

MEMORANDUM

DATE: July 2, 2020

TO: Charles Marshall
Wallace Ranch II, LLC

FROM: Michael Read, PE, Principal, TENW
Trevin Roletto, PE, Design Engineer, TENW

SUBJECT: Wallace Ranch Residential – Preliminary Traffic Analysis
TENW Project No. 2020-146

This memorandum summarizes the results of a preliminary traffic impact analysis associated by the proposed *Wallace Ranch Residential* development and the resultant impacts to local roadways likely used to serve the development. The analysis considers the latest site plan published by Encompass Engineering & Surveying in December of 2019 and contemplates buildout under a phased approach. This review of traffic volume impacts does not consider development potential of adjoining properties, nor does it review specific traffic operational impacts or other transportation improvements needed to mitigate potential impacts of *Wallace Ranch Residential* or other adjoining properties.

Project Description

The Wallace Ranch comprises approximately 1,164 acres and is generally bounded on the west by Thorp Prairie Road and on the east by the foothills of Lookout Mountain. It is bisected by the Yakima River, The John Wayne Trail (west side of the river) and the BNSF railroad and Highway 10 (east side of the river).

The site is located in the FR zone, Rural Working Land Use designation and is currently segregated into a total of 50, 20+/- acre tracts in accordance with current zoning. The applicant proposes the project as a Conservation Plat, which would create 56 smaller single-family residential lots in a clustered subdivision and preserve over 800 acres as open space. As a result, the relative net increase in residential density over current zoning is effectively 6 lots.

Vehicular access would be provided via existing (upgraded) and new site access roadways onto both SR 10 and Thorp Prairie Road. Approximately 18 lots would be accessed via an existing private roadway onto SR 10, while the remaining 38 lots would be access via three new private roadways onto Thorp Prairie Road.

Trip Generation Analysis

Trip generation rates compiled by the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition, 2019*, were used to estimate daily traffic that would be generated by the Wallace Ranch Residential phasing noted above. Average rate equations for Single-Family Detached Housing (ITE Land Use Code 210) was used in estimating project trip generation. As shown in **Table 1**, estimated total average daily traffic (ADT) by primary unit type totals approximately 530 daily vehicle trips. Of this total, approximately 40 would be generated during the typical weekday a.m. peak hour and 66 during the weekday p.m. peak hours.

Table 1 – Wallace Ranch Residential Trip Generation

Unit Type	Lots/Units	Total ADT
Single-Family/Detached	56	530
Totals	56	530

Source: Trip Generation Manual, 10th Edition, 2017.

It should be noted, that this trip generation estimate is conservative in that a majority of homes are expected to be built and occupied as second homes, have seasonal fluctuations in vehicle trip generation, and not be generating typical home-based work trips. Recreational or seasonal homes typically generate approximately 30 percent of typical primary homes, and as such, these estimates would likely generate significantly lower actual trips than those estimated above. With other recreational communities in Eastern Washington, TENW has significant work experience and knowledge in these community types, with primary home ownership less than 25 percent of all units. Under this assumption, total ADT during typical conditions is estimated at approximately 260 ADT (nearly half of those trips estimated above assuming typical primary homes).

Site Access Analysis

With development of residential units under phases, fire and emergency vehicle access, secondary access, and roadway classification of the primary site access roadway are all considerations under County code, WSDOT access management criteria/regulations, and development standards. As noted previously, 18 residential lots would be accessed via upgrade to an existing private roadway onto SR 10. Of the three proposed new site access roadways proposed onto Thorp Prairie Road, the most northern roadway would serve approximately 28 lots, the central roadway would serve 8 lots, and the most southern roadway would serve 2 lots. In total, 38 lots would be accessed via Thorp Prairie Road. As all four private roadways would individual serve less than 30 lots, secondary fire/emergency vehicle access requirements would be satisfied.

Based on the distribution of residential lots and the directness of traffic to vicinity freeway interchange systems, daily trip distribution of the total 530 total project vehicle trips is estimated at 100 ADT west of the site and 70 east of the site on SR 10, 110 ADT west of the site and 250 east of the site on Thorp Prairie Road. Existing ADT on SR 10 (collected in 2019 by WSDOT) west of the site is approximately 1,400 daily vehicle trips, while Thorp Prairie Road has approximately 400 ADT as of 2018 (as recorded by Kittitas County). With buildout of the project, projected ADT on SR 10 west of the site is estimated at approximately 1,500 ADT and 650 ADT east of the site on Thorp Prairie Road.

TENW conducted a sight distance evaluation for proposed site access of the *Wallace Ranch* project. The Site Plan and approximate site access locations are provided in **Attachment A**. TENW performed a field during June 2020 to evaluate Stopping Sight Distance (SSD) and Entering Sight Distance (ESD) for the four proposed site accesses, per *Kittitas County Code – Title 12 | Roads and Bridges* and per *2018 ‘AASHTO A Policy on Geometric Design of Highways and Streets’*.

