
Investigator(s): B. Haddaway, K.Biafora Section, Township, Range: S17, T8N, R10W
Landform (hillslope, terrace, etc.): Interdune Local relief (concave, convex, none): concave Slope (%): 0-2%
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 46.170611° Long: -123.944877° Datum: WGS 84
Soil Map Unit Name: Gearhart fine sandy loam NWI Classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1.			
2.			
3.			
4.			
Total Cover:	0		
Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum			
1. *Lysichiton americanus*	90	Y	OBL
2. *Carex obnupta*	40	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	130		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	0
FACW species		x2 =	0
FAC species		x3 =	0
FACU species		x4 =	0
UPL species		x5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = #DIV/0!

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting
_____ data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-4	10 YR 2/1	100					PEAT	
4-8	10 YR 3/1	90	5 YR 3/4	5	C	M	SANDY LOAM	
			10 YR 4/1	5	D	M		
8-16	10 YR 4/1	80	5 YR 3/4	20	C	M	LOAMY SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches): ___
Water table Present?	Yes	X	No	___	Depth (inches): 6
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches): 4

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix C. Site Photographs

Photo point 1. Photo 1. From the northeastern site boundary looking south down access road and eastern boundary.

Photo point 1. Photo 2. From the northeastern site boundary looking west at upland Sitka spruce forest.

Photo point 2. Photo 1. From the boundary of Wetland A on the north end of the site looking south at wetland vegetated with skunk cabbage and slough sedge.

Photo point 2. Photo 2. From the boundary of Wetland A on the north end of the site looking west at adjacent upland vegetated with salal and Sitka spruce.

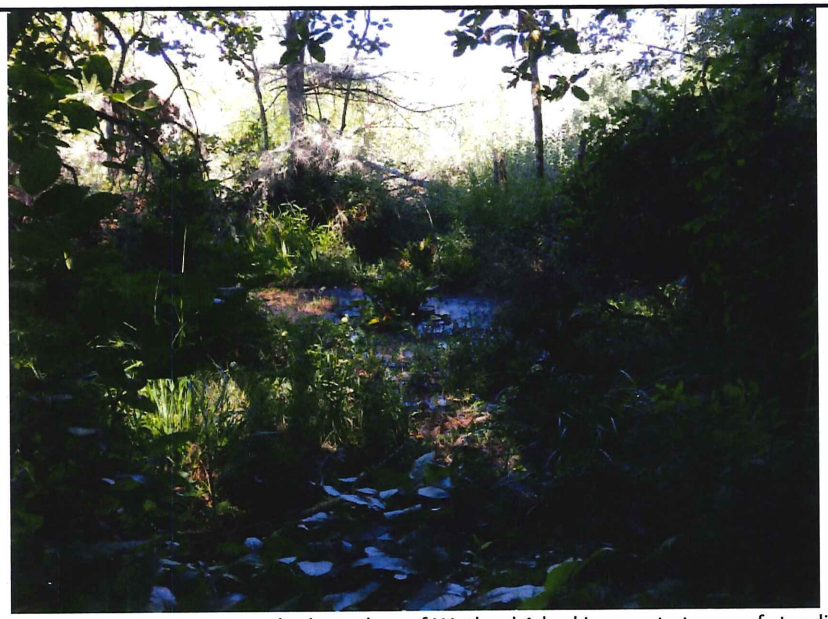


Photo point 3. Photo 1. From the boundary of Wetland A looking west at area of standing water.

Photo point 4. Photo 2. From the boundary of Wetland A looking east at adjacent upland Sitka spruce forest.

Photo point 4. Photo 1. From the boundary of Wetland A looking west at wetland area with slough sedge and willow vegetation.

Photo point 5. Photo 1. From the boundary of Wetland A looking west at standing water in wetland.

Photo point 5. Photo 2. From the boundary of Wetland A looking east at adjacent upland vegetated with western sword fern.

Photo point 6. Photo 2. From the access road on the southern end of the study site looking north along road through upland forest.

Photo point 6. Photo 1. From the access road on the southern end of the study site looking west toward the upland/wetland boundary (marked by orange flagging).

Photo point 6. Photo 3. From the access road on the southern end of the study site looking south along road toward cleared area.

Photo point 7. Photo 1. From the access road that bisects Wetland A on the south end of the site looking north at wetland.

Photo point 7. Photo 2. From the access road that bisects Wetland A on the south end of the site looking southeast at road.

Photo point 8. Photo 1. From the culvert under the access road that bisects Wetland A looking at wetland area south of road.

Photo point 8. Photo 2. From the culvert under the access road that bisects Wetland A looking at wetland area north of road.

Photo point 9. Photo 1. From Wetland B along the eastern site boundary looking south at wetland area sparsely vegetated by skunk cabbage and slough sedge.

Photo point 9. Photo 2. From Wetland B looking west at adjacent upland forest which rises abruptly above the wetland.

Photo point 9. Photo 3. From Wetland B looking north at sparsely vegetated wetland area.

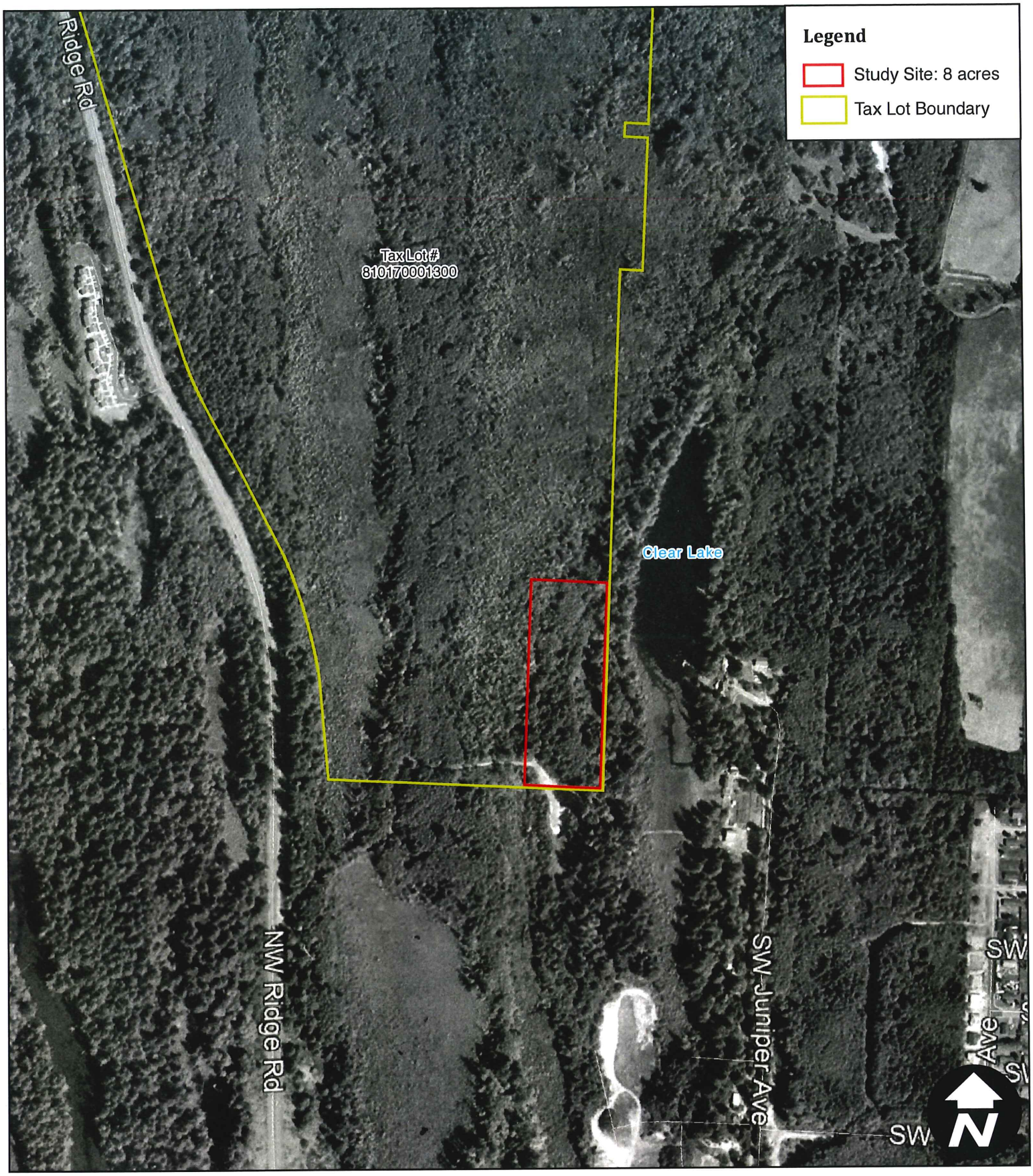
Photo point 10. Photo 1. From Wetland B on the eastern site boundary looking north at skunk cabbage and slough sedge in wetland.

Photo point 10. Photo 2. From Wetland B on the eastern site boundary looking south at slough sedge in wetland.

Photo point 10. Photo 3. From Wetland B on the eastern site boundary looking west at upland/wetland boundary (marked with orange flagging).

Photo of typical peat soil texture found in both wetlands.

Appendix D. Additional Tables and Information



Date: 8/18/2017
Scale: 1 inch = 600 feet
Data Source: ESRI, 2017; Clatsop County GIS, 2012; Google Earth, 2017

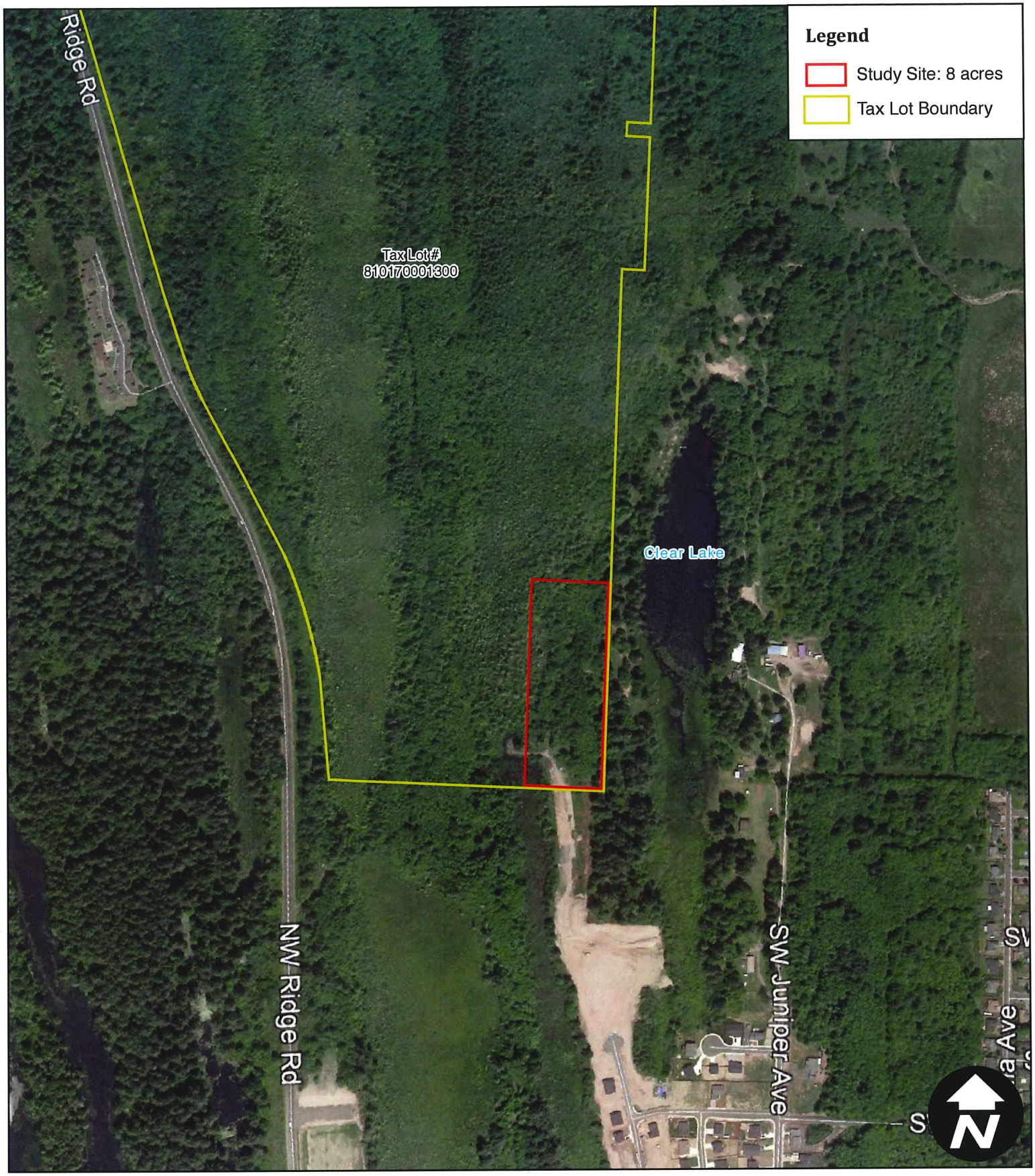
Appendix D. Historical Aerials: September 4, 1994

CASCADE ENVIRONMENTAL GROUP

0 300 600 Feet

Gramson Property - Ridge Road
Wetland Delineation Report

Z:\GIS\157_GramsonLotAdjustment\Mapfiles\AppD_HistoricalAerials.mxd



Date: 8/18/2017
Scale: 1 inch = 600 feet
Data Source: ESRI, 2017; Clatsop County GIS, 2012; Google Earth, 2017

Appendix D. Historical Aerials: July 6, 2012

CASCADE ENVIRONMENTAL GROUP

0 300 600 Feet

Gramson Property - Ridge Road
Wetland Delineation Report

Z:\GIS\157_GramsonLotAdjustment\Mapfiles\AppD_HistoricalAerials.mxd

Almanac for ASTORIA RGNL AP, OR

1-Aug-17

Daily Data	Observed	Normal	Record Highest	Record Lowest
Max Temperature	83	68	83 in 2017	60 in 1954
Min Temperature	51	54	59 in 2000	43 in 1987
Avg Temperature	67	61.1	67.0 in 2017	55.5 in 2002
Precipitation	0	0.02	0.42 in 1989	0.00 in 2017
Snowfall	0	0	0.0 in 2017	0.0 in 2017
Snow Depth	0	-	0 in 2017	0 in 2017
HDD (base 65)	0	4		
CDD (base 65)	2	0	2 in 2017	0 in 2016
Month-to-Date Summary	Observed	Normal	Record Highest	Record Lowest
Avg Max Temperature	83	68.3	83.0 in 2017	60.0 in 1954
Avg Min Temperature	51	53.8	59.0 in 2000	43.0 in 1987
Avg Temperature	67	61.1	67.0 in 2017	55.5 in 2002
Total Precipitation	0	0.02	0.42 in 1989	0.00 in 2017
Total Snowfall	0	0	0.0 in 2017	0.0 in 2017
Max Snow Depth	0	-	0 in 2017	0 in 2017
Total HDD (base 65)	0	4		
Total CDD (base 65)	2	0	2 in 2017	0 in 2016

Year-to-Date Summary	Observed	Normal	Record Highest	Record Lowest
Avg Max Temperature	56.8	57.7	61.3 in 2015	53.6 in 1955
Avg Min Temperature	43.6	43.5	46.6 in 2016	40.5 in 1955
Avg Temperature	50.2	50.6	53.7 in 1983	47.0 in 1955
Total Precipitation	49.67	36.96	54.07 in 1999	20.62 in 1985
Total Snowfall (since July 1)	0	0	0.0 in 2017	0.0 in 2017
Max Snow Depth (since July 1)	0	-	0 in 2017	0 in 2017
Total HDD (since July 1)	141	152		
Total CDD (since Jan 1)	18	0	28 in 2015	0 in 2012

Compare to another year

Climatological Data for ASTORIA RGNL AP, OR - July 2017

Click column heading to sort ascending, click again to sort descending.

Date	Temperature				HDD	CDD	Precipitation
	Maximum	Minimum	Average	Departure			
7/1/2017	64	53	58.5	-0.4	6	0	0
7/2/2017	67	56	61.5	2.5	3	0	T
7/3/2017	64	51	57.5	-1.6	7	0	0
7/4/2017	66	47	56.5	-2.7	8	0	0
7/5/2017	69	48	58.5	-0.8	6	0	0
7/6/2017	66	54	60	0.5	5	0	0
7/7/2017	66	53	59.5	-0.1	5	0	0
7/8/2017	69	48	58.5	-1.2	6	0	0
7/9/2017	68	54	61	1.2	4	0	0
7/10/2017	65	56	60.5	0.6	4	0	0
7/11/2017	66	55	60.5	0.5	4	0	0
7/12/2017	67	51	59	-1.1	6	0	0
7/13/2017	67	52	59.5	-0.7	5	0	0.02
7/14/2017	69	47	58	-2.3	7	0	0
7/15/2017	67	51	59	-1.3	6	0	0
7/16/2017	68	51	59.5	-0.9	5	0	0
7/17/2017	68	48	58	-2.5	7	0	0
7/18/2017	69	50	59.5	-1.1	5	0	0
7/19/2017	69	49	59	-1.6	6	0	0
7/20/2017	67	54	60.5	-0.2	4	0	0.08
7/21/2017	69	50	59.5	-1.2	5	0	0
7/22/2017	76	59	67.5	6.7	0	3	0
7/23/2017	67	56	61.5	0.7	3	0	0
7/24/2017	71	53	62	1.1	3	0	0
7/25/2017	70	56	63	2.1	2	0	0
7/26/2017	68	56	62	1.1	3	0	0
7/27/2017	68	57	62.5	1.5	2	0	0
7/28/2017	67	50	58.5	-2.5	6	0	0
7/29/2017	70	47	58.5	-2.5	6	0	0
7/30/2017	73	59	66	5	0	1	0
7/31/2017	77	48	62.5	1.5	2	0	0
Sum	2117	1619	-	-	141	4	0.1
Average	68.3	52.2	60.3	0	-	-	-
Normal	67.4	53.1	60.3	-	150	3	1.03

Monthly Total Precipitation for ASTORIA RGNL AP, OR

Click column heading to sort ascending, click again to sort descending.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2016	13.75	8.53	12.1	1.99	0.86	2	1.12	0.5	2.13	16.32	17.2	10.35	86.85
2017	5.81	12.07	14.45	8.91	5.89	2.44	0.1	M	M	M	M	M	M
Mean	9.78	10.3	13.28	5.45	3.38	2.22	0.61	0.5	2.13	16.32	17.2	10.35	86.85
Max	13.75	12.07	14.45	8.91	5.89	2.44	1.12	0.5	2.13	16.32	17.2	10.35	86.85
	2016	2017	2017	2017	2017	2017	2016	2016	2016	2016	2016	2016	2016
Min	5.81	8.53	12.1	1.99	0.86	2	0.1	0.5	2.13	16.32	17.2	10.35	86.85
	2017	2016	2016	2016	2016	2016	2017	2016	2016	2016	2016	2016	2016

Accumulated Precipitation Normal (inches)Daily Climate Normals (1981-2010) - ASTORIA RGNL AP, ORJan 1Jul 1Apr 1Oct 10102030405060708October 25Accumulated Precipitation Normal: 44.63 inchesPowered by ACIS

Daily Precipitation Normal (inches)												
Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.34	0.26	0.27	0.21	0.13	0.11	0.05	0.02	0.05	0.11	0.3	0.36
2	0.35	0.27	0.26	0.21	0.12	0.1	0.05	0.03	0.06	0.11	0.3	0.36
3	0.35	0.27	0.26	0.21	0.13	0.1	0.04	0.02	0.07	0.12	0.31	0.36
4	0.35	0.27	0.26	0.2	0.12	0.11	0.05	0.03	0.06	0.12	0.31	0.35
5	0.35	0.27	0.25	0.21	0.13	0.09	0.04	0.02	0.06	0.13	0.32	0.34
6	0.35	0.27	0.25	0.19	0.12	0.1	0.04	0.02	0.06	0.14	0.33	0.34
7	0.35	0.27	0.24	0.19	0.13	0.11	0.05	0.03	0.06	0.14	0.34	0.34
8	0.35	0.27	0.24	0.19	0.11	0.1	0.04	0.03	0.06	0.14	0.35	0.33
9	0.35	0.28	0.25	0.19	0.11	0.1	0.04	0.03	0.06	0.15	0.35	0.31
10	0.35	0.27	0.24	0.18	0.11	0.1	0.04	0.03	0.06	0.16	0.36	0.32
11	0.34	0.27	0.23	0.18	0.11	0.1	0.03	0.03	0.06	0.15	0.37	0.31
12	0.34	0.26	0.25	0.18	0.11	0.09	0.04	0.03	0.06	0.17	0.37	0.31
13	0.33	0.25	0.24	0.18	0.1	0.09	0.04	0.03	0.07	0.18	0.37	0.31
14	0.34	0.25	0.25	0.17	0.1	0.1	0.03	0.04	0.06	0.19	0.38	0.31
15	0.34	0.24	0.25	0.18	0.11	0.09	0.03	0.03	0.06	0.19	0.39	0.31
16	0.35	0.24	0.25	0.17	0.1	0.09	0.03	0.04	0.07	0.19	0.39	0.3
17	0.35	0.25	0.24	0.17	0.1	0.09	0.03	0.04	0.06	0.2	0.4	0.3
18	0.34	0.24	0.24	0.17	0.1	0.08	0.03	0.04	0.07	0.21	0.4	0.29
19	0.34	0.25	0.24	0.17	0.09	0.08	0.03	0.04	0.08	0.21	0.41	0.3
20	0.33	0.24	0.24	0.17	0.1	0.09	0.02	0.04	0.07	0.22	0.41	0.3
21	0.32	0.24	0.24	0.16	0.1	0.07	0.03	0.04	0.08	0.22	0.4	0.31
22	0.31	0.25	0.24	0.16	0.09	0.07	0.03	0.04	0.07	0.23	0.4	0.31
23	0.31	0.25	0.24	0.16	0.1	0.07	0.02	0.05	0.08	0.24	0.4	0.31
24	0.29	0.25	0.23	0.15	0.1	0.07	0.03	0.04	0.08	0.24	0.4	0.32
25	0.3	0.25	0.23	0.15	0.1	0.06	0.03	0.05	0.09	0.23	0.4	0.32
26	0.3	0.26	0.22	0.15	0.1	0.06	0.03	0.05	0.09	0.25	0.4	0.32
27	0.29	0.25	0.23	0.14	0.1	0.06	0.02	0.05	0.1	0.25	0.39	0.32
28	0.3	0.25	0.22	0.14	0.1	0.06	0.02	0.05	0.09	0.26	0.4	0.31
29	0.3	-	0.21	0.14	0.1	0.05	0.02	0.06	0.1	0.27	0.4	0.31
30	0.3	-	0.22	0.13	0.1	0.06	0.03	0.05	0.1	0.28	0.4	0.31
31	0.29	-	0.22	-	0.1	-	0.02	0.06	-	0.28	-	0.3
TOTAL	10.2	7.19	7.45	5.2	3.32	2.55	1.03	1.16	2.14	5.98	11.15	9.89

WETS Station: ASTORIA RGNL AP, OR

Requested years: 1971 - 2000

Month	Temperature (°F)			Precipitation (inches)				
	Avg daily max	Avg daily min	Avg daily mean	Avg	30% chance will have less than	30% chance will have more than	Avg number of days with 0.10 inch or more	Average total snowfall
Jan	48.5	36.7	42.6	9.62	6.41	11.52	16	1.2
Feb	51.2	37.6	44.4	7.87	5.57	9.32	14	0.4
Mar	53.6	38.6	46.1	7.36	5.63	8.56	15	0.1
Apr	56.5	40.8	48.7	4.93	3.64	5.79	12	0.1
May	60.5	45.4	52.9	3.28	2.22	3.91	9	0.0
Jun	63.9	49.8	56.8	2.57	1.70	3.08	6	0.0
Jul	67.6	52.9	60.3	1.16	0.51	1.42	3	0.0
Aug	68.7	53.2	61.0	1.21	0.62	1.48	3	0.0
Sep	67.9	49.5	58.7	2.61	1.00	3.16	6	0.0
Oct	61.3	44.1	52.7	5.61	3.27	6.82	10	0.0
Nov	53.5	40.3	46.9	10.50	7.60	12.39	17	0.2
Dec	48.7	37.0	42.9	10.40	7.62	12.23	16	0.6
Annual:					59.41	73.51		
Average	58.5	43.8	51.2	-	-	-	-	-
Total	-	-	-	67.12			127	2.6

GROWING SEASON DATES

Requested years of data:	1971 - 2000		
Years with missing data:	24 deg = 0	28 deg = 0	32 deg = 0
Years with no occurrence:	24 deg = 12	28 deg = 4	32 deg = 0
Data years used:	24 deg = 30	28 deg = 30	32 deg = 30

Appendix E. Literature Citations

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. (FWS/OBS-79/31.) U.S. Fish and Wildlife Service. Washington, DC.

Environmental Laboratory. 1987. U.S. Army Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1. U.S. Army Waterways Experiment Station. Vicksburg, MS.

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U.S. Army Corps of Engineers. 2010. U.S. Army Corps of Engineers Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). Technical Report TR-10-3. U.S. Army Engineer Research and Development Center. Vicksburg, MS.

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U.S. Fish and Wildlife Service, Division of Habitat and Resource Conservation. 2016. National Wetlands Inventory – Wetlands. Available: http://www.fws.gov/wetlands/

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Oregon
Kate Brown, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregon.gov/dsl

September 28, 2017

Gil Gramson
15 NW 17th Place
Warrenton, OR

Re: WD # 2017-0364 Wetland Delineation Report for the Gramson Property-Ridge Rd Wetland Delineation
Clatsop County; T8N R10W Sec. 17, Tax Lot 1300
City of Warrenton Local Wetland Inventory T-22

Dear Mr. Gramson:

The Department of State Lands has reviewed the wetland delineation report prepared by Cascade Environmental Group for the site referenced above. Please note that the study area includes only a portion of the tax lots described above (see the attached map). Based upon the information presented in the report, we concur with the wetland and waterway boundaries as mapped in revised Figure 6 of the report. Please replace all copies of the preliminary wetland map with this final Department-approved map.

Within the study area, two wetlands, A and B totaling approximately 4.08 acres, were identified. The wetlands are subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in the wetlands or below the ordinary high water line (OHWL) of a waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined). However, on August 8, 2017 Mitigation Specialist Dana Field noted potential fill activities on the edge of the delineated wetland. Therefore, any further impacts may be subject to permitting.

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will review the report and make a determination of jurisdiction for purposes of the Clean Water Act at the time that a permit application is submitted. We recommend that you attach a copy of this concurrence letter to both copies of any subsequent joint permit application to speed application review.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. Please phone me at 503-986-5246 if you have any questions.

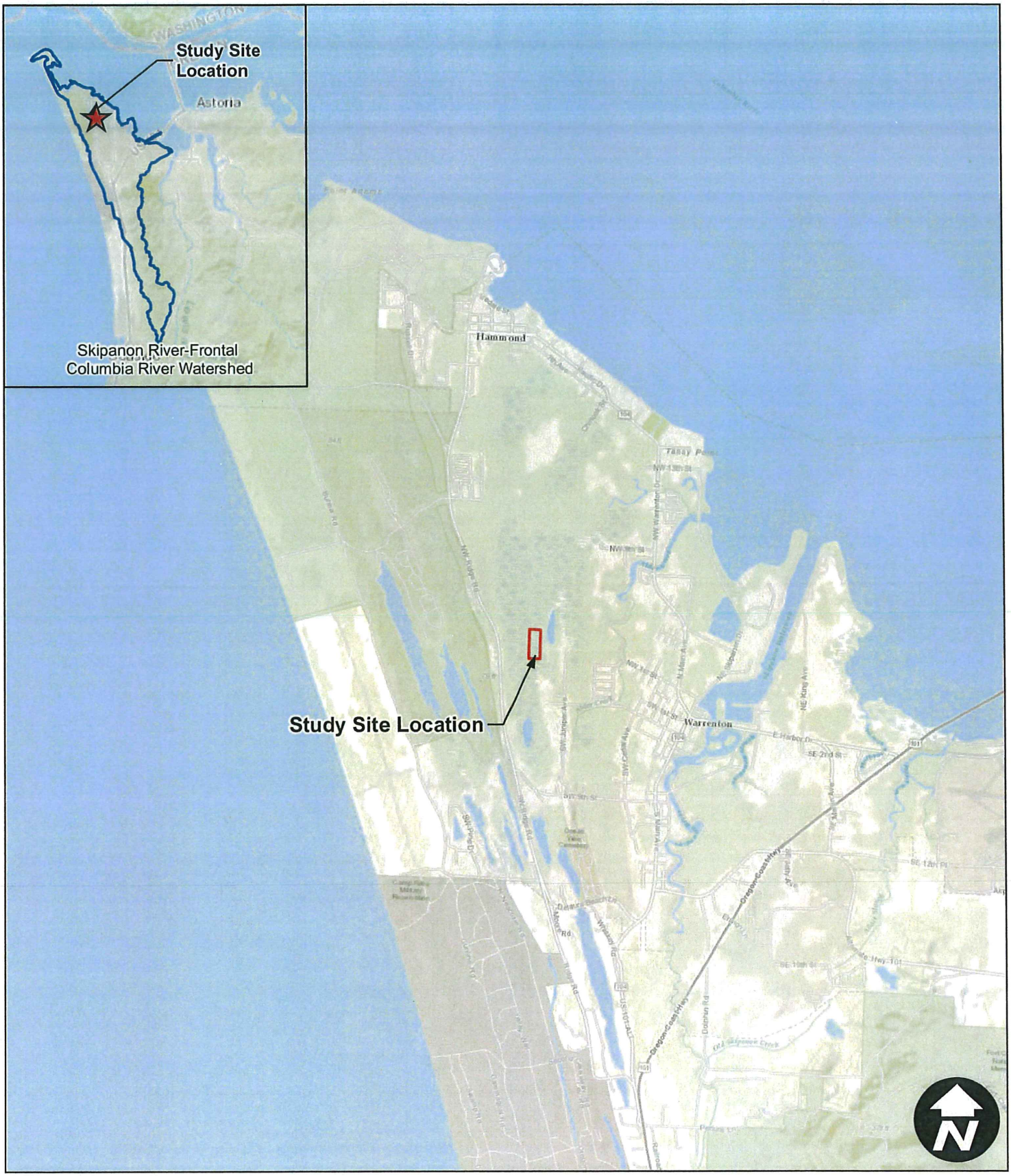
Sincerely,

Chris Stevenson
Jurisdiction Coordinator

Approved by
Kathy Verble, CPSS
Aquatic Resource Specialist

Enclosures

ec: Brent Haddaway, Cascade Environmental Group
Skip Urling, City of Warrenton Planning Dept. (Maps enclosed for updating LWI)
Danielle Erb, Corps of Engineers
Oregon Coastal Management Program
Dan Cary, DSL



Date: 8/9/2017

Scale: 1 inch = 1 mile

Data Source: ESRI, 2017

Figure 1. Location Map

CASCADE ENVIRONMENTAL GROUP

0 0.5 1 2 Miles

Gramson Property - Ridge Road
Wetland Delineation Report

Z:\GIS\157_GramsonLotAdjustment\Mapfiles\Fig1_Location.mxd

Date: 8/9/2017

Scale: 1 inch = 1 mile

Data Source: ESRI, 2017

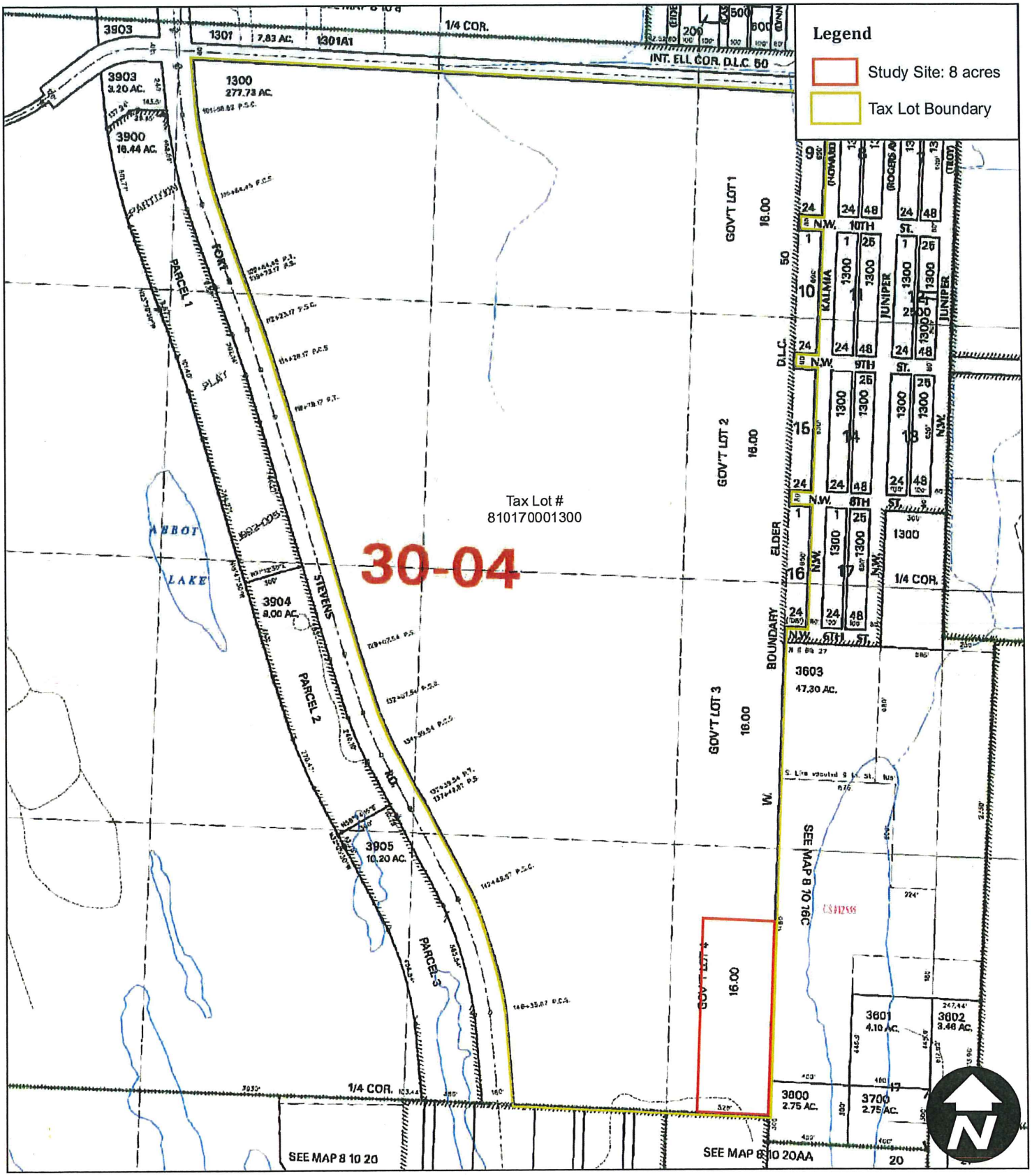
Figure 1. Location Map

CASCADE ENVIRONMENTAL GROUP

0 0.5 1 2 Miles

Gramson Property - Ridge Road
Wetland Delineation Report

Z:\GIS\157_GramsonLotAdjustment\Mapfiles\Fig1_Location.mxd



Date: 8/9/2017
Scale: 1 inch = 650 feet
Data Source: ESRI, 2017; Clatsop County GIS, 2012; ORMAP (http://www.ormap.net)

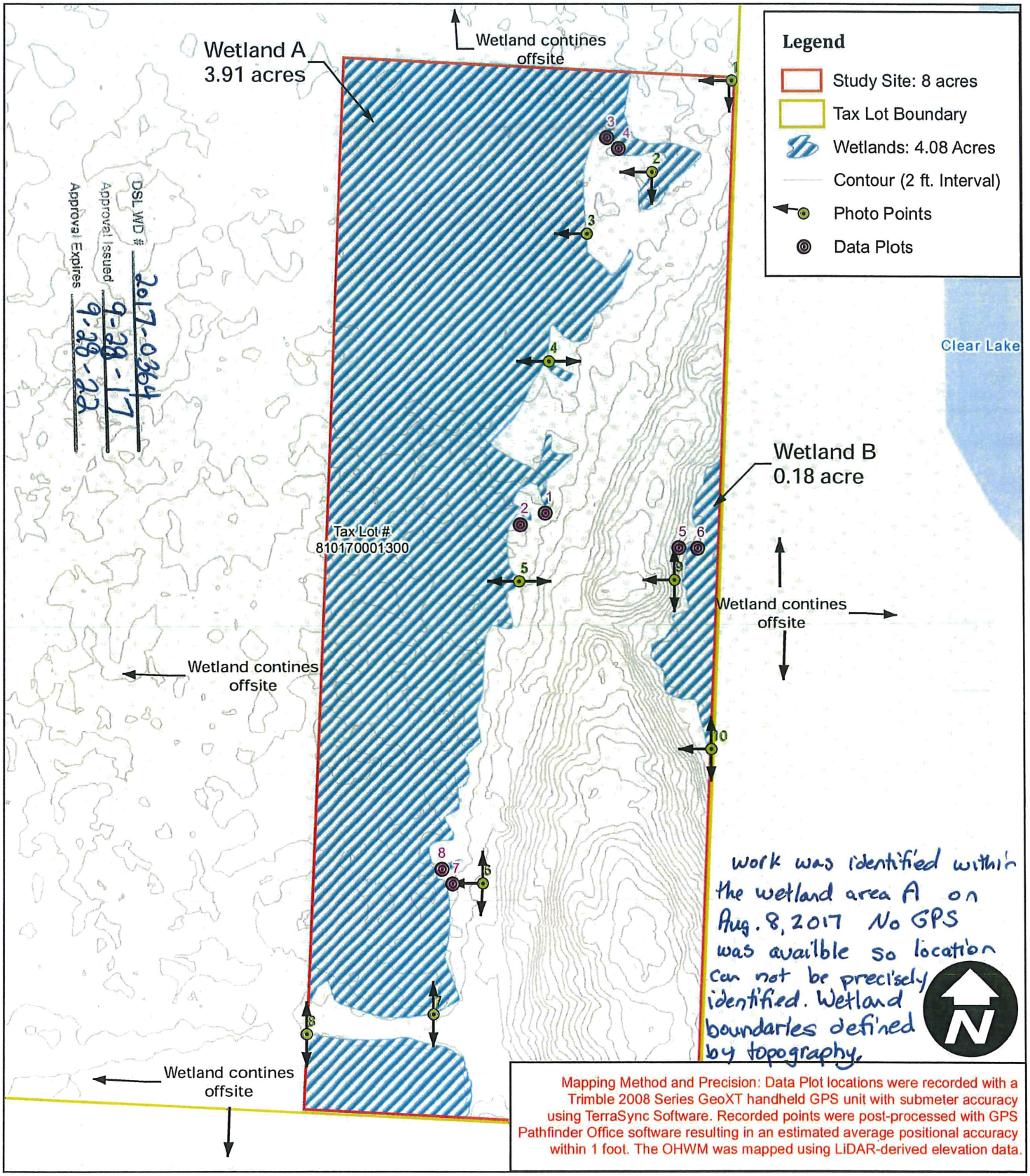
Figure 2. Clatsop County Tax Map: 081017

CASCADE ENVIRONMENTAL GROUP

0 300 600 1,200 Feet

Gramson Property - Ridge Road
Wetland Delineation Report

Z:\GIS\157_GramsonLotAdjustment\Mapfiles\Fig2_TaxMap.mxd



Date: 8/14/2017

Scale: 1 inch = 120 feet

Data Source: ESRI, 2017; Clatsop County GIS, 2012

Figure 6. Wetland Boundary Map

Geotechnical Engineering Report

Clear Lake Development
Warrenton, Oregon

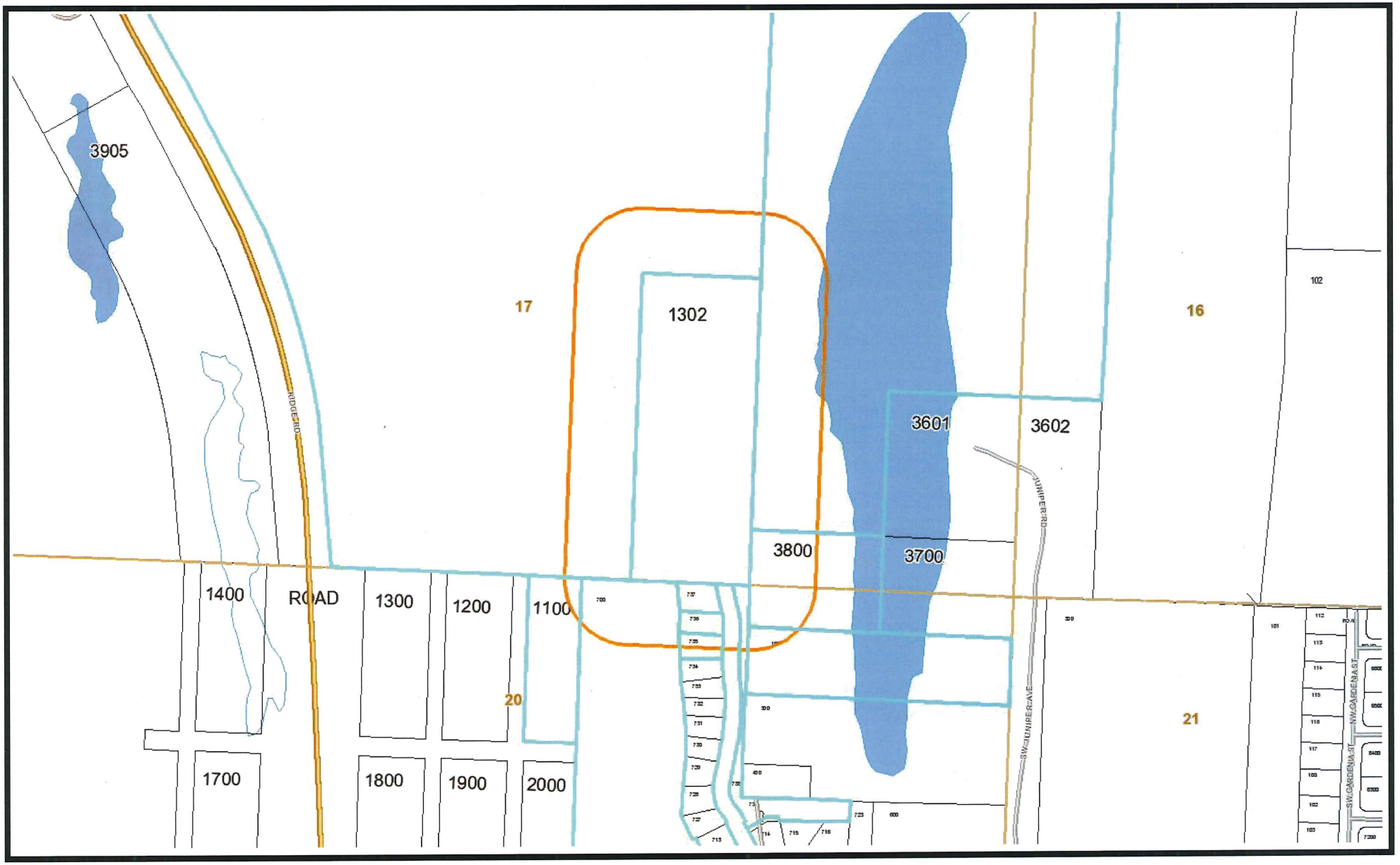
For

Sandworks, Inc.

February 5, 2019

GeoEngineers
Earth Science + Technology

Clear Lake Preliminary PLat APO Buffer



Clatsop County Webmaps

Disclaimer: This map was produced using Clatsop County GIS data. The GIS data is maintained by the County to support its governmental activities. This map should not be used for survey or engineering purposes. The County is not responsible for map errors, omissions, misuse or misinterpretation. Photos may not align with taxlots.

N
W E
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WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

This form must be included with any wetland delineation report submitted to the Department of State Lands for review and approval. A wetland delineation report submittal is not "complete" unless the fully completed and signed report cover form and the required fee are submitted. Attach this form to the front of an unbound report or include a hard copy of the completed form with a CD/DVD that includes a single PDF file of the report cover form and report (minimum 300 dpi resolution) and submit to: **Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279.** A single PDF attachment of the completed cover from and report may be e-mailed to **Wetland_Delineation@dsl.state.or.us.** For submittal of PDF files larger than 10 MB, e-mail instructions on how to access the file from your ftp or other file sharing website. Fees can be paid by check or credit card. Make the check payable to the Oregon Department of State Lands. To pay the fee by credit card, call 503-986-5200.

☐ Applicant ☒ Owner Name, Firm and Address: **Gil Gramson** **15 NW 17th Place** **Warrenton, OR**	Business phone # **503-861-1133** Mobile phone # (optional) E-mail: **gilandanngramson@charter.net**
☐ Authorized Legal Agent, Name and Address:	Business phone # Mobile phone # E-mail:

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: **Gil Gramson** Signature: Gilbert Gramson 8/18/17

Date: Special instructions regarding site access:

Project and Site Information (using decimal degree format for lat/long., enter centroid of site or start & end points of linear project)

Project Name: **Gramson Property – Ridge Road Wetland Delineation**	Latitude: **46.170611°**	Longitude: **-123.944877°**	
Proposed Use: **Lot line adjustment**	Tax Map # 810170001300		
Project Street Address (or other descriptive location): west of 75 SW Juniper Avenue, Warrenton, Oregon	Township **8N** Range **10W** Section **17** QQ **SE/SE** Tax Lot(s) **1300**		
City: **Warrenton** County: **Clatsop**	Waterway: **none** River Mile: **n/a** NWI Quad(s): **Warrenton**		

Wetland Delineation Information

Wetland Consultant Name, Firm and Address: **Brent Haddaway** **Cascasde Environmental Group** **222 NW Davis St, Ste 317** **Portland OR 97209**	Phone # **503-895-8484 Ext 2** Mobile phone # E-mail: **bhaddaway@cascadeenv.com**

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.

Consultant Signature: Date: 8/23/2017

Primary Contact for report review and site access is X Consultant ☐ Applicant/Owner ☐ Authorized Agent

Wetland/Waters Present? ☒ Yes ☐ No | Study Area size: **8.0 ac** Total Wetland Acreage: **4.08**

Check Box Below if Applicable:	**Fees:**
☐ R-F permit application submitted	☐ Fee payment submitted $
☐ Mitigation bank site	☐ Fee ($100) for resubmittal of rejected report
☐ Wetland restoration/enhancement project (not mitigation)	☐ No fee for request for reissuance of an expired report
☐ Industrial Land Certification Program Site	
☐ Reissuance of a recently expired delineation Previous DSL # Expiration date ____	

Other Information:	Y	N	
Has previous delineation/application been made on parcel?	☐	☒	If known, previous DSL #
Does LWI, if any, show wetland or waters on parcel?	☒	☐	

For Office Use Only

DSL Reviewer:	Fee Paid Date: ____ / ____ / ____	DSL WD #
Date Delineation Received: ___ / ____ / ____	DSL Project #	DSL Site #
Scanned: ☐ Final Scan: ☐	DSL WN #	DSL App. #

FILE - CLEAR LAKE GRADING

Oregon
Kate Brown, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregon.gov/dsl

CERTIFIED AND REGULAR MAIL
Tracking #7018 0680 0000 4474 2582

December 10, 2018

DEC600/8115-ENF
GIL GRAMSON
SAND WORKS, INC
15 NW 17TH PL
WARRENTON OR 97146-9728

Re: Notice of Complaint; DSL Enforcement File No. 8115-ENF

Dear Mr. Gramson:

The Oregon Department of State Lands (DSL) administers Oregon's Removal-Fill Law, which protects the state's wetlands and waterways. Removal, filling, or alteration of 50 cubic yards or more of material within the bed and banks of the waters of this state requires a permit from DSL. Removal, fill, or alteration of any amount of material within waters designated Essential Salmonid Habitat or a State Scenic Waterway requires a permit. Waters of this state include the Pacific Ocean, rivers, lakes, most ponds and wetlands, and other natural water bodies.

It has come to our attention that work, specifically clearing, disturbance and filling, has recently occurred or is currently being conducted within or near a wetland near Clear Lake on your property (Township 8N, Range 10W}, Section 17, Tax Lot 1302, Latitude/Longitude 46.173/-123.945) located in Clatsop County. Upon preliminary assessment, the Department believes your activity may be subject to DSL jurisdiction. If you are engaged in activity that requires a permit under Oregon law, this letter serves as notification from the Department that you should cease that activity immediately. In order to make a determination of jurisdiction, the Department would like to meet with you at the site.

Enclosed is a copy of our removal-fill permit brochure, which describes typical situations that require a state permit. Information also is available on the Department of State Lands' website: http://www.oregon.gov/dsl/WW/Pages/Permits.aspx, and in the state law governing removal and fill in state waters, ORS 196.800 - 196.990. A copy of the relevant administrative rules that govern our regulatory process can be found at this web address: http://www.oregon.gov/dsl/WW/Pages/WWLaw.aspx (especially OAR 141-085, 089, and 093).

Please contact me at (503) 986-5302 by December 21 to schedule a site visit. The Department looks forward to your cooperation in resolving this matter.

Sincerely,

Dan Cary

Dan Cary
Aquatic Resource Coordinator
Aquatic Resource Management
Oregon Department of State Lands

DEC:eeb

cc: Robert Bradley, Oregon Dept. of Fish and Wildlife
Danielle Erb, US Army Corps of Engineers, Portland Office
City of Warrenton Planning Dept.
John Wickersham, North Coast Land Conservancy

Geotechnical Engineering Report

Clear Lake Development
Warrenton, Oregon

for
Sandworks, Inc.

February 5, 2019

GeoEngineers

4000 Kruse Way Place
Building 3, Suite 200
Lake Oswego, Oregon 97035
503.624.9274

Geotechnical Engineering Report

Clear Lake Development
Warrenton, Oregon

File No. 23773-001-00

February 5, 2019

Prepared for:

Sandworks, Inc.
15 NW 17th Place
Warrenton, Oregon 97146

Attention: Gil Gramson

Prepared by:

GeoEngineers, Inc.
4000 Kruse Way Place
Building 3, Suite 200
Lake Oswego, Oregon 97035
503.624.9274

Tyler A. Pierce, PE
Project Engineer

Greg A. Landau, PE, GE
Associate Engineer

REGISTERED PROFESSIONAL ENGINEER
77490PE
OREGON
NOV. 8, 2005
GREG ALAN LANDAU
EXPIRES: 12.31.20

TAP:GAL:mls

Table of Contents

LIST OF FIGURES

APPENDICES

INTRODUCTION

This geotechnical report summarizes our geotechnical engineering services for the proposed Clear Lake development located north of Kalmia Avenue in Warrenton, Oregon. A preliminary grading plan for the development was provided by the project civil engineer, Firwood Design Group (Firwood). The preliminary site plan indicates the project will consist of single-family residential buildings, associated stormwater facilities and associated roadways and parking areas. The general location of the site is shown in Figure 1, Vicinity Map.

Our recommendations are based on site development that includes typical light wood-frame structural loads. We have assumed that maximum column and wall loads will be on the order of 10 kips and up to 2 kips per lineal foot (klf) respectively, and that floor loads for slabs on grade will be 75 pounds per square foot (psf) or less. Our recommendations for retaining structures assume that on-site retaining walls will be less than 8 feet in height. Onsite cuts will be up to 16 to 20 feet in some areas and fills will be up to 12 to 16 feet in some areas.

SCOPE OF SERVICES

The purpose of our services was to evaluate soil and groundwater conditions as a basis for developing geotechnical engineering design and construction recommendations for general site development. Our report should not be used for individual residential lot development. Our specific scope of services is summarized in our proposal dated January 18, 2019 and authorized on January 22, 2019, and included the following:

1. Reviewed selected information regarding subsurface soil and groundwater at the site.
2. Coordinated and managed the field explorations, including public utility notification and scheduling of subcontractors and GeoEngineers' field staff.
3. Explored subsurface soil and groundwater conditions at the site by conducting five test pit explorations, extended to approximate depths between 10 to 15 feet below ground surface (bgs) and one infiltration test, conducted at a depth of 2½ feet bgs.
4. Obtained samples at representative intervals from the explorations, observed groundwater conditions and maintained detailed logs in general accordance with ASTM International (ASTM) Standard Practices Test Method D 2488.
5. Performed laboratory tests on selected soil samples obtained from the explorations to evaluate pertinent engineering characteristics.
6. Provided a geotechnical evaluation of the site and design recommendations in this geotechnical report to address the following geotechnical engineering components:
    a. A general description of site topography, geology and subsurface conditions.
    b. An opinion as to the adequacy of the site for development from a geotechnical engineering standpoint.
    c. Recommendations for site preparation measures, including disposition of undocumented fill and unsuitable native soils, recommendations for temporary cut slopes and constraints for wet weather construction.

d. Recommendations for temporary excavation and temporary excavation protection, such as excavation sheeting and bracing.

e. Recommendations for earthwork construction, including use of on-site and imported structural fill, fill placement and compaction requirements, permanent slope construction, and erosion control.

f. Provide geotechnical engineering recommendations for use in designing conventional retaining walls, including backfill and drainage requirements.

g. General recommendations for foundations to support proposed structures, including minimum width and embedment, design soil bearing pressures, settlement estimates (total and differential), coefficient of friction and passive earth pressures for sliding resistance. Individual lot development may require lot-specific explorations and studies to be provided by the individual builders, and the recommendations provided may not be applicable to individual lots.

h. Recommendations for supporting on-grade slabs, including baserock, capillary break and modulus of subgrade reaction.

i. Seismic design parameters, including soil site class evaluation in accordance with the current version of the International Building Code (IBC).

j. Provide infiltration test results.

k. General recommendations for constructing asphaltic concrete (AC) pavements for on-site roadways, including subgrade, drainage, baserock and pavement section.

SITE CONDITIONS

Site Geology

The "Geologic map of the Astoria and Ilwaco quadrangles, Washington and Oregon" shows the site located within dune sand deposits. Dune sands typically consist of large areas of unconsolidated windblown sand. The topography of the site and our field investigations suggest that near-surface site geology is consistent with the published geologic mapping.

Surface Conditions

The proposed development consists of an approximate 7-acre site that stretches north to south and is generally undeveloped with exception of the remains of a sand quarry, located southwest of Clear Lake in Warrenton, Oregon. The site is bordered by Kalmia Avenue and residential developments to the south and forest to the west, north, and east. The site is undeveloped and generally surfaced with dune sand and scattered grasses. Stockpiles of sand, approximately 5 feet high, cover the surface of the northern and western portions of the site, with some concrete debris near the center of the site. In the southeast corner of the site, an approximate 20-foot-high slope drops downward toward the northwest. Over the rest of the site, the ground surface is undulating but generally slopes gently down toward the north.

We also observed the slopes on the east side of Kalmia Avenue, approximately 600 feet south of the project area's southern border. At the time of our exploration, these slopes appeared to be set at an inclination of

1½H:1V and surfaced with grass and scattered shrubs. The remnants of a seed blanket were visible on the upper portions of the slope. We did not observe any signs of sloughing, erosion, or instability.

Subsurface Conditions

In general, the upper subsurface conditions consist of an upper "rootzone" composed of 2 to 4 inches of silty top soil with organics and roots. Beneath the rootzone, gray uniformly graded sand was encountered in all our explorations. In explorations TP-2 through TP-4 the sand had been placed as fill, 2 to 7 feet thick and was generally medium dense, but was loose in isolated areas. Beneath the fill approximately 1 to 2 feet of brown to black silty sand with organics was encountered. The silty sand was likely the previous surface material that was not removed prior to the placement of the fill.

Beneath the silty sand in explorations TP-2 through TP-4 and beneath the rootzone in TP-1 and TP-5 native, massive, uniform sand was encountered. The native sand is generally medium dense, and all test pits were completed within this deposit.

The reader is referred to the exploration logs for more detailed information about the soils encountered in the test pit explorations.

Groundwater

Groundwater was encountered at approximately 13 feet bgs in TP-2. We do not anticipate excavations will extend to this depth but dewatering of trenches and excavations may be required if perched groundwater is encountered. Groundwater conditions at the site are expected to vary seasonally due to rainfall events and other factors not observed in our explorations.

CONCLUSIONS

Based on our explorations, testing and analyses, it is our opinion that the site is suitable for the proposed project from a geotechnical standpoint, provided the recommendations in this report are incorporated into the project design and implemented during construction. We offer the following conclusions regarding geotechnical engineering design and construction at the site.

- Existing utilities if present across the site that will be below proposed structural areas—including proposed buildings and roads—should be relocated or abandoned or grouted full if left in place.
- We anticipate a stripping depth of approximately 2 to 4 inches bgs to remove the rootzone layer. Grubbing and deeper excavations up to several feet will be required to remove the root zones of shrubs and trees. Portions of the site are heavily vegetated and previously buried roots are also expected. Cleared, stripped and grubbed materials should be hauled off site and properly disposed unless otherwise allowed by the project specifications for other uses such as landscaping, stockpiling or on-site burning.
- Permanent cut and fill slopes can be constructed at a slope of 1½H:1V. Slopes will be stable under static conditions but will likely fail during a design level earthquake and will require repair. If failure during a seismic event is unacceptable, a slope buttress should be added as recommended.
- Structures, access roads, and pavements should be set back either 10 feet from the top of the slope or behind a 2H:1V projection from the base of the slope, whichever is greater.

- Proposed residential structures can be satisfactorily supported on continuous and isolated shallow foundations supported on the firm native soils, or on structural fill that extends to the firm native soils.
- If footing subgrade is loose, the sand should be recompacted as described in our recommendations below.
- Slabs-on-grade can be satisfactorily supported on Aggregate Base that is founded on the firm fill soils, firm native soils or on structural fill that extends to the firm native soils. We recommend that slabs-on-grade be provided with proper moisture control by constructing a sub-slab Aggregate Base section as a capillary break and providing a vapor barrier for moisture-sensitive applications.
- Based on the assumed design loads described above, we estimate total settlements will be less than 1 inch for foundations constructed as recommended. If larger structural loads are anticipated, we should review and reassess the estimated settlement.
- As stated above, our report should not be used for individual residential lot development. Specialized studies and additional geotechnical investigations may be required for future development of individual residential lots, depending on the structural requirements and final grading configurations. The recommendations provided in this report are intended for overall site development and infrastructure improvements.
- Infiltration rates provided in this report are in-place infiltration rates and will require correction factors depending on the type of facility selected for the project. Correction factors should be included in design to account for repeated wetting and drying that occur in the area, degree of in-system filtration, frequency and type of system maintenance, vegetation, potential for siltation and bio-fouling, etc., as well as system design correction factors for overflow or redundancy and base and facility size.
- Standard pavement sections, consisting of AC over Aggregate Base and/or Aggregate Subbase, over properly prepared subgrade, can be used to support the estimated traffic loads provided the pavement sections are designed and constructed as recommended in this report.

EARTHWORK RECOMMENDATIONS

Site Preparation

In general, site preparation will include removing or relocating existing site utilities if present, stripping, grubbing and site grading.

Demolition

If present, existing utilities that will be abandoned should be identified prior to project construction. Abandoned utility lines beneath proposed structural areas should be completely removed or filled with grout if abandoned and left in place in order to reduce potential settlement or caving in the future. Materials generated during demolition of existing utilities should be transported off site for disposal.

Existing voids and new depressions created during removal of existing utilities, or other subsurface elements, should be cleaned of loose soil or debris down to firm soil and backfilled with compacted structural fill. Disturbance to a greater depth should be expected if site preparation and earthwork are conducted during periods of wet weather.

Stripping

Based on our observations, we estimate that the depth of stripping will generally be on the order of about 2 to 4 inches. Deeper zones of vegetation should be anticipated in the low lying areas, where we were unable to conduct our explorations. Tree-covered areas, as discussed below, will require deeper localized removal of organics and result in broader disturbance to the upper soils.

Greater stripping depths may be required to remove localized zones of loose or organic soil. The actual stripping depth should be based on field observations at the time of construction. Stripped material and organic material generated during the process should be transported off site for disposal unless otherwise allowed by project specifications for other uses such as landscaping. Clearing and grubbing recommendations provided below should be used in areas where moderate to heavy vegetation are present, or where surface disturbance from prior use has occurred.

Clearing and Grubbing

Where thicker vegetation or trees are present, more extensive site clearing will be required to remove site vegetation, including low-lying wet and heavily vegetated areas, areas of thick grass, or with shrubs and trees that are designated for removal. Following clearing, grubbing and excavations up to several feet will be required to remove the root zones of thick shrubs and trees. Deeper excavations, up to 3 feet may be required to remove the root zones of production trees and up to 5 or 6 feet deep for large mature trees.

In general, roots larger than ½ inch in diameter should be removed. Excavations to remove root zones should be done with a smooth bucket to minimize subgrade disturbance. Portions of the site are heavily vegetated and previously buried roots may be present, even in the current grassy areas of the site. Grubbed materials should be hauled off site and properly disposed unless otherwise allowed by the project specifications for other uses such as landscaping, stockpiling or on-site burning.

Existing voids and new depressions created during demolition, clearing, grubbing or other site preparation activities, should be scarified and recompacted, if possible, or excavated to firm soil and backfilled with Imported Select Structural Fill. Greater depths of disturbance should be expected if site preparation and earthwork are conducted during periods of wet weather.

Subgrade Evaluation

As described above, disturbed material may be present after site stripping and grubbing activities are complete. Subgrade areas to be developed should be prepared to be in a uniformly firm and unyielding condition prior to placing structural fill or structural elements. We recommend that prepared subgrades be observed by a member of our firm, who will evaluate the suitability of the subgrade and identify areas of yielding, which are indicative of soft or loose soil.

Subgrades, including subgrades to receive fill, should be proof-rolled with heavy rubber-tired equipment and/or probed with a ½-inch-diameter steel rod, as appropriate depending on prevailing conditions. If soft, yielding or otherwise unsuitable areas revealed during probing or proof-rolling cannot be compacted to a stable and uniformly firm condition, we recommend that: (1) the subgrade soils be scarified, aerated and recompacted; or (2) the unsuitable soils be removed and replaced with Structural Fill.

Subgrade Protection and Wet Weather Considerations

While the near-surface soils at the site are not highly susceptible to moisture, wet weather construction can still adversely affect the material. Wet weather construction practices may be necessary if work is performed during periods of wet weather. The contractor should be responsible to protect the subgrade during construction.

