



CLARK COUNTY
WASHINGTON

COMMUNITY DEVELOPMENT
LAND USE REVIEW

Pre-Application Conference Agenda

Working together. Securing your safety. Protecting your investment.

Job Number: PAC-2020-00002

Agenda Date: 01/23/2020

Conference Location: Public Service Center
1300 Franklin Street
Room 313
Vancouver WA 98660

Meeting Time: 9:00 AM

Project Name: Yacolt Mountain Quarry Expansion

Description: Project entails expanding the current Yacolt Mountain Quarry to include portions of two parcels recently added to the County's Surface Mining Overlay (SMO). See attached narrative for a full discussion of the project.

Parcel Numbers: 230061000, 230301000

Location: Parcel: No primary address specified

Location: Parcel: No primary address specified

Zoning: FR-80

Neighborhood Association: East Fork Alliance

Staff Names(s):

Name	Email	Phone	Title
Ariel Whitacre	ariel.whitacre@clark.wa.gov	(564) 397-4717	Biologist
David Jardin	david.jardin@clark.wa.gov	(564) 397-2375	Concurrency Engineer
David Jardin	david.jardin@clark.wa.gov	(564) 397-2375	Engineer
Donna Goddard	donna.goddard@clark.wa.gov	(564) 397-2186	Fire Marshal
Hunter Decker	hunter.decker@clark.wa.gov	(564) 397-4852	Forester
Jan Bazala	jan.bazala@clark.wa.gov	(564) 397-4499	Planner
Richard Daviau	richard.daviau@clark.wa.gov	(564) 397-4895	Planner



P.O. Box 9810
Vancouver, WA 98666-9810
1300 Franklin Street
Phone: (360) 397-2375

Application Summary Pre-Application Conference

Accepted Date: 01/02/2020

PAC-2020-00002

Project Name: **Yacolt Mountain Quarry Expansion**
Site Address: **No primary address specified**
Review Type: **Type I**

Parcel: **230061000, 230301000**

Description:

Project entails expanding the current Yacolt Mountain Quarry to include portions of two parcels recently added to the County's Surface Mining Overlay (SMO). See attached narrative for a full discussion of the project.

Applicant: **J.L. Storedahl and Sons**
Address: **2233 Talley Way Kelso, WA 98626 USA**
Phone: **Work - (360) 636-2420**
Email: **bo@storedahl.com**

Owner: **STOREDAHL PROPERTIES LLC**
Address: **2233 TALLEY WAY
KELSO WA 98626**

File Notes

- 1.) **Jan 02, 2020 08:20:50 AM Jeramy Bashaw**
Pre- Application - Jan 23, 2020 9:00 AM
- 2.) **Jan 02, 2020 08:22:28 AM Jeramy Bashaw**
File Location - Pre-App Bin

*DEV 2017-00223
East Fork Alliance*

**SUBMITTAL PACKET FOR
SECOND PRE-APPLICATION CONFERENCE**

PROJECT NAME: YACOLT MOUNTAIN QUARRY EXPANSION

GeoDesign Inc,
1157 3rd Ave
Longview, WA 98632
(360)-232-4803

On behalf of the Applicant:
J.L. Storedahl and Sons, Inc.
2233 Talley Way
Kelso, WA, 98626
(360)-636-2420
bo@storedahl.com

In regards to:
Subject Property Account Numbers: 230061000 & 230301000
Clark County, Washington

For:
Community Development
Clark County, WA

December 31, 2019

GeoDesign Project: Storedahl-15-01

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Additional Reports included with Submittal Packet

Traffic Impact Analysis, Kittelson & Associates, March 21, 2018	
Letter RE: Transportation Impact Study Requirements for Mountain Quarry Expansion (PAC-2019-000052), Kittelson & Associates, September 24, 2019	

1.0 INTRODUCTION & INTEREST

GeoDesign, Inc. has prepared this second pre-application conference submittal packet on behalf of J. L. Storedahl and Sons, Inc. for expansion of the Yacolt Mountain Quarry onto parcel numbers 230061000 and 230301000 located in unincorporated Clark County, Washington. The site area is located approximately 2.5 miles west of the town of Yacolt. Figure 1 shows the proposed expansion area. This packet is intended to satisfy requirements of and apply for a second pre-application conference with Clark County in anticipation of submitting a conditional use permit (CUP) application to expand the mine as described below. The Development Application form is attached in Appendix A, and a Developer's Packet produced by the Clark County Geographic Information System (GIS) is attached in Appendix B.

The first pre-application conference for the project was held on May 9, 2019, resulting in a Pre-Application Final Report prepared by Clark County and dated May 16, 2019. In that Final Report, the County stated it did not understand the proposed expansion included both storage of overburden and expanded mining extraction on the subject parcels. It is the intent of the applicant to first store overburden soils in the expansion area, and at a later date expand mining extraction onto the subject parcels.

The County has indicated a second pre-application conference is required for the project to enable the County to respond to those aspects related to mining extraction. This second pre-application conference submittal packet is hereby submitted for consideration by the County for the full proposed project.

Storedahl Properties LLC is the listed landowner of the two subject parcels for this application (parcel numbers 230061000 and 230301000), and J.L. Storedahl and Sons, Inc. is the owning company of Storedahl Properties LLC. "Storedahl" is collectively used hereafter in this narrative to refer to both the landowner and applicant. GeoDesign, Inc. and Gordon Thomas Honeywell LLP are acting consultants for this application process working on behalf of Storedahl.

2.0 DESCRIPTION

The proposal is to expand mining operations for the existing Yacolt Mountain Quarry south onto the two subject parcels. This expansion will adjoin and remain contiguous with current mining operations. The two subject parcels underwent an Annual Review for inclusion into Clark County's surface mining overlay in 2018. Property ownership and parcel numbers are presented on Figures 2A and 2B. Expansion of the surface mining overlay (SMO) was contingently approved onto parcel number 230301000 and a portion of parcel number 230061000 in accordance with Ordinance No. 2019-02-02. The resulting SMO is shown on the site plan on Figure 3. The controlling condition for approval of the SMO expansion was a covenant running with the land and restricting extraction of materials and various other mining uses from the two subject parcels for a period of ten (10) years from the date of the covenant. The covenant was signed and notarized on December 7, 2018; and a copy is included in Appendix C. Storage of materials removed from the Yacolt Mountain Quarry and ancillary uses such as haul roads and storm drainage improvements are allowed during the 10-year period of restricted use.

Expansion of mining-related activities onto the two subject parcels is needed to allow mining operations underway at Yacolt Mountain Quarry to continue to provide long-term production of aggregates for the region. The proposal is to first use the two subject parcels for storage of overburden soils and material stockpiles for approximately the next ten years or longer, as shown on Figure 4. At some point beyond the 10-year period of restricted use, mining extraction will expand onto the subject parcels, as shown on Figure 5. It is not certain at this time when mining extraction would occur on the subject parcels, but extraction will definitely not occur until the restricting covenant has ended.

The fill topography shown on Figure 4 presents the proposed plan to store overburden soil from the current Yacolt Mountain Quarry on the expansion parcels. The extents of the fill represent approximately the maximum anticipated. As the mine resource is exhausted in the current quarry, the overburden will be removed from the expansion parcels and placed as fill back into the current mine. After the fill has been removed from the expansion area, the mine excavation will continue onto the expansion parcels. The maximum area of extraction is shown on Figure 5. Cross sections depicting the existing, fill, and final cut topography are shown on Figure 6.

3.0 PROPOSED PLAN CRITERIA

The Pre-Application Conference guidance document available from Clark County Community Development (revised October 11, 2018) lists the submittal requirements for a proposed project for the pre-application conference. The listed information from the guidance document is included below in italics along with comments for the proposed mine expansion. Where appropriate, references to figures attached to this packet are included.

Proposed plan

- *Proposed Plan shall be drawn to a minimum scale of 1" = 200' for subdivisions and 1" = 50' for all other applications*
- *Plan sheet size shall be no larger than 24" x 36"*

Comment – The scales for Figures 1 through 6 vary depending on the features being portrayed. Figure 1 is a vicinity map at 1" = ½ mile to show the minimum ¼-mile radius around the site required and to show the physical features and topography surrounding the site. The site plans (Figures 2 through 5) are scaled at 1" = 500 or 600 feet, which is often an appropriate scale for a mining project to portray the horizontal extent of the site and the mining activities proposed for the project. Cross sections are scaled at 1" = 300 feet on Figure 6 with no vertical exaggeration.

The following information shall be clearly depicted on the Proposed Plan:

General information

- *Applicant's name, mailing and e-mail addresses, and phone number*
- *Owner's name, and mailing and e-mail addresses*
- *Contact person's name, mailing and e-mail addresses, and phone number*
- *North arrow oriented to the top, left or right of the page, scale and date*
- *Title of proposed project, such as subdivision or business*
- *Vicinity map covering 1/4 mile radius from the development site*

- *Area of the site in acres or square feet*

Comment – All of the above information is included on Figures 1 through 5, which serve as the main plan maps for the proposed project. Note that the listed contact (Bo Storedahl) serves as contact for both project applicant and landowner.

Note: All the information listed below must be included with the application in order to qualify for contingent vesting. See page 2 for explanation of contingent vesting.

Comment – To the extent possible, all information is provided either in this narrative, on the figures, or in the Developer’s Packet obtained from Clark County GIS.

Existing conditions

Environmental/Critical Areas on site and within 100 feet of the site

- *Topography (at 2 foot contour intervals, if available from a public source)*

Comment – Topography at 2-foot contours is included in the Developer’s Packet. Topography at 20-foot contours is presented on Figures 3 through 5 and is based on LiDAR elevation data obtained from the USGS. This contour interval is more useful than the very dense 2-foot contours shown in the Developer’s Packet, considering the horizontal and vertical extent of the site.

- *Any water courses (streams, rivers, etc.)*
- *Areas within the designated 100 year floodplain*
- *Water bodies and known wetlands*

Comment – Water courses, water bodies, and wetlands identified in the Developer’s Packet are shown on Figures 3 through 5. The 100-year floodplain is not located in the site vicinity.

- *Any unstable slopes and landslide hazard areas*

Comment – The Developer’s Packet shows slopes greater than 15 percent; a significant portion of the site has such slopes and are not shown on Figures 2 through 5 to avoid overshadowing other information. Potentially Unstable Slopes and Historic or Active Landslides are not mapped in the Developer’s Packet in the area of interest or in the site vicinity. In addition, surface reconnaissance conducted by an engineering geologist at the site has not indicated the presence of unstable slopes or potentially active landslides.

- *Significant wildlife habitat or vegetation*
- *Significant historic resources*

Comment – Riparian Habitat Areas from the Developer’s Packet are shown on Figure 3. The applicant has contracted qualified consultants to conduct a critical area evaluation and an archeological predetermination for the project area that will be disturbed by mining-related activities. Their reports will be submitted with the CUP application.

Land Use and Transportation

- *Layout of existing parcels drawn to scale*
- *Location(s) of any existing building(s) on the site*
- *Name and location of roadways and roadway easements (private and public), and surface material of these roads, such as gravel, asphalt or concrete pavement, etc.*
- *Location of existing on-site driveways and those off-site driveways across the street. Include the edge to edge distance between all driveways and roadways*
- *Location and width of existing pedestrian and bicycle facilities on-site and within one 100 feet of the site*
- *Location of transit routes and stops within ¼ mile of the development site*
- *Location of any existing wells and/or septic systems on-site and within 100 feet of the site*

Comment – Parcels are shown to scale on Figure 2. There are no existing buildings, public roadways or easements on site. Private roadways and driveways are shown on Figures 3 through 5. There are no transit routes or stops within ¼-mile the site. There are no pedestrian or bicycle facilities nor wells or septic systems located onsite or within 100 feet of the proposed project area.

Proposed improvements

Critical Environmental Areas

The applicant is encouraged, but not required, to show proposed mitigation measures for identified critical areas, such as geologic hazard areas, wetlands, etc.

Land Use and Transportation

- *Proposed easements*
- *Location and width of proposed on-site road rights-of-way*
- *Location and curb to curb width of proposed on-site roadways, provided by drawing or note*
- *Location and width of off-site rights-of-way and roadways which will provide access to the site*
- *Location and width of proposed pedestrian, such as sidewalks, and bicycle improvements other than those required by the road standards*
- *Location and width of proposed easements for access and drainage, etc., provided by drawing or note*
- *The configuration and dimensions of all proposed lots and tracts, including proposed park, open space, and or drainage tracts or easements. Include the maximum and minimum density calculations for residential developments*
- *Proposed layout of structures, areas to be landscaped and off-street parking and loading areas*
- *The location of proposed septic systems and reserve areas including soil type and brief narrative discussing soil suitability for septic systems*

Comment – None of these criteria apply to the proposed project.

Stormwater

- *Provide a conceptual stormwater system layout that includes locations of proposed stormwater facilities including stormwater lines, treatment and discharge control facilities*

Comment – Conceptual stormwater management is shown on Figure 4 for the proposed storage of overburden soils on the site. Overburden stockpiles will be seeded with a field-vegetation mix for erosion control and should develop a robust vegetative cover similar to existing overburden piles. Preliminary stormwater designs indicate the full overburden storage area with developed field conditions would require a stormwater infiltration basin approximately 100 feet by 50 feet, based on the results of infiltration testing completed onsite. An emergency overflow would be directed toward an onsite swale located northeast of the pond.

Once the mine resource has been exhausted in the current mine, and as overburden soil has been placed into the exhausted mine excavation to reclaim it, mining extraction on the expansion parcels will incise the excavation into the hillside. Stormwater will be managed at that time by capturing and directing it into the mined excavation where it will infiltrate to ground.

6. Traffic information report

- *Provide an estimate of the existing vehicle generation for the site, if any*
- *Provide a specific description of the proposed land use or building use that is the basis for the estimate of the number of vehicle trips generated by the proposed development*
- *Provide a preliminary estimate of the number of vehicle trips generated by the proposed development including the numerical basis for the estimate, such as number of square feet, number of fueling pumps, etc.*

Comment – A traffic impact analysis was completed by Kittelson and Associates in March 2018 to support inclusion of the parcels into the SMO. The traffic study was completed in accordance with Clark County’s transportation impact analysis requirements, which include the information requested above. The results of the study indicate the expansion could occur while maintaining acceptable traffic operations and safety at all study intersections. Four copies of the March 2018 traffic study are included with this application submittal packet.

Following the first pre-application conference, Kittelson and Associates prepared a letter (dated September 24, 2019) to explain that the proposed expansion intends to maintain the current limits to site vehicle trip generation established under the existing CUP. Consequently, the proposed project will not result in increased truck traffic generation. Four copies of the September 2019 traffic memorandum are included with this application submittal packet.

◆ ◆ ◆

Should you have questions, we can be reached at (503) 968-8787.

Sincerely,

GeoDesign, Inc.



Erick J. Staley, L.E.G.
Principal Geologist

cc: Kimball Storedahl, J. L. Storedahl and Sons, Inc. (via email only)
Bo Storedahl, J. L. Storedahl and Sons, Inc. (via email only)

EJS

Attachments

8 copies submitted

Document ID: Storedahl-15-01_PreApp-Yacolt Mine Expansion.docx

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APPENDIX A

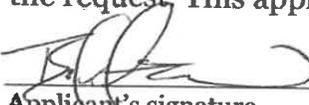
APPLICATION FORM FOR PRE-APPLICATION CONFERENCE

Development Application

Project name: Yacolt Mountain Quarry Expansion		
Type(s) of application (see reverse side): Second Pre-application conference (first pre-app held May 9, 2019; #PAC-2019-00052)		
Description of proposal: Project entails expanding the current Yacolt Mountain Quarry to include portions of two parcels recently added to the County's Surface Mining Overlay (SMO). See attached narrative for a full discussion of the project.		
Applicant name: J.L. Storedahl and Sons, Inc.	Address: 2233 Talley Way, Kelso, WA 98626	
E-mail address: bo@storedahl.com	Phone and fax: (360)-636-2420	
Property owner name (list multiple owners on a separate sheet): Storedahl Properties LLC	Address: 2233 Talley Way, Kelso, WA 98626	
E-mail address: bo@storedahl.com	Phone and fax: (360)-636-2420	
Contact person name (list if not same as applicant): Bo Storedahl & Erick Staley	Address: GeoDesign, Inc. 9450 SW Commerce Circle, Suite 300 Wilsonville, OR 97070 as above and:	
E-mail address: bo@storedahl.com; estaley@geodesigninc.com	Phone and fax: as above and: 503-968-8787	
Project site information: Site address: near 18601 NE Yacolt Mountain Rd, Yacolt, WA 98675	Comp plan designation: FR-1	
Cross street: n/a	Zoning: FR-80	Parcel numbers: 230301000, 230061000
Overlay zones: SMO	Legal: SE 1/4, S05; SW1/4, S03; and SW1/4 & SE1/4, S04, T4N, R3E	Acreage of original parcels: 140
Township: 4 North	Range: 3 East W.M.	1/4 of section: primarily SW

Authorization

The undersigned hereby certifies that this application has been made with the consent of the lawful property owner(s) and that all information submitted with this application is complete and correct. False statements, errors, and/or omissions may be sufficient cause for denial of the request. This application gives consent to the county to enter the properties listed above.

	12/23/2019		12/23/2019
Applicant's signature	Date	Property owner or authorized representative's signature	Date

For staff use only	Case number:		Work order number:	
---------------------------	---------------------	--	---------------------------	--

Revised 6/14/12



Community Development
1300 Franklin Street, Vancouver, Washington
Phone: (360) 397-2375 Fax: (360) 397-2011
www.clark.wa.gov/development



For an alternate format, contact the Clark County ADA Compliance Office.
Phone: (360)397-2322
Relay: 711 or (800) 833-6384
E-mail: ADA@clark.wa.gov

Application types

If you have any questions regarding the type of application being requested, our Permit Technicians will be happy to assist you.

- Annual Review
- Appeal
- Boundary Line Adjustment and Lot Reconfiguration
- Conditional Use

Environmental/Critical Areas

- Critical Aquifer Recharge Area (CARA)
- Columbia River Gorge
- Forestry + (Moratorium Waiver, Moratorium Removal, Class I, Class IVG or COHP)
- Floodplain
- Geological
- Habitat
- Habitat Monitoring
- Historic
- SEPA
- Shoreline
- Wetland
- Wetland Monitoring

Land Division

- Binding Site Plan
- Final Plat
- Plat Alteration
- Short Plat (___ Infill)
- Subdivision (___ Infill)

Miscellaneous

- Addressing
- Accessory Dwelling
- Covenant Release
- Home Business
- Legal Lot Determination and Innocent Purchasers Determination
- Non-Conforming Use Determination
- Sewer Waiver
- Shooting Range
- Sign

Planning Director Review

- Post Decision
- Pre-Application Conference 2nd pre-app
- Pre-Application Waiver
- Public Interest Exception
- Similar Use
- Temporary Use
- Planned Unit Develop/Master Plan
- Road Modification
- Site Plan
- Variance
- Zone Change

APPENDIX B

DEVELOPER'S PACKET

SUBJECT PROPERTY ACCOUNT NUMBERS: 230301000 & 230061000

(230067000 INCLUDED FOR REFERENCE TO ADJACENT YACOLT MOUNTAIN QUARRY)

DEVELOPER'S PACKET

Produced By:

Clark County Geographic Information System (GIS)



For:

GeoDesign, Inc.

Subject Property Account Number(s):

230301000

230061000

230067000

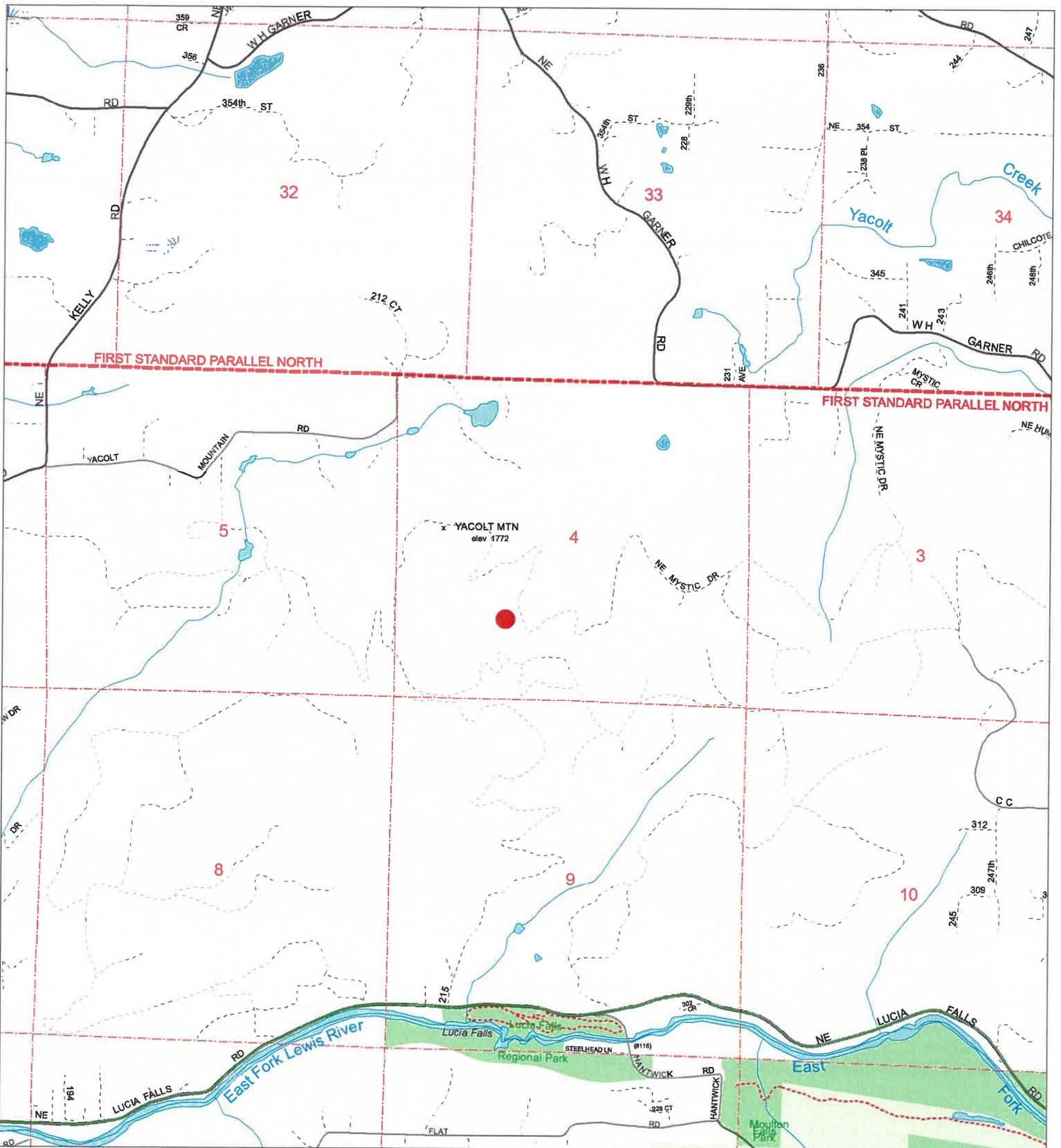
PDF # 216761

Printed: February 07, 2019

Expires: February 07, 2020

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General Location

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

Printed on: February 07, 2019



Geographic Information System
 0 1,000 2,000 Feet

 Location of Subject Property(s)



Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

Property Information Fact Sheet

Mailing Information:

Account No.: 230301000, 230061000, 230067000
Owner: STOREDAHL PROPERTIES LLC
Address: 2233 TALLEY WAY
C/S/Z: KELSO, WA 98626

Assessed Parcel Size: 223.92 Ac

Property Type: Multiple Property Types

PARCEL LOCATION FINDINGS:

Quarter Section(s): SW 1/4,S03,T4N,R3E,
SE 1/4,S04,T4N,R3E,
SW 1/4,S04,T4N,R3E,
NW 1/4,S04,T4N,R3E,
SE 1/4,S05,T4N,R3E

Municipal Jurisdiction: Clark County

Urban Growth Area: County

Zoning: FR-80

Zoning Overlay: Surface Mining Overlay District

Comprehensive Plan Designation: FR-1

Columbia River Gorge NSA: No Mapping Indicators

Late-Comer Area: No Mapping Indicators

Trans. Impact Fee Area: Rural: Current,
Rural 2: End Date Dec. 31, 2016

Park Impact Fee District: No Mapping Indicators

Neighborhood Association: No Mapping Indicators

School District: Battle Ground

Elementary School: Yacolt

Junior High School: Amboy

Senior High School: Battle Ground

Fire District: FD 13, FD 10

Sewer District: Rural/Resource

Water District: Clark Public Utilities

Wildland: No Mapping Indicators,
500+ elevation, and forest, slopes, or no Fire District

ENVIRONMENTAL CONSTRAINTS:

Soil Type(s): CnB, 2.0% of parcel

CnD, 11.3%

CnE, 30.7%

CrE, 0.8%

CrG, 30.9%

KeC, 21.4%

Rk, 2.9%

Hydric Soils: Non-Hydric, 100.0% of parcel

Flood Zone Designation: Outside Flood Area

CARA: No Mapping Indicators

Forest Moratorium Area: 6 Year FPA Parcel Hold

Liquefaction Susceptibility: Bedrock

NEHRP: B

Slope: 0 - 5 percent, 4.6% of parcel

10 - 15 percent, 17.9%

15 - 25 percent, 30.8%

25 - 40 percent, 21.8%

40 - 100 percent, 13.5%

5 - 10 percent, 11.4%

Landslide Hazards: Slopes > 15%

Slope Stability: Severe Erosion Hazard Area

Habitat and Species Resources:

Habitat and Species Impacts: Mapping Indicators Found

Riparian Habitat Area: Fish Habitat Stream

Seasonal Stream

Cultural Resources:

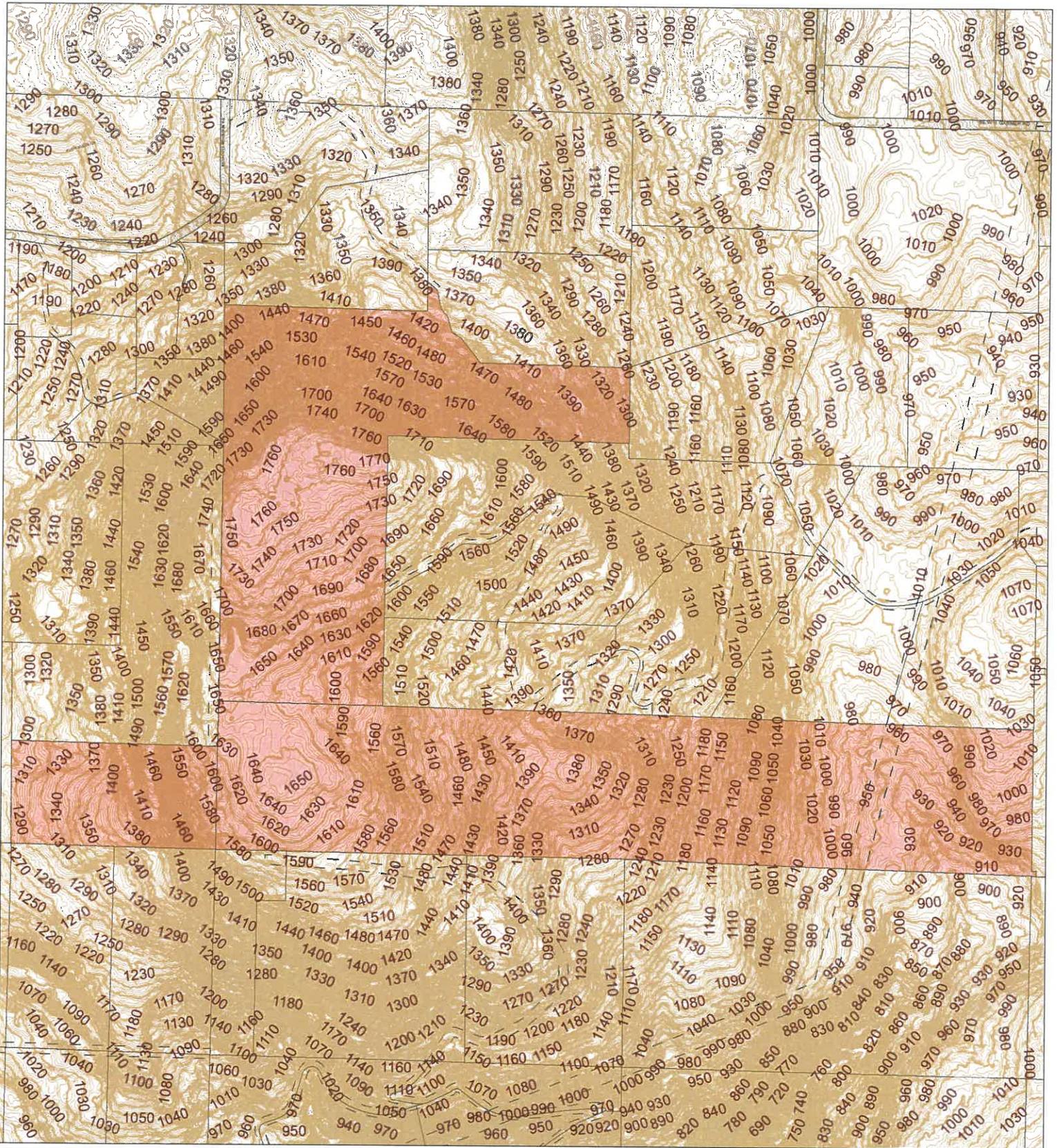
Archeological Predictive: Low, 79.7% of parcel

Low-Moderate, 15.8%

Moderate, 4.5%

Archeological Site Buffers: No Mapping Indicators

Historic Sites: No Mapping Indicators

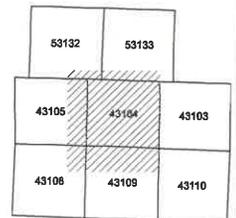


Elevation Contours

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

- Subject Property(s)
- Public Road
- Transportation or Major Utility Easement
- 10' Elevation Contours
- 2' Elevation Contours

Printed on: February 07, 2019





2016 Aerial Photography

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

Printed on: February 07, 2019



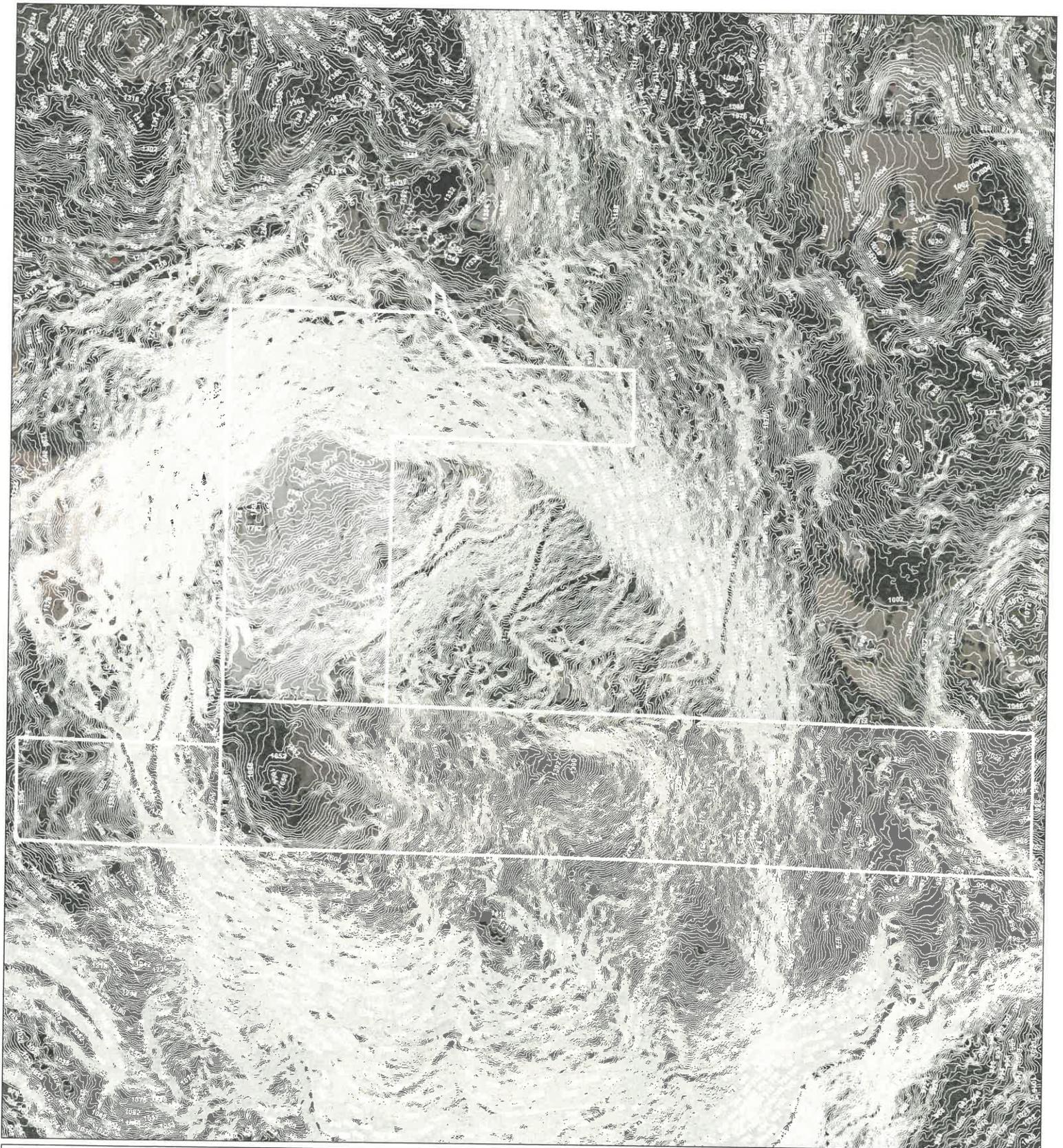
Geographic Information System

0 200 400
 Feet

 Subject Property(s)

53132	53133	
43108	43104	43103
43108	43109	43110

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.