Stopping Sight Distance/Intersection Sight Distance Guidelines

Tables 2 and 3 below summarize the guidelines which were used as the basis of our analysis, including *Kittitas County Code – Title 12 | Roads and Bridges* (County Standards) **Attachment B**, as well as *2018 ‘AASHTO A Policy on Geometric Design of Highways and Streets’*, (AASHTO Standards). County Standards for SSD adopt the AASHTO Standards as the basis of design for evaluation of intersections. As such, wherever the County Standards do not provide specific guidance or design criteria, AASHTO Standards are used.

Table 2: Stopping Sight Distance Guidelines

Roadway Name	SR10	Thorp Prairie Road
Posted Speed	55 MPH	50 MPH
Design Speed	55 MPH	50 MPH
Driver’s Eye Height	3.5’	3.5’
Object Height	2.0’	2.0’
Required SSD at 0% grade	495’	425’
Required SSD at -5% and 5% grade (factor 0.9 and 1.1, respectively)	NA	382.5’/467.5’ ⁽²⁾

(1) Unless otherwise noted, all guidelines are per *Kittitas County Code – Title 12 | Roads and Bridges*.

(2) No guidelines for grade adjustment in *Kittitas County Code – Title 12 | Roads and Bridges*; guidelines from the 2018 ‘AASHTO A Policy on Geometric Design of Highways and Streets’ were used.

Table 3: Entering Sight Distance Guidelines

Roadway Name	SR 10	Thorp Prairie Road
Posted Speed	55 MPH	50 MPH
Design Speed	55 MPH	50 MPH
Driver’s Eye Height	3.5’	3.5’
Object Height	2.0’	2.0’
Required ISD at 0% grade	530’ RT / 610’ LT	475’
Required ISD at -5% and 5% grade (factor 0.9 and 1.1, respectively)	NA	427.5’/522.5’ ⁽²⁾

(1) Unless otherwise noted, all guidelines are per *Kittitas County Code – Title 12 | Roads and Bridges*.

(2) No guidelines for grade adjustment in *Kittitas County Code – Title 12 | Roads and Bridges*; guidelines from the 2018 ‘AASHTO A Policy on Geometric Design of Highways and Streets’ were used.

Sight Distance Findings

Stopping Sight Distance. Two of the proposed site access locations on Thorp Prairie Road and the one proposed site access location on SR 10 meet the current standards for SSD for vehicles traveling both directions. Site 2 does not currently meet SSD for westbound vehicles along Thorp Prairie Road.

Intersection Sight Distance. Two of the proposed site access locations on Thorp Prairie Road and the one proposed site access location on SR 10 meet the current standards for ESD for vehicles traveling both directions. Site 2 does not currently meet entering sight distance for drivers turning right (looking east).

Tables 4 and 5 below summarize TENW's findings. Attachment C includes photos of all sight distance scenarios evaluated.

Table 4: Stopping Sight Distance Evaluation

Site	Direction	Required SSD	Available SSD	AASHTO Standard Met
SR 10				
1	Northbound Vehicle	495'	1500'+	Yes
	Southbound Vehicle	495'	1500'+	Yes
Thorp Prairie Road				
Site	Direction	Required SSD	Available SSD	AASHTO Standard Met
2	Eastbound Vehicle	425'	1000'+	Yes
	Westbound Vehicle	425'	315'	No
3	Northbound Vehicle	425'	1000'+	Yes
	Southbound Vehicle	425'	1000'+	Yes
4	Northbound Vehicle	467.5	1500'+	Yes
	Southbound Vehicle	382.5' (2)	555'	Yes

(2) No guidelines for grade adjustment in Kittitas County Code – Title 12 | Roads and Bridges; guidelines from the 2018 'AASHTO A Policy on Geometric Design of Highways and Streets' were used.

Table 5: Entering Sight Distance Evaluation

Site	Direction (Looking)	Required ESD	Available ESD	AASHTO Standard Met
SR 10				
1	Right Turn (Looking North)	530'	1500'+	Yes
	Left Turn (Looking South)	610' Left Turn	1500' (1)	Yes
Thorp Prairie Road				
2	Right Turn (Looking East)	475'	255'	No
	Left Turn (Looking West)	475'	1000'+	Yes
3	Left Turn (Looking North)	475'	1000'+	Yes
	Right Turn (Looking South)	475'	1000'+	Yes
4	Left Turn (Looking North)	427.5' (2)	625'	Yes
	Right Turn (Looking South)	522.5' (2)	1500'+	Yes

(2) No guidelines for grade adjustment in Kittitas County Code – Title 12 | Roads and Bridges; guidelines from the 2018 'AASHTO A Policy on Geometric Design of Highways and Streets' were used.

