



MEMORANDUM

To: Jenna Kay, Planner II/Shoreline Master Program Coordinator
From: Brent Davis, Wetland and Habitat Review Manager/Shoreline Administrator *BD*
Date: January 10, 2019
Subject: REVISED Analysis to Support Proposed Shoreline Map Amendments in the Shanghai Creek Basin

Introduction

The current Shoreline Map for Clark County includes a large area in the Shanghai Creek basin that was added to the map with the 2012 Shoreline Master Program update based on the 2005 Clark County Wetland Inventory. Shanghai Creek is not a Shoreline stream pursuant to RCW 90.58.030(2)(e), but is a tributary of Fifth Plain Creek. The confluence of Shanghai and Fifth Plain creeks is the point at which Fifth Plain Creek becomes a Shoreline stream. Potential wetlands mapped in the Wetland Inventory that are contiguous with the point downstream where Fifth Plain Creek becomes a Shoreline stream were added to the Shoreline Map, including a large area in the Shanghai Creek basin on the basis that these wetlands may be associated with the Shoreline stream.

In 2016 county staff coordinated with Ecology to determine that the downstream most wetland associated with the south side of Shanghai Creek is not associated to the Shoreline due to a hydrologic break that isolates the wetland from direct interaction with the waters in Fifth Plain Creek. Furthermore, case-by-case review of wetlands entirely within the Shanghai Creek basin have yet to identify a wetland associated to the Shoreline or Shorelands.

As part of the 2020 Periodic Update to the Shoreline Master Program, I have compiled data from the review of several properties located south of Shanghai Creek that are identified on the current Shoreline Map and performed some additional field review of publicly accessible hydrologic breaks caused by the existing roads and drainage infrastructure to support the proposed removal of all areas on the Shoreline Map that are south of Shanghai Creek and entirely within the Shanghai Creek basin (the study area). In addition, I have included a small area of mapped wetlands in the Lacamas Creek basin that has been confirmed to be uplands and since been developed into residential subdivision.

Velvet Acres

Velvet Acres is a recently platted subdivision that spans the divide between Shanghai and Lacamas Creeks at the western end of the study area. There are no wetlands in this subdivision (see Attachment C-1), therefore this area can be removed from the Shoreline Management Area map as proposed in Figure 1.

BFI Subdivision

The BFI Subdivision was platted in 2010. The site was subject to a wetland delineation at the time. No wetlands were identified on portions of the plat that are overlaid with the current shoreline map. One small wetland is shown in the southwest portion of the plat that outside the current shoreline map (see Attachment C-2).



8102 NE 211th Ave.

A residential building permit for a new home was granted on this property in 2014. Wetland and Habitat Review staff determined that there are no wetlands on this property (see Attachment C-3).

8018 NE 201st Ave.

A residential building permit for a home addition was granted on this property in 2019. Wetland and Habitat Review staff identified Wetland Unit I (Figure 1) and determined that it was not associated to the Shoreline Management Area.

Mapped Wetland Inventory in the Shanghai Creek Basin

The county has identified all likely wetlands in the portion of the Shanghai Creek basin south of the channel and West of NE 222nd Ave. and determined that none of these wetlands meet the criteria to be associated with the Shoreline Management Area associated with Fifth Plain Creek. Therefore, these areas can be removed from the Shoreline Management Area map as proposed in Figure 1.

Review of Wetland Units

Since the Shoreline Master Program adoption in 2012, County biologists have reviewed projects on numerous properties in the study area (see Figure 1). Wetland units have been mapped using the assessment unit guidelines in the 2014 Wetland Rating System for Western Washington. Some units have been modified as additional sites within the unit have been evaluated. This review is based on the most current assessment unit boundaries in the study areas. Two units south of NE 83rd St. have been mapped specifically for this review without on-site verification.

1. Unit A

Unit A is the downstream most wetland in this review. The downstream hydrologic break (Figure 3A) was initially established in 2016 based on analysis prepared by a AKS Engineering & Forestry and reviewed on site by Clark County and Ecology (see Attachment A). This unit is a slope wetland isolated from influence by Shanghai Creek, except for during extreme flood events, due to vertical separation from the channel and from the SMA by vertical separation from Fifth Plain Creek and upland terrace elevated above the Flood Hazard Area (1% probability).

The upstream limits of Unit A (Figure 3B) have recently been evaluated through off-site analysis provided by Ecological Land Services, Inc. and reviewed by county biologists.

2. Unit B

Unit B (Figure 3B) is a slope wetland isolated from influence by Shanghai Creek, except for during extreme flood events, due to vertical separation from the channel and from Unit A by a lateral ditch that captures and routes all surface and shallow ground water flows to Shanghai Creek. This unit is isolated from the SMA by Shanghai Creek. The county has not had an opportunity to review this unit on-site but the west and east breaks are clearly visible in aerial photography.

3. Unit C

Unit C (Figure 3B) is a slope wetland isolated from influence by Shanghai Creek, except for during extreme flood events, due to vertical separation from the channel and from Unit B by development that prevents east to west exchanges of hydrology. This unit is isolated from the SMA by Shanghai Creek. County biologists have been on-site in Unit C to verify the slope classification eastern extents. The western hydrologic break is clearly visible in aerial photography.

4. Unit D

Unit D is a slope wetland isolated from influence by Shanghai Creek, except for during extreme flood events, due to vertical separation from the channel and from Unit C by NE 202nd Ave. This unit is isolated from the SMA by Shanghai Creek. County biologists have verified that the culvert draining this unit (Figure 3B) to the west discharges to the roadside ditch on the west side of NE 202nd Ave. which drains directly to Shanghai Creek.

5. Unit E

Unit E is a slope wetland isolated from influence by Shanghai Creek, except for during extreme flood events, due to vertical separation from the channel and from Unit D by NE 212th Ave. This unit is isolated from the SMA by Shanghai Creek. County biologists have been on-site in Unit E and have verified that the culvert draining this unit (Figure 3B) to the west discharges directionally to the Unit D with a sufficient vertical drop to create a hydrologic break.

6. Unit F

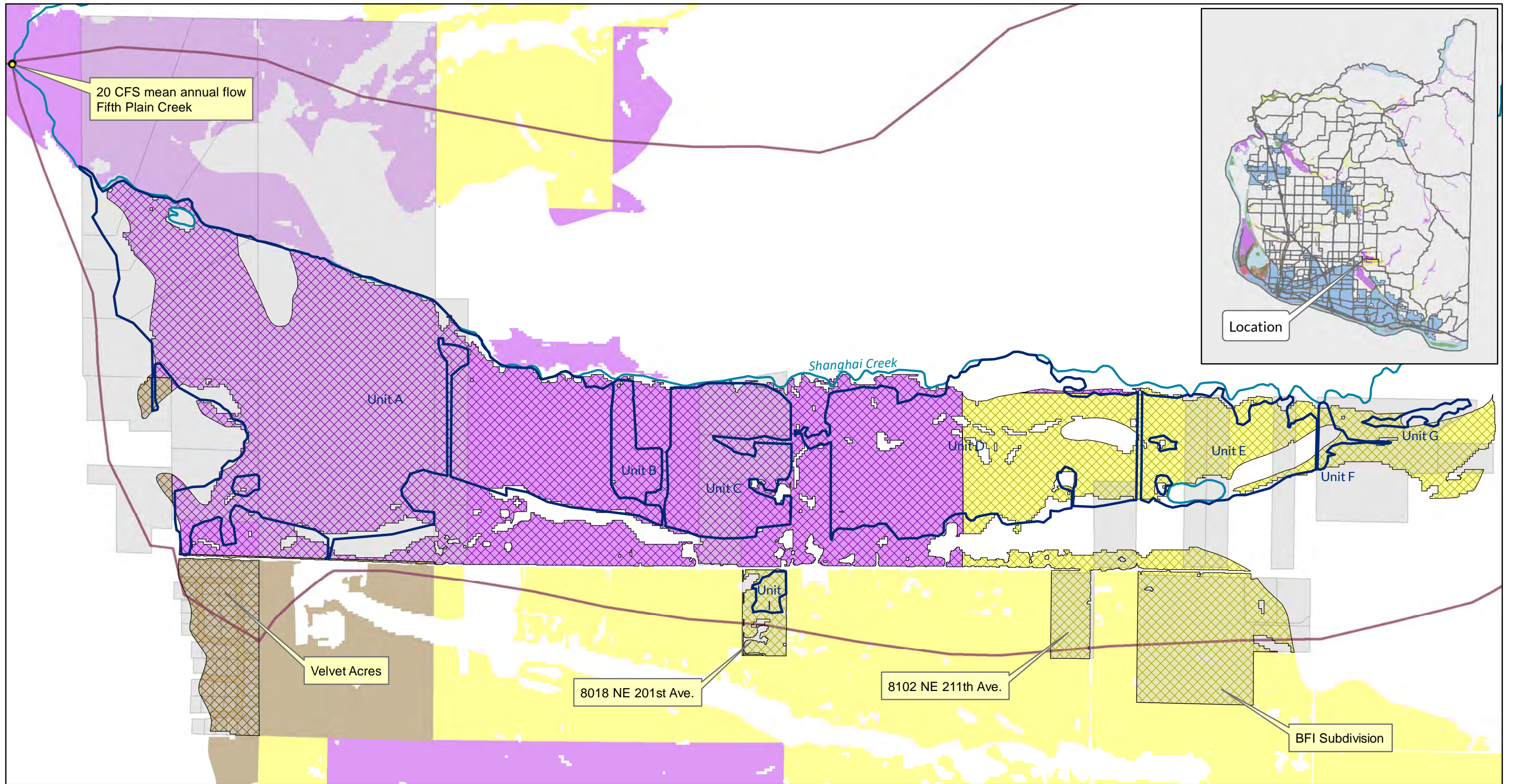
Unit F is a slope wetland isolated from influence by Shanghai Creek, except for during extreme flood events, due to vertical separation from the channel and from Unit E by a strip of upland at the western end. This unit is isolated from the SMA by uplands. County biologists have been on-site in Unit G and have verified the presence of the hydrologic break.