2016 Aerial Photography with Elevation Contours

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

Printed on: February 07, 2019

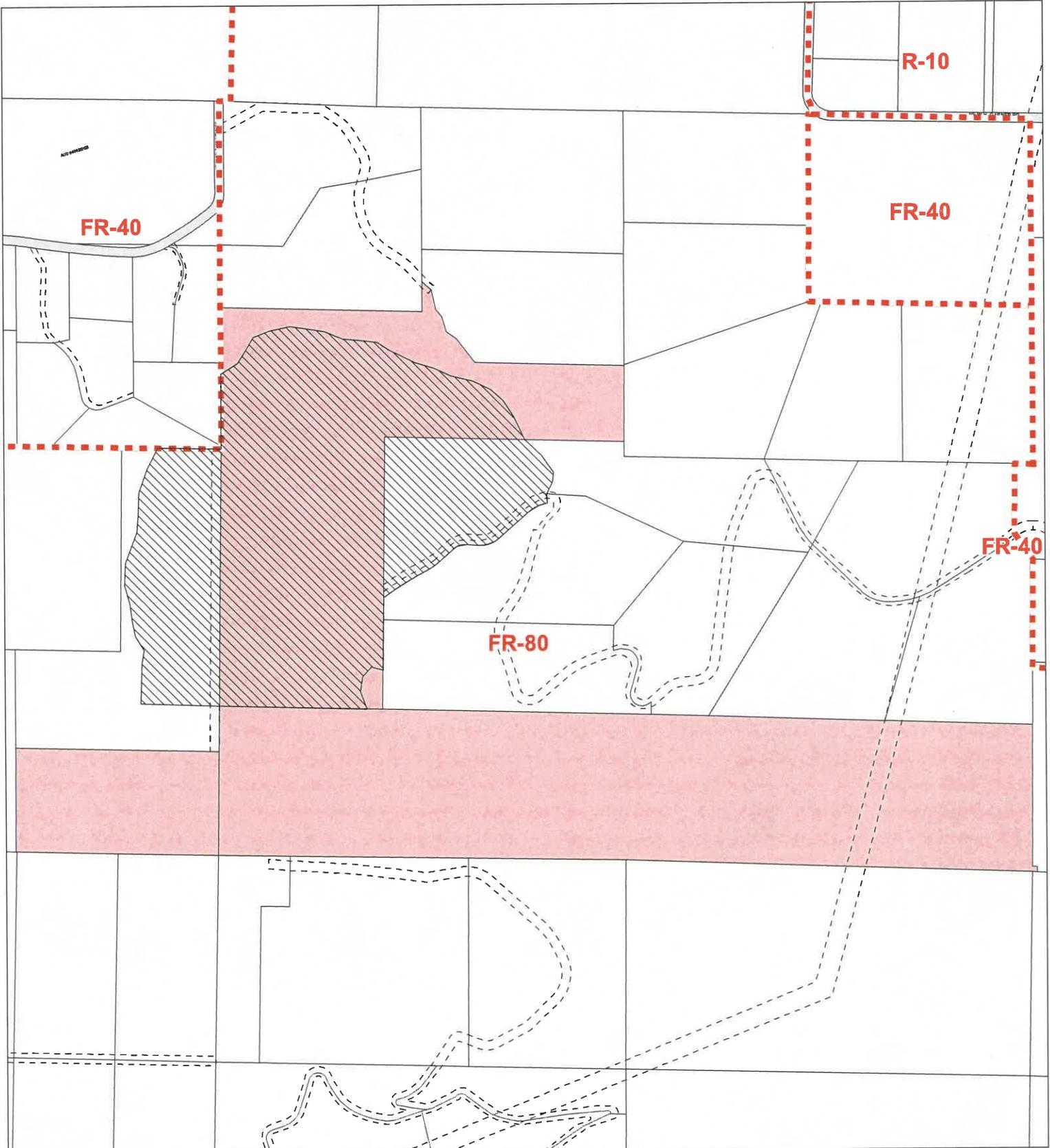


010200
 Feet

 Subject Property(s)
 2' Elevation Contours

53132	53133	
43105	43104	43103
43108	43109	43110

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.



Zoning Designations

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

Printed on: February 07, 2019



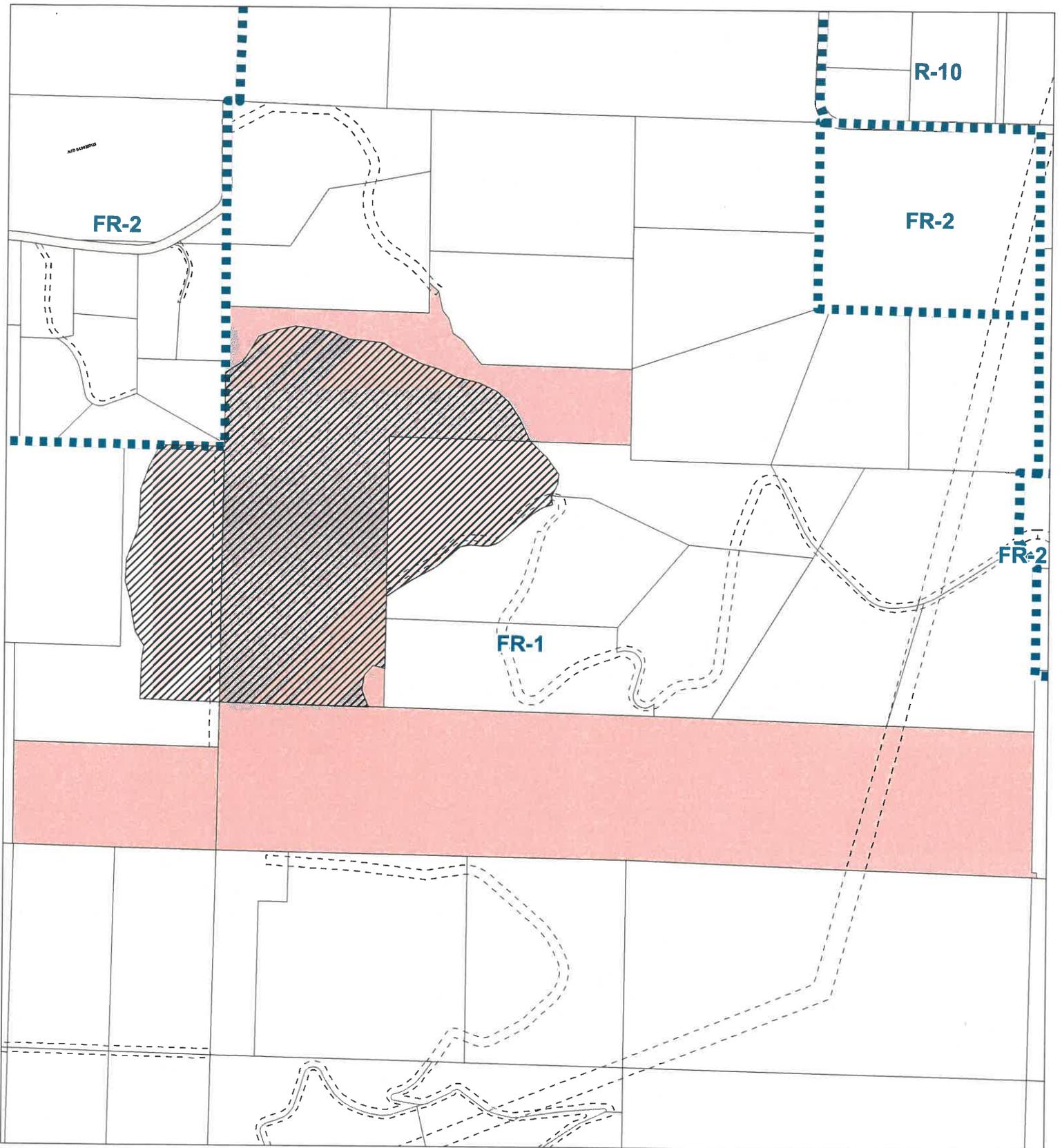
Geographic Information System

0 200 400 Feet

- Subject Property(s)
- Public Road
- Transportation or Major Utility Easement
- Zoning Boundary
- Urban Holding - 10 (UH-10)
- Urban Holding - 20 (UH-20)
- Urban Holding - 40 (UH-40)
- Surface Mining Overlay District

53132	53133
43105	43103
43108	43110

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.



Comprehensive Plan Designations

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

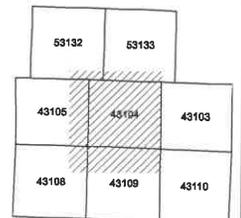
Printed on: February 07, 2019

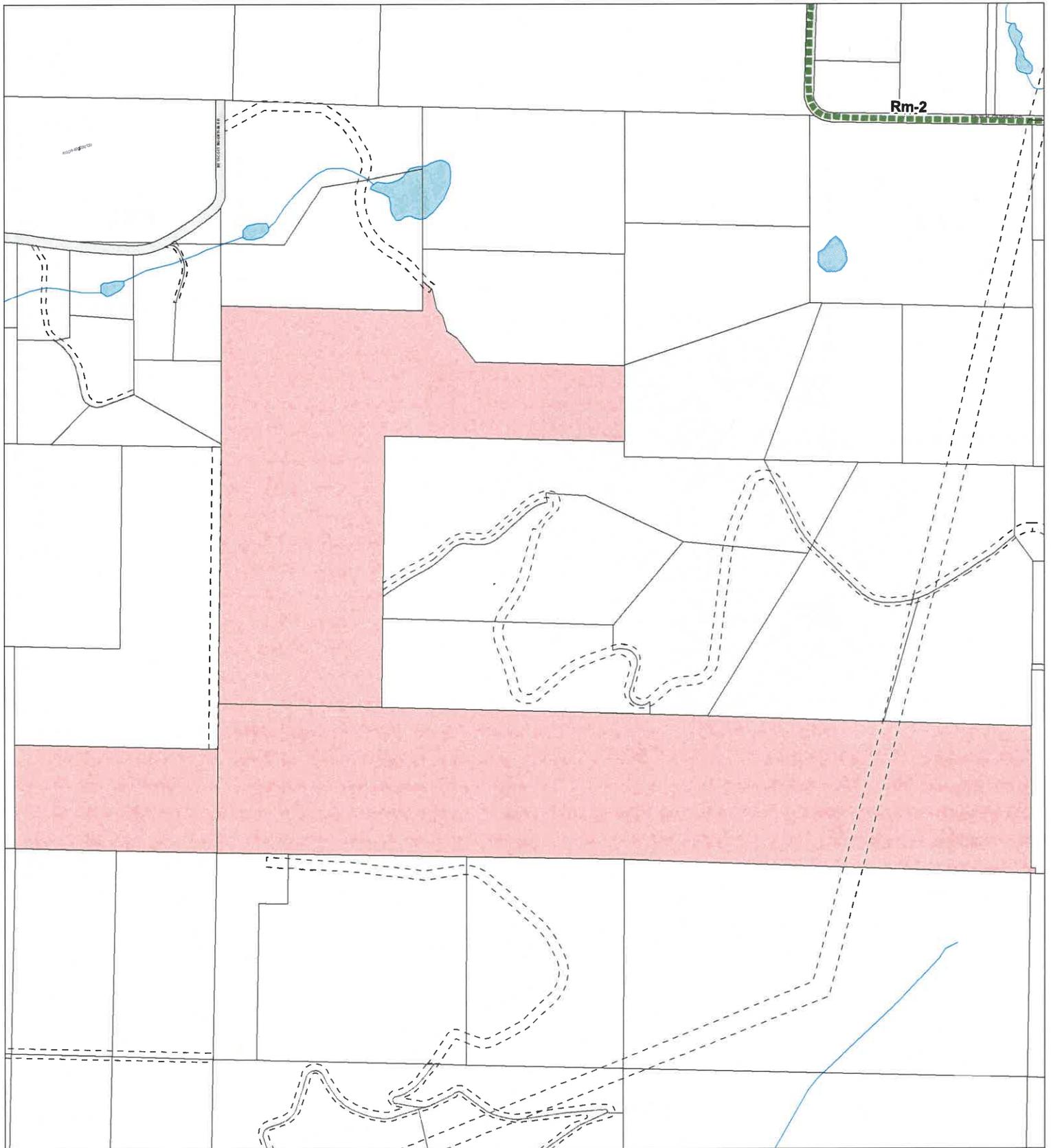


0 200 400 Feet

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

- Subject Property(s)
- Industrial Reserve
- Public Road
- Railroad Industrial Reserve
- Transportation or Major Utility Easement
- Mining
- Comprehensive Plan Boundary
- Rural Center Mixed Use
- Urban Reserve
- Columbia River Gorge Scenic Area





Arterials, C-Tran Bus Routes, Parks & Trails

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

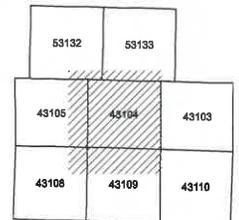
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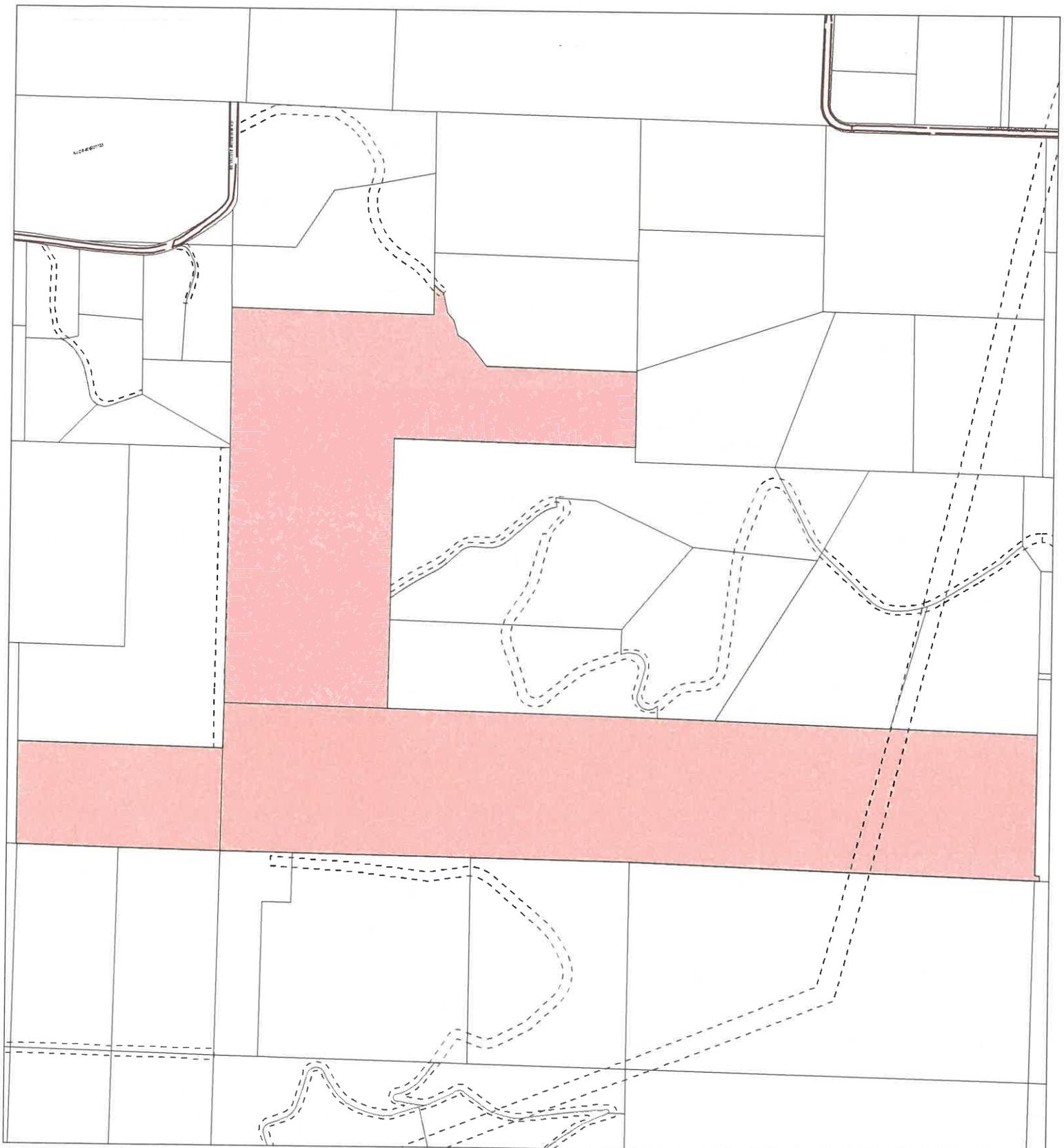


0 200 400 Feet

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

- Subject Property(s)
- Public Road
- Transportation or Major Utility Easement
- Parks
- Trail
- C-Tran Route
- Principal Arterial
- Minor Arterial
- Collector
- Rural Major Collector
- Rural Minor Collector
- State Route
- Other
- Proposed Arterial
- Scenic Highway





Geographic Information System
 0 200 400
 Feet

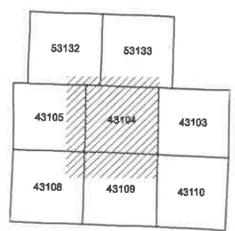
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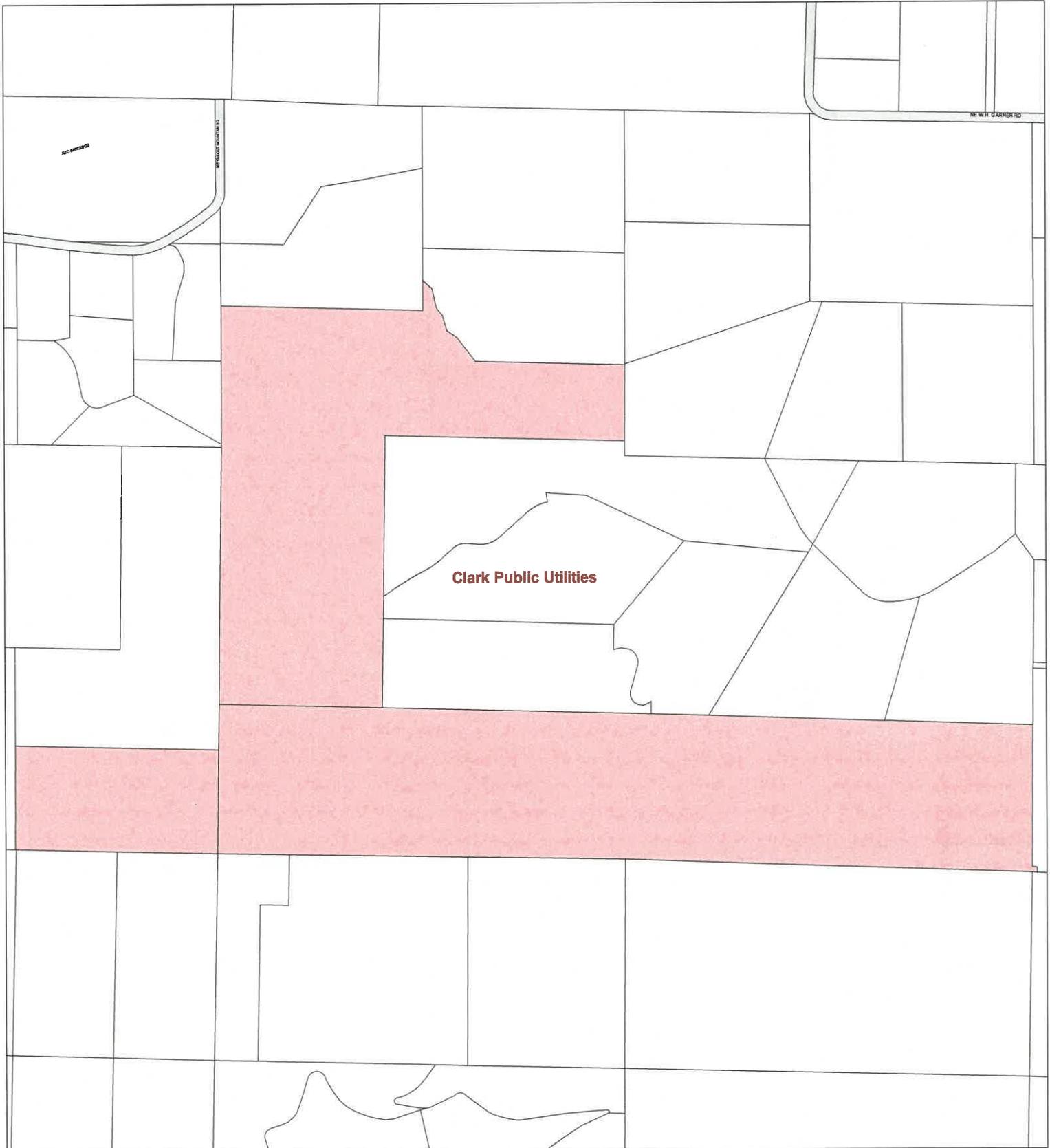
Water, Sewer, and Storm Systems

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

- Subject Property(s)
- Public Road
- Transportation or Major Utility Easement
- Water Lines
- Sewer Lines
- Storm Water Lines
- 1-year Wellhead ZOC
- 5-year Wellhead ZOC
- 10-year Wellhead ZOC
- Hydrants

Printed on: February 07, 2019



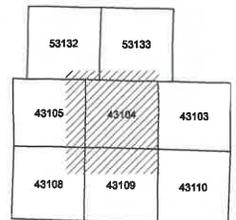


Water Systems

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

Printed on: February 07, 2019

- Subject Property(s)
- Public Road
- Water District Boundary
- Unknown Size Water Line
- < 10" Water Line
- 10-20" Water Line
- > 20" Water Line
- No Flow Data Hydrant
- 0 - 499 GPM at 20 PSI
- 500 - 999 GPM at 20 PSI
- > 1000 - 1749 GPM at 20 PSI
- > 1750 GPM at 20 PSI
- Hydrant > 500' from parcel(s)



CLARK COUNTY, WASHINGTON

Geographic Information System

0 200 400 Feet

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

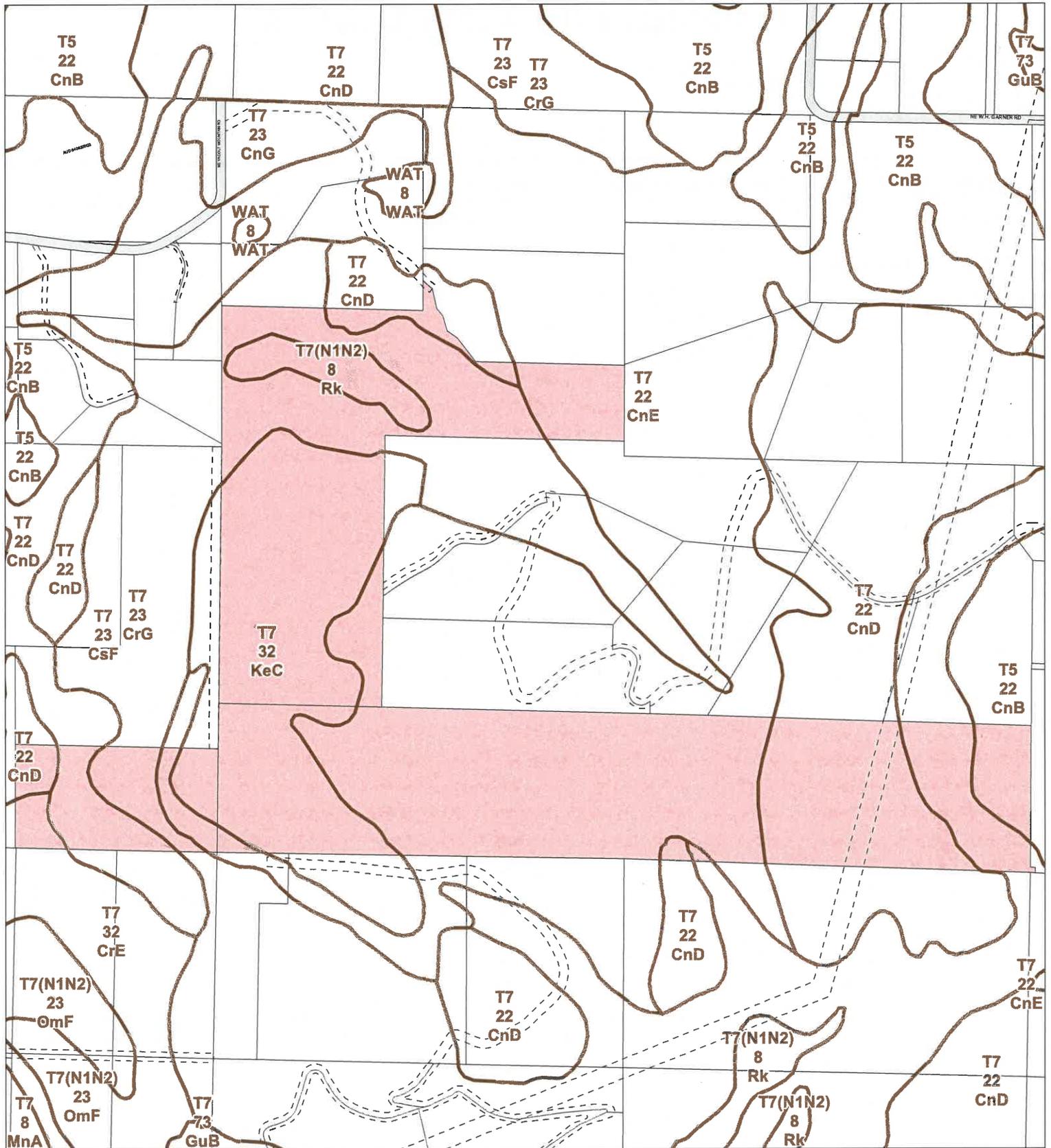
Hydrant Fire Flow Details

Account No.: 230301000, 230061000, 230067000
Owner: STOREDAHL PROPERTIES LLC
Address: 2233 TALLEY WAY
C/S/Z: KELSO, WA 98626

Water District(s)	Hydrant Data Update	Project Site Provider
Clark Public Utilities	January 1, 2017	Service Provider

HYDRANT INFORMATION:

No hydrants found.