In summary, TENW has the following conclusions regarding sight distance:

1. Available SSD approaching the proposed site 1 access, on SR 10, and sites 3 and 4 accesses, on Thorp Prairie Road, meet the 2018 AASHTO standards of 495 feet and 425 feet. Available SSD for eastbound vehicles approaching site 2, on Thorp Prairie Road, also meets the 2018 AASHTO standard of 425 feet.
2. Available SSD for westbound vehicles approaching the proposed site 2 access, on Thorp Prairie Road, does not meet the 2018 AASHTO standard of 425' feet, due to existing horizontal roadway curvature and vegetation. Removal of vegetation and regrading of the northern shoulder within the public right-of-way is expected to mitigate this existing deficiency.
3. Available ESD associated with a vehicle exiting the proposed site 1 access, on SR 10, and sites 3 and 4 accesses, on Thorp Prairie Road, meet the 2018 AASHTO standards of 530 feet/610 feet and the County Standards 475 feet. Available ESD for a vehicle exiting the proposed site 2, looking west on Thorp Prairie Road, also meets the County Standard of 475 feet.
4. Available ESD associated with a vehicle exiting the proposed site 2 access, looking east on Thorp Prairie Road, does not meet the County Standards 475 feet, due to existing horizontal roadway curvature and vegetation. Removal of vegetation and regrading of the northern shoulder within the public right-of-way is expected to mitigate this existing deficiency.

Traffic Mitigation

Currently, the Kittitas County does not assess traffic impact fees on an areawide basis. Based upon the proportional increase in traffic volume impacts to SR 10 and Thorp Prairie Road, no significant adverse traffic impacts are expected with buildout of the 56 single family homes. Given the expected season or "second home" nature likely to be present in the proposed single-family units, total site trip generation will likely be approximately 50 percent less than estimated.

Conclusions

An analysis was conducted of vehicular trip generation, general traffic impacts on roadways, and site access, safety, and circulation issues. Based upon the proportional increase in traffic volume impacts to SR 10 and Thorp Prairie Road, no significant adverse traffic impacts are expected with buildout of the 56 single family homes. Given the expected season or "second home" nature likely to be present in the proposed single-family units, total site trip generation will likely be approximately 50 percent less than estimated. When considering existing zoning, the proposed Conservation Easement and clustered subdivision would result in a net increase of approximately 6 additional single family homes.

Based upon this preliminary traffic impact analysis, the following mitigation measures may be required:

- Work with Kittitas County to clear vegetation and regrading of a cut slope along the northern frontage of Thorp Prairie Road east of the northern most proposed site access roadway to improve both stopping and entering sight distance.

If you have any questions regarding the information presented in this memo, please call me at (206) 361-7333 x 101 or mikeread@tenw.com.

Attachment A
Site Plan with Site Access Locations

WALLACE RANCH PRELIMINARY CONSERVATION PLAT
 A PORTION OF SECTIONS 3, 10, 11, 12, 13 & 14, T. 19 N., R. 16 E., W.M., KITTITAS COUNTY, WASHINGTON

LEGAL DESCRIPTION PER AMERITITLE TITLE COMMITMENT- FILE NO. 280950AM:

TRACT A:

LOT B-1 OF THAT CERTAIN SURVEY AS RECORDED OCTOBER 27, 1997, IN BOOK 23 OF SURVEYS, PAGE 12, UNDER AUDITOR'S FILE NO. 199710270033, RECORDS OF KITTITAS COUNTY, WASHINGTON, BEING A PORTION OF THE EAST HALF OF THE NORTHWEST QUARTER OF SECTION 11, TOWNSHIP 19 NORTH, RANGE 16 EAST, W.M., IN THE COUNTY OF KITTITAS, STATE OF WASHINGTON.

TRACT B:

PARCELS 1-A, 2-A, 3-A, 4-A, 1-B, 2-B, 3-B, 4-B, 1-C, 2-C, 3-C, 1-D, 2-D, 1-E, 2-E, 3-E, 4-E, 1-F, 2-F, 3-F, 4-F, 1-G, 2-G, 1-H, 1-I, 2-I, 1-K, 1-L, AND 1-M OF THAT CERTAIN SURVEY AS RECORDED OCTOBER 8, 2001, IN BOOK 26 OF SURVEYS, PAGES 198 THROUGH 203, UNDER AUDITOR'S FILE NO. 200110090029, RECORDS OF KITTITAS COUNTY, WASHINGTON, BEING PORTIONS OF SECTIONS 3, 10, 11 AND 14, TOWNSHIP 19 NORTH, RANGE 16 EAST, W.M., IN THE COUNTY OF KITTITAS, STATE OF WASHINGTON.