7. Unit G

Unit G (Figure 1) is a closed depression isolated from influence by Shanghai Creek and the SMA by uplands. This unit has been characterized by on-site review by county biologists.

8. Unit I

Unit I slope wetland isolated from influence by Shanghai Creek and the SMA by the hydrologic breaks created by the roadside ditch system along NE 83rd St. This unit has been characterized by on-site review by county biologists (see Attachment B).



Shoreline Designations

- Urban Conservancy
- Rural Conservancy Residential
- Rural Conservancy Resource Land

Areas to be Removed

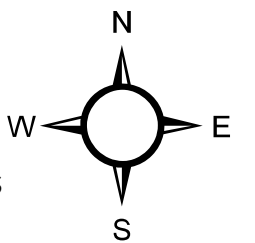
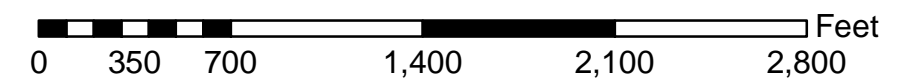
- Urban Conservancy
- Rural Conservancy Residential
- Rural Conservancy Resource Land

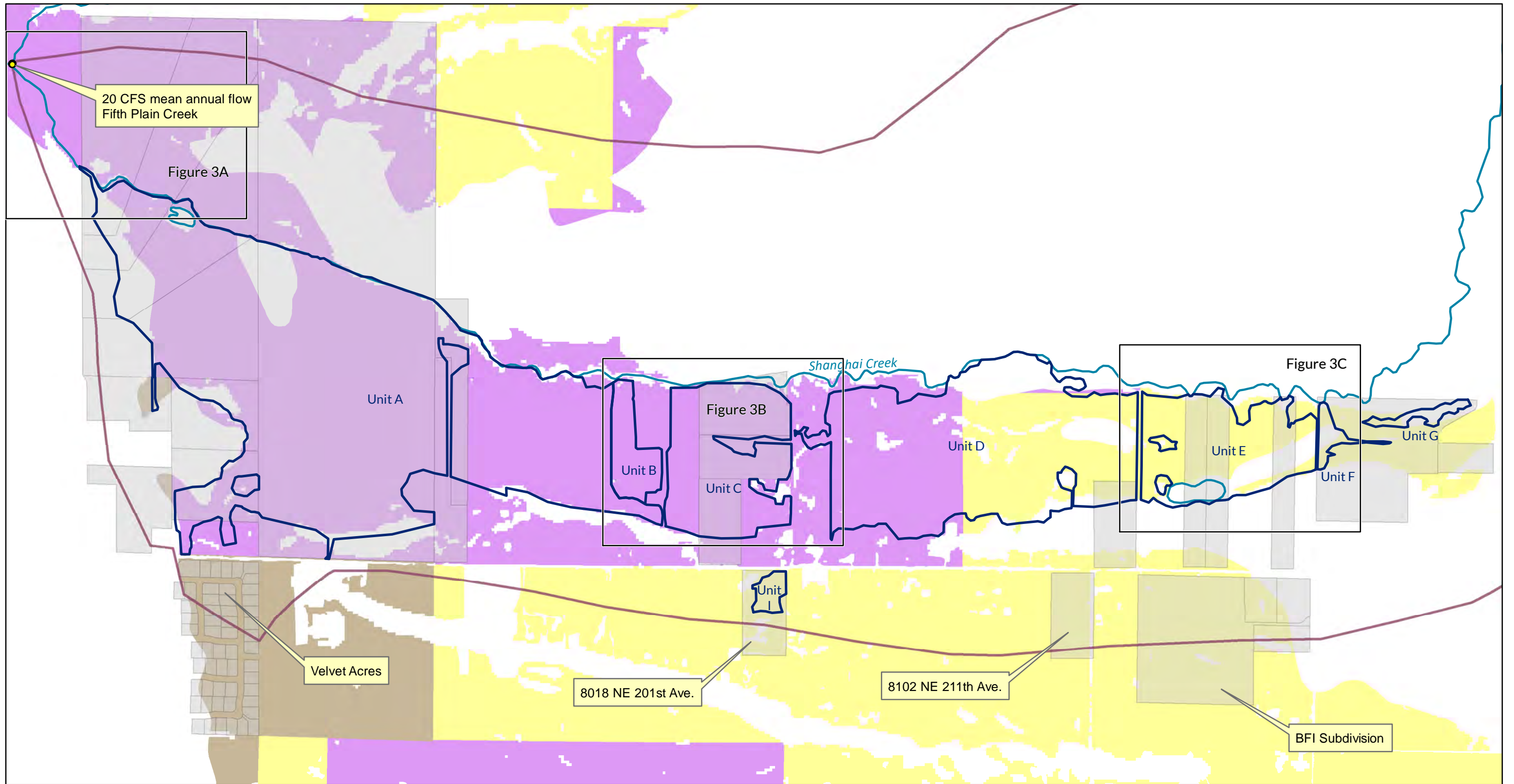
- Validated Wetland Assessment Units
- Properties Reviewed (Current SMP)
- Shanghai Creek Basin Limits



**2020 Shoreline Master Program Update
Shanghai Creek Shoreline Map Revisions**

Figure 1
Wetland Assessment Units and Proposed Map Revisions





Shoreline Designations

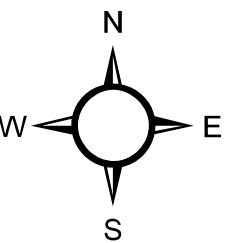
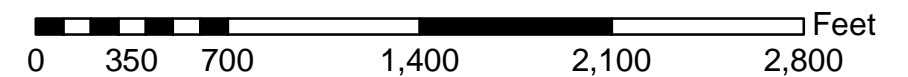
- Urban Conservancy
- Rural Conservancy Residential
- Rural Conservancy Resource Land

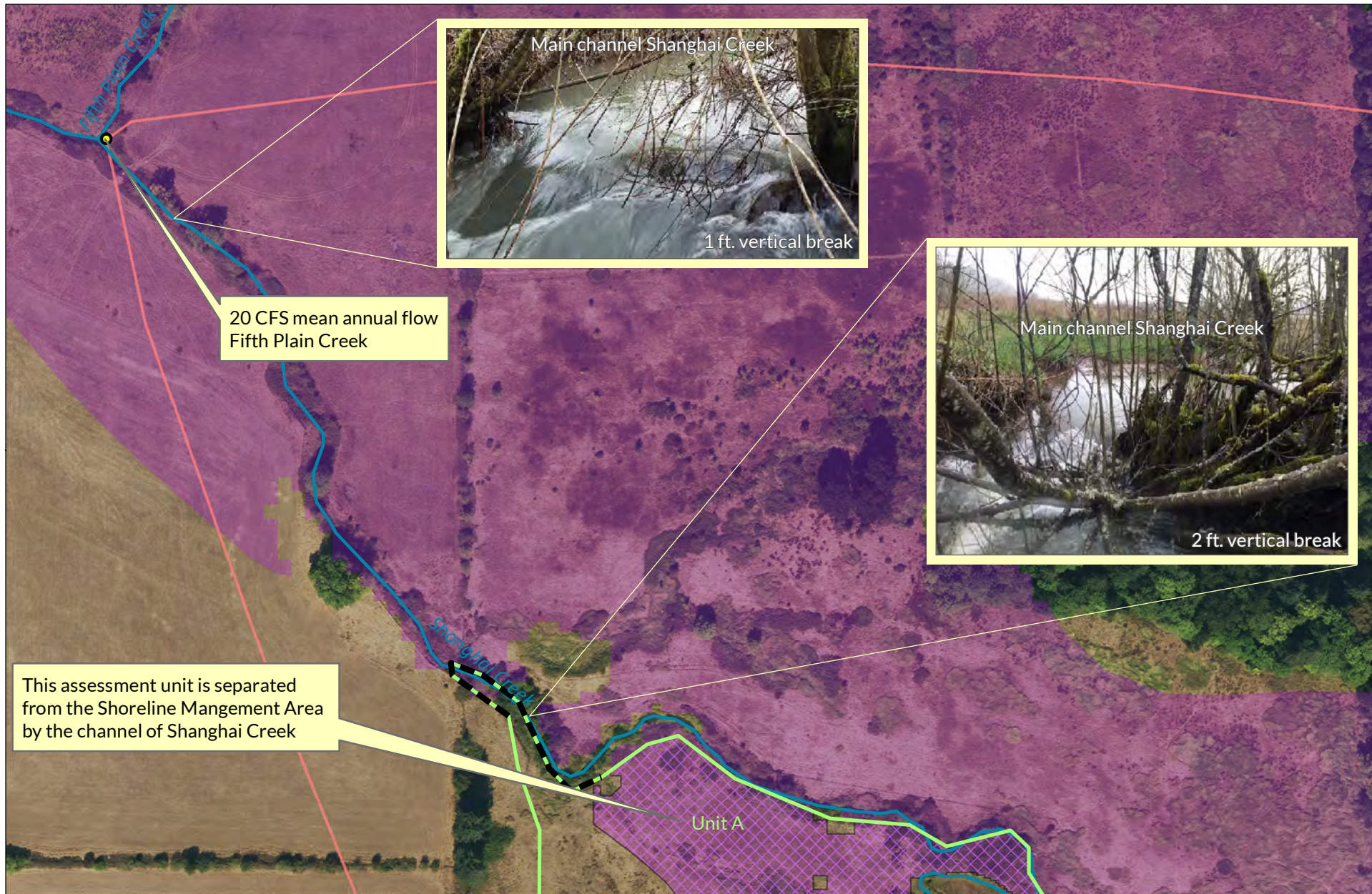
- Validated Wetland Assessment Units
- Properties Reviewed (Current SMP)
- Shanghai Creek Basin Limits