Soil Types

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

Printed on: February 07, 2019

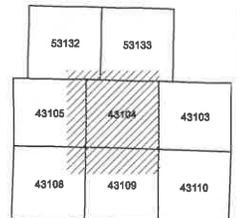


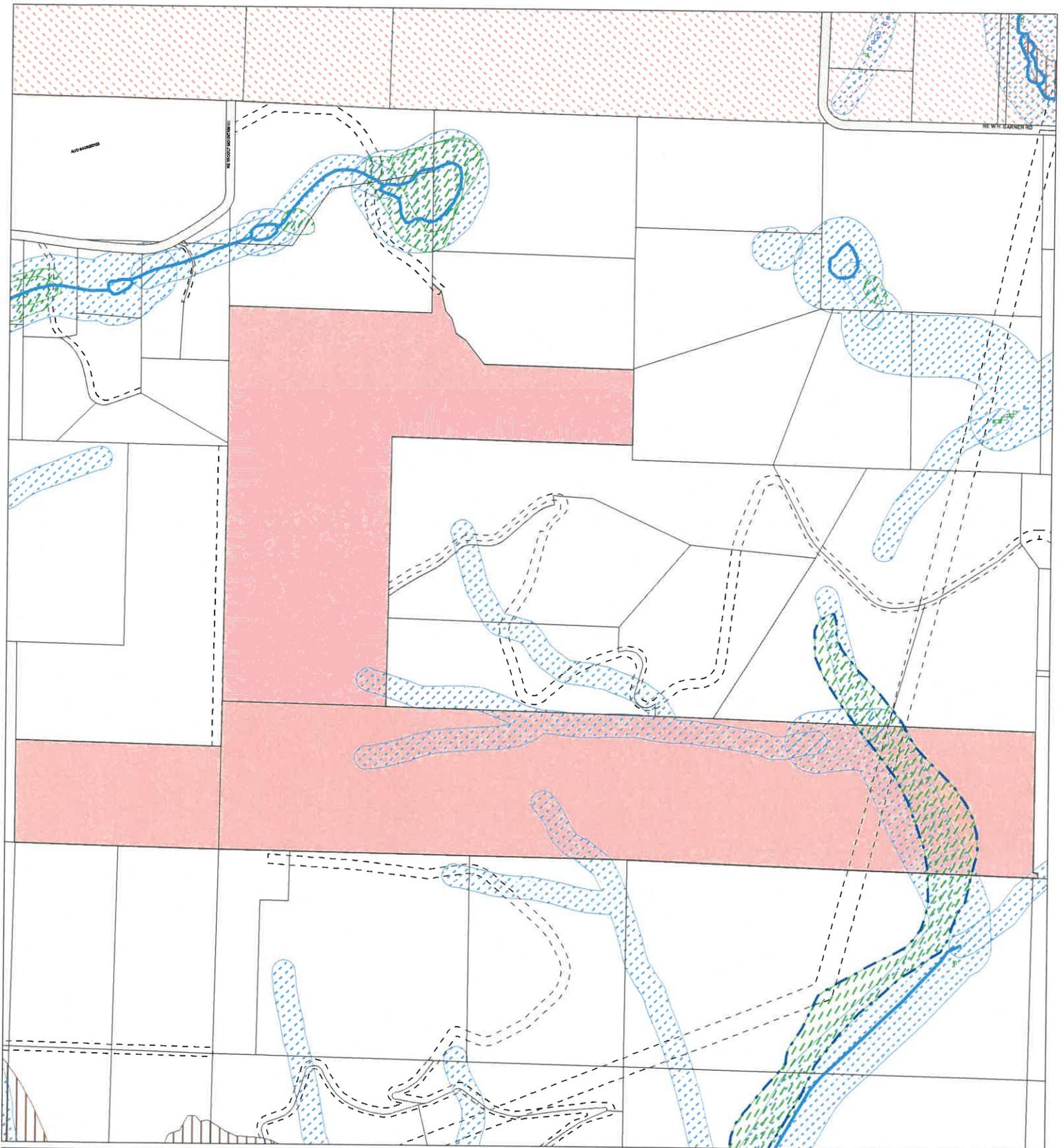
Geographic Information System

0 200 400 Feet

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

- Subject Property(s)
- Public Road
- Transportation or Major Utility Easement
- Soil Type Boundary





Environmental Constraints I

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

Printed on: February 07, 2019



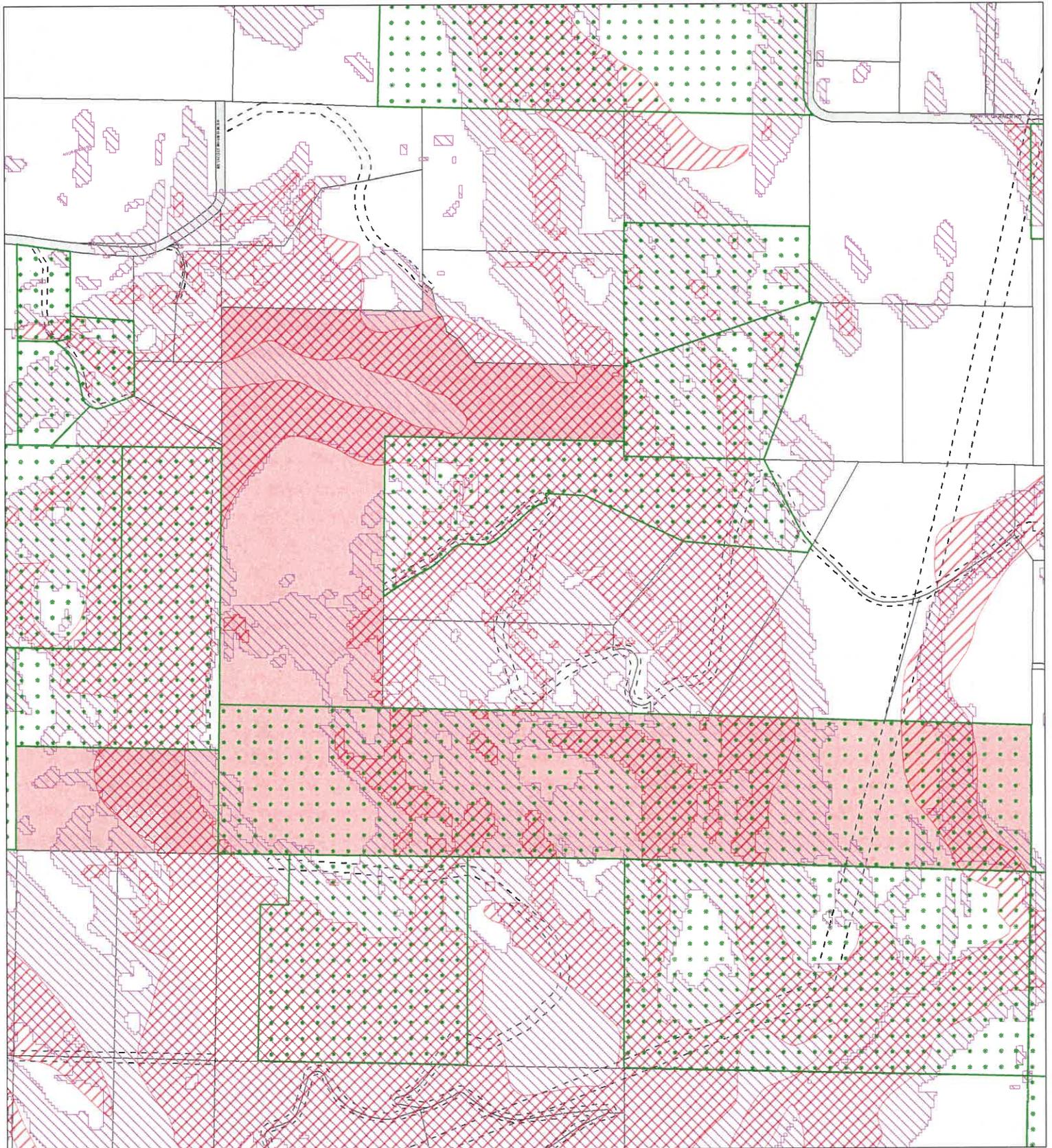
Geographic Information System

0 200 400
 Feet

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

- Subject Property(s)
- Public Road
- Transportation or Major Utility Easement
- Hydric Soils
- Wetland Inventory
- CARA Category 1
- Riparian Habitat or Species Area
- Non-Riparian Habitat or Species Area
- 100 year Floodplains
- Floodway
- Shorelines
- Stream

53132	53133
43105	43104
43108	43109
43103	43110



Environmental Constraints II

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

Printed on: February 07, 2019



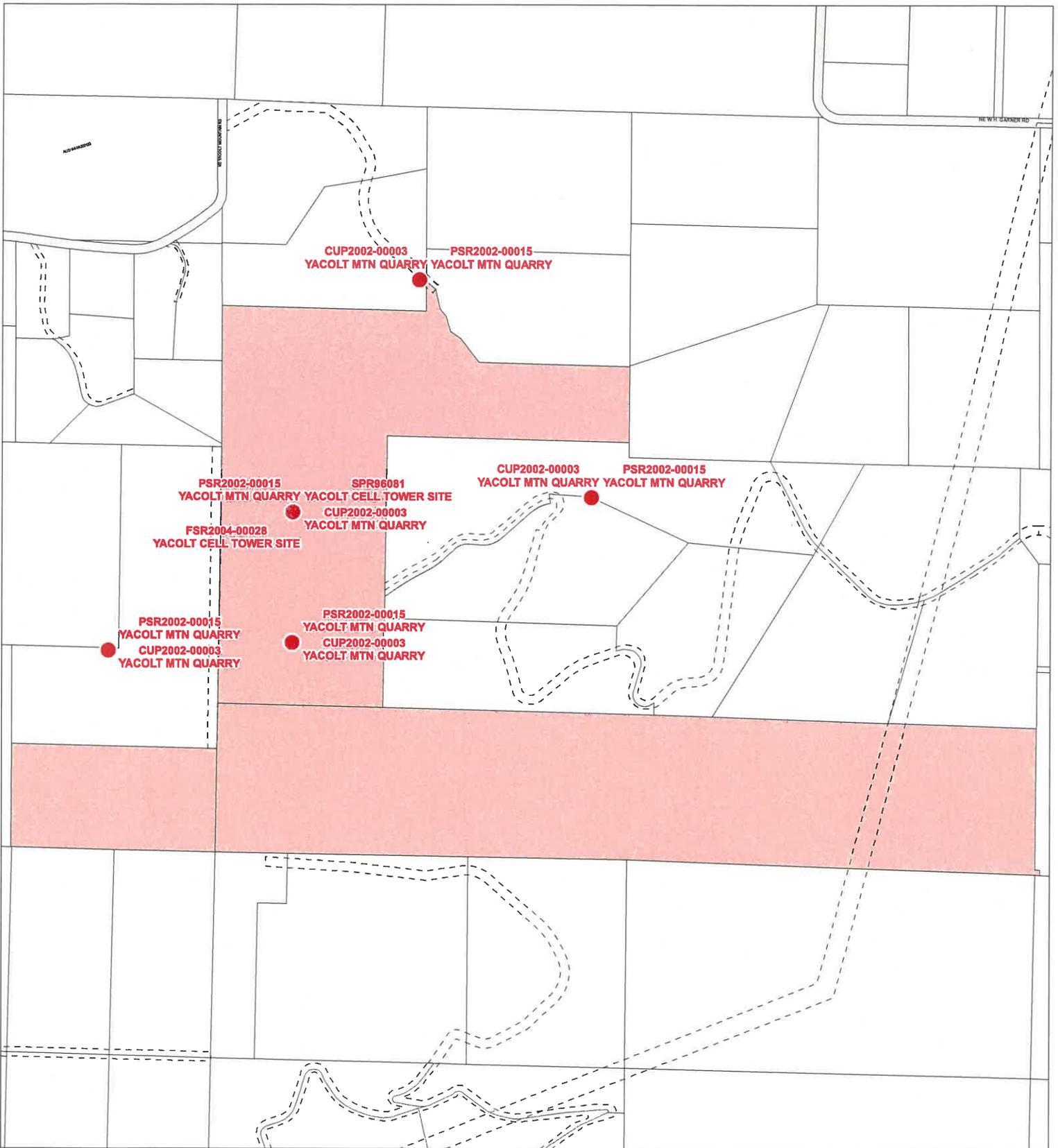
Geographic Information System

0 200 400
 Feet

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

- Subject Property(s)
- Public Road
- Transportation or Major Utility Easement
- Slopes > 15%
- Potentially Unstable Slope
- Historic or Active Landslide
- Severe Erosion Hazard Area
- Forest Moratorium Area
- CCHR Historic Site
- NRHP Historic Site
- INV Historic Site

53132	53133
43105	43104
43108	43109
43103	43110



Adjacent Development

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

Printed on: February 07, 2019



Geographic Information System



Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

- Subject Property(s)
- Public Road
- Transportation or Major Utility Easement
- Adjacent Development

53132	53133
43105	43103
43108	43110



Quarter Section Parcels

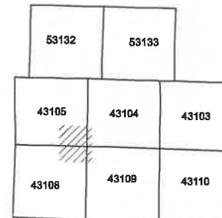
Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

Printed on: February 07, 2019



Geographic Information System
 0 150 300 Feet

- Subdivision Lines
- Subject Property(s)
- Donation Land Claim
- Road Right of Way - Actual Road May not Exist
- Section Quarters
- Transportation or Major Utility Easement
- City Boundaries



Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.



Quarter Section Parcels

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

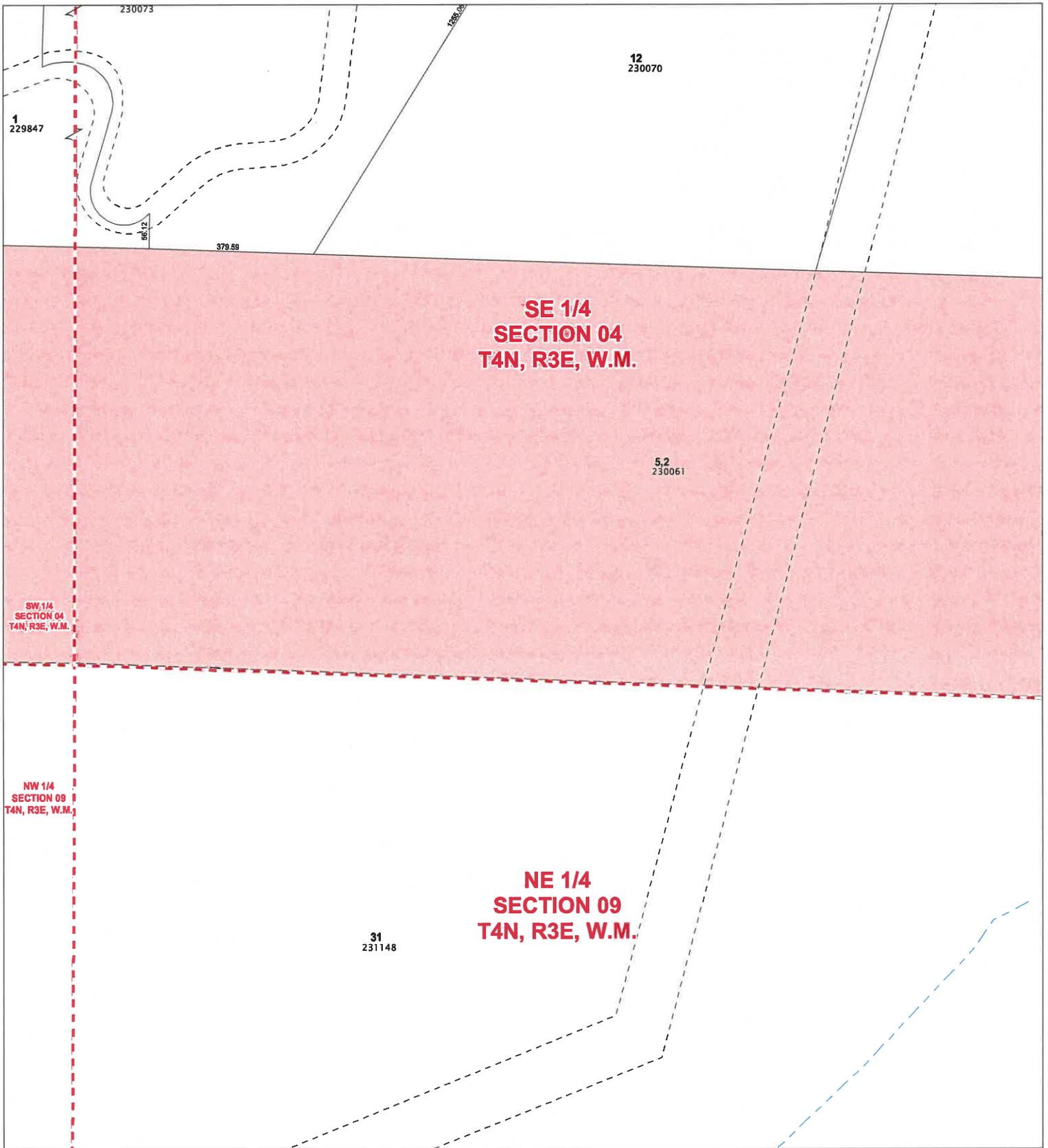
Printed on: February 07, 2019



- Subdivision Lines
- Donation Land Claim
- Section Quarters
- City Boundaries
- Subject Property(s)
- Road Right of Way - Actual Road May not Exist
- Transportation or Major Utility Easement

53132	53133	
43105	43104	43103
43108	43109	43110

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.



Quarter Section Parcels

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

Printed on: February 07, 2019



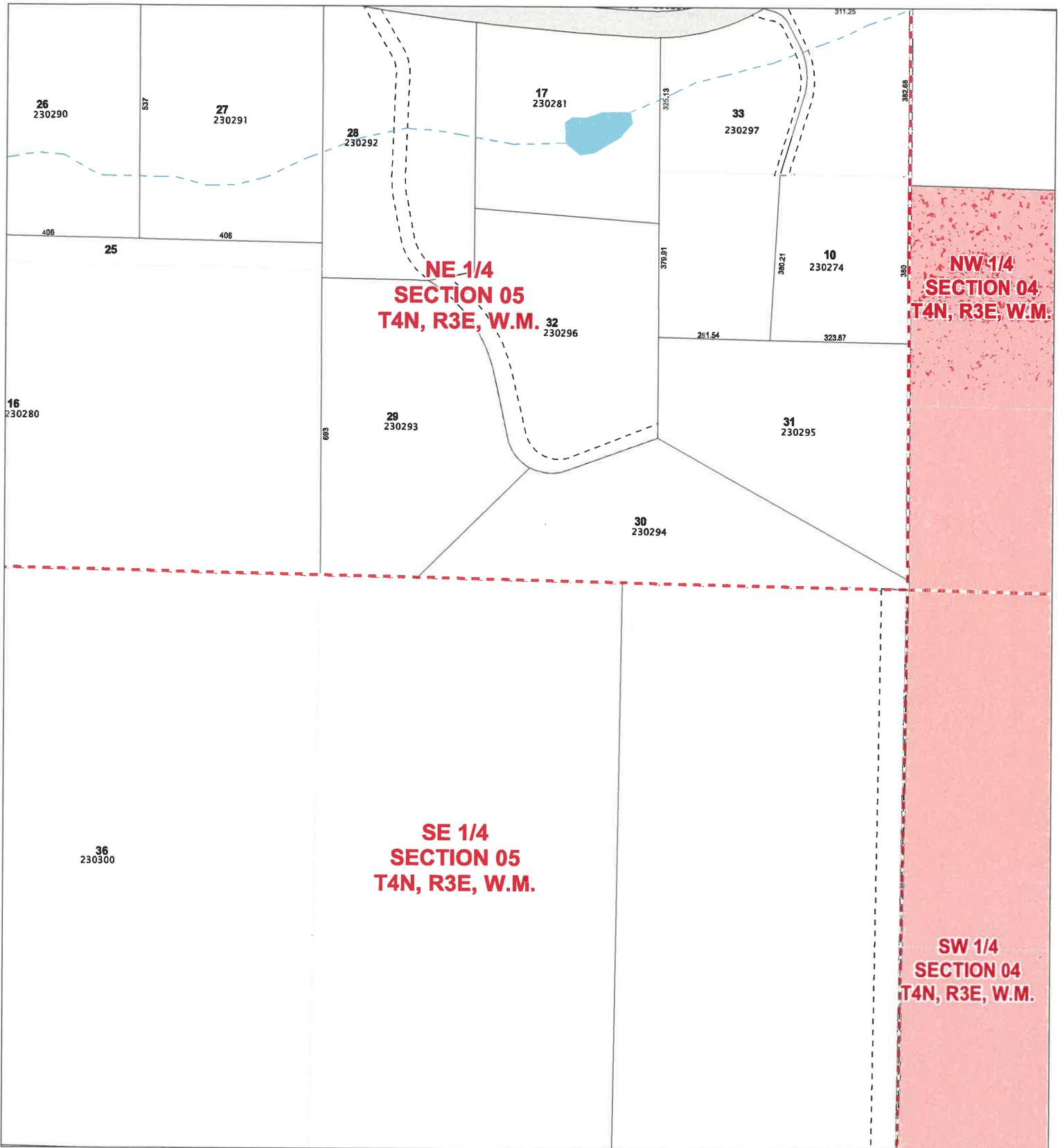
Geographic Information System



- Subdivision Lines
- Donation Land Claim
- Section Quarters
- City Boundaries
- Subject Property(s)
- Road Right of Way - Actual Road May not Exist
- Transportation or Major Utility Easement

53132	53133	
43105	43104	43103
43108	43109	43110

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.



**NE 1/4
SECTION 05
T4N, R3E, W.M.**

**NW 1/4
SECTION 04
T4N, R3E, W.M.**

**SE 1/4
SECTION 05
T4N, R3E, W.M.**

**SW 1/4
SECTION 04
T4N, R3E, W.M.**

Quarter Section Parcels

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

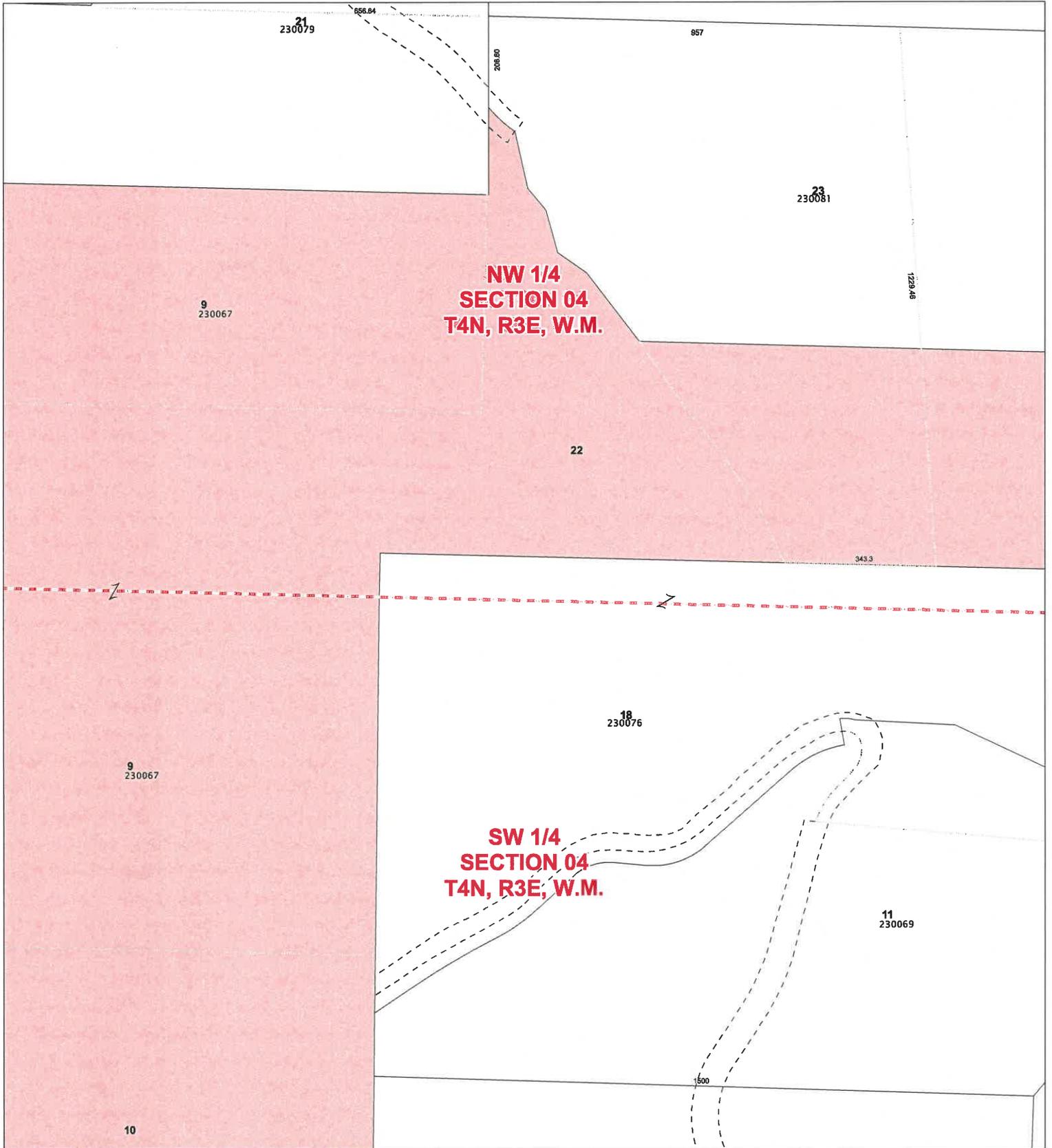
Printed on: February 07, 2019



Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

- Subdivision Lines
- Donation Land Claim
- Section Quarters
- City Boundaries
- Subject Property(s)
- Road Right of Way - Actual Road May not Exist
- Transportation or Major Utility Easement

53132	53133	
43108	43104	43103
43108	43109	43110



Quarter Section Parcels

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

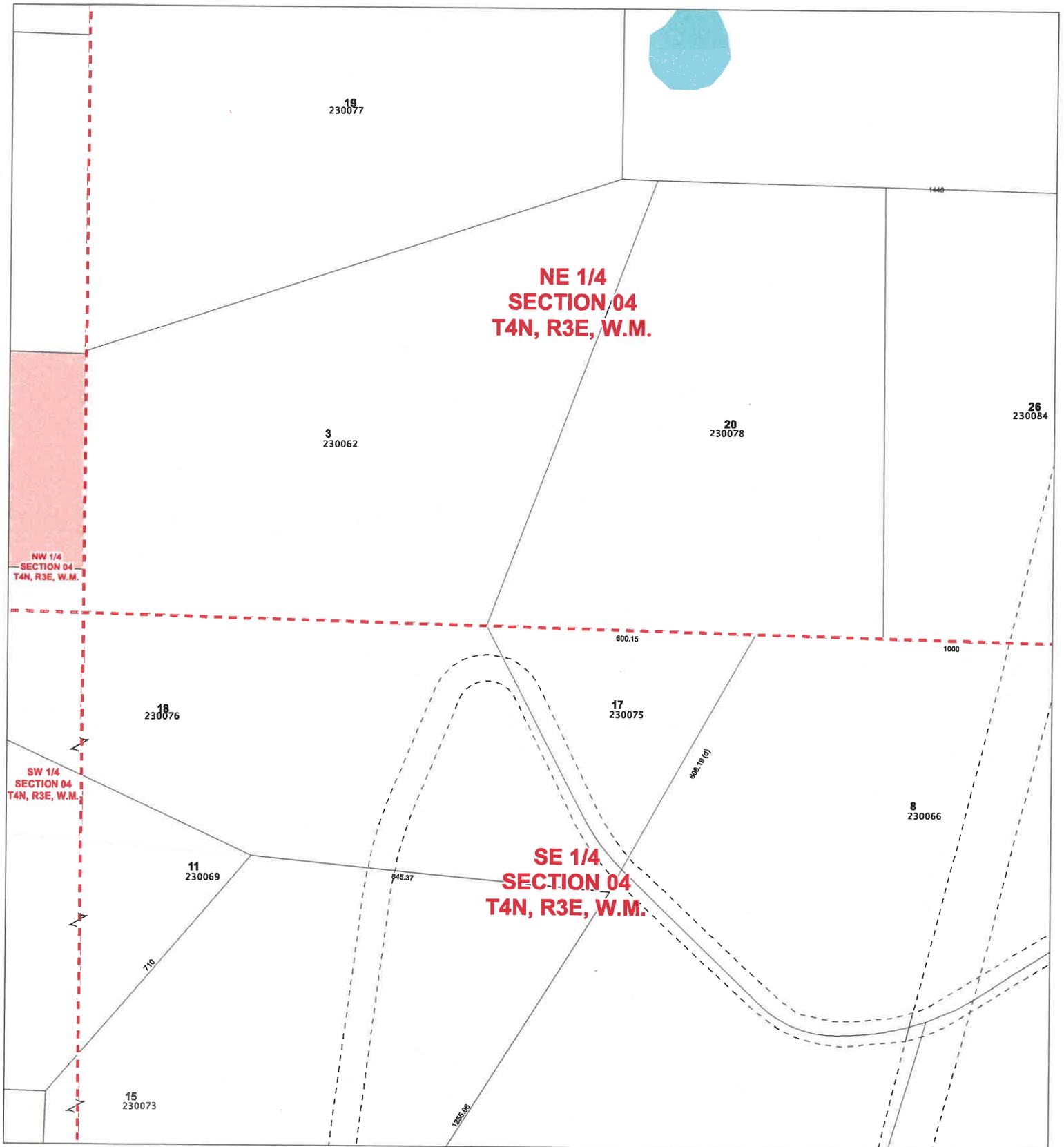
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- Subdivision Lines
- Donation Land Claim
- Section Quarters
- City Boundaries
- Subject Property(s)
- Road Right of Way - Actual Road May not Exist
- Transportation or Major Utility Easement

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43105	43104	43103
43108	43109	43110

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.