Earthwork planning should include considerations for minimizing subgrade disturbance. We provide the following recommendations if wet weather construction is considered:

- The ground surface in and around the work area should be sloped so that surface water is directed to a sump or discharge location. The ground surface should be graded such that areas of ponded water do not develop. Measures should be taken by the contractor to prevent surface water from collecting in excavations and trenches. Measures should be implemented to remove surface water from the work areas.
- Slopes with exposed soils should be covered with plastic sheeting or similar means.
- The site soils should not be left in a disturbed or uncompacted state and exposed to moisture. Sealing the surficial soils by rolling with a smooth-drum roller prior to periods of precipitation may reduce the extent to which these soils become wet or unstable.
- Construction activities should be scheduled so that the length of time that soils are left exposed to moisture is reduced to the extent practicable.
- Construction traffic should be restricted to specific areas of the site, preferably areas that are not susceptible to wet weather disturbance such as haul roads and areas that are adequately surfaced with working pad materials.
- When on-site soils are wet of optimum, they are easily disturbed and will not provide adequate support for construction traffic for the proposed development. The use of granular haul roads and staging areas will be necessary to support heavy construction traffic. Generally, a 12- to 16-inch-thick mat of Imported Select Structural Fill should be sufficient for light staging areas for the building pad and light staging activities but is not expected to be adequate to support repeated heavy equipment or truck traffic. The thickness of the Imported Select Structural Fill for haul roads and areas with repeated heavy construction traffic should be increased to between 18 and 24 inches. The actual thickness of haul roads and staging areas should be determined at the time of construction and based on the contractor's approach to site development and the amount and type of construction traffic.
- The baserock (Aggregate Base and Aggregate Subbase) thicknesses described in the, "Pavement Recommendations," section of this report is intended to support post-construction design traffic loads. The design baserock thicknesses will likely not support repeated heavy construction traffic during site construction, or during pavement construction. A thicker baserock section, as described above for haul roads, will likely be required to support construction traffic.
- During periods of wet weather, concrete should be placed as soon as practical after preparing foundation excavations. Foundation bearing surfaces should not be exposed to standing water. Should water infiltrate and pool in the excavation, the water should be removed, and the foundation subgrade should be re-evaluated before placing reinforcing steel or concrete. Foundation subgrade protection, such as a 3- to 4-inch thickness of Aggregate Base/Aggregate Subbase or lean concrete, may be necessary if footing excavations are exposed to extended wet weather conditions.

During wet weather, or when the exposed subgrade is wet or unsuitable for proof-rolling, the prepared subgrade should be evaluated by observing excavation activity and probing with a steel foundation probe. Observations and probing should be performed by a member of our staff. Wet soil that has been disturbed due to site preparation activities, or soft or loose zones identified during probing, should be scarified and recompacted, if possible, or removed and replaced with Imported Select Structural Fill.

Erosion Control

Erosion control measures should be implemented in accordance with the Erosion Control Notes provided in the, "City of Warrenton Public Works Department Engineering Specifications & Design Criteria".

Excavation

Based on the materials encountered in our subsurface explorations, it is our opinion that conventional earthmoving equipment in proper working condition should be capable of making necessary general excavations.

The earthwork contractor should be responsible for reviewing this report, including the exploration logs, providing their own assessments, and providing equipment and methods needed to excavate the site soils while protecting subgrades.

Dewatering

As discussed in the, "Groundwater" section of this report, groundwater was encountered at a depth of 13 feet bgs in one exploration, as such, we do not expect groundwater to be a major factor during shallow excavations and earthwork. Excavations that extend into saturated/wet soils, or excavations that extend into perched groundwater, should be dewatered. Sump pumps are expected to adequately address perched water encountered in shallow excavations. In addition to groundwater seepage, surface water inflow to the excavations during the wet season can be problematic. Provisions for surface water control during earthwork and excavations should be included in the project plans and should be installed prior to commencing earthwork.

Trench Cuts and Trench Shoring

All trench excavations should be made in accordance with applicable Occupational Safety and Health Administration (OSHA) and state regulations. In our opinion, native soils are generally OSHA Type C. Temporary excavations should be shored or laid back at an inclination of 1½H:1V (horizontal to vertical) or flatter if workers are required to enter. Excavations made to construct footings or other structural elements should be laid back or shored at the surface as necessary to prevent soil from falling into excavations.

It should be expected that unsupported cut slopes will experience some sloughing and raveling if exposed to water. Plastic sheeting, placed over the exposed slope and directing water away from the slope, will reduce the potential for sloughing and erosion of cut slopes during wet weather.

The contractor is responsible for shoring methods and shoring system design. Shoring systems should be designed by a professional engineer before installation.

In our opinion, the contractor will be in the best position to observe subsurface conditions continuously throughout the construction process and to respond to the soil and groundwater conditions. Construction

site safety is generally the sole responsibility of the contractor, who also is solely responsible for the means, methods, and sequencing of the construction operations and choices regarding excavations and shoring.

Under no circumstances should the information provided by GeoEngineers be interpreted to mean that GeoEngineers is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

Permanent Slopes

We performed slope stability analyses to assess the proposed fill slopes with a slope angle of 1.5H:1V, under static and dynamic (seismic) loads. The stability of the most likely failure surface is reported as a FS, which is the ratio of resisting forces to driving forces. Generally, a FS of greater than 1.0 indicates that calculated resisting forces are greater than the driving forces and the slope should be stable. FS less than 1.0 indicate that calculated driving forces are greater than resisting forces and that sliding or soil movement is likely along that plane.

A FS of 1.3 is generally considered suitable for non-critical slopes under static (non-seismic) conditions. Slopes that are expected to remain stable under dynamic conditions (earthquake loads) are typically designed to maintain a FS of at least 1.1.

The slope was modeled as a simple 1.5H:1V slope with soil strength parameters estimated from correlations based on conditions encountered in our explorations and with structural loads setback a minimum of 10 feet from the edge of the slope. Under static conditions a factor of safety of 1.43 was obtained, meeting the minimum requirements for slopes adjacent to but not supporting structures. Under the seismic conditions, a factor of safety of 0.86 was obtained, indicating a portion of the slope will likely fail during a design level earthquake event.

Slope Recommendations

Permanent cut and fill slopes should not exceed 1.5H:1V. The slopes should be planted with appropriate vegetation to provide protection against erosion as soon as possible after grading. New structures, pavements and access roads should be located 10 feet from the edge of the top of the slopes or behind a 2H:1V projection from the base of the slope, whichever is greater. Surface water runoff should be collected and directed away from slopes to prevent water from running down the face of the slope.

Based on the results of the slope stability analysis, it should be expected that after a seismic event, the slopes will require repair as they are likely to experience shallow landslides and sloughing.

If slope failure during seismic events is un-acceptable, a riprap buttress with a slope angle not exceeding 1.5H:1V may be constructed over a cut slope not exceeding a slope angle of 1H:1V. The rock buttress should have a minimum thickness of 2 feet and be embedded a minimum of 3-feet at the base.

Construction Considerations for Cut and Fill Embankments

We recommend excavating a series of horizontal benches where existing slopes extend parallel to proposed embankments and are steeper than 5H:1V so that structural fill can be keyed into the native soil as follows:

- The lowermost bench (keyway) should be keyed at least 3 feet deep, or half the vertical embankment height whichever is less, below existing grade at the toe of the fill slope. We recommend a minimum keyway width of 5 feet.
- The fill should be benched into the slope using a maximum bench height of 3 feet and a minimum bench width of 5 feet before placing each next lift of fill.
- Fill slopes should be overbuilt by at least 12 inches and trimmed back to the required slope to maintain a firm face.

Fill Materials

General

Structural areas include areas beneath foundations, floor slabs, pavements, and any other areas intended to support structures or within the influence zone of structures. Fill intended for use in structural areas should meet the criteria for structural fill presented below. All structural fill soils should be free of debris, clay balls, roots, organic matter, frozen soil, man-made contaminants, particles with greatest dimension exceeding 4 inches (3-inch-maximum particle size in building footprints) and other deleterious materials.

The suitability of soil for use as structural fill will depend on the gradation and moisture content of the soil. As the amount of fines (silt and clay) in the soil matrix increases, the soil becomes increasingly more sensitive to small changes in moisture content and achieving the required degree of compaction becomes more difficult or impossible. Recommendations for suitable fill material are provided in the following sections.

On-Site Soils

The on-site soil consists primarily of fine sand. This material is generally suitable for use as general structural fill provided it meets the recommendations above.

Imported Select Structural Fill

Imported Select Structural Fill may be used as structural fill and should consist of pit or quarry run rock, crushed rock, or crushed gravel and sand that is fairly well-graded between coarse and fine sizes (approximately 25 to 65 percent passing the U.S. No. 4 sieve). It should have less than 5 percent passing the U.S. No. 200 sieve and have a minimum of 75 percent fractured particles according to American Association of State Highway and Transportation Officials (AASHTO) TP-61.

Aggregate Base

Aggregate Base material located under floor slabs and pavements, crushed rock used in footing over-excavations and retaining wall backfill should consist of imported clean, durable, crushed angular rock. Such rock should be well-graded, have a maximum particle size of 1 inch, have less than 5 percent passing the U.S. No. 200 sieve (3 percent for retaining walls) and meet the gradation requirements in Table 1. In addition, Aggregate Base shall have a minimum of 75 percent fractured particles according to AASHTO TP-61 and a sand equivalent of not less than 30 percent based on AASHTO T-176.

TABLE 1. RECOMMENDED GRADATION FOR AGGREGATE BASE

Sieve Size	Percent Passing (by weight)
1 inch	100
½ inch	50 to 65
No. 4	40 to 60
No. 40	5 to 15
No. 200	0 to 5

Aggregate Subbase

Aggregate Subbase material should consist of imported, clean, durable, crushed angular rock. Such rock should be well-graded, have a maximum particle size of 1½ inches, have less than 5 percent passing the U.S. No. 200 sieve. In addition, aggregate base shall have a minimum of 75 percent fractured particles according to AASHTO TP-61 and a sand equivalent of not less than 30 percent based on AASHTO T-176.

Trench Backfill

Backfill for pipe bedding and in the pipe zone should consist of well-graded granular material with a maximum particle size of ¾ inch and less than 5 percent passing the U.S. No. 200 sieve. The material should be free of organic matter and other deleterious materials. Further, the backfill should meet the pipe manufacturer's recommendations. Above the pipe zone backfill, Imported Select Structural Fill may be used as described above.

Fill Placement and Compaction

Structural fill should be compacted at moisture contents that are within 3 percent of the optimum moisture content as determined by ASTM Test Method D 1557 (Modified Proctor). The optimum moisture content varies with gradation and should be evaluated during construction. Fill material that is not near the optimum moisture content should be moisture conditioned prior to compaction.

Fill and backfill material should be placed in uniform, horizontal lifts and compacted with appropriate equipment. The appropriate lift thickness will vary depending on the material and compaction equipment used. Fill material should be compacted in accordance with Table 2. It is the contractor's responsibility to select appropriate compaction equipment and place the material in lifts that are thin enough to meet these criteria. However, in no case should the loose lift thickness exceed 18 inches.

TABLE 2. COMPACTION CRITERIA

	Compaction Requirements		
	Percent Maximum Dry Density Determined by ASTM Test Method D 1557 at ± 3% of Optimum Moisture		
Fill Type	0 to 2 Feet Below Subgrade	> 2 Feet Below Subgrade	Pipe Zone
Onsite granular soils	95	92	-----
Imported Granular, maximum particle size < 1¼ inch	95	95	-----

Fill Type	Compaction Requirements		
	Percent Maximum Dry Density Determined by ASTM Test Method D 1557 at ± 3% of Optimum Moisture		
	0 to 2 Feet Below Subgrade	> 2 Feet Below Subgrade	Pipe Zone
Imported Granular, maximum particle size 1¼ inch to 6 inches (3-inch maximum under building footprints)	n/a (proof-roll)	n/a (proof-roll)	-----
Retaining Wall Backfill*	92	92	-----
Nonstructural Zones	90	90	90
Trench Backfill	95	92	90

Note:

* Measures should be taken to prevent overcompaction of the backfill behind retaining walls. We recommend placing the zone of backfill located within 5 feet of the wall in lifts not exceeding about 6 inches in loose thickness and compacting this zone with hand-operated equipment such as a vibrating plate compactor or a jumping jack.

A representative from GeoEngineers should evaluate compaction of each lift of fill. Compaction should be evaluated by in-place compaction testing with a nuclear density gage, unless other methods are proposed for oversized materials and are approved by GeoEngineers during construction. These other methods typically involve procedural placement and compaction specifications together with verification requirements such as proof-rolling.

INFILTRATION TESTING

As requested, we conducted infiltration testing to assist in evaluating the site for stormwater system design. We conducted an infiltration test near the proposed infiltration facility.

We conducted infiltration testing using the open pit infiltration test method based on the U.S. Environmental Protection Agency's (EPA) Onsite Wastewater Treatment and Disposal Systems Design Manual, EPA/625/1-80-012. The infiltration test was completed at a depth of 2½ feet bgs at the location marked as IT-1 in Figure 2, Site Plan.

Testing Methods and Results

The infiltration test pit was 2 feet wide and 2 to 3 feet long with a testing depth of 2 ½ feet. Approximately 2 inches of clean rock was placed in the bottom of the test location to help minimize disturbance of the materials in the excavation while adding water.

After the saturation period, the test location was filled with clean water to at least 1 foot above the bottom of the excavation. The drop-in water level was measured over a period of one hour after the soak period. The field test results are summarized in Table 3 and specific results can be found in Appendix A, Field Explorations and Laboratory Testing.

TABLE 3. INFILTRATION RESULTS

Infiltration Test No.	Depth (feet)	USCS Material Type	Field Measured Infiltration Rate[1] (inches/hour)
IT-1	2 ½	SP	6

Notes:

[1] Appropriate factors should be applied to the field measured infiltration rate, based on the design methodology and specific system used.

USCS = Unified Soil Classification System

The infiltration rates shown in Table 3 are field-measured infiltration rates. These represent a relatively short-term measured rate taken after the required saturation period, and factors of safety have not been applied for the type of infiltration system being considered, or for variability that may be present in the on-site soil. In our opinion, and consistent with the state of the practice, correction factors should be applied to this measured rate to reflect the small area of testing and the number of tests conducted.

Appropriate correction factors should be applied by the project civil engineer as described below. From a geotechnical perspective, we recommend a factor of safety (correction factor) of at least 2 be applied to the infiltration values derived from field observations to account for potential soil variability with depth and location within the area tested. This will result in a recommended infiltration value of 3 inches per hour prior to any factors deemed necessary by the civil designer.

In addition, the stormwater system design engineer should determine and apply appropriate remaining correction factor values, or factors of safety, to account for repeated wetting and drying that occur in this area, degree of in-system filtration, frequency and type of system maintenance, vegetation, potential for siltation and bio-fouling, etc., as well as system design correction factors for overflow or redundancy and base and facility size.

The actual depths, lateral extent and estimated infiltration rates can vary from the values presented above. Field testing/confirmation during construction is often required in large or long systems or other situations where soil conditions may vary within the area where the system is constructed. The results of this field testing might necessitate that the infiltration locations be modified to achieve the design infiltration rate.

Also, infiltration flow rate of a focused stormwater system typically diminishes over time as suspended solids and precipitates in the stormwater further clog the void spaces between the soil particles or cake on the infiltration surface. The serviceable life of an infiltration media in a stormwater system can be extended by pre-filtering or with on-going accessible maintenance. Eventually, most systems will fail and will need to be replaced or have media regenerated or replaced. We recommend that infiltration systems include an overflow that is connected to a suitable discharge point.

Infiltration systems can cause localized high groundwater levels and should not be located near basement walls, retaining walls, or other embedded structures unless these are specifically designed to account for the resulting hydrostatic pressure. Infiltration locations should not be located on sloping ground, unless it is approved by a geotechnical engineer, and should not be infiltrated at a location that allows for flow to travel laterally toward a slope face, such as a mounded water condition or too close to a slope face.

Suitability of Infiltration System

Successful design and implementation of stormwater infiltration systems and whether a system is suitable for a development depend on several site-specific factors. Stormwater infiltration systems are generally best suited for sites having sandy or gravelly soil with saturated hydraulic conductivities greater than 2 inches per hour as encountered at this site. Sites with silty or clayey soil, including sites with fine sand, silty sand, or gravel that has a high percentage of silt or clay in the matrix, or sites with relatively shallow underlying decomposed rock (residual soil) are generally not well suited for stormwater infiltration. Soil that has fine-grained matrices is susceptible to volumetric change and softening during wetting and drying cycles. Fine-grained soils also have large variations in the magnitude of infiltration rates because of bedding and stratification that occurs during alluvial deposition, and often have thin layers of less permeable or impermeable soil within a larger layer.

Local groundwater conditions also significantly affect the capacity to infiltrate from a stormwater system. Sites with shallow groundwater can result in groundwater mounding. A hydraulic gradient that reaches the level of water in the soil immediately drops to zero and local groundwater will rise and mound and the infiltration rate slows dramatically, resulting in overflows or system flooding (failure). Groundwater mounding can also negatively impact structures, slopes, or other areas adjacent to the stormwater infiltration facility. Typically, we do not recommend using infiltration systems where groundwater is less than 10 feet below the bottom of the proposed system unless the host soil is very permeable and consistently graded and will not cause mounding. Some jurisdictions require a minimum of 5 or 10 feet between high groundwater conditions and the bottom of proposed facilities. Depending on the size of the project, adjacent features such as streams that can source water to a system instead of allowing it to drain, and on-site soil infiltration capacities, there may be conditions where even a 10-foot separation between the level of groundwater and the base of the infiltration system may not be sufficient.

As a result of the measured infiltration rates over 2 inches per hour stormwater infiltration is feasible at this site at the depths tested. The resulting design infiltration value (factored value) may require the overall management system to include other types of stormwater management.

PAVEMENT RECOMMENDATIONS

Our pavement recommendations are based on the results of our field observations and analysis. Pavement analyses and recommendations for on-site roadways were developed in general accordance with the ODOT Pavement Design Guide. The recommended pavement sections assume that final improvements surrounding the pavement will be designed and constructed such that stormwater or excess irrigation water from landscape areas does not infiltrate below the pavement section into the baserock materials.

Pavement subgrades should be prepared in accordance with the "Earthwork Recommendations" section of this report. Our pavement recommendations assume that traffic at the site will consist of residential level car traffic and occasional truck traffic. We do not have specific information on the frequency and type of vehicles that will use the area. We have based our design analysis on an assumption of 50 cars and two trucks per day to account for trash and delivery vehicles. If traffic conditions will exceed these values, we will need to modify our pavement recommendations.

Our pavement recommendations are based on the following parameters:

- The pavement subgrades, fill subgrades and site earthwork used to establish road grades below the Aggregate Subbase and Aggregate Base materials have been prepared as described in the "Earthwork Recommendations" section of this report.
- A resilient modulus of 20,000 psi has been estimated for compacted Aggregate Subbase and Aggregate Base materials.
- A resilient modulus of 4,000 psi based on on-site observations and experience in similar sites.
- Initial and terminal serviceability indices of 4.2 and 2.0, respectively.
- Reliability and standard deviations of 75 percent and 0.45, respectively.
- Structural coefficients of 0.42 and 0.10 for the asphalt and baserock, respectively.
- A 20-year design life with a 2 percent growth rate.
- Estimated traffic of 50 cars per day and 2 dual axle trucks.

If any of the noted assumptions vary from project design use, our office should be contacted with the appropriate information so that the pavement designs can be revised or confirmed adequate.

The alternate pavement section using Aggregate Subbase material is provided because it may be more applicable during wet-weather construction where a gravel haul road or working surface is needed to support construction traffic. Wet weather construction recommendations are provided in the "Earthworks Recommendations" section of this report. The subbase material can be incorporated into the gravel working blankets and haul roads provided the material meets the minimum thickness in Table 4 and meets the specifications for Aggregate Subbase. Working blanket and haul road materials that pump excessively, or have excessive fines from construction traffic, should be removed and replaced with specified materials prior to constructing roadways over those areas.

The calculated recommended minimum pavement sections are provided in Table 4. Based on the Paving & Street Design Criteria provided in the "City of Warrenton Public Works Department Engineering Specifications & Design Criteria", the minimum pavement section allowed by the design criteria is 12 inches of compacted baserock and 2 inches of asphalt (2 inches AC over 12 inches aggregate base). Unless the City permits a site- and traffic-specific pavement design as provided in Table 4 below (section thinner than the prescribed standard), the pavement section outlined by the City should be implemented by the project.

TABLE 4. MINIMUM PAVEMENT SECTIONS FOR ON-SITE LOCAL ROADS AND INTERSECTIONS

Minimum Asphalt Thickness (inches)	Minimum Aggregate Base Thickness (inches)	Minimum Aggregate Sub-Base Thickness (inches)
2.5	6.0	0.0
2.5	3.0	6.0

The Aggregate Base course should conform to the "Aggregate Base" section of this report and be compacted to at least 95 percent of the maximum dry density (MDD) determined in accordance with AASHTO T-180/ASTM Test Method D 1557.

The AC pavement should conform to Section 00745 of the most current edition of the ODOT Standard Specifications for Highway Construction. The Job Mix Formula should meet the requirements for a ½-inch Dense Graded Level 2 Mix. The AC should be PG 64-22 grade meeting the ODOT Standard Specifications for Asphalt Materials. AC pavement should be compacted to 92.0 percent at Maximum Theoretical Unit Weight (Rice Gravity) of AASHTO T-209.

STRUCTURAL DESIGN RECOMMENDATIONS

General Foundation Support

Our foundation support recommendations are general in nature as structure types and loads have not been determined and can be highly variable in type, size, and established in very different grades and support conditions across the site. In general, these foundation support recommendations are intended for wood-framed and lightly loaded structures that will be constructed as support buildings, such as maintenance buildings and community use buildings. Our recommendations are not intended for individual residential lots, which should be required to have their own geotechnical explorations and recommendations appropriate to the specific structures based on City requirements and the requirements of the IBC.

On-site support buildings (non-residential structures) can be satisfactorily founded on continuous wall or isolated column footings supported on firm native soils or on structural fill placed over firm native soils. Exterior footings should be established at least 18 inches below the lowest adjacent grade. The recommended minimum footing depth is greater than the anticipated frost depth. Interior footings can be founded a minimum of 12 inches below the top of the first-floor slab. Isolated column and continuous wall footings should have minimum widths of 24 and 18 inches, respectively. We have assumed that maximum column and wall loads will be on the order of 10 kips per column and 2 klf respectively, and that floor loads for slabs on grade will be 75 psf or less. If design loads exceed these assumed values, our recommendations may need to be revised.

Foundation Subgrade Preparation

The subgrades beneath proposed structural elements should be prepared as described below and in the "Earthworks Recommendations" section of this report. If loose existing fill or loose native sand is encountered at the base of the foundations, the upper 2-feet should be recompacted or removed and replaced as described in the Subgrade Evaluation section of this report. We recommend loose or disturbed soils resulting from foundation excavation be removed before placing reinforcing steel and concrete. Foundation bearing surfaces should not be exposed to standing water. If water infiltrates and pools in the excavation, the water, along with any disturbed soil, should be removed before placing reinforcing steel and concrete. A thin gravel layer consisting of Aggregate Base or Aggregate Subbase material can be placed at the base of foundation excavations to help protect the subgrade from weather and light foot traffic. The thickness for the gravel layer should be determined at the time of construction but is typically 3 to 4 inches. The gravel layer should be compacted as described in the "Fill Placement and Compaction" section.

We recommend GeoEngineers observe all foundation subgrades before placing concrete forms and reinforcing steel to determine that bearing surfaces have been adequately prepared and the soil conditions are consistent with those observed during our explorations.

Bearing Capacity – Spread Footings

We recommend conventional footings be proportioned using a maximum allowable bearing pressure of 2,000 psf if supported on firm native soils, or on structural fill placed over firm native soils. This bearing pressure applies to the total of dead and long-term live loads and may be increased by one-third when considering earthquake or wind loads. This is a net bearing pressure. The weight of the footing and overlying backfill can be ignored in calculating footing sizes.

Foundation Settlement

Foundations designed and constructed as recommended are expected to experience settlements of less than 1 inch. Differential settlements of up to one half of the total settlement magnitude can be expected between adjacent footings supporting comparable loads.

Lateral Resistance

The ability of the soil to resist lateral loads is a function of frictional resistance, which can develop on the base of footings and slabs, and the passive resistance, which can develop on the face of below-grade elements of the structure as these elements tend to move into the soil. For footings and floor slabs founded in accordance with the recommendations presented above, the allowable frictional resistance may be computed using a coefficient of friction of 0.30 applied to vertical dead-load forces. Our analysis indicates that the available passive earth pressure for footings confined by on-site soil and structural fill is 350 pcf, modeled as an equivalent fluid pressure. Typically, the movement required to develop the available passive resistance may be relatively large; therefore, we recommend using a reduced passive pressure of 250 pcf equivalent fluid pressure. In addition, in order to rely on passive resistance, a minimum of 10 feet of horizontal clearance must exist between the face of the footings and adjacent downslopes.

The passive earth pressure and friction components may be combined provided that the passive component does not exceed two-thirds of the total. The passive earth pressure value is based on the assumptions that the adjacent grade is level and that groundwater remains below the base of the footing throughout the year. The top foot of soil should be neglected when calculating passive lateral earth pressures unless the foundation area is covered with pavement or slab-on-grade. The lateral resistance values include a safety factor of approximately 1.5.

Drainage Considerations

We recommend the ground surface be sloped away from buildings at least 2 percent. All downspouts should be tightlined away from the building foundation areas and should be discharged into a stormwater system. Downspouts should not be connected to footing drains.

Although not required based on groundwater depths observed in our explorations, if perimeter footing drains are used for below-grade structural elements to mitigate perched water that may flow downslope from uphill development, or behind walls, they should be installed at the base of the exterior footings. Perimeter footing drains should be provided with cleanouts and should consist of at least 4-inch-diameter perforated pipe placed on a 3-inch bed of, and surrounded by, 6 inches of granular drainage material. Aggregate Base can be used for the granular pipe bedding and drainage materials provided the material has less than 3 percent passing the U.S. No. 200 sieve. The drainage material should be enclosed in a non-woven geotextile such as Mirafi 140N (or approved alternate) to prevent fine soil from migrating into the drain material. We recommend against using flexible tubing for footing drainpipes. The perimeter drains

should be sloped to drain by gravity to a suitable discharge, preferably a storm drain. We recommend that the cleanouts be covered and placed in flush-mounted utility boxes. Water collected in roof downspout lines must not be routed to the footing drain lines.

Floor Slabs

Satisfactory subgrade support for floor slabs on grade supporting the planned 75 psf floor loads can be obtained provided the floor slab subgrade is prepared as described in the "Earthworks Recommendations" section of this report. Slabs should be reinforced according to their proposed use and per the structural engineer's recommendations. Subgrade support for concrete slabs can be obtained from the firm native soils or on structural fill placed over firm native soils.

We recommend that on-grade slabs be underlain by a minimum 6-inch-thickness of Aggregate Base acting as a capillary break material to reduce the potential for moisture migration into the slab and to provide an adequate modulus of subgrade reaction as provided below for slab design. The aggregate base material should be placed as recommended for structural fill in the "Fill Placement and Compaction" section of this report.

If dry on-grade slabs are required, for example at interior spaces where adhesives are used to anchor carpet or tile to the slab, a waterproof liner may be placed as a vapor barrier below the slab. The vapor barrier should be selected by the structural engineer and should be accounted for in the design floor section and mix design selection for the concrete, to accommodate the effect of the vapor barrier on concrete slab curing.

Load-bearing concrete slabs should be designed assuming a modulus of subgrade reaction (k) of 150 psi per inch. We estimate that concrete slabs constructed as recommended will settle less than ½ inch. Floor slab subgrades should be evaluated according to the "Subgrade Evaluation" section of this report.

Conventional Retaining Walls

Drainage

Positive drainage is imperative behind retaining structures. This can be accomplished by providing a drainage zone behind the wall consisting of free-draining material and perforated pipes to collect and dispose the water. The drainage material should consist of Aggregate Base having less than 3 percent passing the U.S. No 200 sieve. The wall drainage zone should extend horizontally at least 18 inches from the back of the wall.

A perforated smooth-walled rigid drainpipe, having a minimum diameter of 4 inches, should be placed at the bottom of the drainage zone along the entire length of the wall, with the pipe invert at or below the base of the wall footing. The drainpipes should discharge to a tightline leading to an appropriate collection and disposal system. An adequate number of cleanouts should be incorporated into the design of the drains to provide access for regular maintenance. Roof downspouts, perimeter drains, or other types of drainage systems should not be connected to retaining wall drain systems.

Design Parameters

The lateral pressures presented in this section for retaining walls assume that backfill placed within 2 feet of the wall is compacted by hand-operated equipment to a density of 90 percent of the MDD and that wall

drainage measures are included as previously recommended. For walls constructed as described above, we recommend using an active lateral earth pressure corresponding to an equivalent fluid density of 34 pcf for level backfill condition (slope behind the wall). For walls with backfill sloping upward behind the wall at 2H:1V, an equivalent fluid density of 52 pcf should be used. If the slope is shallower than 2H:1V, the active lateral earth pressures can be linearly interpolated between the two values above. This assumes that the tops of the walls are not structurally restrained and are free to rotate. For the at-rest condition (walls restrained from movement at the top) 16 pcf should be added to the active lateral earth pressures for design for the level backfill or sloped backfill pressures.

For seismic conditions, we recommend a uniform lateral pressure of 5H (where H is the height of the wall) psf be added to these lateral pressures. If the retaining system is designed as a braced system but is expected to yield a small amount during a seismic event, an active earth pressure condition may be assumed and combined with the uniform seismic surcharge pressure.

The recommended pressures do not include the effects of surcharges from surface loads. If vehicles will be operated within one-half the height of the wall, a traffic surcharge should be added to the wall pressure. The traffic surcharge can be approximated by the equivalent weight of an additional 2 feet of backfill behind the wall. Additional surcharge loading conditions should also be considered on a case-by-case basis.

Retaining walls founded on native soil or structural fill extending to these materials may be designed using the allowable soil bearing values and lateral resistance values presented above in the "Foundation Support Recommendations" section of this report. We estimate settlement of retaining structures will be similar to the values previously presented for building foundations.

Seismic Design

We recommend seismic design be performed using the procedure outlined in the 2015 IBC and the 2014 OSSC. The parameters provided in Table 5 are based on the conditions encountered during our subsurface exploration program and should be used in preparation of response spectra for the proposed structures.

TABLE 5. SEISMIC DESIGN PARAMETERS

Parameter	Value
Site Class	D
Peak Ground Acceleration, PGA	0.6 g
Spectral Response Acceleration, S_s	1.34 g
Spectral Response Acceleration, S_1	0.69 g
Site Coefficient, F_a	1.0
Site Coefficient, F_v	1.5
Spectral Response Acceleration (Short Period), S_{DS}	0.89 g
Spectral Response Acceleration (1-Second Period) S_{D1}	0.69 g

Liquefaction Potential

Liquefaction is a phenomenon caused by a rapid increase in pore water pressure that reduces the effective stress between soil particles to near zero. The excessive buildup of pore water pressure results in the

sudden loss of shear strength in a soil. Granular soil, which relies on interparticle friction for strength, is susceptible to liquefaction until the excess pore pressures can dissipate. Sand boils and flows observed at the ground surface after an earthquake are the result of excess pore pressures dissipating upwards, carrying soil particles with the draining water.

In general, loose, saturated sand soil, typically below the groundwater table, with low silt and clay contents is the most susceptible to liquefaction. We encountered loose to medium dense sands to the bottom of our explorations and observed groundwater at a depth of 13 feet bgs in TP-2. During a seismic event, sands beneath the groundwater is likely to liquefy and cause liquefaction induced settlements. The amount and location of liquefaction induced settlements can be determined during the lot specific geotechnical investigation, if required.

The potential for other seismic hazards, including lateral spreading, fault rupture and earthquake-induced landsliding were also evaluated. The site includes cut and fill slopes and as discussed in the Permanent Slopes section of this report some surface sloughing will occur during a design level seismic event that will need repair, but since groundwater is below the base of the slopes, the potential for lateral spreading in negligible.

The closest mapped fault to the site possibly capable of surface rupture is the Cascadia Fault with its inferred extension approximately 16.5 miles west of the site (Personius 2012). No faults are mapped as crossing the site, and the potential for site fault surface rupture is, therefore, very low.

DESIGN REVIEW AND CONSTRUCTION SERVICES

Recommendations provided in this report are based on the assumptions and preliminary design information stated herein. We welcome the opportunity to review and discuss construction plans and specifications for this project as they are being developed. In addition, GeoEngineers should be retained to review the geotechnical-related portions of the plans and specifications to evaluate whether they are in conformance with the recommendations provided in this report.

Satisfactory foundation and earthwork performance depend to a large degree on quality of construction. Sufficient monitoring of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated.

We recommend that GeoEngineers be retained to observe construction at the site to confirm that subsurface conditions are consistent with the site explorations, and to confirm that the intent of project plans and specifications relating to earthwork, pavement and foundation construction are being met.

LIMITATIONS

We have prepared this report for the exclusive use of Sandworks, Inc. and their authorized agents and/or regulatory agencies for the proposed Clear Lake Development in Warrenton, Oregon.

This report is not intended for use by others, and the information contained herein is not applicable to other sites. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in the area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix B, Report Limitations and Guidelines for Use, for additional information pertaining to use of this report.

REFERENCES

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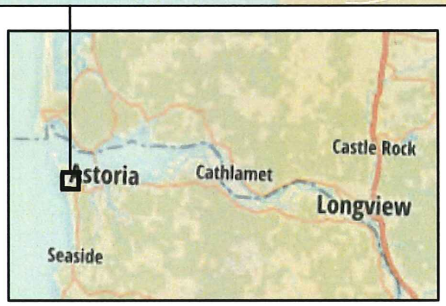

N
W E
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2,000 0 2,000

Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2019

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

Clear Lake Development
Warrenton, Oregon

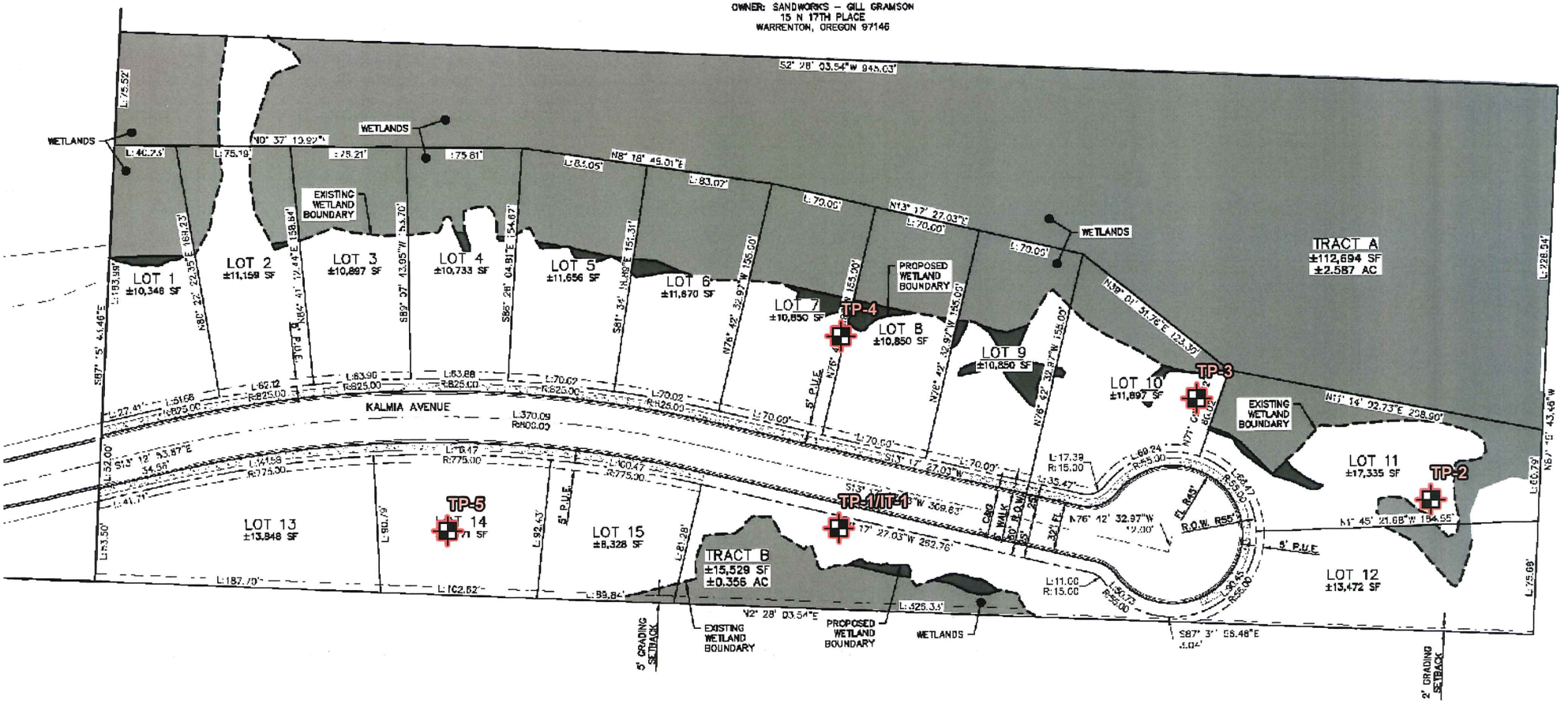
GeoEngineers

Figure 1

P:\23\23773001\GIS\MXD\23773001000_F01_VicinityMap.mxd Date Exported: 02/04/19 by ccabrera

TAX LOT: 8101700001302
TOTAL AREA: ±344,946 SQ. FT. (7.919 ACRES)

OWNER: SANDWORKS – GILL GRAMSON
15 N 17TH PLACE
WARRENTON, OREGON 97146



ABBREVIATIONS:	
R.O.W. = RIGHT OF WAY	PC = POINT OF CURVATURE
P.U.E. = PUBLIC USE EASEMENT	PT = POINT OF TANGENCY
C&G = CURB AND GUTTER	PCC = POINT OF COMPOUND CURVATURE
FL = FLOWLINE	
TC = TOP OF CURB	
SW = SIDEWALK	
P = PAVEMENT	

LEGEND	EXISTING	PROPOSED
MAJOR CONTOUR		
MINOR CONTOUR		
SLOPE (ARROW = DOWN)		-2.0:1
SILT FENCE		
EXISTING WETLANDS		
PROPOSED WETLAND REMOVAL		

NORTH

DRAWN: BD	DESIGNED: EH	CHECKED: EH	
SCALE: AS SHOWN	DATE: JAN. 2019		
PROJECT NO. E18-030			

FDG
Firwood Design Group, LLC
SURVEYING + ENGINEERING + PLANNING
[illegible] HISTORIC COLUMBIA RIVER HWY
TROUTDALE, OREGON 97060
[illegible] (503) 668-3737 • FAX: (503) 665-5736

GILL GRAMSON
15 NW 17TH PLACE
WARRENTON, OR 97146

PRELIMINARY PLAT
CLEAR LAKE SUBDIVISIO
KALMIA AVE, WARRENTON, OR

Legend

TP-1 Approximate Test Pit Location

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APPENDIX A
Field Explorations and Laboratory Testing

APPENDIX A
FIELD EXPLORATIONS AND LABORATORY TESTING

Field Explorations

Soil and groundwater conditions at the proposed Clear Lake development locations were explored on January 25, 2019 by completing 5 test pits (TP-1 through TP-5), and one infiltration test (IT-1). Test pits were extended to approximately 10 feet to 14 feet below ground surface (bgs), the infiltration test was conducted at depth of 2½ bgs, at the approximate locations shown in Figure 2.

Test pits were excavated using an excavator owned and operated by Sandworks, Inc. from Warrenton, Oregon. The test pit excavations were continuously monitored by an engineer from our office who maintained a detailed log of subsurface explorations, visually classified the soil encountered and obtained representative soil samples from the test pits, from the sidewalls above a depth of 4 feet bgs and from excavation spoil below that depth.

Recovered soil samples from exploratory borings were visually classified in the field in general accordance with ASTM International (ASTM) Standard Practices Test Method D 2488 and the classification chart listed in Figure A-1, Key to Exploration Logs. Logs of the test pits are presented in Figures A-2 through A-6. The logs are based on interpretation of the field and laboratory data and indicate the depth at which subsurface materials or their characteristics change, although these changes might actually be gradual.

Laboratory Testing

Soil samples obtained from the explorations were visually classified in the field and in our laboratory using the Unified Soil Classification System (USCS) and ASTM classification methods. ASTM Test Method D 2488 was used to visually classify the soil samples, while ASTM D 2487 was used to classify the soils based on laboratory tests results. Moisture content tests were performed in general accordance with ASTM D 2216-05. Grain size analysis tests were performed in general accordance with ASTM 6913. Results of the moisture contents testing are presented in the appropriate exploration logs at the respective sample depths and results of the grain size analysis are provided in Figure A-7.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

Key to Exploration Logs

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Figure A-1

Date Excavated 1/25/2019	Total Depth (ft) 10	Logged By DMH Checked By TAP	Excavator Equipment Link-Belt 240 Lx Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum Undetermined		Latitude 46.171269 Longitude -123.9443455	Coordinate System Horizontal Datum WGS84	

Elevation (feet) / Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
0				SP	Brown fine sand (medium dense, wet) (native)			
1								
2					Occasional trace roots, roots up to 2 inches in diameter			
3								Infiltration test conduction at 2 1/2 feet bgs
4		1 SA				15	2	
5								
6					No organics			
7								
8								
9		2						Moderate caving observed to full depth
10								

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Test Pit TP-1/IT-1

GeoEngineers

Project: Clear Lake Development
Project Location: Warrenton, Oregon
Project Number: 23773-001-00

Figure A-2
Sheet 1 of 1

Date Excavated 1/25/2019	Total Depth (ft) 14	Logged By DMH Checked By TAP	Excavator Equipment Link-Belt 240 Lx Excavator	See "Remarks" section for groundwater observed See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum Undetermined		Latitude 46.1721717 Longitude -123.9443572	Coordinate System Horizontal Datum WGS84	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				SP	Gray-brown fine sand (loose, moist) (fill)			
	5				SM	Brown to black sandy silt with organic matter (native) (medium dense, moist)			
	6				SP	Gray-brown uniform fine sand (medium dense, moist)			
	12					Becomes gray, wet			
	13		1						Slow groundwater seepage observed at 13 feet Moderate caving observed to full depth
	14								

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Test Pit TP-2

GeoEngineers

Project: Clear Lake Development
Project Location: Warrenton, Oregon
Project Number: 23773-001-00

Figure A-3
Sheet 1 of 1

Date Excavated 1/25/2019	Total Depth (ft) 14	Logged By DMH Checked By TAP	Excavator Equipment Link-Belt 240 Lx Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum Undetermined		Latitude 46.171799 Longitude -123.9446214	Coordinate System Horizontal Datum WGS84	

Elevation (feet) / Depth (feet)	SAMPLE: Testing Sample / Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
0			TS	4-inch root zone			
1			SP	Gray-brown fine sand with concrete debris (medium dense, moist) (fill)			
2			SM	Brown to black silty sand with organic matter (medium dense, moist) (native)			
3			SP	Gray-brown fine sand (medium dense, moist)			
4	1 MC				15		
5							
6							
7							
8							
9							
10							
11							
12							
13							Moderate caving observed to full depth
14							

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Test Pit TP-3

GeoEngineers

Project: Clear Lake Development
Project Location: Warrenton, Oregon
Project Number: 23773-001-00

Figure A-4
Sheet 1 of 1

Date Excavated 1/25/2019	Total Depth (ft) 15	Logged By DMH Checked By TAP	Excavator Equipment Link-Belt 240 Lx Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum Undetermined		Latitude 46.1712555 Longitude -123.9447478	Coordinate System Horizontal Datum WGS84	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				SP	Gray-brown fine sand (loose, moist) (fill)			
	1								
	2								
	3								
	4								
	5								
	6								
	7				SM	Brown to black silty sand with organic matter (medium dense, moist) (native)			
	8								
	9				SP	Orange-brown fine sand (medium dense, moist)			
	10		1						
	11					Becomes gray-brown			
	12								
	13								
	14								
	15								Moderate caving observed to full depth

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Test Pit TP-4

GeoEngineers

Project: Clear Lake Development
Project Location: Warrenton, Oregon
Project Number: 23773-001-00

Figure A-5
Sheet 1 of 1

Date Excavated 1/25/2019	Total Depth (ft) 13	Logged By DMH Checked By TAP	Excavator Equipment Link-Belt 240 Lx Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum Undetermined		Latitude 46.1706788 Longitude -123.9442851	Coordinate System Horizontal Datum WGS84	

Elevation (feet) / Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
0				TS	2-inch root zone			
0				SP	Gray-brown fine sand (medium dense, moist) (native)			
5		1						
12		2						Moderate caving observed to full depth

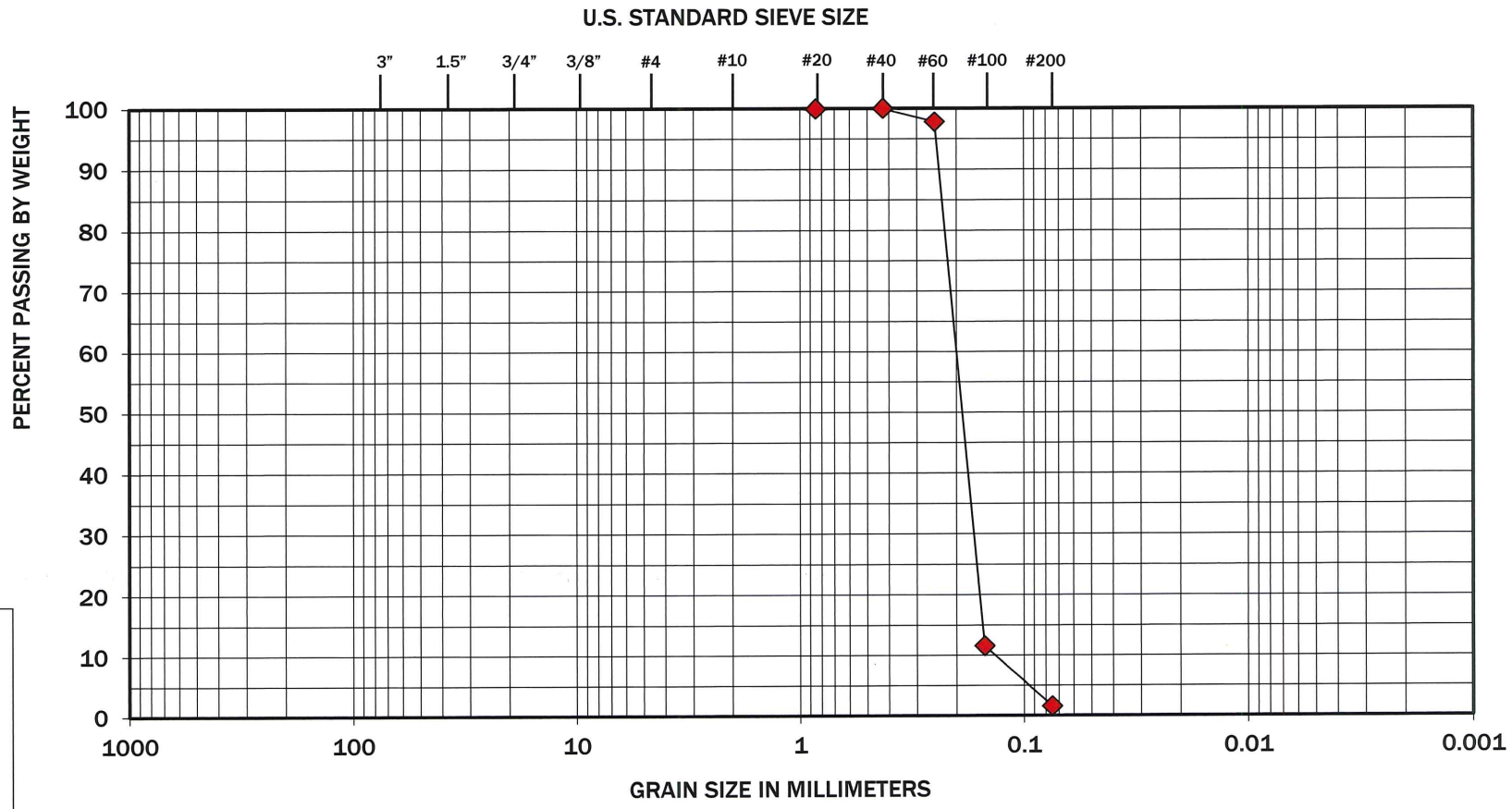
Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Test Pit TP-5

GeoEngineers

Project: Clear Lake Development
Project Location: Warrenton, Oregon
Project Number: 23773-001-00

Figure A-6
Sheet 1 of 1



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Exploration	Depth (feet)	Moisture (%)	Soil Description
◆	TP-1	1	4	Gray Brown Fine Sand (SP)

The grain size analysis results were obtained in general accordance with ASTM D 6913.

GeoEngineers

Clear Lake Development
Warrenton, Oregon

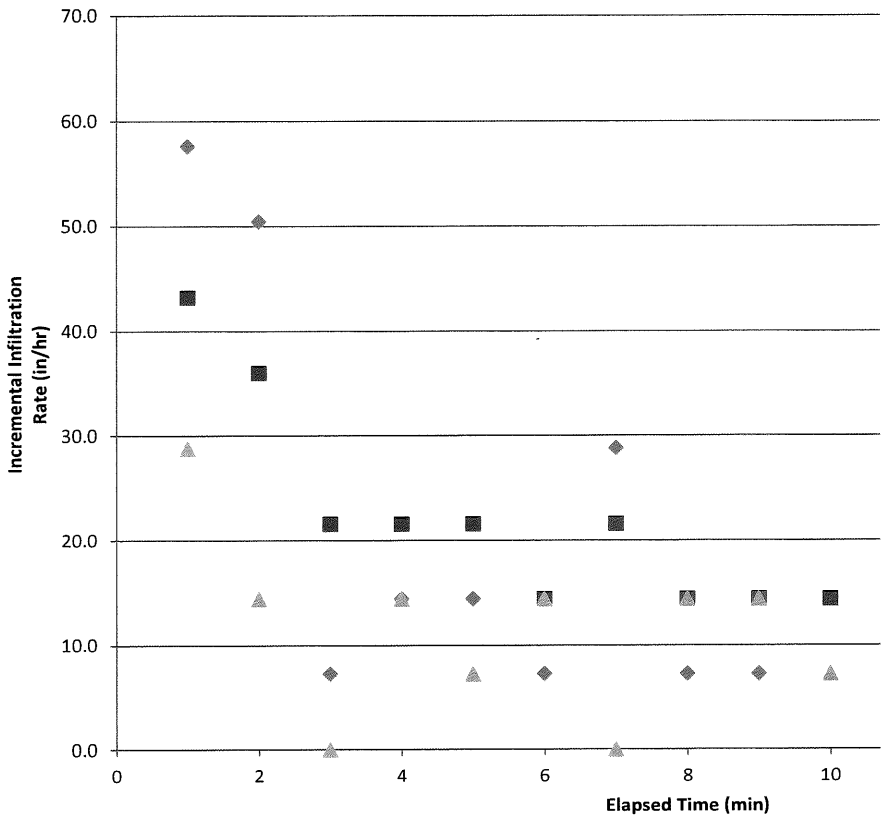
Sieve Analysis Results

Figure A-7

Soil Texture
Brown-Gray Uniform Sand (SP)

Total Time (min)	Depth to Water from Top of Pit (inches)	Dist. Interval (inches)	Infiltration (inches/hour)	
0	24.6			
1	25.6	1.0	57.6	
2	26.4	0.8	50.4	
3	26.5	0.1	7.2	
4	26.8	0.2	14.4	
5	27.0	0.2	14.4	Test #1
6	27.1	0.1	7.2	
7	27.6	0.5	28.8	
8	27.7	0.1	7.2	
9	27.8	0.1	7.2	
0	22.9			
1	23.6	0.7	43.2	
2	24.2	0.6	36.0	
3	24.6	0.4	21.6	
4	25.0	0.4	21.6	
5	25.3	0.4	21.6	Test #2
6	25.6	0.2	14.4	
7	25.92	0.4	21.6	
8	26.2	0.2	14.4	
9	26.4	0.2	14.4	
10	26.6	0.2	14.4	
1	22.2			
2	22.7	0.5	28.8	
3	22.9	0.2	14.4	
4	22.9	0.0	0.0	
5	23.2	0.2	14.4	
6	23.3	0.1	7.2	
7	23.5	0.2	14.4	
8	23.5	0.0	0.0	Test #3
9	23.8	0.2	14.4	
10	24.0	0.2	14.4	
11	24.1	0.1	7.2	
12	24.1	0.0	0.0	
13	24.4	0.2	14.4	
14	24.6	0.2	14.4	
15	24.7	0.1	6.0	
16	24.8	0.1	6.0	

Rate Over Time



APPENDIX B
Report Limitations and Guidelines for Use

APPENDIX B
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory "limitations" provisions in its reports. Please confer with GeoEngineers if you need to know more how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the proposed Clear Lake development specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with Sandworks, Inc. dated January 18, 2019 and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

A Geotechnical Engineering or Geologic Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the proposed Clear Lake development in Warrenton, Oregon. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

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[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structures;
- elevation, configuration, location, orientation or weight of the proposed structure;

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Environmental Concerns Are Not Covered

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

Geotechnical Engineering Report Recommendations Are Not Final

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the

explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable, but separating logs from the report can create a risk of misinterpretation.

Give Contractors a Complete Report and Guidance

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- encourages contractors to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer.

Contractors Are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

GeoEngineers

Geotechnical Engineering Report

Clear Lake Development
Warrenton, Oregon

For

Sandworks, Inc.

February 5, 2019

GeoEngineers
Earth Science + Technology

Geotechnical Engineering Report

Clear Lake Development
Warrenton, Oregon

for
Sandworks, Inc.

February 5, 2019

GeoEngineers

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Geotechnical Engineering Report

Clear Lake Development
Warrenton, Oregon

File No. 23773-001-00

February 5, 2019

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INTRODUCTION

This geotechnical report summarizes our geotechnical engineering services for the proposed Clear Lake development located north of Kalmia Avenue in Warrenton, Oregon. A preliminary grading plan for the development was provided by the project civil engineer, Firwood Design Group (Firwood). The preliminary site plan indicates the project will consist of single-family residential buildings, associated stormwater facilities and associated roadways and parking areas. The general location of the site is shown in Figure 1, Vicinity Map.

Our recommendations are based on site development that includes typical light wood-frame structural loads. We have assumed that maximum column and wall loads will be on the order of 10 kips and up to 2 kips per lineal foot (klf) respectively, and that floor loads for slabs on grade will be 75 pounds per square foot (psf) or less. Our recommendations for retaining structures assume that on-site retaining walls will be less than 8 feet in height. Onsite cuts will be up to 16 to 20 feet in some areas and fills will be up to 12 to 16 feet in some areas.

SCOPE OF SERVICES

The purpose of our services was to evaluate soil and groundwater conditions as a basis for developing geotechnical engineering design and construction recommendations for general site development. Our report should not be used for individual residential lot development. Our specific scope of services is summarized in our proposal dated January 18, 2019 and authorized on January 22, 2019, and included the following:

1. Reviewed selected information regarding subsurface soil and groundwater at the site.
2. Coordinated and managed the field explorations, including public utility notification and scheduling of subcontractors and GeoEngineers' field staff.
3. Explored subsurface soil and groundwater conditions at the site by conducting five test pit explorations, extended to approximate depths between 10 to 15 feet below ground surface (bgs) and one infiltration test, conducted at a depth of 2½ feet bgs.
4. Obtained samples at representative intervals from the explorations, observed groundwater conditions and maintained detailed logs in general accordance with ASTM International (ASTM) Standard Practices Test Method D 2488.
5. Performed laboratory tests on selected soil samples obtained from the explorations to evaluate pertinent engineering characteristics.
6. Provided a geotechnical evaluation of the site and design recommendations in this geotechnical report to address the following geotechnical engineering components:
    a. A general description of site topography, geology and subsurface conditions.
    b. An opinion as to the adequacy of the site for development from a geotechnical engineering standpoint.
    c. Recommendations for site preparation measures, including disposition of undocumented fill and unsuitable native soils, recommendations for temporary cut slopes and constraints for wet weather construction.

d. Recommendations for temporary excavation and temporary excavation protection, such as excavation sheeting and bracing.

e. Recommendations for earthwork construction, including use of on-site and imported structural fill, fill placement and compaction requirements, permanent slope construction, and erosion control.

f. Provide geotechnical engineering recommendations for use in designing conventional retaining walls, including backfill and drainage requirements.

g. General recommendations for foundations to support proposed structures, including minimum width and embedment, design soil bearing pressures, settlement estimates (total and differential), coefficient of friction and passive earth pressures for sliding resistance. Individual lot development may require lot-specific explorations and studies to be provided by the individual builders, and the recommendations provided may not be applicable to individual lots.

h. Recommendations for supporting on-grade slabs, including baserock, capillary break and modulus of subgrade reaction.

i. Seismic design parameters, including soil site class evaluation in accordance with the current version of the International Building Code (IBC).

j. Provide infiltration test results.

k. General recommendations for constructing asphaltic concrete (AC) pavements for on-site roadways, including subgrade, drainage, baserock and pavement section.

SITE CONDITIONS

Site Geology

The "Geologic map of the Astoria and Ilwaco quadrangles, Washington and Oregon" shows the site located within dune sand deposits. Dune sands typically consist of large areas of unconsolidated windblown sand. The topography of the site and our field investigations suggest that near-surface site geology is consistent with the published geologic mapping.

Surface Conditions

The proposed development consists of an approximate 7-acre site that stretches north to south and is generally undeveloped with exception of the remains of a sand quarry, located southwest of Clear Lake in Warrenton, Oregon. The site is bordered by Kalmia Avenue and residential developments to the south and forest to the west, north, and east. The site is undeveloped and generally surfaced with dune sand and scattered grasses. Stockpiles of sand, approximately 5 feet high, cover the surface of the northern and western portions of the site, with some concrete debris near the center of the site. In the southeast corner of the site, an approximate 20-foot-high slope drops downward toward the northwest. Over the rest of the site, the ground surface is undulating but generally slopes gently down toward the north.

We also observed the slopes on the east side of Kalmia Avenue, approximately 600 feet south of the project area's southern border. At the time of our exploration, these slopes appeared to be set at an inclination of

1½H:1V and surfaced with grass and scattered shrubs. The remnants of a seed blanket were visible on the upper portions of the slope. We did not observe any signs of sloughing, erosion, or instability.

Subsurface Conditions

In general, the upper subsurface conditions consist of an upper "rootzone" composed of 2 to 4 inches of silty top soil with organics and roots. Beneath the rootzone, gray uniformly graded sand was encountered in all our explorations. In explorations TP-2 through TP-4 the sand had been placed as fill, 2 to 7 feet thick and was generally medium dense, but was loose in isolated areas. Beneath the fill approximately 1 to 2 feet of brown to black silty sand with organics was encountered. The silty sand was likely the previous surface material that was not removed prior to the placement of the fill.

Beneath the silty sand in explorations TP-2 through TP-4 and beneath the rootzone in TP-1 and TP-5 native, massive, uniform sand was encountered. The native sand is generally medium dense, and all test pits were completed within this deposit.

The reader is referred to the exploration logs for more detailed information about the soils encountered in the test pit explorations.

Groundwater

Groundwater was encountered at approximately 13 feet bgs in TP-2. We do not anticipate excavations will extend to this depth but dewatering of trenches and excavations may be required if perched groundwater is encountered. Groundwater conditions at the site are expected to vary seasonally due to rainfall events and other factors not observed in our explorations.

CONCLUSIONS

Based on our explorations, testing and analyses, it is our opinion that the site is suitable for the proposed project from a geotechnical standpoint, provided the recommendations in this report are incorporated into the project design and implemented during construction. We offer the following conclusions regarding geotechnical engineering design and construction at the site.

- Existing utilities if present across the site that will be below proposed structural areas—including proposed buildings and roads—should be relocated or abandoned or grouted full if left in place.
- We anticipate a stripping depth of approximately 2 to 4 inches bgs to remove the rootzone layer. Grubbing and deeper excavations up to several feet will be required to remove the root zones of shrubs and trees. Portions of the site are heavily vegetated and previously buried roots are also expected. Cleared, stripped and grubbed materials should be hauled off site and properly disposed unless otherwise allowed by the project specifications for other uses such as landscaping, stockpiling or on-site burning.
- Permanent cut and fill slopes can be constructed at a slope of 1½H:1V. Slopes will be stable under static conditions but will likely fail during a design level earthquake and will require repair. If failure during a seismic event is unacceptable, a slope buttress should be added as recommended.
- Structures, access roads, and pavements should be set back either 10 feet from the top of the slope or behind a 2H:1V projection from the base of the slope, whichever is greater.

- Proposed residential structures can be satisfactorily supported on continuous and isolated shallow foundations supported on the firm native soils, or on structural fill that extends to the firm native soils.
- If footing subgrade is loose, the sand should be recompacted as described in our recommendations below.
- Slabs-on-grade can be satisfactorily supported on Aggregate Base that is founded on the firm fill soils, firm native soils or on structural fill that extends to the firm native soils. We recommend that slabs-on-grade be provided with proper moisture control by constructing a sub-slab Aggregate Base section as a capillary break and providing a vapor barrier for moisture-sensitive applications.
- Based on the assumed design loads described above, we estimate total settlements will be less than 1 inch for foundations constructed as recommended. If larger structural loads are anticipated, we should review and reassess the estimated settlement.
- As stated above, our report should not be used for individual residential lot development. Specialized studies and additional geotechnical investigations may be required for future development of individual residential lots, depending on the structural requirements and final grading configurations. The recommendations provided in this report are intended for overall site development and infrastructure improvements.
- Infiltration rates provided in this report are in-place infiltration rates and will require correction factors depending on the type of facility selected for the project. Correction factors should be included in design to account for repeated wetting and drying that occur in the area, degree of in-system filtration, frequency and type of system maintenance, vegetation, potential for siltation and bio-fouling, etc., as well as system design correction factors for overflow or redundancy and base and facility size.
- Standard pavement sections, consisting of AC over Aggregate Base and/or Aggregate Subbase, over properly prepared subgrade, can be used to support the estimated traffic loads provided the pavement sections are designed and constructed as recommended in this report.