**2020 Shoreline Master Program Update
Shanghai Creek Shoreline Map Revisions**

Figure 2
Hydrologic Break Detail Sheet Index





Shoreline Designations

- Rural Conservancy Resource Land
- Areas to be Removed**
- Rural Conservancy Resource Land

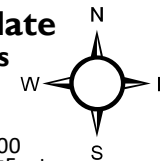
Validated Wetland Assessment Units

- Field Verified Hydrologic Break
- Shanghai Creek Basin Limits



**2020 Shoreline Master Program Update
Shanghai Creek Shoreline Map Revisions**

Figure 3A: Key Hydrologic Breaks - Detail







Shoreline Designations


 Rural Conservancy Resource Land

Areas to be Removed

 Rural Conservancy Resource Land

 Validated Wetland Assessment Units

 Field Verified Hydrologic Break

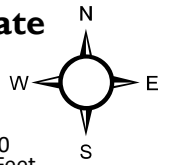
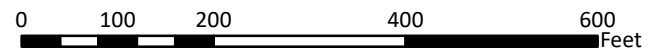
 Ditch

 Culverts



**2020 Shoreline Master Program Update
Shanghai Creek Shoreline Map Revisions**

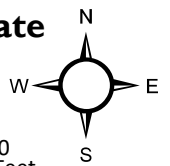
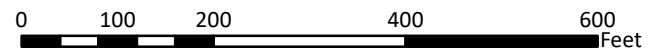
Figure 3B: Key Hydrologic Breaks - Detail





2020 Shoreline Master Program Update
Shanghai Creek Shoreline Map Revisions

Figure 3C: Key Hydrologic Breaks - Detail





IDENTIFIED HYDROLOGY FLOW

The site reconnaissance identified a total of six agriculture ditches that convey hydrology from the 4K wetland unit offsite and north to Shanghai Creek. Two ditches run north/south across the full extent of the offsite area (Ditch 1 and Ditch 2), two ditches run east/west (Ditch 3 and Ditch 4), one ditch runs north/south before turning west/northwest (Ditch 5), and one short ditch (Ditch 6) connects an agriculture pond (AG Pond) pond to Shanghai Creek. Ditch 3 has two sections, Ditch 3 West and Ditch 3 East. Ditch 3 captures hydrology from the northern portion of the onsite 4K Wetland, and conveys it north into Ditch 1.

Hydrology from the eastern portion of the wetland unit is conveyed north/northwest by Ditches 1-4. The hydrology collected by Ditches 1, 2, and 3 is conveyed north to Ditch 4, where the flow merges just prior to flowing down into the AG Pond. Ditch 6 provides a direct connection between the AG Pond and Shanghai Creek.

Hydrology from the western portion of the wetland unit is conveyed by Ditch 5. Ditch 5 is surrounded by two upland areas (Upland 1 and Upland 2). These two upland areas (262-foot contour) are approximately two to four feet higher in elevation than the adjacent wetland unit (258-foot contour), as represented by Clark County GIS topography data (Figure 2). Runoff from these upland areas flows down to the toe of the slope associated with the uplands and into Ditch 5. Ditch 5 conveys hydrology from the western portion of the wetland unit and after passing through a culvert outfalls to Shanghai Creek.

Uplands

Four upland areas were documented during the offsite reconnaissance (Figure 1). Data collected at the "sample plot" locations (SP-1, SP-2, SP-3 and SP-4) are as follows. Also see representative site photos attached of the upland areas.

Location	Soils	Vegetation	Hydrology
SP-1	10YR 4/4, 0-16"	Douglas-fir Orchard grass Himalayan blackberry Common dandelion Common buttercup	None
SP-2	10YR 4/4, 0-16"	AG pasture grass	None
SP-3	10YR 3/4, 0-16"	AG pasture grass	None
SP-4	10YR 3/4, 0-16"	AG pasture grass	None

Ditch Measurements

The below table documents the width and depth of the offsite AG Ditches as documented during the site reconnaissance. The length and width data for the ditches was collected in order to document the size of the ditches, as well as provide an indicator of the approximate flow volume that seasonally flows through the wetland unit. Also see representative site photos attached of the Ditches.

Location	Data Point	Width (feet)	Depth (inches)	Notes:
Ditch 3	1	2	6	West portion of Ditch 3
Ditch 3	2	3	7	West portion of Ditch 3
Ditch 3	3	5	7	West portion of Ditch 3

Ditch 1	4	11	11	Junction of E and W Ditch 3
Ditch 1	5	2	5	East portion of Ditch 3
Ditch 1	6	11	11	
Ditch 1	7	10	13	
Ditch 1	8	9	16	
Ditch 1	9	9	16	
Ditch 1	10	9	14	
Ditch 1	11	9	12	At old east/west fence line
Ditch 1	12	9	13	
Ditch 4	13	11	21	Runs east/west
Ditch 4	14	16	30	
Ditch 5	18	8	16	Runs north/south/west
Ditch 6	15	4	30	Connects pond to S. Cr.
Ditch 1 culvert	16		9	South of culvert
Ditch 1 culvert	17		4	North of culvert

IDENTIFIED CHANGES IN ELEVATION

Survey Data Collection

The elevations of three points along the 4K northern boundary were surveyed. Additionally, the elevations of seven points across offsite locations were surveyed. The seven offsite points were surveyed in an effort to document the change in elevation within the wetland unit, and along Shanghai Creek. The survey points were identified locations in the field where hydrology flow patterns were observed to change, or drop in elevation, and therefore generally change from bi-directional flow to unidirectional flow. The elevations of the points were surveyed with a laser level. The northwest corner of the 4K parcel was used as the baseline point for the survey.

Survey Point Locations	Baseline Elevation (ft.)	Relative Elevation	Difference in Elevation Between Points
E1 (NW property corner of 4K property)	2.02 (at E1)	0 (at baseline)	
E2 (mid-point of N. 4K parcel boundary)		-0.78	
E3 (NE property corner of 4K property)		-2.26	
E4 (Northern extent of Ditch 1)		-8.18	-1.4'
E5 (Eastern edge of AG Pond at Ditch 4)		-9.58	
E6 (AG Pond)		-9.20	-1.82'
E7 (Top of Break 1 – Shanghai Cr.)		-11.02	
E7 (Top of Break 1 – Shanghai Cr.)		-11.02	-2.02' (Break 1)
E7 (Bottom of Break 1 – Shanghai Cr.)		-13.04	
E8 (Top of Break 2 – Shanghai Cr.)		-13.94	-1.03' (Break 2)
E8 (Bottom of Break 2 – Shanghai Cr.)		-14.97	
E8 (Bottom of Break 2 – Shanghai Cr.)		-14.97	-0.17'
E9 (Confluence of Shanghai Creek and Fifth Plain Creek/Upper Fifth Plain Creek)		-15.14	
Totals		-15.14	-6.27

The total difference across the points listed represents the change in elevation from the point within the wetland unit where bi-directional flow changed to unidirectional flow. The unidirectional flow of Shanghai Creek would need to gain over 6 feet in elevation to reach the bi-directional flow area of the wetland unit.

Survey Data Collection Summary

At point E7, a change of over 2 feet was documented (-2.07). At point E8, a change of an additional 1-foot was documented (-1.03'), with another 0.17' drop documented at the confluence of Shanghai Creek and Fifth Plain Creek. This data shows that within approximately 1,800 feet east of the confluence of Fifth Plain Creek (Type S), Shanghai Creek (Type F) increases in elevation by 3.22 feet. These documented changes in elevation along Shanghai Creek are considered significant, and therefore represent a break in hydrology between the Type S water (shoreline) and the Type F water. See representative site photos attached documenting the elevation survey points and Break 1 and Break 2.

Hydrology Flow Direction

The elevation survey documented a drop in elevation of 9.58' from the 4K northwestern property corner (E1) to the eastern boundary of the offsite pond (E5). Due to this change in elevation from west to east, a portion of the onsite 4K wetland hydrology flows to the northeast property corner and out to Ditch 1. The lowest elevation within the wetland unit across the open field north of the 4K property is generally the 260-foot elevation contour. The elevation drops from the wetland in the field by approximately 2 feet to the water level within Shanghai Creek.

The hydrology flow directions are depicted on Figure 2 (4K Shorelines JD Topo Map) for the onsite and offsite portions of the wetland unit associated with the 4K wetland. The ditches combined with the presence of two upland areas (Upland 1 and Upland 2) located above the 256-foot elevation contour (Figure 2) help to convey the wetland hydrology to two main points along the southern bank of Shanghai Creek. These points are depicted on Figure 1 and 2 as "E6" and "E7."

SUMMARY

Identified Breaks

The offsite reconnaissance determined that the 4K Wetland hydrologically generally flows to the north (offsite) through historic agriculture ditches. The slope documented across the offsite field, north of the 4K site, is generally 1 percent (north to south) and the hydrology is therefore allowed to generally flow bi-directionally across this open field and the ditches. When Ditches 1-3 join and flow into Ditch 4, there is unidirectional flow west until the hydrology drops to the AG Pond. The fall into the AG Pond (survey points E4 to E6) documents a drop in elevation of approximately 1.02 feet, or 9.58 feet below that of the 4K Wetland. The pond is separated from Shanghai Creek by a berm approximately 4 feet tall. The AG Pond is a temporary settling point (or bi-directional flow) for the hydrology, as Ditch 5 allows a direct connection to the Shanghai Creek from the AG Pond. Once the hydrology leaving the AG Pond flows out to Shanghai Creek, the flow is again unidirectional, flowing west.