Quarter Section Parcels

Account: 230301000, 230061000, 230067000
 Owner: STOREDAHL PROPERTIES LLC
 Address: 2233 TALLEY WAY
 C/S/Z: KELSO, WA 98626

Printed on: February 07, 2019



Geographic Information System
 0 150 300 Feet

- Subdivision Lines
- Donation Land Claim
- Section Quarters
- City Boundaries
- Subject Property(s)
- Road Right of Way - Actual Road May not Exist
- Transportation or Major Utility Easement

53132	53133	
43105	43108	43103
43108	43108	43110

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

APPENDIX C

**COVENANT RUNNING WITH THE LAND AND RESTRICTING USE OF PROPERTY
DECEMBER 7, 2018**

Exhibit 1B

Return Address

Christine Cook
Clark County Prosecuting Attorney's Office,
Civil Division
P.O. Box 5000
Vancouver, WA 98666-5000

CP 18-08

**COVENANT RUNNING WITH THE LAND
AND RESTRICTING USE OF PROPERTY**

Grantor(owner): Storedahl Properties LLC

Grantee: Clark County

Abbreviated Legal Description The South Half of the Southeast Quarter of the Southeast Quarter of Section 5, Township 4 North, Range 3 East, W.M., Clark County, Washington.

A portion of the South 120 acres of the South Half of Section 4, Township 4 North, Range 3 East, W.M., Clark County, Washington.

Assessor's Property Tax

Parcel/Account No. 230061000, 230301000

Review Case No.:

This Covenant Running with the Land and Restricting Use of Property (Covenant) is made this 7th day of December, 2018 by Storedahl Properties LLC, a Washington limited liability company, (Storedahl), and Clark County, a Washington municipal corporation.

BACKGROUND

A. Storedahl owns property legally described on Exhibit A to this Agreement and referred to as the Storedahl Property (parcel serial numbers 230061000 and 230301000).

Storedahl is the sole and exclusive owner of the Storedahl Property, and/or has authority to bind all persons or entities that have a known interest in the Storedahl Property.

B. Storedahl currently operates a surface mine on adjacent properties which is the subject of permits issued by the County under CPZ2002-00009, CUP2002-00003, PSR2002-00015, SEP2002-00025, and ARC2001-00050, and is referred to here as the Yacolt Mountain Quarry. The properties on which the Yacolt Mountain Quarry is permitted are designated by the Clark County Comprehensive Plan map with an existing Surface Mining Overlay.

C. Storedahl has applied to the County through Annual Review Application CPZ2018-00001 for an amendment to the Clark County Comprehensive Plan Map to designate the Storedahl Property with a Surface Mining Overlay (the Application). The Application states that Storedahl would use the Storedahl Property to extend the life of the Yacolt Mountain Quarry by providing a location to store material removed from the Yacolt Mountain Quarry. Storedahl contemplates that the Storedahl Property may be mined later when the minerals from the Yacolt Mountain Quarry are exhausted; provided, that both the storage of material on the Storedahl Property and potential eventual mining of the Storedahl Property will require additional environmental review and land use permitting.

D. Following State Environmental Policy Act review, and review by the Clark County staff and Planning Commission, the County Council conducted a public hearing on November 27, 2018, which hearing was continued to a time certain on December 11, 2018, to consider the Application. During the hearing, Storedahl was asked by the Council whether it would agree to a condition limiting the use of the Storedahl Property so as to exclude mineral extraction for at least five (5) years. Storedahl indicated it would agree to such a limitation.

E. To make the Storedahl representation a binding commitment running with the land, and as a further clarification of its Application, Storedahl covenants and agrees as set forth below.

COVENANT RUNNING WITH THE LAND

1. **Restriction.** If the County Council approves the Application, Storedahl covenants and agrees for itself and its successors and assigns, and for any subsequent possessor or owner of the Storedahl Property, which hereinafter shall be together referred to as "Storedahl", that for a period of ten (10) years from the date of this Covenant, it will not extract material from the Storedahl Property. During the term of this Covenant, Storedahl shall only use the Storedahl Property for the storage of materials removed from the Yacolt Mountain Quarry and for such ancillary uses as may be necessary to support that use, such as haul roads and storm drainage improvements. These ancillary uses do not include extraction of material, asphalt mixing, concrete batching, clay bulking, rock crushing or temporary offices, shops, or other accessory buildings and structures used for management and maintenance of mining and processing equipment.

2. **Other Permits.** Nothing in this Covenant is intended to excuse Storedahl from applicable County requirements for any proposed activities on the Storedahl Property. Storedahl

Exhibit 1B

shall obtain fill and grade, Conditional Use Permits and/or other permits that may be necessary under applicable County Code.

////

3. Expiration and Termination. This Covenant shall expire 10 years from the date this Covenant is signed by Clark County. The Covenant shall also be null and void if the County does not approve the Application. Storedahl may earlier terminate the Covenant only as provided in Section 4 below.

4. Release or Modification of Covenant. Storedahl agrees not to seek a release or modification any term of the Covenant by any means other than a Type IV legislative procedure, to be considered for approval by the Clark County Council, as set forth in the Clark County Code.

5. Successors and Assigns; Enforceability. This Covenant shall run with the Storedahl Property as a restrictive covenant and shall be binding upon Storedahl until its expiration or termination as set forth above. All obligations made herein by Storedahl shall be enforceable in law or in equity by Clark County against Storedahl, as that term is defined above to include Storedahl Properties LLC, and all of its successors, assigns, and any future possessors or owners of the Storedahl Property.

IN WITNESS WHEREOF, the parties cause this Covenant to be executed the day and date indicated below.

DATED this 7th day of December, 2018.

STOREDAHL PROPERTIES LLC

CLARK COUNTY, WASHINGTON

By: [Signature]
Its: Vice President, IS
Member of Properties, LLC

By: [Signature]
Its: County Chair

Approved as to Form Only:
Anthony F. Golik
Clark County Prosecuting Attorney

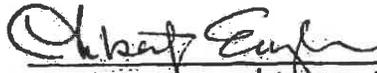
[Signature]
By: Christine M. Cook, Senior Deputy Prosecuting Attorney



STATE OF WASHINGTON)
) ss.
COUNTY OF Cowlitz)

On this 7th day of December, 2018, before me personally appeared Kevin Storedahl, to me known to be ~~the~~ a Member of Storedahl Properties, LLC, the limited liability company that executed the foregoing instrument and acknowledged the said instrument to be the free and voluntary act and deed of said limited liability company for the uses and purposes therein mentioned, and on oath stated that he was authorized to execute and in fact executed said instrument on behalf of the limited liability company.

DATED this 7th day of December, 2018.



Type/Print Name: Liberty Engleman
NOTARY PUBLIC in and for the State of
Washington, residing at Kelso WA
My Commission Expires 10/23/21

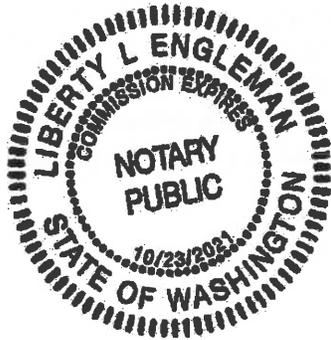
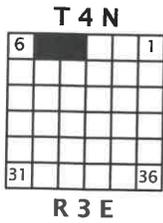


Exhibit 1B

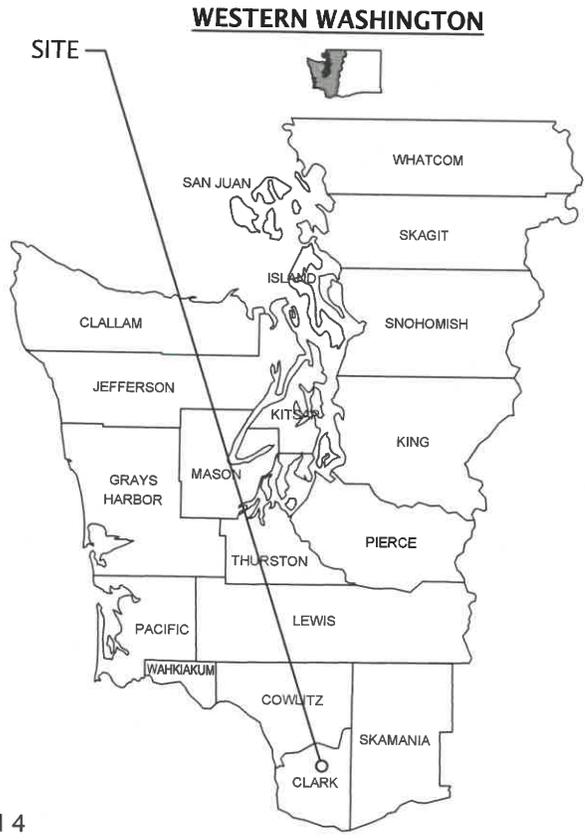
Exhibit A

Parcel 230301000 - the South Half of the Southeast Quarter of the Southeast Quarter of Section 5, Township 4 North, Range 3 East, W.M., Clark County, Washington.

Portion of Parcel 230061000 - the West 3840.00 feet of even width of that portion of the South 120 acres of the South Half of Section 4, Township 4 North, Range 3 East, W.M., Clark County, Washington.



SITE COORDINATES:
 LATITUDE: 45° 51' 23" N
 LONGITUDE: 122° 27' 14" W



DIRECTIONS TO SITE

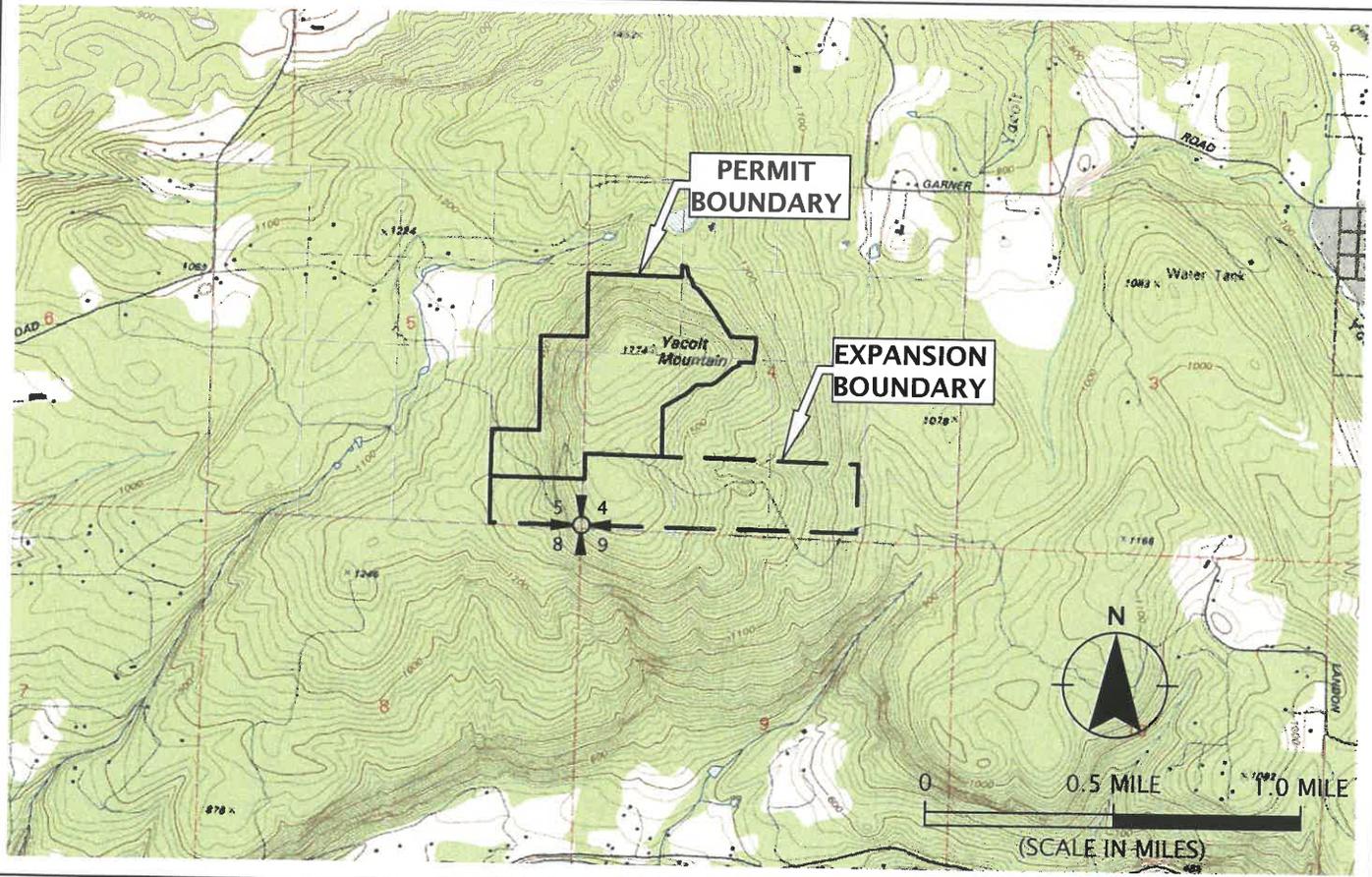
THE SITE IS APPROXIMATELY 3.5 MILES EAST OF YACOLT, WA. FROM YACOLT, DRIVE EAST ON NE W.H. GARNER ROAD. ROUGHLY 0.5 MILES EAST OF YACOLT, TURN LEFT ONTO NE MYSTIC DRIVE. FOLLOW NE MYSTIC DRIVE FOR APPROXIMATELY 3 MILES TO THE SITE.

LEGAL DESCRIPTION

THE SITE IS LOCATED IN PORTIONS OF THE FOLLOWING:

- SE 1/4 OF THE NE 1/4 OF SECTION 5
- NE 1/4 AND SE 1/4 OF THE SE 1/4 OF SECTION 5
- SW 1/4 OF THE SE 1/4 OF SECTION 4
- SE 1/4 AND SW 1/4 OF THE NW 1/4 OF SECTION 4
- NW 1/4, NE 1/4, SE 1/4, AND SW 1/4 OF THE SW 1/4 OF SECTION 4

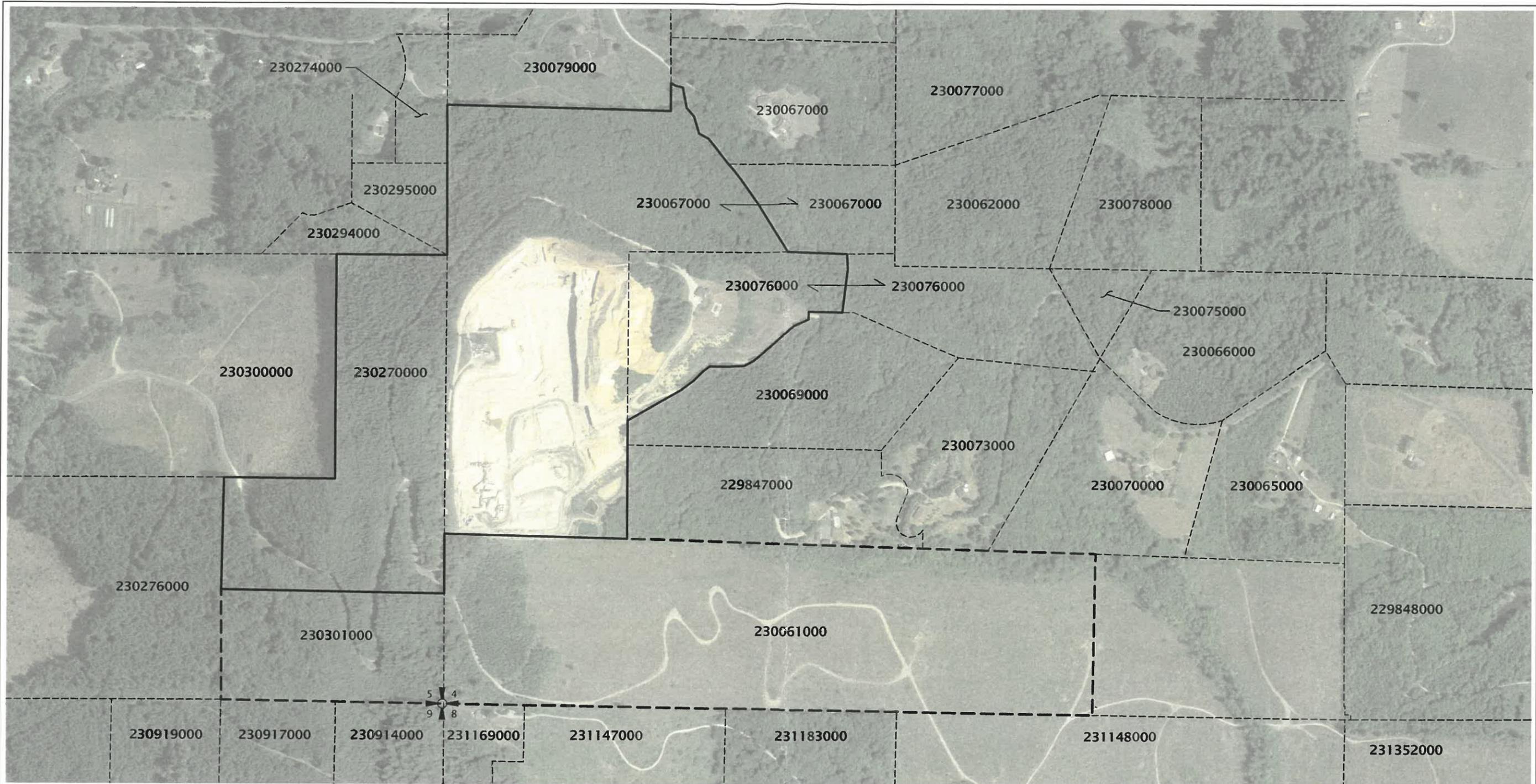
NOTE: USGS TOPOGRAPHIC QUADRANGLE MAP (YACOLT 1990) REPRODUCED USING MAPTECH TERRAIN NAVIGATOR PRO®.



Printed By: mmiller | Print Date: 12/20/2019 10:45:54 AM
 File Name: J:\5\Storedahl\Storedahl-15-01\Figures\CAD\Storedahl-15-01-VM04.dwg | Layout: FIGURE 1

	J.L. STOREDAHL & SONS	VICINITY MAP YACOLT MOUNTAIN QUARRY EXPANSION	
	STOREDAHL-15-01 DECEMBER 2019	CLARK COUNTY, WA SECTIONS 4 AND 5, TOWNSHIP 4N, RANGE 3E, W.M.	
			FIGURE 1

Printed By: mmiller | Print Date: 12/20/2019 10:46:01 AM
 File Name: J:\S-Z\Storedahl\15-01\Storedahl-15-01\Figures\CAD\Storedahl-15-01-AP02.dwg | Layout: FIGURE 2A



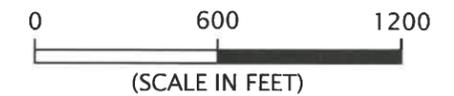
LEGEND:

-  PERMIT BOUNDARY (134.6 ACRES)
-  EXPANSION BOUNDARY (106.6 ACRES)
-  PROPERTY PARCEL BOUNDARY

230061000 PROPERTY IDENTIFICATION NUMBER
 (SEE FIGURE 2B FOR PROPERTY OWNERSHIP INFORMATION)



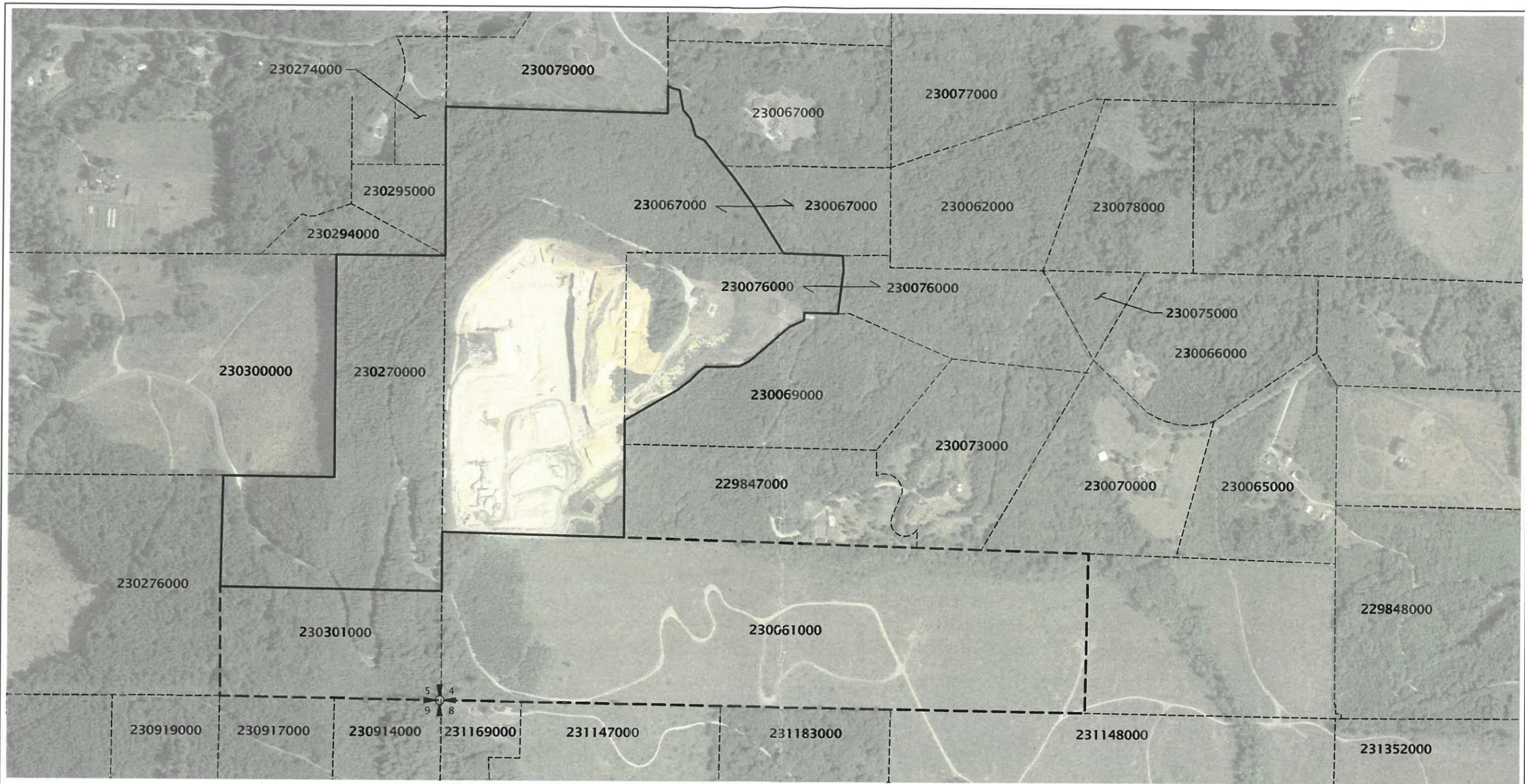
SECTION CORNER



NOTES:

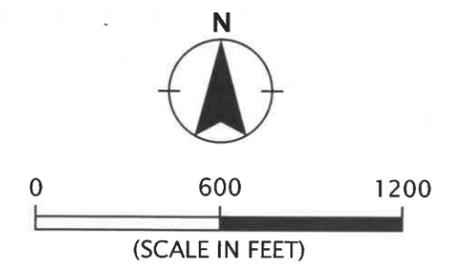
1. AERIAL PHOTOGRAPH (JULY 16, 2018)
OBTAINED FROM GOOGLE EARTH PRO.
2. PROPERTY INFORMATION OBTAINED
FROM CLARK COUNTY ASSESSOR.

Printed By: mmiller | Print Date: 12/20/2019 10:46:01 AM
 File Name: J:\S\Z\Store Dahl\Store Dahl-15\Store Dahl-15-01\Figures\CAD\Store Dahl-15-01-AP02.dwg | Layout: FIGURE 2A



LEGEND:

-  PERMIT BOUNDARY (134.6 ACRES)
-  EXPANSION BOUNDARY (106.6 ACRES)
-  PROPERTY PARCEL BOUNDARY
- 230061000** PROPERTY IDENTIFICATION NUMBER
(SEE FIGURE 2B FOR PROPERTY OWNERSHIP INFORMATION)
-  SECTION CORNER



- NOTES:**
1. AERIAL PHOTOGRAPH (JULY 16, 2018) OBTAINED FROM GOOGLE EARTH PRO.
 2. PROPERTY INFORMATION OBTAINED FROM CLARK COUNTY ASSESSOR.

ADJACENT PROPERTY OWNERSHIP INFORMATION TABLE

PARCEL NUMBER	OWNER NAME	OWNER ADDRESS
230919000 230917000 230914000	POMEROY-PLOWMAN RANCH LIMITED	20902 NE LUCIA FALLS RD YACOLT WA , 98675
231169000	BRUCE AND HEATHER BEARD	31808 NE 215TH AVE YACOLT WA , 98675
231147000	SCOTT JOHNS	PO BOX 65486 VANCOUVER WA , 98665
231183000	DAVID R & MARION L SWENDSEN	32214 NE RAILROAD AVE YACOLT WA , 98675
231148000 231352000	STOREDAHL PROPERTIES LLC	2233 TALLEY WAY KELSO WA , 98626
229848000	LEVI AND JENNIFER STENERSEN	PO BOX 429 YACOLT WA , 98675
230065000	MICHAEL AND JEAN WEST	PO BOX 452 YACOLT WA , 98675
230070000	JONATHAN LOVEGROVE AND NATTAMON CHANGKIEN	31821 NE MYSTIC DR YACOLT WA , 98675
230066000	JUDITH TODD	31714 NE MYSTIC DR YACOLT WA , 98675
230073000	GARY SOUTH	31110 NE MYSTIC DR YACOLT WA , 9867
229847000	GRANT AND SHANNON NELSON	PO BOX 415 YACOLT WA , 98675
230069000	DAVID AND SUSAN STIMES	2024 NE 90TH AVE VANCOUVER WA , 98664
230075000 230078000	GAYLORD AND CAROL STEPHENSON	39904 NE ROTSCHY RD YACOLT WA , 98675
230062000	PAULA G STEEPHENSON TRUSTEE	39904 NE ROTSCHY RD YACOLT WA , 98675
230077000	DENNIS AND KATHY STEPHENSON	39904 NE ROTSCHY RD YACOLT WA , 98675
230067000	YACOLT MOUNTAIN QUARRY LLC	PO BOX 464 YACOLT WA , 98675
230079000	DAN AND SONJA MASSIE	21115 NE YACOLT MOUNTAIN RD YACOLT WA , 98675
230274000	JAMES AND EILEEN KASKI	22011 NE 212TH AVE BATTLE GROUND WA , 98604
230295000 230294000	SAM AND CAROL SMITH	39513 NE 21ST AVE WOODLAND WA , 98674
230300000	JAMES AND LEAH MATILLA	PO BOX 447 BATTLE GROUND WA , 98604
230276000	CECIL AND MARIE ROTSCHY	34522 NE 225TH CT YACOLT WA , 98675

SUBJECT PROPERTY INFORMATION TABLE

PARCEL NUMBER	OWNER NAME	OWNER ADDRESS
230301000 230061000	STOREDAHL PROPERTIES LLC	2233 TALLEY WAY KELSO WA , 98626
230067000	YACOLT MOUNTAIN QUARRY LLC	PO BOX 464 YACOLT WA , 98675
230270000	CECIL AND MARIE ROTSCHY	34522 NE 225TH CT YACOLT WA , 98675
230076000	BRENT AND HEIDI ROTSCHY	PO BOX 464 YACOLT WA , 98675

PROPERTY OWNERSHIP INFORMATION
 YACOLT MOUNTAIN QUARRY EXPANSION

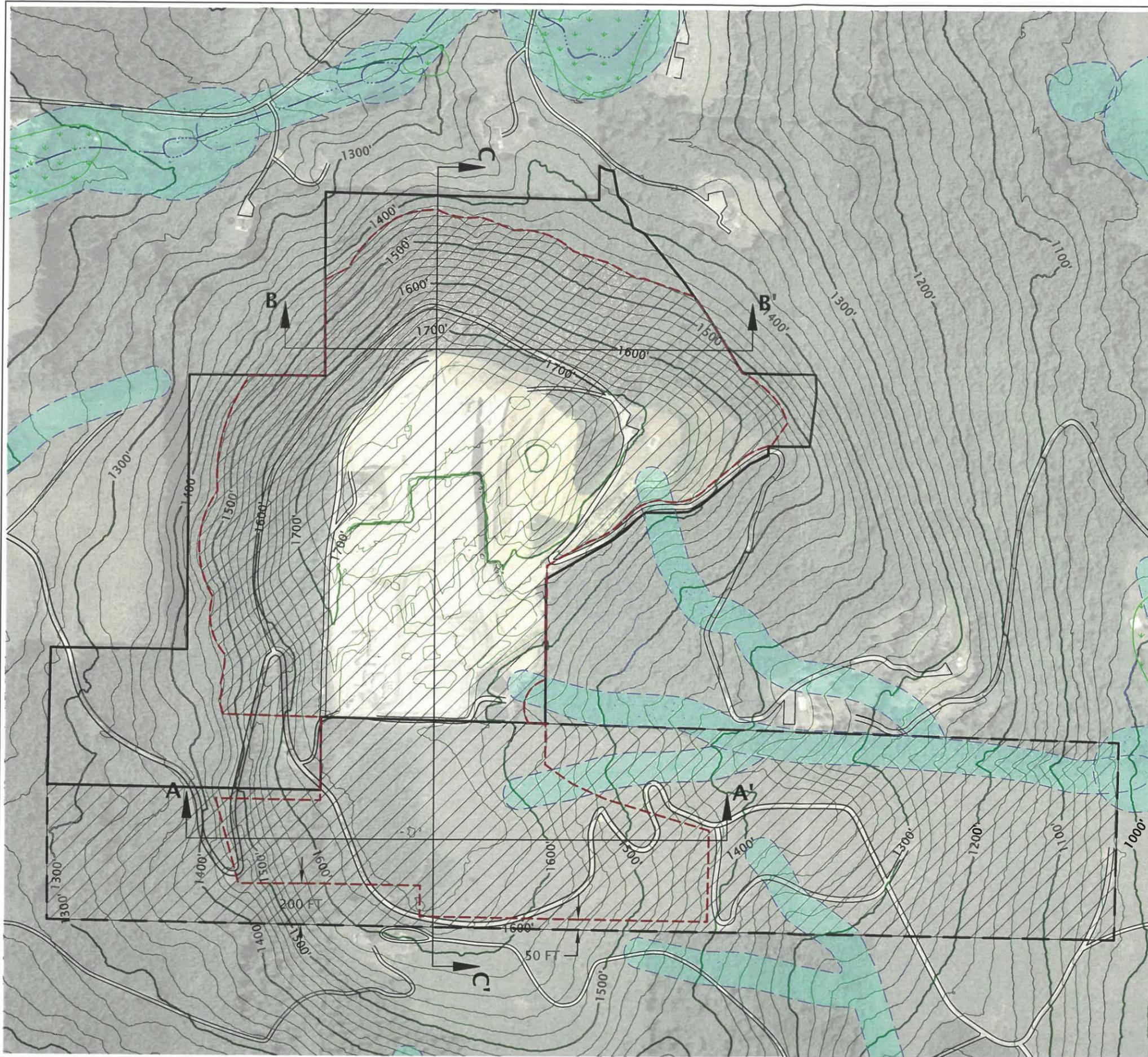
J.L. STOREDAHL & SONS
 STOREDAHL-15-01
 DECEMBER 2019



FIGURE 2B

CLARK COUNTY, WA
 SECTIONS 4 AND 5, TOWNSHIP 4N, RANGE 3E, W.M.