EARTHWORK RECOMMENDATIONS

Site Preparation

In general, site preparation will include removing or relocating existing site utilities if present, stripping, grubbing and site grading.

Demolition

If present, existing utilities that will be abandoned should be identified prior to project construction. Abandoned utility lines beneath proposed structural areas should be completely removed or filled with grout if abandoned and left in place in order to reduce potential settlement or caving in the future. Materials generated during demolition of existing utilities should be transported off site for disposal.

Existing voids and new depressions created during removal of existing utilities, or other subsurface elements, should be cleaned of loose soil or debris down to firm soil and backfilled with compacted structural fill. Disturbance to a greater depth should be expected if site preparation and earthwork are conducted during periods of wet weather.

Stripping

Based on our observations, we estimate that the depth of stripping will generally be on the order of about 2 to 4 inches. Deeper zones of vegetation should be anticipated in the low lying areas, where we were unable to conduct our explorations. Tree-covered areas, as discussed below, will require deeper localized removal of organics and result in broader disturbance to the upper soils.

Greater stripping depths may be required to remove localized zones of loose or organic soil. The actual stripping depth should be based on field observations at the time of construction. Stripped material and organic material generated during the process should be transported off site for disposal unless otherwise allowed by project specifications for other uses such as landscaping. Clearing and grubbing recommendations provided below should be used in areas where moderate to heavy vegetation are present, or where surface disturbance from prior use has occurred.

Clearing and Grubbing

Where thicker vegetation or trees are present, more extensive site clearing will be required to remove site vegetation, including low-lying wet and heavily vegetated areas, areas of thick grass, or with shrubs and trees that are designated for removal. Following clearing, grubbing and excavations up to several feet will be required to remove the root zones of thick shrubs and trees. Deeper excavations, up to 3 feet may be required to remove the root zones of production trees and up to 5 or 6 feet deep for large mature trees.

In general, roots larger than ½ inch in diameter should be removed. Excavations to remove root zones should be done with a smooth bucket to minimize subgrade disturbance. Portions of the site are heavily vegetated and previously buried roots may be present, even in the current grassy areas of the site. Grubbed materials should be hauled off site and properly disposed unless otherwise allowed by the project specifications for other uses such as landscaping, stockpiling or on-site burning.

Existing voids and new depressions created during demolition, clearing, grubbing or other site preparation activities, should be scarified and recompacted, if possible, or excavated to firm soil and backfilled with Imported Select Structural Fill. Greater depths of disturbance should be expected if site preparation and earthwork are conducted during periods of wet weather.

Subgrade Evaluation

As described above, disturbed material may be present after site stripping and grubbing activities are complete. Subgrade areas to be developed should be prepared to be in a uniformly firm and unyielding condition prior to placing structural fill or structural elements. We recommend that prepared subgrades be observed by a member of our firm, who will evaluate the suitability of the subgrade and identify areas of yielding, which are indicative of soft or loose soil.

Subgrades, including subgrades to receive fill, should be proof-rolled with heavy rubber-tired equipment and/or probed with a ½-inch-diameter steel rod, as appropriate depending on prevailing conditions. If soft, yielding or otherwise unsuitable areas revealed during probing or proof-rolling cannot be compacted to a stable and uniformly firm condition, we recommend that: (1) the subgrade soils be scarified, aerated and recompacted; or (2) the unsuitable soils be removed and replaced with Structural Fill.

Subgrade Protection and Wet Weather Considerations

While the near-surface soils at the site are not highly susceptible to moisture, wet weather construction can still adversely affect the material. Wet weather construction practices may be necessary if work is performed during periods of wet weather. The contractor should be responsible to protect the subgrade during construction.

Earthwork planning should include considerations for minimizing subgrade disturbance. We provide the following recommendations if wet weather construction is considered:

- The ground surface in and around the work area should be sloped so that surface water is directed to a sump or discharge location. The ground surface should be graded such that areas of ponded water do not develop. Measures should be taken by the contractor to prevent surface water from collecting in excavations and trenches. Measures should be implemented to remove surface water from the work areas.
- Slopes with exposed soils should be covered with plastic sheeting or similar means.
- The site soils should not be left in a disturbed or uncompacted state and exposed to moisture. Sealing the surficial soils by rolling with a smooth-drum roller prior to periods of precipitation may reduce the extent to which these soils become wet or unstable.
- Construction activities should be scheduled so that the length of time that soils are left exposed to moisture is reduced to the extent practicable.
- Construction traffic should be restricted to specific areas of the site, preferably areas that are not susceptible to wet weather disturbance such as haul roads and areas that are adequately surfaced with working pad materials.
- When on-site soils are wet of optimum, they are easily disturbed and will not provide adequate support for construction traffic for the proposed development. The use of granular haul roads and staging areas will be necessary to support heavy construction traffic. Generally, a 12- to 16-inch-thick mat of Imported Select Structural Fill should be sufficient for light staging areas for the building pad and light staging activities but is not expected to be adequate to support repeated heavy equipment or truck traffic. The thickness of the Imported Select Structural Fill for haul roads and areas with repeated heavy construction traffic should be increased to between 18 and 24 inches. The actual thickness of haul roads and staging areas should be determined at the time of construction and based on the contractor's approach to site development and the amount and type of construction traffic.
- The baserock (Aggregate Base and Aggregate Subbase) thicknesses described in the, "Pavement Recommendations," section of this report is intended to support post-construction design traffic loads. The design baserock thicknesses will likely not support repeated heavy construction traffic during site construction, or during pavement construction. A thicker baserock section, as described above for haul roads, will likely be required to support construction traffic.
- During periods of wet weather, concrete should be placed as soon as practical after preparing foundation excavations. Foundation bearing surfaces should not be exposed to standing water. Should water infiltrate and pool in the excavation, the water should be removed, and the foundation subgrade should be re-evaluated before placing reinforcing steel or concrete. Foundation subgrade protection, such as a 3- to 4-inch thickness of Aggregate Base/Aggregate Subbase or lean concrete, may be necessary if footing excavations are exposed to extended wet weather conditions.

During wet weather, or when the exposed subgrade is wet or unsuitable for proof-rolling, the prepared subgrade should be evaluated by observing excavation activity and probing with a steel foundation probe. Observations and probing should be performed by a member of our staff. Wet soil that has been disturbed due to site preparation activities, or soft or loose zones identified during probing, should be scarified and recompacted, if possible, or removed and replaced with Imported Select Structural Fill.

Erosion Control

Erosion control measures should be implemented in accordance with the Erosion Control Notes provided in the, "City of Warrenton Public Works Department Engineering Specifications & Design Criteria".

Excavation

Based on the materials encountered in our subsurface explorations, it is our opinion that conventional earthmoving equipment in proper working condition should be capable of making necessary general excavations.

The earthwork contractor should be responsible for reviewing this report, including the exploration logs, providing their own assessments, and providing equipment and methods needed to excavate the site soils while protecting subgrades.

Dewatering

As discussed in the, "Groundwater" section of this report, groundwater was encountered at a depth of 13 feet bgs in one exploration, as such, we do not expect groundwater to be a major factor during shallow excavations and earthwork. Excavations that extend into saturated/wet soils, or excavations that extend into perched groundwater, should be dewatered. Sump pumps are expected to adequately address perched water encountered in shallow excavations. In addition to groundwater seepage, surface water inflow to the excavations during the wet season can be problematic. Provisions for surface water control during earthwork and excavations should be included in the project plans and should be installed prior to commencing earthwork.

Trench Cuts and Trench Shoring

All trench excavations should be made in accordance with applicable Occupational Safety and Health Administration (OSHA) and state regulations. In our opinion, native soils are generally OSHA Type C. Temporary excavations should be shored or laid back at an inclination of 1½H:1V (horizontal to vertical) or flatter if workers are required to enter. Excavations made to construct footings or other structural elements should be laid back or shored at the surface as necessary to prevent soil from falling into excavations.

It should be expected that unsupported cut slopes will experience some sloughing and raveling if exposed to water. Plastic sheeting, placed over the exposed slope and directing water away from the slope, will reduce the potential for sloughing and erosion of cut slopes during wet weather.

The contractor is responsible for shoring methods and shoring system design. Shoring systems should be designed by a professional engineer before installation.

In our opinion, the contractor will be in the best position to observe subsurface conditions continuously throughout the construction process and to respond to the soil and groundwater conditions. Construction

site safety is generally the sole responsibility of the contractor, who also is solely responsible for the means, methods, and sequencing of the construction operations and choices regarding excavations and shoring.

Under no circumstances should the information provided by GeoEngineers be interpreted to mean that GeoEngineers is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

Permanent Slopes

We performed slope stability analyses to assess the proposed fill slopes with a slope angle of 1.5H:1V, under static and dynamic (seismic) loads. The stability of the most likely failure surface is reported as a FS, which is the ratio of resisting forces to driving forces. Generally, a FS of greater than 1.0 indicates that calculated resisting forces are greater than the driving forces and the slope should be stable. FS less than 1.0 indicate that calculated driving forces are greater than resisting forces and that sliding or soil movement is likely along that plane.

A FS of 1.3 is generally considered suitable for non-critical slopes under static (non-seismic) conditions. Slopes that are expected to remain stable under dynamic conditions (earthquake loads) are typically designed to maintain a FS of at least 1.1.

The slope was modeled as a simple 1.5H:1V slope with soil strength parameters estimated from correlations based on conditions encountered in our explorations and with structural loads setback a minimum of 10 feet from the edge of the slope. Under static conditions a factor of safety of 1.43 was obtained, meeting the minimum requirements for slopes adjacent to but not supporting structures. Under the seismic conditions, a factor of safety of 0.86 was obtained, indicating a portion of the slope will likely fail during a design level earthquake event.

Slope Recommendations

Permanent cut and fill slopes should not exceed 1.5H:1V. The slopes should be planted with appropriate vegetation to provide protection against erosion as soon as possible after grading. New structures, pavements and access roads should be located 10 feet from the edge of the top of the slopes or behind a 2H:1V projection from the base of the slope, whichever is greater. Surface water runoff should be collected and directed away from slopes to prevent water from running down the face of the slope.

Based on the results of the slope stability analysis, it should be expected that after a seismic event, the slopes will require repair as they are likely to experience shallow landslides and sloughing.

If slope failure during seismic events is un-acceptable, a riprap buttress with a slope angle not exceeding 1.5H:1V may be constructed over a cut slope not exceeding a slope angle of 1H:1V. The rock buttress should have a minimum thickness of 2 feet and be embedded a minimum of 3-feet at the base.

Construction Considerations for Cut and Fill Embankments

We recommend excavating a series of horizontal benches where existing slopes extend parallel to proposed embankments and are steeper than 5H:1V so that structural fill can be keyed into the native soil as follows:

- The lowermost bench (keyway) should be keyed at least 3 feet deep, or half the vertical embankment height whichever is less, below existing grade at the toe of the fill slope. We recommend a minimum keyway width of 5 feet.
- The fill should be benched into the slope using a maximum bench height of 3 feet and a minimum bench width of 5 feet before placing each next lift of fill.
- Fill slopes should be overbuilt by at least 12 inches and trimmed back to the required slope to maintain a firm face.

Fill Materials

General

Structural areas include areas beneath foundations, floor slabs, pavements, and any other areas intended to support structures or within the influence zone of structures. Fill intended for use in structural areas should meet the criteria for structural fill presented below. All structural fill soils should be free of debris, clay balls, roots, organic matter, frozen soil, man-made contaminants, particles with greatest dimension exceeding 4 inches (3-inch-maximum particle size in building footprints) and other deleterious materials.

The suitability of soil for use as structural fill will depend on the gradation and moisture content of the soil. As the amount of fines (silt and clay) in the soil matrix increases, the soil becomes increasingly more sensitive to small changes in moisture content and achieving the required degree of compaction becomes more difficult or impossible. Recommendations for suitable fill material are provided in the following sections.

On-Site Soils

The on-site soil consists primarily of fine sand. This material is generally suitable for use as general structural fill provided it meets the recommendations above.

Imported Select Structural Fill

Imported Select Structural Fill may be used as structural fill and should consist of pit or quarry run rock, crushed rock, or crushed gravel and sand that is fairly well-graded between coarse and fine sizes (approximately 25 to 65 percent passing the U.S. No. 4 sieve). It should have less than 5 percent passing the U.S. No. 200 sieve and have a minimum of 75 percent fractured particles according to American Association of State Highway and Transportation Officials (AASHTO) TP-61.

Aggregate Base

Aggregate Base material located under floor slabs and pavements, crushed rock used in footing over-excavations and retaining wall backfill should consist of imported clean, durable, crushed angular rock. Such rock should be well-graded, have a maximum particle size of 1 inch, have less than 5 percent passing the U.S. No. 200 sieve (3 percent for retaining walls) and meet the gradation requirements in Table 1. In addition, Aggregate Base shall have a minimum of 75 percent fractured particles according to AASHTO TP-61 and a sand equivalent of not less than 30 percent based on AASHTO T-176.

TABLE 1. RECOMMENDED GRADATION FOR AGGREGATE BASE

Sieve Size	Percent Passing (by weight)
1 inch	100
½ inch	50 to 65
No. 4	40 to 60
No. 40	5 to 15
No. 200	0 to 5

Aggregate Subbase

Aggregate Subbase material should consist of imported, clean, durable, crushed angular rock. Such rock should be well-graded, have a maximum particle size of 1½ inches, have less than 5 percent passing the U.S. No. 200 sieve. In addition, aggregate base shall have a minimum of 75 percent fractured particles according to AASHTO TP-61 and a sand equivalent of not less than 30 percent based on AASHTO T-176.

Trench Backfill

Backfill for pipe bedding and in the pipe zone should consist of well-graded granular material with a maximum particle size of ¾ inch and less than 5 percent passing the U.S. No. 200 sieve. The material should be free of organic matter and other deleterious materials. Further, the backfill should meet the pipe manufacturer's recommendations. Above the pipe zone backfill, Imported Select Structural Fill may be used as described above.

Fill Placement and Compaction

Structural fill should be compacted at moisture contents that are within 3 percent of the optimum moisture content as determined by ASTM Test Method D 1557 (Modified Proctor). The optimum moisture content varies with gradation and should be evaluated during construction. Fill material that is not near the optimum moisture content should be moisture conditioned prior to compaction.

Fill and backfill material should be placed in uniform, horizontal lifts and compacted with appropriate equipment. The appropriate lift thickness will vary depending on the material and compaction equipment used. Fill material should be compacted in accordance with Table 2. It is the contractor's responsibility to select appropriate compaction equipment and place the material in lifts that are thin enough to meet these criteria. However, in no case should the loose lift thickness exceed 18 inches.

TABLE 2. COMPACTION CRITERIA

	Compaction Requirements		
	Percent Maximum Dry Density Determined by ASTM Test Method D 1557 at ± 3% of Optimum Moisture		
Fill Type	0 to 2 Feet Below Subgrade	> 2 Feet Below Subgrade	Pipe Zone
Onsite granular soils	95	92	-----
Imported Granular, maximum particle size < 1¼ inch	95	95	-----

Fill Type	Compaction Requirements		
	Percent Maximum Dry Density Determined by ASTM Test Method D 1557 at ± 3% of Optimum Moisture		
	0 to 2 Feet Below Subgrade	> 2 Feet Below Subgrade	Pipe Zone
Imported Granular, maximum particle size 1¼ inch to 6 inches (3-inch maximum under building footprints)	n/a (proof-roll)	n/a (proof-roll)	-----
Retaining Wall Backfill*	92	92	-----
Nonstructural Zones	90	90	90
Trench Backfill	95	92	90

Note:

* Measures should be taken to prevent overcompaction of the backfill behind retaining walls. We recommend placing the zone of backfill located within 5 feet of the wall in lifts not exceeding about 6 inches in loose thickness and compacting this zone with hand-operated equipment such as a vibrating plate compactor or a jumping jack.

A representative from GeoEngineers should evaluate compaction of each lift of fill. Compaction should be evaluated by in-place compaction testing with a nuclear density gage, unless other methods are proposed for oversized materials and are approved by GeoEngineers during construction. These other methods typically involve procedural placement and compaction specifications together with verification requirements such as proof-rolling.

INFILTRATION TESTING

As requested, we conducted infiltration testing to assist in evaluating the site for stormwater system design. We conducted an infiltration test near the proposed infiltration facility.

We conducted infiltration testing using the open pit infiltration test method based on the U.S. Environmental Protection Agency's (EPA) Onsite Wastewater Treatment and Disposal Systems Design Manual, EPA/625/1-80-012. The infiltration test was completed at a depth of 2½ feet bgs at the location marked as IT-1 in Figure 2, Site Plan.

Testing Methods and Results

The infiltration test pit was 2 feet wide and 2 to 3 feet long with a testing depth of 2 ½ feet. Approximately 2 inches of clean rock was placed in the bottom of the test location to help minimize disturbance of the materials in the excavation while adding water.

After the saturation period, the test location was filled with clean water to at least 1 foot above the bottom of the excavation. The drop-in water level was measured over a period of one hour after the soak period. The field test results are summarized in Table 3 and specific results can be found in Appendix A, Field Explorations and Laboratory Testing.

TABLE 3. INFILTRATION RESULTS

Infiltration Test No.	Depth (feet)	USCS Material Type	Field Measured Infiltration Rate[1] (inches/hour)
IT-1	2 ½	SP	6

Notes:

[1] Appropriate factors should be applied to the field measured infiltration rate, based on the design methodology and specific system used.

USCS = Unified Soil Classification System

The infiltration rates shown in Table 3 are field-measured infiltration rates. These represent a relatively short-term measured rate taken after the required saturation period, and factors of safety have not been applied for the type of infiltration system being considered, or for variability that may be present in the on-site soil. In our opinion, and consistent with the state of the practice, correction factors should be applied to this measured rate to reflect the small area of testing and the number of tests conducted.

Appropriate correction factors should be applied by the project civil engineer as described below. From a geotechnical perspective, we recommend a factor of safety (correction factor) of at least 2 be applied to the infiltration values derived from field observations to account for potential soil variability with depth and location within the area tested. This will result in a recommended infiltration value of 3 inches per hour prior to any factors deemed necessary by the civil designer.

In addition, the stormwater system design engineer should determine and apply appropriate remaining correction factor values, or factors of safety, to account for repeated wetting and drying that occur in this area, degree of in-system filtration, frequency and type of system maintenance, vegetation, potential for siltation and bio-fouling, etc., as well as system design correction factors for overflow or redundancy and base and facility size.

The actual depths, lateral extent and estimated infiltration rates can vary from the values presented above. Field testing/confirmation during construction is often required in large or long systems or other situations where soil conditions may vary within the area where the system is constructed. The results of this field testing might necessitate that the infiltration locations be modified to achieve the design infiltration rate.

Also, infiltration flow rate of a focused stormwater system typically diminishes over time as suspended solids and precipitates in the stormwater further clog the void spaces between the soil particles or cake on the infiltration surface. The serviceable life of an infiltration media in a stormwater system can be extended by pre-filtering or with on-going accessible maintenance. Eventually, most systems will fail and will need to be replaced or have media regenerated or replaced. We recommend that infiltration systems include an overflow that is connected to a suitable discharge point.

Infiltration systems can cause localized high groundwater levels and should not be located near basement walls, retaining walls, or other embedded structures unless these are specifically designed to account for the resulting hydrostatic pressure. Infiltration locations should not be located on sloping ground, unless it is approved by a geotechnical engineer, and should not be infiltrated at a location that allows for flow to travel laterally toward a slope face, such as a mounded water condition or too close to a slope face.

Suitability of Infiltration System

Successful design and implementation of stormwater infiltration systems and whether a system is suitable for a development depend on several site-specific factors. Stormwater infiltration systems are generally best suited for sites having sandy or gravelly soil with saturated hydraulic conductivities greater than 2 inches per hour as encountered at this site. Sites with silty or clayey soil, including sites with fine sand, silty sand, or gravel that has a high percentage of silt or clay in the matrix, or sites with relatively shallow underlying decomposed rock (residual soil) are generally not well suited for stormwater infiltration. Soil that has fine-grained matrices is susceptible to volumetric change and softening during wetting and drying cycles. Fine-grained soils also have large variations in the magnitude of infiltration rates because of bedding and stratification that occurs during alluvial deposition, and often have thin layers of less permeable or impermeable soil within a larger layer.

Local groundwater conditions also significantly affect the capacity to infiltrate from a stormwater system. Sites with shallow groundwater can result in groundwater mounding. A hydraulic gradient that reaches the level of water in the soil immediately drops to zero and local groundwater will rise and mound and the infiltration rate slows dramatically, resulting in overflows or system flooding (failure). Groundwater mounding can also negatively impact structures, slopes, or other areas adjacent to the stormwater infiltration facility. Typically, we do not recommend using infiltration systems where groundwater is less than 10 feet below the bottom of the proposed system unless the host soil is very permeable and consistently graded and will not cause mounding. Some jurisdictions require a minimum of 5 or 10 feet between high groundwater conditions and the bottom of proposed facilities. Depending on the size of the project, adjacent features such as streams that can source water to a system instead of allowing it to drain, and on-site soil infiltration capacities, there may be conditions where even a 10-foot separation between the level of groundwater and the base of the infiltration system may not be sufficient.

As a result of the measured infiltration rates over 2 inches per hour stormwater infiltration is feasible at this site at the depths tested. The resulting design infiltration value (factored value) may require the overall management system to include other types of stormwater management.

PAVEMENT RECOMMENDATIONS

Our pavement recommendations are based on the results of our field observations and analysis. Pavement analyses and recommendations for on-site roadways were developed in general accordance with the ODOT Pavement Design Guide. The recommended pavement sections assume that final improvements surrounding the pavement will be designed and constructed such that stormwater or excess irrigation water from landscape areas does not infiltrate below the pavement section into the baserock materials.

Pavement subgrades should be prepared in accordance with the "Earthwork Recommendations" section of this report. Our pavement recommendations assume that traffic at the site will consist of residential level car traffic and occasional truck traffic. We do not have specific information on the frequency and type of vehicles that will use the area. We have based our design analysis on an assumption of 50 cars and two trucks per day to account for trash and delivery vehicles. If traffic conditions will exceed these values, we will need to modify our pavement recommendations.

Our pavement recommendations are based on the following parameters:

- The pavement subgrades, fill subgrades and site earthwork used to establish road grades below the Aggregate Subbase and Aggregate Base materials have been prepared as described in the "Earthwork Recommendations" section of this report.
- A resilient modulus of 20,000 psi has been estimated for compacted Aggregate Subbase and Aggregate Base materials.
- A resilient modulus of 4,000 psi based on on-site observations and experience in similar sites.
- Initial and terminal serviceability indices of 4.2 and 2.0, respectively.
- Reliability and standard deviations of 75 percent and 0.45, respectively.
- Structural coefficients of 0.42 and 0.10 for the asphalt and baserock, respectively.
- A 20-year design life with a 2 percent growth rate.
- Estimated traffic of 50 cars per day and 2 dual axle trucks.

If any of the noted assumptions vary from project design use, our office should be contacted with the appropriate information so that the pavement designs can be revised or confirmed adequate.

The alternate pavement section using Aggregate Subbase material is provided because it may be more applicable during wet-weather construction where a gravel haul road or working surface is needed to support construction traffic. Wet weather construction recommendations are provided in the "Earthworks Recommendations" section of this report. The subbase material can be incorporated into the gravel working blankets and haul roads provided the material meets the minimum thickness in Table 4 and meets the specifications for Aggregate Subbase. Working blanket and haul road materials that pump excessively, or have excessive fines from construction traffic, should be removed and replaced with specified materials prior to constructing roadways over those areas.

The calculated recommended minimum pavement sections are provided in Table 4. Based on the Paving & Street Design Criteria provided in the "City of Warrenton Public Works Department Engineering Specifications & Design Criteria", the minimum pavement section allowed by the design criteria is 12 inches of compacted baserock and 2 inches of asphalt (2 inches AC over 12 inches aggregate base). Unless the City permits a site- and traffic-specific pavement design as provided in Table 4 below (section thinner than the prescribed standard), the pavement section outlined by the City should be implemented by the project.

TABLE 4. MINIMUM PAVEMENT SECTIONS FOR ON-SITE LOCAL ROADS AND INTERSECTIONS

Minimum Asphalt Thickness (inches)	Minimum Aggregate Base Thickness (inches)	Minimum Aggregate Sub-Base Thickness (inches)
2.5	6.0	0.0
2.5	3.0	6.0

The Aggregate Base course should conform to the "Aggregate Base" section of this report and be compacted to at least 95 percent of the maximum dry density (MDD) determined in accordance with AASHTO T-180/ASTM Test Method D 1557.

The AC pavement should conform to Section 00745 of the most current edition of the ODOT Standard Specifications for Highway Construction. The Job Mix Formula should meet the requirements for a ½-inch Dense Graded Level 2 Mix. The AC should be PG 64-22 grade meeting the ODOT Standard Specifications for Asphalt Materials. AC pavement should be compacted to 92.0 percent at Maximum Theoretical Unit Weight (Rice Gravity) of AASHTO T-209.

STRUCTURAL DESIGN RECOMMENDATIONS

General Foundation Support

Our foundation support recommendations are general in nature as structure types and loads have not been determined and can be highly variable in type, size, and established in very different grades and support conditions across the site. In general, these foundation support recommendations are intended for wood-framed and lightly loaded structures that will be constructed as support buildings, such as maintenance buildings and community use buildings. Our recommendations are not intended for individual residential lots, which should be required to have their own geotechnical explorations and recommendations appropriate to the specific structures based on City requirements and the requirements of the IBC.

On-site support buildings (non-residential structures) can be satisfactorily founded on continuous wall or isolated column footings supported on firm native soils or on structural fill placed over firm native soils. Exterior footings should be established at least 18 inches below the lowest adjacent grade. The recommended minimum footing depth is greater than the anticipated frost depth. Interior footings can be founded a minimum of 12 inches below the top of the first-floor slab. Isolated column and continuous wall footings should have minimum widths of 24 and 18 inches, respectively. We have assumed that maximum column and wall loads will be on the order of 10 kips per column and 2 klf respectively, and that floor loads for slabs on grade will be 75 psf or less. If design loads exceed these assumed values, our recommendations may need to be revised.

Foundation Subgrade Preparation

The subgrades beneath proposed structural elements should be prepared as described below and in the "Earthworks Recommendations" section of this report. If loose existing fill or loose native sand is encountered at the base of the foundations, the upper 2-feet should be recompacted or removed and replaced as described in the Subgrade Evaluation section of this report. We recommend loose or disturbed soils resulting from foundation excavation be removed before placing reinforcing steel and concrete. Foundation bearing surfaces should not be exposed to standing water. If water infiltrates and pools in the excavation, the water, along with any disturbed soil, should be removed before placing reinforcing steel and concrete. A thin gravel layer consisting of Aggregate Base or Aggregate Subbase material can be placed at the base of foundation excavations to help protect the subgrade from weather and light foot traffic. The thickness for the gravel layer should be determined at the time of construction but is typically 3 to 4 inches. The gravel layer should be compacted as described in the "Fill Placement and Compaction" section.

We recommend GeoEngineers observe all foundation subgrades before placing concrete forms and reinforcing steel to determine that bearing surfaces have been adequately prepared and the soil conditions are consistent with those observed during our explorations.

Bearing Capacity – Spread Footings

We recommend conventional footings be proportioned using a maximum allowable bearing pressure of 2,000 psf if supported on firm native soils, or on structural fill placed over firm native soils. This bearing pressure applies to the total of dead and long-term live loads and may be increased by one-third when considering earthquake or wind loads. This is a net bearing pressure. The weight of the footing and overlying backfill can be ignored in calculating footing sizes.

Foundation Settlement

Foundations designed and constructed as recommended are expected to experience settlements of less than 1 inch. Differential settlements of up to one half of the total settlement magnitude can be expected between adjacent footings supporting comparable loads.

Lateral Resistance

The ability of the soil to resist lateral loads is a function of frictional resistance, which can develop on the base of footings and slabs, and the passive resistance, which can develop on the face of below-grade elements of the structure as these elements tend to move into the soil. For footings and floor slabs founded in accordance with the recommendations presented above, the allowable frictional resistance may be computed using a coefficient of friction of 0.30 applied to vertical dead-load forces. Our analysis indicates that the available passive earth pressure for footings confined by on-site soil and structural fill is 350 pcf, modeled as an equivalent fluid pressure. Typically, the movement required to develop the available passive resistance may be relatively large; therefore, we recommend using a reduced passive pressure of 250 pcf equivalent fluid pressure. In addition, in order to rely on passive resistance, a minimum of 10 feet of horizontal clearance must exist between the face of the footings and adjacent downslopes.

The passive earth pressure and friction components may be combined provided that the passive component does not exceed two-thirds of the total. The passive earth pressure value is based on the assumptions that the adjacent grade is level and that groundwater remains below the base of the footing throughout the year. The top foot of soil should be neglected when calculating passive lateral earth pressures unless the foundation area is covered with pavement or slab-on-grade. The lateral resistance values include a safety factor of approximately 1.5.

Drainage Considerations

We recommend the ground surface be sloped away from buildings at least 2 percent. All downspouts should be tightlined away from the building foundation areas and should be discharged into a stormwater system. Downspouts should not be connected to footing drains.

Although not required based on groundwater depths observed in our explorations, if perimeter footing drains are used for below-grade structural elements to mitigate perched water that may flow downslope from uphill development, or behind walls, they should be installed at the base of the exterior footings. Perimeter footing drains should be provided with cleanouts and should consist of at least 4-inch-diameter perforated pipe placed on a 3-inch bed of, and surrounded by, 6 inches of granular drainage material. Aggregate Base can be used for the granular pipe bedding and drainage materials provided the material has less than 3 percent passing the U.S. No. 200 sieve. The drainage material should be enclosed in a non-woven geotextile such as Mirafi 140N (or approved alternate) to prevent fine soil from migrating into the drain material. We recommend against using flexible tubing for footing drainpipes. The perimeter drains

should be sloped to drain by gravity to a suitable discharge, preferably a storm drain. We recommend that the cleanouts be covered and placed in flush-mounted utility boxes. Water collected in roof downspout lines must not be routed to the footing drain lines.

Floor Slabs

Satisfactory subgrade support for floor slabs on grade supporting the planned 75 psf floor loads can be obtained provided the floor slab subgrade is prepared as described in the "Earthworks Recommendations" section of this report. Slabs should be reinforced according to their proposed use and per the structural engineer's recommendations. Subgrade support for concrete slabs can be obtained from the firm native soils or on structural fill placed over firm native soils.

We recommend that on-grade slabs be underlain by a minimum 6-inch-thickness of Aggregate Base acting as a capillary break material to reduce the potential for moisture migration into the slab and to provide an adequate modulus of subgrade reaction as provided below for slab design. The aggregate base material should be placed as recommended for structural fill in the "Fill Placement and Compaction" section of this report.

If dry on-grade slabs are required, for example at interior spaces where adhesives are used to anchor carpet or tile to the slab, a waterproof liner may be placed as a vapor barrier below the slab. The vapor barrier should be selected by the structural engineer and should be accounted for in the design floor section and mix design selection for the concrete, to accommodate the effect of the vapor barrier on concrete slab curing.

Load-bearing concrete slabs should be designed assuming a modulus of subgrade reaction (k) of 150 psi per inch. We estimate that concrete slabs constructed as recommended will settle less than ½ inch. Floor slab subgrades should be evaluated according to the "Subgrade Evaluation" section of this report.

Conventional Retaining Walls

Drainage

Positive drainage is imperative behind retaining structures. This can be accomplished by providing a drainage zone behind the wall consisting of free-draining material and perforated pipes to collect and dispose the water. The drainage material should consist of Aggregate Base having less than 3 percent passing the U.S. No 200 sieve. The wall drainage zone should extend horizontally at least 18 inches from the back of the wall.

A perforated smooth-walled rigid drainpipe, having a minimum diameter of 4 inches, should be placed at the bottom of the drainage zone along the entire length of the wall, with the pipe invert at or below the base of the wall footing. The drainpipes should discharge to a tightline leading to an appropriate collection and disposal system. An adequate number of cleanouts should be incorporated into the design of the drains to provide access for regular maintenance. Roof downspouts, perimeter drains, or other types of drainage systems should not be connected to retaining wall drain systems.

Design Parameters

The lateral pressures presented in this section for retaining walls assume that backfill placed within 2 feet of the wall is compacted by hand-operated equipment to a density of 90 percent of the MDD and that wall

drainage measures are included as previously recommended. For walls constructed as described above, we recommend using an active lateral earth pressure corresponding to an equivalent fluid density of 34 pcf for level backfill condition (slope behind the wall). For walls with backfill sloping upward behind the wall at 2H:1V, an equivalent fluid density of 52 pcf should be used. If the slope is shallower than 2H:1V, the active lateral earth pressures can be linearly interpolated between the two values above. This assumes that the tops of the walls are not structurally restrained and are free to rotate. For the at-rest condition (walls restrained from movement at the top) 16 pcf should be added to the active lateral earth pressures for design for the level backfill or sloped backfill pressures.

For seismic conditions, we recommend a uniform lateral pressure of 5H (where H is the height of the wall) psf be added to these lateral pressures. If the retaining system is designed as a braced system but is expected to yield a small amount during a seismic event, an active earth pressure condition may be assumed and combined with the uniform seismic surcharge pressure.

The recommended pressures do not include the effects of surcharges from surface loads. If vehicles will be operated within one-half the height of the wall, a traffic surcharge should be added to the wall pressure. The traffic surcharge can be approximated by the equivalent weight of an additional 2 feet of backfill behind the wall. Additional surcharge loading conditions should also be considered on a case-by-case basis.

Retaining walls founded on native soil or structural fill extending to these materials may be designed using the allowable soil bearing values and lateral resistance values presented above in the "Foundation Support Recommendations" section of this report. We estimate settlement of retaining structures will be similar to the values previously presented for building foundations.

Seismic Design

We recommend seismic design be performed using the procedure outlined in the 2015 IBC and the 2014 OSSC. The parameters provided in Table 5 are based on the conditions encountered during our subsurface exploration program and should be used in preparation of response spectra for the proposed structures.

TABLE 5. SEISMIC DESIGN PARAMETERS

Parameter	Value
Site Class	D
Peak Ground Acceleration, PGA	0.6 g
Spectral Response Acceleration, S_s	1.34 g
Spectral Response Acceleration, S_1	0.69 g
Site Coefficient, F_a	1.0
Site Coefficient, F_v	1.5
Spectral Response Acceleration (Short Period), S_{DS}	0.89 g
Spectral Response Acceleration (1-Second Period) S_{D1}	0.69 g

Liquefaction Potential

Liquefaction is a phenomenon caused by a rapid increase in pore water pressure that reduces the effective stress between soil particles to near zero. The excessive buildup of pore water pressure results in the

sudden loss of shear strength in a soil. Granular soil, which relies on interparticle friction for strength, is susceptible to liquefaction until the excess pore pressures can dissipate. Sand boils and flows observed at the ground surface after an earthquake are the result of excess pore pressures dissipating upwards, carrying soil particles with the draining water.

In general, loose, saturated sand soil, typically below the groundwater table, with low silt and clay contents is the most susceptible to liquefaction. We encountered loose to medium dense sands to the bottom of our explorations and observed groundwater at a depth of 13 feet bgs in TP-2. During a seismic event, sands beneath the groundwater is likely to liquefy and cause liquefaction induced settlements. The amount and location of liquefaction induced settlements can be determined during the lot specific geotechnical investigation, if required.

The potential for other seismic hazards, including lateral spreading, fault rupture and earthquake-induced landsliding were also evaluated. The site includes cut and fill slopes and as discussed in the Permanent Slopes section of this report some surface sloughing will occur during a design level seismic event that will need repair, but since groundwater is below the base of the slopes, the potential for lateral spreading in negligible.

The closest mapped fault to the site possibly capable of surface rupture is the Cascadia Fault with its inferred extension approximately 16.5 miles west of the site (Personius 2012). No faults are mapped as crossing the site, and the potential for site fault surface rupture is, therefore, very low.

DESIGN REVIEW AND CONSTRUCTION SERVICES

Recommendations provided in this report are based on the assumptions and preliminary design information stated herein. We welcome the opportunity to review and discuss construction plans and specifications for this project as they are being developed. In addition, GeoEngineers should be retained to review the geotechnical-related portions of the plans and specifications to evaluate whether they are in conformance with the recommendations provided in this report.

Satisfactory foundation and earthwork performance depend to a large degree on quality of construction. Sufficient monitoring of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated.

We recommend that GeoEngineers be retained to observe construction at the site to confirm that subsurface conditions are consistent with the site explorations, and to confirm that the intent of project plans and specifications relating to earthwork, pavement and foundation construction are being met.

LIMITATIONS

We have prepared this report for the exclusive use of Sandworks, Inc. and their authorized agents and/or regulatory agencies for the proposed Clear Lake Development in Warrenton, Oregon.

This report is not intended for use by others, and the information contained herein is not applicable to other sites. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in the area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix B, Report Limitations and Guidelines for Use, for additional information pertaining to use of this report.

REFERENCES

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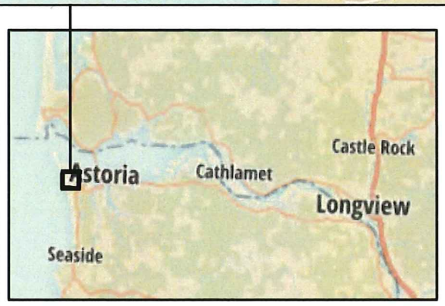

N
W E
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2,000 0 2,000

Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2019

Projection: NAD 1983 UTM Zone 10N

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Vicinity Map

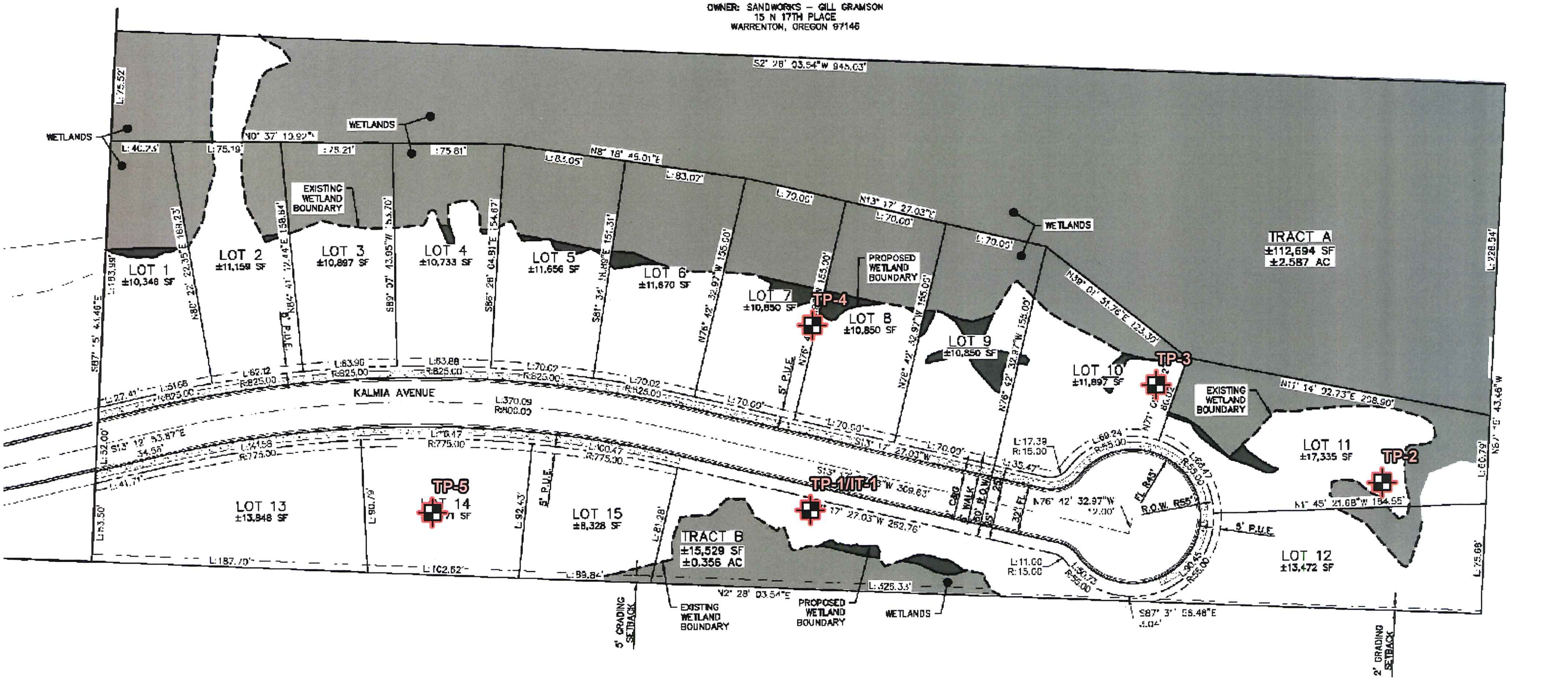
Clear Lake Development
Warrenton, Oregon

GeoEngineers

Figure 1

TAX LOT: 810170001302
TOTAL AREA: ±344,946 SQ. FT. (7.919 ACRES)

OWNER: SANDWORKS – GILL GRAMSON
15 N 17TH PLACE
WARRENTON, OREGON 97146



ABBREVIATIONS:

R.O.W. = RIGHT OF WAY
P.U.E. = PUBLIC USE EASEMENT
C&G = CURB AND GUTTER
FL = FLOWLINE
TC = TOP OF CURB
SW = SIDEWALK
P = PAVEMENT
PC = POINT OF CURVATURE
PT = POINT OF TANGENCY
PCC = POINT OF COMPOUND CURVATURE

LEGEND

	EXISTING	PROPOSED
MAJOR CONTOUR		
MINOR CONTOUR		
SLOPE (ARROW = DOWN)		–2.0:1
SILT FENCE		
EXISTING WETLANDS		
PROPOSED WETLAND REMOVAL		

NORTH

DRAWN: BD	DESIGNED: EH	CHECKED: EH
SCALE: AS SHOWN	DATE: JAN. 2019	
PROJECT NO. E18–030		

FDG
Firwood Design Group, LLC
SURVEYING + ENGINEERING + PLANNING
TROUTDALE, OREGON 97060
FAX: (503) 668-5786

GILL GRAMSON
15 NW 17TH PLACE
WARRENTON, OR 97146

PRELIMINARY PLAT
CLEAR LAKE SUBDIVISIO
KALMIA AVE, WARRENTON, OF

Legend

TP-1 Approximate Test Pit Location

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GeoEngineers

APPENDIX A
Field Explorations and Laboratory Testing

APPENDIX A
FIELD EXPLORATIONS AND LABORATORY TESTING

Field Explorations

Soil and groundwater conditions at the proposed Clear Lake development locations were explored on January 25, 2019 by completing 5 test pits (TP-1 through TP-5), and one infiltration test (IT-1). Test pits were extended to approximately 10 feet to 14 feet below ground surface (bgs), the infiltration test was conducted at depth of 2½ bgs, at the approximate locations shown in Figure 2.

Test pits were excavated using an excavator owned and operated by Sandworks, Inc. from Warrenton, Oregon. The test pit excavations were continuously monitored by an engineer from our office who maintained a detailed log of subsurface explorations, visually classified the soil encountered and obtained representative soil samples from the test pits, from the sidewalls above a depth of 4 feet bgs and from excavation spoil below that depth.

Recovered soil samples from exploratory borings were visually classified in the field in general accordance with ASTM International (ASTM) Standard Practices Test Method D 2488 and the classification chart listed in Figure A-1, Key to Exploration Logs. Logs of the test pits are presented in Figures A-2 through A-6. The logs are based on interpretation of the field and laboratory data and indicate the depth at which subsurface materials or their characteristics change, although these changes might actually be gradual.

Laboratory Testing

Soil samples obtained from the explorations were visually classified in the field and in our laboratory using the Unified Soil Classification System (USCS) and ASTM classification methods. ASTM Test Method D 2488 was used to visually classify the soil samples, while ASTM D 2487 was used to classify the soils based on laboratory tests results. Moisture content tests were performed in general accordance with ASTM D 2216-05. Grain size analysis tests were performed in general accordance with ASTM 6913. Results of the moisture contents testing are presented in the appropriate exploration logs at the respective sample depths and results of the grain size analysis are provided in Figure A-7.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

Key to Exploration Logs

GeoEngineers

Figure A-1

Date Excavated 1/25/2019	Total Depth (ft) 10	Logged By DMH Checked By TAP	Excavator Equipment Link-Belt 240 Lx Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum Undetermined		Latitude 46.171269 Longitude -123.9443455	Coordinate System Horizontal Datum WGS84	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				SP	Brown fine sand (medium dense, wet) (native)			
	1								
	2					Occasional trace roots, roots up to 2 inches in diameter			
	3								Infiltration test conduction at 2 1/2 feet bgs
	4	■	1 / SA				15	2	
	5								
	6					No organics			
	7								
	8								
	9	■	2						Moderate caving observed to full depth
	10								

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Test Pit TP-1/IT-1

GeoEngineers

Project: Clear Lake Development
Project Location: Warrenton, Oregon
Project Number: 23773-001-00

Figure A-2
Sheet 1 of 1

Date Excavated 1/25/2019	Total Depth (ft) 14	Logged By DMH Checked By TAP	Excavator Equipment Link-Belt 240 Lx Excavator	See "Remarks" section for groundwater observed See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum Undetermined		Latitude 46.1721717 Longitude -123.9443572	Coordinate System Horizontal Datum WGS84	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				SP	Gray-brown fine sand (loose, moist) (fill)			
	5				SM	Brown to black sandy silt with organic matter (native) (medium dense, moist)			
	6				SP	Gray-brown uniform fine sand (medium dense, moist)			
	12					Becomes gray, wet			
	13		1						Slow groundwater seepage observed at 13 feet Moderate caving observed to full depth
	14								

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Test Pit TP-2

GeoEngineers

Project: Clear Lake Development
Project Location: Warrenton, Oregon
Project Number: 23773-001-00

Figure A-3
Sheet 1 of 1

Date Excavated 1/25/2019	Total Depth (ft) 14	Logged By DMH Checked By TAP	Excavator Equipment Link-Belt 240 Lx Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum Undetermined		Latitude 46.171799 Longitude -123.9446214	Coordinate System Horizontal Datum WGS84	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					TS	4-inch root zone			
	1				SP	Gray-brown fine sand with concrete debris (medium dense, moist) (fill)			
	2				SM	Brown to black silty sand with organic matter (medium dense, moist) (native)			
	3				SP	Gray-brown fine sand (medium dense, moist)			
	4	■	1 MC				15		
	5								
	6								
	7								
	8								
	9								
	10								
	11								
	12								
	13								Moderate caving observed to full depth
	14								

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Test Pit TP-3

GeoEngineers

Project: Clear Lake Development
Project Location: Warrenton, Oregon
Project Number: 23773-001-00

Figure A-4
Sheet 1 of 1

Date Excavated 1/25/2019	Total Depth (ft) 15	Logged By DMH Checked By TAP	Excavator Equipment Link-Belt 240 Lx Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum Undetermined		Latitude 46.1712555 Longitude -123.9447478	Coordinate System Horizontal Datum WGS84	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				SP	Gray-brown fine sand (loose, moist) (fill)			
	1								
	2								
	3								
	4								
	5								
	6								
	7				SM	Brown to black silty sand with organic matter (medium dense, moist) (native)			
	8								
	9				SP	Orange-brown fine sand (medium dense, moist)			
	10		1						
	11					Becomes gray-brown			
	12								
	13								
	14								
	15								Moderate caving observed to full depth

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Test Pit TP-4

GeoEngineers

Project: Clear Lake Development
Project Location: Warrenton, Oregon
Project Number: 23773-001-00

Figure A-5
Sheet 1 of 1

Date Excavated 1/25/2019	Total Depth (ft) 13	Logged By DMH Checked By TAP	Excavator Equipment Link-Belt 240 Lx Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum Undetermined		Latitude 46.1706788 Longitude -123.9442851	Coordinate System Horizontal Datum WGS84	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					TS	2-inch root zone			
					SP	Gray-brown fine sand (medium dense, moist) (native)			
	1								
	2								
	3								
	4								
	5		1						
	6								
	7								
	8								
	9								
	10								
	11								
	12		2						Moderate caving observed to full depth
	13								

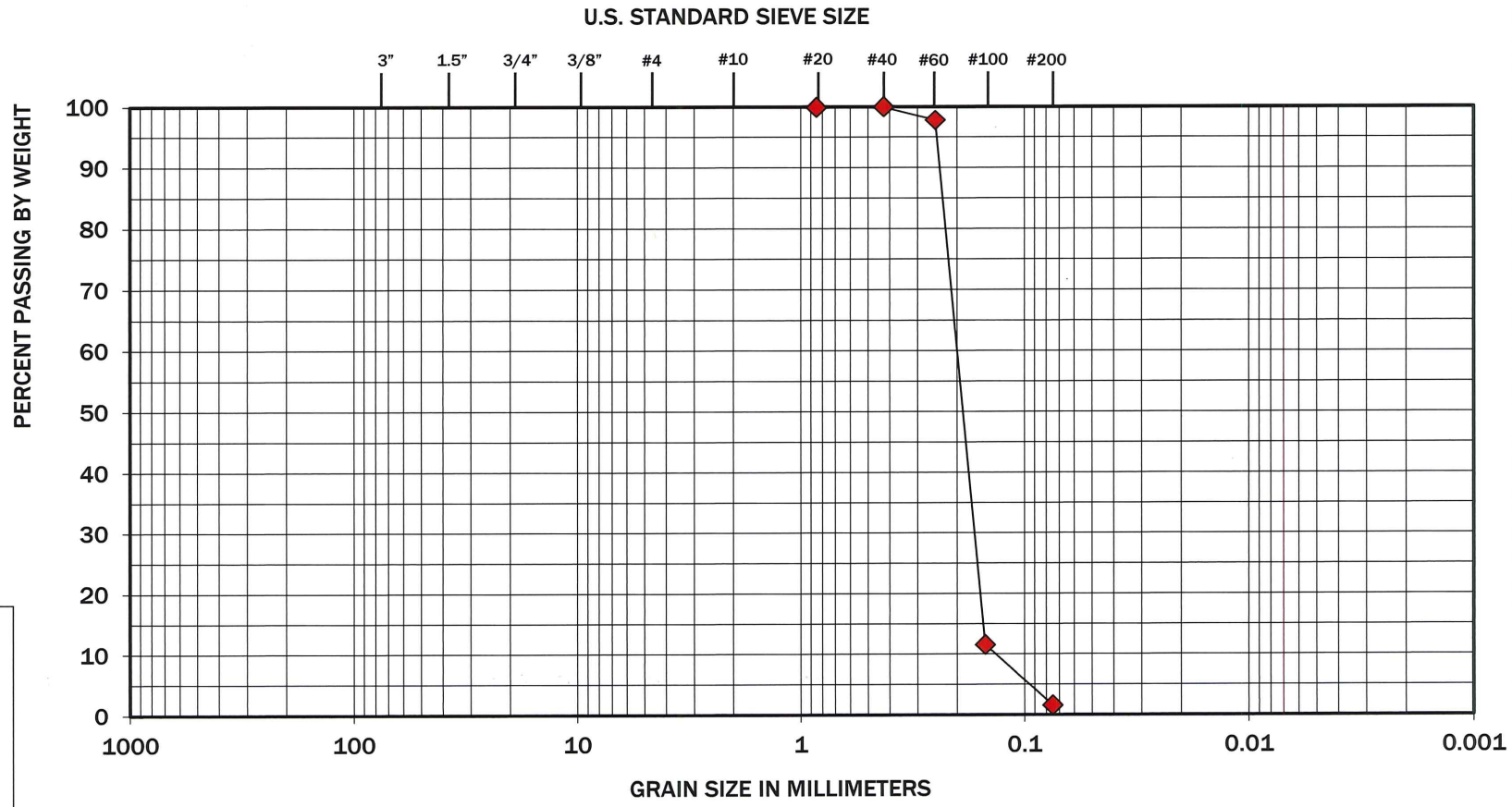
Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Test Pit TP-5

GeoEngineers

Project: Clear Lake Development
Project Location: Warrenton, Oregon
Project Number: 23773-001-00

Figure A-6
Sheet 1 of 1



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Exploration	Depth (feet)	Moisture (%)	Soil Description
◆	TP-1	1	4	Gray Brown Fine Sand (SP)

Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.

The grain size analysis results were obtained in general accordance with ASTM D 6913.

GeoEngineers

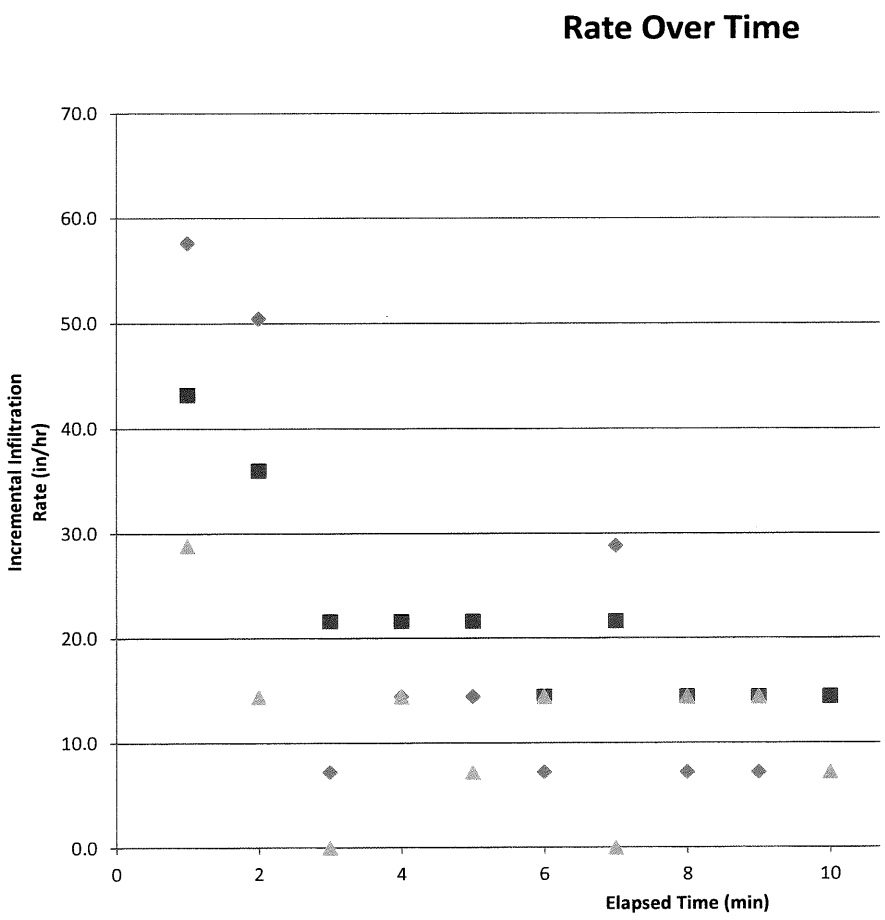
Clear Lake Development
Warrenton, Oregon

Sieve Analysis Results

Figure A-7

Soil Texture
Brown-Gray Uniform Sand (SP)

Total Time (min)	Depth to Water from Top of Pit (inches)	Dist. Interval (inches)	Infiltration (inches/hour)	
0	24.6			
1	25.6	1.0	57.6	
2	26.4	0.8	50.4	
3	26.5	0.1	7.2	
4	26.8	0.2	14.4	
5	27.0	0.2	14.4	Test #1
6	27.1	0.1	7.2	
7	27.6	0.5	28.8	
8	27.7	0.1	7.2	
9	27.8	0.1	7.2	
0	22.9			
1	23.6	0.7	43.2	
2	24.2	0.6	36.0	
3	24.6	0.4	21.6	
4	25.0	0.4	21.6	
5	25.3	0.4	21.6	Test #2
6	25.6	0.2	14.4	
7	25.92	0.4	21.6	
8	26.2	0.2	14.4	
9	26.4	0.2	14.4	
10	26.6	0.2	14.4	
1	22.2			
2	22.7	0.5	28.8	
3	22.9	0.2	14.4	
4	22.9	0.0	0.0	
5	23.2	0.2	14.4	
6	23.3	0.1	7.2	
7	23.5	0.2	14.4	
8	23.5	0.0	0.0	Test #3
9	23.8	0.2	14.4	
10	24.0	0.2	14.4	
11	24.1	0.1	7.2	
12	24.1	0.0	0.0	
13	24.4	0.2	14.4	
14	24.6	0.2	14.4	
15	24.7	0.1	6.0	
16	24.8	0.1	6.0	



APPENDIX B
Report Limitations and Guidelines for Use

APPENDIX B
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory "limitations" provisions in its reports. Please confer with GeoEngineers if you need to know more how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the proposed Clear Lake development specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with Sandworks, Inc. dated January 18, 2019 and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

A Geotechnical Engineering or Geologic Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the proposed Clear Lake development in Warrenton, Oregon. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

---

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structures;
- elevation, configuration, location, orientation or weight of the proposed structure;

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Environmental Concerns Are Not Covered

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

Geotechnical Engineering Report Recommendations Are Not Final

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the

explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable, but separating logs from the report can create a risk of misinterpretation.

Give Contractors a Complete Report and Guidance

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- encourages contractors to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer.