West of the AG Pond, two changes in elevation within the main channel of Shanghai Creek were observed and documented at survey points; E7 top/E7 bottom, and E8 top/E8 bottom. The change in elevation between the AG Pond (E6) and E7 top was -1.82 feet. From E7 top to E7 bottom the change in elevation was -2.02'. This change in the water elevation of over two feet was considered significant, and documented as "Break 1" (Figure 1)

The change in elevation between E8 top and E8 bottom was -1.03'. This change in the water elevation of over one foot within the main channel of Shanghai Creek was considered significant, and documented as "Break 2".

The overall difference in elevation documented between Ditch 4 within the wetland unit (the location where bi-directional flow is lost), to survey point E8 bottom (Break 2) is over six feet. The elevation difference and the loss of bi-directional flow across this area is considered significant enough to be considered a "break" in the wetland hydrology between the 4K Wetland and Shanghai Creek, and the downstream Shoreline waters of the state (Fifth Plain Creek). Therefore, the criteria for associated wetlands is not met, and the 4K wetland unit can be separated from that of the Fifth Plain Creek Shoreline designation.

Associated wetlands are defined as *"those wetlands which are in proximity to and either influence or are influenced by waters of a lake, river or stream subject to the SMA."*

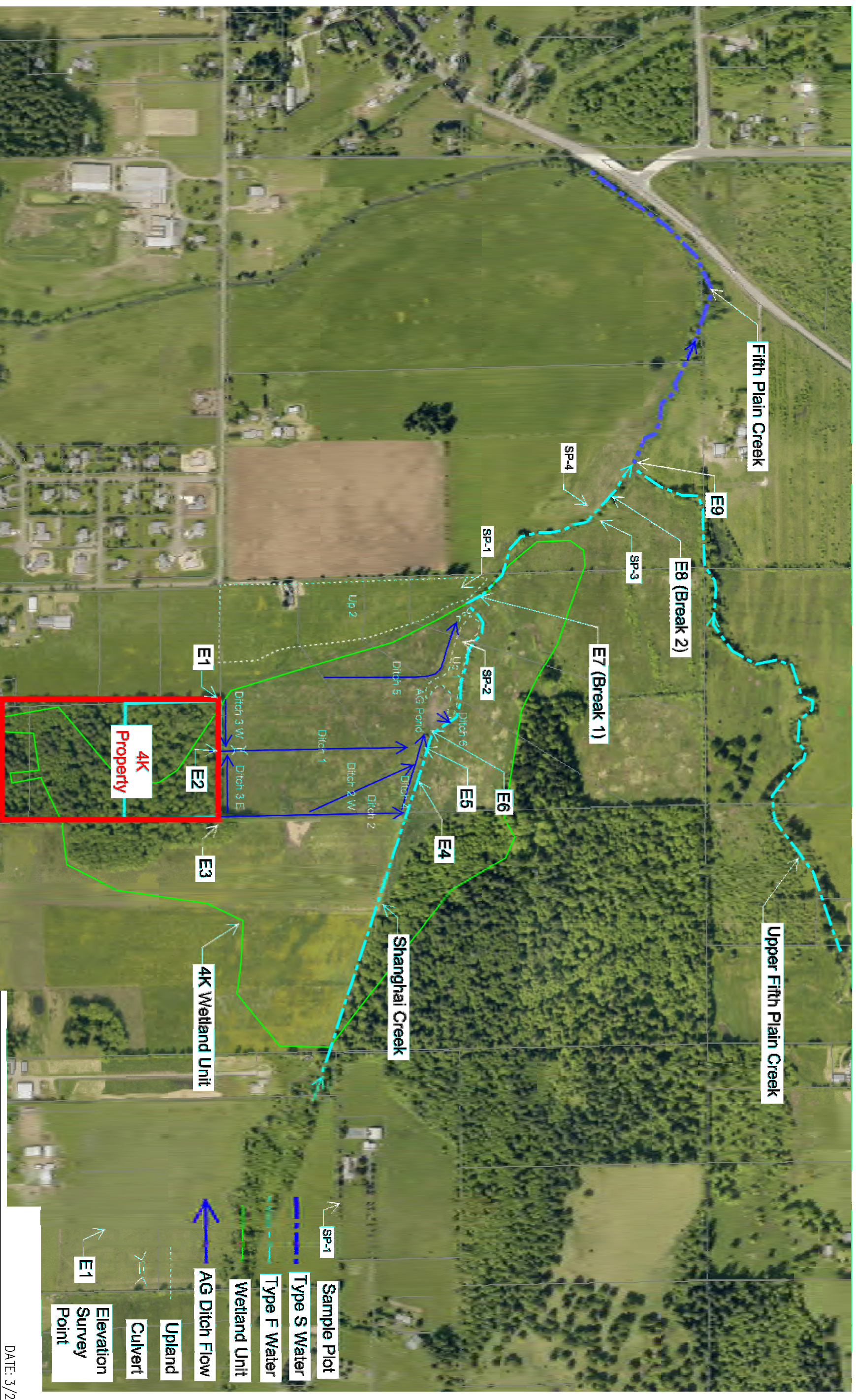
The 4K Wetland hydrology is conveyed to Shanghai Creek and the Shoreline waters of the state (and therefore influences it), but the "Shoreline waters" do not flow bi-directionally up to the 4K wetland unit, and therefore the 4K Wetland is not influenced by "Shoreline waters."

For this reason, the 4K Wetland does not meet the criteria for an associated wetland, and should not be considered a Shoreline of the state, and should not be regulated by the Shoreline Management Act (SMA).



Andrea Aberle, Sr. Biologist/Project Manager
aberlea@aks-eng.com

Attachments



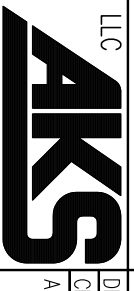
DATE: 3/25/2016

4K SHORELINES JD MAP

FIGURE

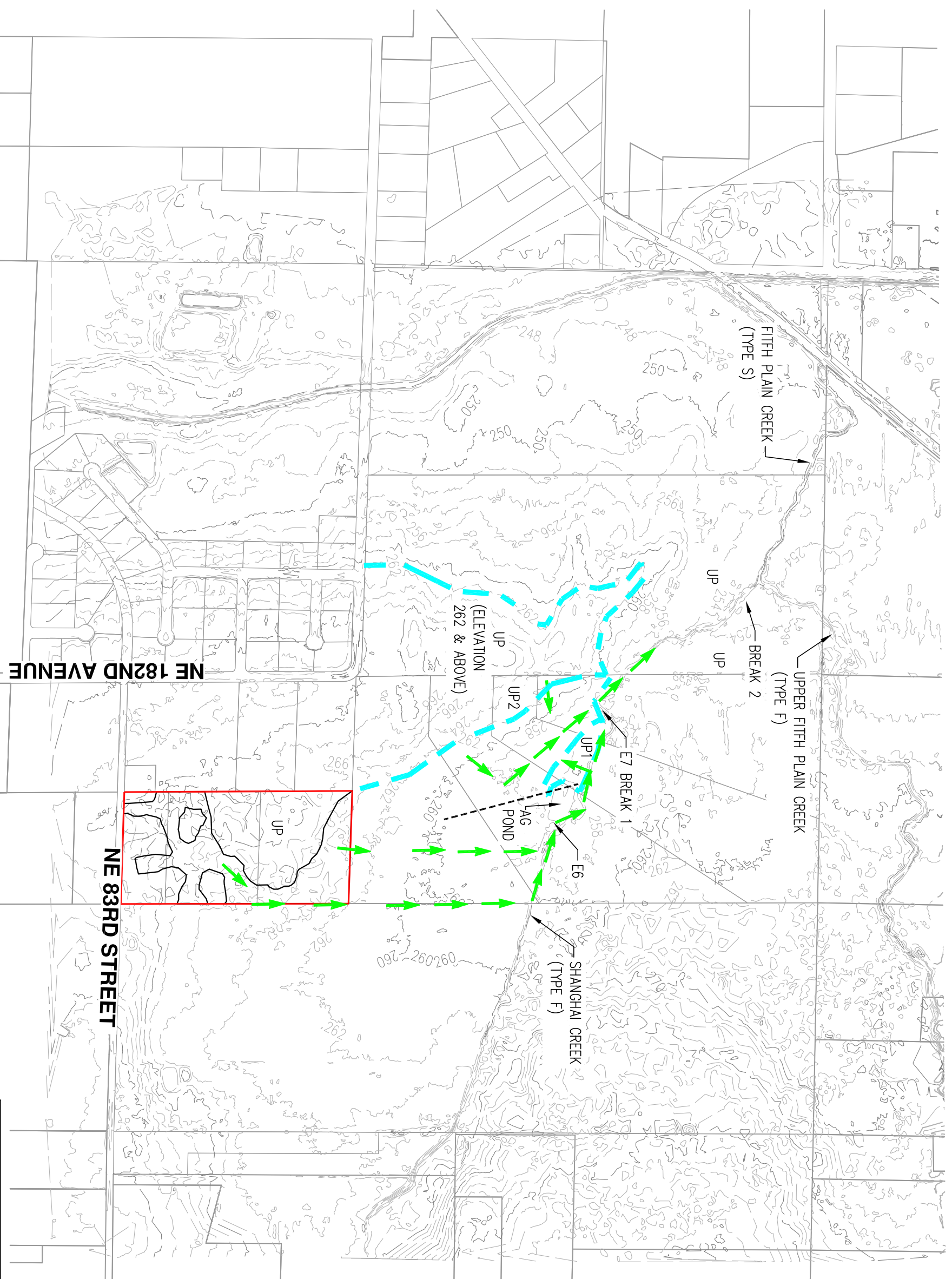
AUSTIN HERIGAGE





AKS ENGINEERING & FORESTRY SALEM-KEIZER, LLC
 4300 CHERRY AVE NE
 KEIZER, OR 97303
 P: 503.400.6028 F: 503.400.7722 aks-eng.com



DRWN: SKW
 CHKD: AA
 AKS JOB: 4702

1



- LEGEND**
-  HYDROLOGY FLOW DIRECTION
 -  APPROXIMATE BREAK IN FLOW DIRECTION
 -  UPLANDS LOCATED NEAR 256' & 258' CONTOURS
 -  ELEVATION SURVEY POINT

NOTES

1. THE WETLAND UNIT HYDROLOGY FLOW IS CONVEYED TO EITHER POINT E6 OR E7 BY THE DITCHES PRESENT ON SITE.
2. CONTOURS PROVIDED BY CLARK COUNTY GIS.