- NOTES:**
 1. PROPERTY OWNERSHIP INFORMATION OBTAINED FROM CLARK COUNTY ASSESSOR.
 2. FOR PROPERTY LOCATIONS, SEE FIGURE 2A.



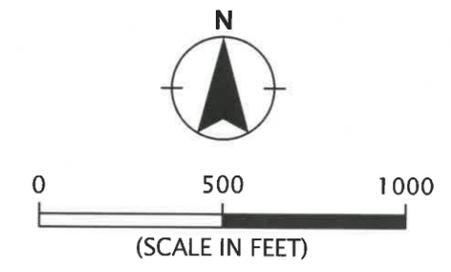
LEGEND:

- PERMIT BOUNDARY (134.6 ACRES)
- EXPANSION BOUNDARY (106.6 ACRES)
- EXISTING TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
- SURFACE MINING COMPREHENSIVE PLAN MINERAL OVERLAY (CLARK COUNTY GIS)
- RIPARIAN HABITAT OR SPECIES AREA (CLARK COUNTY GIS)
- WETLAND (CLARK COUNTY GIS)
- STREAM (CLARK COUNTY GIS)
- EXISTING ROADS AND DRIVEWAYS
- PROPOSED LIMITS OF DISTURBANCE (139.4 ACRES)
- CROSS SECTION

APPLICANT:
 J.L. STOREDAHL AND SONS, INC.
 2233 TALLEY WAY
 KELSO, WA, 98626
 (360)-636-2420

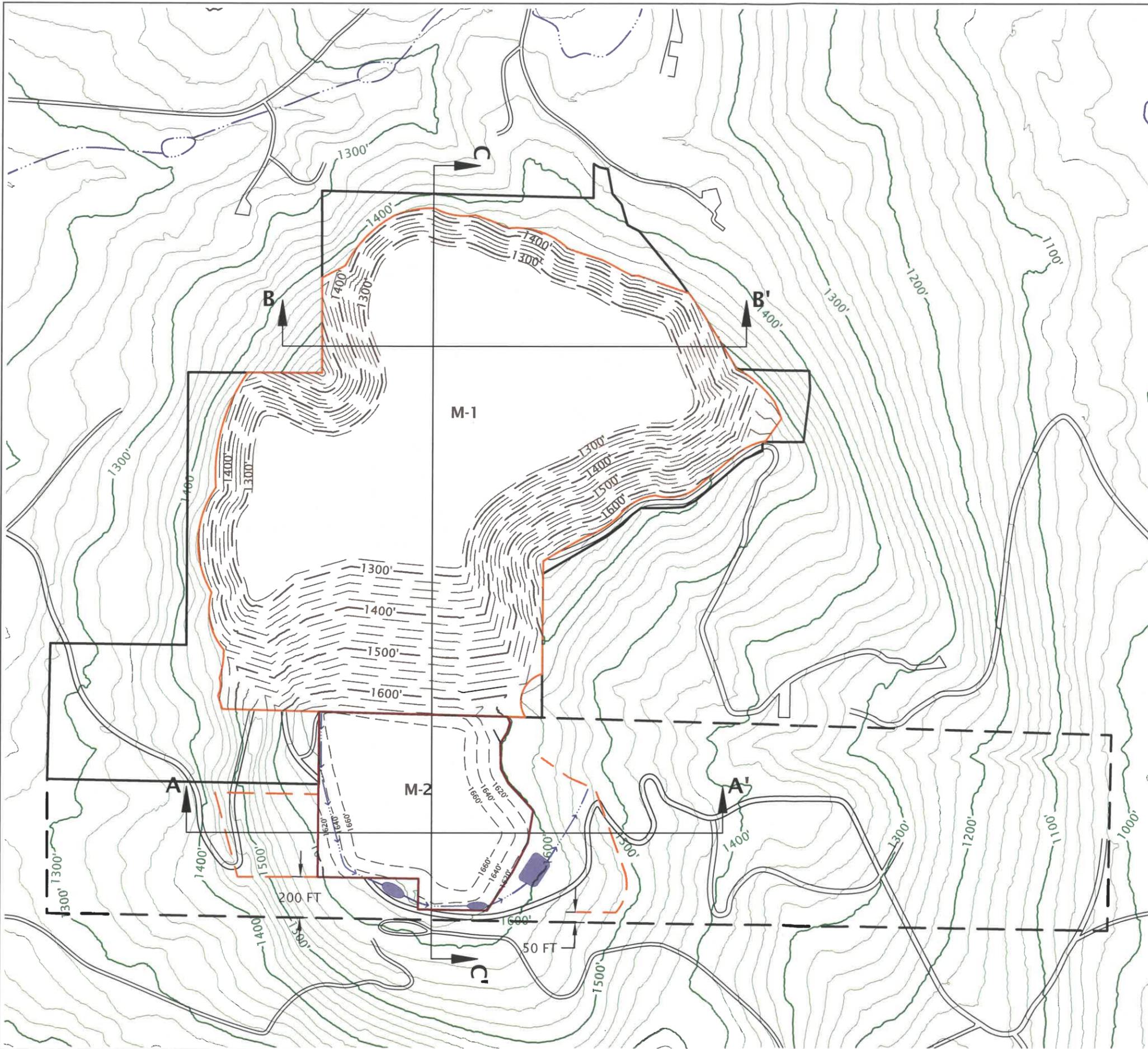
CONTACT: BO STOREDAHL

LAND OWNER: STOREDAHL PROPERTIES LLC
 (CONTACT INFORMATION SAME AS APPLICANT)

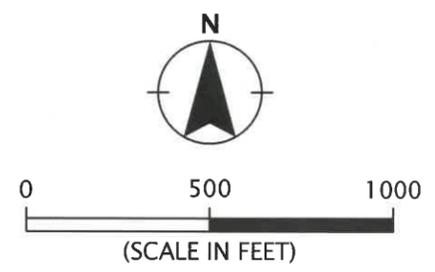


- NOTES:**
1. EXISTING TOPOGRAPHY OBTAINED FROM USGS LIDAR DATED 2016.
 2. AERIAL PHOTOGRAPH (JULY 16, 2018) OBTAINED FROM GOOGLE EARTH PRO.

Printed By: mmiller | Print Date: 12/20/2019 10:46:23 AM
 File Name: J:\S-Z\Store Dahl\Store Dahl-15-01\Store Dahl-15-01\Figures\CAD\Figures\CAD\Store Dahl-15-01-SP15.dwg | Layout: FIGURE 4

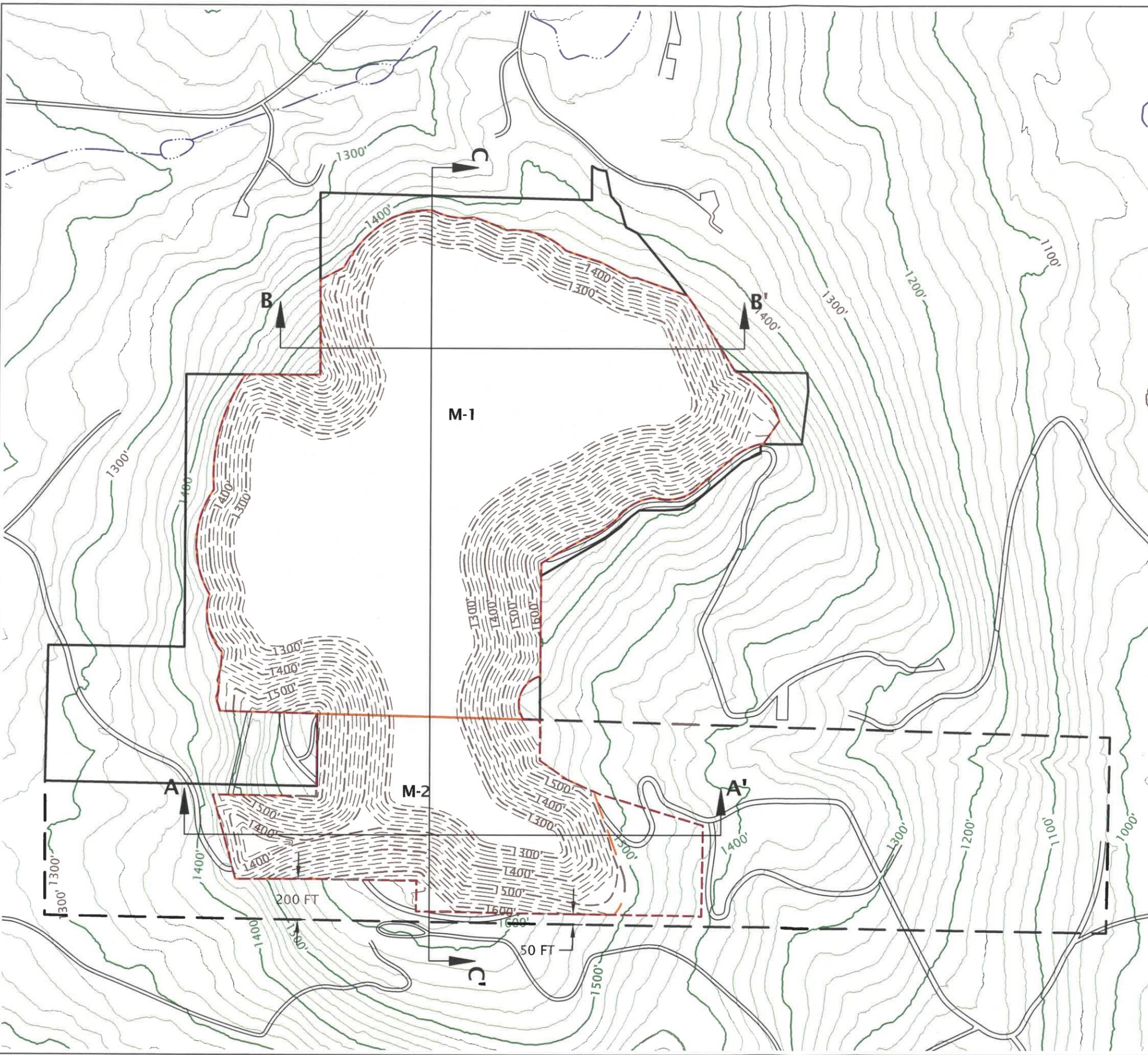


- LEGEND:**
- PERMIT BOUNDARY (134.6 ACRES)
 - EXPANSION BOUNDARY (106.6 ACRES)
 - MINING SEGMENT 1 (102.9 ACRES)
 - MINING SEGMENT 2 (31.5 ACRES)
 - LIMITS OF FILL (18.9 ACRES)
 - CUT TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
 - FILL TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
 - EXISTING TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
 - STREAM (CLARK COUNTY GIS)
 - EXISTING ROADS AND DRIVEWAYS
 - CONVEYANCE DITCH
 - SEDIMENT/INFILTRATION POND
- CROSS SECTION**
-

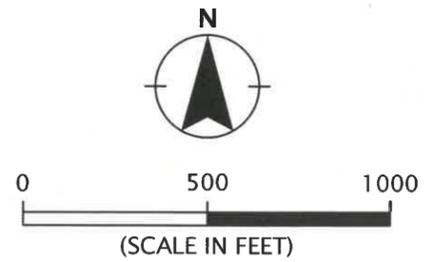


NOTE:
 1. EXISTING TOPOGRAPHY OBTAINED FROM USGS LIDAR DATED 2016.

Printed By: mmiller | Print Date: 12/20/2019 10:46:28 AM
 File Name: J:\S-Z\Store Dahl\Store Dahl-15-01\Figures\CAD\Store Dahl-15-01-SP15.dwg | Layout: FIGURE 5

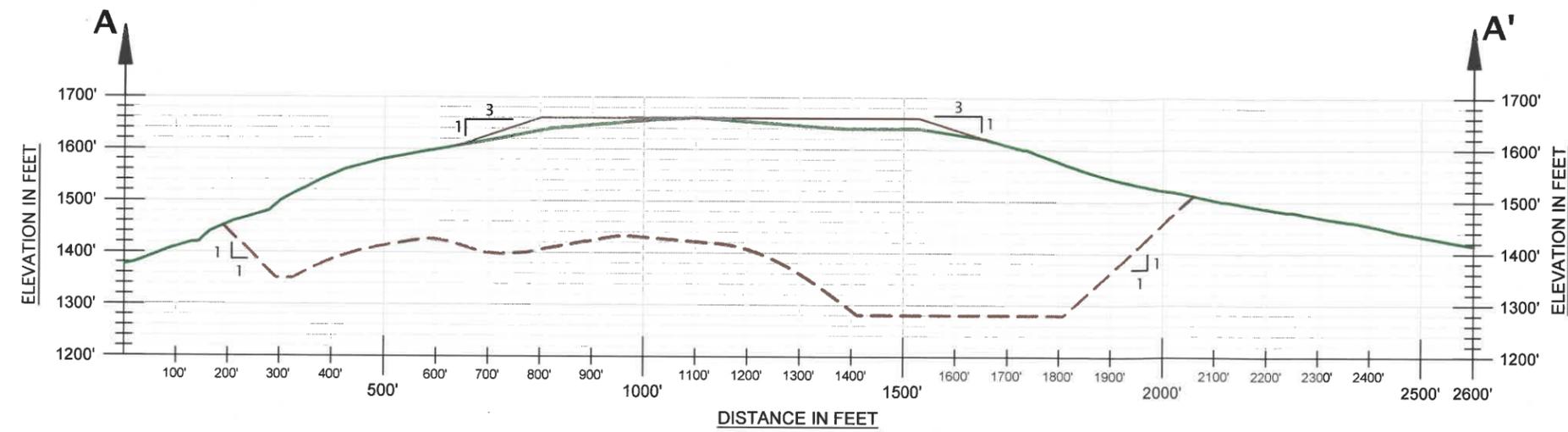


- LEGEND:**
- PERMIT BOUNDARY (134.6 ACRES)
 - - - EXPANSION BOUNDARY (106.6 ACRES)
 - - - LIMITS OF DISTURBANCE (139.4 ACRES)
 - MINING SEGMENT 1 (102.9 ACRES)
 - MINING SEGMENT 2 (31.5 ACRES)
 - CUT TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
 - EXISTING TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
 - STREAM (CLARK COUNTY GIS)
 - EXISTING ROADS AND DRIVEWAYS
 - A A' CROSS SECTION



NOTE:
 1. EXISTING TOPOGRAPHY OBTAINED FROM USGS LIDAR DATED 2016.

Printed By: mmiller | Print Date: 12/20/2019 10:49:04 AM
 File Name: J:\S-Z\Store Dahl\Store Dahl-15-01\Figures\CAD\Store Dahl-15-01-CS06.dwg | Layout: FIGURE 6

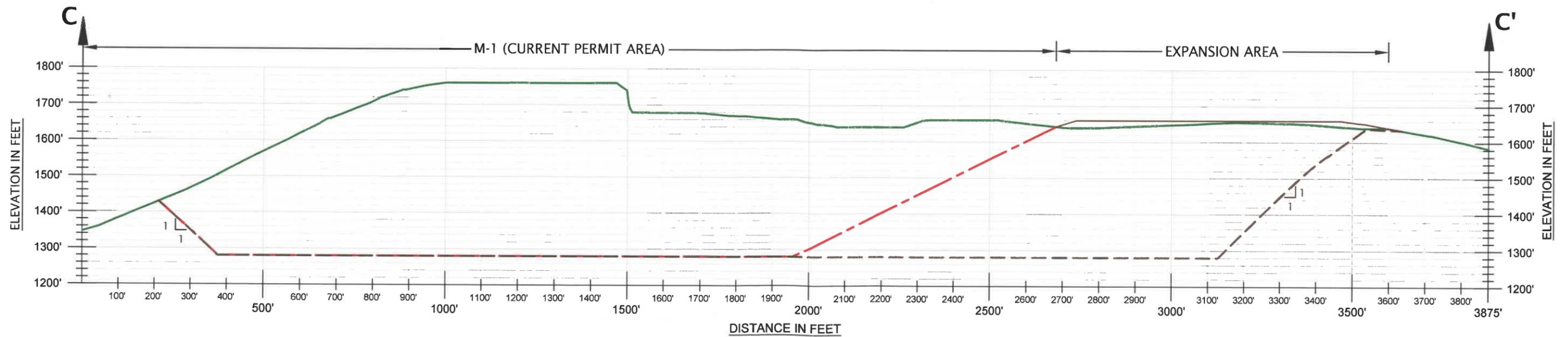
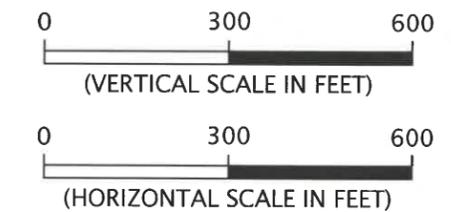
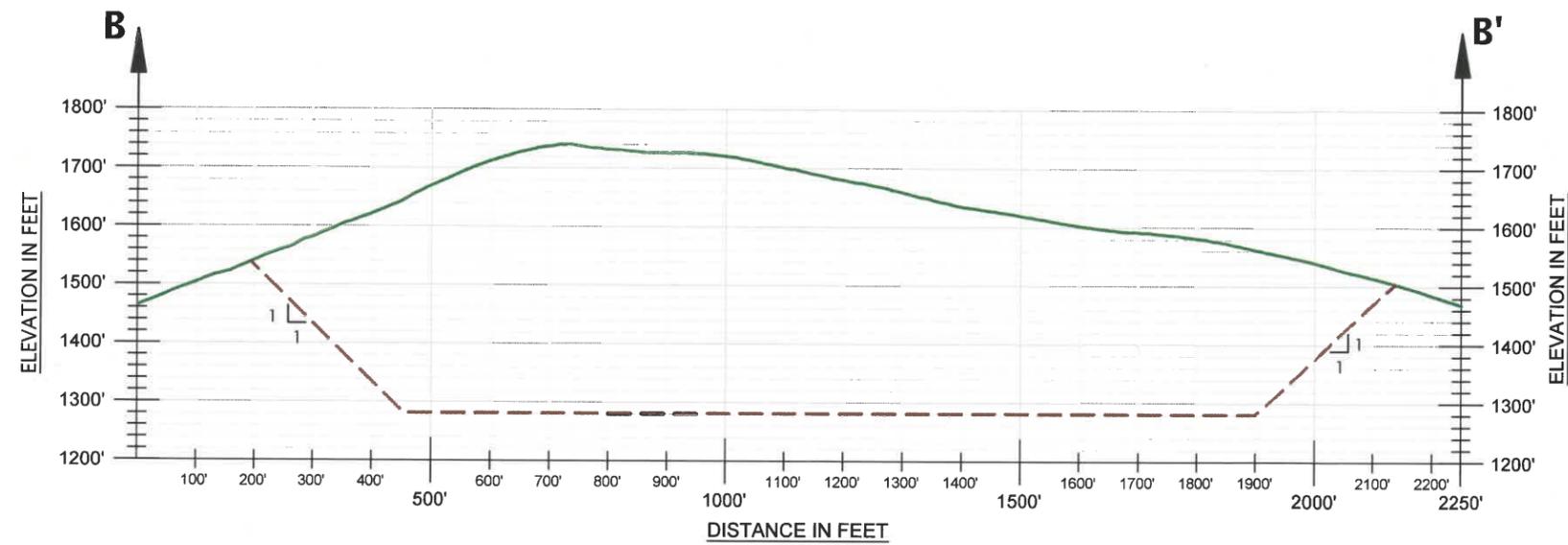


LEGEND:
 — EXISTING TOPOGRAPHY
 — FILL TOPOGRAPHY
 - - INTERIM CUT TOPOGRAPHY
 - - FINAL CUT TOPOGRAPHY

FILL VOLUME:
 ~375,020 CUBIC YARDS

CUT VOLUME (CURRENT PERMIT AREA - M-1):
 ~ 45,321,810 CUBIC YARDS

TOTAL CUT VOLUME: (CURRENT AND EXPANSION AREA):
 ~ 59,212,700 CUBIC YARDS



September 24, 2019

Project #: 22350

David Jardin
Clark County Department of Public Works
1300 Franklin Street
Vancouver, WA 98660

RE: Transportation Impact Study Requirements for Mountain Quarry Expansion (PAC-2019-00052)

Dear David,

This letter was prepared to address the transportation requirements for Storedahl Properties, LLC's proposal to expand the property boundary of the Yacolt Mountain Quarry in Clark County, WA. The Yacolt Mountain Quarry is located just over two miles west of the City of Yacolt and is accessed from a private road connection to NE Kelly Road, west of NE Yacolt Mountain Road.

From conversations with the Applicant, Storedahl Properties, LLC, it is our understanding that the proposed development includes an expansion of the mine property boundary onto two adjacent parcels, as depicted in Attachment A, for the purpose of storing overburden soils (the material that lies above an area that lends itself to mining). Storage of the overburden soils on these two new parcels would occur until the depletion of the extractable aggregate on the existing site is complete. At such time, the overburden would be transferred back to the existing site and mining could begin on the expanded site.

Though the proposed development includes an expansion of site acreage, the applicant is committed to maintaining the existing trip cap established in the prior Conditional Use Permit (CUP) approval of the Yacolt Mountain Quarry (CPZ 2002- 0009). This letter does not prohibit the Applicant from seeking to alter or remove the existing trip cap at a later date through a CUP amendment.

The current trip cap effectively put in place by Clark County established the following stipulations for the quarry that limit site trip generation characteristics and related business hours of operation. These included the following:

- *Condition N10: No more than 30 truck trips (one-way) per hour shall be allowed in and out of the mine in accordance with the truck noise study.*
- *Condition Q1: It shall be noted on the final site plan that truck hauling from the quarry shall be limited to the following hours:*
 - *May to October hauling hours: (Monday-Friday, 7am-6pm)*
 - *November to April hauling hours: (Monday-Friday, 7am-5pm)*
 - *Year Round: (Saturdays, 7am-4pm)*
 - *Sundays and Legal Holidays: (No Hauling)*
 - *Extended hauling hours shall be limited to 18 working days per year between 6 and 8pm.*

- *Condition Q2: Hours of operation for equipment maintenance, onsite activities, and other internal operations shall fall between 6am and 8pm as allowed in CCC 18.329.030(F).*

The applicant's commitment to adhere to the trip cap above ensures that the proposed site expansion will not result in any increased traffic generation by the Yacolt Mountain Quarry site. As such, the proposed land use action does not trigger the volume-based Traffic Impact Analysis (TIA) criteria under Clark County Code 40.350.020 (Transportation Concurrency Management). Therefore, no updated TIA should be required.

Sincerely,
KITTELSON & ASSOCIATES, INC.



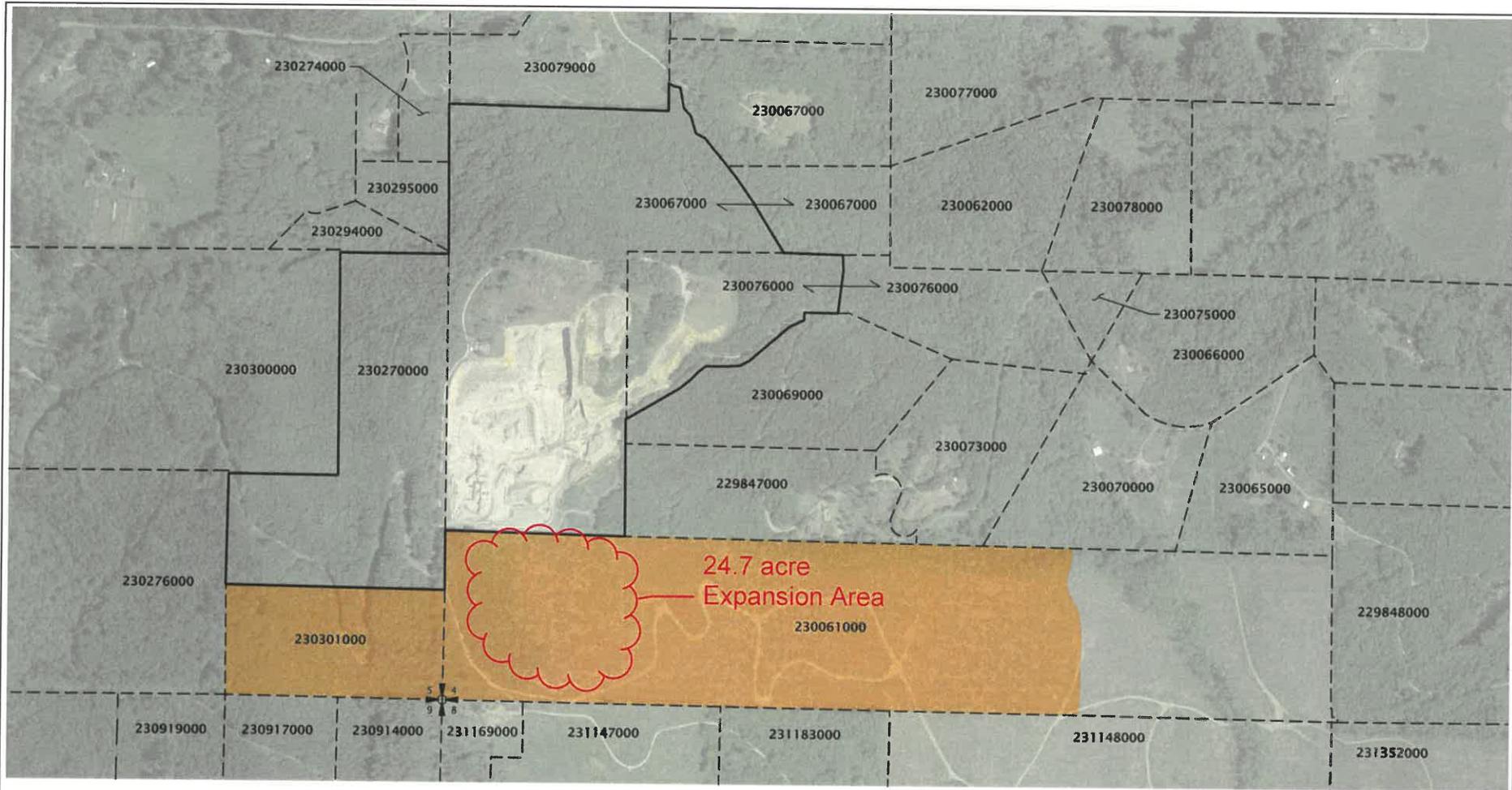
Brian J. Dunn, PE
Associate Engineer



Alec Kauffman
Transportation Analyst

Attachment A Parcel Map

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LEGEND:

-  APPROXIMATE EXISTING PERMIT BOUNDARY
-  PROPOSED MINERAL OVERLAY EXPANSION AREA (~107 ACRES)
-  PROPERTY PARCEL BOUNDARY
- 230061000** PROPERTY IDENTIFICATION NUMBER
(SEE FIGURE 3 FOR PROPERTY OWNERSHIP INFORMATION)
-  SECTION CORNER



- NOTES:**
1. AERIAL PHOTOGRAPH (MAY 22, 2017) OBTAINED FROM GOOGLE EARTH PRO.
 2. PROPERTY INFORMATION OBTAINED FROM CLARK COUNTY ASSESSOR.