Contractors Are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

GeoEngineers

Clear Lake Subdvsion

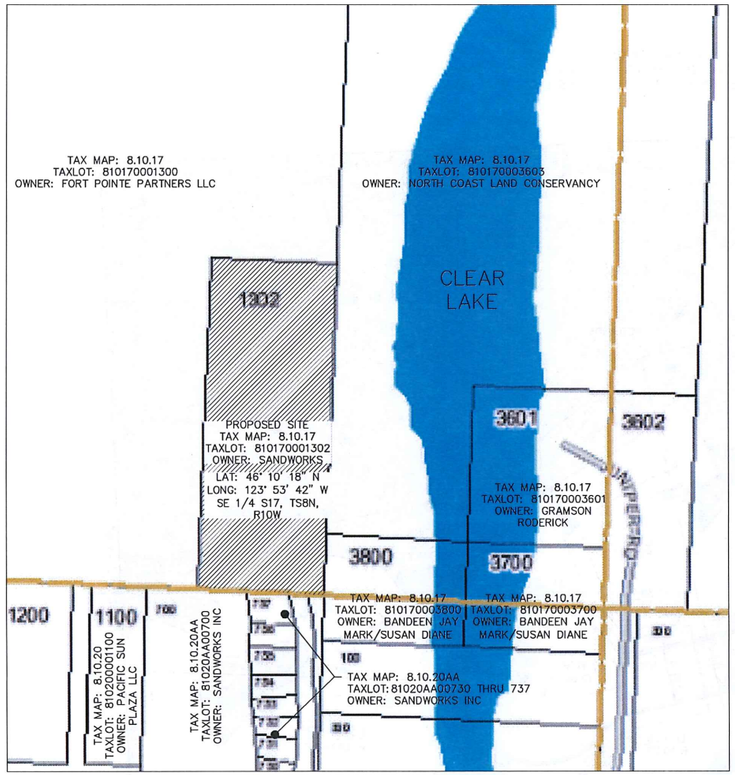
Lot #	Area (SF)	Acres
1	10,946	0.251
2	10,565	0.243
3	10,897	0.250
4	10,733	0.246
5	11,656	0.268
6	11,670	0.268
7	10,850	0.249
8	10,850	0.249
9	10,850	0.249
10	11,897	0.273
11	17,335	0.398
12	13,472	0.309
13	13,848	0.318
14	10,171	0.233
15	10,070	0.231
Average	**11,721**	**0.269**
Tract A	112,694	2.587
Tract B	13,787	0.317
	126481	
Total Tracts and lots	138,202	3.173
Total Parcel	344,946	7.919
ROW dedication	206,744	4.746

344,946
- 126,481 (WETLANDS
218,465 = 5 AC

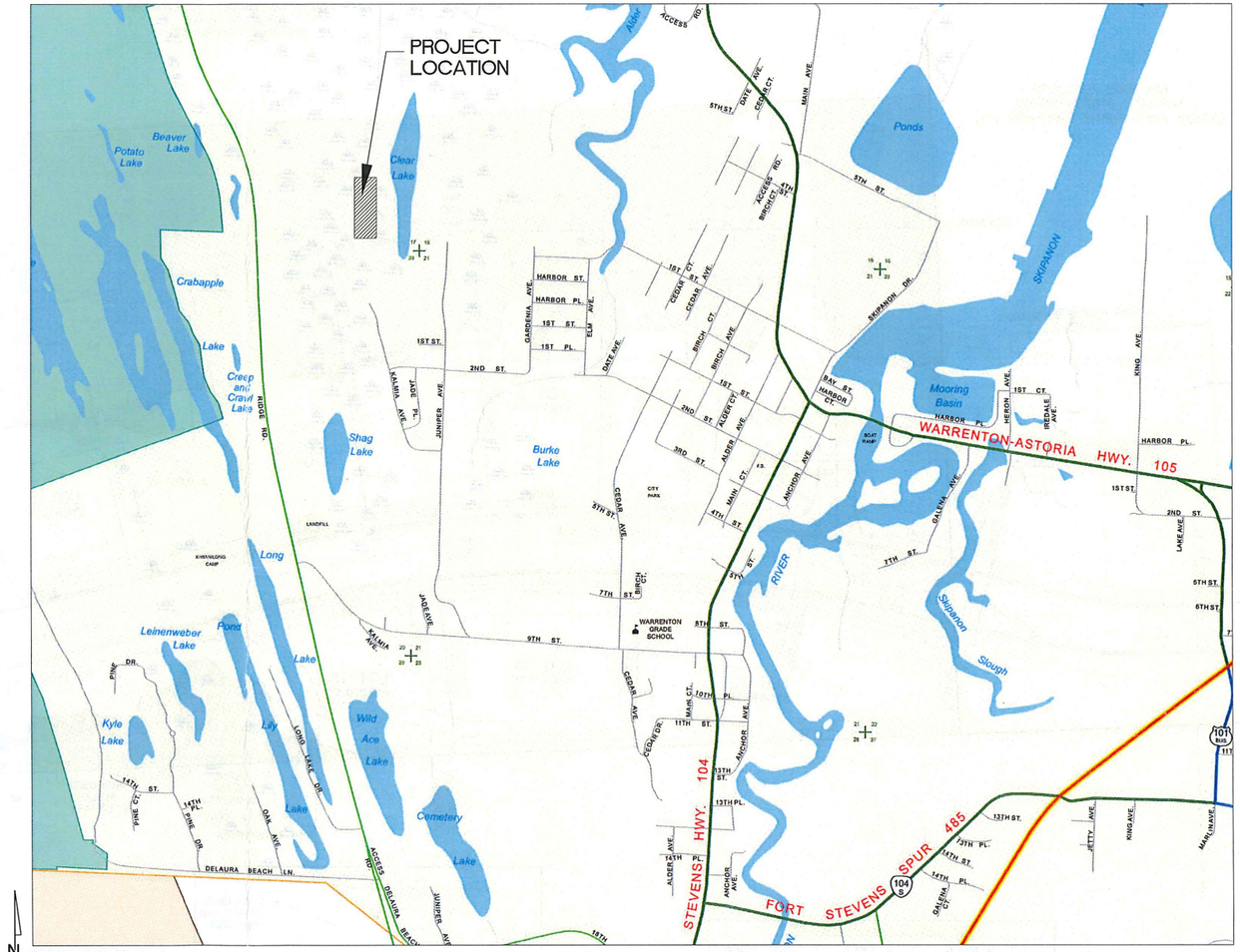
CLEAR LAKE SUBDIVISION

LAND USE SUBMITTAL

LOCATED AT THE NORTHERLY TERMINUS OF KALMIA AVENUE



TAXLOT AND OWNER MAP
SCALE: 1"=200'



VICINITY MAP
SCALE: 1"=800'

OWNER:

GILL GRAMSON
SANDWORKS
15 N 17TH PLACE
WARRENTON, OREGON 97146

ENGINEER:

FIRWOOD DESIGN GROUP, LLC
359 E. HISTORIC COLUMBIA RIVER DRIVE
TROUTDALE, OREGON 97060
(503) 668-3737

SHEET INDEX

DATUM

HORIZONTAL DATUM:
NAD_1983_HARN_STATEPLANE_OREGON_NORTH_FIPS_3601_FEET_INTL

VERTICAL DATUM:
NAVD 88

PRELIMINARY

DATE:	NO.	REVISION

DRAWN: BD | DESIGNED: EH | CHECKED: EH
SCALE: AS SHOWN | DATE: FEB 5, 2019
PROJECT NO. E18-030

FDG
Firwood Design Group, LLC
SURVEYING + ENGINEERING + PLANNING
359 E HISTORIC COLUMBIA RIVER HWY
TROUTDALE, OREGON 97060
BUS: (503) 668-3737 ✦ FAX: (503) 668-3788

GILL GRAMSON
15 NW 17TH PLACE
WARRENTON, OR 97146

COVER SHEET & VICINITY MAP
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146

15–LOT SUBDIVISION PRELIMINARY PLAT

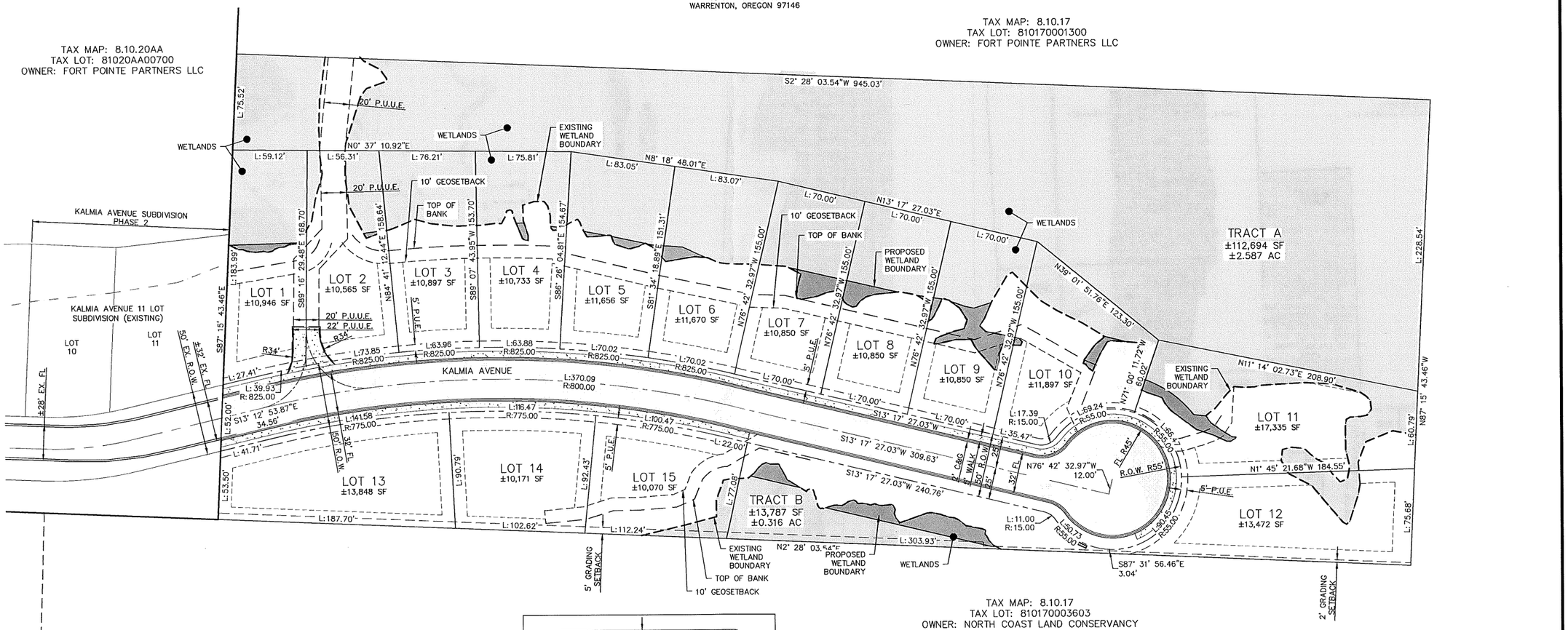
LOCATED IN SE 1/4 OF SECTION 17, TOWNSHIP 8 NORTH, RANGE 10 WEST,
WILLAMETTE MERIDIAN, CITY OF WARRENTON, COUNTY OF CLATSOP, STATE OF OREGON

ZONING: R-10 GROWTH MANAGEMENT
TAX MAP: 8.10.17
TAX LOT: 810170001302
TOTAL AREA: ±344,946 SQ. FT. (7.919 ACRES)
PROPOSED SINGLE FAMILY RESIDENTIAL LOTS: 15
DENSITY: 1.89 UNITS/ACRE

OWNER: SANDWORKS – GILL GRAMSON
15 N 17TH PLACE
WARRENTON, OREGON 97146

TAX MAP: 8.10.20AA
TAX LOT: 81020AA00700
OWNER: FORT POINTE PARTNERS LLC

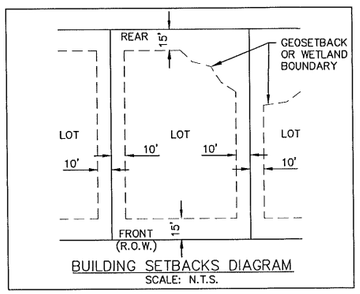
TAX MAP: 8.10.17
TAX LOT: 810170001300
OWNER: FORT POINTE PARTNERS LLC



TAX MAP: 8.10.17
TAX LOT: 810170003603
OWNER: NORTH COAST LAND CONSERVANCY

BUILDABLE AREA MATRIX:

LOT NUMBER	TOTAL AREA	BUILDABLE AREA
1	10,946 SF	2,594 SF
2	10,565 SF	3,108 SF
3	10,897 SF	2,599 SF
4	10,733 SF	2,594 SF
5	11,656 SF	2,352 SF
6	11,670 SF	2,056 SF
7	10,850 SF	2,174 SF
8	10,850 SF	2,200 SF
9	10,850 SF	2,300 SF
10	11,897 SF	2,173 SF
11	17,335 SF	5,897 SF
12	13,472 SF	7,117 SF
13	13,848 SF	5,269 SF
14	10,171 SF	5,885 SF
15	10,070 SF	3,049 SF



BUILDING SETBACKS DIAGRAM
SCALE: N.T.S.

ABBREVIATIONS:

R.O.W. = RIGHT OF WAY	TC = TOP OF CURB
P.U.E. = PUBLIC UTILITY EASEMENT	SW = SIDEWALK
	P = PAVEMENT
P.U.U.E. = PUBLIC UTILITY AND USE EASEMENT	PC = POINT OF CURVATURE
	PT = POINT OF TANGENCY
C&G = CURB AND GUTTER	PCC = POINT OF COMPOUND CURVATURE
FL = FLOWLINE	

FLOODPLAIN NOTE:

THE 100–YEAR FLOODPLAIN IS BEYOND THE PROJECT EXTENTS.

WETLAND LEGEND

	EXISTING	PROPOSED
EXISTING WETLANDS		
PROPOSED WETLAND REMOVAL		

NORTH

0 40 80
SCALE IN FEET

PRELIMINARY

DATE:	NO.	REVISION

DRAWN: BD | DESIGNED: EH | CHECKED: EH
SCALE: AS SHOWN | DATE: FEB 5, 2019
PROJECT NO. E18–030

FDG
Firwood Design Group, LLC
SURVEYING + ENGINEERING + PLANNING
359 E HISTORIC COLUMBIA RIVER HWY
TROUTDALE, OREGON 97060
BUS: (503) 668-3737 ▼ FAX: (503) 668-3788

GILL GRAMSON
15 NW 17TH PLACE
WARRENTON, OR 97146

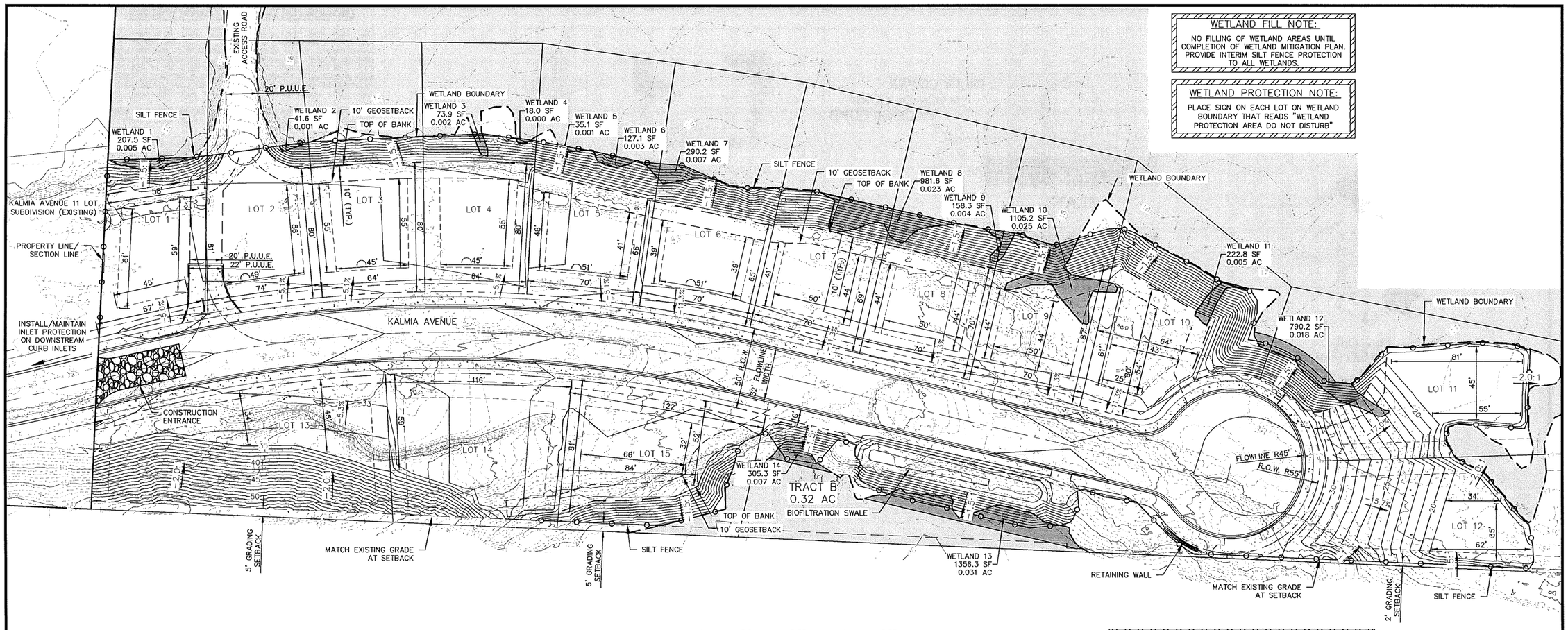
PRELIMINARY PLAT
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146

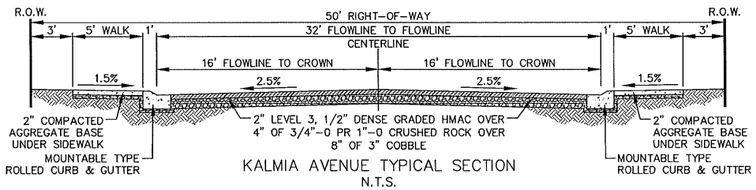
WETLAND FILL NOTE:

NO FILLING OF WETLAND AREAS UNTIL COMPLETION OF WETLAND MITIGATION PLAN. PROVIDE INTERIM SILT FENCE PROTECTION TO ALL WETLANDS.

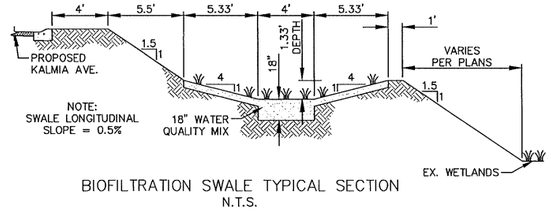
WETLAND PROTECTION NOTE:

PLACE SIGN ON EACH LOT ON WETLAND BOUNDARY THAT READS "WETLAND PROTECTION AREA DO NOT DISTURB"

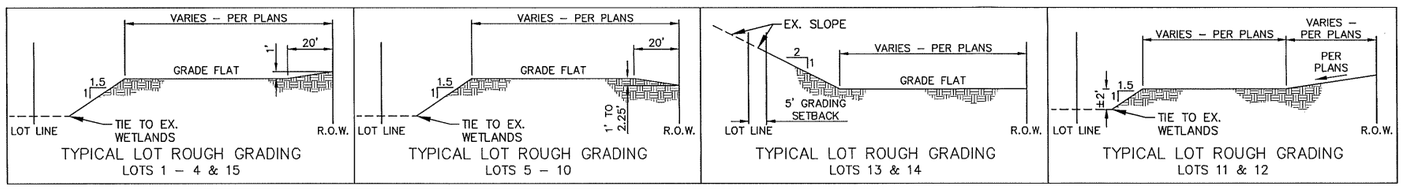




KALMIA AVENUE TYPICAL SECTION
N.T.S.



BIOFILTRATION SWALE TYPICAL SECTION
N.T.S.



TYPICAL LOT ROUGH GRADING
LOTS 1 – 4 & 15

TYPICAL LOT ROUGH GRADING
LOTS 5 – 10

TYPICAL LOT ROUGH GRADING
LOTS 13 & 14

TYPICAL LOT ROUGH GRADING
LOTS 11 & 12

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C&G = CURB AND GUTTER	PC = POINT OF CURVATURE
FL = FLOWLINE	PT = POINT OF TANGENCY
	PCC = POINT OF COMPOUND CURVATURE

LEGEND

	EXISTING	PROPOSED
MAJOR CONTOUR	40	40
MINOR CONTOUR	36	36
SLOPE (ARROW = DOWN)		2.0:1
SILT FENCE		
EXISTING WETLANDS		
PROPOSED WETLAND REMOVAL		

NORTH

0 30 60
SCALE IN FEET

PRELIMINARY

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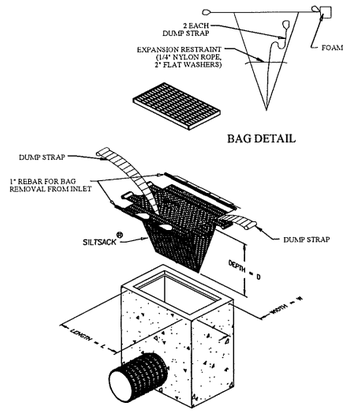
WARRENTON, OR 97146

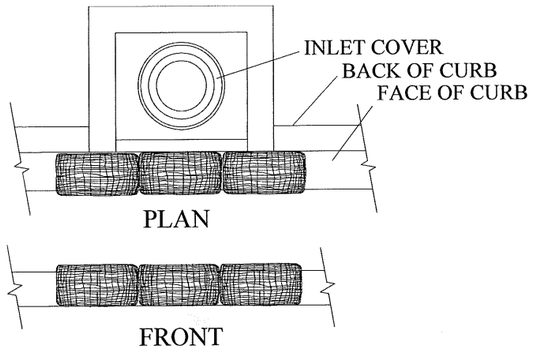
GRADING & EROSION CONTROL PLAN
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146



Regular Flow Only
Do not use High Flow Insert Bags.

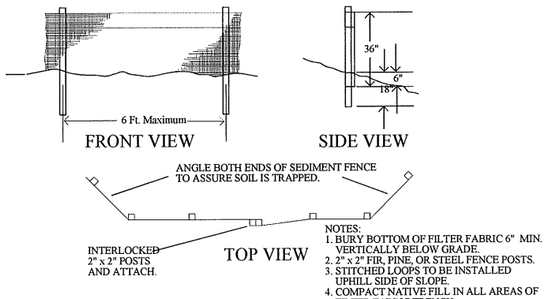
Catch Basin Insert Bag

INLET PROTECTION DETAIL



Ensure that no gaps exist
between bags and 1/2
bag overlap of opening.

"CURB INLET" INLET PROTECTION



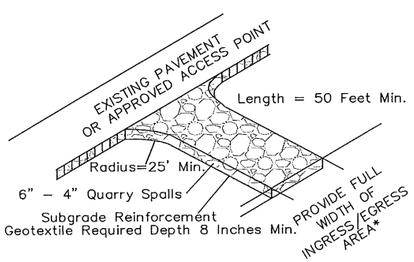
Sediment Fence

NTS

SEDIMENT CONTROL FENCES :

1. AT NO TIME SHALL SEDIMENT BE ALLOWED TO ACCUMULATE BEHIND A SEDIMENT FENCE MORE THAN ONE-THIRD OF THE FENCE HEIGHT ABOVE GROUND. SEDIMENT SHOULD BE REMOVED OR REGRADED ONTO SLOPES, AND THE SEDIMENT FENCES REPAIRED AND REESTABLISHED AS NEEDED.

2. FENCE SHALL BE REMOVED ONLY WHEN UPSLOPE AREAS ARE PERMANENTLY STABILIZED.



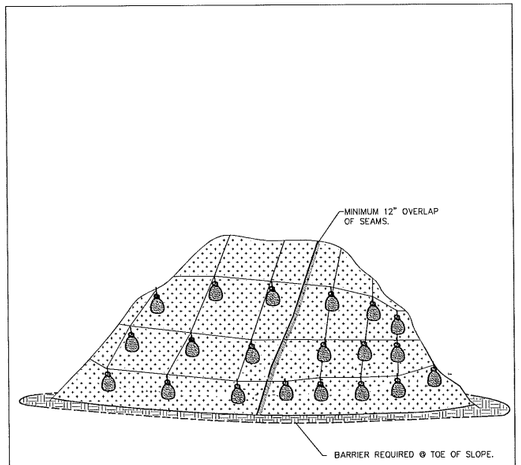
*20' MIN. FOR SINGLE FAMILY AND DUPLEX RESIDENTIAL

GRAVEL CONSTRUCTION ENTRANCES :

1. STABILIZED CONSTRUCTION ENTRANCE(S) SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

2. ALL VEHICLES LEAVING THE SITE SHALL LEAVE BY DRIVING ACROSS THE GRAVEL CONSTRUCTION ENTRANCE(S) IF GRAVEL ENTRANCE BECOME FILLED WITH MUD AND IS NO LONGER FUNCTIONAL, ADDITIONAL GRAVEL SHALL BE PLACED. VEHICLE TIRES SHALL BE FREE FROM DIRT BEFORE LEAVING THE SITE.

3. AT TIME OF ROAD CONSTRUCTION THE GRAVEL CONSTRUCTION ENTRANCE SHALL BE REBUILD TO ALLOW FOR THE APPROPRIATE ROAD BASE AND ASPHALT THICKNESS.



PLASTIC SHEETING

NOTES:
1. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.
2. BARRIER REQUIRED @ TOE OF STOCK PILE.
3. COVERING MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR TIRES ON ROPES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.

PLASTIC SHEETING	Detail Drawing 4-4

RESEEDING/ESTABLISHMENT OF VEGETATIVE COVER :

1. RECOMMENDED EROSION CONTROL GRASS SEED MIXES ARE AS SPECIFIED AS BELOW. SIMILAR MIXES DESIGNED TO ACHIEVE EROSION CONTROL MAY BE SUBSTITUTED WITH APPROVAL. IN GENERAL, USE OF QUICK GROWING, STERILE GRASSES AND GRAINS IN MIXTURE WITH PERMANENT VEGETATIVE COVER IS RECOMMENDED TO ACHIEVE QUICK COVER OF EXPOSED SOILS.

   a. DWARF GRASS MIX (LOW HEIGHT, LOW MAINTENANCE), 100 POUNDS PER ACRE SEED RATE

   (MINIMUM):
   1. DWARF PERENNIAL RYEGRASS, 80% BY SEED COUNT.
   2. CREEPING RED FESCUE, 20% BY SEED COUNT.

2. IT IS RECOMMENDED THAT TOP SOIL ON SLOPES BE PREPARED BY ROUGHENING THE SLOPES BEFORE SEEDING.

3. AREAS THAT FAIL TO ESTABLISH GRASS COVER ADEQUATE TO PREVENT EROSION SHALL BE RESEEDED AS SOON AS SUCH AREAS ARE IDENTIFIED, AND ALL APPROPRIATE MEASURES TAKEN TO ESTABLISH COVER.

4. EROSION CONTROL MEASURES SHALL BE MAINTAINED BY CONTRACTOR UNTIL GRASS COVER IS ESTABLISHED AND UP TO ONE YEAR AFTER COMPLETION OF CONSTRUCTION, WHICHEVER IS SOONER.

5. MULCH SHALL BE SPREAD UNIFORMLY IMMEDIATELY FOLLOWING SEEDING.

EROSION AND SEDIMENT CONTROL NOTES

1. THE OWNER/PERMITTEE, OR EPSC MANAGER, SHALL BE RESPONSIBLE FOR PROPER INSTALLATION, MONITORING, MAINTENANCE, AND REMOVAL OF ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH THE CITY, STATE, AND FEDERAL REGULATIONS. RESPONSIBILITY WILL CONTINUE UNTIL PERMANENT VEGETATION OR LANDSCAPE IS COMPLETE. OWNER/PERMITTEE SHALL BE RESPONSIBLE FOR MAINTENANCE UNTIL THE FOLLOWING CONDITIONS ARE MET: 1) THE PROJECT HAS BEEN ACCEPTED BY THE CITY; 2) ALL INDIVIDUAL LOTS ARE SOLD; AND 3) TERMINATION OF THE 1200-C PERMIT BY THE DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ).

2. APPROVAL OF THE PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G., SIZE AND LOCATION OR ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES).

3. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON A PLAN SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE MARKINGS SHALL BE MAINTAINED BY THE OWNER/PERMITTEE OR DESIGNEE FOR THE DURATION OF CONSTRUCTION.

4. THE EPSC BMPS SHOWN ON THE PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, IN ACCORDANCE WITH THE CONDITIONS OF APPROVAL, PUBLIC WORKS STANDARDS, DEVELOPMENT CODE, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT, SEDIMENT LADEN WATER, AND OTHER POLLUTANTS DO NOT ENTER THE DRAINAGE SYSTEM OR ROADWAYS, OR VIOLATE APPLICABLE WATER QUALITY STANDARDS.

5. THE EPSC BMPS SHOWN ON THE PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE
6. CONDITIONS. DURING THE CONSTRUCTION PERIOD, THE BMPS SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT LEAVE THE SITE.

7. THE EPSC BMPS SHALL BE INSPECTED DAILY DURING STORMWATER AND SNOWMELT RUNOFF AND AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT THAT PRODUCES AT LEAST ½ OF AN INCH OF RAIN PER 24-HOUR PERIOD. ON INACTIVE PERIODS OF GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS, INSPECTIONS ARE REQUIRED EVERY TWO (2) WEEKS.

8. AT NO TIME SHALL SEDIMENT BE ALLOWED TO ACCUMULATE MORE THAN ONE-THIRD THE HEIGHT OF ANY SEDIMENT CONTROL BARRIER. TRAPPED SEDIMENTS SHALL BE REMOVED FROM CATCH BASINS WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PROJECT FINAL INSPECTION. THE CLEANING OPERATION SHALL NOT FLUSH OR INTENTIONALLY WASH SEDIMENT-LADEN WATER INTO THE DOWNSTREAM STORMWATER SYSTEM, STREAMS OR DRAINAGE WAYS.

9. SEDIMENT THAT LEAVES THE SITE SHALL BE CLEANED UP WITHIN 24 HOURS AND PLACED BACK ON THE SITE OR PROPERLY DISPOSED. ANY IN-STREAM CLEAN UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO REQUIREMENTS OF THE U.S. ARMY CORPS OF ENGINEERS AND THE OREGON DEPARTMENT OF STATE LANDS.

10. STORM DRAIN INLETS, CATCH BASINS, AND AREA DRAINS SHALL BE PROTECTED UNTIL PAVEMENT SURFACES ARE COMPLETED AND PERMANENT VEGETATION HAS BEEN ESTABLISHED.

11. STABILIZED GRAVEL ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

12. CONCRETE WASHOUT LOCATION SHALL BE PROVIDED FOR WASHING OF CONCRETE TRUCKS AND EQUIPMENT SO THAT CONCRETE SLURRY IS NOT WASHED INTO THE STORMWATER SYSTEM, STREAMS, OR DRAINAGE WAYS. IDENTIFY THE LOCATION ON THE PLAN AND INCLUDE THE NOTE: "DO NOT OVERFILL AND BURY WHEN FINISHED."

13. GROUNDCOVER AND/OR SEEDING SHALL BE COMPLETED AS SOON AS PRACTICABLE FOR EACH PHASE OF CONSTRUCTION AND NOT LATER THAN SEPTEMBER 1. IF FERTILIZERS ARE USED TO ESTABLISH VEGETATION, THE APPLICATION RATES SHALL FOLLOW MANUFACTURER'S GUIDELINES AND THE APPLICATION SHALL BE PERFORMED IN SUCH A WAY TO MINIMIZE NUTRIENT-LADEN RUNOFF TO RECEIVING WATERS. THE PLAN SHALL STATE THE CONDITIONS FOR DETERMINING SUCCESSFUL VEGETATION ESTABLISHMENT.

14. NON-STORMWATER POLLUTANT CONTROL MEASURES INCLUDING ANY USE OF TOXIC OR OTHER HAZARDOUS MATERIALS SHALL INCLUDE PROPER STORAGE, SPILL CONTAINMENT, APPLICATION, AND DISPOSAL.

15. WET WEATHER MEASURES SHALL BE ESTABLISHED BY OCTOBER 1ST AND CONTINUE TO FUNCTION THROUGH MAY 31ST OF THE FOLLOWING YEAR. PRIOR TO DISCONTINUING ACTIVITIES ON ANY PORTION OF THE SITE BETWEEN OCTOBER 1 AND MAY 31, ANY EXPOSED AREA SHALL BE STABILIZED WITHIN 7 DAYS TO PREVENT EROSION. BETWEEN JUNE 1 AND SEPTEMBER 30, THE SITE MUST BE STABILIZED WITHIN 30 DAYS. STABILIZATION MAY OCCUR BY APPLYING APPROPRIATE COVER (E.G., MULCH, EROSION CONTROL BLANKETS, BINDERS, TACKIFIERS) OR ESTABLISHING ADEQUATE VEGETATIVE COVER.

16. PRIOR TO FINAL PROJECT ACCEPTANCE BY THE CITY, THE SITE SHALL BE PERMANENTLY STABILIZED (SEED AND MULCH OR TACKIFIER, OR PERMANENT LANDSCAPING). SEE APPENDIX F: CITY OF WARRENTON NATIVE PLANT RESTORATION GUIDE AS A RESOURCE. FOR SUBDIVISIONS, TEMPORARY GROUNDCOVER WILL BE ACCEPTED IF HOME CONSTRUCTION WILL BEGIN WITHIN 30 DAYS OF PROJECT FINALIZATION.

17. THE OWNER/PERMITTEE IS RESPONSIBLE FOR REMOVING ALL SEDIMENT CONTROL MEASURES ONCE PERMANENT STABILIZATION HAS BEEN ESTABLISHED. DEQ WILL NOT TERMINATE THE 1200-C PERMIT UNTIL PERMANENT VEGETATION IS ESTABLISHED.

PRELIMINARY

DATE:	NO.	REVISION

DRAWN: BD | DESIGNED: EH | CHECKED: EH
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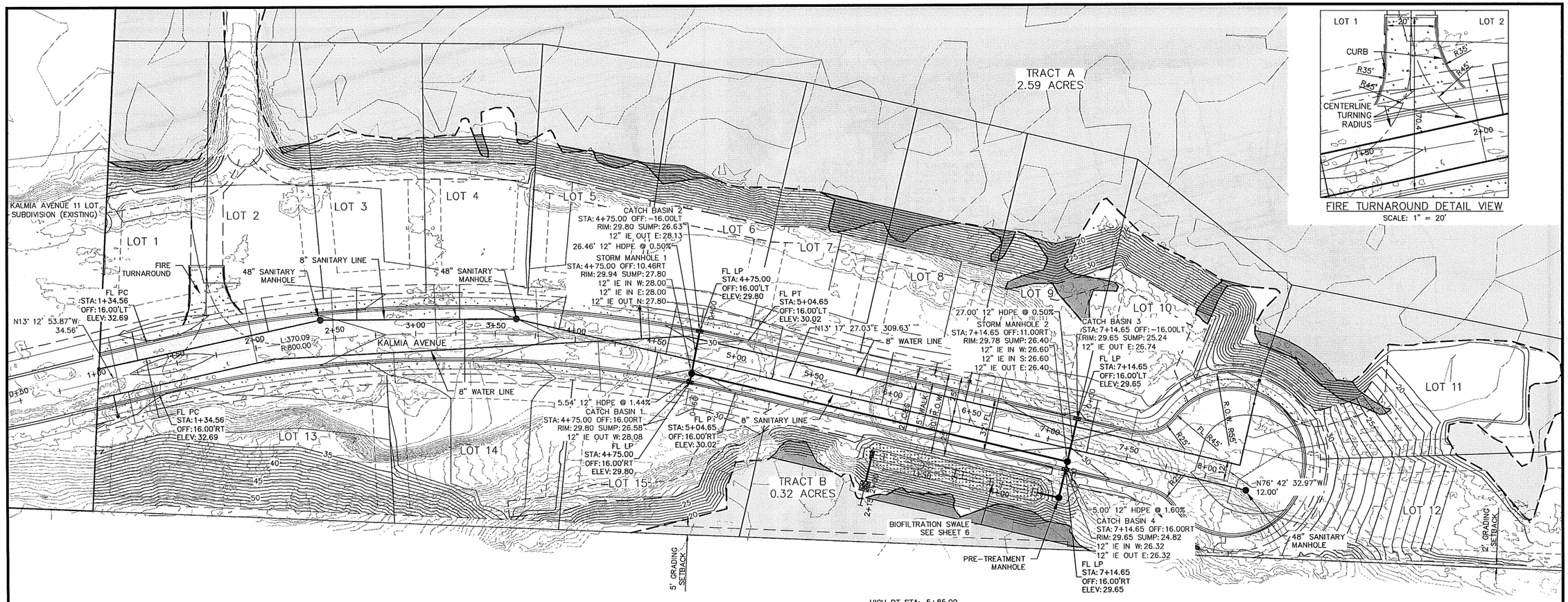
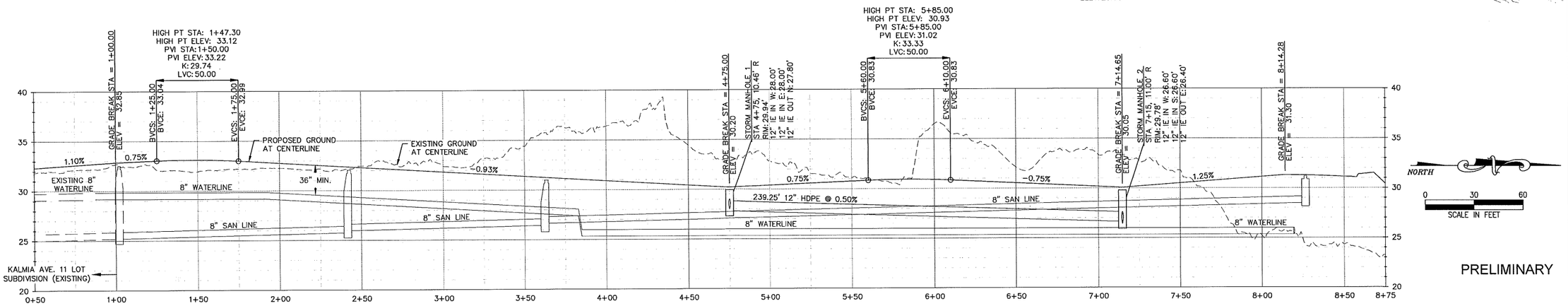
EROSION CONTROL NOTES & DETAILS
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146



FIRE TURNAROUND DETAIL VIEW
SCALE: 1" = 20'



KALMIA AVENUE PROFILE
VERTICAL SCALE: 1" = 5'

NORTH
0 30 60
SCALE IN FEET

PRELIMINARY

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STREET AND STORM SEWER PLAN
CLEAR LAKE SUBDIVISION
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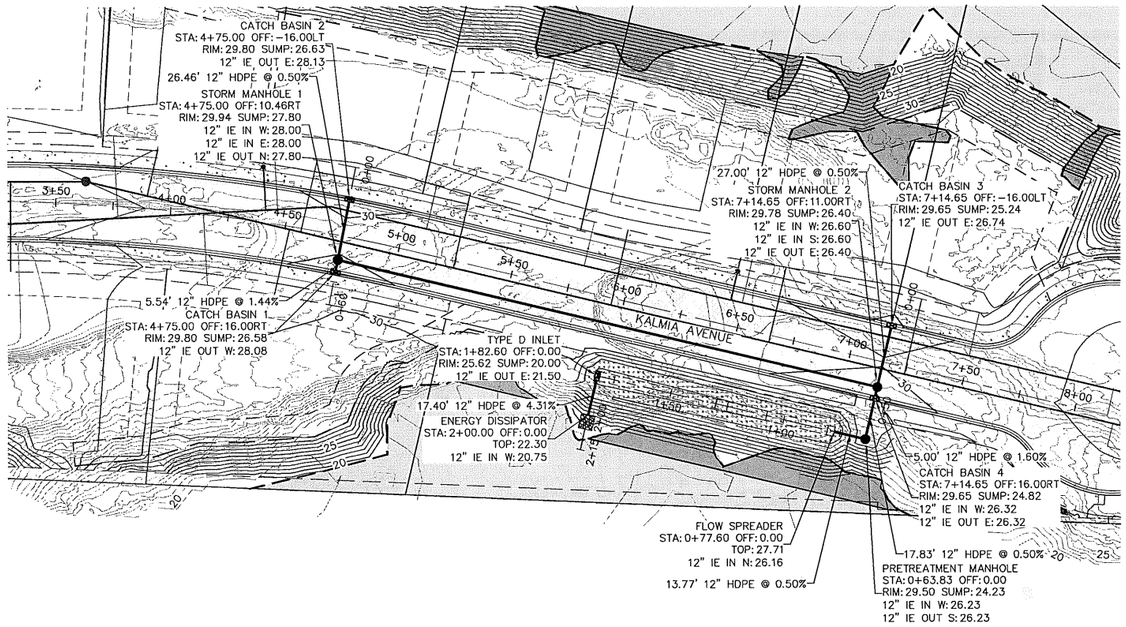
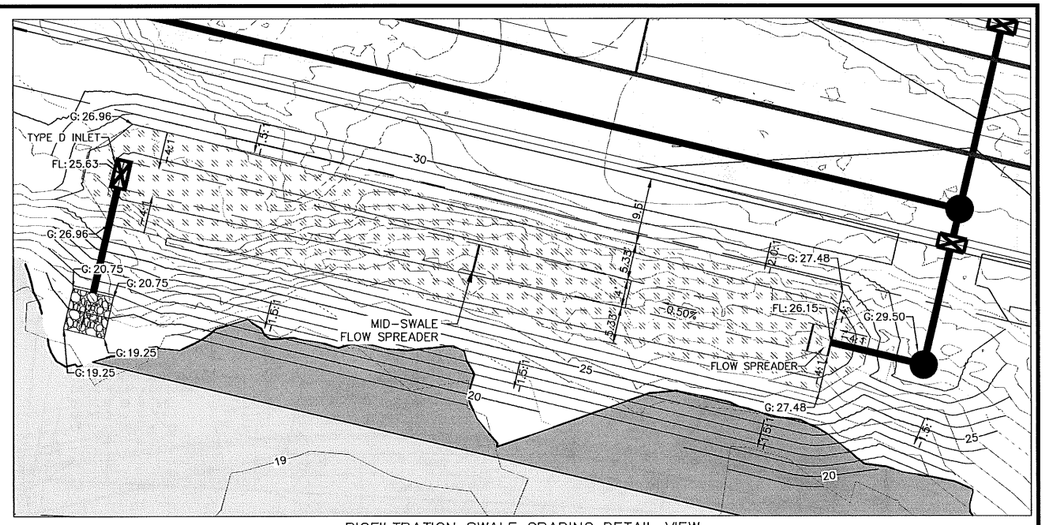
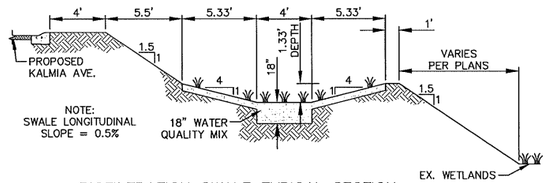
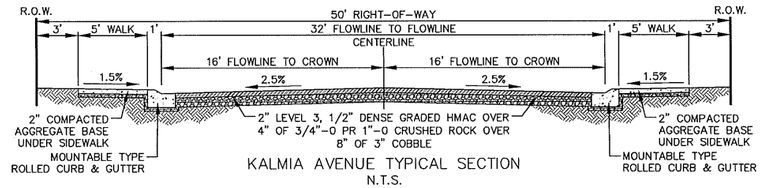




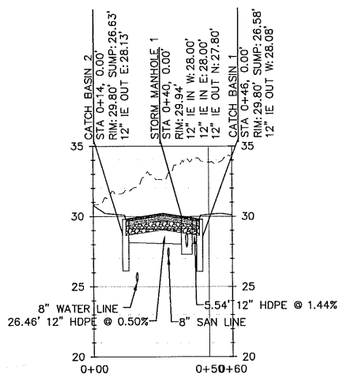
BIOFILTRATION SWALE GRADING DETAIL VIEW
VERTICAL SCALE: 1" = 10'



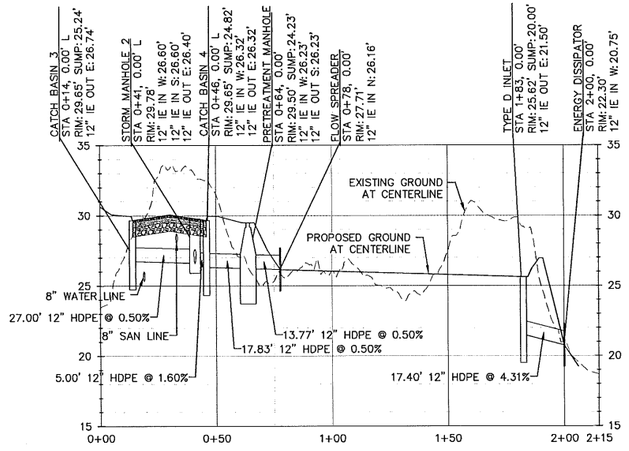
BIOFILTRATION SWALE TYPICAL SECTION
N.T.S.



KALMIA AVENUE TYPICAL SECTION
N.T.S.



STORM LATERAL PROFILE
VERTICAL SCALE: 1" = 5'



STORM OUTFALL AND BIOFILTRATION SWALE PROFILE
VERTICAL SCALE: 1" = 5'

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FL = FLOWLINE	

LEGEND

	EXISTING	PROPOSED
MAJOR CONTOUR	40	40
MINOR CONTOUR	36	36
SLOPE (ARROW = DOWN)		-2.0:1
SILT FENCE		
EXISTING WETLANDS		
PROPOSED WETLAND REMOVAL		

NORTH

0 30 60
SCALE IN FEET

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STORM SEWER AND OUTFALL PLAN
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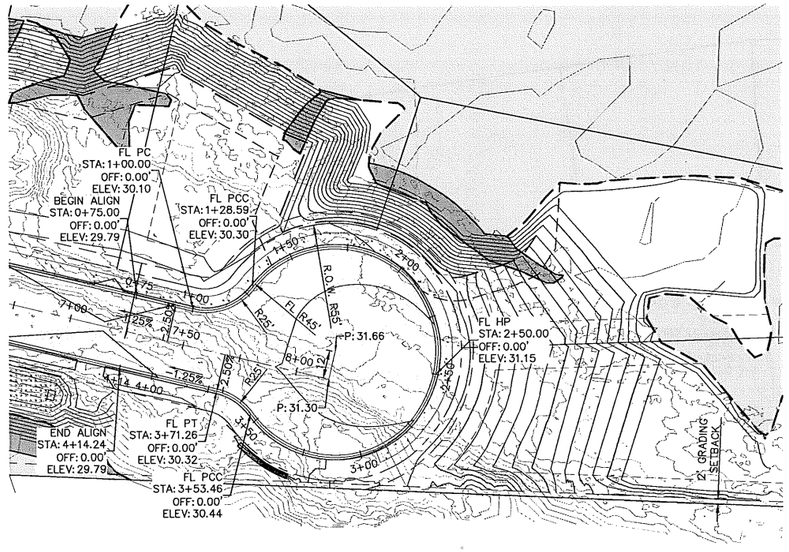
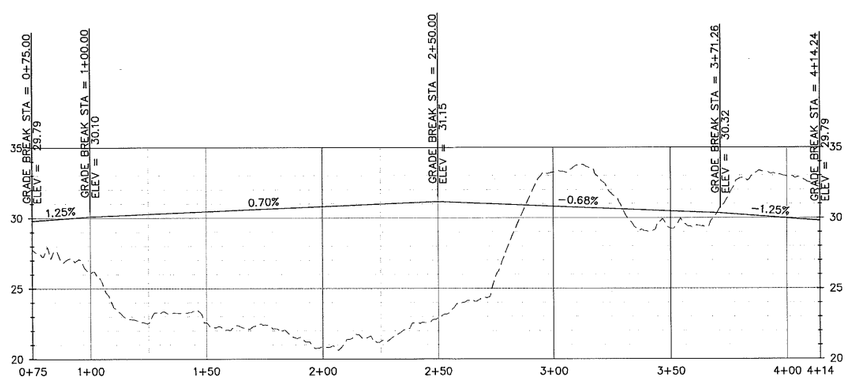
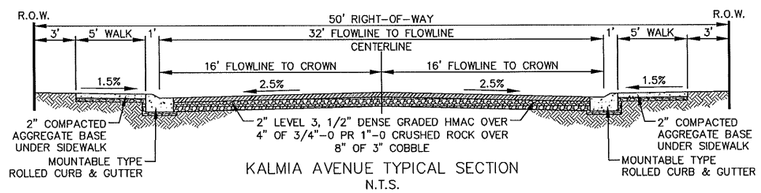
KALMIA AVE, WARRENTON, OR 97146





KALMIA AVENUE CUL-DE-SAC FLOWLINE PROFILE

VERTICAL SCALE: 1" = 5'



KALMIA AVENUE TYPICAL SECTION

N.T.S.

ABBREVIATIONS:

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C&G = CURB AND GUTTER	PCC = POINT OF COMPOUND CURVATURE
FL = FLOWLINE	

LEGEND	EXISTING	PROPOSED
MAJOR CONTOUR	40	40
MINOR CONTOUR	36	36
SLOPE (ARROW = DOWN)		-2.0:1
SILT FENCE		
EXISTING WETLANDS		
PROPOSED WETLAND REMOVAL		

NORTH

0 30 60

SCALE IN FEET

PRELIMINARY

DATE:	NO.	REVISION

DRAWN: BD | DESIGNED: EH | CHECKED: EH

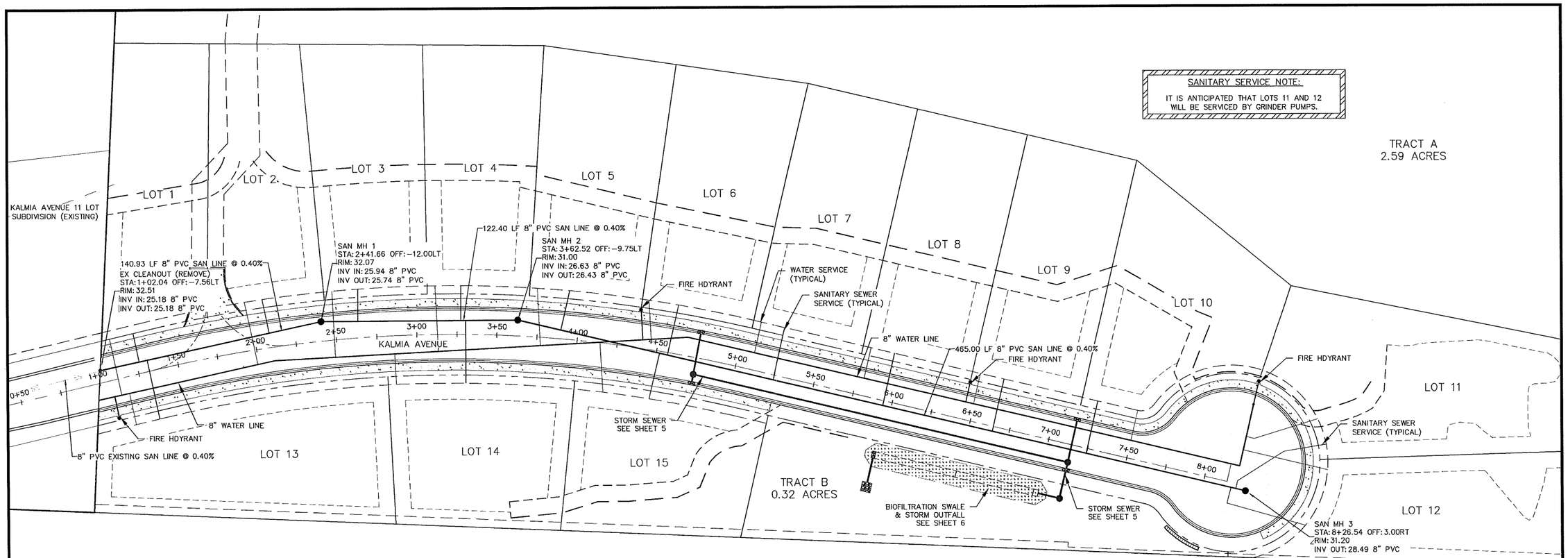
SCALE: AS SHOWN | DATE: FEB 5, 2019

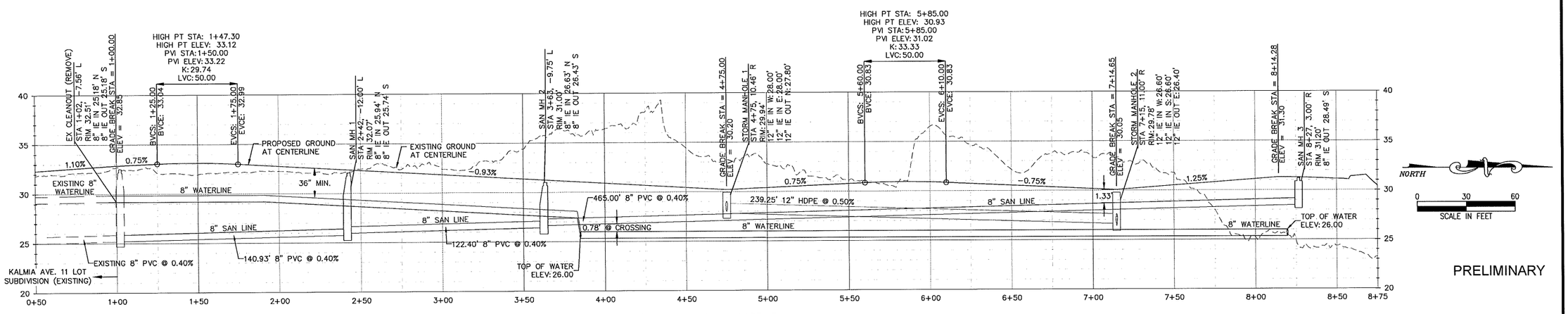
PROJECT NO. E18-030

FDG
Firwood Design Group, LLC
SURVEYING + ENGINEERING + PLANNING
359 E HISTORIC COLUMBIA RIVER HWY
TROUTDALE, OREGON 97060
BUS: (503) 668-3737 + FAX: (503) 668-3788

GILL GRAMSON
15 NW 17TH PLACE
WARRENTON, OR 97146

CUL-DE-SAC PLAN
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146





KALMIA AVENUE PROFILE
VERTICAL SCALE: 1" = 5'

PRELIMINARY

DATE:	NO.	REVISION

DRAWN: BD | DESIGNED: EH | CHECKED: EH
SCALE: AS SHOWN | DATE: FEB 5, 2019
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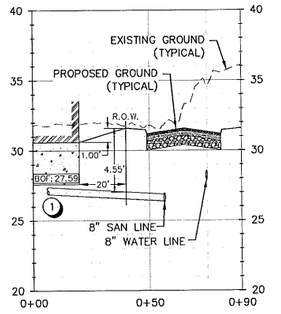
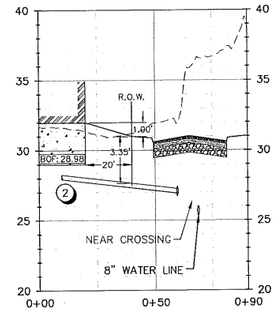
GILL GRAMSON
15 NW 17TH PLACE
WARRENTON, OR 97146

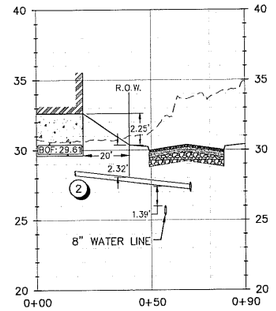
WATER AND SANITARY SEWER PLAN
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146



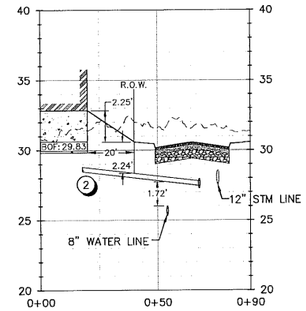
SANITARY SERVICE LOT 4 PROFILE
VERTICAL SCALE: 1" = 5'



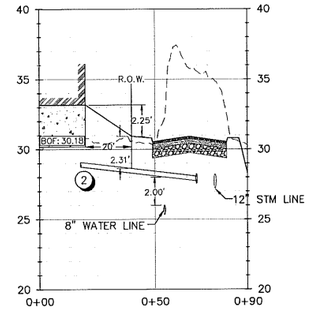
SANITARY SERVICE LOT 5 PROFILE
VERTICAL SCALE: 1" = 5'



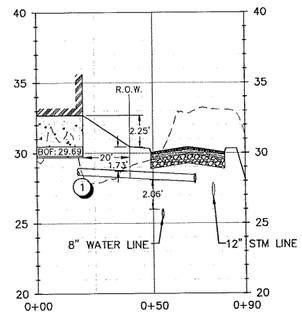
SANITARY SERVICE LOT 6 PROFILE
VERTICAL SCALE: 1" = 5'



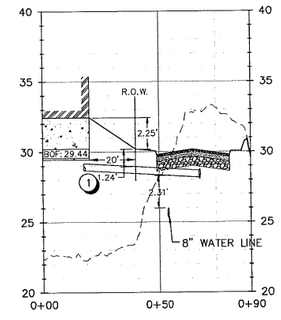
SANITARY SERVICE LOT 7 PROFILE
VERTICAL SCALE: 1" = 5'



SANITARY SERVICE LOT 8 PROFILE
VERTICAL SCALE: 1" = 5'



SANITARY SERVICE LOT 9 PROFILE
VERTICAL SCALE: 1" = 5'



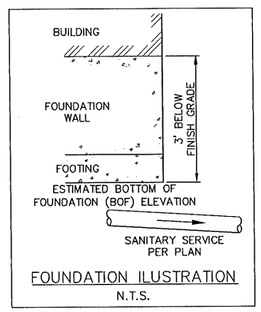
SANITARY SERVICE LOT 10 PROFILE
VERTICAL SCALE: 1" = 5'

KEY NOTES

1. 6" C900 PVC SANITARY SEWER SERVICE SLOPED AT 1%
2. 4" C900 PVC SANITARY SEWER SERVICE SLOPED AT 2%

SANITARY SERVICE NOTE:

IT IS ANTICIPATED THAT LOTS 11 AND 12 WILL BE SERVICED BY GRINDER PUMPS.



FOUNDATION ILUSTRATION
N.T.S.

NORTH

0 30 60
SCALE IN FEET

PRELIMINARY

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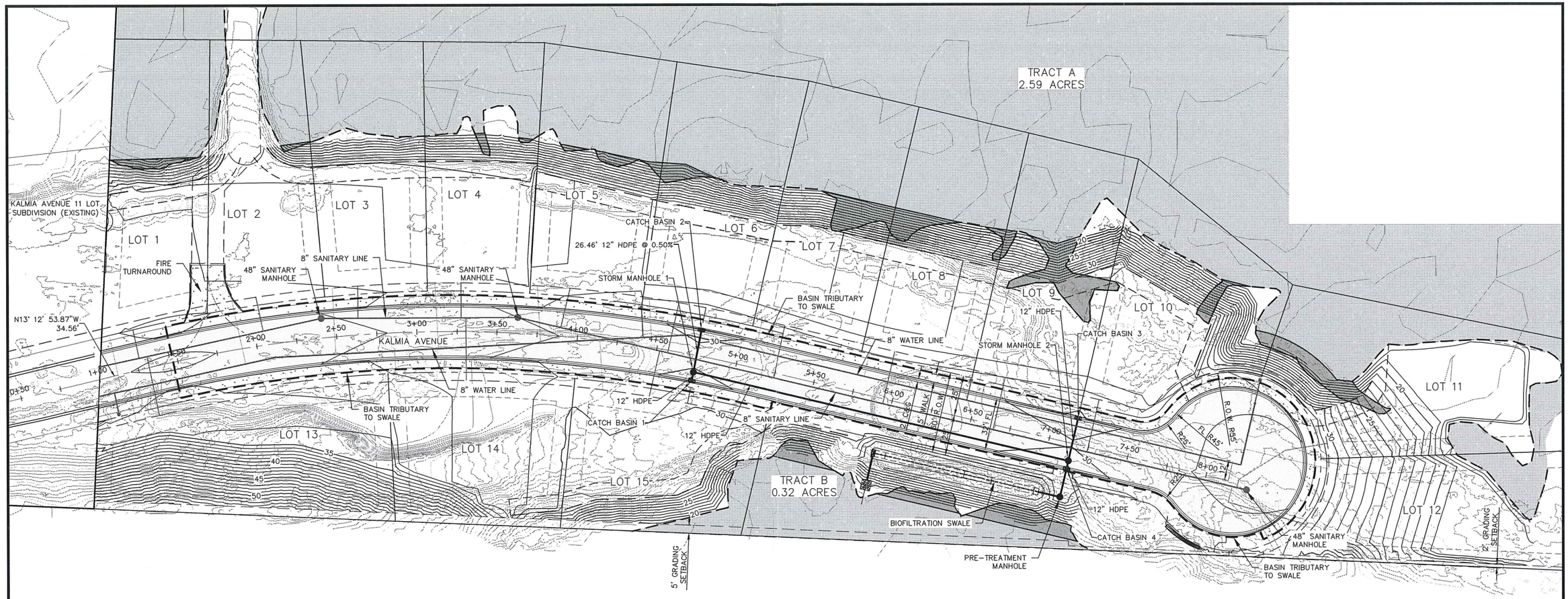
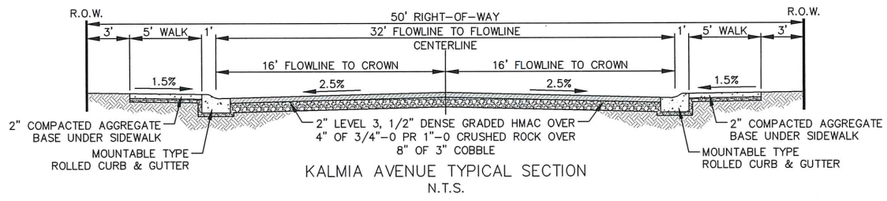
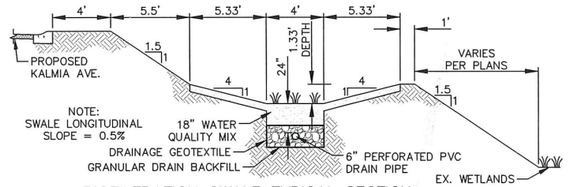
GILL GRAMSON
15 NW 17TH PLACE
WARRENTON, OR 97146

SANITARY SEWER SERVICE PROFILES
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146





KALMIA AVENUE TYPICAL SECTION
N.T.S.



BIOFILTRATION SWALE TYPICAL SECTION
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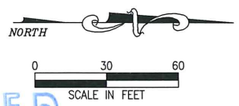

PRELIMINARY

DATE:	NO.	REVISION	DRAWN: BD	DESIGNED: EH	CHECKED: EH
			SCALE: AS SHOWN	DATE: FEB 5, 2019	
			PROJECT NO. E18-030		

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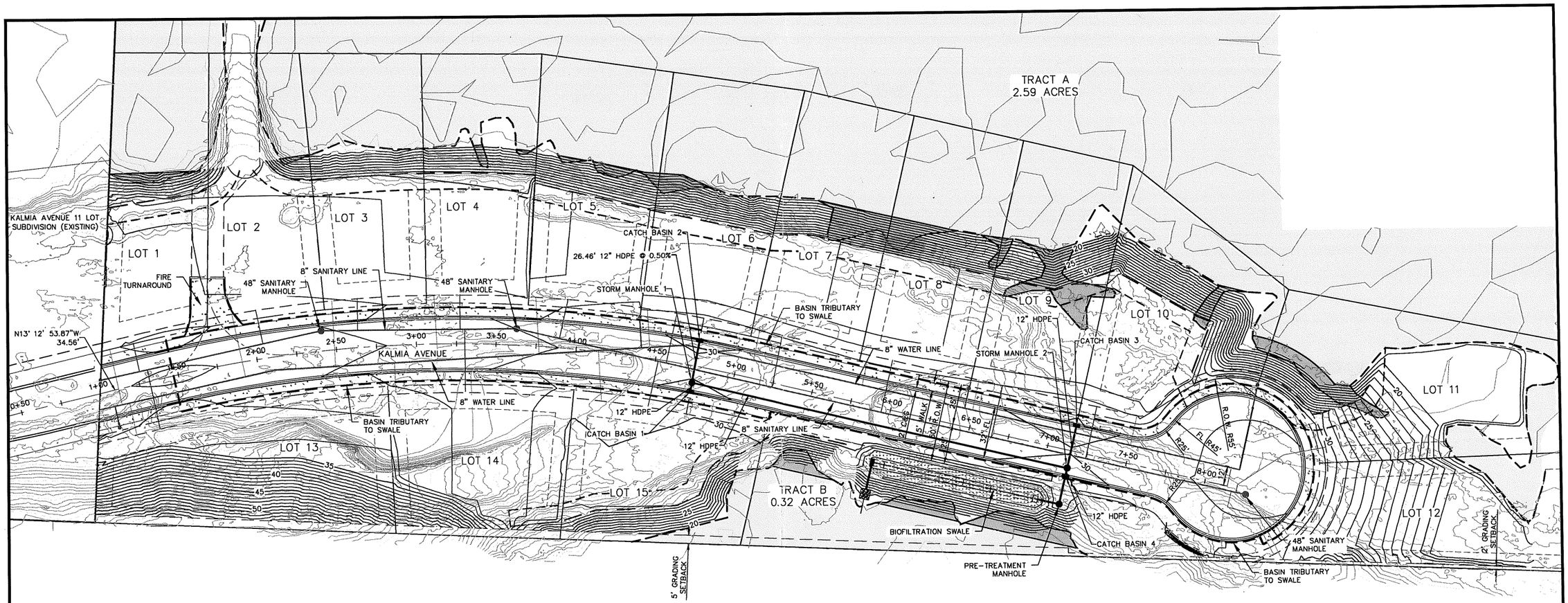
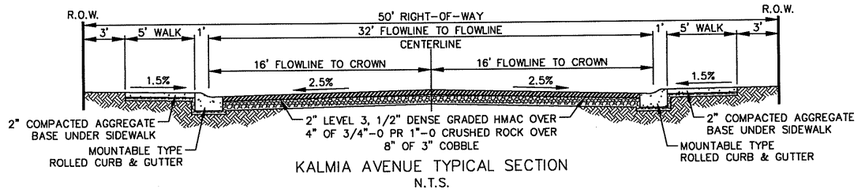
GILL GRAMSON
15 NW 17TH PLACE
WARRENTON, OR 97146

PRELIMINARY DRAINAGE MAP
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146

1/1





KALMIA AVENUE TYPICAL SECTION
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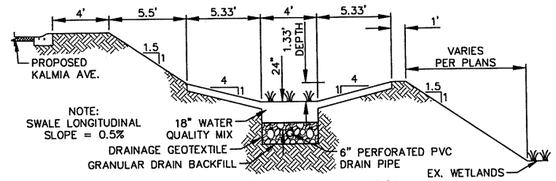

BIOFILTRATION SWALE TYPICAL SECTION
N.T.S.