TRACT C:

PARCELS 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28 AND 29 OF THAT CERTAIN SURVEY RECORDED JANUARY 18, 2004, IN BOOK 29 OF SURVEYS, PAGES 208 THROUGH 210, UNDER AUDITOR'S FILE NO. 200401160041, RECORDS OF KITTITAS COUNTY, STATE OF WASHINGTON, BEING PORTIONS OF SECTIONS 10, 11, 12, 13 AND 14 OF TOWNSHIP 19 NORTH, RANGE 16 EAST, W.M., IN THE COUNTY OF KITTITAS, STATE OF WASHINGTON.

TRACT D:

A STRIP OF LAND 60 FEET WIDE, LOCATED IN THE SOUTH HALF OF THE NORTHEAST QUARTER, SECTION 10, TOWNSHIP 19 NORTH, RANGE 16 EAST, W.M., KITTITAS COUNTY, STATE OF WASHINGTON, AND SAID STRIP BEING 30 FEET WIDE ON EITHER SIDE OF THE FOLLOWING DESCRIBED CENTERLINE:

BEGINNING AT THE INTERSECTION OF THE NORTHEASTERLY RIGHT OF WAY LINE OF THE PECH POINT ROAD WITH A LINE LOCATED 30 FEET SOUTHERLY OF THE NORTHERLY LINE OF THE BONNEVILLE POWER ADMINISTRATION TRANSMISSION LINE RIGHT OF WAY, SAID INTERSECTION BEING LOCATED APPROXIMATELY SOUTH 25° EAST 1,175 FEET FROM THE NORTH ONE-QUARTER CORNER OF THE SAID SECTION 10; THENCE PARALLEL TO THE SAID TRANSMISSION LINE RIGHT OF WAY SOUTH 87°19' EAST 1,100 FEET; THENCE SOUTH 72° EAST 300 FEET; THENCE SOUTH 67°13' EAST 250 FEET; THENCE SOUTH 60° EAST 240 FEET, MORE OR LESS, TO ITS INTERSECTION WITH THE EAST LINE OF SAID SECTION 10, SAID POINT OF INTERSECTION BEING 1,815 FEET SOUTHERLY, MORE OR LESS, FROM THE NORTHEAST CORNER OF SAID SECTION 10, KITTITAS COUNTY, STATE OF WASHINGTON.

TRACT E:

ALL OF THE CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD COMPANY'S RIGHT OF WAY AND EXTRA WIDTH RIGHT OF WAY LOCATED IN THE SOUTHWEST QUARTER AND IN THE SOUTH HALF OF THE NORTHWEST QUARTER, SECTION 11, TOWNSHIP 19 NORTH, RANGE 16 EAST, W.M., KITTITAS COUNTY, WASHINGTON, ALL AS CONVEYED TO SAID RAILROAD COMPANY BY DEEDS RECORDED JULY 14, 1908, JANUARY 24, 1937, FEBRUARY 21, 1911 AND OCTOBER 2, 1947 UNDER AUDITOR'S FILE NO.'S 18077, 18078, 17518, 20041 AND 197214, EXCLUSIVELY.

EXCEPT: THAT CERTAIN STRIP OF LAND 100 FEET IN WIDTH CONVEYED TO KITTITAS RECLAMATION DISTRICT BY DEED RECORDED JUNE 18, 1927 UNDER AUDITOR'S FILE NO. 86487 AS SPILLWAY NO. 1146.