4K SHORELINES JD TOPO MAP

DATE: 3/25/2016

FIGURE

AUSTIN HERIGAGE

AKS ENGINEERING & FORESTRY SALEM-KEIZER, LLC
 4300 CHERRY AVE NE
 KEIZER, OR 97303
 P: 503.400.6028 F: 503.400.7722 dks-eng.com



2

DRWN: SKW
 CHKD: AA
 AKS JOB: 4702



Photo 1.

View south of the forested wetland present on the northern portion of the 4K property. Photo taken from the field north and off site of the 4K property.



Photo 2.

View west across Ditch 3. Ditch 3 collects hydrology from the 4K wetland and conveys it north to Ditch 1.



Photo 3.

Representative photo of hydrology present within Ditch 1, Data point 9.



Photo 4.

Representative photo of hydrology present within Ditch 1, Data point 11. Approximate width of channel is 9 feet, and depth 12 inches.



Photo 5.

View south down Ditch 2 from the northeast property corner associated with the northern 4K parcel. The E3 survey point was also at this location.



Photo 6.

View south down Ditch 2 from the fenceline near Shanghai Creek. Ditch 2 flows directly into Shanghai Creek north of this fenceline.



Photo 7.
View west down Shanghai Creek from
location directly north of Ditch 4.



Photo 8.
View west down Shanghai Creek from
location directly north of AG Pond.



Photo 9.
View east down Ditch 4 from location just
above AG Pond. Ditch 4 flows into AG Pond.
Survey point E5 located just east of AG Pond.
Location where Ditch 4 falls into AG Pond.



Photo 10.

View west down Ditch 4 toward AG Pond.



Photo 11.

Ditch 6 is visible in bottom left corner of photo. Ditch 6 connects the AG Pond to Shanghai Creek.



Photo 12.

View west across AG Pond. Measurement denotes the upland berm height (3' 9") associated with the north side of the AG Pond. The upland area continues west of the pond "Upland 1" on the site map.



Photo 13.

View west of the Douglas-fir line present along the western boundary of the "Upland 2" area (See Figure 1). The Ditch 5 hydrology runs along the toe of this upland slope before flowing through a culvert and joining the bi-directional flow of Shanghai Creek.



Photo 14.

View across the northern tip of the "Upland 2" area. The culvert that conveys the Ditch 5 hydrology is located just below the fence post visible in right side of photo.

The first drop over 2 feet in elevation within of Shanghai Creek ("Break 1") is located within the tall shrubs in the center of photo.



Photo 15.

View of the metal corrugated culvert (top of photo) present at the northern extent of Ditch 5. The wetland hydrology present within Ditch 5 is conveyed through this culvert to Shanghai Creek.



Photo 16.

View of the channel present directly north of the corrugated culvert associated with the northern extent of Ditch 5. The convergence of the Ditch 5 hydrology (side channel) and Shanghai Creek is visible in upper right of photo.



Photo 17.

Photo of "Break 1". Drop in elevation at this location was documented by laser level survey to be over 2 feet.



Photo 18.

Photo of “Break 2”. Drop in elevation at this location was measured by laser level survey to be over 1-foot.



Photo 19.

Photo of agriculture fields that flank the “Break 2” location along Shanghai Creek.



Photo 20.

Photo of soils documented at SP- 3 within agriculture fields that flank the “Break 2” location along Shanghai Creek.



Photo 21.

Photo of the agriculture fields that flank the “Break 2” location along Shanghai Creek.



Photo 22.

Photo of the agriculture fields that flank the “Break 2” location along Shanghai Creek.



Photo 23.

Photo of the agriculture fields that flank the “Break 2” location along Shanghai Creek.



Photo 24.

Photo of the agriculture fields that flank the “Break 2” location along Shanghai Creek.



Photo 25.

Photo of the agriculture fields that flank the “Break 2” location along Shanghai Creek.



Photo 26.

Photo of soils documented at SP-4 within agriculture fields that flank the “Break 2” location along Shanghai Creek.

Item	Action	Value
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Aug 28, 2019 15:12:37 - Ariel Whitacre

Perform Review

Assignments

Ariel Whitacre	Delete
Lance Watt	Create

Sep 13, 2019 11:19:44 - Lance Watt

Perform Review

Complete

Outcome

Accepted with Conditions

Date Completed

Sep 13, 2019 11:19:39

Notes

Review Approval Note Unlocked

Create

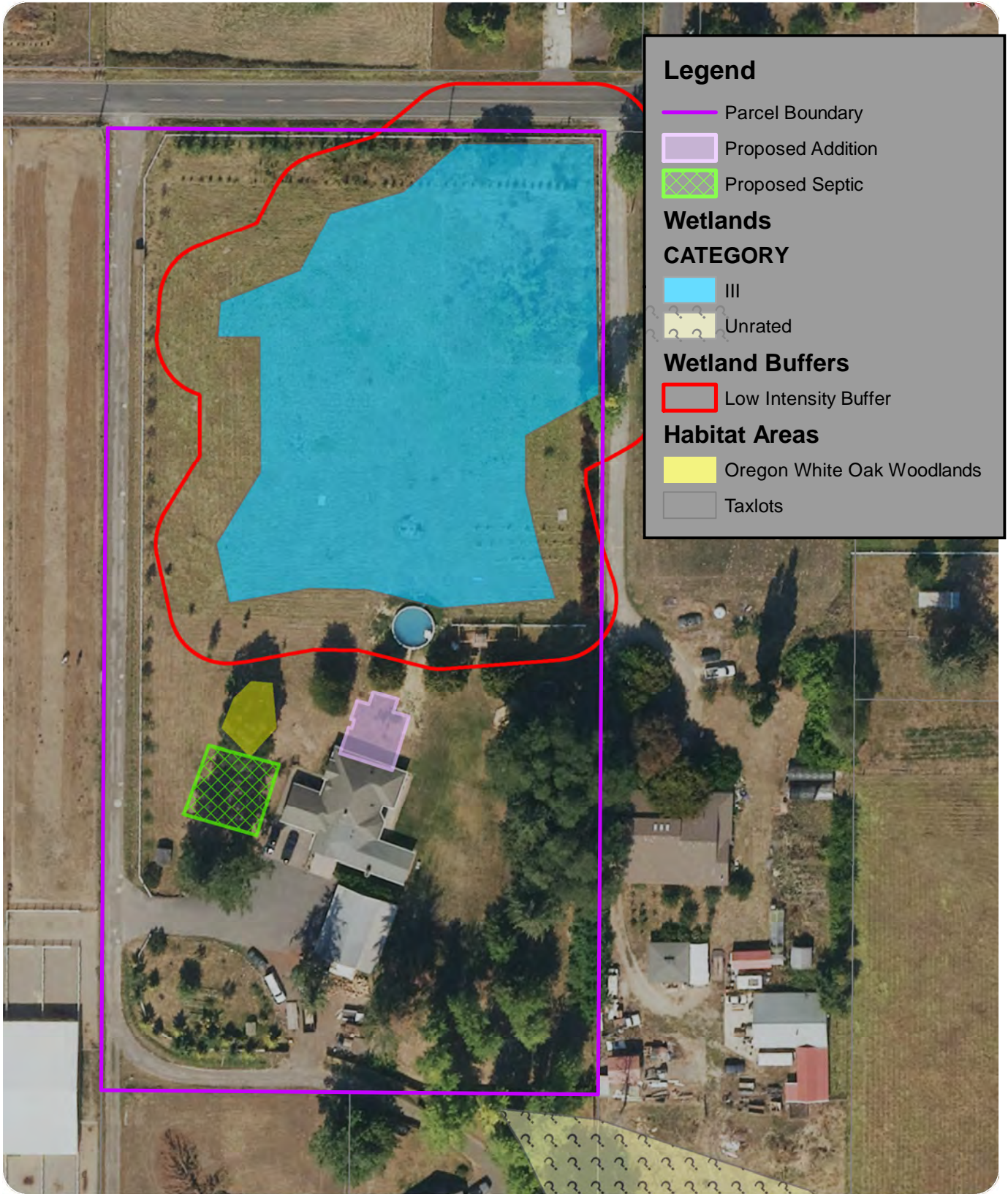
Proposed addition avoids wetland buffers (see attached map). The wetland is within the subwatershed for Shanghai Creek. There is a hydrologic break for the wetland at NE 83rd Street; additionally a hydrologic break was established for Shoreline for Shanghai Creek further to the north and west. The wetland is found to not be associated with Shoreline; no further wetland review required.

The proposed septic addition appears to avoid the drip line of the Oregon white oak onsite. If this changes and impacts are drip line of the oak is impacted then additional habitat review may be required.