NORTH

0 30 60
SCALE IN FEET

PRELIMINARY

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DRAWN: BD | DESIGNED: EH | CHECKED: EH
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GILL GRAMSON
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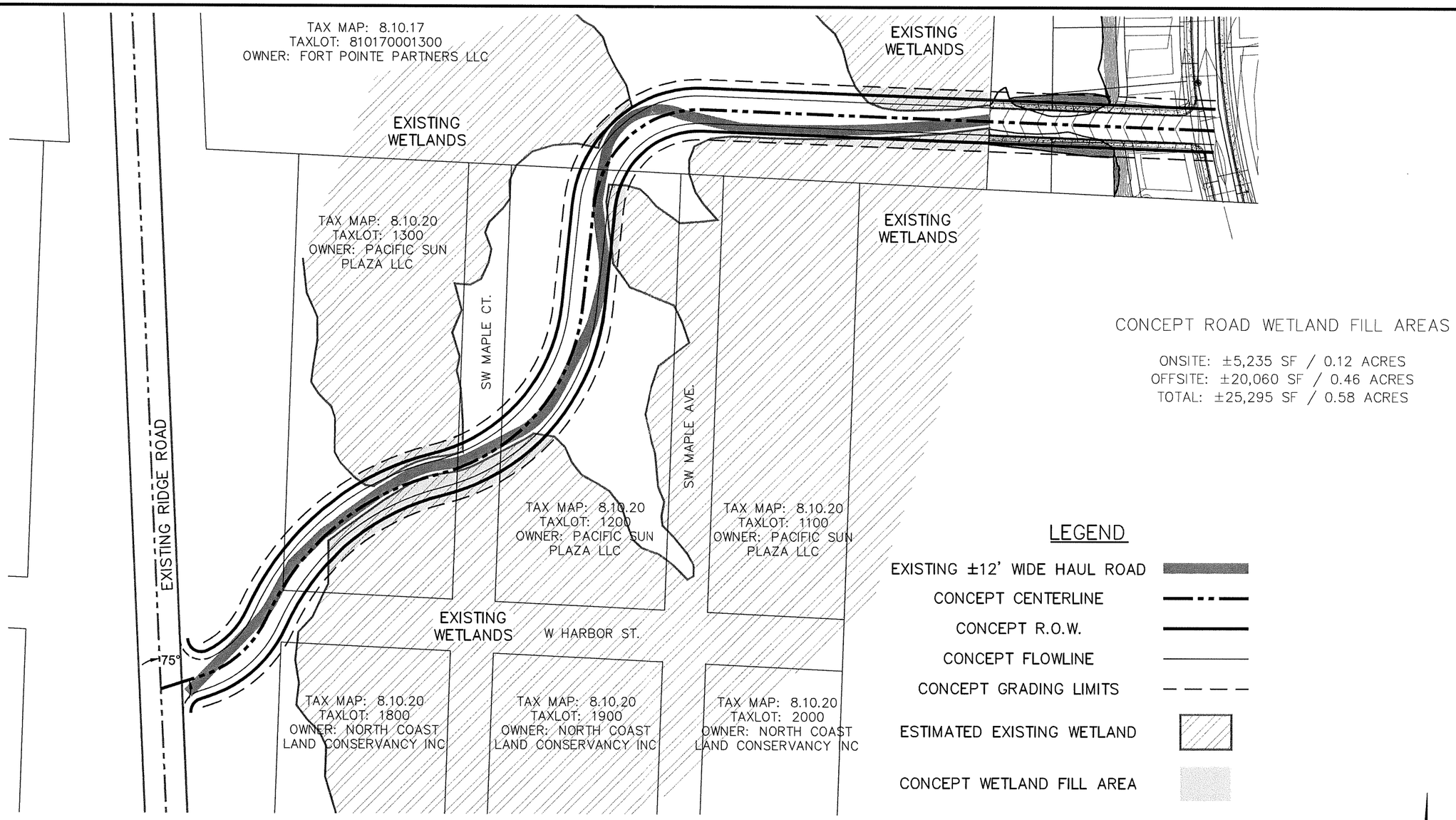
WARRENTON, OR 97146

PRELIMINARY DRAINAGE MAP
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146

1/1

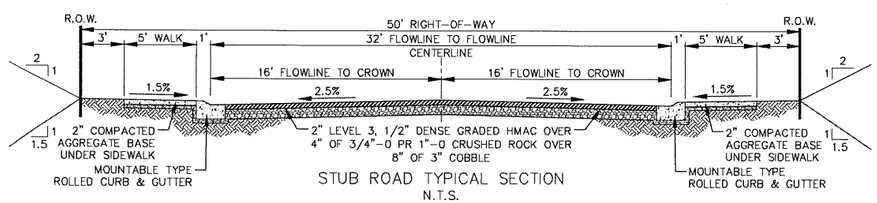


CONCEPT ROAD WETLAND FILL AREAS

ONSITE: ±5,235 SF / 0.12 ACRES
OFFSITE: ±20,060 SF / 0.46 ACRES
TOTAL: ±25,295 SF / 0.58 ACRES

LEGEND

- EXISTING ±12' WIDE HAUL ROAD
- CONCEPT CENTERLINE
- CONCEPT R.O.W.
- CONCEPT FLOWLINE
- CONCEPT GRADING LIMITS
- ESTIMATED EXISTING WETLAND
- CONCEPT WETLAND FILL AREA



STUB ROAD TYPICAL SECTION
N.T.S.

0 60 120
SCALE IN FEET

NORTH

DATE:	NO.	REVISION

DRAWN: BD | DESIGNED: BD | CHECKED: EH
SCALE: AS SHOWN | DATE: APR 9, 2019
PROJECT NO. E18-030

FDG
Firwood Design Group, LLC
SURVEYING ✦ ENGINEERING ✦ PLANNING
359 E HISTORIC COLUMBIA RIVER HWY
TROUTDALE, OREGON 97060
BUS: (503) 668-3737 ✦ FAX: (503) 668-3788

GILL GRAMSON
15 NW 17TH PLACE
WARRENTON, OR 97146

CONCEPT OFFSITE ROAD EXHIBIT
CLEAR LAKE SUBDIVISION
KALMIA AVE, WARRENTON, OR 97146

1/1

CITY OF WARRENTON
PLANNING AND BUILDING DEPARTMENT

SUBDIVISION APPLICATION

(To be accompanied by a Tentative Map, and copy of property deed, Letter of Authorization, if applicable.)

OFFICE USE ONLY
FILE # SUB-19-1 FEE $1200.00
ZONING DISTRICT
RECEIPT # 8780893
DATE RECEIVED 2/7/19

Legal Description of the Subject Property:

Township	Range	Section	Tax Lot
8	10	17	810170001302

Street address of the property:

I/WE, THE UNDERSIGNED APPLICANT(S) OR AUTHORIZED AGENT, AFFIRM BY MY/OUR SIGNATURE(S) THAT THE INFORMATION CONTINED IN THE FOREGOING APPLICATION AND ASSOCIATED SUBMISSIONS IS TRUE AND CORRECT.

APPLICANT:

Printed Name: Gil Gramson

Signature: Gil Gramson Date: Feb 5, 2019

Address: 15 N 17th Place Phone: 503.440.6818

City/State/Zip: WarrentonOR 97146 Fax:

PROPERTY OWNER (if different from Applicant)

Printed Name: Sand Works Inc

Signature: Date: Feb 5, 2019

Address: 15 N 17th Place Phone: 503.440.6818

City/State/Zip: WarrentonOR 97146 Fax:

Is this a Planned Unit Development (PUD)? No XX Yes

IS THIS A "PHASED DEVELOPMENT"? Yes No XX

****

a. Overall development plan, including phase or unit sequence.

15 lot subdivision with typical utilities. One tract will be developed for a stormwater biofiltration facility and another will be left as open space. The applicant willl grant a 20 foot easement to the city for utility extensions to the west and future pedestrian trail.

b. Projected Timetable for sequence of development

Construction is anticipated to begin in the spring/early summer 2019

c. Development plans for any common elements or facilities.

None.

d. If the proposed subdivision has an unknown impact upon adjacent lands or land within the general vicinity, the Planning Commission may require a potential street development pattern for adjoining lands to be submitted together with the tentative plan as part of the phased development plan for the subject subdivision.

adjacent lands to the east are owned by the North Coast Land Conservancy and are held in preservation. Land to the north and west is wetland and environmentally constrained.

e. Show compliance with the Comprehensive Plan and applicable sections of the Development Code.

Please refer to the application narrative.

f. Schedule of improvements and completion.

Construction is anticipated to begin late spring/early summer and be completed within a year.

g. Overall transportation and traffic pattern.

Traffic will transit to the city's circulation system via a single extension of SW Kalmia Avenue.

PRELIMINARY SUBDIVISION PLAT REQUIREMENTS

****

A "preliminary subdivision plat" shall be submitted with the following information depicted:

1. Proposed name of the subdivision;

2. Names, addresses, and phone numbers of property owner(s) (including mortgage holders if any), surveyor, and applicant if different from property owner, and assumed business name(s) filed or to be filed with the Corporation Commission by the applicant;

3. Proposed subdivision showing the parcel boundaries and dimensions, the area of each parcel, location of any and all easements (and what the easement is), right-of-way widths, existing roads;

4. Date of map preparation, north point, scale, property identification by township, range, section and tax lot numbers;

5. Location of all existing buildings, creeks, canals, ditches, any topographical features (ie., canyons, bluffs, wetlands, natural springs, floodplain);

6. Location, width, name, curve ratio, and approximate grade of all proposed right-of-ways;

7. Location of any existing features such as section lines, section corners, city and special district boundary lines, and survey monuments;

8. Existing sewer lines, water mains, culverts, and other underground and overhead utilities within and adjacent to the proposed subdivision together with pipe sizes, grades and locations;

9. Contour lines related to some established bench mark or other engineering acceptable datum;

10. Zoning of subject property, and adjacent tax lots to the proposed subdivision;

11. Location, names, width, typical improvements, cross sections, bridges, culverts, approximate grades, curve radii and centerline lengths and reserve strips of all proposed streets, and the relationship to all existing and projected streets;

12. Location, width and purpose of all proposed easements or right-of-ways, and relationship to all existing easements and right-of-ways;

13. Location of at least one temporary bench mark within the proposed subdivision boundary;

14. Location, approximate area and dimensions of each lot, and proposed lot and block numbers;

15. Location, approximate area and dimensions of any lot or area proposed for public use, the type of use proposed, and plans for improvements or development;

16. Proposed use, location, approximate area and dimensions of any lot intended for non-residential use;

17. Source, method, and preliminary plans for domestic and other water supplies, sewer lines, and all utilities;

18. Description and location of any proposed community facility;

19. Storm water and other drainage facility plans;

20. Proposed deed restrictions including access restrictions or protective covenants if such are proposed to be utilized for the proposed subdivision;

ADDITIONAL SUBMITTALS

21. Statement from each utility company proposed to serve the proposed subdivision stating that each company is able and willing to serve the proposed subdivision as set forth in the tentative plan, and the conditions and estimated costs of each service;

22. Proposed Fire protection system for the proposed subdivision and written approval thereof by the fire chief.

23. Statement from School District.

****
REQUIREMENTS
****

1. A vicinity map must be submitted showing the proposed subdivision in relationship to the adjacent properties, roadways, and ownership patterns. This map must include names of all existing roadways.

2. Who will supply the water? City of Warrenton

3. Access will be taken from SW Kalmia Avenue

4. What is the intended use of the parcels being created? Single family residential

5. What is the current use of the parcel? undeveloped

6. Proposal is in compliance with the City of Warrenton's Comprehensive Plan and Development Code.

yes. Please refer to the attached application narrative

7. Proposal does not conflict with acquired public access easements within or adjacent to the subdivision.

No. Access would be provided by extending SW Kalmia Avenue. A utility and pedestrian trail easement will be granted to the city.

8. All required public services and facilities are available and adequate or are proposed to be provided by the applicant.

The applicant will extend all utilities and service facilities to the development.

9. The subdivision contributes to orderly development and land use patterns in the area, and provides for the preservation of natural features and resources such as streams, lakes, natural vegetation, and special terrain features.

The proposed development would be an extension of existing residential development to the south. With the exception of filling approximately 1/10th of one acre of wetlands, the remaining on site wetlands will be preserved.

10. The subdivision will not create an excessive demand on public facilities and services required to serve the development.

Please refer to the attached impact assessment.

11. The preliminary plat for the proposed subdivision meets the requirements of ORS 92.090.

The proposal is consistent with the applicable chapters and sections of the municipal code and therefore consistent with the statute.

****

Return Application To: City of Warrenton
Planning and Building Department
PO Box 250
225 SW Main Street
Warrenton, Oregon 97146
Phone: 503-861-0920
Fax: 503-861-2351

CITY OF WARRENTON

PLANNING AND BUILDING DEPARTMENT

Telephone: 503-861-0920

VARIANCE APPLICATION

OFFICE USE ONLY

FILE # V-19-1 FEE $ 1,250.00

ZONING DISTRICT _____

RECEIPT # 8781516

To be accompanied by a Site Plan, copy of property deed and Letter of Authorization, if applicable.

The Variance application process is a method for assuring compliance with the City of Warrenton Comprehensive Plan and Development Code, and to ensure wise utilization of natural resources, and the proper integration of land uses utilizing appropriate landscaping or screening measures. Please answer the questions as completely as possible.

Legal Description of the Subject Property: Township 8, Range 10, Section(s) 17
Tax Lot(s) 810170001302

Property street address : none

I/we, the undersigned applicant(s) or authorized agent, affirm by my/our signature(s) that the information contained in the foregoing application and associated submissions is true and correct.

APPLICANT:

Printed Name: Gil Gramson

Signature: Gil Gramson (by EH) Date: Feb 5, 2019

Address: 15 N 17th Place Phone: 503.440.6818

City/State/Zip: WarrentonOR 97146 Fax: _____

PROPERTY OWNER (if different from Applicant):

Printed Name: Sand Works Inc -- Gil Gramson

Signature: _____ Date: Feb 5, 2019

Address: 15 N 17th Place Phone: 503.440.6818

City/State/Zip: WarrentonOR 97146 Fax: _____

This application will not be officially accepted until department staff has determined that the application is completed, the site plan map requirements are met, and a copy of the deed is included.

NARRATIVE: Please describe the variance request:

Wetland hardship variance pursuant to Warrenton Municipal Code 16.156.080 to fill less than 1/10th of 1 acre of significant wetlands as part of the proposed Clear Lake subdivision. Note that the wetland hardship variance criteria in the above cited code differ from the standard variance criteria below. The wetland hardship criteria are presented in the preliminary plat appliation narrative together with responses.

Standard	Required	Proposed
Front Yard Setback		
Rear Yard Setback		
Side Yard Setback		
Lot Dimension		
Height		
Landscaping		
Parking		

SIX VARIANCE CRITERIA

1. The hardship was not created by the person requesting the variance. Please explain.

2. The request is necessary to make reasonable use of the property. There will be an unreasonable economic impact upon the person requesting the variance if the request is denied.

3. The request will not substantially be injurious to the neighborhood in which the property in located. The variance will not result in physical impacts, such as visual, noise, traffic or increased potential for drainage, erosion and landslide hazards, beyond those impacts that would typically occur with development in the subject zone.

4. The request is not in conflict with the Comprehensive Plan. Please explain.

5. The request is not in conflict with the Development Code. No variance may be granted which will result in a use not permitted in the applicable zone or which will increase the allowable residential density in any zone with the exception of individual lot size reduction. Please explain.

6. Physical circumstance(s) related to the property involved preclude conformance with the standard to be varied. Please explain.

Return Application To: **City of Warrenton**
Planning and Building Department
PO Box 250, 225 S. Main Street
Warrenton, Oregon 97146

"Making a difference through excellence of service"

CITY OF WARRENTON

February 14, 2019

Gil Gramson
15 NW 17th Place
Warrenton OR 97146

Re: Preliminary Plat Application | SUB 19-1 | Clear Lake Subdivision

Thank you for your submittal of the supplemental information provided today. As a result, I can now deem the preliminary plat application complete. Please note that as the City conducts its substantive review of the Development Code, we may find a need to request additional information or data. The Planning Commission is tentatively scheduled to review the request at a public hearing on March 14, 2019.

For engineering review of the land use stage, we will use an existing agreement to offset nay costs for consultant expenses. If the expenses exceed the deposited amount, we will request additional funds to draw down as the project proceeds to full engineering review.

We look forward to working with you to make this project successful.

Respectfully submitted,

Kevin A. Cronin, AICP
Community Development Director

P.O. Box 250 WARRENTON, OR 97146-0250
503/861-2233 FAX: 503/861-2351
www.ci.warrenton.or.us

FDG
Firwood Design Group, LLC
SURVEYING • ENGINEERING • PLANNING

February 6, 2019

Clear Lake Subdivision
Impact Study

Introduction:
Per Warrenton Municipal Code, Section 16.208.050.B.2.e . requirements for all Type III applications, the applicant has prepared this impact study. Many of these items are also discussed in the project narrative responses also provided with this application.

The applicant is proposing to developed 13 single family lots accessed by the extension of SW Kalmia Avenue. A preliminary plat, grading plan, and utility plans are included in this application.

Transportation:
Due to the small number of proposed lots (15), this development should have no significant impact on the City's transportation system. The total trips per day that will be generated falls significantly below the amount that would trigger a traffic study. Due to constraints of wetlands to the west and north and property owned by the North Coast Land Conservancy on the east and the Conservancy's goal of preserving it, it is presumed that continuation of the roadway will not be feasible. The roadway right-of-way will be dedicated to the public. No bikeways are proposed, but the 32 ft. wide proposed roadway and sidewalks will provide bike access as is found on nearby neighborhoods.

An easement to be dedicated to the City will provide for future pedestrian access to an informal trail/road that continues across adjoining property to the soccer fields to the west.

Drainage System
Negligible impact to the areas drainage system are anticipated. This site is underlain by pervious silty sand. A Preliminary Stormwater Report is included in this package. This development will not rely on an existing downstream piped stormwater system. While treatment is of stormwater is typically not required in the City of Warrenton, the applicant is providing stormwater treatment in anticipation of requirements for a Wetland Mitigation Plan which is in progress. Existing and proposed surface run-off will continue similarly to the wetland areas on the east and west sides of the development.

Parks:
The proposed development will have negligible impacts, positive or negative, to the City's parks.

Water System:
Extension of the City water system is proposed to service the property. No concerns about impacts to the water system have been raised by City staff. It is assumed that for a small development such as this, that the existing system has the capacity needed in terms of flows and storage needs. While not verified yet by the City's hydraulic modeling, it is currently assumed that adequate fire flow is available.

Sanitary Sewer System:
The minimal contribution of wastewater flows from the proposed additional 13-residences to the City's sewer system is assumed to be insignificant. Extension of the gravity sanitary sewer through the development is proposed.

Noise Impacts:
The noise impacts are assumed to be the same as for the adjoining single family residences to the south.

Impacts to Smith Lake:
The proposed Clear Lake Subdivision should have no measurable or foreseen impacts to the water level of Smith Lake. Smith lake is located approximately one and a half miles upstream to the south of the project site and is at one to two foot higher elevation than the wetland area adjacent to the west side of the proposed subdivision site. The area between the project site and Smith Lake consists of a chain of several lakes and adjoining wetland areas that would attenuate the effects of any increase in surface water discharge to the up-gradient Smith Lake.

(End Impact Study)

Clear Lake Subdivision Preliminary Plat
Application Narrative and Suggested Findings

This application is for a preliminary plat for 15 lots averaging areas of greater than 10,000 square feet for future single family dwellings on Tax Lot 810170001302, located at the northern terminus of Kalmia Avenue. The subject property consists of 7.919 acres and is zoned GM-R-10. In addition to seeking preliminary plat approval, the application package includes request for a variance to Warrenton Municipal Code (WMC) 16.136.020.M and guided by WMC 16.132.020.B to extend Kalmia Avenue beyond the 200 standard; and a Hardship Variance to fill 0.095 acres of wetland as governed by WMC 16.156.080.

A discussion of how the proposal satisfies the applicable standards of the Municipal Code as listed below. Municipal code is presented in *italics* with the responses/suggested findings in regular font.

Chapter 16.112 Growth Management (GM) Zone Standards
Chapter 16.28 Intermediate Density Residential (R-10) District
Chapter 16.136 Public Facilities Standards
Chapter 16.140 Stormwater And Surface Water Management
Chapter 16.152 Grading, Excavating, And Erosion Control Plans
Chapter 16.156 Wetland And Riparian Corridor Development Standards
Section 16.208.050 Type III Procedure (Quasi-Judicial).
Chapter 16.216 Land Divisions And Lot Line Adjustments

- *16.112.030 Growth Management Standards.*

The following standards shall apply to development within growth management areas:

A. All development shall provide the following primary urban services: water, sanitary sewer facilities connecting to the City sewer system, local streets, fire protection and drainage. An inability to provide an acceptable level of all primary services shall result in the denial of a land use application.

B. All development shall be reviewed to ascertain whether an adequate level of the following secondary urban services exists: collector and arterial streets, school, police protection and parks. Where the City determines and supports with findings that an unacceptable level of secondary urban services exist, the City may deny the land-use application unless the developer insures the availability of an acceptable level of the services within five years from occupancy.

C. City specifications shall be the standard used as measurement of acceptability of a service.

D. Encourage the development within urban areas before the conversion of urbanizable areas.

Included with the preliminary plat are plans for a local street designed to provide access to all of the proposed lots together with preliminary plans for the extension of sanitary sewer and potable water for domestic use and fire flow. Access for emergency service providers such as police and fire department personnel and equipment and school busses for transporting students both the primary and high schools will be provided via the extension of Kalmia Avenue. There is also a preliminary plan for managing storm water runoff and treatment via a biofiltration swale facility designed to Oregon Department of Transportation and Oregon Department of Environmental Quality standards. A pedestrian trail access and utility extension easement to be dedicated to the city is shown on the preliminary plat to contribute to future recreational and open space facilities access and the anticipated utilities to improve the city's water distribution system. The subject property abuts a previously approved and developed urban subdivision where the lots have dwellings either completed or under construction, and as such the proposal is a natural extension of the urbanized area.

The proposal satisfies these growth management standards.

- 16.112.050 Land Divisions.

A. All land divisions which would create a parcel under five acres in size shall be subject to approval under the appropriate procedures in this Code (Chapter 16.216). Land divisions which would create a parcel under five acres in size in growth management areas shall be approved only if:

1. The lots created are at R-10 urban densities;

2. Primary and secondary urban services are supplied in accordance with Section 16.28.050;

3. An exception is approved as provided in Section 16.112.040.

B. All land divisions that would create parcels between five and 10 acres in size shall be reviewed to insure that the proposed parcel layout (i.e., relationship to roads, easements and utilities) and building placement is such that the parcel can be re-divided at urban densities.

The preliminary plat application has been prepared and submitted consistent with standards for land divisions set forth by WMC 16.216 and designed to meet the standards of WMC 16.28.040 (discussed below). The standards of WMC 16.28.050 will be met through the installation of utilities and services facilities and the behavior of future residents. None of the lots will exceed the five-acre threshold in Subparagraph B. above.

The preliminary plat satisfies these criteria.

- 16.112.060 Cost Allocation.

The cost of providing the required urban services for a particular land use proposal under consideration shall be borne by the applicant or benefited properties unless otherwise authorized by the City Commission.

The applicant understands that he is solely responsible for the costs of providing the required urban services.

☐ 16.112.080 Public Improvement Guarantee.

For the purposes of this section, the word "insure" shall mean a legal and enforceable document, contract or process which guarantees to the City a public improvement will be accomplished. Assurances include, but are not limited to, the following:

A. Performance bond.

B. Cash in escrow, assignment of letter of credit, etc.

C. Establishment of an LID (post-remonstrance period).

D. Evidence of formal action by other public or private agencies or companies authorizing monies or scheduling of a requisite public improvement.

E. The requisite improvement is included in an adopted capital improvement program with funds assured by the City.

F. Any other legally binding agreement which assures the improvement will be made.

The applicant understands the requirements for public improvement guarantees, and if a guarantee is warranted, will comply to insure completion of the improvement(s).

☐ *16.28.020 Permitted Uses.*

The following uses and their accessory uses are permitted in the R-10 zone if the Community Development Director determines that the uses conform to the standards in Sections 16.28.040 through 16.28.050, applicable Zoning Ordinance standards, and other City laws:

A. Single-family detached dwelling.

The GM zone defaults to the R-10 Intermediate Density standards for permitted uses and development standards; single family detached dwellings are permitted outright. The applicant's intent is to develop lots for the future construction of such dwellings. The application satisfies this standard.

☐ *16.28.040 Development Standards.*

The following development standards are applicable in the R-10 zone:

A. Density Provisions.

1. Minimum lot area for residences: 10,000 square feet.

2. Minimum lot width at the front building line: 50 feet.

3. Minimum lot depth: 70 feet.

4. Not more than 35% of the lot area shall be covered by buildings except as may be permitted by conditional use permit or variance.

5. Maximum building height: 30 feet.

6. Maximum building height for agricultural buildings: 40 feet.

B. Setback Requirements.

1. Minimum front yard setback: 15 feet.

2. Minimum side yard setback: 10 feet.

3. Corner lot minimum street side yard setback: 10 feet.

4. Minimum rear yard setback: 15 feet, except accessory structures that meet the criteria of Section 16.280.020, may extend to within five feet of a rear property line.

5. Corner lot minimum rear yard setback: 10 feet.

All lots have been designed to comply with the areal and dimension standards of WMC 16.28.040.A. above, and have sufficient area to meet the setback standards of WMC 16.28.040.B; the application satisfies these standards.

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□ *16.28.050 Other Applicable Standards.*

A. Outside sales and service areas shall be approved by the Warrenton Planning Commission if not enclosed by suitable vegetation, fencing or walls.

B. Outside storage areas shall be enclosed by suitable vegetation, fencing or walls, in conformance with Chapter 16.124.

C. All uses shall comply with access and parking standards in Chapters 16.116 and 16.128 except as may be permitted by conditional use or variance.

D. Signs shall comply with standards in Chapter 16.144.

E. All development shall comply with the wetland and riparian area protection standards of Chapter 16.156.

F. Manufactured homes must comply with the criteria of Section 16.168.010.

G. A garage or carport is required and shall conform to the standards of Chapter 16.180.

H. All other applicable Development Code requirements must be met.

I. All new sewer and water connections for a proposed development shall comply with all City regulations.

J. RV parks shall comply with Chapter 16.176 and all applicable State and Federal laws and regulations.

Most of these standards do not apply. Those that do would primarily be applicable to future property owners. Utility connections will be stubbed to each lot as the subdivision is developed. Compliance with the wetland protection standards of WMC 16.156 is discussed below.

- *16.136.020 Transportation Standards.*

A. Development Standards. No development shall occur unless the lot or parcel abuts a public or private street, other than an alley, for at least 25 feet and is in conformance with the provisions of Chapter 16.120, Access and Circulation, and the following standards are met:

1. Streets within or adjacent to a development shall be improved in accordance with the Comprehensive Plan, Transportation System Plan, and the provisions of this chapter;

2. Development of new streets (public or private), and additional street width or improvements planned as a portion of an existing street, shall be improved in accordance with this section, and public streets shall be dedicated to the applicable City, County or State jurisdiction;

3. New streets and drives connected to a City collector or arterial street shall be paved; and

4. The City may accept a future improvement guarantee [e.g., owner agrees not to remonstrate (object) against the formation of a local improvement district in the future] in lieu of street improvements if one or more of the following conditions exist:

a. A partial improvement may create a potential safety hazard to motorists or pedestrians,

b. Due to the developed condition of adjacent properties it is unlikely that street improvements would be extended in the foreseeable future and the improvement associated with

the project under review does not, by itself, provide increased street safety or capacity, or improved pedestrian circulation,

c. The improvement would be in conflict with an adopted capital improvement plan, or

d. The improvement is associated with an approved land partition on property zoned residential and the proposed land partition does not create any new streets.

The proposed Kalmia Avenue extension for the Clear Lake subdivision will meet these standards. It will be paved for its length and is designed pursuant to the Transportation System Plan standards in effect at the time of submittal. Curb to curb width is proposed at 32 feet, 4 feet wider than the existing 28-foot wide street segment it will be extended from. It is premature to decide whether a surety will be necessary. All new lots will have a frontage of greater than 60 feet.

B. Variances. Variances to the transportation design standards in this section may be granted by means of a Class 2 variance, as governed by Chapter 16.272, Variances. A variance may be granted under this provision only if a required improvement is not feasible due to topographic constraints or constraints posed by sensitive lands (see Chapter 16.156).

A variance to the cul-de-sac length of 200 feet per WMC 16.130.020.M is requested and the criteria of WMC 16.272 is discussed below. The subject property is bounded by wetlands to the west, north and partially to the east. Where wetlands to the east terminate a sand dune presents topographic constraints to the construction of a road. This is further complicated by the North Coast Land Conservancy ownership of the easterly abutting tract and the Conservancy's goal of preserving that property from development.

C. Creation of Rights-of-Way for Streets and Related Purposes. Streets shall be created through the approval and recording of a final subdivision or partition plat; except the City may approve the creation of a street by acceptance of a deed, provided that the street is deemed essential by the City Commission for the purpose of implementing the Transportation System Plan, and the deeded right-of-way conforms to the standards of this Code. All deeds of dedication shall be in a form prescribed by the City Attorney and shall name "the public," as grantee.

D. Creation of Access Easements. The City may approve an access easement established by deed when the easement is necessary to provide for access and circulation in conformance with Chapter 16.120, Access and Circulation. Access easements shall be created and maintained in accordance with the Uniform Fire Code, as amended.

E. Street Location, Width and Grade. Except as noted below, the location, width and grade of all streets shall conform to the Transportation System Plan and Comprehensive Plan, as applicable; and an approved street plan or subdivision plat. Street location, width and grade

shall be determined in relation to existing and planned streets, topographic conditions, public convenience and safety, and in appropriate relation to the proposed use of the land to be served by such streets:

1. Street grades shall be approved by the City-appointed engineer in accordance with the design standards in subsection N of this section; and

2. Where the location of a street is not shown in an existing street plan (see subsection H of this section), the location of streets in a development shall either:

a. Provide for the continuation and connection of existing streets in the surrounding areas, conforming to the street standards of this chapter, or

b. Conform to a street plan adopted by the City, if it is impractical to connect with existing street patterns because of particular topographical or other existing conditions of the land. Such a plan shall be based on the type of land use to be served, the volume of traffic, the capacity of adjoining streets and the need for public convenience and safety.

F. Minimum Rights-of-Way and Street Sections. Street rights-of-way and improvements shall conform to the design standards in Table 16.136.010. A variance shall be required in accordance with Chapter 16.272 of this Code to vary the standards in Table 16.136.010. Where a range of width is indicated, the width shall be determined by the decision-making authority based upon the following factors:

1. Street classification in the Transportation System Plan or Comprehensive Plan;

2. Anticipated traffic generation;

3. On-street parking needs;

4. Sidewalk and bikeway requirements based on anticipated level of use;

5. Requirements for placement of utilities;

6. Street lighting;

7. Street tree location, as provided for in Chapter 16.124;

8. Protection of significant vegetation and wetland and riparian areas, as provided for in Chapters 16.124 and 16.156;

9. Safety and comfort for motorists, bicyclists, and pedestrians;

10. Street furnishings (e.g., benches, lighting, bus shelters, etc.), when provided;

11. Access needs for emergency vehicles; and

12. Transition between different street widths (i.e., existing streets and new streets), as applicable.

The proposed Kalmia Avenue extension as a local alternative street is consistent with these criteria. The right-of-way is 50 feet which includes sufficient space for a new street to accommodate anticipated traffic generation of 150 average daily traffic, on-street parking, sidewalks, utilities, street lighting, street trees, protection of sensitive lands, safety and comfort for motorists, bicyclists, and pedestrians, emergency vehicle access, and the transition for the right-of-way and existing 28-foot pavement width of Kalmia Avenue.

Table 16.136.010

City of Warrenton Street Design Standards

Type of Street	*Average Daily Trips (ADT)*	*Right-of-Way Width*	*Curb-to-Curb Pavement Width*	*Motor Vehicle Travel Lanes*[4]	*Median/Flex Lane*[5]	*Bike Lanes or On-Street Parking (both sides)*	*Curb*	*Planting Strip*[5]	*Sidewalks*
Arterial Roads									
4-Lane Arterial	*Varies*	*80 - 102 ft.*	*64 - 78 ft.*	*12 ft.*[4]	*14 ft.*	*8 ft.*	*Yes*	*6 ft.*	*6 ft.*
2-Lane Arterial	*Varies*	*80 ft.*	*40 - 54 ft.*	*12 ft.*[4]	*14 ft.*	*8 ft.*	*Yes*	*6 ft.*	*6 ft.*
Collector Roads									
Collector Road	*Varies*	*60 - 64 ft.*	*36 - 40 ft.*	*12 ft.*[4]	*None*	*6-8 ft.*	*Yes*	*6 ft.*	*6 ft.*
Local Roads									
Local Road	*Varies*	*50 - 60 ft.*	*36 ft.*	*10-12 ft.*	*None*	*8 ft. parking (on one or both sides*[1)]	*Yes (on one or both sides)*	*5 ft.*	*5 ft.*[3]
Alternative Local Road[2]	*< 250*	*50 ft.*	*20 - 28 ft. (no curbs required)*	*10 ft.*	*None*	*None*[1]	*None*	*5 ft.*	*None*
Alleys	*N/A*	*12 - 24 ft.*	*12 - 24 ft.*	*N/A*	*N/A*	*None*	*None*	*None*	*None*
Multi-Use Paths	*N/A*	*8 - 16 ft.*	*8 - 16 ft.*	*N/A*	*N/A*	*None*	*None*	*None*	*None*

Notes:

[1] Bike lanes are generally not needed on low volume (less than 3,000 ADT) and/or low travel speed (less than 35 mph) roads.

[2] *The alternative local road standard may be used when approved by the City of Warrenton. The standard is intended to apply under the following circumstances:*

- *The local road will serve 18 or fewer dwelling units upon buildout of adjacent property.*
- *The ADT volume of the road is less than 250 vehicles per day.*
- *Significant topographical or environmental constraints are present.*
- *Use of the alternative local road standard will not create gaps in connectivity or roadway standards with adjacent roadway sections (i.e., side-walk, parking, travel lane widths).*
- *The City-appointed engineer and emergency service providers have reviewed and accepted usage of the alternative local roadway standard.*

[3] *Sidewalks are required on all local roads in high-density residential and commercial zones unless exempted by the City-appointed engineer or Planning Commission.*

[4] *Where parking is constructed next to a travel lane, the travel lane shall be increased to a width of 14 feet to function as a shared roadway and accommodate bicycles.*

[5] *Footnote indicates that these features are optional. Flex lanes would provide for traffic flow in one direction or another depending upon the specific traffic patterns and demands for an area. Flex lanes could be used for transit routes or emergencies, and would provide extra right-of-way width for future rail or transit. Appropriate safety measures would need to be installed in conjunction with flex lanes.*

The proposed 32-foot street width exceeds the upper range width of 28 feet identified in the table above; it also includes sidewalks. We believe the proposed width is appropriate and supported by the code criteria: it will serve fewer than 18 dwellings; average daily traffic at 150 trips is below the 250 ADT threshold; and it more easily transitions to the narrow road from which it is extended without creating a gap in connectivity with the existing adjacent street section. Because of the development constraints imposed by the environmental conditions on the adjacent properties, the likelihood of extending Kalmia Avenue further is nil such that conditions allowing for an alternative street width will not change.

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G. Traffic Signals. Traffic signals shall be required with development when traffic signal warrants are met, in conformance with the Highway Capacity Manual, and Manual of Uniform Traffic Control Devices. The location of traffic signals shall be noted on approved street plans. Where a proposed street intersection will result in an immediate need for a traffic signal, a signal meeting approved specifications shall be installed. The developer's cost and the timing of improvements shall be included as a condition of development approval. Traffic signals on roads under state jurisdiction shall be determined by the Oregon Department of Transportation.

Because there is no intersection with the street extension, there is no need for a traffic signal.

H. *Future Street Plan and Extension of Streets.*

1. A future street plan shall be filed by the applicant in conjunction with an application for a subdivision in order to facilitate orderly development of the street system. The plan shall show the pattern of existing and proposed future streets from the boundaries of the proposed land division and shall include other parcels within 500 feet surrounding and adjacent to the proposed land division. The street plan is not binding; rather it is intended to show potential future street extensions with future development.

2. Streets shall be extended to the boundary lines of the parcel or tract to be developed, when the Community Development Director or Planning Commission determines that the extension is necessary to give street access to, or permit a satisfactory future division of, adjoining land. The point where the streets temporarily end shall conform to subparagraphs a through c of this paragraph:

a. These extended streets or street stubs to adjoining properties are not considered to be cul de-sacs since they are intended to continue as through streets when the adjoining property is developed.

b. A barricade (e.g., fence, bollards, boulders or similar vehicle barrier) shall be constructed at the end of the street by the subdivider and shall not be removed until authorized by the City or other applicable agency with jurisdiction over the street. The cost of the barricade shall be included in the street construction cost.

c. Temporary turnarounds (e.g., hammerhead or bulb-shaped configuration) may be constructed for stub streets over 150 feet in length for a time period of up to two years. The developer shall guarantee conversion of the temporary hammerhead into a cul-de-sac that meets the standards of this Code by posting a performance bond that guarantees the required improvement within the time specified.

Environmental conditions make the likelihood of extending the street to adjacent properties nil, therefor it is appropriate to develop the cul-de-sac to city standards rather than extend the road to the north property line.

I. *Street Alignment and Connections.*

1. Staggering of streets making "T" intersections at collectors and arterials shall not be designed so that jogs of less than 300 feet on such streets are created, as measured from the centerline of the street.

2. Spacing between local street intersections shall have a minimum separation of 125 feet, except where more closely spaced intersections are designed to provide an open space, pocket

park, common area or similar neighborhood amenity. This standard applies to four-way and three-way (off-set) intersections.

3. All local and collector streets which abut a development site shall be extended within the site to provide through circulation unless prevented by environmental or topographical constraints, existing development patterns or compliance with other standards in this Code. This exception applies when it is not possible to redesign or reconfigure the street pattern to provide required extensions. Land is considered topographically constrained if the slope is greater than 15% for a distance of 250 feet or more. In the case of environmental or topographical constraints, the mere presence of a constraint is not sufficient to show that a street connection is not possible. The applicant must show why the environmental or topographic constraint precludes some reasonable street connection.

4. Proposed streets or street extensions shall be located to provide direct access to existing or planned commercial services and other neighborhood facilities, such as schools, shopping areas and parks.

5. In order to promote efficient vehicular and pedestrian circulation throughout the City, the design of subdivisions and alignment of new streets shall conform to the following standards in Chapter 16.120, Access and Circulation: The maximum block length shall not exceed 1,000 feet between street corner lines unless it is adjacent to an arterial street or unless the topography or the location of adjoining streets justifies an exception. The maximum length of blocks along an arterial is 1,800 feet. A block shall have sufficient width to provide for two tiers of building sites unless topography or location of adjoining streets justifies an exception.

Exceptions to the above standards may be granted when an accessway is provided at or near mid block, in conformance with the provisions of Section 16.120.030.

This section does not apply.

J. Sidewalks, Planter Strips, Bicycle Lanes. Sidewalks, planter strips, and bicycle lanes shall be installed in conformance with the standards in Table 16.136.010, applicable provisions of the Transportation System Plan, the Comprehensive Plan, and adopted street plans. Maintenance of sidewalks, curbs, and planter strips is the continuing obligation of the adjacent property owner.

The right-of-way extends 3 feet beyond the standard 5-foot sidewalk and is available as a planting strip. Bicycle lanes are not warranted.

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K. Intersection Angles. Streets shall be laid out so as to intersect at an angle as near to a right angle as practicable, except where topography requires a lesser angle or where a reduced angle is necessary to provide an open space, pocket park, common area or similar neighborhood amenity. In addition, the following standards shall apply:

1. Streets shall have at least 25 feet of tangent adjacent to the right-of-way intersection unless topography requires a lesser distance;

2. Intersections which are not at right angles shall have a minimum corner radius of 20 feet along the right-of-way lines of the acute angle; and

3. Right-of-way lines at intersection with arterial streets shall have a corner radius of not less than 20 feet.

No intersections are proposed.

L. Existing Rights-of-Way. Whenever existing rights-of-way adjacent to or within a tract are of less than standard width, additional rights-of-way shall be provided at the time of subdivision or development, subject to the provisions of this chapter.

No existing right-of-way is on the subject property.

M. Cul-de-Sacs. A dead-end street shall be no more than 200 feet long, shall not provide access to greater than 18 dwelling units, and shall only be used when environmental or topographical constraints, existing development patterns, or compliance with other standards in this Code preclude street extension and through circulation.

1. All cul-de-sacs shall terminate with a circular turnaround. Circular turnarounds shall have a radius of no less than 40 feet from center to edge of pavement except that turnarounds that contain a landscaped island or parking bay in their center shall have a minimum radius of 45 feet. When an island or parking bay is provided, there shall be a fire apparatus lane of at least 20 feet in width; and

2. The length of the cul-de-sac shall be measured along the centerline of the roadway from the near side of the intersecting street to the farthest point of the cul-de-sac.

See Section 16.120.020 for fire access and parking area turnaround requirements based on Uniform Fire Code standards, as amended.

The cul-de-sac has been designed to these standards. A variance to the length standard is requested and discussed below.

N. Grades and Curves. Grades shall not exceed 10% on arterials, 12% on collector streets, or 12% on any other street (except that local or residential access streets may have segments with grades up to 15% for distances of no greater than 250 feet), and:

1. Centerline curve radii shall not be less than 700 feet on arterials, 500 feet on major collectors, 350 feet on minor collectors, or 100 feet on other streets; and

2. Streets intersecting with a minor collector or greater functional classification street, or streets intended to be posted with a stop sign or signalization, shall provide a landing averaging five percent or less. Landings are that portion of the street within 20 feet of the edge of the intersecting street at full improvement.

The street design adheres to these standards.

O. Curbs, Curb Cuts, Ramps, and Driveway Approaches. Concrete curbs, curb cuts, wheelchair, bicycle ramps and driveway approaches shall be constructed in accordance with standards specified in Chapter 16.120, Access and Circulation, and City construction standards.

These standards will be adhered to at the time of home construction.

P. Streets Adjacent to Railroad Right-of-Way. Wherever the proposed development contains or is adjacent to a railroad right-of-way, a street approximately parallel to and on each side of such right-of-way at a distance suitable for the appropriate use of the land shall be created. New railroad crossings and modifications to existing crossings are subject to review and approval by Oregon Department of Transportation.

Q. Development Adjoining Arterial Streets. Where a development adjoins or is crossed by an existing or proposed arterial street, the development design shall separate residential access and through traffic, and shall minimize traffic conflicts. The design shall include one or more of the following:

1. A parallel access street along the arterial with a landscape buffer separating the two streets;

2. Deep lots abutting the arterial or major collector to provide adequate buffering with frontage along another street. Double-frontage lots shall conform to the buffering standards in Chapter 16.164;

3. Screen planting at the rear or side property line to be contained in a non-access reservation (e.g., public easement or tract) along the arterial; or

4. Other treatment suitable to meet the objectives of this subsection;

5. If a lot has access to two streets with different classifications, primary access shall be from the lower classification street, in conformance with Section 16.120.020.

There are no railroads or arterial streets in the vicinity.

R. Alleys, Public or Private. Alleys shall conform to the standards in Table 16.136.010. While alley intersections and sharp changes in alignment shall be avoided, the corners of necessary alley intersections shall have a radius of not less than 12 feet.

S. Private Streets. Private streets shall not be used to avoid connections with public streets. Gated communities (i.e., where a gate limits access to a development from a public street) are prohibited. Design standards for private streets are the same as design standards for public streets and shall conform to the provisions of Table 16.136.010.

No alleys are proposed. The right-of-way and street will be dedicated to the public at the time of final plat recordation.

T. Street Names. Street naming and numbering in the City of Warrenton (and Hammond) shall follow the uniform system of the City's addressing ordinance (Ord. No. 359-A). Street names, signs and numbers shall conform to the City's addressing ordinance.

The applicant's intent is to continue the street name Kalmia Avenue.

U. Survey Monuments. Upon completion of a street improvement and prior to acceptance by the City, it shall be the responsibility of the developer's registered professional land surveyor to provide certification to the City that all boundary and interior monuments shall be reestablished and protected.

Acknowledged.

V. Street Signs. The City, county or state with jurisdiction shall install all signs for traffic control and street names. The cost of signs required for new development shall be the responsibility of the developer. Street name signs shall be installed at all street intersections. Stop signs and other signs may be required.

W. Mail Boxes. Plans for mail boxes to be used shall be approved by the United States Postal Service.

X. Street Light Standards. Street lights shall be installed in accordance with City standards.

Y. Street Cross-Sections. The final lift of asphalt or concrete pavement shall be placed on all new constructed public roadways prior to final City acceptance of the roadway and within one year of the conditional acceptance of the roadway unless otherwise approved by the City-appointed engineer.

1. Sub-base and leveling course shall be of select crushed rock;

2. Surface material shall be of Class C or B asphaltic concrete;

3. The final lift shall be Class C asphaltic concrete as defined by O.D.O.T/A.P.W.A. standard specifications;

4. No lift shall be less than one and one-half inches in thickness; and

5. All streets shall be developed in accordance with City of Warrenton construction standards.

The requirements of sub-paragraphs V through Y are acknowledged.

16.136.030 Public Use Areas.

A. Dedication Requirements.

1. Where a proposed park, playground or other public use shown in a plan adopted by the City is located in whole or in part in a subdivision, the City may require the dedication or reservation of this area on the final plat for the subdivision.

2. If determined by the Planning Commission to be in the public interest in accordance with adopted Comprehensive Plan policies, and where an adopted plan of the City does not indicate proposed public use areas, the City may require the dedication or reservation of areas within the subdivision of a character, extent and location suitable for the development of parks and other public uses.

3. All required dedications of public use areas shall conform to Section 16.136.010(D) (Conditions of Development Approval).

B. Acquisition by Public Agency. If the developer is required to reserve land area for a park, playground, or other public use, the land shall be acquired by the appropriate public agency within 12 months following final plat approval, at a price agreed upon prior to approval of the plat, or the reservation shall be released to the property owner.

C. System Development Charge Credit. Dedication of land to the City for public use areas shall be eligible as a credit toward any required system development charge for parks.

No park or recreational facility is shown in a city approved plan to be located wholly or partially within the boundaries of the subject property. We also note that WMC 16.216.020.I sets the threshold for requiring neighborhood parks to developments of 20 lots or more; this proposal has 15 lots. However, in the spirit of cooperation, the application includes a 20-foot wide easement between Lots 1and 2 to the subject property western boundary for utilities and to facilitate the development of a pedestrian trail toward recreation facilities along Ridge Road. These criteria are satisfied.

- *16.136.040 Sanitary Sewer and Water Service Improvements.*

A. Sewers and Water Mains Required. Sanitary sewers and water mains shall be installed to serve each new development and to connect developments to existing mains in accordance with the City's construction specifications and the applicable Comprehensive Plan policies. Where City sanitary sewers are not physically or legally available to service the site, the applicant must

demonstrate provisions for a suitable on-site disposal system permitted by DEQ prior to issuance of City permits. All development within a growth management (GM) zone, as identified on the official Warrenton Zoning Map, shall comply with the growth management zone standards of Chapter 16.112.

B. Sewer and Water Plan Approval. Development permits for sewer and water improvements shall not be issued until the City-appointed engineer has approved all sanitary sewer and water plans in conformance with City standards.

C. Over-sizing. Proposed improvements to the City sewer and water systems shall be sized to accommodate additional development within the area as projected by the Comprehensive Plan, Water System Master Plan, and/or Sanitary Sewer Master Plan. The developer shall be entitled to system development charge credits for the over-sizing.

D. Permits Denied. Development permits may be restricted by the City where a deficiency exists in the existing water or sewer system which cannot be rectified by the development and which if not rectified will result in a threat to public health or safety, surcharging of existing mains, or violations of state or federal standards pertaining to operation of domestic water and sewerage treatment systems. Building moratoriums shall conform to the criteria and procedures contained in ORS 197.505.

Included with the application plan set are preliminary designs for the extension of both potable water and sanitary sewer lines from their present terminus at the southern property line of the subject property. The plans call for the extension of 8-inch pipes for both utilities, with manholes as appropriate and necessary for the sanitary sewer pipe system. The designs have been prepared according to the Engineering Standards & Design Criteria manual establishing standards for civil engineering plan submittals and public infrastructure construction for development and improvement projects within the City of Warrenton. Preliminary modelling of the water system indicates that the proposed water main would provide water in adequate quantities and pressure for domestic flow as well as for fire flow needs. Fire hydrants will be Mueller Centurion 250 Model A-423 or an approved equivalent with a recirculation oil lubrication system. Hydrant locations will be submitted to the Warrenton Fire Chief for approval

Both utilities would terminate at the cul-de-sac on the north end of the subject property. Fort Pointe Properties LLC owns the land abutting on the north. It is mapped as significant wetlands on the city's Wetland Inventory. Fort Pointe has secured the development entitlements for portions of that tract adjacent to Ridge Road and has expressed that it has little interest in developing in the vicinity of the subject property. Similarly, the North Coast Land Conservancy acquired the land to the east with the goal of preserving it in its present state. The likelihood of extending either utility beyond the designed termini is quite low.

- *16.136.050 Storm Drainage Improvements.*

A. General Provisions. The City shall issue a development permit only where adequate provisions for stormwater and floodwater runoff have been made in conformance with Chapter 16.140, Stormwater and Surface Water Management.

B. Accommodation of Upstream Drainage. Culverts and other drainage facilities shall be large enough to accommodate potential runoff from the entire upstream drainage area, whether inside or outside the development. Such facilities shall be subject to review and approval by the City-appointed engineer.

C. Effect on Downstream Drainage. Where it is anticipated by the City-appointed engineer that the additional runoff resulting from the development will overload an existing drainage facility, the City shall withhold approval of the development until provisions have been made for improvement of the potential condition or until provisions have been made for storage of additional runoff caused by the development in accordance with City standards.

D. Easements. Where a development is traversed by a watercourse, wetland, drainage way, channel or stream, the City may require a dedication of a stormwater easement or drainage right-of-way conforming substantially with the lines of such watercourse and such further width as will be adequate for conveyance and maintenance.

The project design for storm water management shows a series of catch basins, manholes and a storm water quality treatment biofiltration facility located east of the planned Kalmia Avenue extension north of Lot 15. All storm water runoff from the new pavement and sidewalks would be directed to this facility where it would be treated as it partially infiltrates and flows through the vegetated swale before discharging to the adjacent wetland. The biofiltration swale has been designed to Oregon Department of Transportation standards and in addition to the need to be approved by the City, must also be approved by the Oregon Department of Environmental Quality as part of the Wetland Mitigation Plan approval process.

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The application satisfies these criteria.

- *16.136.060 Utilities.*

A. Underground Utilities. All utility lines including, but not limited to, those required for electric, communication, lighting and cable television services and related facilities shall be placed underground, except for surface mounted transformers, surface mounted connection boxes and meter cabinets which may be placed above ground, temporary utility service facilities during construction, and high capacity electric lines operating at 50,000 volts or above. The following additional standards apply to all new land divisions, in order to facilitate underground placement of utilities:

1. The developer shall make all necessary arrangements with the serving utility to provide the underground services. Care shall be taken to ensure that all above ground equipment does not obstruct circulation and access aisles or impede vision clearance areas for vehicular traffic (Chapters 16.120 and 16.132);

2. The City reserves the right to approve the location of all surface mounted facilities;

3. All underground utilities, including sanitary sewers and storm drains installed in streets by the developer, shall be constructed prior to the surfacing of the streets; and

4. Stubs for service connections shall be long enough to avoid disturbing the street improvements when service connections are made.

B. Easements. Easements shall be provided for all underground utility facilities.

C. Exception to Undergrounding Requirement. The standard applies only to proposed land divisions and large-scale developments. An exception to the undergrounding requirement may be granted due to physical constraints, such as steep topography or existing development conditions.

All utilities will be constructed underground except for necessary above ground pedestals with plans coordinated and approved by the serving utility and surface mounted pedestal locations approved by the City. Obviously, all utilities to be installed between the curbs will be completed prior to paving. Stubs will be onto each new lot such that disturbance to the street is avoided when service connections are requested. The plans call for a 5-foot utility easement outside the right-of-way to accommodate private service utility facilities.

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The application meets these criteria.

- *16.136.070 Easements.*

Easements for sewers, storm drainage and water quality facilities, water mains, electric lines or other public utilities shall be dedicated on a final plat, or provided for in the deed restrictions. See also Chapter 16.212, Site Design Review, and Chapter 16.216, Land Divisions and Lot Line Adjustments. The developer or applicant shall make arrangements with the City, the applicable district, and each utility franchise for the provision and dedication of utility easements necessary to provide full services to the development. The City's standard width for public main line utility easements shall be 20 feet unless otherwise specified by the utility company, applicable district, or City-appointed engineer.

Application plans currently include a 5-foot wide utility easement outside the proposed right-of-way to accommodate utility service providers such as power and communications. A 20-foot public access and utility easement is also proposed between Lots 1 and 2 to accommodate future City extensions of water mains to improve looping in the water system and to contribute to the provision of future pedestrian access to public and private recreational facilities along Ridge Road.

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- *16.136.080 Construction Plan Approval and Assurances.*

No public improvements, including sanitary sewers, storm sewers, streets, sidewalks, curbs, lighting, parks, or other requirements shall be undertaken except after the plans have been approved by the City, permit fee paid, and permit issued. The permit fee is required to defray the cost and expenses incurred by the City for construction and other services in connection with the improvement. The permit fee shall be set by resolution of the City Commission. The City may require the developer or land divider to provide bonding or other performance guarantees to ensure completion of required public improvements. See also Section 16.212.040, Site Design Review, and Chapter 16.216, Land Divisions and Lot Line Adjustments.

The applicant acknowledges this administrative requirement and will comply.

☐ *16.136.090 Installation.*

A. Conformance Required. Improvements installed by the developer either as a requirement of these regulations or at his/her own option, shall conform to the requirements of this chapter, approved construction plans, and to improvement standards and specifications adopted by the City.

B. Adopted Installation Standards. The Oregon Standard Specifications for Construction (combined APWA/ODOT standards) shall be a part of the City's adopted installation standard(s); other standards may also be required upon recommendation of the City-appointed engineer.

C. Commencement. Work shall not begin until the City has been notified in advance and all required permits have been issued.

D. Resumption. If work is discontinued for more than one month, it shall not be resumed until the City is notified.

E. City Inspection. Improvements shall be constructed under the inspection and to the satisfaction of the City. The City may require minor changes in typical sections and details if unusual conditions arising during construction warrant such changes in the public interest. Modifications requested by the developer shall be subject to land use review under Chapter 16.228, Modifications to Approved Plans and Conditions of Approval. Any monuments that are disturbed before all improvements are completed by the subdivider shall be replaced prior to final acceptance of the improvements.

F. Engineer's Certification and As-Built Plans. A registered civil engineer shall provide written certification in a form required by the City that all improvements, workmanship and materials are in accord with current and standard engineering and construction practices, conform to approved plans and conditions of approval, and are of high grade, prior to City acceptance of the public improvements, or any portion thereof, for operation and maintenance. The developer's engineer shall also provide four set(s) of "as-built" plans, in conformance with the City-appointed engineer's specifications, for permanent filing with the City.

The applicant acknowledges these administrative requirements and will comply.

- *16.140.010 Natural Drainage System Maintained to Extent Feasible.*

A. To the extent practicable, all development must conform to the natural contours of the land and natural and pre-existing man-made drainage ways must remain undisturbed.

B. To the extent practicable, lot boundaries created by partition or subdivision must coincide with natural and pre-existing man-made drainage ways to avoid the creation of lots that can be built upon only by altering such drainage ways.

There are no apparent natural or pre-existing man-made drainage ways on the subject property. To improve general water quality, add to wetland protections and manage new storm water runoff from the increased impervious surfaces created by the proposed street and driveways, the project includes a biofiltration facility which will treat new storm water prior to discharge to the adjacent wetland.

- *16.140.020 Developments Must Drain Properly.*

A. All developments must provide an adequate drainage system to prevent the undue detention or retention of stormwater or surface water on the development site. Stormwater or surface water will not be regarded as unduly detained or retained if:

1. The detention or retention results from a technique, practice or device deliberately installed as part of an approved sedimentation or stormwater runoff control plan prepared by an engineer; or

2. The detention or retention is not substantially different in location or degree than that experienced by the development site in its predevelopment state, unless such detention or retention presents a danger to health or safety.

B. No stormwater may be channeled and directed into a sewer line.

C. Whenever practicable, the drainage system of a development must coordinate with and connect to the drainage systems or drainage ways on surrounding properties or streets.

D. All developments must be constructed and maintained so that adjacent properties are not unreasonably burdened with stormwater runoff as a result of the developments.

The engineered storm water system is designed to satisfy all these criteria. Conveying all runoff from the street to the biofiltration facility will result in some infiltration but will also passively meter the discharge of treated storm water to the adjacent wetland.

- *16.140.030 Surface Water Management.*

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All developments must be constructed and maintained so that impacts to natural and man-made drainage ways do not unreasonably burdened upstream or downstream properties with surface water flooding as a result of the developments. More specifically:

A. No development may be constructed or maintained so that the development unreasonably impedes the natural flow of water from higher adjacent properties across the development, resulting in substantial damage to the higher adjacent properties; and

B. No development may be constructed or maintained so that stormwater from the development is collected and channeled into natural or man-made drainage ways, such that the volume and/or rate of flow is substantially greater than the pre-development volume and/or rate.

C. No development may be constructed such that the flow of water through natural or existing man-made drainage ways is obstructed. Bridges and culverts constructed to allow the flow of water through a development must be designed to pass flow during a 100-year storm event.

As discussed above, the focus of the project surface water management system is to collect and convey all post development runoff to a facility where it will partially infiltrate to ground water and otherwise be treated prior to discharge to the adjacent wetland. Because of the existing and proposed topography on the site and the property to the east, the higher adjacent property runoff will not be impeded. Additional surface water flows are anticipated to be insignificant due to the pervious nature the underlying sandy soils. Since the area of the development is essentially a contiguous high point mostly surrounded by wetlands, No flows through the subject property will be obstructed. No bridges or culverts are proposed. Please refer to the attached storm water plan for details.

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☐ *16.140.040 Erosion and Sediment Control.*

A. For projects that disturb over one acre, applicants must apply to Oregon Department of Environmental Quality (DEQ) for a National Pollutant Discharge Elimination Control System (NPDES) 1200(C) permit.

B. Erosion and sediment control plans are required by the City as a component of the site plan for all plats and all projects which require site plan review. Erosion control plans must be designed to the specifications as outlined in this chapter.

C. Development of the land may not begin (and no building permits may be issued) until the City-appointed engineer approves the erosion control plan.

D. For purposes of this section, "disturb" means any use of the land by any person in any development, and/or road construction and maintenance that results in a change in the natural cover or topography that may cause or contribute to sedimentation. Sedimentation occurs whenever solid particulate matter, mineral or organic, is transported by water, air, gravity or ice from the site of its origin.

The applicant fully intends to submit application to ODEQ for a 1200 C erosion control permit and will submit that plan to the city for review and approval as well as a Land Use Compatibility Statement application. Typically, erosion control methods will include silt fencing around the perimeter of the project site, and best management practices (BMPs). Cut and fill slopes will be stabilized during construction as recommended by the geotechnical engineering report and permanent stabilization of these slopes will similarly follow the geotechnical report recommendations. See the attached Geoengineers report for details.

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Comment [4]: We need to add some limited detail from that report

☐ *16.140.050 Stormwater System Design.*

A. Storm sewers constructed within the street will be sized by the developer's engineer and will consider all potential runoff requirements within the site and upstream of the site.

1. The storm sewer will be sized for a 100-year design recurrence criteria for storm drainage facilities.

2. The minimum size of storm sewers is eight inches in diameter.

3. Spacing of catch basins along the street must conform to published engineering recommendations, which consider profile of the street and street width.

B. On-site detention shall be required for new development where downstream deficiencies exist or are anticipated to exist. The square footage considers the total development of the property including the future potential impervious surface. Required design recurrence criteria for a commercial or residential storm drainage detention facility is a 10-year interval. Development that has less than 5,000 square feet of impervious surface is exempt from detention requirements.

C. Pervious pavement, and pavement and roofs that drain to an infiltration facility will not be counted when sizing a detention facility to handle the stormwater design.

The stormwater system will be designed per the City's standards.
Onsite detention is not proposed for this project since the large surrounding wetlands have essentially infinite flow capacity; thus. to do not present a downstream deficiency.

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☐ *16.140.060 Illegal Discharge of Materials Into the Stormwater System.*

The discharge of any material other than stormwater into the stormwater system is prohibited. The placement of materials in a location where they are likely to be carried into the stormwater system by any means is also prohibited.

The applicant acknowledges this illegal discharge prohibition.

☐ *16.152.030 Permits Required.*

Except as provided in Section 16.152.040 of this chapter, no person shall do any grading work without first having attained a grading permit from the building official.

No further earth movement will take place until after preliminary plat approval, inclusive of approval of the grading plan, and application for a grading permit has been submitted and approved.

- *16.152.060 Grading Permit Requirements.*

A. Permits Required. Except as exempted in Section 16.152.040, no person shall do any grading without first obtaining a grading permit from the building official. A separate permit shall be obtained for each site, and may cover both excavations and fills.

B. Application. To obtain a grading permit, the applicant shall file an application in writing to the City of Warrenton on a form furnished by the building official. Every such application shall contain:

1. Identification and description of work to be covered by the permit for which the application is made, including estimated quantities of work involved.

2. Description of the land on which the proposed work is to be done by legal description, street address, assessor parcel number, or similar description that will readily identify and definitely locate the proposed building or work.

3. Indication of the use or occupancy for which the proposed work is intended.

4. Plans, diagrams, computations, and specifications, and other data as required by this chapter. Plans and specifications shall be drawn to scale and shall be of sufficient clarity to indicate the location, nature, and extent of the work proposed, and show in detail that it will conform to all provisions of this Code and relevant laws, ordinances, rules, and regulations of the City.

5. Applicant's signature.

6. Other data as required by the building official.

C. Grading Designation. Grading in excess of 5,000 cubic yards shall be permitted in accordance with the approved grading plan prepared by a civil engineer, and shall be designated as "engineered grading." Grading involving less than 5,000 cubic yards shall be designated as "regular grading" unless the permittee chooses to have the grading performed as engineered grading, or the building official determines that special conditions or unusual hazards exist, in which case grading shall conform to the requirements of engineered grading.