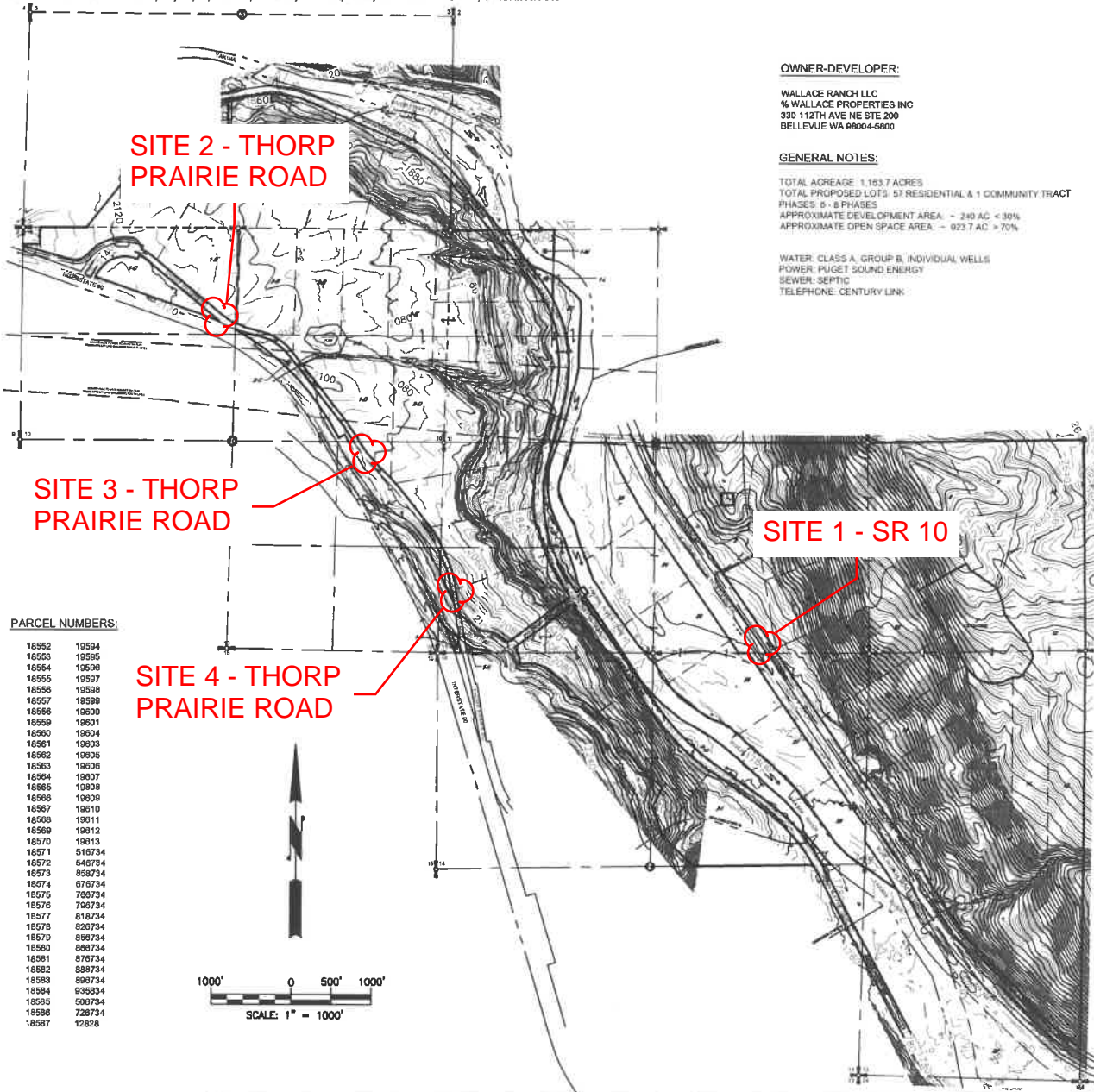
OWNER-DEVELOPER:

WALLACE RANCH LLC
 % WALLACE PROPERTIES INC
 330 112TH AVE NE STE 200
 BELLEVUE WA 98004-6800

GENERAL NOTES:

TOTAL ACREAGE: 1,153.7 ACRES
 TOTAL PROPOSED LOTS: 57 RESIDENTIAL & 1 COMMUNITY TRACT
 PHASES: 6 - B PHASES
 APPROXIMATE DEVELOPMENT AREA: - 240 AC < 30%
 APPROXIMATE OPEN SPACE AREA: - 923.7 AC > 70%

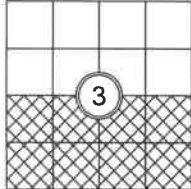
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 POWER: PUGET SOUND ENERGY
 SEWER: SEPTIC
 TELEPHONE: CENTURY LINK



PARCEL NUMBERS:

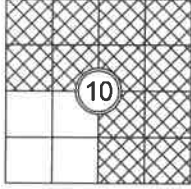
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INDEX LOCATION
 SEC. 3 T. 19 N.R. 16 E.W.M.

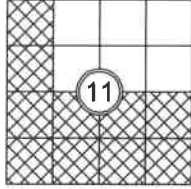


THIS LAYOUT IS FOR ILLUSTRATION PURPOSES ONLY PORTRAYING A LIKELY LAYOUT FOR THE WALLACE RANCH CONSERVATION PLAT

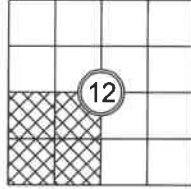
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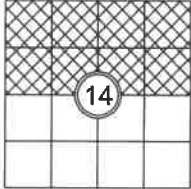
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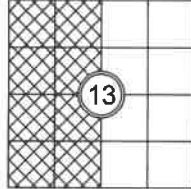
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INDEX LOCATION
 SEC. 14 T. 19 N.R. 16 E.W.M.



INDEX LOCATION
 SEC. 13 T. 19 N.R. 16 E.W.M.