Sep 30, 2019 07:18:59 - William Anderson

Perform Review

Review Complete Process ID	from:	
	to:	25106940



Kovalenko Addition

ADS-2019-00319

Drawn By:
wattl
Sheet
X of Y
9/13/2019

Attachment C-1 VELVET ACRES SUBDIVISION PHASE 1

A SUBDIVISION IN A PORTION SW 1/4 OF THE SE 1/4 OF SECTION 6 T. 2 N., R. 3 E., W. M., CLARK COUNTY, WASHINGTON
SHEET 2 OF 4



LINE	BEARING	DISTANCE
L1	S 70°33'36" E	42.33
L2	N 70°49'25" E	42.33
L3	N 70°49'25" E	52.56
L4	N 70°49'24" E	42.33
L5	S 70°33'36" E	42.33
L6	S 00°18'03" E	1.00
L7	S 44°27'18" E	31.80
L8	S 80°27'09" E	1.18
L9	S 00°18'03" E	17.89
L10	S 40°13'37" W	40.92
L11	S 00°18'03" E	18.79
L12	N 47°39'37" W	48.60
L13	N 80°12'17" W	29.18
L14	N 00°00'00" E	16.92
L15	S 40°13'37" W	49.12
L16	N 80°12'17" W	20.30
L17	N 00°18'03" E	15.40
L18	N 43°52'21" E	42.71
L19	N 80°12'17" W	16.04
L20	S 00°18'03" E	21.37
L21	S 43°58'02" W	52.76
L22	N 80°12'17" W	21.42
L23	N 80°12'17" W	14.44
L24	S 40°09'40" E	42.89
L25	S 00°18'03" E	14.41

LINE	BEARING	DISTANCE
L26	N 80°12'17" W	13.78
L27	N 43°06'30" W	52.78
L28	S 00°18'03" E	18.86
L29	S 00°18'03" E	8.27
L30	S 40°18'18" W	43.42
L31	S 80°12'17" E	8.80
L32	N 80°12'17" W	13.81
L33	S 40°13'37" E	49.21
L34	N 00°18'03" E	12.11
L35	N 00°18'03" E	14.31
L36	N 43°06'30" E	47.42
L37	N 80°12'17" W	10.62
L38	N 01°47'42" E	21.02
L39	S 43°21'54" W	51.08
L40	N 80°12'17" W	18.50
L41	N 80°12'17" W	16.80
L42	N 44°30'06" W	43.30
L43	S 01°47'42" E	10.29
L44	N 80°12'17" W	12.20
L45	N 40°14'17" E	87.54
L46	S 00°18'03" E	8.40
L47	N 80°12'17" E	8.42
L48	N 80°12'17" W	3.00
L49	N 00°18'03" E	52.54
L50	S 80°12'17" E	20.00



- LEGEND:**
- INDICATES MONUMENT FOUND AS NOTED
 - INDICATES 1/2" x 24" REBAR WITH YELLOW PLASTIC CAP INSCRIBED "313269477" SET
 - ⊕ INDICATES ROCK NAIL WITH BRASS WASHER INSCRIBED "PLS 35477" SET AT THE EXTENSION OF LOT LINE IN THE CURB FOR THE PURPOSE OF WITNESS CORNER
 - ⊙ INDICATES CALCULATED POSITION NOTHING SET
 - R/W INDICATES RIGHT-OF-WAY
 - ⊗ INDICATES ABANDON SEPTIC SYSTEM
 - ⊕ INDICATES ABANDON WELL
 - ⊙ INDICATES SIGHT DISTANCE ENVELOPE
 - S.F. INDICATES SQUARE FEET
 - ⊕ INDICATES 1/2" x 24" REBAR WITH YELLOW PLASTIC CAP INSCRIBED "313269477" SET AS 4.00 FOOT WITNESS CORNER



MINISTER AND GLAESER SURVEYING, INC. MAKES NO WARRANTIES AS TO MATTERS OF UNWRITTEN TITLE SUCH AS ADVERSE POSSESSION, ACQUISITION, ESTOPPEL, ETC.
A FIELD TRAVERSE WAS PERFORMED USING A FIVE SECOND TOTAL STATION. THE FIELD TRAVERSE MET THE MINIMUM STANDARDS FOR SURVEYS AS DESIGNATED BY M3C 332-130-060. ALL CORNERS NOTED AS FOUND WERE VISITED ON 10-11-15.

MINISTER-GLAESER SURVEYING, INC.
2200 S. EVERGREEN BLVD.
VANCOUVER, WA 98661
(360) 694-3313

JOB NO: 13-352
DATE: 7-18-18
CALC BY: DAD
DRAWN BY: DEEL
CHECKED BY: DAD
FILE: 130320-1.DWG

Attachment C-1 VELVET ACRES SUBDIVISION PHASE 2

A SUBDIVISION IN TRACT "C" OF VELVET ACRES SUBDIVISION PHASE-1 311-971 IN A PORTION SW 1/4 OF THE SE 1/4 OF SECTION 6 T. 2 N., R. 3 E., W. M., CLARK COUNTY, WASHINGTON SHEET 2 OF 3

NOTE: SEE SHEET 3 OF 3 FOR LINE AND CURVE TABLES

SURVEY REFERENCES:

- 1) WRITTEN SURVEY BOOK 37 PAGE 65
- 2) MOEY'S GARDEN BOOK 3 PAGE 322
- 3) BENTON SURVEY BOOK 53 PAGE 174
- 4) LAWSON SURVEY BOOK 17 PAGE 143
- 5) BENTON SURVEY BOOK 44 PAGE 168

DEED REFERENCE:

GRANTOR: HINTON DEVELOPMENT
 GRANTEE: GARY BOLDT
 APN: 5407937
 DATE: 5-30-2017

LEGEND:

- INDICATES FOUND AND HELD 1/2" x 24" REBAR WITH O.DENNY CAP 35477.
- ⊙ INDICATES 1/2" x 24" REBAR WITH YELLOW PLASTIC CAP INSCRIBED "D DENNY 35477" SET
- ⊙ INDICATES ROCK NAIL WITH BRASS WASHER INSCRIBED "PLS 35477" SET AT THE EXTENSION OF LOT LINE OR THE CURB FOR THE PURPOSE OF WITNESS CORNER
- R/W INDICATES RIGHT-OF-WAY
- SOE INDICATES SIGHT DISTANCE ENVELOPE
- S/E INDICATES SQUARE FEET
- INDICATES 1/2" x 24" REBAR WITH YELLOW PLASTIC CAP INSCRIBED "D DENNY 35477" SET AS 5.00' FOOT WITNESS CORNER UNLESS OTHERWISE NOTED.



MINISTER-GLAESER SURVEYING INC.
 2200 E. EVERGREEN BLVD
 VANCOUVER, WA 98661
 (360) 694-3313

JOB NO: 13-322
 DATE: 2-1-18
 CALC BY: JAD
 DRAWN BY: JAD
 CHECKED BY: JAD
 FILE: 13-322-2.DWG

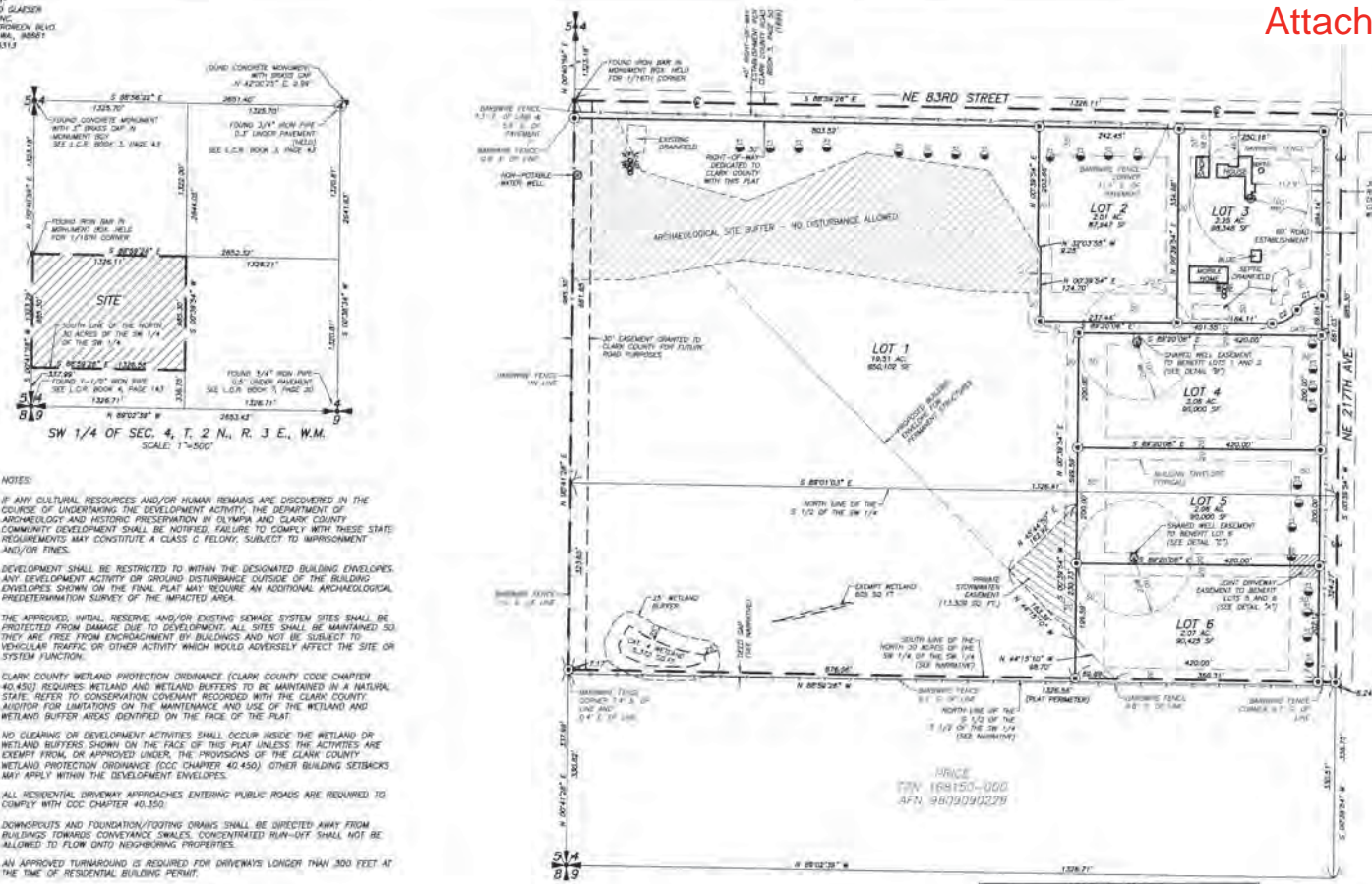


MINISTER AND GLAESER SURVEYING, INC. MAKES NO WARRANTIES AS TO MATTERS OF UNWRITTEN TITLE SUCH AS ADVERSE POSSESSION, ACQUESCENCE, ESTOPPLE, ETC.
 A FIELD TRAVERSE WAS PERFORMED USING A FIVE SECOND TOTAL STATION. THE FIELD TRAVERSING MET THE MINIMUM STANDARDS FOR SURVEYS AS DESIGNATED BY WAC 332-130-010. ALL CORNERS NOTED AS FOUND WERE VISITED ON 10-11-15.