D. Engineered Grading Requirements. As required by 2010 Oregon Structural Specialty Code Appendix J, as may be amended.

E. Regular Grading Requirements. Each application for a grading permit shall be accompanied by a plan in sufficient clarity to indicate the nature and extent of the work. The plans shall give the location of the work, the name of the owner, and the name of the person who prepared the plan. The plan shall include the following information:

1. General vicinity of the proposed site.

2. Limiting dimensions and depth of cut and fill.

3. Location of any buildings or structures where work is to be performed, and the location of any buildings or structures within 15 feet of the proposed grading.

F. Issuance.

1. The application, plans, specifications, computations, and other data filed by an applicant for a grading permit shall be reviewed by the building official. Such plans may be reviewed by other City departments to verify compliance with any applicable laws of the City. The building official may require that grading operations and project designs be modified if delays occur which incur weather generated problems not considered at the time the permit was issued. The provisions of UBC Section 106.4 are applicable to grading permits.

2. The building official may require professional inspection and testing by the soils engineer. When the building official has cause to believe that geologic factors may be involved, the grading will be required to conform to engineered grading.)

The preliminary plat application plan set illustrates the proposed grading plan for all cuts and fills with an estimated total volume of material moved at 22,285 cubic yards. The drawings are stamped by an engineer licensed in the state of Oregon. Upon approval of the preliminary plat application, the applicant will submit an application for a grading permit with all the required components identified by the code above.

- *16.152.100 Cuts.*

A. General. Unless otherwise recommended in the approved soils engineering or engineering geology report, cuts shall conform to the provisions of this section. In the absence of an approved soils engineering report, these provisions may be waived for minor cuts not intended to support structures.

B. Slope. The slope of cut surfaces shall be no steeper than is safe for the intended use and shall be no steeper than one unit vertical in two units horizontal (50% slope) unless the permittee furnishes a soils engineering or engineering geology report, or both, stating that the site has been investigated and given an opinion that a cut at a steeper slope will be stable and not create a hazard to public or private property.

All cut slopes are designed at the requisite 1v:2h standard.

□ *16.152.110 Fills.*

A. General. Unless otherwise recommended in the approved soils engineering report, fills shall conform to the provisions of this section. In the absence of an approved soils engineering report, these provisions may be waived for minor fills not intended to support structures.

B. Preparation of Ground. Fill slopes shall not be constructed on natural slopes steeper than one unit vertical in two units horizontal (50% slope). The ground surface shall be prepared to receive fill by removing vegetation, noncomplying fill, topsoil, and other unsuitable materials scarifying to provide a bond with the new fill and, where slopes are steeper than one unit vertical in five units horizontal (20% slope) and the height is greater than five feet, by benching into sound bedrock or other competent material as determined by the soils engineer. The bench under the toe of a fill on a slope steeper than one unit vertical in five units horizontal (20% slope) shall be at least 10 feet wide. The area beyond the toe of the fill shall be sloped for sheet overflow or a paved drain shall be provided. When fill is to be placed over a cut, the bench under the toe of the fill shall be at least 10 feet wide but the cut shall be made before placing the fill and acceptance by the soils engineer or engineering geologist or both as a suitable foundation for fill.

C. Fill Material. Detrimental amounts of organic material shall not be permitted in fills. Except as permitted by the building official, no rock or similar irreducible material with a maximum dimension of greater than 12 inches shall be buried or placed in fills. The building official may permit the placement of larger rock when the soils engineer properly devises a method of placement and continuously inspects its placement and approves the fill stability. The following conditions shall also apply: (1) prior to issuance of a grading permit, potential rock disposal areas shall be delineated on the grading plan; (2) rock sizes greater than 12 inches in maximum dimension shall be 10 feet or more below grade, measured vertically; and (3) rocks shall be placed so as to assure filling of all voids with well-graded soil.

D. Compaction. All fills shall be compacted to a minimum of 90% of maximum density.

E. Slope. The slope of fill surfaces shall be no steeper than is safe for the intended use. Fill slopes shall be no steeper than one unit vertical in two units horizontal.

These standards will be adhered to during construction. All fill slopes are adjacent to existing wetlands. The applicant requests fill slopes at 1v:1.5 h as a measure to reduce impacts to those wetlands. The geotechnical report supports this slope.

□ *16.152.120 Setbacks.*

A. General. Cut and fill slopes shall be set back from site boundaries in accordance with this section. Setback dimensions shall be horizontal distances measured perpendicular to the site boundary.

B. Top of Cut Slope. The top of cut slopes shall not be made nearer to a site boundary line than one-fifth the vertical height of cut with a minimum of two feet and a maximum of 10 feet. The setback may need to be increased for any required interceptor drains.

C. Toe of Fill Slope. The toe of fill slope shall be made not nearer to the site boundary line than one half the height of the slope with a minimum of two feet and a maximum of 20 feet. Where a fill slope is to be located near the site boundary and the adjacent off-site property is developed, special precautions shall be incorporated in the work as the building official deems necessary to protect adjoining property from damage as a result of such grading. These precautions may include, but are not limited, to (1) additional setbacks; (2) provisions for retaining or slough walls; (3) mechanical or chemical treatment of the fill slope surface to minimize erosion; and (4) provisions for the control of surface waters.

D. Modification of Slope Location. The building official may approve additional setbacks. The building official may require investigation and recommendation by a qualified engineer or engineering geologist to demonstrate that the intent of this section has been satisfied.

The setback of the cut slope in Lots 13 and 14 is a uniform 20 percent of the widest portion of the cut. This setback continues for the fill slope in Lot 15

- *16.152.130 Drainage and Terracing.*

A. General. Unless otherwise indicated on the approved grading plan, drainage facilities and terracing shall conform to the provisions of this section for cut or fill slopes steeper than one unit vertical in three units horizontal (33.3% slope).

B. Terraces.

1. Terraces at least six feet in width shall be established at not more than 30-foot vertical intervals on all cut or fill slopes to control surface drainage and debris except that where only one terrace is required, it shall be a mid-height. For cut or fill slopes greater than 60 feet and up to 120 feet in vertical height, one terrace at approximately mid-height, shall be 12 feet in width. Terrace widths and spacing for cut and fill slopes greater than 120 feet in height shall be designed by a civil engineer and approved by the building official. Suitable access shall be provided to permit proper cleaning and maintenance.

Terraces will not be needed since the total cut and fill proposed is substantially less than the minimum threshold of 30 vertical feet.

2. Swales or ditches or terraces shall have a minimum gradient of five percent and must be paved with reinforced concrete not less than three inches in thickness or and approved equal paving. They shall have a minimum depth at the deepest point of one foot and a minimum paved width of five feet.

3. A single run of swale or ditch shall not collect runoff from a tributary exceeding 13,500 square feet (projected) without discharging into a down drain.

No swales or ditches are proposed.

C. Subsurface Drainage. Cut and fill slopes shall be provided with subsurface drainage as necessary for stability.

Comment noted. Recommendations in the geotechnical report will be followed.

D. Disposal.

1. All drainage facilities shall be designed to carry waters to the nearest practicable drainage way approved by the building official or other appropriate jurisdiction as a safe place to deposit such waters. Erosion of ground in the area of discharge shall be prevented by installation of non-erosive down-drains or other devices.

The proposed stormwater system and outfall protection meets this requirement

2. Building pads shall have a drainage gradient of two percent toward approved drainage facilities unless waived by the building official. The gradient from the building pad may be one percent if all of the following conditions exist throughout the permit area: (a) no proposed fills are greater than 10 feet in maximum depth; (b) no proposed finish cut or fill slope faces a vertical height in excess of 10 feet; and (c) no existing slope faces, which have a slope face steeper than one unit vertical in 10 units horizontal, have a vertical height in excess of 10 feet.

As shown on the attached grading plan, the proposed lot grading meets this criteria.

E. Interceptor Drains. Paved interceptor drains shall be installed along the top of all cut slopes where the tributary drainage area above slopes toward the cut and has a drainage path greater than 40 feet measured horizontally. Interceptor drains shall be paved with a minimum of three inches of concrete or gunite and reinforced. They shall have a minimum depth of 12 inches and a minimum paved width of 30 inches measured horizontally across the drain. The slope of the drain shall be approved by the building official.

Interceptor drains above the cut slope in the southeastern are not required due to the negligible amount of upslope area.

- *16.152.140 Erosion Control.*

A. Slopes. The faces of cut and fill slopes shall be prepared and maintained to control against erosion. This control may consist of effective planting. The protection of the slopes shall be installed as soon as practicable and prior to calling for final approval. Where cut slopes are

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not subject to erosion due to the erosion-resistant character of the material, such protection may be omitted.

B. Other Devices. Where necessary, check dams, cribbing, riprap, or other devices or methods shall be employed to control erosion and provide safety.

No other devices are proposed, although future property owners may pursue rip rap or retaining walls.

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☐ *16.152.150 Completion of Work.*

Upon completion of the rough grading work and at the completion of the work, the following reports and drawings and supplements thereto are required for engineered grading or when professional inspection is performed for regular grading, as applicable:

A. An as-built grading plan prepared by the civil engineer retained to provide such services in accordance with Section 16.152.070 showing original ground surface elevations, as-graded ground surface elevations, lot drainage patterns, and the locations and elevations of surface drainage facilities and of the outlets of subsurface drains. As-constructed locations, elevations, and details of subsurface drains shall be shown as reported by the soils engineer.

Civil engineers shall state that to the best of their knowledge the work within the specified area of responsibility was done in accordance with the final approved grading plan.

B. A report prepared by a soils engineer retained to provide such services in accordance with Section 16.152.070, including locations and elevations of field density tests, summaries of field and laboratory tests, other substantiating data, and comments on any changes made during grading and their effect on recommendations made in the approved soils engineering investigation report. Soils engineers shall submit a statement that, to the best of their knowledge, the work within their area of responsibilities is in accordance with the approved soils engineering report and applicable provisions of this chapter.

These requirements are noted and will be complied with.

☐ *16.156.030 Wetland Area Development Standards.*

Wetland areas in the City of Warrenton are identified on the 1" equals 400' feet maps entitled City of Warrenton Wetland Conservation Plan Inventory dated October 17, 1997. These maps show approximate wetland boundaries for wetland areas within the Warrenton Urban Growth Boundary.

A. Applications to the City of Warrenton for subdivision, partition planned unit development, conditional use, site design review, variance, or temporary building permits that would lead to the disturbance of a wetland upon approval and issuance of grading or building permits, shall include a delineation of the wetland boundary, approved by the Oregon Department of State Lands.

A copy of the delineation prepared by Cascade Environmental Group LLC is included in the application package together with the September 28, 2017 concurrence letter from the Department of State Lands.

- *16.156.040 Significant Wetland Area Development Standards.*

A. The following additional development standards shall apply to all development in significant wetlands as designated on the City of Warrenton Locally Significant Wetland Map dated January 21, 2004.

B. Alteration of a significant wetland or portion of a significant wetland by grading, excavating, placement of fill including structures, and removal of vegetation, shall be prohibited, except for the following uses, upon demonstration that the uses are designed and constructed to minimize intrusion into the wetland area:

7. Uses authorized by an approved City of Warrenton hardship variance in conjunction with a valid State of Oregon Wetland Removal-Fill Authorization.

The wetland hardship variance criteria from WMC16.156.080 are presented below.

- *16.156.080 Hardship Variance Procedure and Criteria.*

A. For any lands demonstrated to have been rendered not buildable by application of this chapter, the property owner may apply for a hardship variance for relief from the restrictions of this chapter.

B. Hardship variance applications are subject to review in accordance with the standards of Section 16.208.050, Type III Procedure (Quasi-Judicial). Granting of a hardship variance requires that:

1. The proposed development represents a reasonable and legal use of the lot or parcel, considering the zoning.

The subject property is zoned Growth Management and permitted uses defaults to the R-10 Intermediate district standards which allow single family dwellings outright. The proposal is to subdivide and develop the property for lots for single family dwellings. This criterion is met.

2. Strict adherence to this chapter and other applicable standards would effectively preclude a use of the parcel that could be reasonably expected to occur in similarly zoned parcels.

The proposal includes plans to fill less than $1/10^{th}$ of one acre of wetlands. By doing so, the lots and tract to be filled will result in the continuity of a more regular shaped buildable area for each of the affected lots and a certainty that the impacted wetland areas would be mitigated for. Failure to fill the areas at this stage of development would make the buildable area of those lots

more difficult. Additionally, the lack of fill by this applicant would increase the likelihood that future lot owners would fill the affected areas without mitigation. This criterion is met.

3. The property owner would be precluded a substantial property right enjoyed by the majority of landowners in the vicinity.

The two subdivisions to the south of the subject property were permitted to fill small amounts of wetlands as part of entitlement approvals as was the Fort Pointe application along Ridge Road. Denial of his variance would preclude substantial property rights granted to and enjoyed by those developments. The vast expanse of wetlands without any buildable uplands in the vicinity of the project site, and the North Coast Land Conservancy's ownership to the east which has a goal of preserving the Clear Lake property in its natural and enhanced state, limit the number of properties to compare to this one to those identified above. This criterion is met.

4. The variance is the minimum necessary to retain use of the property.

As described above, the proposed wetland fill encompasses less than $1/10^{th}$ of 1 acre via 14 separate fills ranging in size from approximately 35 to 1,100 square feet. This is the minimum necessary to make the property more manageable and as noted above, will help to protect the resource from otherwise unregulated fills. This criterion is satisfied.

5. Granting of the variance will not be materially detrimental to the public welfare or be injurious to property or improvements in the neighborhood of the premises.

The proposed fills are entirely within the interior of the subject property and separated from adjacent properties and improvements in the neighborhood; granting the variance for the fills will not be injurious to neighboring man-made or natural features and, as stated above, the impacts of the fill will be mitigated, a certainty that if left in their current state, potentially filling of the wetlands by future property owners would likely not be regulated. To facilitate this protection, the applicant will post permanent notices along the upland edges cautioning of the wetland resource and prohibiting future fill.

6. The variance will be in general harmony with the intent and purpose of this chapter, and will not adversely affect any officially adopted Comprehensive Plan policy.

The Comprehensive Plan states:

> OAR 660-023-0024-(2) establishes the requirements of the Statewide Planning Goal (sic) 16 and 17supercede the requirements of Statewide Planning Goal 5 for natural resources also subject to and regulated by those goals. As a result, whether and under what circumstances development impact wetlands and riparian corridors in estuarine and coast shoreland areas is governed by the policies implementing Goals 16 and17 rather than the City's adopted Goal 5 implementation program.

Wetlands and riparian corridors are important to the citizens of Warrenton as natural resources. To ensure that this goal is attainable, wetland and riparian corridor mitigation (emphasis added)restoration creation and enhancement shall be allowed in all zoning districts where practicable. Page 39.

The fact that the wetland code includes a route to a variance to the regulations provides the opportunity of harmony under appropriate circumstances. In this case, the impacted wetland area is quite small and necessary to facilitate the development. Such variances have been granted to other properties in the vicinity. Granting the variance will facilitate to greater protection than if not granted. And, the proposal is consistent on its face with a Comprehensive Plan policy. This criterion is satisfied.

- *16.216.020 General Requirements.*

A. Subdivision and Partition Approval Through Two-step Process. Applications for subdivision or partition approval shall be processed through a two-step process: the preliminary plat and the final plat.

1. The preliminary plat shall be approved before the final plat can be submitted for approval consideration; and

2. The final plat shall include all conditions of approval of the preliminary plat.

B. Compliance with ORS Chapter 92. All subdivision and partition proposals shall be in conformance to state regulations set forth in Oregon Revised Statutes (ORS) Chapter 92, Subdivisions and Partitions.

The applicant understands this process.

Future Re-Division Plan. When subdividing or partitioning tracts into large lots (i.e., greater than two times or 200% the minimum lot size allowed by the underlying land use district), the City shall require that the lots be of such size, shape, and orientation as to facilitate future re-division in accordance with the requirements of the land use district and this Code. A re-division plan shall be submitted which identifies:

1. Potential future lot division(s) in conformance with the housing and density standards of Division 2.

2. Potential street right-of-way alignments to serve future development of the property and connect to adjacent properties, including existing or planned rights-of-way.

3. A disclaimer that the plan is a conceptual plan intended to show potential future development. It shall not be binding on the City or property owners, except as may be required through conditions of land division approval. For example, dedication and improvement of

rights-of-way within the future plan area may be required to provide needed secondary access and circulation.

This section is not applicable.

C. Lot Size Averaging. Single-family residential lot size may be averaged to allow lots less than the minimum lot size in the residential district, as long as the average area for all lots is not less than allowed by the district. No lot created under this provision shall be less than 80% of the minimum lot size allowed in the underlying district. For example, if the minimum lot size is 5,000 square feet, the following three lots could be created: 4,000 square feet, 5,000 square feet, and 6,000 square feet.

Lot size averaging is not being used.

D. Temporary Sales Office. A temporary sales office in conjunction with a subdivision may be approved as set forth in Section 16.240.010, Temporary Use Permits.

If and when the applicant decides to erect a temporary sales office, he will apply for the applicable permits.

E. Minimize Flood Damage. All subdivisions and partitions shall be designed based on the need to minimize the risk of flood damage. Development in a flood hazard designation shall comply with the standards of Chapter 16.88, Flood Hazard Overlay (FHO) District, and Federal Emergency Management Agency requirements, including fill to elevate structures above the base flood elevation.

F. Determination of Base Flood Elevation. Shall comply with Chapter 16.88 of the Warrenton Development Code. Based on a review of Clatsop Webmaps, the subject property is not within a flood hazard overlay zone.

Based on a review of Clatsop Webmaps, the subject property is not within a flood hazard overlay zone.

G. Need for Adequate Utilities. Shall comply with Chapters 16.136 and 16.216.

H. Need for Adequate Drainage. All subdivision and partition proposals shall comply with Chapter 16.140.

As discussed above, the proposal includes plans to provide water, sanitary sewer and storm water management facilities that meet the need of the proposed development.

I. Open space shall provide opportunities for active and/or passive recreation and may include existing stands of trees, resource areas, and storm water facilities as outlined in this section. Active open space shall allow human activities including recreational and social opportunities such as play fields, playgrounds, swimming pools, plazas and other recreational

facilities. Open space may also be passive and include human activities limited to walking, running, and cycling, seating areas and wildlife viewing or natural areas such as a wetland.

1. A proposed subdivision preliminary plat with 20 lots or more shall provide baseline active open space of an area equal to at least five percent of the subject site.

2. Active open space shall be easily accessible, physically or visually, to all members of the planned community via a minimum 30-foot wide street frontage or access easement.

3. Active open space areas shall have a dedicated meter and underground irrigation system to ensure adequate water supply during establishment period (three years) and during periods of drought for all newly planted areas.

4. Active open space shall be no smaller than the minimum lot size requirement of the underlying zoning district with a minimum width 40 feet.

5. Active open space may abut a collector or greater classified street as identified in the City's adopted Transportation System Plan, when separated from the street by a constructed barrier, such as a fence or wall, at least three feet in height.

6. Active open space shall be physically accessible to all residents of the development.

7. Active open space shall include physical improvements to enhance the area. Physical improvements may include benches, gazebos, plazas, picnic areas, playground equipment, sport courts, play fields, or other items permitted by the Planning Commission.

8. An association of owners or tenants, created as a non-profit corporation under the laws of the state (ORS 94.572) which shall adopt and impose articles of incorporation and bylaws and adopt and impose a declaration of covenants and restrictions on the common open space that is acceptable to the City Attorney as providing for the continuing care of the space. Any subsequent changes to such CC&Rs regarding the active open space must be approved by the City Attorney. Such an association shall be formed and continued for the purpose of maintaining the common open space and shall provide for City intervention and the imposition of a lien against the entire subdivision development in the event the association fails to perform as required.

9. A public agency which agrees to maintain the dedicated active open space and any buildings, structures, or other improvements which have been placed on it.

10. Dedicated active open space shall be protected by Covenants (CC&Rs) or deed restriction to prevent any future commercial, industrial, or residential development.

At 15 lots, the proposal is below the threshold for requiring the development of open space or recreation facilities. However, the application includes plans to grant an easement to the city for future utility extensions and pedestrian access to its western property line to facilitate the city's development of a trail to public and private recreation facilities along Ridge Road.

J. Street Names.

1. All proposed streets west of Main Avenue shall have a tree or plant life name; and all proposed streets between Highway 101 and Main Avenue shall have a "nautical" name.

2. All proposed streets shall have directional prefixes as part of the street name (i.e., E, NE, SW, S).

3. All proposed streets east of Highway 101 shall follow the street naming procedure as outlined below:

a. Proposed street names shall be submitted as part of a subdivision or partition application to the Planning and Building Department. The request shall include the proposed name(s), the specific street location and brief but complete background information on the name and how it meets the street name policy. If the new street name is indicated on the proposed plat at the time of the land use application it shall be labeled "proposed," such as "proposed Willener Court."

b. Streets shall generally be named after people, places, events, and things related to the City and the citizens of Warrenton. Proposed names should meet one of the following criteria:

i. To honor and commemorate noteworthy persons associated with the City of Warrenton, Clatsop County, and the State of Oregon;

ii. To commemorate local history, places, events or culture;

iii. To strengthen neighborhood identity; or

iv. To recognize native wildlife, flora, fauna or natural features related to the community and the City of Warrenton.

Consideration should be given to names of local area or historic significance. Names of living persons should be used only in exceptional circumstances. Only a person's last name should be used as a street name unless additional identification is necessary to prevent duplications of existing street names in Warrenton and Clatsop County.

c. Names to Avoid.

i. Street names being a duplicate of an existing street in the City of Warrenton or in Clatsop County shall be avoided.

ii. Similar sounding names such as Beach Avenue and Peach Avenue, Maywood Court and Maywood Lane shall be avoided.

iii. Cumbersome, corrupted or modified names, discriminatory or derogatory names, from the point of view of race, sex, color, creed, political affiliation or other social factors, shall be avoided.

iv. Names for public streets that could be construed as advertising a particular business shall be avoided.

v. The reuse of a former street name should be discouraged because of the confusion this causes in property records management and fire and police protection.

d. Street Type Designations. Depending on roadway function, length and configuration, designations exist to define the character of a street. The following designations shall be used:

i. Avenue. A public or City right-of-way that runs in a north-south direction (except for the Hammond area, which has avenues going east-west).

ii. Street. A public or City right-of-way that runs generally in an east-west direction.

iii. Boulevard. A major landscaped arterial that carries moderate to heavy volumes of traffic at moderate to high speeds.

iv. Court. A local road that is of short length, that carries a low volume of traffic at low speeds, with no cross streets and generally terminates in a cul-de-sac.

v. Drive, Parkway, Trail. A meandering collector or arterial that carries low, moderate or high volumes of traffic at low, moderate or high speeds.

vi. Lane. A local road that is of short length, that carries a low volume of traffic, at low speeds, and generally terminates in a cul-de-sac.

vii. Place, Way. A local road that is of a short length and carries low volumes of traffic at low speeds.

viii. Terrace, Gardens, Grove, Heights. For low-volume, short-length streets.

The applicant intends to continue the street name Kalmia Avenue for the street extension into the subdivision.

☐ *16.216.040 Preliminary Plat Submission Requirements.*

A. General Submission Requirements. For partitions (three lots or fewer), the applicant shall submit an application containing all of the information required under Section 16.208.040. For subdivisions (greater than three lots), the application shall contain all of the information required under Section 16.208.050.

B. Preliminary Plat Information. In addition to the general information described in subsection A of this section, the preliminary plat application shall consist of drawings and supplementary written material (i.e., on forms and/or in a written narrative) adequate to provide the following information:

1. General Information.

a. Name of subdivision (not required for partitions). This name must not duplicate the name of another subdivision in the county in which it is located (please check with County Surveyor);

b. Date, north arrow, and scale of drawing;

c. Location of the development sufficient to define its location in the City, boundaries, and a legal description of the site;

d. Names, addresses and telephone numbers of the owners, designer, and engineer or surveyor if any, and the date of the survey; and

e. Identify the drawing as a "preliminary plat."

2. Site Analysis.

a. Streets. Location, name, present condition (i.e., paved, gravel, unimproved, etc.), and width of all streets, alleys and rights-of-way on and abutting the site;

b. Easements. Width, location and purpose of all existing easements of record on and abutting the site;

c. Utilities. Location and identity of all utilities on and abutting the site. If water mains and sewers are not on or abutting the site, indicate the direction and distance to the nearest ones;

d. Ground elevations shown by contour lines at five-foot vertical intervals for ground slopes exceeding 10% and at two-foot intervals for ground slopes of less than 10%. Such ground elevations shall be related to some established bench mark or other datum approved by the County Surveyor. This requirement may be waived for partitions when grades, on average, are less than two percent;

e. The location and elevation of the closest benchmark(s) within or adjacent to the site (i.e., for surveying purposes);

f. Potential natural hazard areas, including floodplain, landslide areas, and areas having a high erosion potential;

g. Wetland areas, streams, wildlife habitat, and other areas identified by the City or natural resource regulatory agencies as requiring protection. (See also Chapter 16.156 and relevant portions of the Comprehensive Plan.);

h. Site features, including existing structures, pavement, drainage ways, canals and ditches;

i. Designated historic and cultural resources on the site and adjacent parcels or lots;

j. North arrow, scale, name and address of owner;

k. Name and address of surveyor or engineer; and

l. Other information, as deemed appropriate by the Community Development Director. The City may require studies or exhibits prepared by qualified professionals to address specific site features and code requirements.

3. Proposed Improvements.

a. Public and private streets, tracts, driveways, open space and park land; location, names, right-of-way dimensions, approximate radius of street curves; and approximate finished street center line grades. All streets and tracts which are being held for private use and all reservations and restrictions relating to such private tracts shall be identified;

b. Easements. Location, width and purpose of all easements;

c. Lots and private tracts (e.g., private open space, common area, or street): approximate dimensions, area calculation (e.g., in square feet), and identification numbers for all lots and tracts;

d. Proposed uses of the property, including all areas proposed to be dedicated to the public or reserved as open space for the purpose of surface water management, recreation, or other use;

e. Proposed improvements, as required by Division 3 (Design Standards), and timing of improvements (e.g., in the case of streets, sidewalks, street trees, utilities, etc.);

f. The proposed source of domestic water;

g. The proposed method of sewage disposal and method of surface water drainage (shall comply with Chapter 16.140). Water quality treatment areas, if required;

h. The approximate location and identity of other utilities, including the locations of street lighting fixtures;

i. Proposed railroad crossing or modifications to an existing crossing, if any, and evidence of contact with Oregon Department of Transportation related to proposed railroad crossing(s);

j. Changes to navigable streams, shorelines or other water courses. Provision or closure of public access to these areas shall be shown on the preliminary plat, as applicable;

k. Identification of the base flood elevation. Evidence of contact with the Federal Emergency Management Agency to initiate a floodplain map amendment shall be required when development is proposed to modify a designated 100-year flood plain;

l. Evidence of contact with Oregon Department of Transportation (ODOT) for any development requiring access to a highway under the state's jurisdiction; and

m. For proposals that would alter land within 25 feet of a mapped wetland, a jurisdictional delineation of the wetland boundary concurred with by the appropriate resource agency with jurisdiction.

All the required information is included in the preliminary plat plan set.

- ☐ 16.272 VARIANCES
- ☐ 16.272.020 Criteria.

Variances to a quantitative requirement of this Code may be granted only if, on the basis of the written application, investigation, and evidence submitted by the applicant, findings of fact are made by the zoning administrator (for Class 1 applications) or Planning Commission (for Class 2 applications) that satisfy the criteria of subsections A through F of this section. Prior variances allowed in the neighborhood shall not be considered by the granting authority in reaching its decision. A determination of whether the standards set forth in this section are satisfied necessarily involves the balancing of competing and conflicting interests. Each request shall be considered on its own merits.

This section addresses the need to vary the 200-foot cul-de-sac length standard of WMC 16.136.020.M and permitted by WMC 16.136.020.B. The proposed extension of Kalmia Avenue would be approximately 800 feet long.

A. The hardship was not created by the person requesting the variance;

The subject property is abutted on the west, north and partially the east by wetlands deemed significant by the city's wetland inventory. Where the wetlands terminate on the east, the topography is such that building a road is not practicable. This is further complicated by the North Coast Land Conservancy's ownership of the parcel to the east and its goal of preserving the Clear Lake tract from development. The applicant did not create the hardship.

B. The request is necessary to make reasonable use of the property. There will be an unreasonable economic impact upon the person requesting the variance if the request is denied;

Denial of the variance would prohibit access to the property which is absolutely essential to its development and the intended use. The subject property is zoned GM/R-10 and is intended for urban development as urban facilities become available; those facilities became available with the development of the land immediately to the south. Prohibiting access via a variance to exceed the 200-foot length limit would essentially prohibit development of the property which would be nothing but an unreasonable economic impact on the applicant. There is no other option for either providing access or connecting the proposed road to the city's street network.

C. The request will not substantially be injurious to the neighborhood in which the property is located. The variance will not result in physical impacts, such as visual, noise, traffic or increased potential for drainage, erosion and landslide hazards, beyond those impacts that would typically occur with development in the subject zone;

Extending the road as proposed would not result in visual or noise impacts because the proposed development is exactly the same to existing development in the immediate facility. Storm water runoff from the road will be managed by an engineered drainage system designed to meet ODOT and ODEQ standards. Presently, the developments to the south would result in 27 single family residences at build out, which would result in approximately 270 vehicle trips (in and out, cumulative), and approximately 27 total in/out trips during the afternoon peak hour. The proposed development would add approximately 150 total daily trips and about 15 during the afternoon peak hour, for a total of 42 trips. We anticipate a 60% in/40%out directional split at the intersection of Kalmia Avenue and 2nd Street and do not anticipate a failure of intersection operations.

D. The request is not in conflict with the Comprehensive Plan;

The comprehensive plan is silent on cul-de-sac lengths.

E. The request is not in conflict with the Development Code. No variance may be granted which will result in a use not permitted in the applicable zone or which will increase the allowable residential density in any zone with the exception of individual lot size reduction; and

The development of the subdivision is for lots for single family residences which requires access via the proposed street and which are permitted outright in the GM R-10 zoning district. There is no intent or request for other uses which are not explicitly permitted.

F. Physical circumstance(s) related to the property involved preclude conformance with the standard to be varied.

The environmental constraints presented by surrounding wetlands and steep dune hills make the cul-de-sac street the only option for accessing the subject property and future lots. There is no other option.

Clear Lake Subdivision Appeal

Record of Decision | Index of Documents

Subdivision (SUB 19-1) & Variance (VAR 19-1) Application

- Application Forms
- Narrative
- Preapplication Notes/Responses
- Density Calculation (+ Staff Notes version)
- Stormwater Report: Firwood Design Group
- Geotech Report:
- 11 x 17 Plan Set: Firwood Design Group
- Completeness Letter

Public Notice

- Published
- Affected Property Owner
- Affected Agency

Staff Report – April 4, 2019 (revised from March 7, 2019)

City Engineer (HHPR) Comment Letter

Department of State Lands Enforcement Letter

Planning Commission Minutes

- April 11, 2019
- April 25, 2019

Notice of Decision

Appeal: Rod Gramson

- Letter
- Public Notice

Appeal Letter: Sandridge Construction

- Letter
- Public Notice
- Plan Set

City Commission Agenda Summary: June 25, 2019

From: "Kevin Cronin" <cityplanner@ci.warrenton.or.us>
To: "Skip Urling" <skip@urlingplanning.com>
Cc: "eh@firwooddesign.com" <eh@firwooddesign.com>, "gilandanngramson@charter.net" <gilandanngramson@charter.net>
Date: Thursday February 14 2019 4:43:24PM

RE: Clear Lake narrative revised

Completeness letter for your records.

From: Skip Urling <skip@urlingplanning.com>
Sent: Thursday, February 14, 2019 1:44 PM
To: Kevin Cronin <cityplanner@ci.warrenton.or.us>
Cc: eh@firwooddesign.com; gilandanngramson@charter.net
Subject: Clear Lake narrative revised

Attached is the Clear Lake preliminary plat narrative without the track changes. Gil will deliver 3 hard copies tomorrow. Erik deleted the old file from the dropbox and will upload this file. Also attached is a spreadsheet with the density calculations, which I summarized in the narrative.

We also revised the narrative to address the trail requirement from the cul-de-sac to the northern property boundary. WMC 16.120.030.A.4.e provides an exception to the requirement for the trail when certain physical characteristics of the property make it impracticable. We believe the site meets those criteria.

Please call me if you feel the need to discuss.

Thanks

Skip Urling
Urling Planning Associates
360.431.5117

Clear Lake Subdivision Preliminary Plat
Application Narrative and Suggested Findings

This application is for a preliminary plat for 15 lots averaging areas of greater than 10,000 square feet for future single family dwellings on Tax Lot 810170001302, located at the northern terminus of Kalmia Avenue. The subject property consists of 7.919 acres and is zoned GM-R-10. In addition to seeking preliminary plat approval, the application package includes request for a variance to Warrenton Municipal Code (WMC) 16.136.020.M and guided by WMC 16.132.020.B to extend Kalmia Avenue beyond the 200 standard; and a Hardship Variance to fill 0.095 acres of wetland as governed by WMC 16.156.080.

A discussion of how the proposal satisfies the applicable standards of the Municipal Code as listed below. Municipal code is presented in *italics* with the responses/suggested findings in regular font.

Chapter 16.112 Growth Management (GM) Zone Standards
Chapter 16.28 Intermediate Density Residential (R-10) District
Chapter 16.136 Public Facilities Standards
Chapter 16.140 Stormwater And Surface Water Management
Chapter 16.152 Grading, Excavating, And Erosion Control Plans
Chapter 16.156 Wetland And Riparian Corridor Development Standards
Section 16.208.050 Type III Procedure (Quasi-Judicial).
Chapter 16.216 Land Divisions And Lot Line Adjustments

- *16.112.030 Growth Management Standards.*

The following standards shall apply to development within growth management areas:

A. All development shall provide the following primary urban services: water, sanitary sewer facilities connecting to the City sewer system, local streets, fire protection and drainage. An inability to provide an acceptable level of all primary services shall result in the denial of a land use application.

B. All development shall be reviewed to ascertain whether an adequate level of the following secondary urban services exists: collector and arterial streets, school, police protection and parks. Where the City determines and supports with findings that an unacceptable level of secondary urban services exist, the City may deny the land-use application unless the developer insures the availability of an acceptable level of the services within five years from occupancy.

C. City specifications shall be the standard used as measurement of acceptability of a service.

D. Encourage the development within urban areas before the conversion of urbanizable areas.

Included with the preliminary plat are plans for a local street designed to provide access to all of the proposed lots together with preliminary plans for the extension of sanitary sewer and potable water for domestic use and fire flow. Access for emergency service providers such as police and fire department personnel and equipment and school busses for transporting students both the primary and high schools will be provided via the extension of Kalmia Avenue. There is also a preliminary plan for managing storm water runoff and treatment via a biofiltration swale facility designed to Oregon Department of Transportation and Oregon Department of Environmental Quality standards. A pedestrian trail access and utility extension easement to be dedicated to the city is shown on the preliminary plat to contribute to future recreational and open space facilities access and the anticipated utilities to improve the city's water distribution system. The subject property abuts a previously approved and developed urban subdivision where the lots have dwellings either completed or under construction, and as such the proposal is a natural extension of the urbanized area.

The proposal satisfies these growth management standards.

- 16.112.050 Land Divisions.

A. All land divisions which would create a parcel under five acres in size shall be subject to approval under the appropriate procedures in this Code (Chapter 16.216). Land divisions which would create a parcel under five acres in size in growth management areas shall be approved only if:

1. The lots created are at R-10 urban densities;

2. Primary and secondary urban services are supplied in accordance with Section 16.28.050;

3. An exception is approved as provided in Section 16.112.040.

B. All land divisions that would create parcels between five and 10 acres in size shall be reviewed to insure that the proposed parcel layout (i.e., relationship to roads, easements and utilities) and building placement is such that the parcel can be re-divided at urban densities.

The preliminary plat application has been prepared and submitted consistent with standards for land divisions set forth by WMC 16.216 and designed to meet the standards of WMC 16.28.040 (discussed below). The standards of WMC 16.28.050 will be met through the installation of utilities and services facilities and the behavior of future residents. None of the lots will exceed the five-acre threshold in Subparagraph B. above.

The preliminary plat satisfies these criteria.

- 16.112.060 Cost Allocation.

The cost of providing the required urban services for a particular land use proposal under consideration shall be borne by the applicant or benefited properties unless otherwise authorized by the City Commission.

The applicant understands that he is solely responsible for the costs of providing the required urban services.

- 16.112.080 Public Improvement Guarantee.

For the purposes of this section, the word "insure" shall mean a legal and enforceable document, contract or process which guarantees to the City a public improvement will be accomplished. Assurances include, but are not limited to, the following:

A. Performance bond.

B. Cash in escrow, assignment of letter of credit, etc.

C. Establishment of an LID (post-remonstrance period).

D. Evidence of formal action by other public or private agencies or companies authorizing monies or scheduling of a requisite public improvement.

E. The requisite improvement is included in an adopted capital improvement program with funds assured by the City.

F. Any other legally binding agreement which assures the improvement will be made.

The applicant understands the requirements for public improvement guarantees, and if a guarantee is warranted, will comply to insure completion of the improvement(s).

- *16.28.020 Permitted Uses.*

The following uses and their accessory uses are permitted in the R-10 zone if the Community Development Director determines that the uses conform to the standards in Sections 16.28.040 through 16.28.050, applicable Zoning Ordinance standards, and other City laws:

A. Single-family detached dwelling.

The GM zone defaults to the R-10 Intermediate Density standards for permitted uses and development standards; single family detached dwellings are permitted outright. The applicant's intent is to develop lots for the future construction of such dwellings. The application satisfies this standard.

- *16.28.040 Development Standards.*

The following development standards are applicable in the R-10 zone:

A. Density Provisions.

1. Minimum lot area for residences: 10,000 square feet.

2. Minimum lot width at the front building line: 50 feet.

3. Minimum lot depth: 70 feet.

4. Not more than 35% of the lot area shall be covered by buildings except as may be permitted by conditional use permit or variance.

5. Maximum building height: 30 feet.

6. Maximum building height for agricultural buildings: 40 feet.

B. Setback Requirements.

1. Minimum front yard setback: 15 feet.

2. Minimum side yard setback: 10 feet.

3. Corner lot minimum street side yard setback: 10 feet.

4. Minimum rear yard setback: 15 feet, except accessory structures that meet the criteria of Section 16.280.020, may extend to within five feet of a rear property line.

5. Corner lot minimum rear yard setback: 10 feet.

All lots have been designed to comply with the areal and dimension standards of WMC 16.28.040.A. above, and have sufficient area to meet the setback standards of WMC 16.28.040.B; the application satisfies these standards.

- *16.28.050 Other Applicable Standards.*

A. Outside sales and service areas shall be approved by the Warrenton Planning Commission if not enclosed by suitable vegetation, fencing or walls.

B. Outside storage areas shall be enclosed by suitable vegetation, fencing or walls, in conformance with Chapter 16.124.

C. All uses shall comply with access and parking standards in Chapters 16.116 and 16.128 except as may be permitted by conditional use or variance.

D. Signs shall comply with standards in Chapter 16.144.

E. All development shall comply with the wetland and riparian area protection standards of Chapter 16.156.

F. Manufactured homes must comply with the criteria of Section 16.168.010.

G. A garage or carport is required and shall conform to the standards of Chapter 16.180.

H. All other applicable Development Code requirements must be met.

I. All new sewer and water connections for a proposed development shall comply with all City regulations.

J. RV parks shall comply with Chapter 16.176 and all applicable State and Federal laws and regulations.

Most of these standards do not apply. Those that do would primarily be applicable to future property owners. Utility connections will be stubbed to each lot as the subdivision is developed. Compliance with the wetland protection standards of WMC 16.156 is discussed below.

- *16.120.030 Pedestrian Access and Circulation.*

A. Pedestrian Access and Circulation. To ensure safe, direct and convenient pedestrian circulation, all developments, except single-family detached housing, duplexes, or triplexes on individual lots, shall provide a continuous pedestrian and/or multi-use pathway system. (Pathways only provide for pedestrian circulation. Multi-use pathways accommodate pedestrians and bicycles.) The system of pathways shall be designed based on the standards in paragraphs 1 through 3 of this subsection:

4. Street Connectivity. Pathways (for pedestrians and bicycles) shall be provided at or near mid-block where the block length exceeds the length required by Section 16.120.020. Pathways shall also be provided where cul-de-sacs or dead-end streets are planned, to connect the ends of the streets together, to other streets, and/or to other developments, as applicable. Pathways used to comply with these standards shall conform to all of the following criteria:

e. The Planning Commission or Community Development Director may determine, based upon facts in the record, that a pathway is impracticable due to: physical or topographic conditions (e.g., freeways, railroads, extremely steep slopes, sensitive lands, and similar physical constraints); buildings or other existing development on adjacent properties that physically prevent a connection now or in the future, considering the potential for redevelopment; and sites where the provisions of recorded leases, easements, covenants, restrictions, or other agreements recorded as of the effective date of the ordinance codified in this chapter prohibit the pathway connection.

The applicant understands the concept of providing connectivity and continuity of streets and pedestrian paths as required by the code above. As discussed in section 16.136.030, the applicant has provided a public access and utility easement between Lots 1 and 2. However, we note that subsection 4.e. provides an exception to this requirement when physical characteristics of the property and landscape make such trails impractical. In this case, City staff has requested a pedestrian trail along the common lot line of Lots 11 and 12 from the cul-de-sac to the northern property line of the subject property. The preliminary grading plan (sheet 3 of 9) shows the final graded slope of this area to be approximately 16 percent, which is relatively steep, but could be accommodated by a form of stairs; serpentine switchbacks would consume too much territory of the privately owned lots and likely prevent suitable driveway placement.

Addtionally, the environmental constraints on the subject property and abutting property to the north present much greater challenges. As illustrated on Sheet 3, there is a wetland not planned for fill that straddles the common property line between Lots 11 and 12. Constructing a trail would require additional wetland fill impacts. Further, the trail would lead to private property that is also mapped as wetlands on the National Wetland Inventory and mapped as designated as Significant Wetlands on Warrenton's Local Wetland Inventory. The potential for development of this property is highly unlikely. Thus, a pedestrian trail to be constructed as part of the Clear Lake subdivision between Lots 11 and 12 would require the applicant to fill wetlands on site for a trail that would functionally and practically terminate at the property line and not fulfill the purpose of providing connectivity and continuity to other development or potential developable properties. The exception afforded by Subparagraph 4.e. is warranted.

- *16.136.020 Transportation Standards.*

A. Development Standards. No development shall occur unless the lot or parcel abuts a public or private street, other than an alley, for at least 25 feet and is in conformance with the provisions of Chapter 16.120, Access and Circulation, and the following standards are met:

1. Streets within or adjacent to a development shall be improved in accordance with the Comprehensive Plan, Transportation System Plan, and the provisions of this chapter;

2. Development of new streets (public or private), and additional street width or improvements planned as a portion of an existing street, shall be improved in accordance with this section, and public streets shall be dedicated to the applicable City, County or State jurisdiction;

3. New streets and drives connected to a City collector or arterial street shall be paved; and

4. The City may accept a future improvement guarantee [e.g., owner agrees not to remonstrate (object) against the formation of a local improvement district in the future] in lieu of street improvements if one or more of the following conditions exist:

a. A partial improvement may create a potential safety hazard to motorists or pedestrians,

b. Due to the developed condition of adjacent properties it is unlikely that street improvements would be extended in the foreseeable future and the improvement associated with the project under review does not, by itself, provide increased street safety or capacity, or improved pedestrian circulation,

c. The improvement would be in conflict with an adopted capital improvement plan, or

d. The improvement is associated with an approved land partition on property zoned residential and the proposed land partition does not create any new streets.

The proposed Kalmia Avenue extension for the Clear Lake subdivision will meet these standards. It will be paved for its length and is designed pursuant to the Transportation System Plan standards in effect at the time of submittal. Curb to curb width is proposed at 32 feet, 4 feet wider than the existing 28-foot wide street segment it will be extended from. It is premature to decide whether a surety will be necessary. All new lots will have a frontage of greater than 60 feet.

B. Variances. Variances to the transportation design standards in this section may be granted by means of a Class 2 variance, as governed by Chapter 16.272, Variances. A variance may be granted under this provision only if a required improvement is not feasible due to topographic constraints or constraints posed by sensitive lands (see Chapter 16.156).

A variance to the cul-de-sac length of 200 feet per WMC 16.130.020.M is requested and the criteria of WMC 16.272 is discussed below. The subject property is bounded by wetlands to the west, north and partially to the east. Where wetlands to the east terminate a sand dune presents topographic constraints to the construction of a road. This is further complicated by the North Coast Land Conservancy ownership of the easterly abutting tract and the Conservancy's goal of preserving that property from development.

C. Creation of Rights-of-Way for Streets and Related Purposes. Streets shall be created through the approval and recording of a final subdivision or partition plat; except the City may approve the creation of a street by acceptance of a deed, provided that the street is deemed essential by the City Commission for the purpose of implementing the Transportation System Plan, and the deeded right-of-way conforms to the standards of this Code. All deeds of dedication shall be in a form prescribed by the City Attorney and shall name "the public," as grantee.

D. Creation of Access Easements. The City may approve an access easement established by deed when the easement is necessary to provide for access and circulation in conformance with Chapter 16.120, Access and Circulation. Access easements shall be created and maintained in accordance with the Uniform Fire Code, as amended.

E. Street Location, Width and Grade. Except as noted below, the location, width and grade of all streets shall conform to the Transportation System Plan and Comprehensive Plan, as applicable; and an approved street plan or subdivision plat. Street location, width and grade shall be determined in relation to existing and planned streets, topographic conditions, public convenience and safety, and in appropriate relation to the proposed use of the land to be served by such streets:

1. Street grades shall be approved by the City-appointed engineer in accordance with the design standards in subsection N of this section; and

2. Where the location of a street is not shown in an existing street plan (see subsection H of this section), the location of streets in a development shall either:

a. Provide for the continuation and connection of existing streets in the surrounding areas, conforming to the street standards of this chapter, or

b. Conform to a street plan adopted by the City, if it is impractical to connect with existing street patterns because of particular topographical or other existing conditions of the land. Such a plan shall be based on the type of land use to be served, the volume of traffic, the capacity of adjoining streets and the need for public convenience and safety.

F. Minimum Rights-of-Way and Street Sections. Street rights-of-way and improvements shall conform to the design standards in Table 16.136.010. A variance shall be required in accordance with Chapter 16.272 of this Code to vary the standards in Table 16.136.010. Where a range of width is indicated, the width shall be determined by the decision-making authority based upon the following factors:

1. Street classification in the Transportation System Plan or Comprehensive Plan;

2. Anticipated traffic generation;

3. On-street parking needs;

4. Sidewalk and bikeway requirements based on anticipated level of use;

5. Requirements for placement of utilities;

6. Street lighting;

7. Street tree location, as provided for in Chapter 16.124;

8. Protection of significant vegetation and wetland and riparian areas, as provided for in Chapters 16.124 and 16.156;

9. Safety and comfort for motorists, bicyclists, and pedestrians;

10. Street furnishings (e.g., benches, lighting, bus shelters, etc.), when provided;

11. Access needs for emergency vehicles; and

12. Transition between different street widths (i.e., existing streets and new streets), as applicable.

The proposed Kalmia Avenue extension as a local alternative street is consistent with these criteria. The right-of-way is 50 feet which includes sufficient space for a new street to accommodate anticipated traffic generation of 150 average daily traffic, on-street parking, sidewalks, utilities, street lighting, street trees, protection of sensitive lands, safety and comfort for motorists, bicyclists, and pedestrians, emergency vehicle access, and the transition for the right-of-way and existing 28-foot pavement width of Kalmia Avenue.

Table 16.136.010

City of Warrenton Street Design Standards

Type of Street	*Average Daily Trips (ADT)*	*Right-of-Way Width*	*Curb-to-Curb Pavement Width*	*Motor Vehicle Travel Lanes*[4]	*Median/ Flex Lane*[5]	*Bike Lanes or On-Street Parking (both sides)*	*Curb*	*Planting Strip*[5]	*Sidewalks*
Arterial Roads									
4-Lane Arterial	*Varies*	*80 - 102 ft.*	*64 - 78 ft.*	*12 ft.*[4]	*14 ft.*	*8 ft.*	*Yes*	*6 ft.*	*6 ft.*
2-Lane Arterial	*Varies*	*80 ft.*	*40 - 54 ft.*	*12 ft.*[4]	*14 ft.*	*8 ft.*	*Yes*	*6 ft.*	*6 ft.*
Collector Roads									
Collector Road	*Varies*	*60 - 64 ft.*	*36 - 40 ft.*	*12 ft.*[4]	*None*	*6-8 ft.*	*Yes*	*6 ft.*	*6 ft.*

Local Roads									
Local Road	*Varies*	*50 - 60 ft.*	*36 ft.*	*10-12 ft.*	*None*	*8 ft. parking (on one or both sides[1])*	*Yes (on one or both sides)*	*5 ft.*	*5 ft.[3]*
Alternative Local Road[2]	*< 250*	*50 ft.*	*20 - 28 ft. (no curbs required)*	*10 ft.*	*None*	*None [1]*	*None*	*5 ft.*	*None*
Alleys	*N/A*	*12 - 24 ft.*	*12 - 24 ft.*	*N/A*	*N/A*	*None*	*None*	*None*	*None*
Multi-Use Paths	*N/A*	*8 - 16 ft.*	*8 - 16 ft.*	*N/A*	*N/A*	*None*	*None*	*None*	*None*

Notes:

[1] Bike lanes are generally not needed on low volume (less than 3,000 ADT) and/or low travel speed (less than 35 mph) roads.

[2] The alternative local road standard may be used when approved by the City of Warrenton. The standard is intended to apply under the following circumstances:

- *The local road will serve 18 or fewer dwelling units upon buildout of adjacent property.*
- *The ADT volume of the road is less than 250 vehicles per day.*
- *Significant topographical or environmental constraints are present.*
- *Use of the alternative local road standard will not create gaps in connectivity or roadway standards with adjacent roadway sections (i.e., side-walk, parking, travel lane widths).*
- *The City-appointed engineer and emergency service providers have reviewed and accepted usage of the alternative local roadway standard.*

[3] Sidewalks are required on all local roads in high-density residential and commercial zones unless exempted by the City-appointed engineer or Planning Commission.

[4] *Where parking is constructed next to a travel lane, the travel lane shall be increased to a width of 14 feet to function as a shared roadway and accommodate bicycles.*

[5] *Footnote indicates that these features are optional. Flex lanes would provide for traffic flow in one direction or another depending upon the specific traffic patterns and demands for an area. Flex lanes could be used for transit routes or emergencies, and would provide extra right-of-way width for future rail or transit. Appropriate safety measures would need to be installed in conjunction with flex lanes.*

The proposed 32-foot street width exceeds the upper range width of 28 feet identified in the table above; it also includes sidewalks. We believe the proposed width is appropriate and supported by the code criteria: it will serve fewer than 18 dwellings; average daily traffic at 150 trips is below the 250 ADT threshold; and it more easily transitions to the narrow road from which it is extended without creating a gap in connectivity with the existing adjacent street section. Because of the development constraints imposed by the environmental conditions on the adjacent properties, the likelihood of extending Kalmia Avenue further is nil such that conditions allowing for an alternative street width will not change.

G. Traffic Signals. Traffic signals shall be required with development when traffic signal warrants are met, in conformance with the Highway Capacity Manual, and Manual of Uniform Traffic Control Devices. The location of traffic signals shall be noted on approved street plans. Where a proposed street intersection will result in an immediate need for a traffic signal, a signal meeting approved specifications shall be installed. The developer's cost and the timing of improvements shall be included as a condition of development approval. Traffic signals on roads under state jurisdiction shall be determined by the Oregon Department of Transportation.

Because there is no intersection with the street extension, there is no need for a traffic signal.

H. Future Street Plan and Extension of Streets.

1. A future street plan shall be filed by the applicant in conjunction with an application for a subdivision in order to facilitate orderly development of the street system. The plan shall show the pattern of existing and proposed future streets from the boundaries of the proposed land division and shall include other parcels within 500 feet surrounding and adjacent to the proposed land division. The street plan is not binding; rather it is intended to show potential future street extensions with future development.

2. Streets shall be extended to the boundary lines of the parcel or tract to be developed, when the Community Development Director or Planning Commission determines that the extension is necessary to give street access to, or permit a satisfactory future division of, adjoining land. The point where the streets temporarily end shall conform to subparagraphs a through c of this paragraph:

a. These extended streets or street stubs to adjoining properties are not considered to be cul de-sacs since they are intended to continue as through streets when the adjoining property is developed.

b. A barricade (e.g., fence, bollards, boulders or similar vehicle barrier) shall be constructed at the end of the street by the subdivider and shall not be removed until authorized by the City or other applicable agency with jurisdiction over the street. The cost of the barricade shall be included in the street construction cost.

c. Temporary turnarounds (e.g., hammerhead or bulb-shaped configuration) may be constructed for stub streets over 150 feet in length for a time period of up to two years. The developer shall guarantee conversion of the temporary hammerhead into a cul-de-sac that meets the standards of this Code by posting a performance bond that guarantees the required improvement within the time specified.

Environmental conditions make the likelihood of extending the street to adjacent properties nil, therefor it is appropriate to develop the cul-de-sac to city standards rather than extend the road to the north property line.

I. Street Alignment and Connections.

1. Staggering of streets making "T" intersections at collectors and arterials shall not be designed so that jogs of less than 300 feet on such streets are created, as measured from the centerline of the street.

2. Spacing between local street intersections shall have a minimum separation of 125 feet, except where more closely spaced intersections are designed to provide an open space, pocket park, common area or similar neighborhood amenity. This standard applies to four-way and three-way (off-set) intersections.

3. All local and collector streets which abut a development site shall be extended within the site to provide through circulation unless prevented by environmental or topographical constraints, existing development patterns or compliance with other standards in this Code. This exception applies when it is not possible to redesign or reconfigure the street pattern to provide required extensions. Land is considered topographically constrained if the slope is greater than 15% for a distance of 250 feet or more. In the case of environmental or topographical constraints, the mere presence of a constraint is not sufficient to show that a street connection is not possible. The applicant must show why the environmental or topographic constraint precludes some reasonable street connection.

4. Proposed streets or street extensions shall be located to provide direct access to existing or planned commercial services and other neighborhood facilities, such as schools, shopping areas and parks.

5. In order to promote efficient vehicular and pedestrian circulation throughout the City, the design of subdivisions and alignment of new streets shall conform to the following standards in Chapter 16.120, Access and Circulation: The maximum block length shall not exceed 1,000 feet between street corner lines unless it is adjacent to an arterial street or unless the topography or the location of adjoining streets justifies an exception. The maximum length of blocks along an arterial is 1,800 feet. A block shall have sufficient width to provide for two tiers of building sites unless topography or location of adjoining streets justifies an exception.

Exceptions to the above standards may be granted when an accessway is provided at or near mid block, in conformance with the provisions of Section 16.120.030.

This section does not apply.

J. Sidewalks, Planter Strips, Bicycle Lanes. Sidewalks, planter strips, and bicycle lanes shall be installed in conformance with the standards in Table 16.136.010, applicable provisions of the Transportation System Plan, the Comprehensive Plan, and adopted street plans. Maintenance of sidewalks, curbs, and planter strips is the continuing obligation of the adjacent property owner.

The right-of-way extends 3 feet beyond the standard 5-foot sidewalk and is available as a planting strip. Bicycle lanes are not warranted.

K. Intersection Angles. Streets shall be laid out so as to intersect at an angle as near to a right angle as practicable, except where topography requires a lesser angle or where a reduced angle is necessary to provide an open space, pocket park, common area or similar neighborhood amenity. In addition, the following standards shall apply:

1. Streets shall have at least 25 feet of tangent adjacent to the right-of-way intersection unless topography requires a lesser distance;

2. Intersections which are not at right angles shall have a minimum corner radius of 20 feet along the right-of-way lines of the acute angle; and

3. Right-of-way lines at intersection with arterial streets shall have a corner radius of not less than 20 feet.

No intersections are proposed.

L. Existing Rights-of-Way. Whenever existing rights-of-way adjacent to or within a tract are of less than standard width, additional rights-of-way shall be provided at the time of subdivision or development, subject to the provisions of this chapter.

No existing right-of-way is on the subject property.

M. *Cul-de-Sacs. A dead-end street shall be no more than 200 feet long, shall not provide access to greater than 18 dwelling units, and shall only be used when environmental or topographical constraints, existing development patterns, or compliance with other standards in this Code preclude street extension and through circulation.*

1. All cul-de-sacs shall terminate with a circular turnaround. Circular turnarounds shall have a radius of no less than 40 feet from center to edge of pavement except that turnarounds that contain a landscaped island or parking bay in their center shall have a minimum radius of 45 feet. When an island or parking bay is provided, there shall be a fire apparatus lane of at least 20 feet in width; and

2. The length of the cul-de-sac shall be measured along the centerline of the roadway from the near side of the intersecting street to the farthest point of the cul-de-sac.

See Section 16.120.020 for fire access and parking area turnaround requirements based on Uniform Fire Code standards, as amended.

The cul-de-sac has been designed to these standards. A variance to the length standard is requested and discussed below.

N. *Grades and Curves. Grades shall not exceed 10% on arterials, 12% on collector streets, or 12% on any other street (except that local or residential access streets may have segments with grades up to 15% for distances of no greater than 250 feet), and:*

1. Centerline curve radii shall not be less than 700 feet on arterials, 500 feet on major collectors, 350 feet on minor collectors, or 100 feet on other streets; and

2. Streets intersecting with a minor collector or greater functional classification street, or streets intended to be posted with a stop sign or signalization, shall provide a landing averaging five percent or less. Landings are that portion of the street within 20 feet of the edge of the intersecting street at full improvement.

The street design adheres to these standards.

O. *Curbs, Curb Cuts, Ramps, and Driveway Approaches. Concrete curbs, curb cuts, wheelchair, bicycle ramps and driveway approaches shall be constructed in accordance with standards specified in Chapter 16.120, Access and Circulation, and City construction standards.*

These standards will be adhered to at the time of home construction.

P. Streets Adjacent to Railroad Right-of-Way. Wherever the proposed development contains or is adjacent to a railroad right-of-way, a street approximately parallel to and on each side of such right-of-way at a distance suitable for the appropriate use of the land shall be created. New

railroad crossings and modifications to existing crossings are subject to review and approval by Oregon Department of Transportation.

Q. Development Adjoining Arterial Streets. Where a development adjoins or is crossed by an existing or proposed arterial street, the development design shall separate residential access and through traffic, and shall minimize traffic conflicts. The design shall include one or more of the following:

1. A parallel access street along the arterial with a landscape buffer separating the two streets;

2. Deep lots abutting the arterial or major collector to provide adequate buffering with frontage along another street. Double-frontage lots shall conform to the buffering standards in Chapter 16.164;

3. Screen planting at the rear or side property line to be contained in a non-access reservation (e.g., public easement or tract) along the arterial; or

4. Other treatment suitable to meet the objectives of this subsection;

5. If a lot has access to two streets with different classifications, primary access shall be from the lower classification street, in conformance with Section 16.120.020.

There are no railroads or arterial streets in the vicinity.

R. Alleys, Public or Private. Alleys shall conform to the standards in Table 16.136.010. While alley intersections and sharp changes in alignment shall be avoided, the corners of necessary alley intersections shall have a radius of not less than 12 feet.

S. Private Streets. Private streets shall not be used to avoid connections with public streets. Gated communities (i.e., where a gate limits access to a development from a public street) are prohibited. Design standards for private streets are the same as design standards for public streets and shall conform to the provisions of Table 16.136.010.

No alleys are proposed. The right-of-way and street will be dedicated to the public at the time of final plat recordation.

T. Street Names. Street naming and numbering in the City of Warrenton (and Hammond) shall follow the uniform system of the City's addressing ordinance (Ord. No. 359-A). Street names, signs and numbers shall conform to the City's addressing ordinance.

The applicant's intent is to continue the street name Kalmia Avenue.

U. Survey Monuments. Upon completion of a street improvement and prior to acceptance by the City, it shall be the responsibility of the developer's registered professional land surveyor to

provide certification to the City that all boundary and interior monuments shall be reestablished and protected.

Acknowledged.

V. Street Signs. The City, county or state with jurisdiction shall install all signs for traffic control and street names. The cost of signs required for new development shall be the responsibility of the developer. Street name signs shall be installed at all street intersections. Stop signs and other signs may be required.

W. Mail Boxes. Plans for mail boxes to be used shall be approved by the United States Postal Service.

X. Street Light Standards. Street lights shall be installed in accordance with City standards.

Y. Street Cross-Sections. The final lift of asphalt or concrete pavement shall be placed on all new constructed public roadways prior to final City acceptance of the roadway and within one year of the conditional acceptance of the roadway unless otherwise approved by the City-appointed engineer.

1. Sub-base and leveling course shall be of select crushed rock;

2. Surface material shall be of Class C or B asphaltic concrete;

3. The final lift shall be Class C asphaltic concrete as defined by O.D.O.T/A.P.W.A. standard specifications;

4. No lift shall be less than one and one-half inches in thickness; and

5. All streets shall be developed in accordance with City of Warrenton construction standards.

The requirements of sub-paragraphs V through Y are acknowledged.

16.136.030 Public Use Areas.

A. Dedication Requirements.

1. Where a proposed park, playground or other public use shown in a plan adopted by the City is located in whole or in part in a subdivision, the City may require the dedication or reservation of this area on the final plat for the subdivision.

2. If determined by the Planning Commission to be in the public interest in accordance with adopted Comprehensive Plan policies, and where an adopted plan of the City does not indicate proposed public use areas, the City may require the dedication or reservation of areas within the subdivision of a character, extent and location suitable for the development of parks and other public uses.

3. All required dedications of public use areas shall conform to Section 16.136.010(D) (Conditions of Development Approval).

B. Acquisition by Public Agency. If the developer is required to reserve land area for a park, playground, or other public use, the land shall be acquired by the appropriate public agency within 12 months following final plat approval, at a price agreed upon prior to approval of the plat, or the reservation shall be released to the property owner.

C. System Development Charge Credit. Dedication of land to the City for public use areas shall be eligible as a credit toward any required system development charge for parks.