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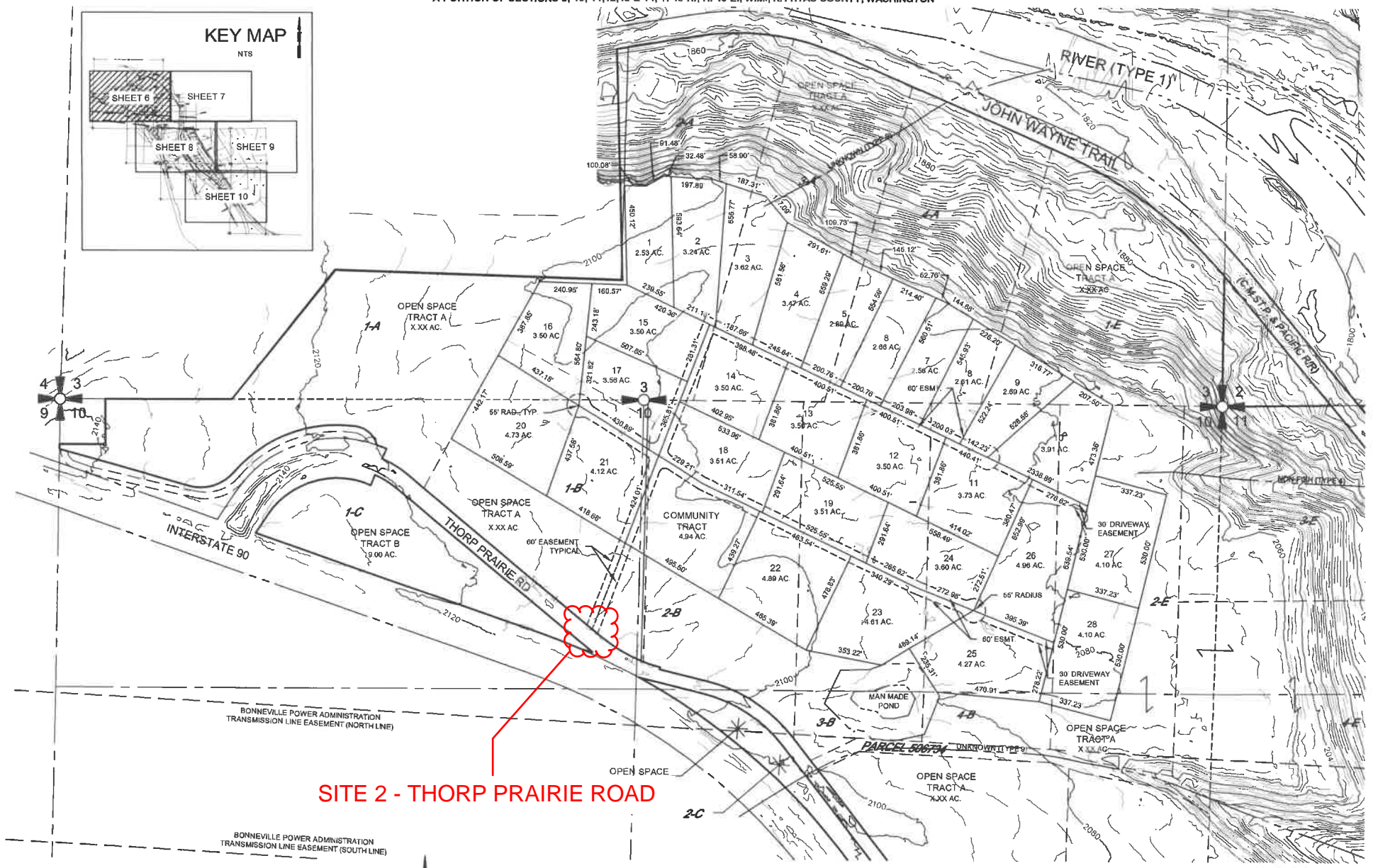
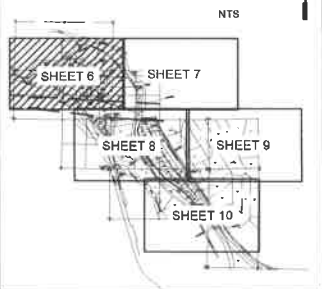
Western Washington Division
 165 NE Juniper Street, Suite 201 • Issaquah, WA 98027 • Phone: (425) 392-0250

Eastern Washington Division
 407 Swiftwater Blvd. • Cle Elum, WA 98922 • Phone: (509) 674-7433

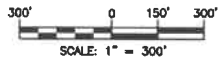
WALLACE RANCH PRELIMINARY CONSERVATION PLAT PREPARED FOR WALLACE RANCH II LLC A PORTION OF SECTIONS 3, 10, 11, 12, 13 & 14 TOWNSHIP 19 NORTH, RANGE 16 EAST, W.M.		
KITTITAS COUNTY WASHINGTON		
DWN BY	DATE	JOB NO.
G.W.	12/2019	19066
CHKD BY	SCALE	SHEET
M.K.K.	1" = 1000'	1 OF 10