Attachment C-2 BFI SUBDIVISION

A SUBDIVISION IN A PORTION OF THE SW 1/4 OF THE SW 1/4 OF SECTION 4, T. 2 N., R. 3 E., W. M., CLARK COUNTY, WASHINGTON
JOB NO. 09-020 DATE: 3-10-10

PREPARED BY:
MINISTER AND GLAESER
SURVEYING, INC.
2200 E EVERGREEN BLVD
HANOVER, WA, 98043
(360) 594-5313



SW 1/4 OF SEC. 4, T. 2 N., R. 3 E., W. M.
SCALE: 1"=500'

- NOTES:
- 1) IF ANY CULTURAL RESOURCES AND/OR HUMAN REMAINS ARE DISCOVERED IN THE COURSE OF UNDERMINING THE DEVELOPMENT ACTIVITY, THE DEPARTMENT OF ARCHAEOLOGY AND HISTORIC PRESERVATION IN OLYMPIA AND CLARK COUNTY COMMUNITY DEVELOPMENT SHALL BE NOTIFIED. FAILURE TO COMPLY WITH THESE STATE REQUIREMENTS MAY CONSTITUTE A CLASS C VIOLATION, SUBJECT TO IMPROVEMENT AND/OR FINES.
 - 2) DEVELOPMENT SHALL BE RESTRICTED TO WITHIN THE DESIGNATED BUILDING ENVELOPES. ANY DEVELOPMENT ACTIVITY OR GROUND DISTURBANCE OUTSIDE OF THE BUILDING ENVELOPES SHOWN ON THE FINAL PLAT MAY REQUIRE AN ADDITIONAL ARCHAEOLOGICAL PREDETERMINATION SURVEY OF THE IMPACTED AREA.
 - 3) THE APPROVED, INITIAL RESERVE AND/OR EXISTING SEWAGE SYSTEM SITES SHALL BE PROTECTED FROM DAMAGE DUE TO DEVELOPMENT. ALL SITES SHALL BE MAINTAINED SO THEY ARE FREE FROM ENCROACHMENT BY BUILDINGS AND NOT BE SUBJECT TO VEHICULAR TRAFFIC OR OTHER ACTIVITY WHICH WOULD ADVERSELY AFFECT THE SITE OR SYSTEM FUNCTION.
 - 4) CLARK COUNTY WETLAND PROTECTION ORDINANCE (CLARK COUNTY CODE CHAPTER 40.450) REQUIRES WETLAND AND WETLAND BUFFERS TO BE MAINTAINED IN A NATURAL STATE. REFER TO CONSERVATION COVENANT RECORDED WITH THE CLARK COUNTY AUDITOR FOR LIMITATIONS ON THE MAINTENANCE AND USE OF THE WETLAND AND WETLAND BUFFER AREAS IDENTIFIED ON THE FACE OF THE PLAT.
 - 5) NO CLEARING OR DEVELOPMENT ACTIVITIES SHALL OCCUR INSIDE THE WETLAND OR WETLAND BUFFERS SHOWN ON THE FACE OF THIS PLAT UNLESS THE ACTIVITIES ARE EXEMPT FROM, OR APPROVED UNDER, THE PROVISIONS OF THE CLARK COUNTY WETLAND PROTECTION ORDINANCE (CCC CHAPTER 40.450). OTHER BUILDING SETBACKS MAY APPLY WITHIN THE DEVELOPMENT ENVELOPES.
 - 6) ALL RESIDENTIAL DRIVEWAY APPROACHES ENTERING PUBLIC ROADS ARE REQUIRED TO COMPLY WITH CCC CHAPTER 40.350.
 - 7) DOWNSPROUTS AND FOUNDATION/FOOTING DRAINS SHALL BE DIRECTED AWAY FROM BUILDINGS TOWARDS CONVEYANCE SWALES. CONCENTRATED RUN-OFF SHALL NOT BE ALLOWED TO FLOW INTO NEIGHBORING PROPERTIES.
 - 8) AN APPROVED TURNAROUND IS REQUIRED FOR DRIVEWAYS LONGER THAN 300 FEET AT THE TIME OF RESIDENTIAL BUILDING PERMIT.

DEED REFERENCE
GRANTOR: NORMA JEAN MATSON, ET AL
GRANTEE: BFI PROPERTIES LLC
AC. NO. 403636
RECORDED: 1-14-2009

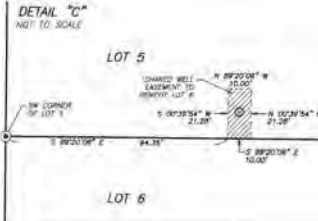
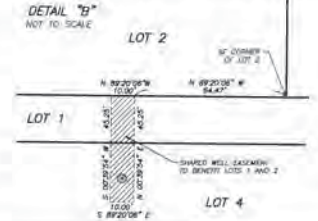
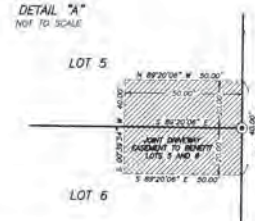
- SURVEY REFERENCES:
- 1) HAGEDORN SURVEY BOOK 27, PAGE 4
 - 2) HAGEDORN SURVEY BOOK 34, PAGE 81
 - 3) GREENWOOD SURVEY BOOK 4, PAGE 95
 - 4) OLSON SURVEY BOOK 2, PAGE 160
 - 5) LAWSON SURVEY BOOK 34, PAGE 32
 - 6) MINISTER SURVEY BOOK 32, PAGE 19



SURVEYOR'S NARRATIVE:
THE PURPOSE OF THIS PLAT IS TO SUBDIVIDE THAT TRACT OF LAND CONVEYED TO BFI PROPERTIES LLC BY STATUTORY WARRANTY DEED RECORDED UNDER AUDITOR'S FILE NUMBER 452855, CLARK COUNTY DEED RECORDS. THE DEED FOR THE SUBJECT PROPERTY DESCRIBES THE PROPERTY AS THE NORTH 30 ACRES OF THE SW QUARTER OF THE SW QUARTER, THE DEED FOR THE ADJUGER (PRICE) TO THE SOUTH DESCRIBES THEIR PROPERTY AS THE SOUTH ONE-HALF OF THE SW QUARTER OF THE SW QUARTER. WHEN THE DEEDS ARE TAKEN AT FACE VALUE THIS CREATES A DEED GAP SINCE THE SOUTH LINE OF THE STATED NORTH 30 ACRES OF THE SW QUARTER OF THE SW QUARTER, LIES SIX TO SEVEN FEET NORTH OF THE NORTH LINE OF THE SOUTH ONE-HALF OF THE SW QUARTER OF THE SW QUARTER.

CURVE LENGTH	RADIUS	DELTA	CHORD	CHORD BEARING
51.81	180.00'	92°21'28"	49.81'	S 87°28'50" W
51.81	180.00'	92°21'28"	49.81'	S 87°28'50" W

LOT	GROSS AREA	NET AREA
LOT 1	800,102 SF	803,025 SF
LOT 2	2,019 SF	1,653 SF
LOT 3	2,258 SF	1,810 SF
LOT 4	26,348 SF	21,432 SF
LOT 5	80,000 SF	68,000 SF
LOT 6	80,000 SF	68,000 SF



- LEGEND:
- INDICATES MONUMENT FOUND AS NOTED
 - INDICATES 1/2" x 24" IRON ROD WITH (GALVAN ANODE) CAP SET
 - ⊙ INDICATES EXISTING WELL
 - ⊕ INDICATES EXISTING SEPTIC TANK
 - ⊗ INDICATES SEPTIC TEST PIT
 - WZ INDICATES WELL PROTECTION ZONE

CLARK COUNTY PLANNING DIRECTOR:
APPROVED BY: *W. J. A.* 5-16-10
PLANNING DIRECTOR DATE

CLARK COUNTY ASSESSOR:
THIS PLAT MEETS THE REQUIREMENTS OF RCW 80.17.170, LAWS OF WASHINGTON, 1981, TO BE KNOWN AS BFI SUBDIVISION, CLARK COUNTY, WASHINGTON.
PLAT NO. CLARK COUNTY, WASHINGTON.
APPROVED BY: *J. B. B.* 3-22-2010
DATE

CLARK COUNTY COMMISSIONERS:
APPROVED AND ACCEPTED BY THE BOARD OF COUNTY COMMISSIONERS, CLARK COUNTY, WASHINGTON, THIS DAY OF *March* 2010.
CLARK COUNTY COMMISSIONERS
ATTENDED BY: *James Richard*
CLERK TO THE BOARD OF CLARK COUNTY COMMISSIONERS