No park or recreational facility is shown in a city approved plan to be located wholly or partially within the boundaries of the subject property. We also note that WMC 16.216.020.I sets the threshold for requiring neighborhood parks to developments of 20 lots or more; this proposal has 15 lots. However, in the spirit of cooperation, the application includes a 20-foot wide easement between Lots 1and 2 to the subject property western boundary for utilities and to facilitate the development of a pedestrian trail toward recreation facilities along Ridge Road. These criteria are satisfied.

- *16.136.040 Sanitary Sewer and Water Service Improvements.*

A. Sewers and Water Mains Required. Sanitary sewers and water mains shall be installed to serve each new development and to connect developments to existing mains in accordance with the City's construction specifications and the applicable Comprehensive Plan policies. Where City sanitary sewers are not physically or legally available to service the site, the applicant must demonstrate provisions for a suitable on-site disposal system permitted by DEQ prior to issuance of City permits. All development within a growth management (GM) zone, as identified on the official Warrenton Zoning Map, shall comply with the growth management zone standards of Chapter 16.112.

B. Sewer and Water Plan Approval. Development permits for sewer and water improvements shall not be issued until the City-appointed engineer has approved all sanitary sewer and water plans in conformance with City standards.

C. Over-sizing. Proposed improvements to the City sewer and water systems shall be sized to accommodate additional development within the area as projected by the Comprehensive Plan, Water System Master Plan, and/or Sanitary Sewer Master Plan. The developer shall be entitled to system development charge credits for the over-sizing.

D. *Permits Denied. Development permits may be restricted by the City where a deficiency exists in the existing water or sewer system which cannot be rectified by the development and which if not rectified will result in a threat to public health or safety, surcharging of existing mains, or violations of state or federal standards pertaining to operation of domestic water and sewerage treatment systems. Building moratoriums shall conform to the criteria and procedures contained in ORS 197.505.*

Included with the application plan set are preliminary designs for the extension of both potable water and sanitary sewer lines from their present terminus at the southern property line of the subject property. The plans call for the extension of 8-inch pipes for both utilities, with manholes as appropriate and necessary for the sanitary sewer pipe system. The designs have been prepared according to the Engineering Standards & Design Criteria manual establishing standards for civil engineering plan submittals and public infrastructure construction for development and improvement projects within the City of Warrenton. Preliminary modelling of the water system indicates that the proposed water main would provide water in adequate quantities and pressure for domestic flow as well as for fire flow needs. Fire hydrants will be Mueller Centurion 250 Model A-423 or an approved equivalent with a recirculation oil lubrication system. Hydrant locations will be submitted to the Warrenton Fire Chief for approval

Both utilities would terminate at the cul-de-sac on the north end of the subject property. Fort Pointe Properties LLC owns the land abutting on the north. It is mapped as significant wetlands on the city's Wetland Inventory. Fort Pointe has secured the development entitlements for portions of that tract adjacent to Ridge Road and has expressed that it has little interest in developing in the vicinity of the subject property. Similarly, the North Coast Land Conservancy acquired the land to the east with the goal of preserving it in its present state. The likelihood of extending either utility beyond the designed termini is quite low.

- *16.136.050 Storm Drainage Improvements.*

A. *General Provisions. The City shall issue a development permit only where adequate provisions for stormwater and floodwater runoff have been made in conformance with Chapter 16.140, Stormwater and Surface Water Management.*

B. *Accommodation of Upstream Drainage. Culverts and other drainage facilities shall be large enough to accommodate potential runoff from the entire upstream drainage area, whether inside or outside the development. Such facilities shall be subject to review and approval by the City-appointed engineer.*

C. *Effect on Downstream Drainage. Where it is anticipated by the City-appointed engineer that the additional runoff resulting from the development will overload an existing drainage facility, the City shall withhold approval of the development until provisions have been made for improvement of the potential condition or until provisions have been made for storage of additional runoff caused by the development in accordance with City standards.*

D. Easements. Where a development is traversed by a watercourse, wetland, drainage way, channel or stream, the City may require a dedication of a stormwater easement or drainage right-of-way conforming substantially with the lines of such watercourse and such further width as will be adequate for conveyance and maintenance.

The project design for storm water management shows a series of catch basins, manholes and a storm water quality treatment biofiltration facility located east of the planned Kalmia Avenue extension north of Lot 15. All storm water runoff from the new pavement, driveways, and sidewalks would be directed to this facility where it would be treated as it partially infiltrates and flows through the vegetated swale before discharging to the adjacent wetland. The biofiltration swale has been designed to Oregon Department of Transportation standards and in addition to the need to be approved by the City, must also be approved by the Oregon Department of Environmental Quality as part of the Wetland Mitigation Plan approval process.

The application satisfies these criteria.

- *16.136.060 Utilities.*

A. Underground Utilities. All utility lines including, but not limited to, those required for electric, communication, lighting and cable television services and related facilities shall be placed underground, except for surface mounted transformers, surface mounted connection boxes and meter cabinets which may be placed above ground, temporary utility service facilities during construction, and high capacity electric lines operating at 50,000 volts or above. The following additional standards apply to all new land divisions, in order to facilitate underground placement of utilities:

1. The developer shall make all necessary arrangements with the serving utility to provide the underground services. Care shall be taken to ensure that all above ground equipment does not obstruct circulation and access aisles or impede vision clearance areas for vehicular traffic (Chapters 16.120 and 16.132);

2. The City reserves the right to approve the location of all surface mounted facilities;

3. All underground utilities, including sanitary sewers and storm drains installed in streets by the developer, shall be constructed prior to the surfacing of the streets; and

4. Stubs for service connections shall be long enough to avoid disturbing the street improvements when service connections are made.

B. Easements. Easements shall be provided for all underground utility facilities.

C. Exception to Undergrounding Requirement. The standard applies only to proposed land divisions and large-scale developments. An exception to the undergrounding requirement may be granted due to physical constraints, such as steep topography or existing development conditions.

All utilities will be constructed underground except for necessary above ground pedestals with plans coordinated and approved by the serving utility and surface mounted pedestal locations approved by the City. Obviously, all utilities to be installed between the curbs will be completed prior to paving. Stubs will be onto each new lot such that disturbance to the street is avoided when service connections are requested. The plans call for a 5-foot utility easement outside the right-of-way to accommodate private service utility facilities.

The application meets these criteria.

- *16.136.070 Easements.*

Easements for sewers, storm drainage and water quality facilities, water mains, electric lines or other public utilities shall be dedicated on a final plat, or provided for in the deed restrictions. See also Chapter 16.212, Site Design Review, and Chapter 16.216, Land Divisions and Lot Line Adjustments. The developer or applicant shall make arrangements with the City, the applicable district, and each utility franchise for the provision and dedication of utility easements necessary to provide full services to the development. The City's standard width for public main line utility easements shall be 20 feet unless otherwise specified by the utility company, applicable district, or City-appointed engineer.

Application plans currently include a 5-foot wide utility easement outside the proposed right-of-way to accommodate utility service providers such as power and communications. A 20-foot public access and utility easement is also proposed between Lots 1 and 2 to accommodate future City extensions of water mains to improve looping in the water system and to contribute to the provision of future pedestrian access to public and private recreational facilities along Ridge Road.

- *16.136.080 Construction Plan Approval and Assurances.*

No public improvements, including sanitary sewers, storm sewers, streets, sidewalks, curbs, lighting, parks, or other requirements shall be undertaken except after the plans have been approved by the City, permit fee paid, and permit issued. The permit fee is required to defray the cost and expenses incurred by the City for construction and other services in connection with the improvement. The permit fee shall be set by resolution of the City Commission. The City may require the developer or land divider to provide bonding or other performance guarantees to ensure completion of required public improvements. See also Section 16.212.040, Site Design Review, and Chapter 16.216, Land Divisions and Lot Line Adjustments.

The applicant acknowledges this administrative requirement and will comply.

- *16.136.090 Installation.*

A. Conformance Required. Improvements installed by the developer either as a requirement of these regulations or at his/her own option, shall conform to the requirements of this chapter,

approved construction plans, and to improvement standards and specifications adopted by the City.

B. Adopted Installation Standards. The Oregon Standard Specifications for Construction (combined APWA/ODOT standards) shall be a part of the City's adopted installation standard(s); other standards may also be required upon recommendation of the City-appointed engineer.

C. Commencement. Work shall not begin until the City has been notified in advance and all required permits have been issued.

D. Resumption. If work is discontinued for more than one month, it shall not be resumed until the City is notified.

E. City Inspection. Improvements shall be constructed under the inspection and to the satisfaction of the City. The City may require minor changes in typical sections and details if unusual conditions arising during construction warrant such changes in the public interest. Modifications requested by the developer shall be subject to land use review under Chapter 16.228, Modifications to Approved Plans and Conditions of Approval. Any monuments that are disturbed before all improvements are completed by the subdivider shall be replaced prior to final acceptance of the improvements.

F. Engineer's Certification and As-Built Plans. A registered civil engineer shall provide written certification in a form required by the City that all improvements, workmanship and materials are in accord with current and standard engineering and construction practices, conform to approved plans and conditions of approval, and are of high grade, prior to City acceptance of the public improvements, or any portion thereof, for operation and maintenance. The developer's engineer shall also provide four set(s) of "as-built" plans, in conformance with the City-appointed engineer's specifications, for permanent filing with the City.

The applicant acknowledges these administrative requirements and will comply.

- *16.140.010 Natural Drainage System Maintained to Extent Feasible.*

A. To the extent practicable, all development must conform to the natural contours of the land and natural and pre-existing man-made drainage ways must remain undisturbed.

B. To the extent practicable, lot boundaries created by partition or subdivision must coincide with natural and pre-existing man-made drainage ways to avoid the creation of lots that can be built upon only by altering such drainage ways.

There are no apparent natural or pre-existing man-made drainage ways on the subject property. To improve general water quality, add to wetland protections, and manage new storm water runoff from the increased impervious surfaces created by the proposed street and driveways, the

project includes a biofiltration facility which will treat new storm water prior to discharge to the adjacent wetland.

- *16.140.020 Developments Must Drain Properly.*

A. All developments must provide an adequate drainage system to prevent the undue detention or retention of stormwater or surface water on the development site. Stormwater or surface water will not be regarded as unduly detained or retained if:

1. The detention or retention results from a technique, practice or device deliberately installed as part of an approved sedimentation or stormwater runoff control plan prepared by an engineer; or

2. The detention or retention is not substantially different in location or degree than that experienced by the development site in its predevelopment state, unless such detention or retention presents a danger to health or safety.

B. No stormwater may be channeled and directed into a sewer line.

C. Whenever practicable, the drainage system of a development must coordinate with and connect to the drainage systems or drainage ways on surrounding properties or streets.

D. All developments must be constructed and maintained so that adjacent properties are not unreasonably burdened with stormwater runoff as a result of the developments.

The engineered storm water system is designed to satisfy all these criteria. Conveying all runoff from the street to the biofiltration facility will result in some infiltration but will also passively meter the discharge of treated storm water to the adjacent wetland

- *16.140.030 Surface Water Management.*

All developments must be constructed and maintained so that impacts to natural and man-made drainage ways do not unreasonably burdened upstream or downstream properties with surface water flooding as a result of the developments. More specifically:

A. No development may be constructed or maintained so that the development unreasonably impedes the natural flow of water from higher adjacent properties across the development, resulting in substantial damage to the higher adjacent properties; and

B. No development may be constructed or maintained so that stormwater from the development is collected and channeled into natural or man-made drainage ways, such that the volume and/or rate of flow is substantially greater than the pre-development volume and/or rate.

C. No development may be constructed such that the flow of water through natural or existing man-made drainage ways is obstructed. Bridges and culverts constructed to allow the

flow of water through a development must be designed to pass flow during a 100-year storm event.

As discussed above, the focus of the project surface water management system is to collect and convey all post development runoff to a facility where it will partially infiltrate to ground water and otherwise be treated prior to discharge to the adjacent wetland. Because of the existing and proposed topography on the site and the property to the east, the higher adjacent property runoff will not be impeded. Additional surface water flows are anticipated to be insignificant due to the pervious nature the underlying sandy soils. Since the area of the development is essentially a contiguous high point mostly surrounded by wetlands, no flows through the subject property will be obstructed. No bridges or culverts are proposed. Please refer to the attached storm water plan for details.

- *16.140.040 Erosion and Sediment Control.*

A. For projects that disturb over one acre, applicants must apply to Oregon Department of Environmental Quality (DEQ) for a National Pollutant Discharge Elimination Control System (NPDES) 1200(C) permit.

B. Erosion and sediment control plans are required by the City as a component of the site plan for all plats and all projects which require site plan review. Erosion control plans must be designed to the specifications as outlined in this chapter.

C. Development of the land may not begin (and no building permits may be issued) until the City-appointed engineer approves the erosion control plan.

D. For purposes of this section, "disturb" means any use of the land by any person in any development, and/or road construction and maintenance that results in a change in the natural cover or topography that may cause or contribute to sedimentation. Sedimentation occurs whenever solid particulate matter, mineral or organic, is transported by water, air, gravity or ice from the site of its origin.

The applicant fully intends to submit application to ODEQ for a 1200 C erosion control permit and will submit that plan to the City for review and approval as well as a Land Use Compatibility Statement application. Typically, erosion control methods will include silt fencing around the perimeter of the project site, and best management practices (BMPs). Cut and fill slopes will be stabilized during construction as recommended by the geotechnical engineering report and permanent stabilization of these slopes will similarly follow the geotechnical report recommendations. See the attached Geoengineers report for details.

- *16.140.050 Stormwater System Design.*

A. Storm sewers constructed within the street will be sized by the developer's engineer and will consider all potential runoff requirements within the site and upstream of the site.

1. The storm sewer will be sized for a 100-year design recurrence criteria for storm drainage facilities.

2. The minimum size of storm sewers is eight inches in diameter.

3. Spacing of catch basins along the street must conform to published engineering recommendations, which consider profile of the street and street width.

B. On-site detention shall be required for new development where downstream deficiencies exist or are anticipated to exist. The square footage considers the total development of the property including the future potential impervious surface. Required design recurrence criteria for a commercial or residential storm drainage detention facility is a 10-year interval. Development that has less than 5,000 square feet of impervious surface is exempt from detention requirements.

C. Pervious pavement, and pavement and roofs that drain to an infiltration facility will not be counted when sizing a detention facility to handle the stormwater design.

The stormwater system will be designed using industry standards and reviewed by the City. The proposed biofiltration facility will be designed per the ODOT Hydraulics Manual for ODEQ approval in the absence of City design parameters for this type of facility. See the Preliminary Stormwater Report for additional information. In the absence of a homeowners association for this subdivision, it is currently assumed that this facility will be maintained by the Cit Onsite detention is not proposed for this project since the large surrounding wetlands have essentially infinite flow capacity; thus, do not present a downstream deficiency.

- *16.140.060 Illegal Discharge of Materials Into the Stormwater System.*

The discharge of any material other than stormwater into the stormwater system is prohibited. The placement of materials in a location where they are likely to be carried into the stormwater system by any means is also prohibited.

The applicant acknowledges this illegal discharge prohibition.

- *16.152.030 Permits Required.*

Except as provided in Section 16.152.040 of this chapter, no person shall do any grading work without first having attained a grading permit from the building official.

No further earth movement will take place until after preliminary plat approval, inclusive of approval of the grading plan, and application for a grading permit has been submitted and approved.

- *16.152.060 Grading Permit Requirements.*

A. Permits Required. Except as exempted in Section 16.152.040, no person shall do any grading without first obtaining a grading permit from the building official. A separate permit shall be obtained for each site, and may cover both excavations and fills.

B. Application. To obtain a grading permit, the applicant shall file an application in writing to the City of Warrenton on a form furnished by the building official. Every such application shall contain:

1. Identification and description of work to be covered by the permit for which the application is made, including estimated quantities of work involved.

2. Description of the land on which the proposed work is to be done by legal description, street address, assessor parcel number, or similar description that will readily identify and definitely locate the proposed building or work.

3. Indication of the use or occupancy for which the proposed work is intended.

4. Plans, diagrams, computations, and specifications, and other data as required by this chapter. Plans and specifications shall be drawn to scale and shall be of sufficient clarity to indicate the location, nature, and extent of the work proposed, and show in detail that it will conform to all provisions of this Code and relevant laws, ordinances, rules, and regulations of the City.

5. Applicant's signature.

6. Other data as required by the building official.

C. Grading Designation. Grading in excess of 5,000 cubic yards shall be permitted in accordance with the approved grading plan prepared by a civil engineer, and shall be designated as "engineered grading." Grading involving less than 5,000 cubic yards shall be designated as "regular grading" unless the permittee chooses to have the grading performed as engineered grading, or the building official determines that special conditions or unusual hazards exist, in which case grading shall conform to the requirements of engineered grading.

D. Engineered Grading Requirements. As required by 2010 Oregon Structural Specialty Code Appendix J, as may be amended.

E. Regular Grading Requirements. Each application for a grading permit shall be accompanied by a plan in sufficient clarity to indicate the nature and extent of the work. The plans shall give the location of the work, the name of the owner, and the name of the person who prepared the plan. The plan shall include the following information:

1. General vicinity of the proposed site.

2. Limiting dimensions and depth of cut and fill.

3. Location of any buildings or structures where work is to be performed, and the location of any buildings or structures within 15 feet of the proposed grading.

F. Issuance.

1. The application, plans, specifications, computations, and other data filed by an applicant for a grading permit shall be reviewed by the building official. Such plans may be reviewed by other City departments to verify compliance with any applicable laws of the City. The building official may require that grading operations and project designs be modified if delays occur which incur weather generated problems not considered at the time the permit was issued. The provisions of UBC Section 106.4 are applicable to grading permits.

2. The building official may require professional inspection and testing by the soils engineer. When the building official has cause to believe that geologic factors may be involved, the grading will be required to conform to engineered grading.)

The preliminary plat application plan set illustrates the proposed grading plan for all cuts and fills with an estimated total volume of material moved at 22,285 cubic yards. The drawings are stamped by an engineer licensed in the state of Oregon. Upon approval of the preliminary plat application, the applicant will submit an application for a grading permit with all the required components identified by the code above.

- *16.152.100 Cuts.*

A. General. Unless otherwise recommended in the approved soils engineering or engineering geology report, cuts shall conform to the provisions of this section. In the absence of an approved soils engineering report, these provisions may be waived for minor cuts not intended to support structures.

B. Slope. The slope of cut surfaces shall be no steeper than is safe for the intended use and shall be no steeper than one unit vertical in two units horizontal (50% slope) unless the permittee furnishes a soils engineering or engineering geology report, or both, stating that the site has been investigated and given an opinion that a cut at a steeper slope will be stable and not create a hazard to public or private property.

All cut slopes are designed at the requisite 1v:2h standard.

- *16.152.110 Fills.*

A. General. Unless otherwise recommended in the approved soils engineering report, fills shall conform to the provisions of this section. In the absence of an approved soils engineering report, these provisions may be waived for minor fills not intended to support structures.

B. Preparation of Ground. Fill slopes shall not be constructed on natural slopes steeper than one unit vertical in two units horizontal (50% slope). The ground surface shall be prepared

to receive fill by removing vegetation, noncomplying fill, topsoil, and other unsuitable materials scarifying to provide a bond with the new fill and, where slopes are steeper than one unit vertical in five units horizontal (20% slope) and the height is greater than five feet, by benching into sound bedrock or other competent material as determined by the soils engineer. The bench under the toe of a fill on a slope steeper than one unit vertical in five units horizontal (20% slope) shall be at least 10 feet wide. The area beyond the toe of the fill shall be sloped for sheet overflow or a paved drain shall be provided. When fill is to be placed over a cut, the bench under the toe of the fill shall be at least 10 feet wide but the cut shall be made before placing the fill and acceptance by the soils engineer or engineering geologist or both as a suitable foundation for fill.

C. Fill Material. Detrimental amounts of organic material shall not be permitted in fills. Except as permitted by the building official, no rock or similar irreducible material with a maximum dimension of greater than 12 inches shall be buried or placed in fills. The building official may permit the placement of larger rock when the soils engineer properly devises a method of placement and continuously inspects its placement and approves the fill stability. The following conditions shall also apply: (1) prior to issuance of a grading permit, potential rock disposal areas shall be delineated on the grading plan; (2) rock sizes greater than 12 inches in maximum dimension shall be 10 feet or more below grade, measured vertically; and (3) rocks shall be placed so as to assure filling of all voids with well-graded soil.

D. Compaction. All fills shall be compacted to a minimum of 90% of maximum density.

E. Slope. The slope of fill surfaces shall be no steeper than is safe for the intended use. Fill slopes shall be no steeper than one unit vertical in two units horizontal.

These standards will be adhered to during construction. Most fill slopes are adjacent to existing wetlands. The applicant requests fill slopes at 1v:1.5 h as a measure to reduce impacts to those wetlands. Shallower slopes would increase the area of wetland filling. The geotechnical report supports this slope.

- *16.152.120 Setbacks.*

A. General. Cut and fill slopes shall be set back from site boundaries in accordance with this section. Setback dimensions shall be horizontal distances measured perpendicular to the site boundary.

B. Top of Cut Slope. The top of cut slopes shall not be made nearer to a site boundary line than one-fifth the vertical height of cut with a minimum of two feet and a maximum of 10 feet. The setback may need to be increased for any required interceptor drains.

C. Toe of Fill Slope. The toe of fill slope shall be made not nearer to the site boundary line than one half the height of the slope with a minimum of two feet and a maximum of 20 feet. Where a fill slope is to be located near the site boundary and the adjacent off-site property is developed, special precautions shall be incorporated in the work as the building official deems

necessary to protect adjoining property from damage as a result of such grading. These precautions may include, but are not limited, to (1) additional setbacks; (2) provisions for retaining or slough walls; (3) mechanical or chemical treatment of the fill slope surface to minimize erosion; and (4) provisions for the control of surface waters.

D. Modification of Slope Location. The building official may approve additional setbacks. The building official may require investigation and recommendation by a qualified engineer or engineering geologist to demonstrate that the intent of this section has been satisfied.

The setback of the cut slope in Lots 13 and 14 is a uniform 20 percent of the widest portion of the cut. This setback continues for the fill slope in Lot 15

- *16.152.130 Drainage and Terracing.*

A. General. Unless otherwise indicated on the approved grading plan, drainage facilities and terracing shall conform to the provisions of this section for cut or fill slopes steeper than one unit vertical in three units horizontal (33.3% slope).

B. Terraces.

1. Terraces at least six feet in width shall be established at not more than 30-foot vertical intervals on all cut or fill slopes to control surface drainage and debris except that where only one terrace is required, it shall be a mid-height. For cut or fill slopes greater than 60 feet and up to 120 feet in vertical height, one terrace at approximately mid-height, shall be 12 feet in width. Terrace widths and spacing for cut and fill slopes greater than 120 feet in height shall be designed by a civil engineer and approved by the building official. Suitable access shall be provided to permit proper cleaning and maintenance.

Terraces will not be needed since the total cut and fill proposed is substantially less than the minimum threshold of 30 vertical feet.

2. Swales or ditches or terraces shall have a minimum gradient of five percent and must be paved with reinforced concrete not less than three inches in thickness or and approved equal paving. They shall have a minimum depth at the deepest point of one foot and a minimum paved width of five feet.

3. A single run of swale or ditch shall not collect runoff from a tributary exceeding 13,500 square feet (projected) without discharging into a down drain.

No swales or ditches are proposed.

C. Subsurface Drainage. Cut and fill slopes shall be provided with subsurface drainage as necessary for stability.

Comment noted. Recommendations in the geotechnical report will be followed.

D. Disposal.

1. All drainage facilities shall be designed to carry waters to the nearest practicable drainage way approved by the building official or other appropriate jurisdiction as a safe place to deposit such waters. Erosion of ground in the area of discharge shall be prevented by installation of non-erosive down-drains or other devices.

The proposed stormwater system and outfall protection meets this requirement

2. Building pads shall have a drainage gradient of two percent toward approved drainage facilities unless waived by the building official. The gradient from the building pad may be one percent if all of the following conditions exist throughout the permit area: (a) no proposed fills are greater than 10 feet in maximum depth; (b) no proposed finish cut or fill slope faces a vertical height in excess of 10 feet; and (c) no existing slope faces, which have a slope face steeper than one unit vertical in 10 units horizontal, have a vertical height in excess of 10 feet.

As shown on the attached grading plan, the proposed lot grading meets this criterion.

E. Interceptor Drains. Paved interceptor drains shall be installed along the top of all cut slopes where the tributary drainage area above slopes toward the cut and has a drainage path greater than 40 feet measured horizontally. Interceptor drains shall be paved with a minimum of three inches of concrete or gunite and reinforced. They shall have a minimum depth of 12 inches and a minimum paved width of 30 inches measured horizontally across the drain. The slope of the drain shall be approved by the building official.

Interceptor drains above the cut slope in the southeastern are not required due to the negligible amount of upslope area.

- *16.152.140 Erosion Control.*

A. Slopes. The faces of cut and fill slopes shall be prepared and maintained to control against erosion. This control may consist of effective planting. The protection of the slopes shall be installed as soon as practicable and prior to calling for final approval. Where cut slopes are not subject to erosion due to the erosion-resistant character of the material, such protection may be omitted.

B. Other Devices. Where necessary, check dams, cribbing, riprap, or other devices or methods shall be employed to control erosion and provide safety.

No other devices are proposed, although future property owners may pursue rip rap or retaining walls.

- *16.152.150 Completion of Work.*

Upon completion of the rough grading work and at the completion of the work, the following reports and drawings and supplements thereto are required for engineered grading or when professional inspection is performed for regular grading, as applicable:

A. An as-built grading plan prepared by the civil engineer retained to provide such services in accordance with Section 16.152.070 showing original ground surface elevations, as-graded ground surface elevations, lot drainage patterns, and the locations and elevations of surface drainage facilities and of the outlets of subsurface drains. As-constructed locations, elevations, and details of subsurface drains shall be shown as reported by the soils engineer.

Civil engineers shall state that to the best of their knowledge the work within the specified area of responsibility was done in accordance with the final approved grading plan.

B. A report prepared by a soils engineer retained to provide such services in accordance with Section 16.152.070, including locations and elevations of field density tests, summaries of field and laboratory tests, other substantiating data, and comments on any changes made during grading and their effect on recommendations made in the approved soils engineering investigation report. Soils engineers shall submit a statement that, to the best of their knowledge, the work within their area of responsibilities is in accordance with the approved soils engineering report and applicable provisions of this chapter.

These requirements are noted and will be complied with.

- *16.156.030 Wetland Area Development Standards.*

Wetland areas in the City of Warrenton are identified on the 1" equals 400' feet maps entitled City of Warrenton Wetland Conservation Plan Inventory dated October 17, 1997. These maps show approximate wetland boundaries for wetland areas within the Warrenton Urban Growth Boundary.

A. Applications to the City of Warrenton for subdivision, partition planned unit development, conditional use, site design review, variance, or temporary building permits that would lead to the disturbance of a wetland upon approval and issuance of grading or building permits, shall include a delineation of the wetland boundary, approved by the Oregon Department of State Lands.

A copy of the delineation prepared by Cascade Environmental Group LLC is included in the application package together with the September 28, 2017 concurrence letter from the Department of State Lands.

- *16.156.040 Significant Wetland Area Development Standards.*

A. The following additional development standards shall apply to all development in significant wetlands as designated on the City of Warrenton Locally Significant Wetland Map dated January 21, 2004.

B. Alteration of a significant wetland or portion of a significant wetland by grading, excavating, placement of fill including structures, and removal of vegetation, shall be prohibited, except for the following uses, upon demonstration that the uses are designed and constructed to minimize intrusion into the wetland area:

7. Uses authorized by an approved City of Warrenton hardship variance in conjunction with a valid State of Oregon Wetland Removal-Fill Authorization.

The wetland hardship variance criteria from WMC16.156.080 are presented below.

- *16.156.080 Hardship Variance Procedure and Criteria.*

A. For any lands demonstrated to have been rendered not buildable by application of this chapter, the property owner may apply for a hardship variance for relief from the restrictions of this chapter.

B. Hardship variance applications are subject to review in accordance with the standards of Section 16.208.050, Type III Procedure (Quasi-Judicial). Granting of a hardship variance requires that:

1. The proposed development represents a reasonable and legal use of the lot or parcel, considering the zoning.

The subject property is zoned Growth Management and permitted uses defaults to the R-10 Intermediate district standards which allow single family dwellings outright. The proposal is to subdivide and develop the property for lots for single family dwellings. This criterion is met.

2. Strict adherence to this chapter and other applicable standards would effectively preclude a use of the parcel that could be reasonably expected to occur in similarly zoned parcels.

The proposal includes plans to fill approximately 11.5 percent of an acre of wetlands. By doing so, the lots and tract to be filled will result in the continuity of a more regular shaped buildable area for each of the affected lots and a certainty that the impacted wetland areas would be mitigated for. Failure to fill the areas at this stage of development would make the buildable area of those lots more difficult. Additionally, the lack of fill by this applicant would increase the likelihood that future lot owners would fill the affected areas without mitigation. This criterion is met.

3. The property owner would be precluded a substantial property right enjoyed by the majority of landowners in the vicinity.

The two subdivisions to the south of the subject property were permitted to fill small amounts of wetlands as part of entitlement approvals as was the Fort Pointe application along Ridge Road. Denial of his variance would preclude substantial property rights granted to and enjoyed by those developments. The vast expanse of wetlands without any buildable uplands in the vicinity of the project site, and the North Coast Land Conservancy's ownership to the east which has a goal of preserving the Clear Lake property in its natural and enhanced state, limit the number of properties to compare to this one to those identified above. This criterion is met.

4. *The variance is the minimum necessary to retain use of the property.*

As described above, the proposed wetland fill encompasses approximately 11.5 percent an acre via 15 separate fills ranging in size from approximately 35 to 1,105 square feet. These areas may change slightly as the Wetland Mitigation Plan and construction plan approval processes are completed. The proposed areas are the minimum necessary to make the property more manageable and as noted above, will help to protect the resource from otherwise unregulated fills. This criterion is satisfied.

5. *Granting of the variance will not be materially detrimental to the public welfare or be injurious to property or improvements in the neighborhood of the premises.*

The proposed fills are entirely within the interior of the subject property and separated from adjacent properties and improvements in the neighborhood; granting the variance for the fills will not be injurious to neighboring man-made or natural features and, as stated above, the impacts of the fill will be mitigated, a certainty that if left in their current state, potentially filling of the wetlands by future property owners would likely not be regulated. To facilitate this protection, the applicant will post permanent notices along the upland edges cautioning of the wetland resource and prohibiting future fill.

6. *The variance will be in general harmony with the intent and purpose of this chapter, and will not adversely affect any officially adopted Comprehensive Plan policy.*

The Comprehensive Plan states:

> OAR 660-023-0024-(2) establishes the requirements of the Statewide Planning Goal (sic) 16 and 17supercede the requirements of Statewide Planning Goal 5 for natural resources also subject to and regulated by those goals. As a result, whether and under what circumstances development impact wetlands and riparian corridors in estuarine and coast shoreland areas is governed by the policies implementing Goals 16 and17 rather than the City's adopted Goal 5 implementation program.
>
> Wetlands and riparian corridors are important to the citizens of Warrenton as natural resources. To ensure that this goal is attainable, wetland and riparian corridor <u>mitigation</u> (emphasis added)restoration creation and enhancement shall be allowed in all zoning districts where practicable. Page 39.

The fact that the wetland code includes a route to a variance to the regulations provides the opportunity of harmony under appropriate circumstances. In this case, the impacted wetland area is quite small and necessary to facilitate the development. Such variances have been granted to other properties in the vicinity. Granting the variance will facilitate to greater protection than if not granted. And, the proposal is consistent on its face with a Comprehensive Plan policy. This criterion is satisfied.

- *16.216.020 General Requirements.*

A. Subdivision and Partition Approval Through Two-step Process. Applications for subdivision or partition approval shall be processed through a two-step process: the preliminary plat and the final plat.

1. The preliminary plat shall be approved before the final plat can be submitted for approval consideration; and

2. The final plat shall include all conditions of approval of the preliminary plat.

B. Compliance with ORS Chapter 92. All subdivision and partition proposals shall be in conformance to state regulations set forth in Oregon Revised Statutes (ORS) Chapter 92, Subdivisions and Partitions.

The applicant understands this process.

Future Re-Division Plan. When subdividing or partitioning tracts into large lots (i.e., greater than two times or 200% the minimum lot size allowed by the underlying land use district), the City shall require that the lots be of such size, shape, and orientation as to facilitate future re-division in accordance with the requirements of the land use district and this Code. A re-division plan shall be submitted which identifies:

1. Potential future lot division(s) in conformance with the housing and density standards of Division 2.

2. Potential street right-of-way alignments to serve future development of the property and connect to adjacent properties, including existing or planned rights-of-way.

3. A disclaimer that the plan is a conceptual plan intended to show potential future development. It shall not be binding on the City or property owners, except as may be required through conditions of land division approval. For example, dedication and improvement of rights-of-way within the future plan area may be required to provide needed secondary access and circulation.

This section is not applicable.

C. Lot Size Averaging. Single-family residential lot size may be averaged to allow lots less than the minimum lot size in the residential district, as long as the average area for all lots is not less than allowed by the district. No lot created under this provision shall be less than 80% of the minimum lot size allowed in the underlying district. For example, if the minimum lot size is 5,000 square feet, the following three lots could be created: 4,000 square feet, 5,000 square feet, and 6,000 square feet.

Lot size averaging is not being used.

D. Temporary Sales Office. A temporary sales office in conjunction with a subdivision may be approved as set forth in Section 16.240.010, Temporary Use Permits.

If and when the applicant decides to erect a temporary sales office, he will apply for the applicable permits.

E. Minimize Flood Damage. All subdivisions and partitions shall be designed based on the need to minimize the risk of flood damage. Development in a flood hazard designation shall comply with the standards of Chapter 16.88, Flood Hazard Overlay (FHO) District, and Federal Emergency Management Agency requirements, including fill to elevate structures above the base flood elevation.

F. Determination of Base Flood Elevation. Shall comply with Chapter 16.88 of the Warrenton Development Code. Based on a review of Clatsop Webmaps, the subject property is not within a flood hazard overlay zone.

Based on a review of Clatsop Webmaps, the subject property is not within a flood hazard overlay zone.

G. Need for Adequate Utilities. Shall comply with Chapters 16.136 and 16.216.

H. Need for Adequate Drainage. All subdivision and partition proposals shall comply with Chapter 16.140.

As discussed above, the proposal includes plans to provide water, sanitary sewer and storm water management facilities that meet the need of the proposed development.

I. Open space shall provide opportunities for active and/or passive recreation and may include existing stands of trees, resource areas, and storm water facilities as outlined in this section. Active open space shall allow human activities including recreational and social opportunities such as play fields, playgrounds, swimming pools, plazas and other recreational facilities. Open space may also be passive and include human activities limited to walking, running, and cycling, seating areas and wildlife viewing or natural areas such as a wetland.

1. A proposed subdivision preliminary plat with 20 lots or more shall provide baseline active open space of an area equal to at least five percent of the subject site.

2. Active open space shall be easily accessible, physically or visually, to all members of the planned community via a minimum 30-foot wide street frontage or access easement.

3. Active open space areas shall have a dedicated meter and underground irrigation system to ensure adequate water supply during establishment period (three years) and during periods of drought for all newly planted areas.

4. Active open space shall be no smaller than the minimum lot size requirement of the underlying zoning district with a minimum width 40 feet.

5. Active open space may abut a collector or greater classified street as identified in the City's adopted Transportation System Plan, when separated from the street by a constructed barrier, such as a fence or wall, at least three feet in height.

6. Active open space shall be physically accessible to all residents of the development.

7. Active open space shall include physical improvements to enhance the area. Physical improvements may include benches, gazebos, plazas, picnic areas, playground equipment, sport courts, play fields, or other items permitted by the Planning Commission.

8. An association of owners or tenants, created as a non-profit corporation under the laws of the state (ORS 94.572) which shall adopt and impose articles of incorporation and bylaws and adopt and impose a declaration of covenants and restrictions on the common open space that is acceptable to the City Attorney as providing for the continuing care of the space. Any subsequent changes to such CC&Rs regarding the active open space must be approved by the City Attorney. Such an association shall be formed and continued for the purpose of maintaining the common open space and shall provide for City intervention and the imposition of a lien against the entire subdivision development in the event the association fails to perform as required.

9. A public agency which agrees to maintain the dedicated active open space and any buildings, structures, or other improvements which have been placed on it.

10. Dedicated active open space shall be protected by Covenants (CC&Rs) or deed restriction to prevent any future commercial, industrial, or residential development.

At 15 lots, the proposal is below the threshold for requiring the development of open space or recreation facilities. However, the application includes plans to grant an easement to the city for future utility extensions and pedestrian access to its western property line to facilitate the city's development of a trail to public and private recreation facilities along Ridge Road.

J. <u>Street Names</u>.

1. All proposed streets west of Main Avenue shall have a tree or plant life name; and all proposed streets between Highway 101 and Main Avenue shall have a "nautical" name.

2. All proposed streets shall have directional prefixes as part of the street name (i.e., E, NE, SW, S).

3. All proposed streets east of Highway 101 shall follow the street naming procedure as outlined below:

a. Proposed street names shall be submitted as part of a subdivision or partition application to the Planning and Building Department. The request shall include the proposed name(s), the specific street location and brief but complete background information on the name and how it meets the street name policy. If the new street name is indicated on the proposed plat at the time of the land use application it shall be labeled "proposed," such as "proposed Willener Court."

b. Streets shall generally be named after people, places, events, and things related to the City and the citizens of Warrenton. Proposed names should meet one of the following criteria:

i. To honor and commemorate noteworthy persons associated with the City of Warrenton, Clatsop County, and the State of Oregon;

ii. To commemorate local history, places, events or culture;

iii. To strengthen neighborhood identity; or

iv. To recognize native wildlife, flora, fauna or natural features related to the community and the City of Warrenton.

Consideration should be given to names of local area or historic significance. Names of living persons should be used only in exceptional circumstances. Only a person's last name should be used as a street name unless additional identification is necessary to prevent duplications of existing street names in Warrenton and Clatsop County.

c. <u>Names to Avoid</u>

i. Street names being a duplicate of an existing street in the City of Warrenton or in Clatsop County shall be avoided.

ii. Similar sounding names such as Beach Avenue and Peach Avenue, Maywood Court and Maywood Lane shall be avoided.

iii. Cumbersome, corrupted or modified names, discriminatory or derogatory names, from the point of view of race, sex, color, creed, political affiliation or other social factors, shall be avoided.

iv. Names for public streets that could be construed as advertising a particular business shall be avoided.

v. The reuse of a former street name should be discouraged because of the confusion this causes in property records management and fire and police protection.

d. Street Type Designations. Depending on roadway function, length and configuration, designations exist to define the character of a street. The following designations shall be used:

i. Avenue. A public or City right-of-way that runs in a north-south direction (except for the Hammond area, which has avenues going east-west).

ii. Street. A public or City right-of-way that runs generally in an east-west direction.

iii. Boulevard. A major landscaped arterial that carries moderate to heavy volumes of traffic at moderate to high speeds.

iv. Court. A local road that is of short length, that carries a low volume of traffic at low speeds, with no cross streets and generally terminates in a cul-de-sac.

v. Drive, Parkway, Trail. A meandering collector or arterial that carries low, moderate or high volumes of traffic at low, moderate or high speeds.

vi. Lane. A local road that is of short length, that carries a low volume of traffic, at low speeds, and generally terminates in a cul-de-sac.

vii. Place, Way. A local road that is of a short length and carries low volumes of traffic at low speeds.

viii. Terrace, Gardens, Grove, Heights. For low-volume, short-length streets.

The applicant intends to continue the street name Kalmia Avenue for the street extension into the subdivision.

- *16.216.040 Preliminary Plat Submission Requirements.*

A. General Submission Requirements. For partitions (three lots or fewer), the applicant shall submit an application containing all of the information required under Section 16.208.040. For subdivisions (greater than three lots), the application shall contain all of the information required under Section 16.208.050.

B. Preliminary Plat Information. In addition to the general information described in subsection A of this section, the preliminary plat application shall consist of drawings and supplementary written material (i.e., on forms and/or in a written narrative) adequate to provide the following information:

1. General Information.

a. Name of subdivision (not required for partitions). This name must not duplicate the name of another subdivision in the county in which it is located (please check with County Surveyor);

b. Date, north arrow, and scale of drawing;

c. Location of the development sufficient to define its location in the City, boundaries, and a legal description of the site;

d. Names, addresses and telephone numbers of the owners, designer, and engineer or surveyor if any, and the date of the survey; and

e. Identify the drawing as a "preliminary plat."

2. Site Analysis.

a. Streets. Location, name, present condition (i.e., paved, gravel, unimproved, etc.), and width of all streets, alleys and rights-of-way on and abutting the site;

b. Easements. Width, location and purpose of all existing easements of record on and abutting the site;

c. Utilities. Location and identity of all utilities on and abutting the site. If water mains and sewers are not on or abutting the site, indicate the direction and distance to the nearest ones;

d. Ground elevations shown by contour lines at five-foot vertical intervals for ground slopes exceeding 10% and at two-foot intervals for ground slopes of less than 10%. Such ground elevations shall be related to some established bench mark or other datum approved by the County Surveyor. This requirement may be waived for partitions when grades, on average, are less than two percent;

e. The location and elevation of the closest benchmark(s) within or adjacent to the site (i.e., for surveying purposes);

f. Potential natural hazard areas, including floodplain, landslide areas, and areas having a high erosion potential;

g. Wetland areas, streams, wildlife habitat, and other areas identified by the City or natural resource regulatory agencies as requiring protection. (See also Chapter 16.156 and relevant portions of the Comprehensive Plan.);

h. Site features, including existing structures, pavement, drainage ways, canals and ditches;

i. Designated historic and cultural resources on the site and adjacent parcels or lots;

j. North arrow, scale, name and address of owner;

k. Name and address of surveyor or engineer; and

l. Other information, as deemed appropriate by the Community Development Director. The City may require studies or exhibits prepared by qualified professionals to address specific site features and code requirements.

3. Proposed Improvements.

a. Public and private streets, tracts, driveways, open space and park land; location, names, right-of-way dimensions, approximate radius of street curves; and approximate finished street center line grades. All streets and tracts which are being held for private use and all reservations and restrictions relating to such private tracts shall be identified;

b. Easements. Location, width and purpose of all easements;

c. Lots and private tracts (e.g., private open space, common area, or street): approximate dimensions, area calculation (e.g., in square feet), and identification numbers for all lots and tracts;

d. Proposed uses of the property, including all areas proposed to be dedicated to the public or reserved as open space for the purpose of surface water management, recreation, or other use;

e. Proposed improvements, as required by Division 3 (Design Standards), and timing of improvements (e.g., in the case of streets, sidewalks, street trees, utilities, etc.);

f. The proposed source of domestic water;

g. The proposed method of sewage disposal and method of surface water drainage (shall comply with Chapter 16.140). Water quality treatment areas, if required;

h. The approximate location and identity of other utilities, including the locations of street lighting fixtures;

i. Proposed railroad crossing or modifications to an existing crossing, if any, and evidence of contact with Oregon Department of Transportation related to proposed railroad crossing(s);

j. Changes to navigable streams, shorelines or other water courses. Provision or closure of public access to these areas shall be shown on the preliminary plat, as applicable;

k. Identification of the base flood elevation. Evidence of contact with the Federal Emergency Management Agency to initiate a floodplain map amendment shall be required when development is proposed to modify a designated 100-year flood plain;

l. Evidence of contact with Oregon Department of Transportation (ODOT) for any development requiring access to a highway under the state's jurisdiction; and

m. For proposals that would alter land within 25 feet of a mapped wetland, a jurisdictional delineation of the wetland boundary concurred with by the appropriate resource agency with jurisdiction.

All the required information is included in the preliminary plat plan set.

- 16.272 VARIANCES
- 16.272.020 Criteria.

Variances to a quantitative requirement of this Code may be granted only if, on the basis of the written application, investigation, and evidence submitted by the applicant, findings of fact are made by the zoning administrator (for Class 1 applications) or Planning Commission (for Class 2 applications) that satisfy the criteria of subsections A through F of this section. Prior variances allowed in the neighborhood shall not be considered by the granting authority in reaching its decision. A determination of whether the standards set forth in this section are satisfied necessarily involves the balancing of competing and conflicting interests. Each request shall be considered on its own merits.

This section addresses the need to vary the 200-foot cul-de-sac length standard of WMC 16.136.020.M and permitted by WMC 16.136.020.B. The proposed extension of Kalmia Avenue would be approximately 800 feet long.

A. The hardship was not created by the person requesting the variance;

The subject property is abutted on the west, north and partially the east by wetlands deemed significant by the city's wetland inventory. Where the wetlands terminate on the east, the topography is such that building a road is not practicable. This is further complicated by the North Coast Land Conservancy's ownership of the parcel to the east and its goal of preserving the Clear Lake tract from development. The applicant did not create the hardship.

B. The request is necessary to make reasonable use of the property. There will be an unreasonable economic impact upon the person requesting the variance if the request is denied;

Denial of the variance would prohibit access to the property which is absolutely essential to its development and the intended use. The subject property is zoned GM/R-10 and is intended for urban development as urban facilities become available; those facilities became available with the development of the land immediately to the south. Prohibiting access via a variance to exceed the 200-foot length limit would essentially prohibit development of the property which would be nothing but an unreasonable economic impact on the applicant. There is no other option for either providing access or connecting the proposed road to the city's street network.

C. *The request will not substantially be injurious to the neighborhood in which the property is located. The variance will not result in physical impacts, such as visual, noise, traffic or increased potential for drainage, erosion and landslide hazards, beyond those impacts that would typically occur with development in the subject zone;*

Extending the road as proposed would not result in visual or noise impacts because the proposed development is exactly the same to existing development in the immediate facility. Storm water runoff from the road will be managed by an engineered drainage system designed to meet ODOT and ODEQ standards. Presently, the developments to the south would result in 27 single family residences at build out, which would result in approximately 270 vehicle trips (in and out, cumulative), and approximately 27 total in/out trips during the afternoon peak hour. The proposed development would add approximately 150 total daily trips and about 15 during the afternoon peak hour, for a total of 42 trips. We anticipate a 60% in/40%out directional split at the intersection of Kalmia Avenue and 2nd Street and do not anticipate a failure of intersection operations.

D. *The request is not in conflict with the Comprehensive Plan;*

The comprehensive plan is silent on cul-de-sac lengths.

E. *The request is not in conflict with the Development Code. No variance may be granted which will result in a use not permitted in the applicable zone or which will increase the allowable residential density in any zone with the exception of individual lot size reduction; and*

The development of the subdivision is for lots for single family residences which requires access via the proposed street and which are permitted outright in the GM R-10 zoning district. There is no intent or request for other uses which are not explicitly permitted.

F. Physical circumstance(s) related to the property involved preclude conformance with the standard to be varied.

The environmental constraints presented by surrounding wetlands and steep dune hills make the cul-de-sac street the only option for accessing the subject property and future lots. There is no other option.

Clear Lake Subdvsion

Lot #	Area (SF)	Acres
1	10,946	0.251
2	10,565	0.243
3	10,897	0.250
4	10,733	0.246
5	11,656	0.268
6	11,670	0.268
7	10,850	0.249
8	10,850	0.249
9	10,850	0.249
10	11,897	0.273
11	17,335	0.398
12	13,472	0.309
13	13,848	0.318
14	10,171	0.233
15	10,070	0.231
Average	**11,721**	**0.269**
Tract A	112,694	2.587
Tract B	13,787	0.317
Total Tracts and lots	138,202	3.173
Total Parcel	344,946	7.919
ROW dedication	206,744	4.746

Urling Planning Associates
2366 West Hills Drive
Longview WA 98632

February 5, 2019

Kevin Cronin, Community Development Director
City of Warrenton
PO Box 250
Warrenton OR 97146

RE: Pre-application meeting notes—Clear Lake Subdivision

This letter is in response to your memorandum on the pre-application conference we held January 23rd.

We agree that the preliminary plat will require a Type III hearing together with the application for wetland hardship variance and the application for a variance to cul-de-sac length. However, we disagree with the need for site design review for a variety of reasons. First, WMC 16.212.040 was amended in 2013 during my tenure to clarify the level of opportunity for public review for multiple family dwelling proposals into three tiers. Second, a plain reading of WMC 16.212.040.A.1.a states that the requirements for site design review apply to "a. Residential developments with between five and nine dwelling units shall be reviewed as a Type II application, except when development review is allowed under Section 16.212.020. Residential developments with greater than nine units shall be reviewed as a Type III application." There are no dwellings proposed with the Clear Lake preliminary plat application package. The preliminary plat will show all lot dimensions and areas of regulatory setbacks and the typical array of utilities, pavement width, sidewalks, grades, graded slopes both fill and cut, etc, as required by the municipal code. At this stage of the project, it is premature to show driveways and landscaping because there are no building footprints to plan to.

The subject property is not zoned RM Medium Density Residential. The subject property is zoned Growth Management Zone, with development standards defaulting to the R-10 Intermediate Residential zoning district. That being said, the applicant's intent is to develop the property for single family residences only. We also note that the North Coast Land Conservancy property is east of the subject property, not north. We find it unlikely that the Department of State Lands would permit a fence in the wetland that crosses the property line between the two ownerships or, for that matter, in the wetland along the shared property lines with Fort Pointe Partners LLC.

A copy of the wetland delineation performed by Cascade Environmental Group LLC together with the concurrency letter from the Department of State Lands is included with the application package. The delineation report is of substantial volume. Please tell us how many hard copies you need; a digital copy is also included in the application package. We are not aware of any regulatory wetland setback requirements at either the local or state level.

A review of Clatsop Webmaps data indicates that the subject property is outside the floodplain. If the FIRM panel for this property indicates otherwise, please inform us as soon as possible.

Regarding the open space dedication issue, we agree that the project is below the threshold for requiring the dedication of open space or any active recreation facilities. However, the applicant will grant an easement to the city for the future development of a trail and water line.

The applicant has no plans at this time for a temporary sales office. Should that intent change, he will apply for permits prior to placing a structure on the site.

Supporting arguments for a 32-foot wide street, rather than the code required 36 feet is included in the narrative. A typical street cross section is on Sheet 3 of the plan set.

Preliminary grading plans are included in the preliminary plat plan set drawings. While these are not construction drawings, the applicant will submit such engineered construction drawings with a grading permit application after preliminary plat approval.

We recognize that invasive species need to be removed from the developable portion of the subject property but are reluctant to disturb the wetland areas. Additionally, we recognize the code landscaping requirements; however it is not practical to land scape any of the lots until construction is virtually completed so that any plantings are not ruined by vehicles or craftsmen.

Thank you for your guidance.

Very truly yours,

Skip Urling

"Making a difference through excellence of service"

CITY OF WARRENTON

January 28, 2019

To: Skip Urling | Urling Planning Associates
From: Kevin A. Cronin, AICP | Community Development Director
Re: Clear Lake Subdivision | Pre-Application Notes

A pre-application conference was held on January 23, 2019 at Warrenton City Hall. The purpose of this memo is to document requirements and concerns raised at the conference. The proposal includes a 15-lot subdivision for single family detached units and extension of SW Kalmia Ave into a cul-de-sac near Clear Lake. The subject property is located adjacent to a previous subdivision from the same developer on SW Kalmia Ave.

This project is considered a subdivision pursuant to WMC Chapter 16.216 and will require site design review per WMC 212.040. The application will be reviewed via a Type 3 process with a public hearing before the Planning Commission and notice described in WMC 16.208.050. The Community & Economic Development Department performance review time for a Type 3 application from "completeness" to "notice of decision" is 4-8 weeks. Application requirements are listed in WMC 16.216 & 16.220. In addition to the subdivision and site design review, a request was made for a wetland hardship variance (WMC 16.156.080) and a variance (WMC 16.272) to the street length without a permanent connection.

A site plan shall have calculations for building area (lots), landscaped area, and parking to streamline the review process. Provide calculations for lot size averaging if lots are below the minimum standard.

The subject property is zoned RM Medium Density Residential, which allows duplexes, townhouses in addition to single family detached. Currently, there no minimum density provisions. However, the City is implementing a new policy in 2019 as a result of housing needs assessment. North of the property is open space owned by North Coast Land Conservancy (NCLC). A wildlife fence that would allow limited access for pedestrians but facilitate deer and other wildlife crossings should be considered.

Applicable site design standards include:

- *WMC 16.156 Wetland & Riparian Corridor*. Please submit documentation from DSL that addresses any jurisdictional wetlands. A concurrence letter and/or enforcement action letter from the previous grading activity is required for submittal. All wetlands that will be preserved shall be clearly illustrated and setbacks noted.

P.O. Box 250 Warrenton, OR 97146-0250
503/861-2233 FAX: 503/861-2351
www.ci.warrenton.or.us

- *WMC 16.88 Floodplain Development Review*. Preliminary plat and site plan shall illustrate 100-year floodplain. If new development is proposed within the 100-year floodplain, a separate permit and fee will be required and pre and post elevation certificates required.
- *WMC 16.216.020.I Open Space Dedication*. The proposal does not meet the minimum threshold (20 units) for this standard to apply. However, trail improvements will satisfy the intent of the policy.
- *WMC 16.214 Temporary Use*. A temporary sales office is allowed and can be reviewed concurrently with the subdivision application.
- *WMC 16.136.010 Transportation Standards*. The recently adopted TSP requires a 36-foot wide curb to curb street. If an alternative design is proposed at 28 feet, findings must be made that satisfies the City Engineer and Community Development Director before review and approval by the Planning Commission. A cross section that details the proposed street improvements is required.
- *WMC 16.152 Grading & Filling*. Submit engineered plans for any grading and filling for review by contract engineer (HHPR).
- *WMC 16.120 Vehicular & Pedestrian Access and Circulation*. Address pedestrian circulation with direct access from all private and public roads. A pedestrian easement and trail shall be indicated on the plans heading north of the property towards Ridge Road. A secondary pedestrian access to Clear Lake is under consideration pending discussions with the.
- *WMC 16.124 Landscaping, Street Trees, Fences and Walls* – For residential projects, 20% of the site shall be landscaped. Hardscape features open to the public can count towards up to 50% of the required landscaping. Conservation of native landscaping is strongly suggested to help meet the standard and all invasive species shall be removed. Contact Dan Cary at DSL on technical advice for removal of invasive species. Flowering species of shrubs and other plant materials is strongly encouraged. A street tree plan or alternative method is required.
- *Vehicle and Bicycle Parking*: 2 spaces per lot. Bicycle parking is not required for single family detached.
- Engineering and Public Works issues are identified in a separate memo and herein referenced. An impact study is also required to demonstrate availability of public facilities. In such cases there are deficiencies, the applicant shall recommend solutions to correct the deficiency such as the aforementioned sewer capacity.
- Fire Department comments are separate and referenced.

Permit Fees & SDCs

The estimated permit fees are as follows:

- Preliminary plat: $750 + $30/lot + Actual Costs = $1,200
- Site Design Review: $2,500
- Variance: $1,250
- Wetland Hardship: $1,250
- Temporary Use: $300
- **Estimated Total: $6,500**

Grading permits and engineering design are reviewed by a third-party consultant and requires a deposit and direct charge for services. System Development Charges will be collected at time of building permits. SDCs are being adjusted to 2019 costs of construction at a minimum until a new SDC study can be commissioned.

Please use this letter as a checklist for your land use submittal.

Written responses to each concern are required.

If you have any questions about the requirements or any City related issues, please let me know.

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Written responses to each concern are required.

If you have any questions about the requirements or any City related issues, please let me know.

WARRENTON-HAMMOND SCHOOL DISTRICT NO. 30

820 SW Cedar, Warrenton, OR 97146-9799 • Phone (503) 861-2281 • Fax (503) 861-2911

Erik Hoovestol
Firwood Design Group
359 E. Historic Columbia River Hwy
Troutdale, OR 97060

February 5, 2019

Dear Mr. Hoovestol,

I received your request for a statement concerning Warrenton-Hammond School District's ability to serve potential students residing in a planned 15-lot subdivision owned by Gil Gramson/Sandworks at the north terminus of SW Kalmia Avenue. The District's determination is based on the assumption the lots will be used for single family houses. The current occupancy for housing units within the district boundary is 2.5 persons per unit. This equates to a potential enrollment increase of approximately 7 to 8 students. Should our assumption be incorrect as to single family as opposed to multifamily units please notify me and I will revised this letter.

The District has added seven additional classrooms to Warrenton Grade School in August 2017 and a new middle school is planned for completion within the next 36 months. Warrenton High School currently has adequate space for this additional enrollment.

At this time the Warrenton-Hammond School District has the capacity to provide educational services to the families who will reside in the units mentioned above.

If you have further questions please feel free to contact me at (503) 861-2281

Mark Jeffery, Superintendent
Warrenton-Hammond School District
Warrenton, Oregon

Kevin Cronin

From: Skip Urling <skip@urlingplanning.com>
Sent: Thursday, February 14, 2019 1:44 PM
To: Kevin Cronin
Cc: eh@firwooddesign.com; gilandanngramson@charter.net
Subject: Clear Lake narrative revised
Attachments: Clear Lake Lot Areas.xlsx; Gramson narrative rev2 021419.docx

Attached is the Clear Lake preliminary plat narrative without the track changes. Gil will deliver 3 hard copies tomorrow. Erik deleted the old file from the dropbox and will upload this file. Also attached is a spreadsheet with the density calculations, which I summarized in the narrative.

We also revised the narrative to address the trail requirement from the cul-de-sac to the northern property boundary. WMC 16.120.030.A.4.e provides an exception to the requirement for the trail when certain physical characteristics of the property make it impracticable. We believe the site meets those criteria.

Please call me if you feel the need to discuss.

Thanks

Skip Urling
Urling Planning Associates
360.431.5117

Janice Weese

From: Kevin Cronin
Sent: Wednesday, June 19, 2019 10:56 AM
To: skip@urlingplanning.com
Cc: Janice Weese; Lindsay Duarte
Subject: Re: Clear Lake Subdivision Appeal

Thanks, Skip

Janice: Please print and add to file.

Lindsay: Please add to packet for CC if not too late.

Please reply all on timing for distribution of packet.

From: skip@urlingplanning.com <skip@urlingplanning.com>
Sent: Tuesday, June 18, 2019 5:12 PM
To: Kevin Cronin
Subject: RE: Clear Lake Subdivision Appeal

Gil agreed to a 60 day extension of the 120 day rule.

From: Kevin Cronin <cityplanner@ci.warrenton.or.us>
Sent: Tuesday, June 18, 2019 3:07 PM
To: skip@urlingplanning.com
Subject: RE: Clear Lake Subdivision Appeal

Ok, thanks

Waiting for City Attorney review and then I can release.

From: skip@urlingplanning.com <skip@urlingplanning.com>
Sent: Tuesday, June 18, 2019 1:45 PM
To: Kevin Cronin <cityplanner@ci.warrenton.or.us>
Subject: RE: Clear Lake Subdivision Appeal

I've got a call into Gil for authorization.

From: Kevin Cronin <cityplanner@ci.warrenton.or.us>
Sent: Tuesday, June 18, 2019 11:52 AM
To: skip@urlingplanning.com
Cc: eh@firwooddesign.com
Subject: RE: Clear Lake Subdivision Appeal

Getting to ready to hit print on staff report.

Please send a 120 day extension request since your client appealed the decision.

An additional 60 days should suffice.

From: skip@urlingplanning.com <skip@urlingplanning.com>
Sent: Friday, May 31, 2019 11:33 AM
To: Kevin Cronin <cityplanner@ci.warrenton.or.us>
Subject: RE: Clear Lake Subdivision Appeal

Gil will deliver envelopes Monday.

From: Kevin Cronin <cityplanner@ci.warrenton.or.us>
Sent: Thursday, May 30, 2019 6:24 AM
To: Skip Urling <skip@urlingplanning.com>
Subject: RE: Clear Lake Subdivision Appeal

Hi Skip:

We received the appeal letter and fee for the above application.

I have not received stamped envelopes to do notice.

I'd like to schedule one hearing for both appeals on June 25.

In order for you to meet this deadline, I need a complete application by June 4.

I am confirming with the City Attorney on his attendance and processing a double appeal.

Please confirm the submittal requirements.

Thanks - Kevin

Kevin A. Cronin, AICP
Assistant City Manager/Community Development Director
Community & Economic Development Department
City of Warrenton
Warrenton | OR | 97146
503-861-0920 | 503-861-2531 FAX
www.ci.warrenton.or.us
FB | LinkedIn
Warrenton | ALL IN!

PRELIMINARY STORMWATER REPORT

Clear Lake 15-Lot Subdivision
Located at the northerly terminus of Kalmia Avenue
Warrenton, OR 97146

Prepared For:
Sandworks, LLC
Gil Gramson

February 5, 2019

FDG #E18-030

Prepared By:

FDG
Firwood Design Group, LLC
SURVEYING • ENGINEERING • PLANNING

359 E. Historic Columbia River Highway
Troutdale, OR 97060
503.668.3737- fax 503.668.3788

TABLE OF CONTENTS

I. OBJECTIVE

Stormwater treatment and detention are typically not required by the City of Warrenton; however, treatment is required by Oregon DEQ as part of the wetland impact mitigation process. The objective is to collect and convey stormwater runoff from the portion of Kalmia Avenue proposed with this subdivision to an on-site biofiltration swale designed to the standards described in the Oregon Department of Transportation (ODOT) Hydraulics Design Manual. The bulk of stormwater runoff from each lot, including roof drains, shall be collected and treated on each lot and therefore is not accounted for in runoff calculations tributary to the proposed biofiltration swale. Driveways from nine proposed lots are anticipated to be tributary to the water quality swale; though driveways will be designed as part of individual lot improvements and are not a part of these plans, the contributing tributary area has been estimated and included in the calculations.