WALLACE RANCH PRELIMINARY CONSERVATION PLAT
 A PORTION OF SECTIONS 3, 10, 11, 12, 13 & 14, T. 19 N., R. 16 E., W.M., KITTITAS COUNTY, WASHINGTON

KEY MAP



SITE 2 - THORP PRAIRIE ROAD



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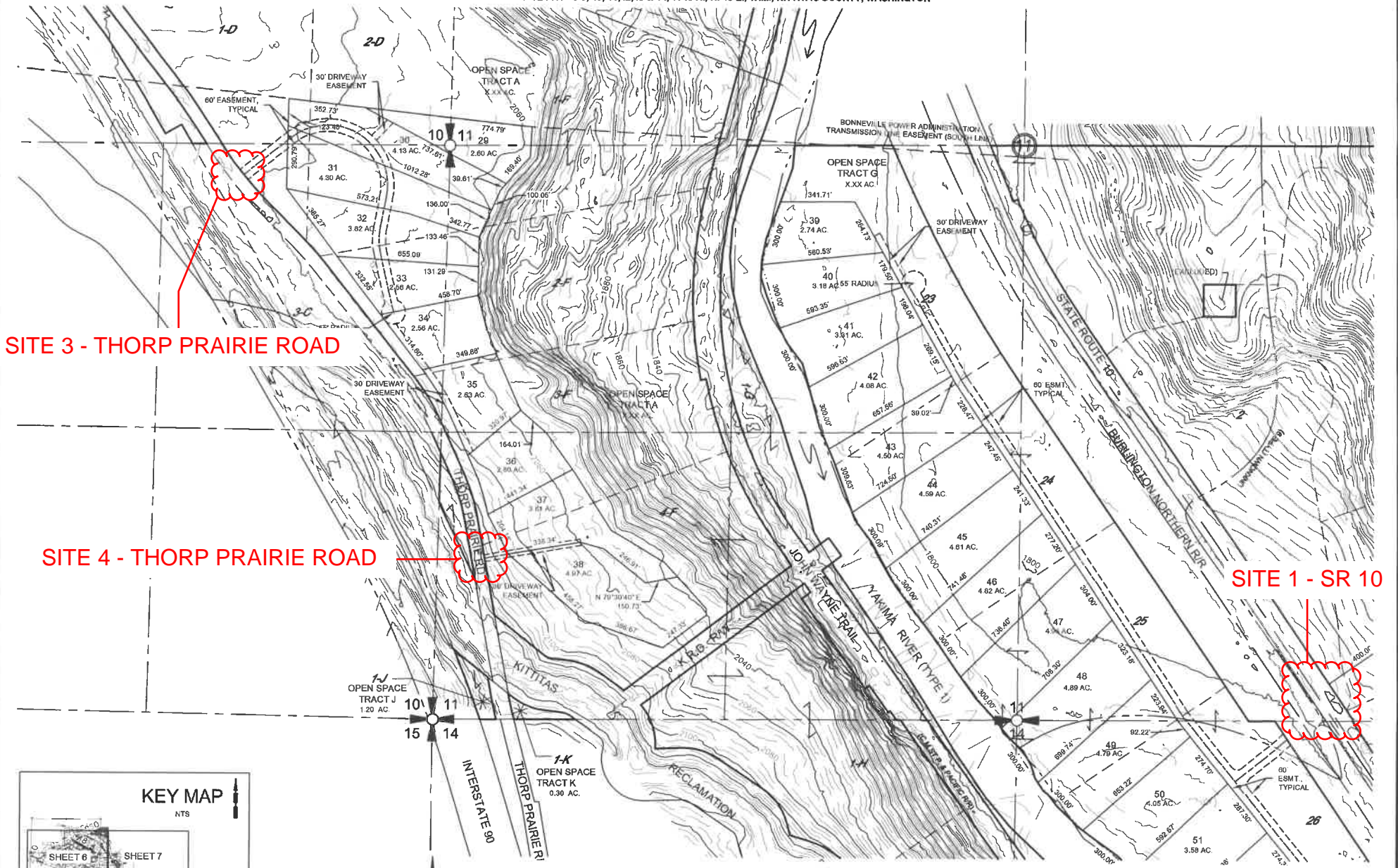
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WALLACE RANCH PRELIMINARY CONSERVATION PLAT

PREPARED FOR
 WALLACE RANCH II LLC
 A PORTION OF SECTIONS 3, 10, 11, 12, 13 & 14
 TOWNSHIP 19 NORTH, RANGE 16 EAST, W.M.