SITE PLAN - PROPERTY OWNERSHIP MAP YACOLT MOUNTAIN TEMPORARY STOCKPILE AREA	FIGURE 2
J.L. STOREDAHL & SONS STOREDAHL-15-01 JANUARY 2018	CLARK COUNTY, WA SECTIONS 3, 4, AND 5, TOWNSHIP 4N, RANGE 3E, W.M.
 1187 1st Avenue, Suite 208 Longview, WA 98632 360.266.4883 www.geodesigninc.com	

ADJACENT PROPERTY OWNERSHIP INFORMATION TABLE

PARCEL NUMBER	OWNER NAME	OWNER ADDRESS
230919000 230917000 230914000	POMEROY-PLOWMAN RANCH LIMITED	20902 NE LUCIA FALLS RD YACOLT WA , 98675
231169000	BRUCE AND HEATHER BEARD	31808 NE 215TH AVE YACOLT WA , 98675
231147000	SCOTT JOHNS	PO BOX 65486 VANCOUVER WA , 98665
231183000	DAVID R & MARION L SWENDSEN	32214 NE RAILROAD AVE YACOLT WA , 98675
231148000 231352000	STOREDAHL PROPERTIES LLC	2233 TALLEY WAY KELSO WA , 98626
229848000	LEVI ANDJENNIFER STENERSEN	PO BOX 429 YACOLT WA , 98675
230065000	MICHAEL AND JEAN WEST	PO BOX 452 YACOLT WA , 98675
230070000	JONATHAN LOVEGROVE AND NATTAMON CHANGKWEN	31821 NE MYSTIC DR YACOLT WA , 98675
230066000	JUDITH TODD	31714 NE MYSTIC DR YACOLT WA , 98675
230073000	GARY SOUTH	31110 NE MYSTIC DR YACOLT WA , 9867
229847000	GRANT AND SHANNON NELSON	PO BOX 415 YACOLT WA , 98675
230069000	DAVID AND SUSAN STIMES	2024 NE 90TH AVE VANCOUVER WA , 98664
230075000 230078000	GAYLORD AND CAROL STEPHENSON	39904 NE ROTSCHY RD YACOLT WA , 98675
230062000	PAULA G STEEPHENSON TRUSTEE	39904 NE ROTSCHY RD YACOLT WA , 98675
230077000	DENNIS AND KATHY STEPHENSON	39904 NE ROTSCHY RD YACOLT WA , 98675
230067000	YACOLT MOUNTAIN QUARRY LLC	PO BOX 464 YACOLT WA , 98675
230079000	DAN AND SONJA MASSIE	21115 NE YACOLT MOUNTAIN RD YACOLT WA , 98675
230274000	JAMES AND EILEEN KASKI	22011 NE 212TH AVE BATTLE GROUND WA , 98604
230295000 230294000	SAM AND CAROL SMITH	39513 NE 21ST AVE WOODLAND WA , 98674
230300000	JAMES AND LEAH MATILLA	PO BOX 447 BATTLE GROUND WA , 98604
230276000	CECIL AND MARIE ROTSCHY	34522 NE 225TH CT YACOLT WA , 98675

SUBJECT PROPERTY INFORMATION TABLE

PARCEL NUMBER	OWNER NAME	OWNER ADDRESS
230301000 230061000	STOREDAHL PROPERTIES LLC	2233 TALLEY WAY KELSO WA , 98626
230067000	YACOLT MOUNTAIN QUARRY LLC	PO BOX 464 YACOLT WA , 98675
230270000	CECIL AND MARIE ROTSCHY	34522 NE 225TH CT YACOLT WA , 98675
230076000	BRENT AND HEIDI ROTSCHY	PO BOX 464 YACOLT WA , 98675

NOTES:

1. PROPERTY OWNERSHIP INFORMATION OBTAINED FROM CLARK COUNTY ASSESSOR.
2. FOR PROPERTY LOCATIONS, SEE FIGURE 2.

PROPERTY OWNERSHIP INFORMATION
 YACOLT MOUNTAIN TEMPORARY STOCKPILE AREA

J.L. STOREDAHL & SONS

STOREDAHL-15-01
 JANUARY 2018

FIGURE 3

CLARK COUNTY, WA
 SECTIONS 3, 4, AND 5, TOWNSHIP 4N, RANGE 3E, W.M.

March 21, 2018

Project #: 22350.0

Gary Albrecht and Laurie Lebowsky
Clark County Community Planning
1300 Franklin Street, Third Floor
Vancouver, WA 98660

RE: Traffic Study for Surface Mining Overlay Expansion for Yacolt Mountain Quarry – Clark County

Dear Mr. Albrecht and Ms. Lebowsky,

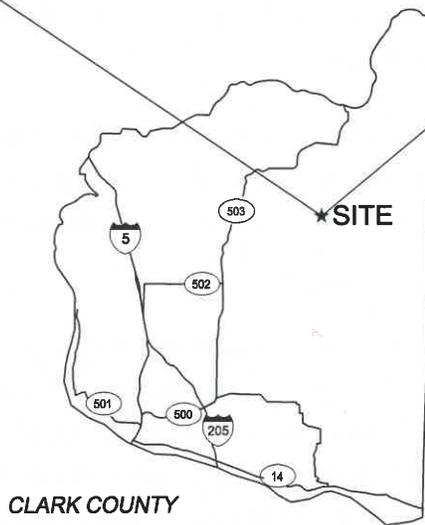
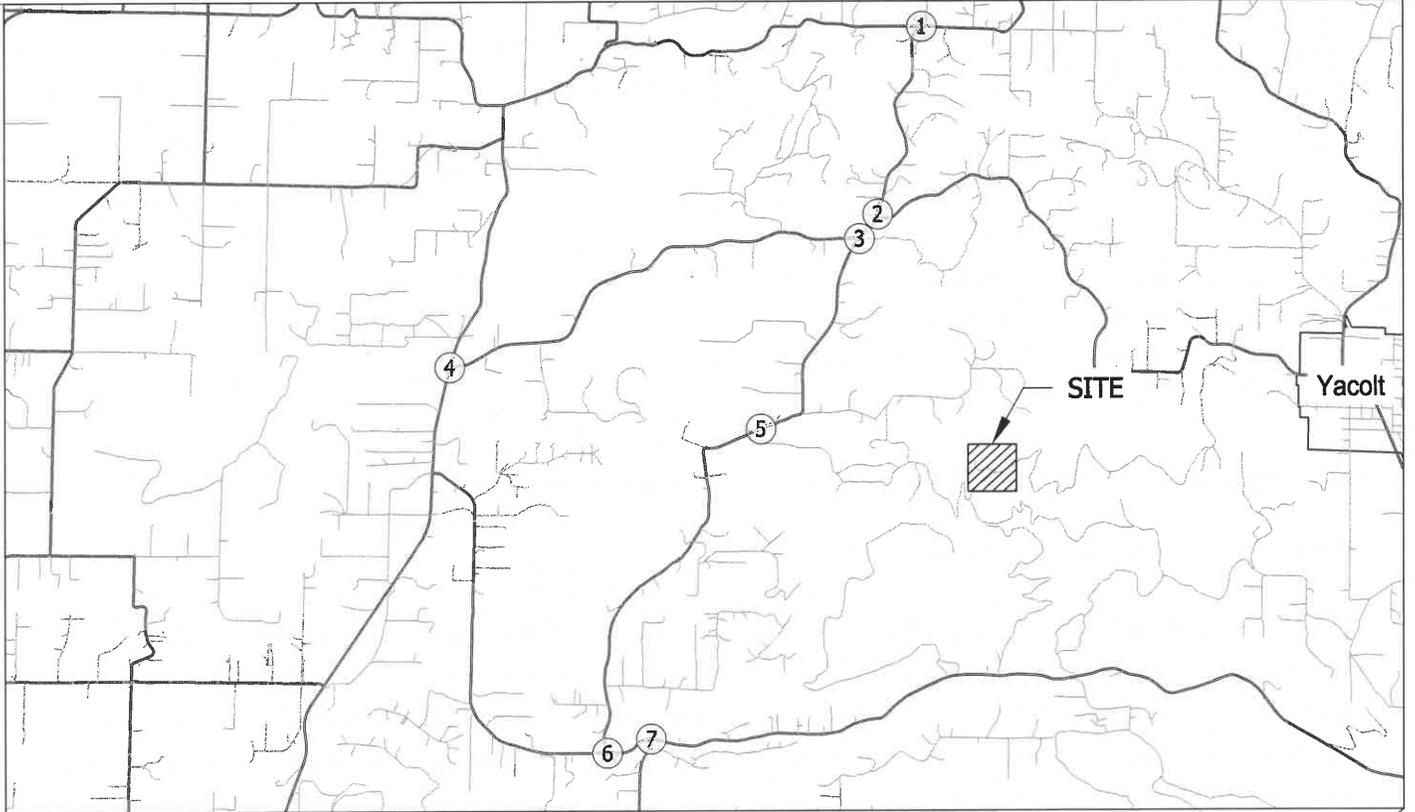
This letter presents the results of a Traffic Impact Analysis (TIA) prepared to support Storedahl Properties, LLC's proposal to expand the *Surface Mining Overlay District* covering the Yacolt Mountain Quarry in Clark County, WA. The Yacolt Mountain Quarry is located just over two miles west of the City of Yacolt, and is accessed from a private road connection to NE Kelly Road, west of NE Yacolt Mountain Road. Figure 1 illustrates the site vicinity map.

As shown in exhibits provided in Attachment "A" of this study, the properties encompassed the quarry area have a Clark County Comprehensive Plan Designation of *FR-1* and a Zoning designation of *FR-80* (Forest Zone). In addition, there is a *Surface Mining Overlay District* boundary that defines where quarry operations can occur on specific properties. The current *Surface Mining Overlay District* boundary is approximately 135 acres in size, and the proposed land use amendment would expand this boundary further by approximately 107 acres. The location and properties contained in this new expansion area are shown in the exhibits provided in Attachment "A" (See southern Parcels 230301000 and 230061000 in attachment figures 1 through 4).

The results of this TIA indicate that the proposed *Surface Mining Overlay District* expansion can occur while maintaining acceptable traffic operations and safety at all study intersections. Additional details of the study methodology, findings, and recommendations are provided herein.

SCOPE OF THE REPORT

This analysis identifies the transportation-related impacts associated with the proposed *Surface Mining Overlay* expansion covering the Yacolt Mountain Quarry and was prepared in accordance with Clark County's transportation impact analysis requirements. The study scope and overall study area for this project were selected based on a review of the transportation planning comments contained in the November 3, 2017 pre-application conference report, our review of the original 2001 TIA prepared for the Yacolt Mountain Quarry conditional use permit (Reference 1), and detailed scoping discussions with Clark County Planning staff.



- STUDY INTERSECTION

Site Vicinity Map
Clark County, WA

Figure
1

As required under Clark County Code 40.350.020, Transportation Concurrency Management, this analysis was prepared to address the following transportation issues:

- Existing land use and transportation system operating and safety conditions within the site vicinity during the weekday AM and PM peak hours;
- Planned/funded developments and transportation improvements in the study area;
- A 19-year traffic forecast of year 2037 weekday AM and PM peak hour conditions at all study intersections, assuming no further expansion of the *Surface Mining Overlay*;
- Trip generation and distribution estimates of theoretical development scenarios on the subject properties, assuming development under the current *FR-80* zoning and development under the expanded *Surface Mining Overlay* boundary;
- Year 2037 total traffic operating conditions at all study intersections during the weekday AM and PM peak hours, assuming development under current *FR-80* zoning and under the proposed *Surface Mining Overlay* expansion;
- Volume-to-capacity ratios for all applicable Clark County concurrency roadway segments;
- Vehicle queuing needs at key study intersections and primary site access; and,
- Identification of potential deficiencies and mitigation measures.

Study Intersections

The following 7 study intersections were identified in the original TIA for the Yacolt Mountain Quarry conditional use permit and through collaboration with Clark County Planning staff:

1. SR-503/NE Gabriel Road
2. SR-503/NE Kelly Road
3. NE Kelly Road/NE Garner Road
4. NE Kelly Road/NE Gabriel Road
5. NE Kelly Road/NE Longview Fiber Road (site access)
6. NE Kelly Road/NE Lucia Falls Road
7. NE 172nd Avenue/NE Lucia Falls Road

ANALYSIS METHODOLOGY

Performance Measures

Per Clark County standards, the level-of-service (LOS) performance measure was used to evaluate traffic operations at the study intersections. The volume-to-capacity (v/c) ratio was also used to evaluate roadway segments for the concurrency analyses. A brief description of each performance measure is provided below:

- *Level-of-service* (LOS) ranks intersections from “A” to “F” based on the average control delay experienced by motorists. LOS “A” reflects relatively low vehicle delay times (10 seconds or less) while LOS “F” reflects relatively high vehicle delay times (over 50 seconds at unsignalized intersections and over 80 seconds at signalized intersections), which is considered unacceptable to most motorists. A more detailed description of level-of-service, and how it is measured is provided in *Attachment “B.”*
- *Volume-to-capacity* (v/c) is a ratio that compares the volume of traffic on a particular roadway segment to the theoretical capacity of that roadway segment to accommodate traffic. A v/c ratio of 1.0 indicates a roadway segment that is operating at capacity. A v/c ratio over 1.0 indicates that the capacity of the roadway segment has been (or would be) exceeded.

All LOS analyses described in this report were performed in accordance with the procedures stated in the *2010 Highway Capacity Manual* (HCM 2010 – Reference 2) for the unsignalized stop-controlled study intersections. All LOS analyses used the peak 15-minute flow rate that occurred during the individual weekday AM and PM peak hours of each study intersection. Using the peak 15-minute flow rate of each intersection’s individual peak hour ensures that the analyses are based on a worst-case scenario. For this reason, the analyses reflect conditions that are only likely to occur for 15 minutes out of each peak hour. The transportation system will likely operate under conditions better than those described in this report during all other time periods.

Facility Performance Standards

Clark County Operating Standards

Clark County Code (CCC) Section 40.350.020.G defines the County’s performance standards for roadway segments as well as signalized and unsignalized intersections.

Roadway Segments

Per CCC Section 40.350.020.G.1.a: *“The maximum volume to capacity ratio for each roadway segment shall not exceed nine-tenths (0.9), when measured independently for each direction of travel...the capacity [of the roadway] shall be based on the factors described in Table 40.350.020-1, Roadway Capacities.”*

Signalized Intersections

Per CCC Section 40.350.020.G.1.b: *“Individual movements at each signalized intersection of regional significance in the unincorporated county shall not exceed an average of two (2) cycle lengths or two hundred forty (240) seconds of delay (whichever is less).”*

Unsignalized Intersections

Per CCC Section 40.350.020.G.1.c: *“All unsignalized intersections of regional significance in the unincorporated county shall achieve LOS E standards or better (if warrants are not met). If warrants are*

met, unsignalized intersections of regional significance shall achieve LOS D standards or better. Intersection control or mitigation of unsignalized intersections shall be at the discretion of the Public Works Director and shall not obligate the county to meet this LOS standard. However, proposed developments shall not be required to mitigate their impacts in order to obtain a concurrency approval unless:

- (1) The proposed development adds at least five (5) peak hour trips to a failing intersection approach; and
- (2) The worst movement on the failing approach is worsened by the proposed development. In determining whether the movement is worsened, the Public Works Director shall consider trip volume, delay, and any other relevant factors."

WSDOT Operating Standards

There are two study intersections along SR-503, which is operated and maintained by the Washington State Department of Transportation (WSDOT). WSDOT enforces LOS standards for highways of statewide significance (HSS) based on Revised Code of Washington (RCW) 47.06.140(2). However, regional transportation planning organizations (RTPOs) and WSDOT jointly develop and establish LOS standards for non-HSS regionally significant facilities based on RCW 47.80.030(1)(c). SR-503 is designated "rural" in this portion of Clark County and it is not a highway of statewide significance based on the WSDOT Highway System Plan (Reference 3). Therefore, as a regionally significant facility, Clark County Concurrency performance standards apply at both study intersections along SR-503. This was confirmed with Clark County traffic engineering staff.

EXISTING CONDITIONS

The existing conditions analysis identifies the site conditions and the current physical and operational characteristics of roadways within the study area. The purpose of this section is to provide a basis for comparison to future conditions.

The site and surrounding study area was visited and inventoried in March 2018. At that time, information was collected regarding site conditions, adjacent land uses, existing traffic operations, and transportation facilities in the study area.

Site Conditions

The current *Surface Mining Overlay District* boundary encompassing the Yacolt Mountain Quarry is approximately 135 acres in size. The proposed expansion, at approximately 107 acres, involves two vacant land parcels as shown in the exhibits in Attachment "A". Both parcels have a Comprehensive Plan Designation of *FR-1* and a Zoning designation of *FR-80 (Forest Zone)*.

Adjacent Land Uses

Immediately north of the two subject parcels is the Yacolt Mountain Quarry, which is a commercial quarry and rock crushing operation approved by Clark County in 2002 through a Conditional Use Permit

process. For information purposes, a summary of current quarry operations, including employee count, current hauling routes, daily traffic volume demand, seasonal traffic patterns, and vehicle classifications is provided in Attachment “C”. Also, a 24-hour directional traffic count was performed at the quarry entrance on Longview Fiber Road (private road) on a mid-week day in March of 2018. The results of this count are provided in Attachment “D”.

As part of final CUP approval of the Yacolt Mountain Quarry (CPZ 2002- 0009), Clark County established additional stipulations for the quarry that limit site trip generation characteristics and related business hours of operation. These included the following:

- *Condition N10: No more than 30 truck trips (one-way) per hour shall be allowed in and out of the mine in accordance with the truck noise study.*
- *Condition Q1 It shall be noted on the final site plan that truck hauling from the quarry shall be limited to the following hours:*
 - *May to October hauling hours: (Monday-Friday, 7am-6pm)*
 - *November to April hauling hours: (Monday-Friday, 7am-5pm)*
 - *Year Round: (Saturdays, 7am-4pm)*
 - *Sundays and Legal Holidays: (No Hauling)*
 - *Extended hauling hours shall be limited to 18 working days per year between 6 and 8pm.*
- *Condition Q2: Hours of operation for equipment maintenance, onsite activities, and other internal operations shall fall between 6am and 8pm as allowed in CCC 18.329.030(F).*

Other land uses in the site vicinity besides the quarry consist of low density signal family homes on large land parcels, with some agricultural and forest-related uses all around the Yacolt mountain.

Transportation Facilities

Table 1 summarizes the characteristics of key transportation facilities within the site vicinity.

Table 1: Existing Roadway Facilities

Roadway	Classification ¹	Cross Section	Speed Limit (miles per hour)	Sidewalks?	Bicycle Lanes?	On-Street Parking?
SR-503	State Route Rural Arterial (W)	2 lane	50	No	No	No
NE Gabriel Road	Rural Minor Collector (Rm-2)	2 lane	Not Posted ⁴	No	No	No
NE Kelly Road	Rural Minor Collector (Rm-2)	2 lane	Not Posted ⁴	No	No	No
NE Garner Road	Rural Minor Collector (Rm-2)	2 lane	Not Posted ⁴	No	No	No
NE Longview Fiber Road	Private Road	2 lane	Not Posted	No	No	No
NE Lucia Falls Road	Primary Arterial (S) ² Rural Major Collector (R2) ³	2 lane	40	No	No	No
NE 172 nd Avenue	Primary Arterial (S)	2 lane	Not Posted ⁴	No	No	No

¹Based on Clark County Arterial Atlas

²East of NE 172nd Avenue

³West of NE 172nd Avenue

⁴Rural roadways with no posted speed automatically have an assumed posted speed of 50 mph on County roadways, per RCW 46.61.400.

Roadway Facilities

SR-503 is the primary roadway servicing this region of Clark County. SR-503 extends northward from its intersection with SR-500 & NE 117th Avenue in Vancouver, carrying traffic between the Vancouver urban area and North County through Battle Ground. SR-503 further extends into Cowlitz County. Other roadways addressed in this study and utilized by traffic associated with the Yacolt Mountain Quarry include NE Gabriel Road, NE Kelly Road, NE Lucia Falls Road, and NE 172nd Avenue. These roadways are either Rural Minor Collectors or Primary Arterials. NE Longview Fiber Road is a private road providing direct access to the quarry site. It facilitates two-way travel and is paved.

Figure 2 illustrates the existing lane configurations and traffic control devices at the study intersections.

Transit Facilities

Local transit service is not provided in the immediate vicinity of the Yacolt Mountain Quarry. However C-TRAN does provide limited fixed route bus service to the City of Yacolt along Route 47 (Battle Ground/Yacolt). Route 47 proceeds south from Yacolt along Railroad Avenue, west on Lucia Falls Road, and eventually into Battle Ground. From there, the route proceeds west to I-5 and then south to connections with the 99th Street Transit Center, Clark College, and then downtown Vancouver. Service is provided on weekdays with one stop leaving at 6:22 AM and returning at 6:23 PM.

Traffic Volumes and Peak Hour Operations

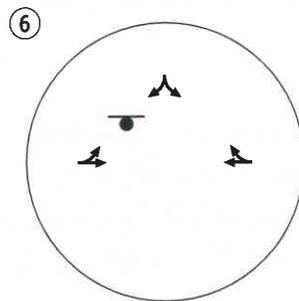
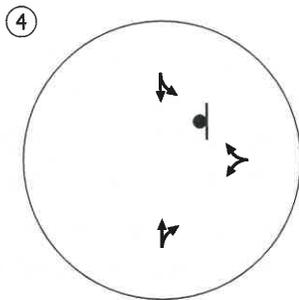
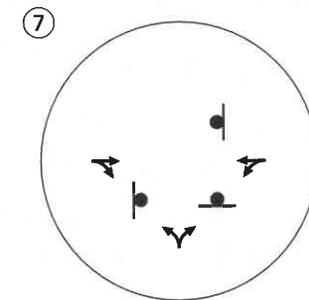
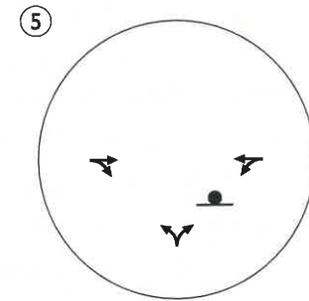
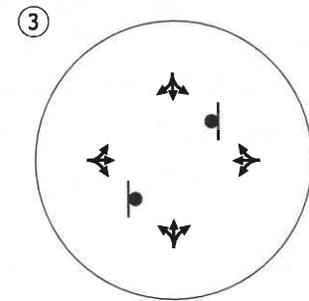
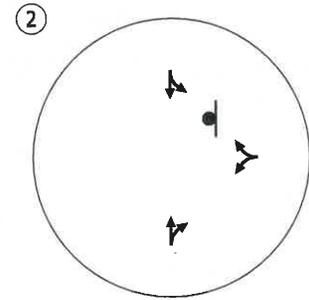
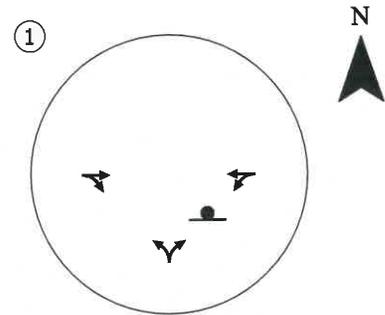
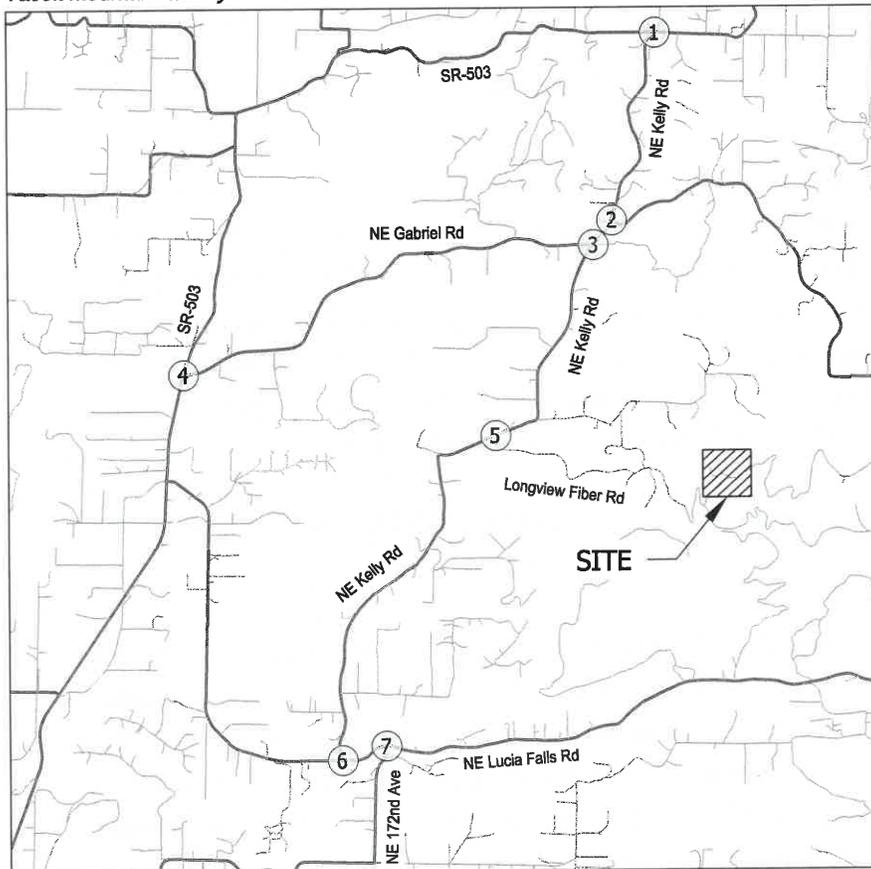
Manual turning movement counts were collected on Thursday, March 1, 2018 during the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods. Counts were then adjusted upwards using a seasonal factor to reach existing traffic levels that represent the average day of the average month. This adjustment factor of 1.019 was developed using guidance provided by the Southwest Washington Regional Transportation Council (RTC). Also, the independent peak hours of each study intersection were utilized in this analysis, as opposed to a system peak hour. Figures 3 and 4 summarize the adjusted current year 2018 turning movement volumes for the weekday AM and PM peak hours at all study intersections. *Attachment "E" contains the traffic count worksheets.*

Existing Traffic Operations

Figures 3 and 4 also summarize analysis results for the study intersections under existing traffic conditions of the weekday AM and PM peak hours, respectively. As shown, all study intersections currently operate at acceptable levels of service during the weekday AM and PM peak hours per their applicable performance standards. *Attachment "F" includes the existing traffic conditions worksheets.*

Traffic Safety

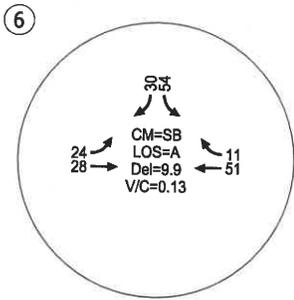
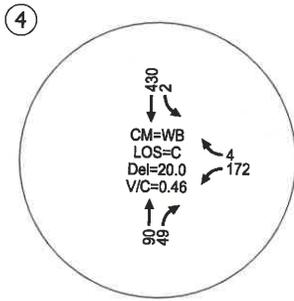
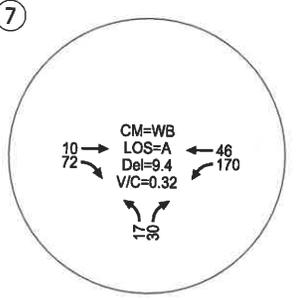
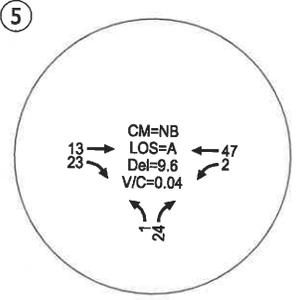
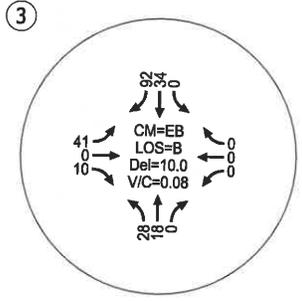
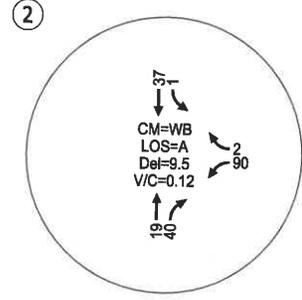
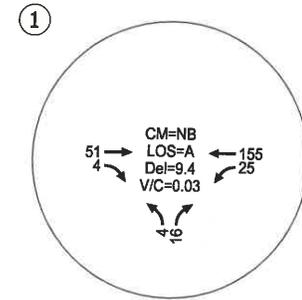
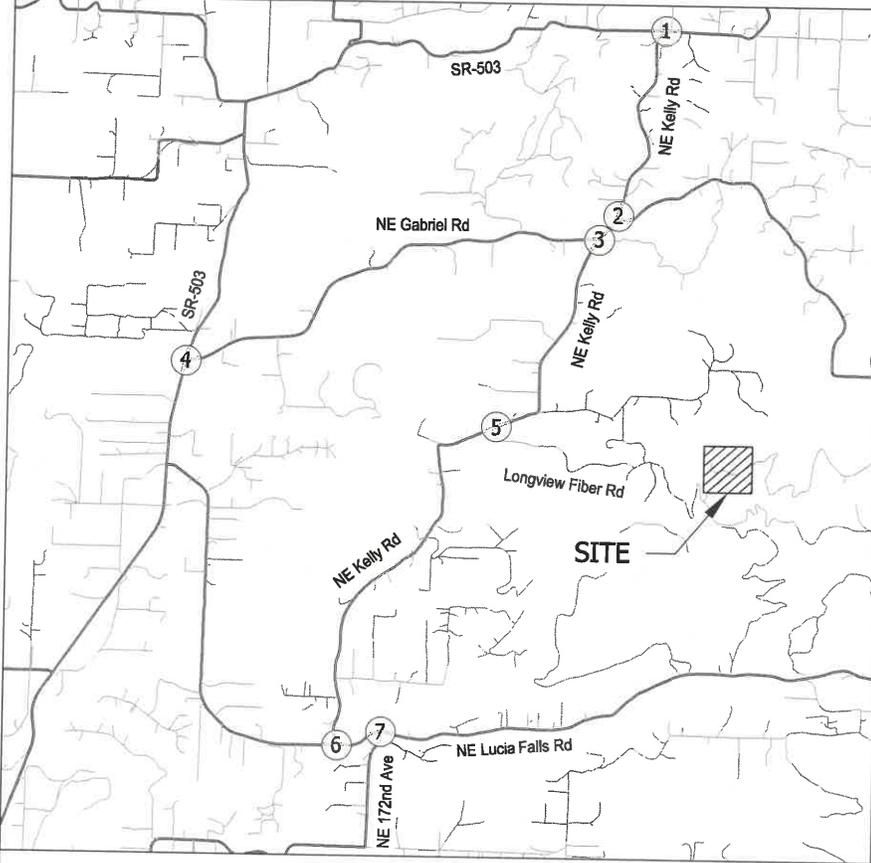
The crash histories of all study intersections were reviewed in an effort to identify potential safety issues within the study area. Officer-reported crash records were obtained from WSDOT for the period from January 1, 2013 to December 31, 2017. The data includes the total number and severity of all reported crashes at the intersections over the five-year period. *Attachment "G" contains the crash data obtained from WSDOT.*