II. METHODOLOGY

The ODOT Hydraulics Design Manual was used to develop the proposed stormwater management swale for the addition to Kalmia Avenue. Swale geometry was determined by Chapter 14, Appendix B. Minimum requirements for swale geometry is summarized as follows:

- The swale shall have a longitudinal slope between 0.5 and 6.0%
- The swale cross-section shall be trapezoidal
- The swale cross-section shall have a flat bottom of 4 feet or wider
- The swale cross-section shall have maximum 1V:4H side slopes
- The swale depth must be adequate to convey peak flow for on-line designs
- The swale freeboard depth is 1 foot minimum
- The swale length must be equal to or greater than 100 feet
- A swale with a gradient between 0.5 and 4.0% shall have a maximum water quality depth of 0.33 feet (4 inches)
- The design Manning's n used shall be 0.24
- The minimum hydraulic residence time is 9 minutes
- A sub-surface drain is required when the subsoil classification is NRCS Hydrologic soil groups C or D and the bottom slopes less than 1.5%

The 24-hour storm events used in analysis are summarized as follows:

- Water Quality Storm – ½ of the 2-year storm event of 3.5", or 1.75"
- 25-Year Storm – 5.0"

III. REFERENCES:

NRCS Soil Survey
Oregon Department of Transportation (ODOT) Hydraulics Design Manual
City of Warrenton Development Code
Clear Lake Subdivision Geotechnical Report

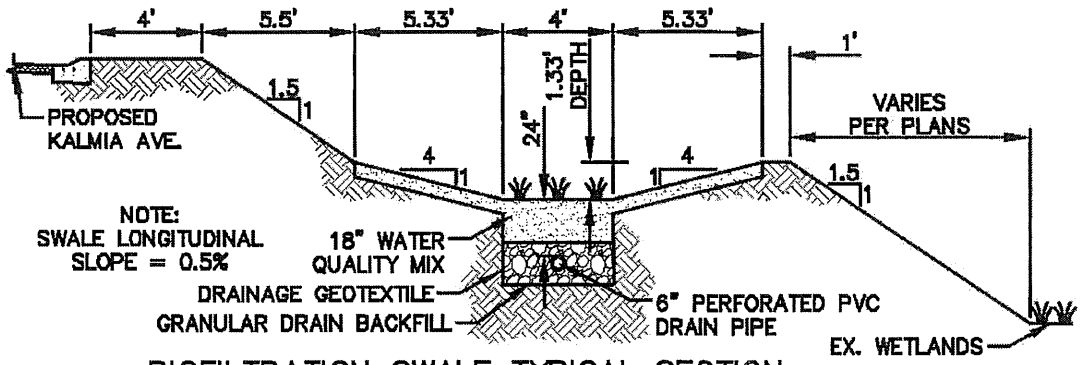
IV. SITE DESCRIPTION:

The existing site topography consists of basically flat wetland areas bordering a low, broad ridge. The proposed improvements to the site consist of mass grading and the construction of a road to provide access to 15 residential lots above the grade of the surrounding wetlands. In areas delineated on the preliminary grading plan, fill material will be placed on portions of the wetlands to develop a buildable area for each proposed residential lot. No known hazardous conditions exist on site, and the portion of the site with proposed improvements is not subject to flooding or ponding as it is several feet or more above the wetlands. Access to this site is via Kalmia Avenue.

The site soils per the NRCS Soil Survey consist of Bergsvik mucky peat, hydrologic soil group B/D, and Gearhart fine sandy loam, hydrologic soil group A. Refer to the appendices for additional information on these site soils in the NRCS soils report. Generally, the mucky peat is located in the lower-lying wetland areas, so the majority of the proposed construction activity and site improvements will be underlain by fine sandy loam. GeoEngineers performed geotechnical testing on this site as described in the geotechnical report dated February 5, 2019. The report confirmed assumptions made based on the NRCS Soil Survey map for the proposed site, and provides infiltration data to be used in the design and construction of water quality features for individual residential lots.

V. STORMWATER MANAGEMENT:

Runoff from proposed Kalmia Avenue will be conveyed to the biofiltration swale via gutter flow and storm drain lines. Estimated tributary impervious area is approximately 32,600 square feet, or 0.794 acres. StormCAD outputs have been included in the appendices detailing peak flow in both the water quality and 25-year storm events. Street capacity and 12" storm drain line capacity calculations have been included as well; over triple the required capacity for the 25-year storm event is available in the storm line and the street capacity is over double what is required to convey the entire 25-year storm event in one-half of the street, providing a factor of safety to compensate for construction tolerances and storm events larger than the design storm. Via the storm drain line, flow is routed through a pretreatment structure as required by the ODOT hydraulic manual, then released into the biofiltration swale. The biofiltration swale typical section shows proposed swale geometry in conformance with the listed ODOT requirements.



BIOFILTRATION SWALE TYPICAL SECTION
N.T.S.

Flow in the swale was analyzed for both the water quality and 25-year storm events, and Hydraflow outputs have been included in the appendices for reference. In the water quality event, one foot of freeboard is provided as required with a maximum flow depth of 0.33 feet (4 inches); in the 25-year event, there is sufficient capacity in the swale to convey all flow to the outlet structure with a flow depth of 0.60 feet (7.2 inches). The biofiltration swale terminates to a Type "D" inlet with outlet pipe, which releases to the surrounding wetlands. Per the ODOT manual, an energy dissipator must be provided when the swale outlet pipe discharges to a sloped bank; energy dissipator design will be included with final construction plans.

The only impervious area of proposed lots anticipated to drain to Kalmia Avenue and the biofiltration swale is from the driveways of nine lots that are expected to slope toward Kalmia. Stormwater calculations in this report include an estimate for those driveways (approximately 20' deep by 16' wide double driveways), but the roof runoff and all other impervious areas from the residences to be constructed on each lot is expected to be treated via drywell infiltration or other approved method, to be determined at the time of design and construction for each lot. The site geotechnical report confirms that site soils are suitable for infiltration facilities.

Appendix A

HydroCAD and Hydraflow Express Calculations

Summary for Subcatchment 1S: Road + Driveways

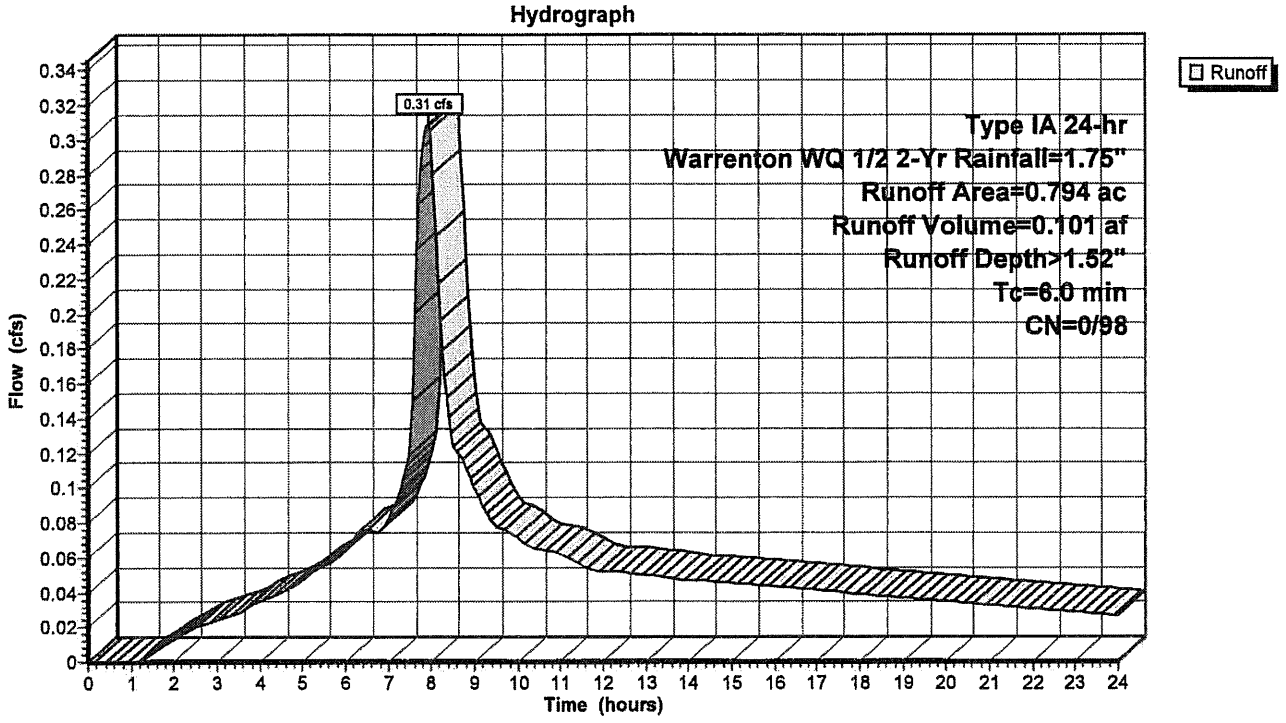
Runoff = 0.31 cfs @ 7.92 hrs, Volume= 0.101 af, Depth> 1.52"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr Warrenton WQ 1/2 2-Yr Rainfall=1.75"

Area (ac)	CN	Description
0.794	98	Paved parking, HSG B
0.794	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Standard Min Tc**

Subcatchment 1S: Road + Driveways



Summary for Subcatchment 1S: Road + Driveways

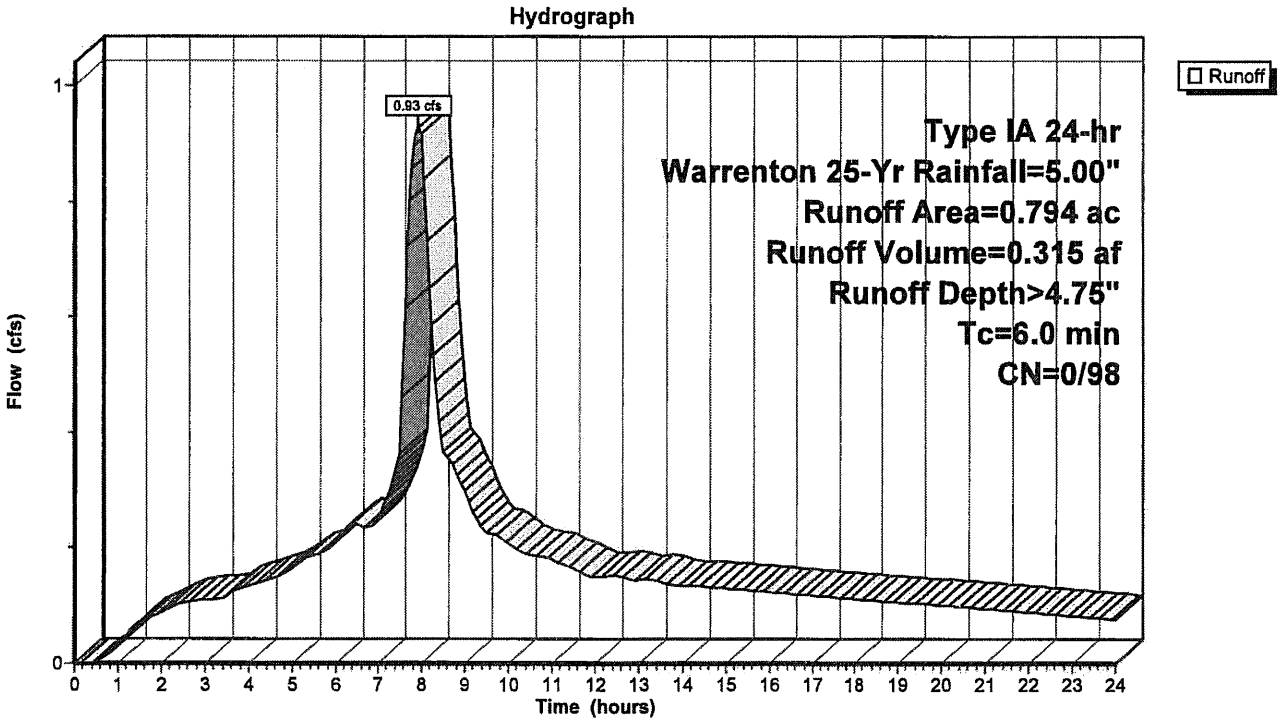
Runoff = 0.93 cfs @ 7.91 hrs, Volume= 0.315 af, Depth> 4.75"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr Warrenton 25-Yr Rainfall=5.00"

Area (ac)	CN	Description
0.794	98	Paved parking, HSG B
0.794	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Standard Min Tc**

Subcatchment 1S: Road + Driveways



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Jan 30 2019

12in PVC Stormline Capacity

Circular

Diameter (ft)	= 1.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.011

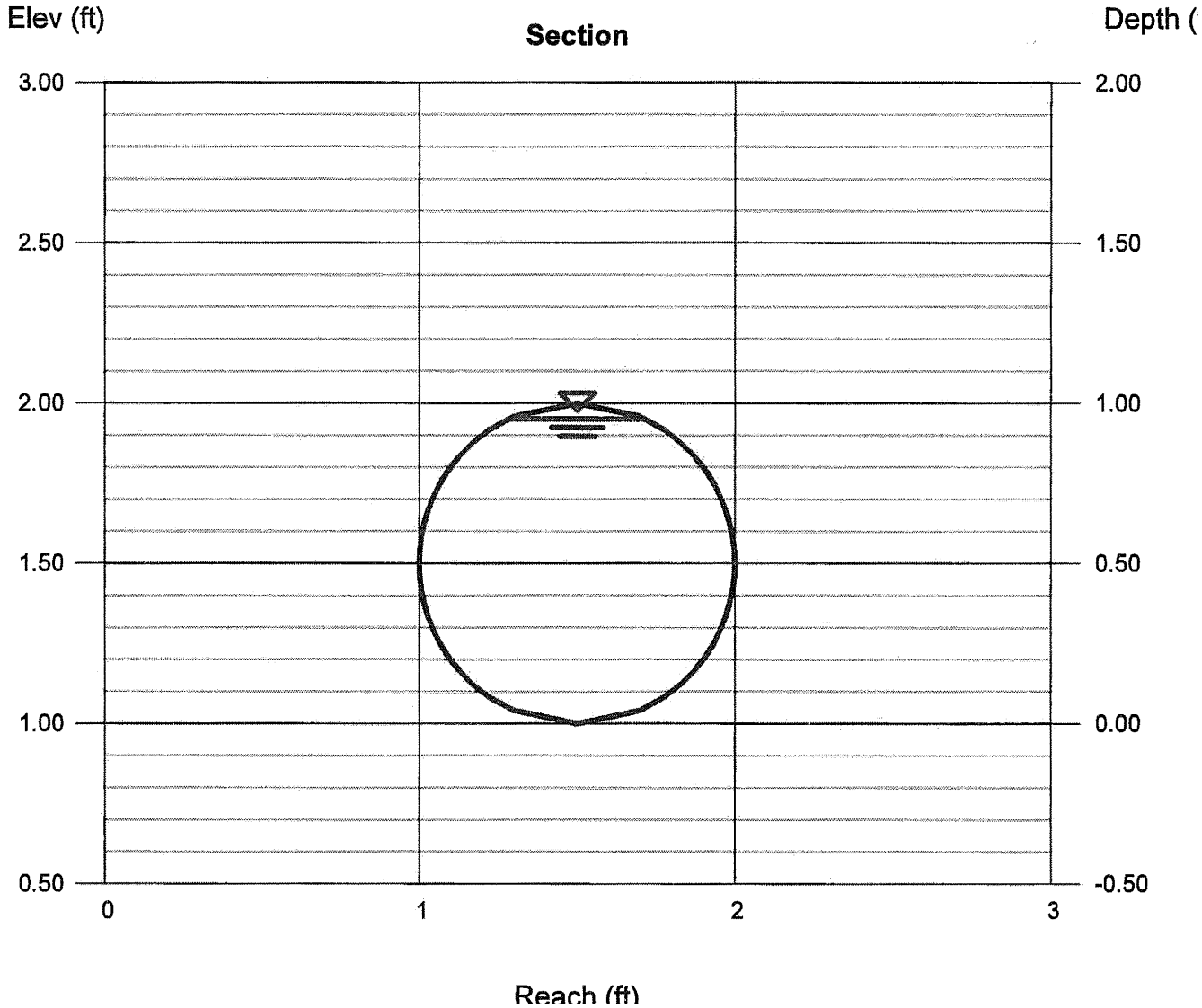
Calculations

Compute by:	Q vs Depth
No. Increments	= 20

Highlighted

Depth (ft)	= 0.95
Q (cfs)	= 3.197
Area (sqft)	= 0.77
Velocity (ft/s)	= 4.15
Wetted Perim (ft)	= 2.70
Crit Depth, Yc (ft)	= 0.77
Top Width (ft)	= 0.43
EGL (ft)	= 1.22

MAXIMUM CAPACITY OF 12" PVC SLOPED AT 0.5% IS AT A DEPTH OF APPROXIMATELY 0.95', WITH A FLOW OF NEARLY 3.2 CFS, MUCH GREATER THAN REQUIRED.



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Jan 30 2019

Kalmia Curb - 3 Inch Flow Depth Capacity

3.5" ROLLOVER CURB, USED 3" TO BE CONSERVATIVE

Gutter

Cross Sl, Sx (ft/ft)	= 0.025
Cross Sl, Sw (ft/ft)	= 0.025
Gutter Width (ft)	= 1.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.016

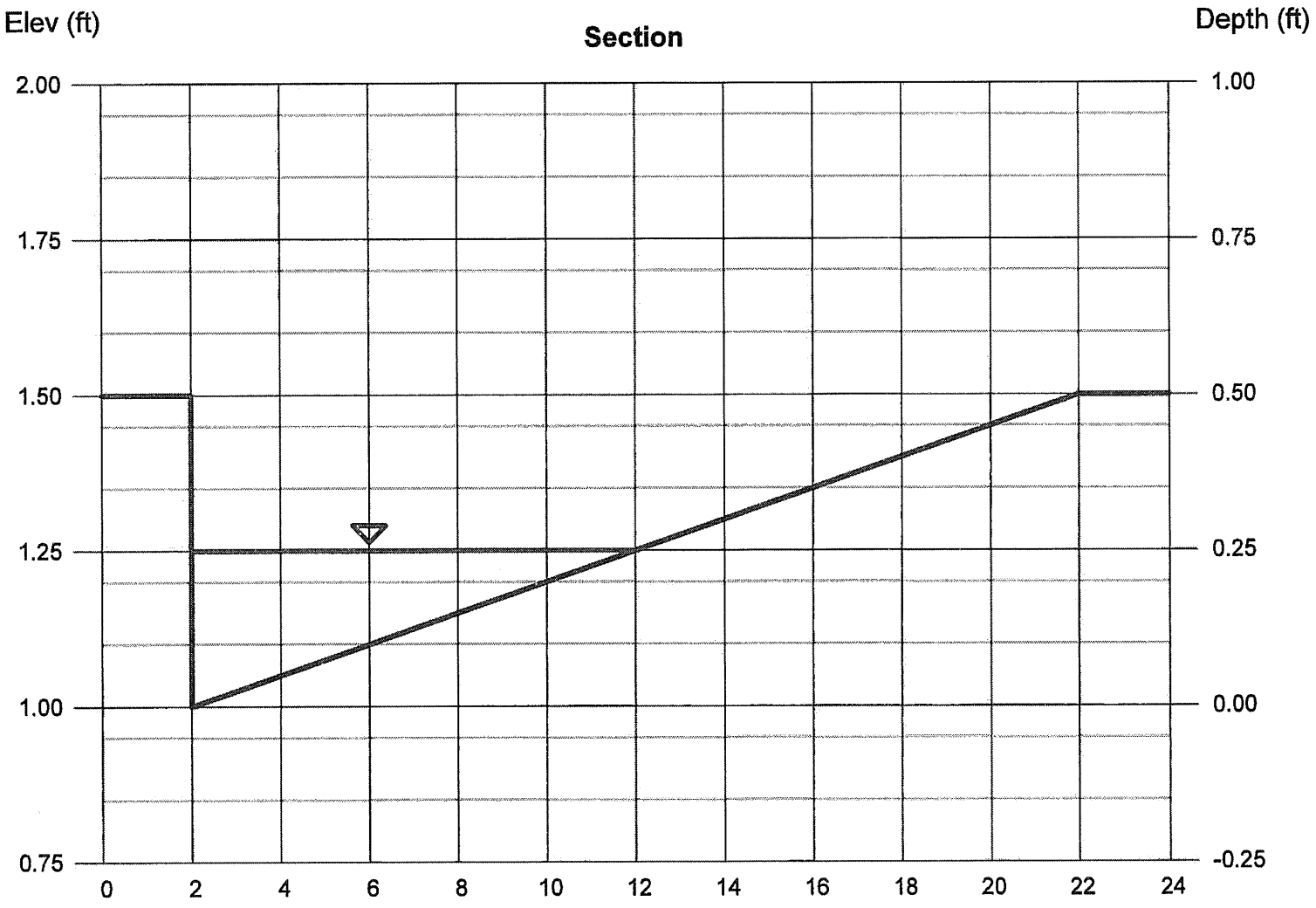
Highlighted

Depth (ft)	= 0.25
Q (cfs)	= 2.444
Area (sqft)	= 1.25
Velocity (ft/s)	= 1.96
Wetted Perim (ft)	= 10.25
Crit Depth, Yc (ft)	= 0.25
Spread Width (ft)	= 10.00
EGL (ft)	= 0.31

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 0.25

MAXIMUM STREET CAPACITY AT THE MINIMUM LONGITUDINAL SLOPE IS MUCH GREATER THAN 25-YEAR PEAK FLOW FOR THE ENTIRE STREET.



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Jan 30 2019

Biofiltration Swale - Water Quality

Trapezoidal	
Bottom Width (ft)	= 4.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 1.33
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.240

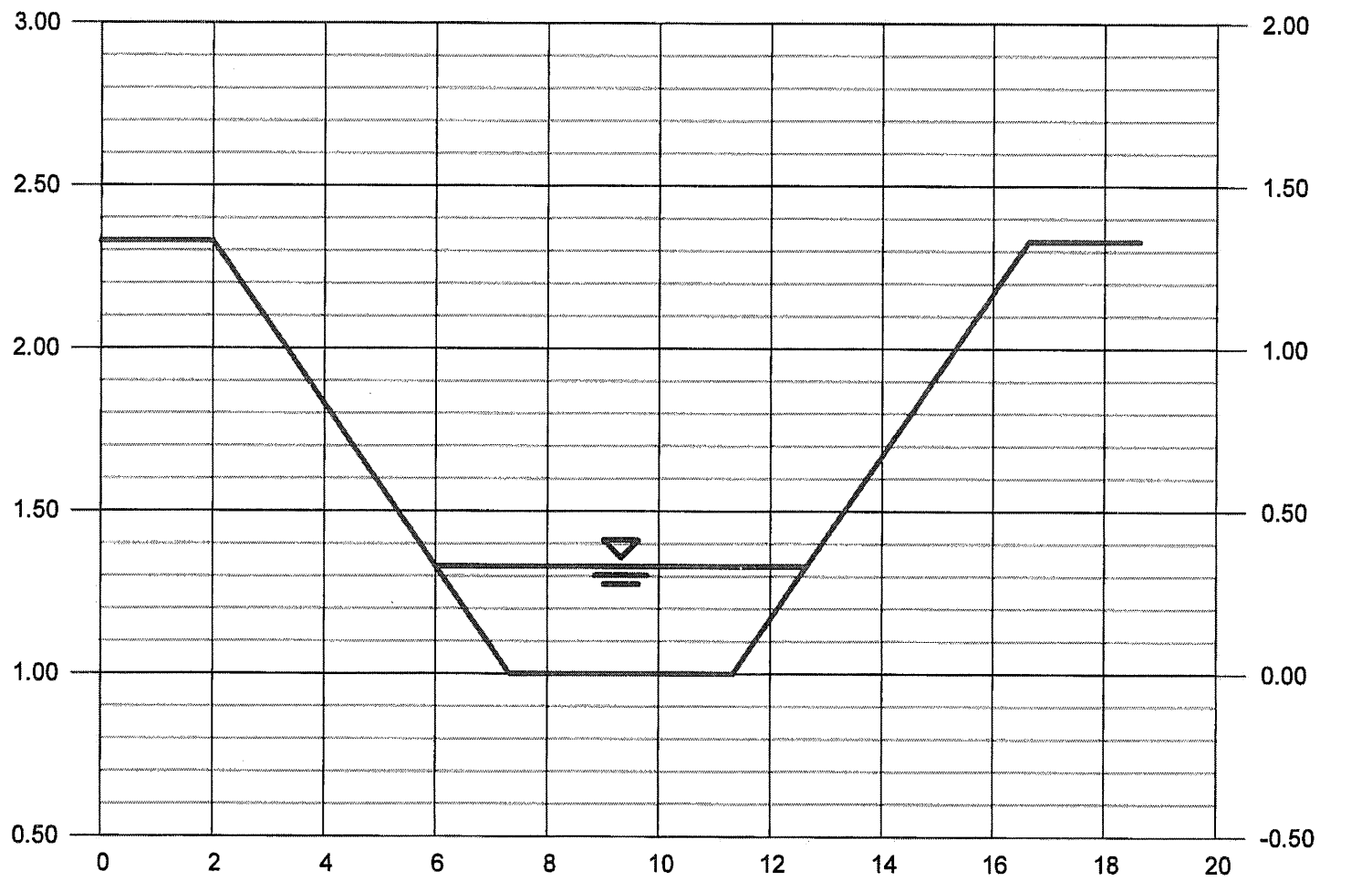
Highlighted	
Depth (ft)	= 0.33
Q (cfs)	= 0.310
Area (sqft)	= 1.76
Velocity (ft/s)	= 0.18
Wetted Perim (ft)	= 6.72
Crit Depth, Yc (ft)	= 0.06
Top Width (ft)	= 6.64
EGL (ft)	= 0.33

Calculations	
Compute by:	Known Q
Known Q (cfs)	= 0.31

WATER QUALITY FLOW DEPTH ADHERES TO 4" DEPTH REQUIREMENT. VELOCITY OF 0.18 ft/s OVER A 100-FOOT SWALE YIELDS A HYDRAULIC RESIDENCE TIME GREATER THAN THE REQUIRED 9 MINUTES.

$\frac{100'}{0.18'/SEC} = 556\,SEC \div 60\,SEC = 9.25\,MINUTES$

Section



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Jan 30 2019

Biofiltration Swale - 25-Yr Storm

Trapezoidal

Bottom Width (ft)	= 4.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 1.33
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.240

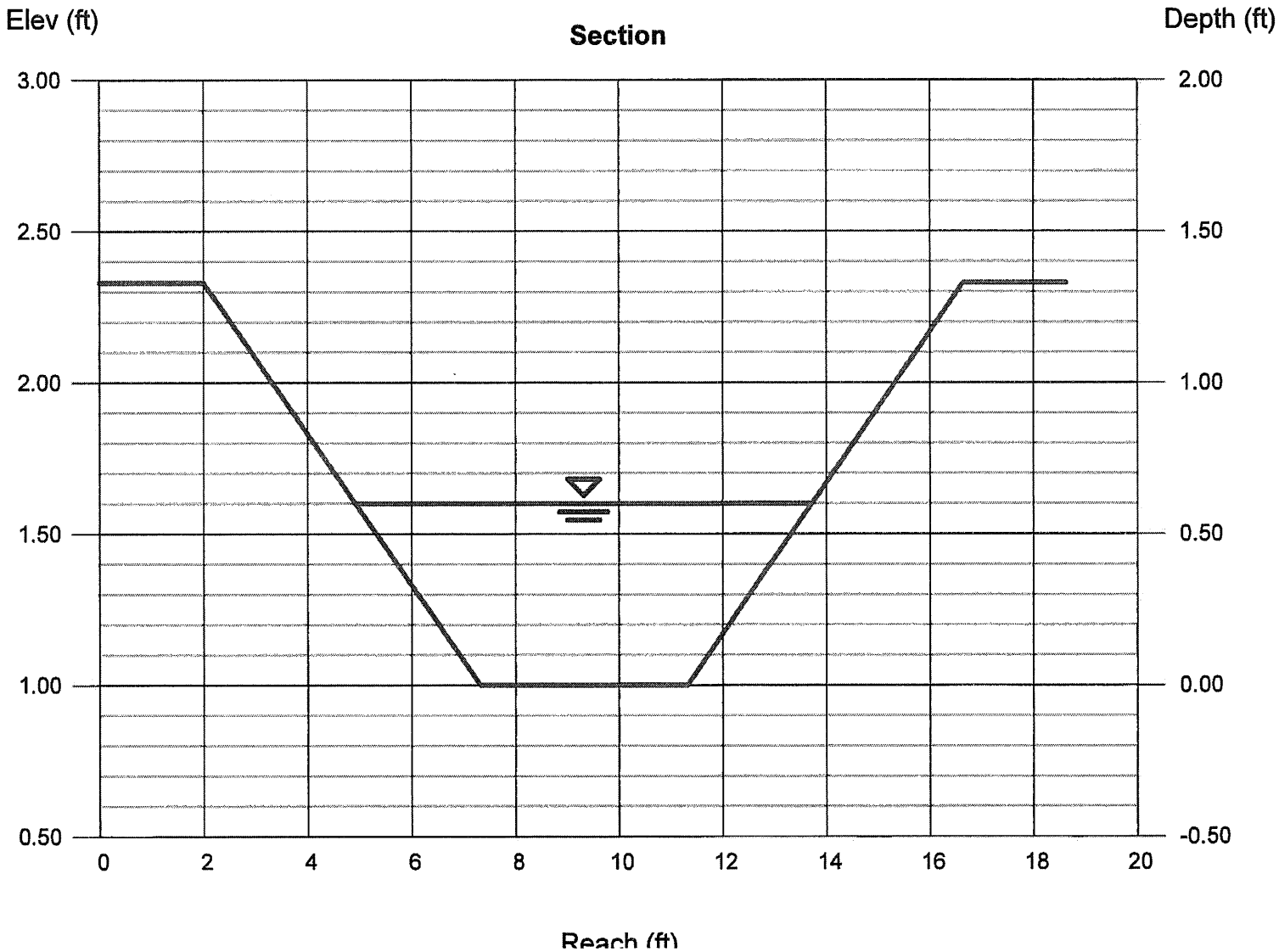
Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.93

Highlighted

Depth (ft)	= 0.60
Q (cfs)	= 0.930
Area (sqft)	= 3.84
Velocity (ft/s)	= 0.24
Wetted Perim (ft)	= 8.95
Crit Depth, Yc (ft)	= 0.12
Top Width (ft)	= 8.80
EGL (ft)	= 0.60

25-YEAR STORM FLOW DEPTH CAN BE CONVEYED IN THE PROPOSED SWALE TO THE OUTLET STRUCTURE AND WETLANDS



Appendix B

NRCS Soil Survey

United States Department of Agriculture

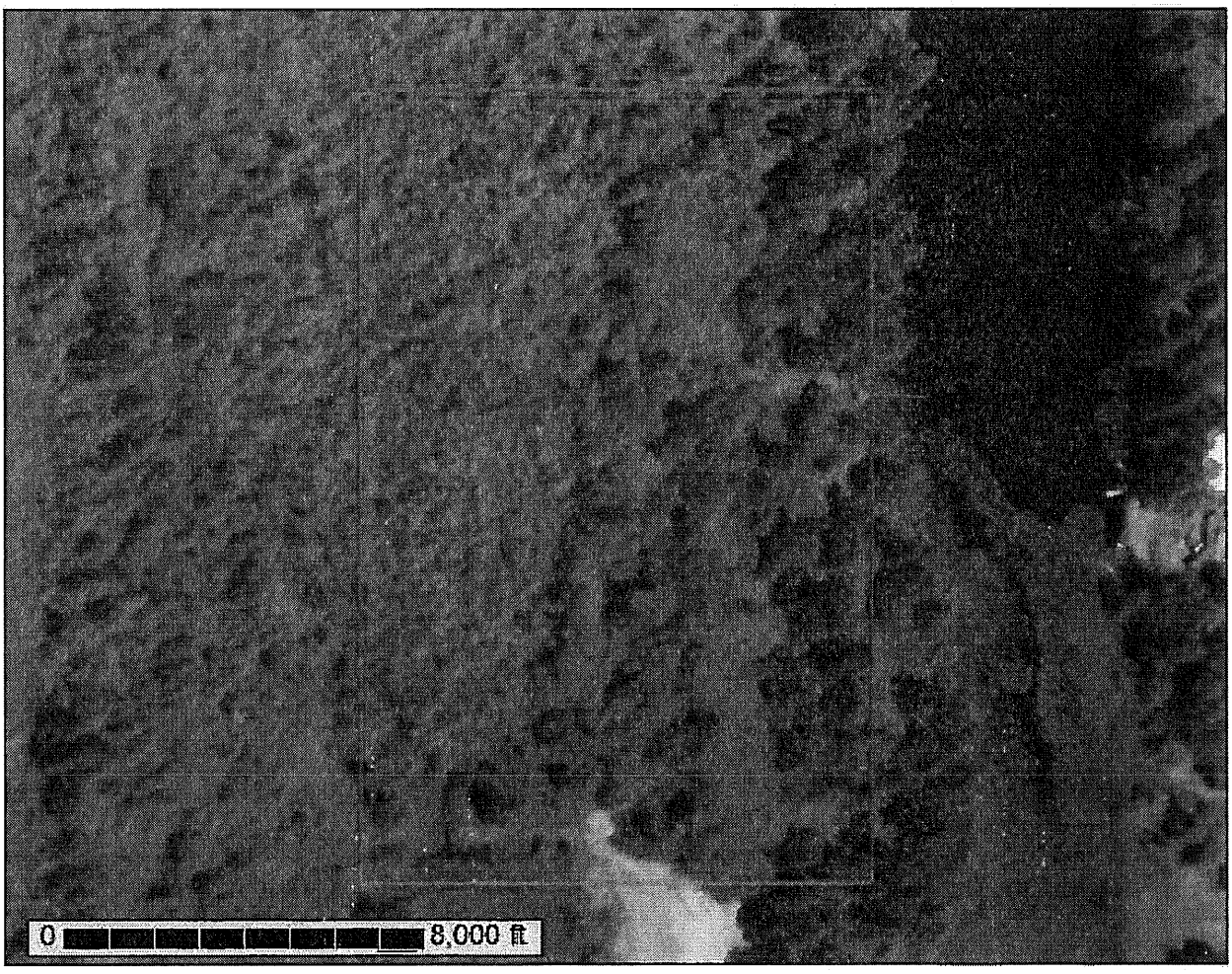
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Clatsop County, Oregon

Clear Lake Soil Map



January 30, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

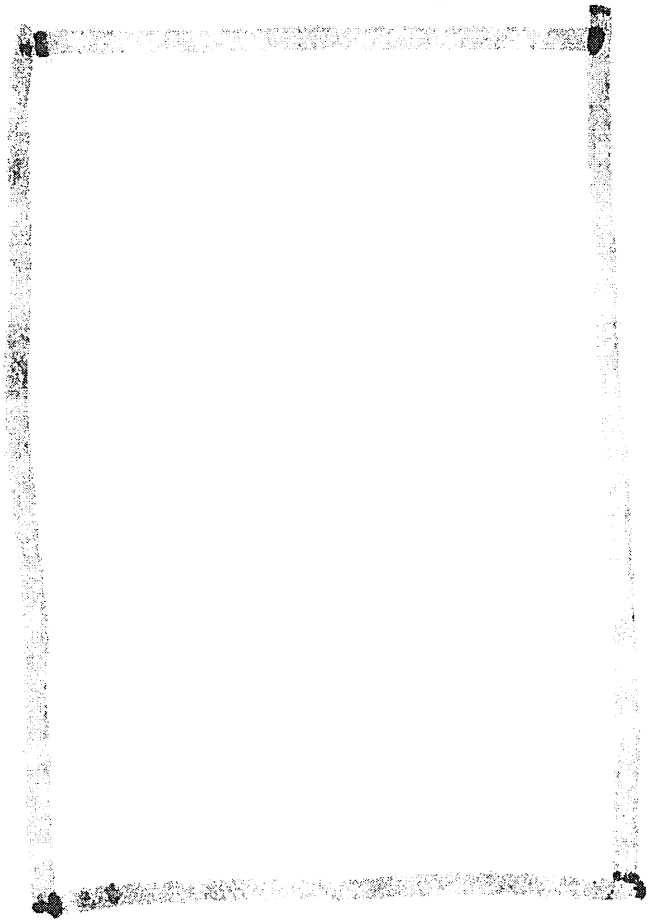
The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

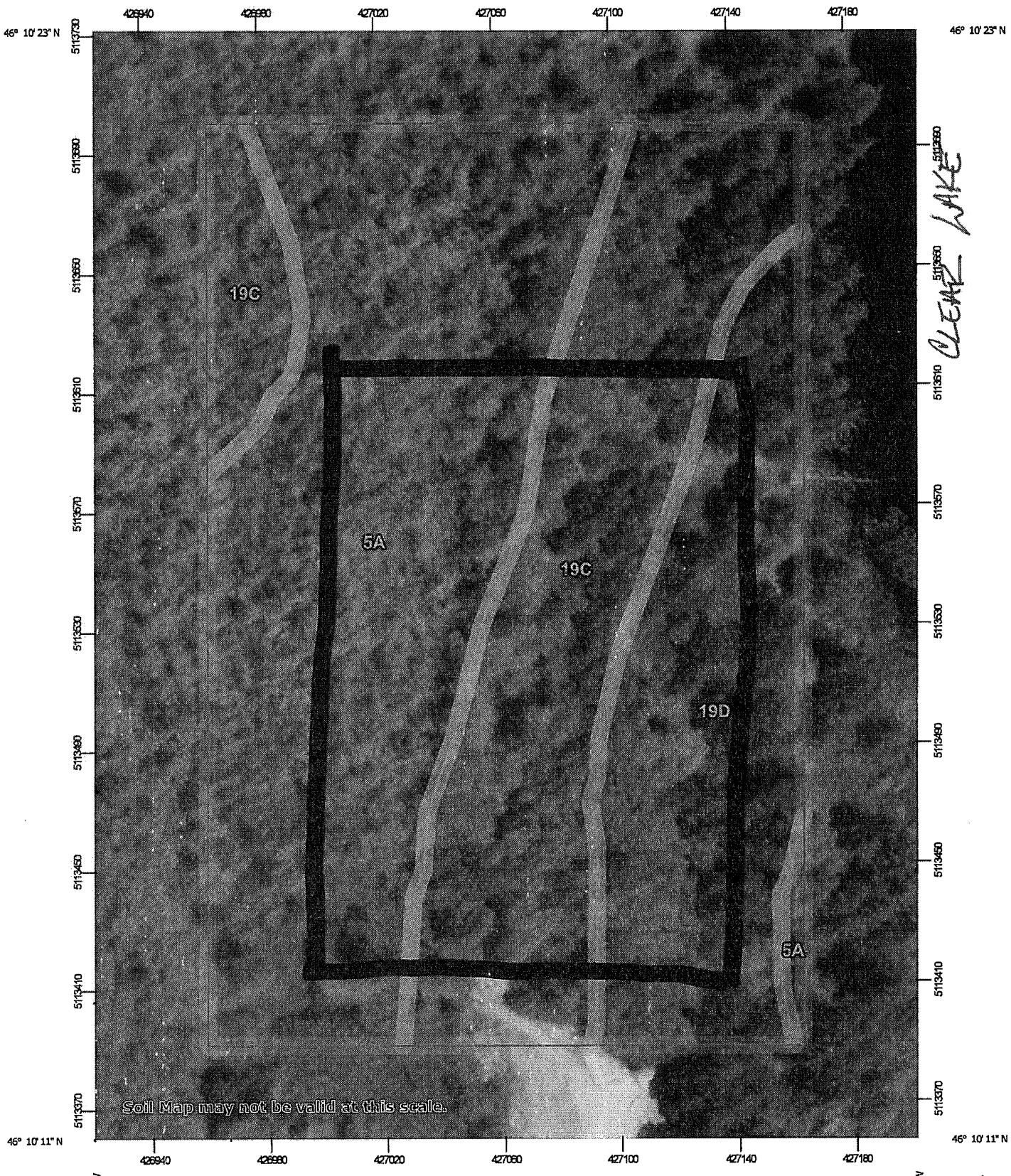
Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



Custom Soil Resource Report
Soil Map



Map Scale: 1:1,810 if printed on A portrait (8.5" x 11") sheet.

N

0 25 50 100 150 Meters

0 50 100 200 300 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

ESTIMATED SITE BOUNDARY, ADDITIONAL AREA SHOWN TO DEMONSTRATE AREA'S LOCATION & PROXIMAL CONDITIONS

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clatsop County, Oregon
Survey Area Data: Version 16, Sep 18, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 5, 2004—Feb 12, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
5A	Bergsvik mucky peat, 0 to 1 percent slopes	7.1	45.5%
19C	Gearhart fine sandy loam, 3 to 15 percent slopes	5.0	32.1%
19D	Gearhart fine sandy loam, 15 to 30 percent slopes	3.5	22.4%
Totals for Area of Interest		**15.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Clatsop County, Oregon

5A—Bergsvik mucky peat, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 21d0
Elevation: 10 to 20 feet
Mean annual precipitation: 70 to 100 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 175 to 220 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Bergsvik and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bergsvik

Setting

Landform: Depressions
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Partially decomposed woody and herbaceous organic material over eolian sands

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
Oe - 2 to 38 inches: mucky peat
H1 - 38 to 62 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Very high (about 14.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Psammaquents

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Histosols
Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Bergsvik, sandy surface
Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

19C—Gearhart fine sandy loam, 3 to 15 percent slopes

Map Unit Setting
National map unit symbol: 21b2
Elevation: 10 to 70 feet
Mean annual precipitation: 60 to 100 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 210 to 245 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Gearhart and similar soils: 85 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gearhart

Setting
Landform: Dunes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian sands

Typical profile
Oi - 0 to 1 inches: slightly decomposed plant material
H1 - 1 to 12 inches: fine sandy loam
H2 - 12 to 17 inches: loamy fine sand
H3 - 17 to 61 inches: fine sand

Properties and qualities
Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Forage suitability group: Somewhat Excessively Drained (G004AY012OR)
Hydric soil rating: No

Minor Components

Aquepts

Percent of map unit: 7 percent
Landform: Depressions
Hydric soil rating: Yes

19D—Gearhart fine sandy loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 21b3
Elevation: 10 to 70 feet
Mean annual precipitation: 60 to 100 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 210 to 245 days
Farmland classification: Not prime farmland

Map Unit Composition

Gearhart and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gearhart

Setting

Landform: Dunes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian sands

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
H1 - 1 to 12 inches: fine sandy loam
H2 - 12 to 17 inches: loamy fine sand
H3 - 17 to 61 inches: fine sand

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Forage suitability group: Somewhat Excessively Drained (G004AY012OR)
Hydric soil rating: No

Appendix C

Geotechnical Report

Geotechnical Engineering Report

Clear Lake Development
Warrenton, Oregon

For

Sandworks, Inc.

February 5, 2019

GeoEngineers
Earth Science + Technology

EXCERPT FOR REFERENCE

REFER TO FULL GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION

Geotechnical Engineering Report

Clear Lake Development
Warrenton, Oregon

for
Sandworks, Inc.

February 5, 2019

GeoEngineers

4000 Kruse Way Place
Building 3, Suite 200
Lake Oswego, Oregon 97035
503.624.9274

Geotechnical Engineering Report

Clear Lake Development
Warrenton, Oregon

File No. 23773-001-00

February 5, 2019

Prepared for:

Sandworks, Inc.
15 NW 17th Place
Warrenton, Oregon 97146

Attention: Gil Gramson

Prepared by:

GeoEngineers, Inc.
4000 Kruse Way Place
Building 3, Suite 200
Lake Oswego, Oregon 97035
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Tyler A. Pierce, PE
Project Engineer

Greg A. Landau, PE, GE
Associate Engineer

REGISTERED PROFESSIONAL ENGINEER
77490PE
OREGON
NOV. 8, 2005
GREG ALAN LANDAU
EXPIRES: 12.31.20

TAP:GAL:mls

Fill Type	Compaction Requirements Percent Maximum Dry Density Determined by ASTM Test Method D 1557 at ± 3% of Optimum Moisture 0 to 2 Feet Below Subgrade	> 2 Feet Below Subgrade	Pipe Zone
Imported Granular, maximum particle size 1¼ inch to 6 inches (3-inch maximum under building footprints)	n/a (proof-roll)	n/a (proof-roll)	—
Retaining Wall Backfill*	92	92	—
Nonstructural Zones	90	90	90
Trench Backfill	95	92	90

Note:

* Measures should be taken to prevent overcompaction of the backfill behind retaining walls. We recommend placing the zone of backfill located within 5 feet of the wall in lifts not exceeding about 6 inches in loose thickness and compacting this zone with hand-operated equipment such as a vibrating plate compactor or a jumping jack.

A representative from GeoEngineers should evaluate compaction of each lift of fill. Compaction should be evaluated by in-place compaction testing with a nuclear density gage, unless other methods are proposed for oversized materials and are approved by GeoEngineers during construction. These other methods typically involve procedural placement and compaction specifications together with verification requirements such as proof-rolling.

INFILTRATION TESTING

As requested, we conducted infiltration testing to assist in evaluating the site for stormwater system design. We conducted an infiltration test near the proposed infiltration facility.

We conducted infiltration testing using the open pit infiltration test method based on the U.S. Environmental Protection Agency's (EPA) Onsite Wastewater Treatment and Disposal Systems Design Manual, EPA/625/1-80-012. The infiltration test was completed at a depth of 2½ feet bgs at the location marked as IT-1 in Figure 2, Site Plan.

Testing Methods and Results

The infiltration test pit was 2 feet wide and 2 to 3 feet long with a testing depth of 2 ½ feet. Approximately 2 inches of clean rock was placed in the bottom of the test location to help minimize disturbance of the materials in the excavation while adding water.

After the saturation period, the test location was filled with clean water to at least 1 foot above the bottom of the excavation. The drop-in water level was measured over a period of one hour after the soak period. The field test results are summarized in Table 3 and specific results can be found in Appendix A, Field Explorations and Laboratory Testing.

TABLE 3. INFILTRATION RESULTS

Infiltration Test No.	Depth (feet)	USCS Material Type	Field Measured Infiltration Rate[1] (Inches/hour)
IT-1	2 ½	SP	6

Notes:

[1] Appropriate factors should be applied to the field measured infiltration rate, based on the design methodology and specific system used.

USCS = Unified Soil Classification System

The infiltration rates shown in Table 3 are field-measured infiltration rates. These represent a relatively short-term measured rate taken after the required saturation period, and factors of safety have not been applied for the type of infiltration system being considered, or for variability that may be present in the on-site soil. In our opinion, and consistent with the state of the practice, correction factors should be applied to this measured rate to reflect the small area of testing and the number of tests conducted.

Appropriate correction factors should be applied by the project civil engineer as described below. From a geotechnical perspective, we recommend a factor of safety (correction factor) of at least 2 be applied to the infiltration values derived from field observations to account for potential soil variability with depth and location within the area tested. This will result in a recommended infiltration value of 3 inches per hour prior to any factors deemed necessary by the civil designer.

In addition, the stormwater system design engineer should determine and apply appropriate remaining correction factor values, or factors of safety, to account for repeated wetting and drying that occur in this area, degree of in-system filtration, frequency and type of system maintenance, vegetation, potential for siltation and bio-fouling, etc., as well as system design correction factors for overflow or redundancy and base and facility size.

The actual depths, lateral extent and estimated infiltration rates can vary from the values presented above. Field testing/confirmation during construction is often required in large or long systems or other situations where soil conditions may vary within the area where the system is constructed. The results of this field testing might necessitate that the infiltration locations be modified to achieve the design infiltration rate.

Also, infiltration flow rate of a focused stormwater system typically diminishes over time as suspended solids and precipitates in the stormwater further clog the void spaces between the soil particles or cake on the infiltration surface. The serviceable life of an infiltration media in a stormwater system can be extended by pre-filtering or with on-going accessible maintenance. Eventually, most systems will fail and will need to be replaced or have media regenerated or replaced. We recommend that infiltration systems include an overflow that is connected to a suitable discharge point.

Infiltration systems can cause localized high groundwater levels and should not be located near basement walls, retaining walls, or other embedded structures unless these are specifically designed to account for the resulting hydrostatic pressure. Infiltration locations should not be located on sloping ground, unless it is approved by a geotechnical engineer, and should not be infiltrated at a location that allows for flow to travel laterally toward a slope face, such as a mounded water condition or too close to a slope face.

Suitability of Infiltration System

Successful design and implementation of stormwater infiltration systems and whether a system is suitable for a development depend on several site-specific factors. Stormwater infiltration systems are generally best suited for sites having sandy or gravelly soil with saturated hydraulic conductivities greater than 2 inches per hour as encountered at this site. Sites with silty or clayey soil, including sites with fine sand, silty sand, or gravel that has a high percentage of silt or clay in the matrix, or sites with relatively shallow underlying decomposed rock (residual soil) are generally not well suited for stormwater infiltration. Soil that has fine-grained matrices is susceptible to volumetric change and softening during wetting and drying cycles. Fine-grained soils also have large variations in the magnitude of infiltration rates because of bedding and stratification that occurs during alluvial deposition, and often have thin layers of less permeable or impermeable soil within a larger layer.

Local groundwater conditions also significantly affect the capacity to infiltrate from a stormwater system. Sites with shallow groundwater can result in groundwater mounding. A hydraulic gradient that reaches the level of water in the soil immediately drops to zero and local groundwater will rise and mound and the infiltration rate slows dramatically, resulting in overflows or system flooding (failure). Groundwater mounding can also negatively impact structures, slopes, or other areas adjacent to the stormwater infiltration facility. Typically, we do not recommend using infiltration systems where groundwater is less than 10 feet below the bottom of the proposed system unless the host soil is very permeable and consistently graded and will not cause mounding. Some jurisdictions require a minimum of 5 or 10 feet between high groundwater conditions and the bottom of proposed facilities. Depending on the size of the project, adjacent features such as streams that can source water to a system instead of allowing it to drain, and on-site soil infiltration capacities, there may be conditions where even a 10-foot separation between the level of groundwater and the base of the infiltration system may not be sufficient.

As a result of the measured infiltration rates over 2 inches per hour stormwater infiltration is feasible at this site at the depths tested. The resulting design infiltration value (factored value) may require the overall management system to include other types of stormwater management.

PAVEMENT RECOMMENDATIONS

Our pavement recommendations are based on the results of our field observations and analysis. Pavement analyses and recommendations for on-site roadways were developed in general accordance with the ODOT Pavement Design Guide. The recommended pavement sections assume that final improvements surrounding the pavement will be designed and constructed such that stormwater or excess irrigation water from landscape areas does not infiltrate below the pavement section into the baserock materials.

Pavement subgrades should be prepared in accordance with the "Earthwork Recommendations" section of this report. Our pavement recommendations assume that traffic at the site will consist of residential level car traffic and occasional truck traffic. We do not have specific information on the frequency and type of vehicles that will use the area. We have based our design analysis on an assumption of 50 cars and two trucks per day to account for trash and delivery vehicles. If traffic conditions will exceed these values, we will need to modify our pavement recommendations.

Our pavement recommendations are based on the following parameters:

6-C

AGENDA MEMORANDUM

TO: The Warrenton City Commission
FROM: Kevin A. Cronin, AICP, Community Development Director
DATE: For the Agenda of June 25, 2019
SUBJ: **PUBLIC HEARING**: Clear Lake Subdivision, Variance, & Wetland Hardship Variance Appeals

On April 25, 2019, the Planning Commission approved applications for subdivision, variance, and wetland hardship variance for a 15 lot, single family development north of the terminus of SW Kalmia Avenue. The applicant is Gil Gramson of Sandridge Construction. The subject property is zoned Growth Management (RGM – R10). Despite objections from an adjacent affected property owner – Rod Gramson - the Planning Commission approved the request and included 14 conditions of approval. The City received appeals from the applicant and from the affected property owner before the appeal period expired. The appeals were deemed complete and a hearing scheduled for June 25, 2019. Appeal letters are enclosed as is the voluminous record of decision.

According to WMC 16.128.050.H appeals are heard by the City Commission and require the same notice procedures as the original hearing. Notice was mailed to affected property owners on June 3, 2019 and published in *The Columbia Press* on June 7, 2019. To date no comments have been received. In addition, before the hearing is opened, the City Commission must make a key decision on the scope of the appeal to either allow a *de novo* hearing or conduct a hearing on just the evidence in the record and those issues identified in the appeals (WMC 128.050.H.2.b). Staff has requested and confirmed the attendance of the City Attorney to assist with the procedural requirements.

The conditions being appealed are presented below followed by the appellants argument (abbreviated) for each followed by staff's response.

Condition No. 6: All retaining walls shall be reviewed and approved by the City Engineer and Building Official. Developer shall work with NCLC on a design for a wildlife fence to the adjacent Clear Lake property. Said fence shall be installed prior to final plat acceptance.

Sandridge argument: The requirement for a wildlife fence along the eastern property line to protect the property owned by the North Coast Land Conservancy should be deleted.

Staff response: The North Coast Land Conservancy (NCLC) is an affected property owner with the same rights and responsibilities as the applicant. NCLC submitted comments and requested a wildlife fence. The design, location, and other details will need to be worked out between the developer and the property owner. The Planning Commission is well within its role and discretion to assign conditions of approval to meet the applicable criteria for impacts to affected property owners. In particular, Section 16.124.050.A allows the City to require a fence, and accordingly the Planning Commission conditioned the approval to require installation of the wildlife fence.

The maintenance of said fence would be the responsibility of the homeowner's association (HOA), which is a requirement for final plat approval. While pets could traverse a wildlife fence, the intended purpose is to allow migration of large ungulates (deer, elk, etc) that are native to the North Coast terrestrial environment while delineating a property boundary. This condition should be upheld.

Condition 4: A landscape plan designed to WMC 16.124.070 shall be submitted as part of the engineering review phase and reviewed and approved by the Community Development Director prior to signature of a final plat. An interim grading permit on the upland portion of the property can be granted subject to engineering review and a protection plan for existing trees. Landscape plan shall indicate conservation areas, protection areas and best practices to preserve significant trees in Tract A & B consistent with Department of State Lands best practices and WMC 16.156.040 Significant Wetland Area Development Standards. Conservation areas shall be clearly marked with orange fencing and other protective measures for the duration of construction activities.

Sandridge argument. Condition No. 4 calls for a landscape plan to be prepared meeting the requirements of WMC 16.124.070. However, as one reads through the standards of the rest of this code section it clearly is oriented toward commercial...This condition also calls for following the practices of the Department of State Lands mitigation for preserving the significant trees in the wetland tracts A and B. No trees are being considered for removal. We ask that this condition be revised to state the applicant be allowed to use a mitigation plan approved by the DSL in lieu of a more typically required for other commercial and industrial developments.

Staff response: The landscape standard provides wide latitude for all new

development in Warrenton to meet site specific areas and different types of development. In addition, Section 16.124.070.A provides, *"Applicability. This section shall apply to all developments within the City of Warrenton"* and accordingly applies to the application. Although the specific code standards are more relevant to commercial and industrial, it doesn't absolve the applicant's responsibility to meeting the standard. Staff already compromised on the use of a DSL mitigation standard. Given the previous history of grading and removal of trees from the site prior to any permits being issued, and DSL potentially conducting an investigation into illegal activity, there is concern further degradation will occur without an approved wetland preservation plan and landscape plan. There is no valid reason to remove this condition.

Condition 5: Two street trees shall be installed per each issued single family permit on individual lots in the front yard in lieu of a planting strip. A certificate of occupancy shall not be issued until the trees are properly installed. A two year maintenance agreement with a local landscaping company shall be required and verified in the purchase and sale agreement (PSA) for each lot. Developer shall furnish a PSA template to verify the condition.

Sandridge argument: This condition calls for two street trees to be planted on each, which the applicant agrees to. However, rather than the developer engaging a landscaping company to monitor the trees vitality and replacement of trees that fail to survive for two years after planting, we propose the applicant be responsible for such monitoring and replacing as necessary. The applicant will post a performance security with the city to insure this requirement is fulfilled.

Staff response: Staff believes a third party that specializes in tree planting and maintenance (landscape company) provides better insurance to the future homeowners and the health of the trees. A purchase and sale agreement provides a legal instrument to convey and execute the requirement. A performance security is allowed per Code. Alternatively, the Commission could require cash (cashier's check) for the future value of 30 trees and maintenance as determined by the City per 16.216.090.B allows the City to set the estimated amount "as required to cover the cost of the improvements and repairs, including related engineering and incidental expenses." Otherwise, this condition should be upheld.

Condition 14: A secondary access at the existing gravel road shall be stubbed for future connection to Ridge Road. A 20 ft wide section of pavement shall be installed up to the property line for emergency turnaround. A non-remonstrance agreement shall be recorded for each lot to allow the formation of a local improvement district to finance the connection of a city street to TSP standards. In addition, the developer shall secure a 20 ft wide drivable surface public access for emergency access only to Ridge Road.

Sandridge's argument: This paved surface would be approximately 225 feet long and no emergency vehicle would travel that distance only to need to back up the same distance

to turnaround. Our concern is with the vagueness the way the condition is written.

Staff response: The Planning Commission was very concerned about emergency vehicle access and providing a secondary access to connect future development of the adjacent properties along Ridge Road. The Planning Commission is well within its role and discretion to require a secondary access for a development that has been phased to this degree and is also part and parcel of a variance request from the street length standard. Per WMC 16. 136.020.H & 16.120.020.J. This condition should be upheld.

In response to the concern of vagueness, staff has proposed rewording to the following:

A secondary access starting between Lots 1 & 2 shall be platted as a 50 ft right of way and continue west up to the subject property line and then continue using the existing gravel road that exits to Ridge Road. The developer shall be responsible for securing and documenting an easement or legal access. This road shall be designed to city street standards up to the subject property line and transition to a 20 ft drivable surface for emergency vehicles for the remaining length to Ridge Road. A non-remonstrance agreement shall be recorded for each lot to allow the formation of a local improvement district to finance the connection of a city street to TSP standards from the subject property line to Ridge Road.

RECOMMENDATION/SUGGESTED MOTION

Staff recommended and the Planning Commission approved 14 conditions of approval to ensure that the project would satisfy Development Code standards and criteria as well as ensure that it would not result in adverse impacts to the immediate area. Staff believes the conditions as amended are legally defensible, rational, and reasonable to accommodate future growth and development of new housing while protecting wetlands, wildlife, and public safety. Staff recommends that the appeal be denied and the Planning Commission's approval be upheld, with staff's recommended changes.

Suggested motion: *Based on the April 4, 2019 staff report to the Planning Commission, the record established by the Planning Commission in its review of Applications SUB 19-1, VAR 19-1, & WH 19-1, and the Agenda Summary for the June 25, 2019 City Commission public hearing, I move to deny Sandridge's appeal of the Planning Commission's decision, deny Mr. Rod Gramson's appeal, and uphold the approval with the modification to Condition 14 as recommended by Staff .*

ALTERNATIVE MOTION

Based on new evidence and issues identified on the June 25th public hearing, I move to continue the hearing (or close the hearing and continue deliberation) to the next City Commission meeting on July 9, 2019.

Rod Gramson Appeal

According to WMC 16.128.050.H appeals are heard by the City Commission and require the same notice procedures as the original hearing. Notice was mailed to affected property owners on May 30, 2019 and published in *The Columbia Press* on May 31, 2019. To date no comments have been received.

In general, Mr. Rod Gramson's appeal raises issues relative to numerous criteria not being met as opposed to specific issues with the conditions of approval. The appellant's arguments (abbreviated) are described below with a staff response.

Statement of Specific Issues Raised on Appeal:

1. *Appellant's Argument: The location of the subdivision at the end of a quarter mile long dead end street creates impedances to both ingress and egress, especially in the event of fire, flood, and earthquake, tsunami, medical...or other unexpected event.*

   Staff response: The Planning Commission addressed this concern and required a secondary access. See condition of approval No. 14. There is no specific Development Code criterion identified that, with the imposition of Condition 14, is not satisfied. The applicant established that the applicable criteria had been satisfied, and the appellant does not specify which criteria the application does not satisfy for the variance.

2. *Appellant's Argument: The platted lots cannot be developed without encroaching on Locally Significant Wetlands, which is a designated resource and adopted by the City to protect an extremely important community resource...."*

   Staff response: The Planning Commission approved findings of fact for a wetland hardship variance. The variance request is a last resort to allow development of a small fraction of the overall wetland environment. The applicant established that the applicable criteria provided for a wetland hardship variance in Section 16.156.080 had been satisfied, and the appellant has not identified one or more of those criteria that he disputes has been satisfied. In addition, pursuant to Section 16.08.030, which requires that the development "be consistent with the adopted Comprehensive Plan of Warrenton as implemented by this Code, and with applicable state and federal laws and regulations", the developer remains responsible for securing any and all applicable state and federal fill/removal permits prior to construction activities and to perfect the hardship variance request. Without such authorizations, the developer's project cannot proceed.

3. *Appellant's Argument: The proximity of the proposed houses to a large tract of conservation land, the property to the east containing Clear Lake, will increase the likelihood that domestic animals, especially dogs, will come onto NCLC*

property...."

Staff response: The Planning Commission approved a staff recommendation and request from NCLC to create a pilot wildlife fence. See discussion above and Condition No. 6. Further, the appellant does not identify one or more of the applicable criteria that the application does not satisfy by locating structures where proposed by the application.

Based on the lack of evidence, all of the conditions should be upheld.

Issues Concerning the Variance:

1. *Appellant's Argument: The existing dead end street, which was created via two prior variances to the same developer, is more than 1,500 feet long and already serves 28 lots, so the existing development is already 750% of the length standard more than 155% of the maximum dwelling unit standard....."*

   Staff response: The Planning Commission approved findings of fact in support of the variance. In addition, the Planning Commission required a secondary access to mitigate the impact of the variance request. See condition of approval No.14. The applicant established that the applicable criteria had been satisfied, and the appellant does not specify which criteria the application does not satisfy for the variance.

2. *Appellant's Argument: WMC 16.272.020 in part states that, "Prior variance allowed in the neighborhood shall not be considered by the granting authority in reaching its decision."*

   Staff response: Although the Planning Commission noted the pervious case history, the adopted findings of fact are based on the evidence in the record of the current request. and the existence of prior variances granted was not a basis for the variance approval.

Issues Concerning the Wetland Hardship Variance:

The appellant raises numerous issues relative to the approval and findings made in support of the wetland hardship variance. Although each issue raised is a valid concern, none of the arguments relate to any of the applicable criteria, provide sufficient new evidence to amend the conditions of approval or deny the issuance of the variance.

RECOMMENDATION/SUGGESTED MOTION

Staff recommended and the Planning Commission approved 14 conditions of approval to ensure that the project would satisfy Development Code standards and criteria as

well as ensure that it would not result in adverse impacts to the immediate area. Staff believes the conditions are legally defensible, rational, and reasonable to accommodate future growth and development of new housing while protecting wetlands, wildlife, and public safety. Ultimately, the conditions strive to strike a balance between two parties with differing viewpoints on how property should be developed but must be relative to the criteria. Staff recommends that the appeal be denied and the Planning Commission's approval be upheld, as modified.

FISCAL IMPACT

None

Approved by City Manager:

All supporting documentation, i.e., maps, exhibits, etc., must be attached to this memorandum.