KITTITAS COUNTY		WASHINGTON	
DWN BY	DATE	JOB NO.	
G.W.	12/2019	19066	
CHKD BY	SCALE	SHEET	
M.K.K.	1" = 300'	6 OF 10	

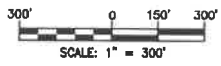
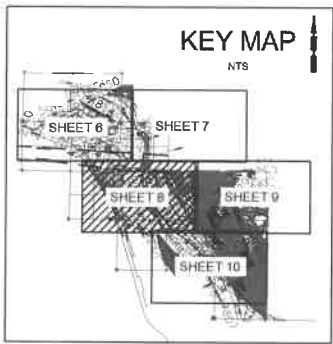
WALLACE RANCH PRELIMINARY CONSERVATION PLAT
 A PORTION OF SECTIONS 3, 10, 11, 12, 13 & 14, T. 19 N., R. 16 E., W.M., KITTITAS COUNTY, WASHINGTON



SITE 3 - THORP PRAIRIE ROAD

SITE 4 - THORP PRAIRIE ROAD

SITE 1 - SR 10



<h2>Encompass</h2> <p>ENGINEERING & SURVEYING</p> <p>Western Washington Division 165 NE Juniper Street, Suite 201 • Issaquah, WA 98027 • Phone: (425) 392-0230</p> <p>Eastern Washington Division 407 Swiftwater Blvd. • Cle Elum, WA 98922 • Phone: (509) 674-7433</p>			WALLACE RANCH PRELIMINARY CONSERVATION PLAT PREPARED FOR WALLACE RANCH II LLC A PORTION OF SECTIONS 3, 10, 11, 12, 13 & 14 TOWNSHIP 19 NORTH, RANGE 16 EAST, W.M.		
KITTITAS COUNTY			WASHINGTON		
DWN BY	DATE	JOB NO.			
G.W.	12/2019	19066			
CHKD BY	SCALE	SHEET			
M.K.K.	1" = 300'	8 OF 10			

Attachment B

Stopping Sight Distance Standards
Kittitas County Code – Title 12 Roads and Bridges

Table 5-1

Access Spacing Requirements^{1,2}

Road Classification(FFC³)	Speed	Access⁴ Spacing
Rural Arterial	Above 35	475 ft.
Rural Major Collector	35 and below	250 ft.
Rural Minor Collector	Above 35	300 ft.
	35 and below	150 ft.
Rural Local Access	Above 35	100 ft.
All Urban Classifications	35 and below	100 ft.

¹Any access that cannot meet applicable spacing will require an approved variance

² Residential & urban zones will be evaluated on a case by case basis

³ Federal Functional Classification - Refer to KCC 12.03.030

⁴ Includes public and private roads and all other access points

Table 5-2

Sight Distance Requirements

Posted Speed Limit	Distance
25 Mph	150 ft.
35 Mph	250 ft.
50 Mph	475 ft.

(Ord. 2015-010, 2015)

Attachment C

Field Inventory of Sight Distance at Proposed Site Access

Photographs Stopping Sight Distance



Site 1 (SR 10): Stopping Sight Distance Northbound Vehicle (1500'+ available SSD)



Site 2 (SR 10): Stopping Sight Distance Southbound Vehicle (1500'+ available SSD)



Site 2 (Thorp Prairie Road): Stopping Sight Distance Westbound Vehicle (315' available SSD)



Site 2 (Thorp Prairie Road): Stopping Sight Distance Northbound Vehicle (1000'+ available SSD)



Site 3 (Thorp Prairie Road): Stopping Sight Distance Northbound Vehicle (1000'+ available SSD)



Site 3 (Thorp Prairie Road): Stopping Sight Distance Northbound Vehicle (1000'+ available SSD)



Site 4 (Thorp Prairie Road): Stopping Sight Distance Northbound Vehicle (1500'+ available SSD)



Site 4 (Thorp Prairie Road): Stopping Sight Distance Northbound Vehicle (555'+ available SSD)

Photographs Entering Sight Distance



Site 1 (SR 10): Intersection Sight Distance Looking North (1500'+ available ISD)



Site 1 (SR 10): Intersection Sight Distance Looking South (1000'+ available ISD)



Site 2 (Thorpe Prairie Road): Intersection Sight Distance Looking East (255' available ISD)



Site 2 (Thorpe Prairie Road): Intersection Sight Distance Looking West (1000'+ available ISD)



Site 3 (Thorpe Prairie Road): Intersection Sight Distance Looking North (1000'+ available ISD)



Site 3 (Thorpe Prairie Road): Intersection Sight Distance Looking South (1000'+ available ISD)



Site 4 (Thorp Prairie Road): Intersection Sight Distance
Looking North (625' available ISD)



Site 4 (Thorp Prairie Road): Intersection Sight Distance
Looking South (1,500'+ available ISD)