● - STOP SIGN

Existing Lane Configurations and Traffic Control Devices Clark County, WA

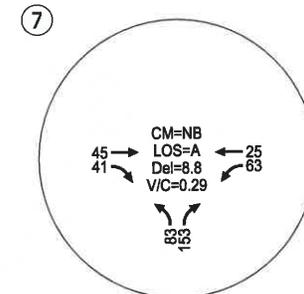
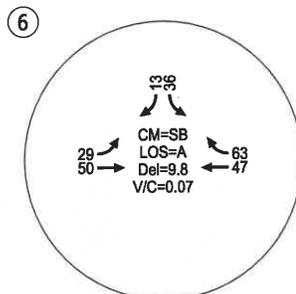
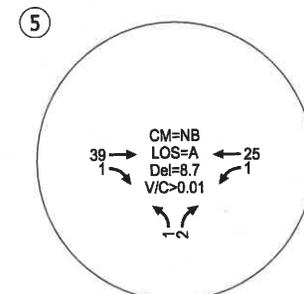
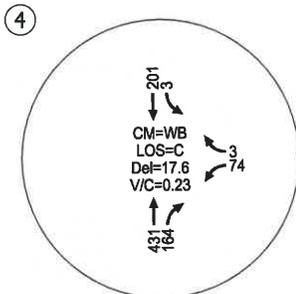
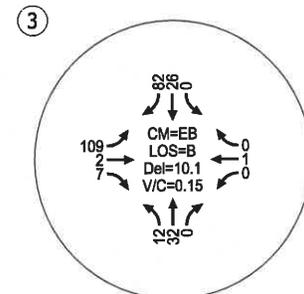
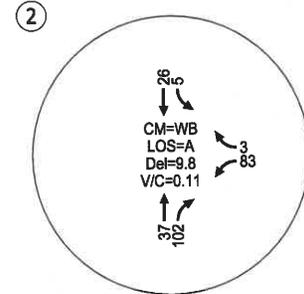
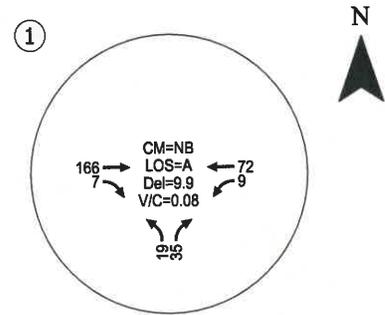
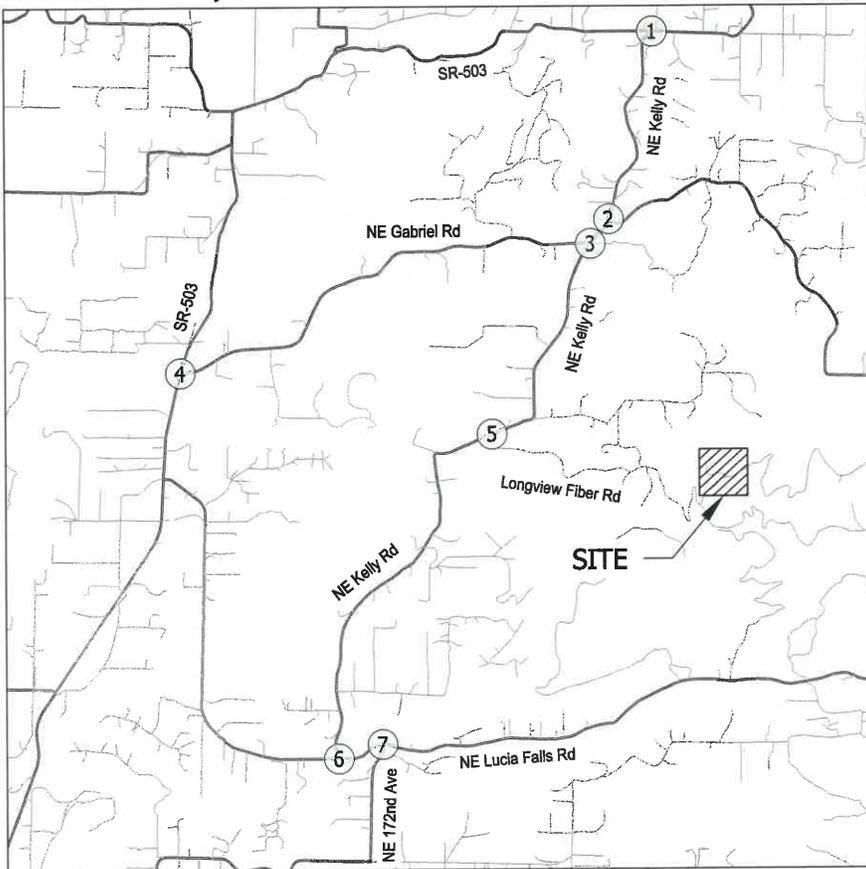
Figure 2



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/
 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION DELAY(SIGNALIZED)/
 CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Existing Traffic Conditions
 Weekday AM Peak Hour
 Clark County, WA

Figure
 3



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/
 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION DELAY(SIGNALIZED)/
 CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Existing Traffic Conditions
 Weekday PM Peak Hour
 Clark County, WA

Figure
 4

Table 2 summarizes the crash data and the crash rate per million entering vehicles (MEV). Clark County generally considers a crash rate greater than 1.00 crashes/MEV to be an indicator that a potential geometric or operational issue may exist and that further evaluations should be considered.

Table 2: Study Intersection Crash History (January 2013 to December 2017)

Intersection	Crash Type					Crash Severity			Total Crashes	Crash Rate ¹ /MEV
	Angle	Turn	Ditch/ Embankment	Fixed Object	Head-on	PDO ²	Injury	Fatal		
SR-503/NE Kelly Rd	0	0	0	1	0	0	1	0	1	0.18
NE Kelly Rd/NE Garner Rd	0	0	2	0	0	2	0	0	2	0.43
NE Kelly Rd/NE Gabriel Rd	1	0	1	1	0	1	2	0	3	0.61
SR-503/NE Gabriel Rd	3	2	0	0	1	5	1	0	6	0.38
NE Kelly Rd/NE Lucia Falls Rd	0	0	4	0	0	3	1	0	4	0.92
NE Lucia Falls Rd/NE 172 nd	1	1	2	1	0	4	1	0	5	0.67

¹ (5-Year Total Crashes x 1,000,000) / (Weekday PM Peak Hour Volume x 10 x 365 days/year x 5 years)

² Property Damage Only

As shown in the table above, the four study intersections reviewed have a crash rate below 1.00 crashes/MEV over the 5-year reported history. Also no vehicle crashes were reported at the Longview Fiber Road access with NE Kelly Road.

Concurrency Corridor V/C Ratios

Existing traffic volumes were compared with adopted Clark County capacity thresholds for corridor segments to assess compliance with concurrency requirements. Table 3 summarizes the existing bi-direction traffic volumes along the SR-503, at the higher-volume legs of the two study intersections during the weekday AM or PM peak hour (whichever is greater) along with the single direction roadway capacity as specified under Clark County Code 40.350.020 Transportation Concurrency Management and Table 40.350.020-1. As shown in Table 3, all of the concurrency corridor segments currently operate below a V/C ratio of 0.90.

Table 3: Existing Traffic Volumes and Roadway Capacities (SR-503)

Count Location	Road Classification ¹	Single Direction Capacity/Hour ²	Maximum Volume (vph) ³	V/C Ratio
SR-503				
South of NE Gabriel Road (SB)	Rural Arterial (W)	800 ⁴	578	0.72
South of NE Gabriel Road (NB)			595	0.74
East of NE Kelly Road (EB)	Rural Arterial (W)	800 ⁴	201	0.25
East of NE Kelly Road (WB)			180	0.23

¹ Source: Clark County Arterial Atlas, 2013 (Reference 4)

² Per Clark County Code: For roadways not fully built-out to county standards, the capacity shall be determined based on the current roadway condition. For roadways with lane widths twelve (12) feet and greater, and with paved shoulder widths two (2) feet and greater, the lane capacity shall be eight hundred (800) vehicles per hour. For roadways with lane widths between eleven (11) and twelve (12) feet and with paved shoulder widths two (2) feet and greater, the lane capacity shall be seven hundred (700) vehicles per hour. For roadways with lane widths less than eleven (11) feet, the lane capacity shall be six hundred (600) vehicles per hour.

³ vph: vehicles per hour, based on turning movement counts collected at the study intersections.

⁴ Based on existing 2-lane cross-section

TRANSPORTATION IMPACT ANALYSIS

The transportation impact analysis identifies how the study area's transportation system would operate in the year 2037, which is two years past the planning horizon of the Clark County RTP. The impact of traffic generated by the proposed development was examined as follows:

- Planned/funded developments and transportation improvements in the site vicinity were identified and reviewed;
- A 19-year traffic forecast of year 2037 weekday AM and PM peak hour conditions was estimated for all study intersections, assuming no further expansion of the *Surface Mining Overlay*;
- Trip generation and distribution estimates were prepared of theoretical development scenarios on the subject properties, assuming development under the current *FR-80* zoning and development under the expanded *Surface Mining Overlay* boundary;
- Year 2037 total traffic operating conditions were estimated for all study intersections during the weekday AM and PM peak hours, assuming development under current *FR-80* zoning and under the proposed *Surface Mining Overlay* expansion;
- Future link volumes and volume-to-capacity ratios were reviewed on applicable Clark County concurrency roadway segments (SR-503).
- Vehicle queuing needs were assessed at key study intersections and the primary site access; and,
- Potential capacity and/or safety deficiencies were identified along with appropriate mitigation measures.

Planned Developments and Transportation Improvements

Kittelson & Associates reviewed Clark County's Transportation Improvement Program (TIP, Reference 5) and the 2014 Update of the Regional Transportation System Plan for Clark County (Reference 6) and found no transportation improvements expected to be funded or complete in the site vicinity prior to the planning horizon year selected for this study.

Forecast Year 2037 Traffic Volumes

The 2014 Update of the Regional Transportation Plan for Clark County establishes a planning horizon year of 2035 for assessing long-term traffic conditions. However, per scoping discussions with Clark County Planning staff, a planning horizon year of 2037 was selected for this study to achieve a more conservative estimate of future traffic levels.

For this study, future traffic conditions were estimated using travel demand model information provided by Southwestern Washington RTC for the weekday AM and PM peak hours. RTC data consisted of link volume plots for baseline year 2010 and planning horizon year 2035. From this data, annual traffic growth rates could be determined using the roadway link approach volumes at each

study intersection. These annual growth rates were then transformed into 19-year total traffic growth rates that were applied to existing 2018 traffic in order to achieve a 2037 forecast. *Calculations used to develop these future traffic growth rates are provided in Attachment "H" along with the RTC model data.* However, also included in this attachment are calculations showing how historic traffic growth rates along most of the study area roadways have been much lower than future RTC model projections. These calculations were made by comparing the year 2000 traffic counts from the former Yacolt Mountain Quarry TIS with current year 2018 counts taken for this study, and from an accounting of historical ADT volume data collected by Clark County for SR-503 over the past 15 years.

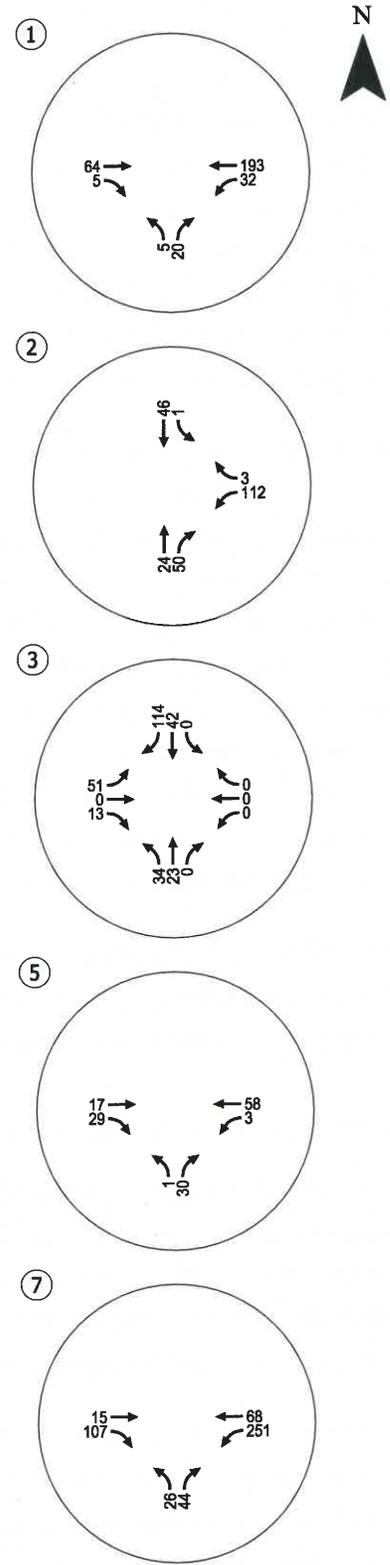
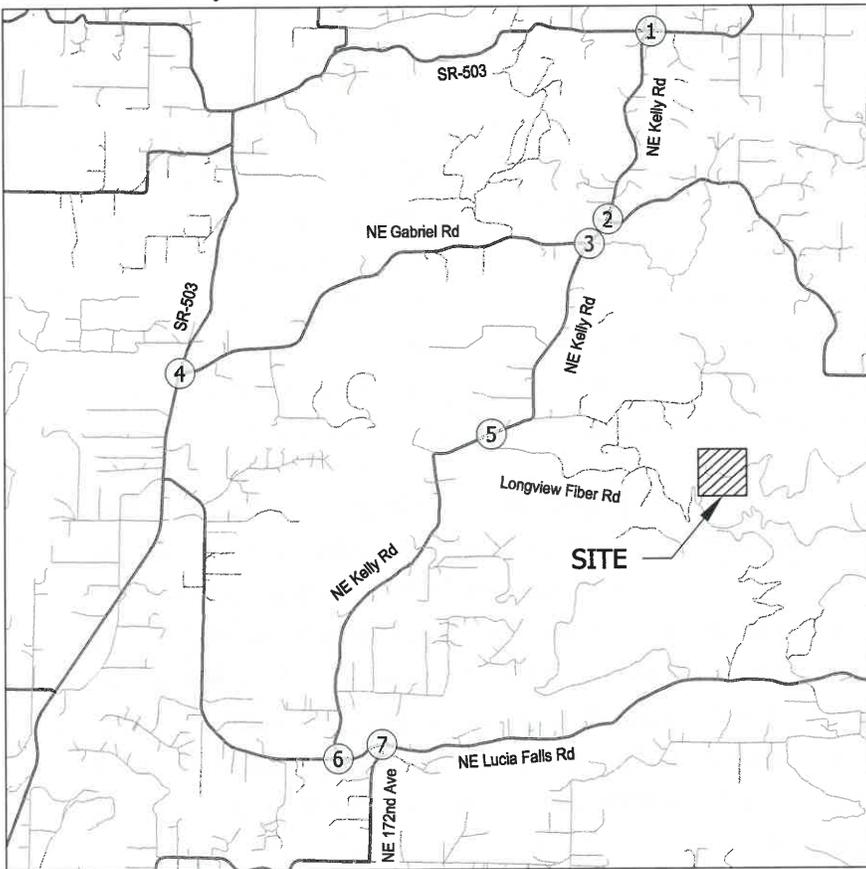
It should be emphasized here that prior to applying annual growth rates determined from the RTC model, an adjustment was made to remove trips associated with the Yacolt Mountain Quarry from the busiest study intersection at SR-503/Gabriel Road. Based on a review of 24-hour data collected at the site entry and the turn movement counts collected at the Longview Fiber Road/Kelly Road intersection, and from evidence provided by the quarry owner and operator about primary hauling routes, it was determined that 24 weekday AM peak hour vehicle trips should be removed from the westbound left-turn movement at the SR-503/Gabriel Road intersection. This was done so as not to double-count, or compound, the traffic on this approach that is due to existing quarry trips, which are fixed. Once the growth rates were applied, these existing 24 trips were added back into the long-range forecast. This change was not needed for the weekday PM peak hour because quarry trips were observed to be very low in the 4:00-6:00 PM period.

Figures 5 and 6 illustrate the resulting year 2037 traffic forecast volumes at the study intersections during the weekday AM and PM peak hours, respectively. Again, the traffic volumes shown do not reflect any specific development on the subject parcels adjacent to the Yacolt Mountain Quarry.

Proposed Land Use Amendment

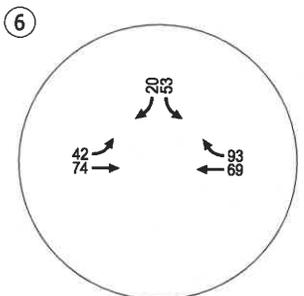
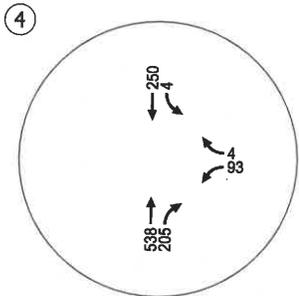
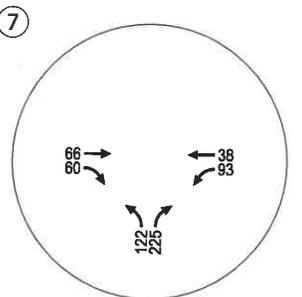
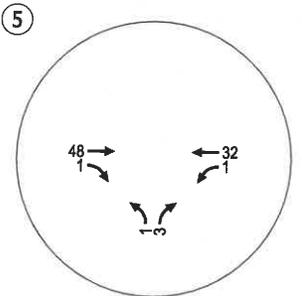
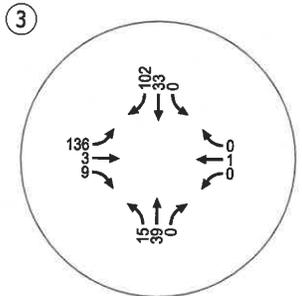
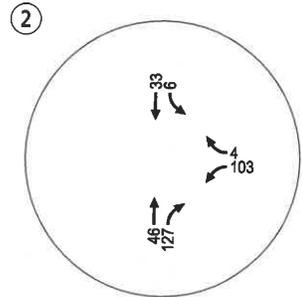
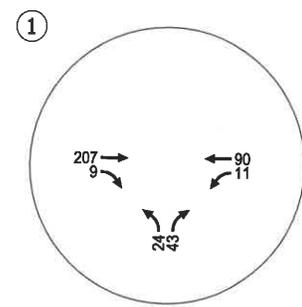
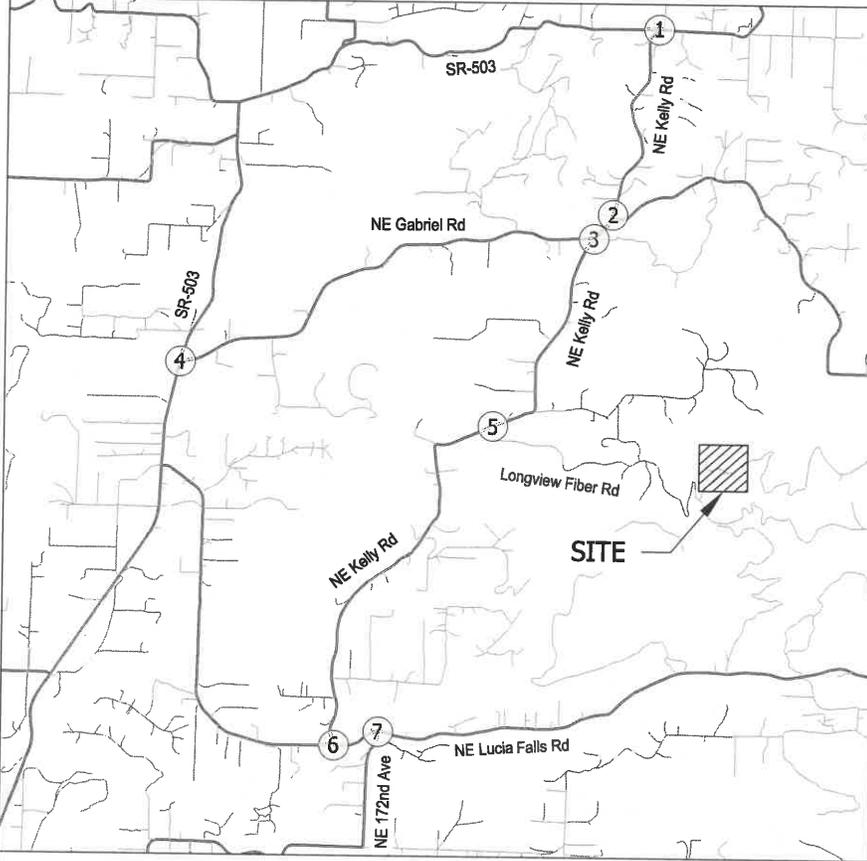
The two subject parcels involved in the proposed expansion to the *Surface Mining Overlay District* are adjacent to and south of the Yacolt Mountain Quarry. They currently have a Comprehensive Plan Designation of *FR-1* and a Zoning designation of *FR-80 (Forest Zone)*. The proposed land use amendment would expand the *Surface Mining Overlay District* that now covers the quarry, enlarging the boundary from approximately 135 acres to 242 acres, for an increase of approximately 107 acres.

As communicated to Clark County staff through the land use application and subsequent meetings, the two properties within the mining overlay expansion area will be under the control of the Yacolt Mountain Quarry owner and operator, and will initially be used for stockpiling soil from the existing mine, that ultimately will be re-established in the process of reclaiming the quarry site. Therefore, the planned use of the new mining overlay area is not intended to result in any increased business activity or added vehicle trips relative to current operations at the quarry. However, County staff have been clear that the traffic impacts of any proposed land use amendment involving the subject parcels must be analyzed independently assuming reasonable development scenarios for the existing *FR-80* zoning and for the proposed *Surface Mining Overlay District*.



2037 Forecast Traffic Volumes
Weekday AM Peak Hour
Clark County, WA

Figure
5



2037 Forecast Traffic Volumes
Weekday PM Peak Hour
Clark County, WA

Figure
6

H:\2222350 - Yacolt Mountain Quarry\design\CD\222350-Figures.dwg Mar 20, 2018 - 2:06pm - ccox Layout Tab: BG PM

Reasonable Land Development Scenario (FR-80 Zoning)

Per County Code Section 40.210.010(A), the purpose of the *FR-80* zoning is to “*maintain and enhance resource-based industries, encourage the conservation of productive forest lands and discourage incompatible uses consistent with the Forest I policies of the comprehensive plan.*” Based on our review of Clark County Code Section 40.210.010(B), there is a wide variety of uses permitted outright in the *FR-80* zone. For context, some uses listed include single family homes, family day cares, adult family homes, commercial nurseries, agricultural markets, private kennels/animal boarding, public recreation, scenic and park use areas, public interpretive/educational uses, dispersed recreation areas (campsites/trailheads), public recreation accessways, equestrian facilities, agricultural resource activities, growing/harvesting of timber, wildlife management, wholesaling and retailing of vegetation from forest land (i.e. fuel wood, Christmas trees), mineral exploration, accessory buildings, forestry and natural resource research and facilities, utility facilities, and wireless communication facilities.

While there are many unique land uses permitted in the *FR-80* district, most uses are not compatible or associated with land use designations contained in the standard reference *ITE Trip Generation Manual, 9th Edition* (Reference 7), for the purposes of estimating vehicle trips. To explain further, the *Trip Generation Manual* has no specific land use category for a common *FR-80* land use such as a timber operation, a farm, or a nursery. There are no compatible ITE categories for industrial uses either. This is because the data backing most industrial land uses in ITE are collected in urban and suburban settings, not rural areas. There are two ITE land use categories in the Recreational arena that have potential applications. They include Campgrounds (ITE 416) and Public Parks (ITE 411). However, the likelihood of these types of facilities being located adjacent to the existing mine on Yacolt Mountain is very low and not reasonable.

Our research indicates that Single Family Home (ITE 210) is the most reasonable land use to apply to the *FR-80* zoning, given the prevailing pattern of rural residences all around the Yacolt Mountain area. However, it should be emphasized that Clark County Code Section 40.210.010(B) limits each legal lot to one single family residence. Because the proposed overlay district encompasses two tax lots (Parcels 230061000 and 23030100), only 2 single family homes can be built.

Reasonable Land Development Scenario (Surface Mining Overlay)

The *ITE Trip Generation Manual* does not contain any land use or trip generation data for a mining or rock quarry operation. Therefore, a customized trip generation profile was created using the current acreage of the *Surface Mining Overlay District* encompassing the Yacolt Mountain Quarry and the 24-hour traffic count collected at the quarry entrance, which also yields hourly traffic flows. This profile resulted in a trip generation rate of 3.93 trips per acre for an average weekday, 0.46 trips per acre for the weekday AM peak hour, 0.08 trips per acre for the weekday PM peak hour. It should be emphasized that the peak hour rates reflect the peak hours of adjacent street traffic occurring from 7:00-9:00 AM and 4:00-6:00 PM.

Site Trip Generation

Trip generation estimates were prepared for the two separate land development scenarios under current *FR-80* zoning and the proposed *Surface Mining Overlay District* expansion. As stated above, ITE trip generation rates were applied to the current zoning development scenario, under the assumption two single family homes would be built. Customized trip rates developed from the Yacolt Mountain Quarry were applied to the 107-acre expansion of the *Surface Mining Overlay District*.

Table 4 summarizes the anticipated number of trips that will be generated by each development scenario for typical weekday and for the weekday AM and PM peak hours.

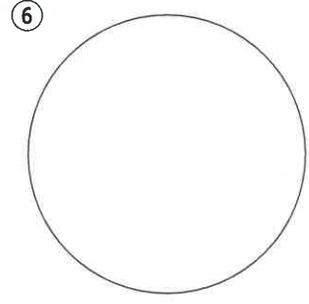
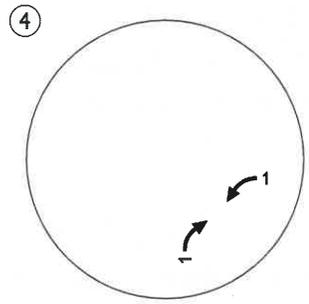
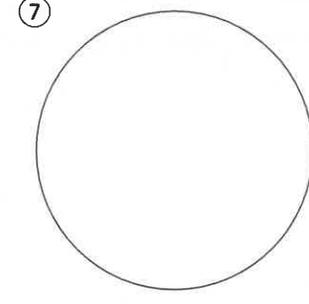
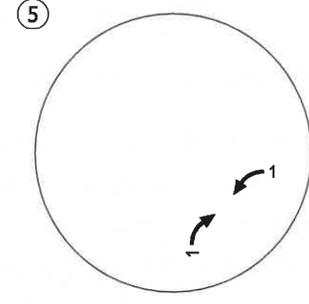
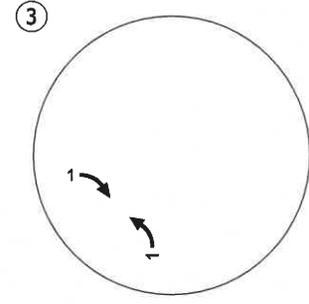
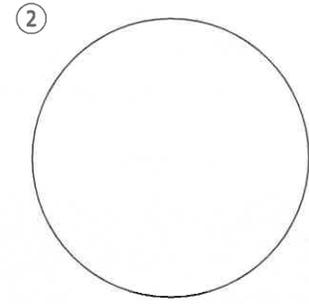
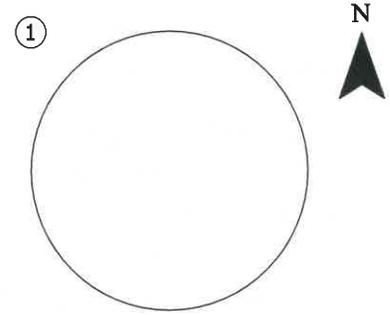
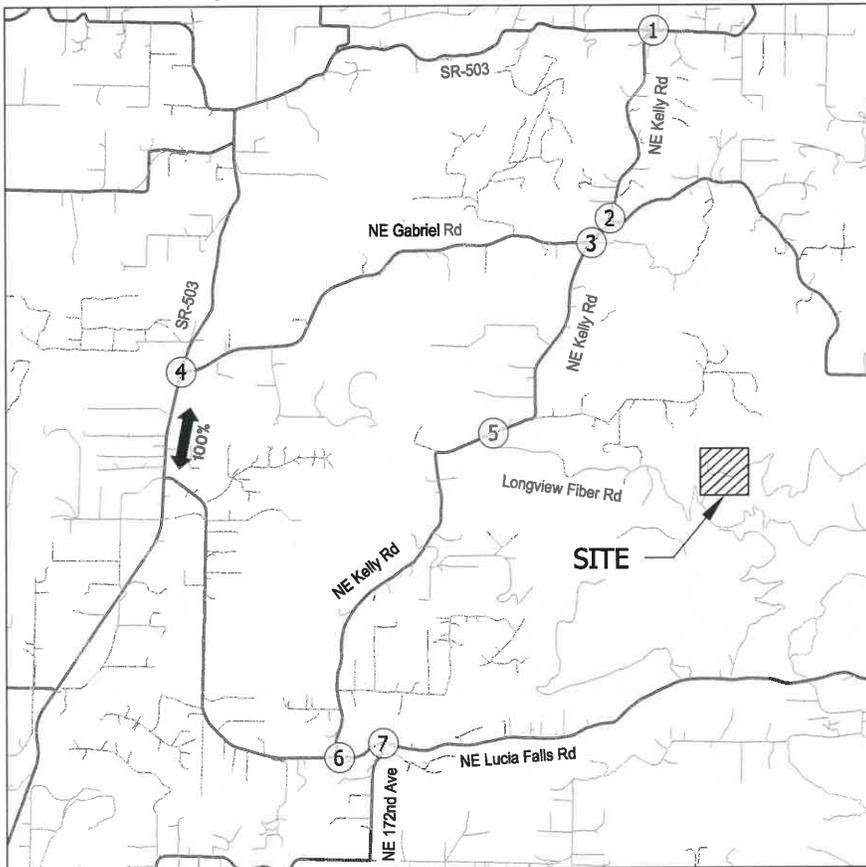
Table 4: Trip Generation Estimate

Land Use	ITE Code	Size	Average Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Single Family Home (FR-80 Zoning)	210	2 DU's	19	2	1	1	2	1	1
Mine/Quarry (Surface Mining Overlay)	N/A	107 acres	421	49	22	27	9	2	7

As shown in Table 4, the current zoning development scenario is expected to generate approximately 19 average daily trips, including 2 trips during the weekday AM and PM peak hours. The proposed overlay development scenario is estimated to generate approximately 421 average daily trips, including 49 trips during the weekday AM peak hour and 9 trips during the weekday PM peak hour.