CLARK COUNTY ENGINEER:
Shawn C. Schmitt 5-17-2010
CLARK COUNTY ENGINEER DATE

SURVEYOR'S CERTIFICATE:
I HEREBY CERTIFY THAT THIS PLAT AS SHOWN IS A TRUE RETURN FROM THE FIELD AND THAT THE DELINEATION IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.
Shawn C. Schmitt 3-10-10
CLARK COUNTY PROFESSIONAL LAND SURVEYOR DATE

COUNTY HEALTH DEPARTMENT:
LOTS 1 THRU 6 ARE APPROVED. AN APPROVED PRIVATE WATER SUPPLY AND INDIVIDUAL ON-SITE SEWAGE SYSTEMS ARE REQUIRED.
Carla C. Jordan, R.E. 3-11-10
COUNTY HEALTH OFFICER

AUDITOR'S CERTIFICATE:
FILED FOR RECORD THIS 22nd DAY OF *March* 2010
IN BOOK 311 OF PLATS, AT PAGE 645 AT THE REQUEST OF BFI PROPERTIES LLC
AUDITOR'S FILE NUMBER 41690160
Shay Kinney by K. Hilde
CLARK COUNTY AUDITOR

UTILITY AND SIDEWALK EASEMENT:
AN EASEMENT IS HEREBY RESERVED UNDER AND UPON THE EXTERIOR SIX (6) FEET AT THE FRONT BOUNDARY LINES OF ALL LOTS FOR THE INSTALLATION, CONSTRUCTING, RENEWING, OPERATING AND MAINTAINING ELECTRIC, TELEPHONE, TV CABLE, WATER AND SANITARY SEWER SERVICES, ALSO A SEWER EASEMENT AS NECESSARY TO COMPLY WITH ADA SLOPE REQUIREMENTS UPON THE EXTERIOR SIX (6) FEET ALONG THE FRONT BOUNDARY LINES OF ALL LOTS ADJACENT TO PUBLIC STREETS.

MINISTER AND GLAESER SURVEYING, INC. MAKES NO WARRANTIES AS TO MATTERS OF UNWRITTEN TITLE SUCH AS ADVERSE POSSESSION, ACCOESCUENCE, ESTOPPLE, ETC.
A FIELD TRAVERSE WAS PERFORMED USING A FIVE SECOND TOTAL STATION. THE FIELD TRAVERSE MET THE MINIMUM STANDARDS FOR SURVEYS AS DESIGNATED IN WAC 332-130-090. ALL CORNERS NOTED AS FOUND WERE VISITED ON 02-20-09.

Address: 8102 NE 211TH AVE VAN 98682

Disposition	Date 1	Date 2	Date 3	Assigned	Done By	Description	Notes
DONE			3/19/2014		DEB	Rcv App Check Completeness**	
DONE			5/13/2014		RAG	Customer Ntfyd Plans Ready*	NTF\$\$
DONE			1/23/2015		SJA	Finaled **	
DONE			1/26/2015		SJA	Finaled **	
DONE	9/25/2014		10/3/2014		DLSH	Stop Work Order Issued **	Note: A stop work order has been posted for listing certified erosion control persons on both erosion control log and on permit (2-different companies) that are not associated nor have given permission to list their companies as Stoneridge certified erosion control people Corr: 0107, Corrections as follow: Corr: 0109, Upon re-inspection, failure to comply with the 1st correction notice will result in a fee of \$148.00. Failure to comply with subsequent re-inspections will result in a fee of \$296.00. Corr: 0414, Construction entrance must be a minimum of 15 feet width and 20 foot long using 2 inch minimum size clean rock. Corr: 0601, All erosion and sediment control BMP;s must be maintained and repaired as needed to ensure continued performance of their intended function. Note: 1) Please address construction entrances and contractor parking at this project and your project to the south IMMEDIATELY to avoid fine and possible stop work order; also address any mud on pavement ~~0107~0109~0414~0601N
DONE					DLSH	Prmt Reapprovd-STATUS CHG ONLY	STOP WORK ORDER LIFTED
DONE					DLW	Prmt Reapprovd-STATUS CHG ONLY	Changed status to APR from SWO due to entered in error- per Jim Muir
DONE					ALM	Prmt Reapprovd-STATUS CHG ONLY	
DONE			3/19/2014		DEB	Print Application Summary	
DONE			4/17/2014		KWH	Print Application Summary	
DONE			5/12/2014		DEB	Print Application Summary	
DONE			5/20/2014		KWH	Print Application Summary	AN AUTOMATIC SPRINKLER SYSTEM NOT REQUIRED.
DONE			7/30/2014		MRC	Print Application Summary	
CCL	9/18/2014	9/18/2014	9/18/2014		SJA	Print Application Summary	Corr: Upon re-inspection, failure to comply with the 1st correction notice will result in a fee of \$148.00. Failure to comply with subsequent re-inspections will result in a fee of \$296.00. ~N
DONE			3/19/2014		DEB	Print Fees Due at Application	
DONE			5/13/2014		RAG	Print Fees Due at Issuance	
DONE			7/30/2014		MRC	Print Fees Due at Issuance	
DONE	3/19/2014		3/19/2014		DEB	Verify Tif district & Rate	
DONE			3/19/2014		DEB	Route to Date Bin **	TO DATE BIN
DONE	3/19/2014		5/14/2014		JME	Water/Well Approval Req/Rec	NEED WAVE PRIOR TO ISSUANCE - FORM GIVEN TO APPLICANT
DONE	3/19/2014		3/19/2014		DEB	Sewer/Septic Approval Req/Rec	5/13/14 WAVE app received. App is complete and released w/o any conditions of approval. Ref WP9682, SR19825. J. Ellingson CCPH x7251. SR0019397 - VALID FROM 2-25-2014 UNTIL 2-25-2019 - 4 BDRMS - NO OCC UNTIL FINAL INSP BY CC HEALTH DEPT

Disposition	Date 1	Date 2	Date 3	Assigned	Done By	Description	Notes
DONE	3/19/2014		4/17/2014		BDM	Verify Erosion Control Person	SLL - 9/26/14 - RECEIVED JOHN DEWITZ LETTER VIA EMAIL AND CHANGED IN SYSTEM. BDM 4/17/2014 - APPLICANT PROVIDED NAME OF MARSHELLE WOOD
DONE	3/19/2014		3/19/2014		DEB	Verify WUII	NEED LETTER FROM JOHN DEWITZ PRIOR TO ISSUANCE NOT IN
RTE			5/12/2014		DEB	Addn'l Documents Received	2 REVISED STORMWATER PLANS WITH CONTOUR LINES AND 50' DRAINAGE PATHS MATCHING AS REQUEST BY BRYAN - TO BDM DESK WITH FILE FOR REVIEW
DONE	3/19/2014		4/14/2014		DGO	Plan Exam Recv's/Reviews**	NEEDS PLAN REVIEW
DONE	3/19/2014		4/22/2014		BDM	Zoning Rec's/Reviews **	Restamp BDM 4/22/2014 - LOT CREATED BY SEG REQUEST DATED 4/15/1993 - PREDATES 1993 LRG LT ORD AND MEETS CURRENT ZONING REQ'S BDM 4/21/2014 - NEEDS EITHER ADD'L DEEDS OR COPY OF SEG REQUEST TO APPROVE LLD FOR THIS LOT (NEEDS SOMETHING PRIOR TO 4/19/1993) - 5AC R-5 - MEETS MIN SB'S SALES HISTORY REC'D - NEEDS LEGAL LOT DETERMINATION R-5 ZN - 5 ACRES
DONE	4/16/2014		4/17/2014		KWH	Fire Rec's/Reviews **	BACK TO BUILDING PLAN REVIEW
DONE	3/19/2014		4/21/2014		BDM	Addressing Rec's/Reviews	BDM 4/21/2014 - ACCESSING 30' WIDE PVT RD ESMT - AF#9303310104 GRANTS ACCESS (ALTHOUGH ENTIRELY ON SUBJECT PARCEL THEREFORE TECHNICALLY DOESN'T NEED LEGAL ACCESS) - ADDRESSED TO FIT GRID AND EXISTING - 8102 NE 211TH AVE - UPDATED SITUS
DONE	3/19/2014		3/19/2014		DEB	Gorge Recv's/Revw's**	NEEDS ADDRESS N/A
DONE	3/19/2014	3/19/2014	3/19/2014		DEB	Habitat Rts/ Recv's/Revw's	NONE PRESENT
DONE	3/19/2014		3/24/2014		BHD	Wetland Rts/ Recv's/Revw's**	No wetlands on site - BHD 3/24/13 ENTIRE AREA IS MAPPED AS WETLAND PRESENCE OR MODELED WETLAND - COPY OF PLOT PLAN SUBMITTED TO BRENT FOR REVIEW ALONG WITH COPY OF LETTER FROM ECOLOGICAL LAND SERVICES FOR PROPERTY TO THE SOUTH.
DONE			5/14/2014		SLL	Permit Issued **	
DONE	3/19/2014		5/13/2014		BDM	Stormwater Review	BDM 5/13/2014 - APPLICANT'S STMWTR PLAN APPEARS TO COMPLY WITH MINIMUM DOE REQ'S FOR SPLASHBLOCKS - SEE CONDITIONS BDM 4/21/2014 - NEEDS STMWTR PLAN THAT MATCHES CONTOURS
DONE	3/19/2014		3/19/2014		DEB	Slopes-GeoHazards	PROPOSING RAIN DRAINS TO SPLSH BLKS WITH LESS THAN 700 SF PER SPLSH BLK AND 50' VEGETATED FLOW PER SP BLK FLAT LOT
DONE	3/19/2014		4/17/2014		BDM	Shoreline	BDM 4/17/2014 - NO WTLNDS ONSITE PER BRENT - SEE WTLND ACTIVITY SHORELINE IS ONLY APPLICABLE IF THERE ARE WETLANDS PRESENT - ROUTED TO BRENT