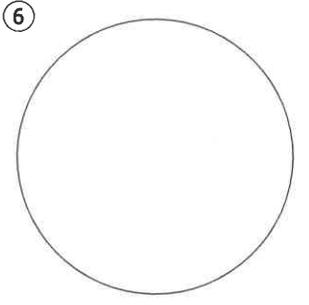
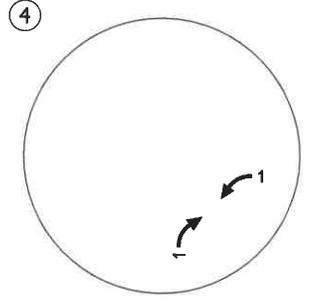
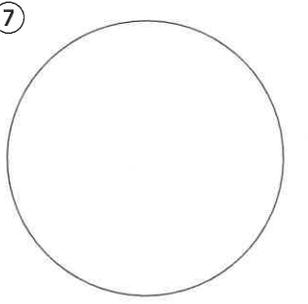
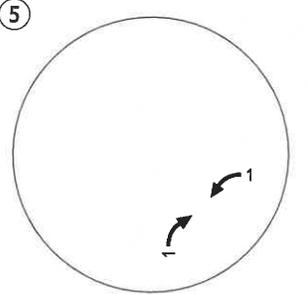
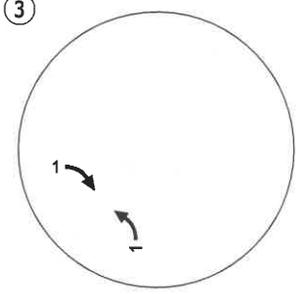
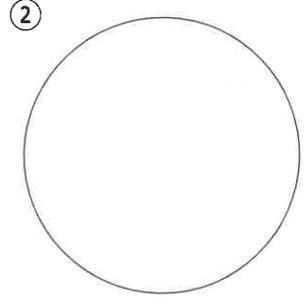
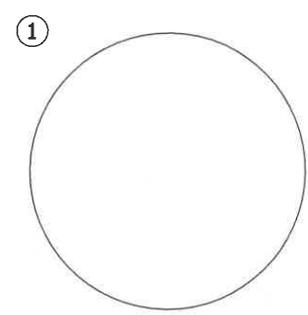
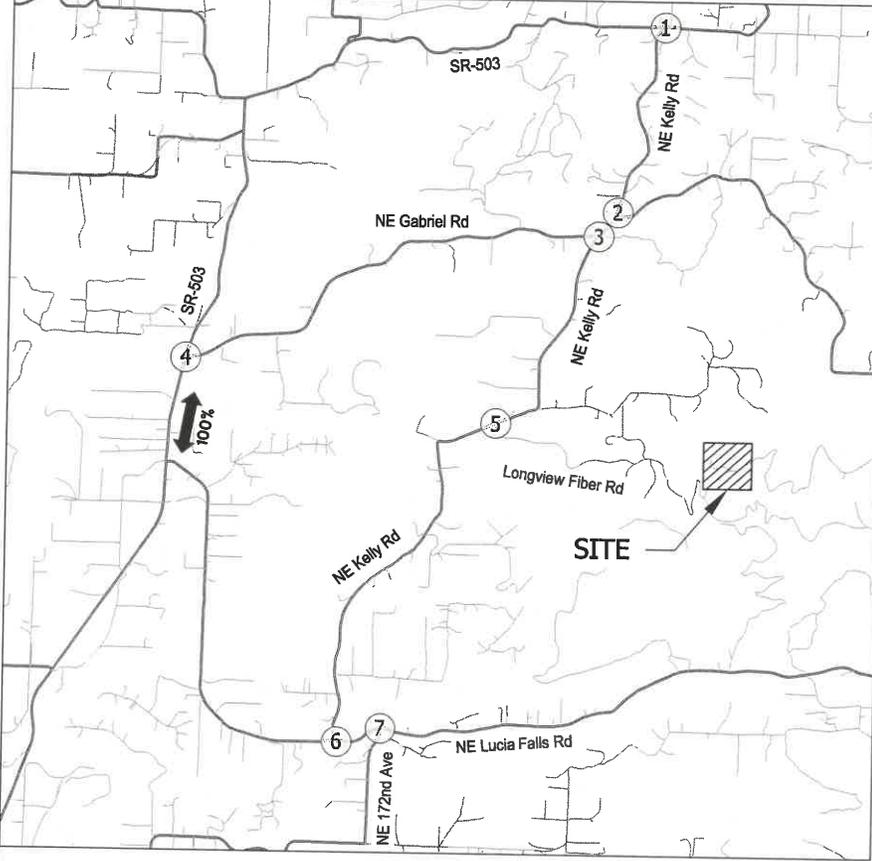
Trip Distribution/Assignment

The site-generated trips shown in Table 4 for the two development scenarios were distributed onto the study area roadways based on a review of current traffic count patterns. Figures 7 and 8 illustrate the estimated trip distribution pattern and assignment for the current *FR-80* zoning development scenario for the weekday AM and PM peak hours, respectively. Similarly, Figures 9 and 10 illustrate the site-generated trips that are expected to use the roadway system under the proposed *Surface Mining Overlay* development scenario during the weekday AM and PM peak hours, respectively.



Estimated Trip Distribution and Assignment (FR-80 Zoning)
 Weekday AM Peak Hour
 Clark County, WA

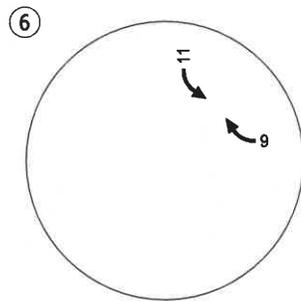
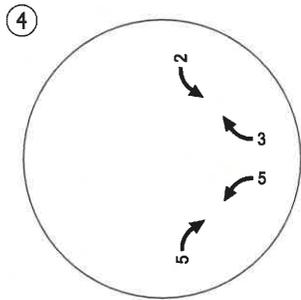
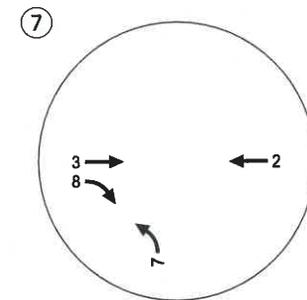
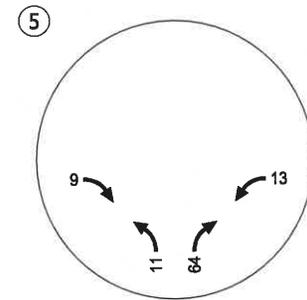
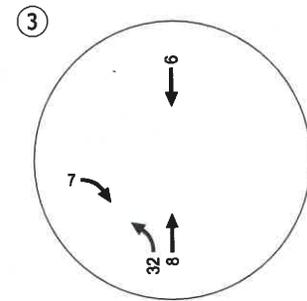
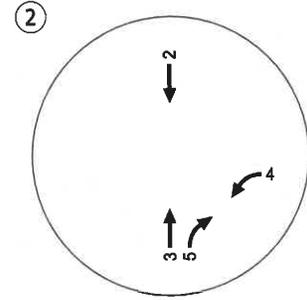
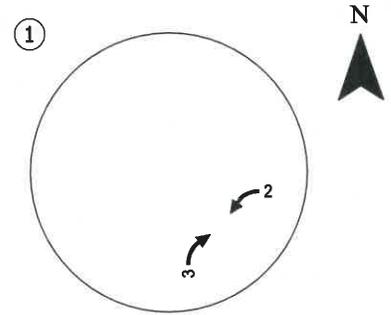
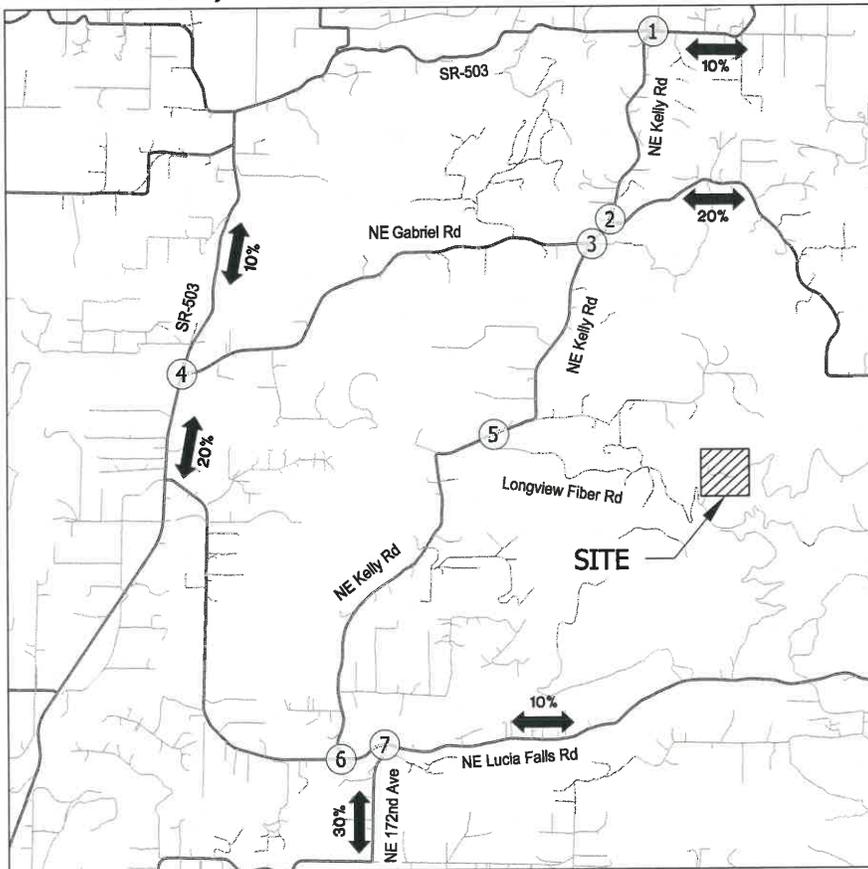
Figure
 7



Estimated Trip Distribution and Assignment (FR-80 Zoning)
 Weekday PM Peak Hour
 Clark County, WA

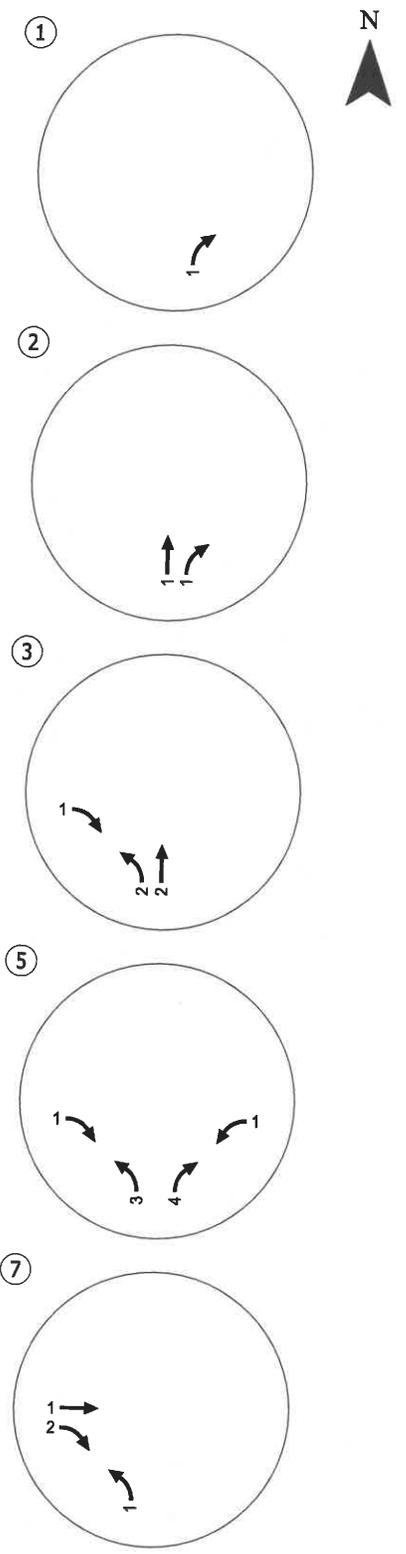
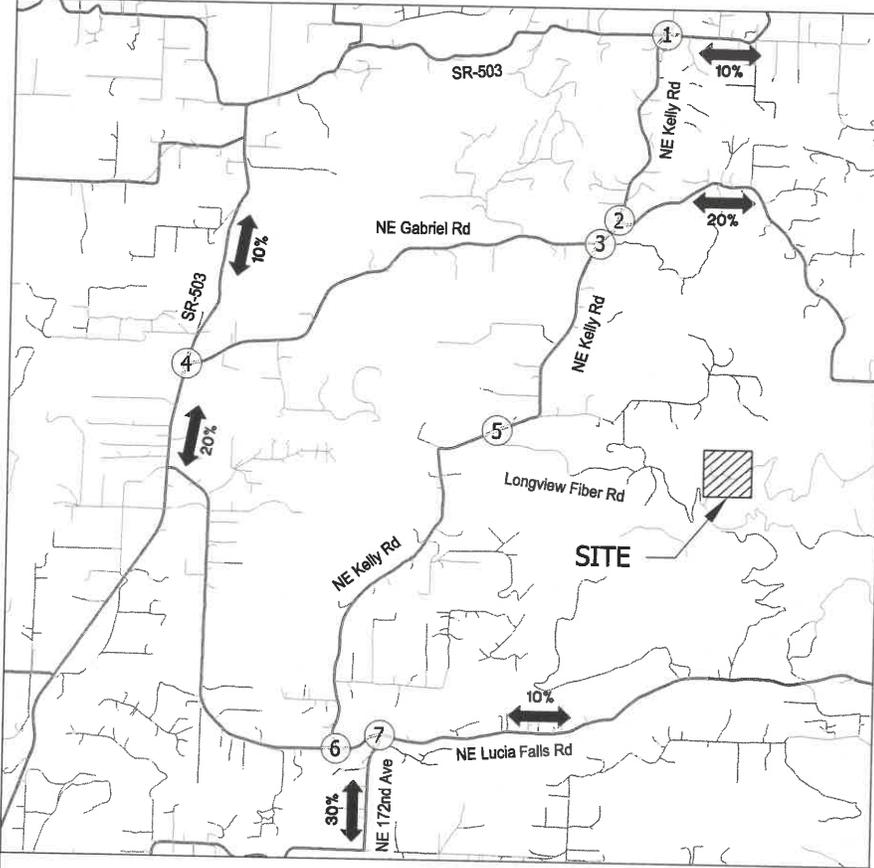
Figure
 8

H:\2222350 - Yacolt Mountain Quarry\design\CD\2222350-Figures.dwg Mar 20, 2018 - 2:07pm - ccox Layout Tab. FR-80 SG PM



Estimated Trip Distribution and Assignment
(Surface Mining Overlay Zoning)
Weekday AM Peak Hour

Figure 9



Estimated Trip Distribution and Assignment
 (Surface Mining Overlay Zoning)
 Weekday PM Peak Hour

Figure
 10

Year 2037 Total Traffic Conditions

The year 2037 total traffic conditions analysis forecasts how the study area’s transportation system will operate with traffic generated by development on the subject site. The year 2037 forecast traffic volumes shown in Figures 5 and 6 were added to the site-generated traffic shown in Figures 7 and 8 to arrive at the year 2037 total traffic volumes for the current *FR-80* zoning scenario shown in Figures 11 and 12 for the weekday AM and PM peak hours, respectively. The same process was followed to develop the year 2037 total traffic volumes for the proposed *Surface Mining Overlay* expansion, as shown in Figures 13 and 14.

Intersection Adjustment Factors for Long-Range Operations Analysis

It should be emphasized that the existing Peak Hour Factors (PHF’s) observed at the two SR-503 study intersections at NE Gabriel Road and at NE Kelly Road were adjusted upwards to reflect the spreading effect of traffic demand over time, particularly for these two intersections which experience moderate traffic demand today and high traffic growth expectations over the 19-year forecast, per the County traffic model data. Table 5 below provides more background on how the intersection PHF’s were adjusted for year 2037 traffic conditions, with comparisons to existing year 2018 PHF’s and historical PHF’s from the year 2000, which were obtained from the original traffic study for the Yacolt Mountain Quarry (Reference 1).

Table 5: Peak Hour Factor Adjustments (SR-503 Study Intersections)

Intersection	Year 2000 PHF ¹		Existing 2018 PHF ²		Adjusted 2037 PHF ³	
	AM	PM	AM	PM	AM	PM
SR-503/NE Gabriel Road	0.78	0.90	0.88	0.91	0.95	0.95
SR-503/NE Kelly Road	0.76	0.92	0.79	0.91	0.90	0.95

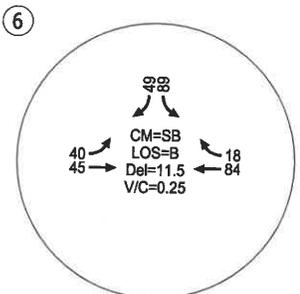
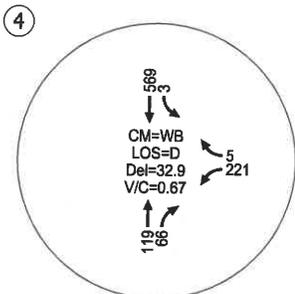
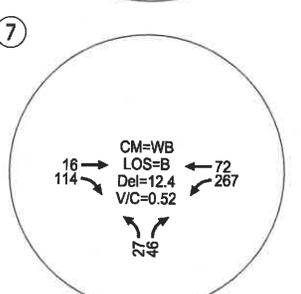
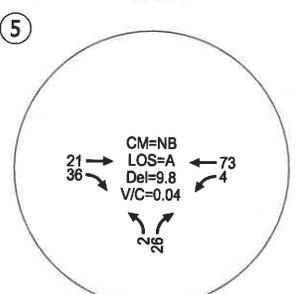
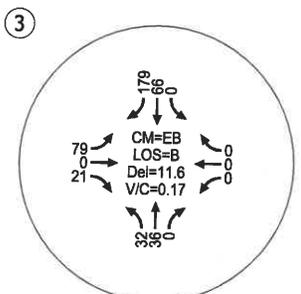
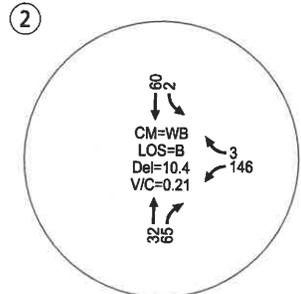
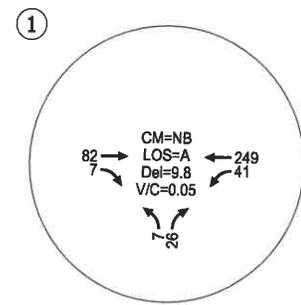
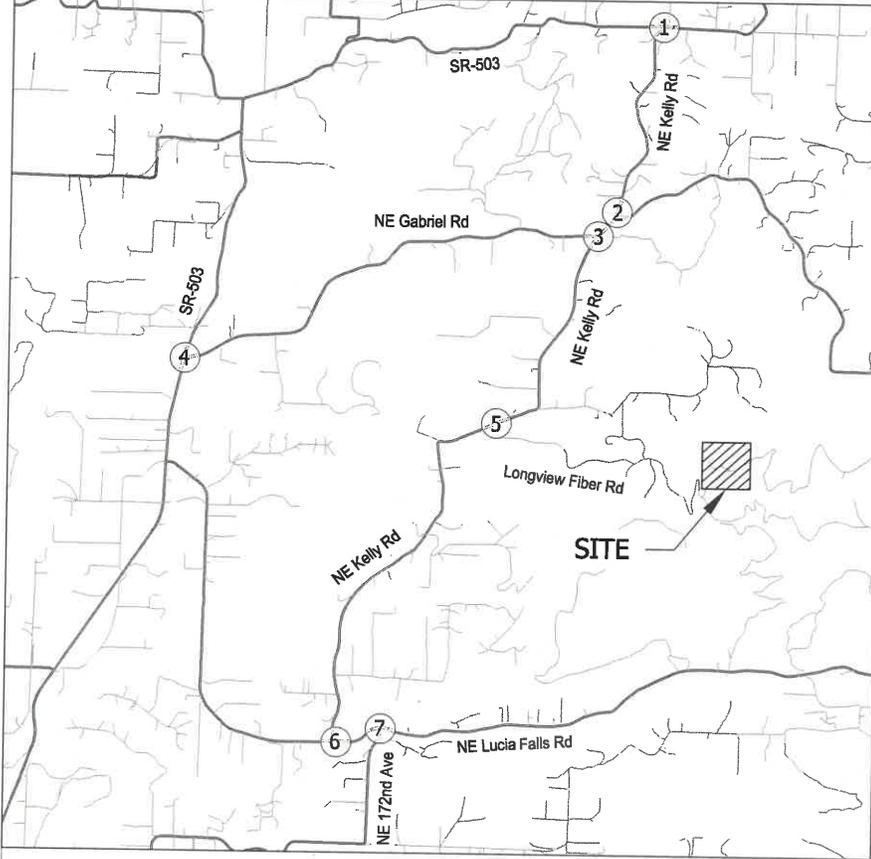
¹ Source: Traffic Impact Study for Yacolt Mountain Quarry prepared by CTS Engineers, November 2001.

² Source: Existing turn movement volume counts (see Attachment “E”).

³ PHF’s were adjusted upwards to 0.95 for most intersections and time periods, except for the AM condition at SR-503/Kelly Road. The adjustment to 0.90 for this intersection was due to the lower existing year 2018 PHF, at 0.79, which was too low to make such a large adjustment.

Intersection Operations (FR-80 Zoning Scenario)

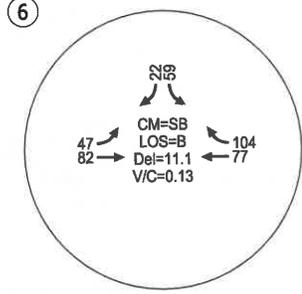
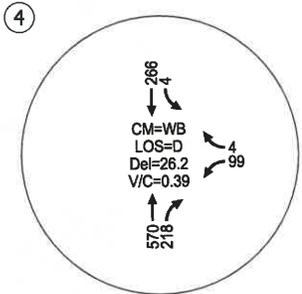
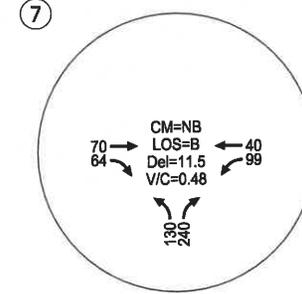
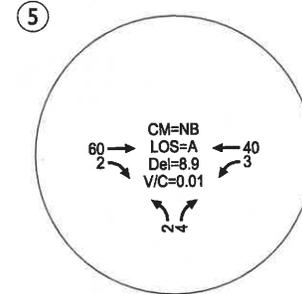
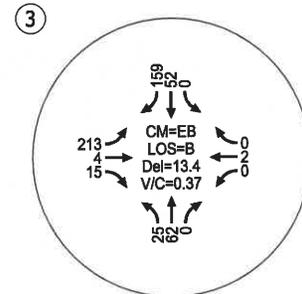
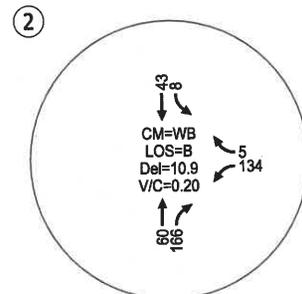
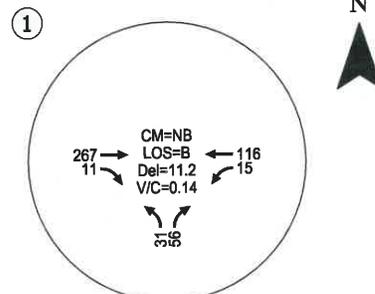
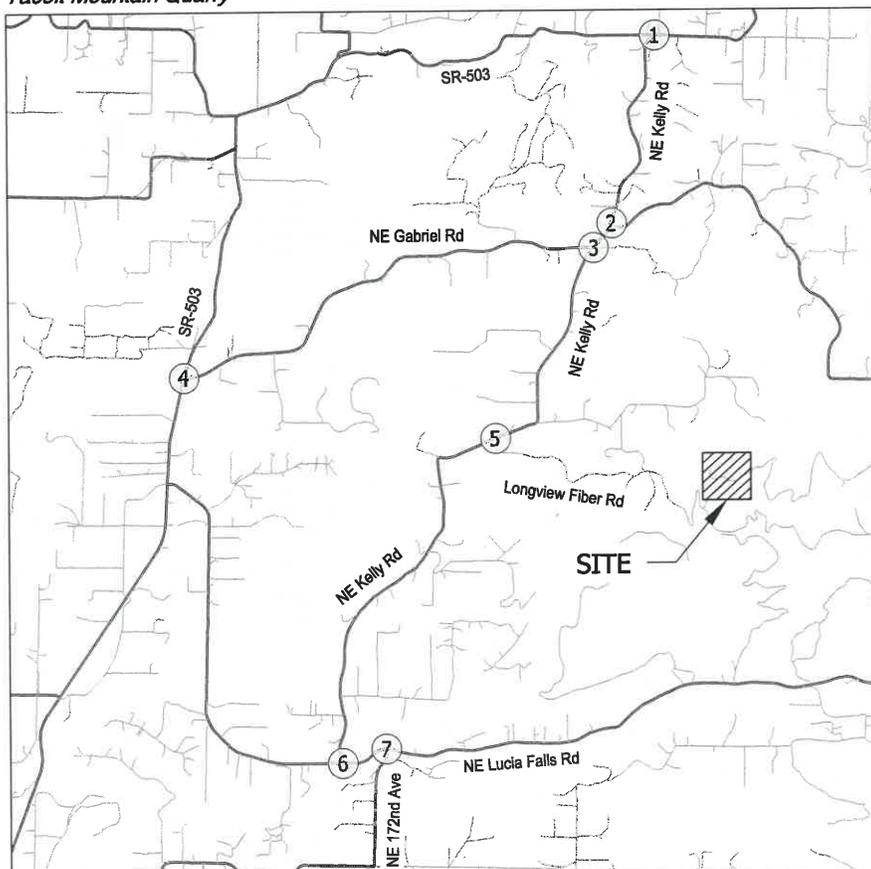
The operations analysis results for the current *FR-80* zoning development scenario are shown in Figures 11 and 12 for the weekday AM and PM peak hours, respectively. As shown, all study intersections are forecast to operate acceptably during the weekday AM and PM peak hours per the applicable Clark County performance standards. The busiest intersection at SR-503/NE Gabriel Road is forecast to operate at LOS “D” during the weekday AM and PM peak hours, which meets the Clark County standard of LOS “D” or better. *Attachment “I” contains the year 2037 total traffic conditions worksheets for the current FR-80 zoning scenario.*



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/
 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION DELAY(SIGNALIZED)/
 CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2037 Total Traffic Conditions
 (FR-80 Zoning)
 Weekday AM Peak Hour

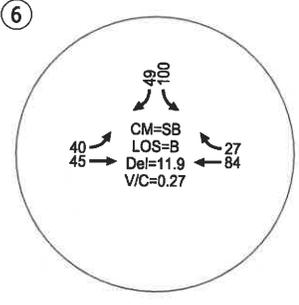
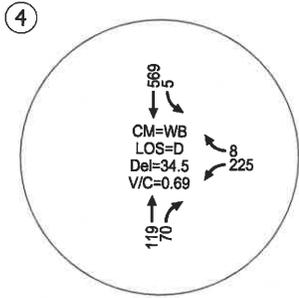
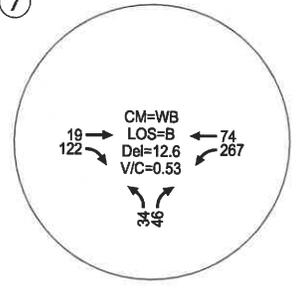
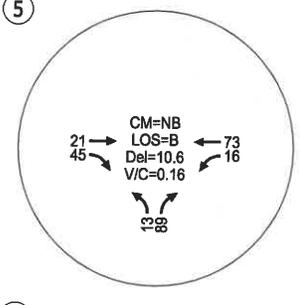
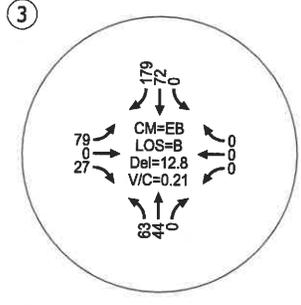
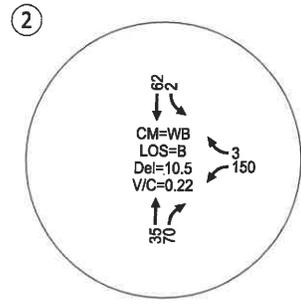
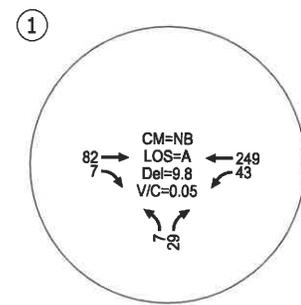
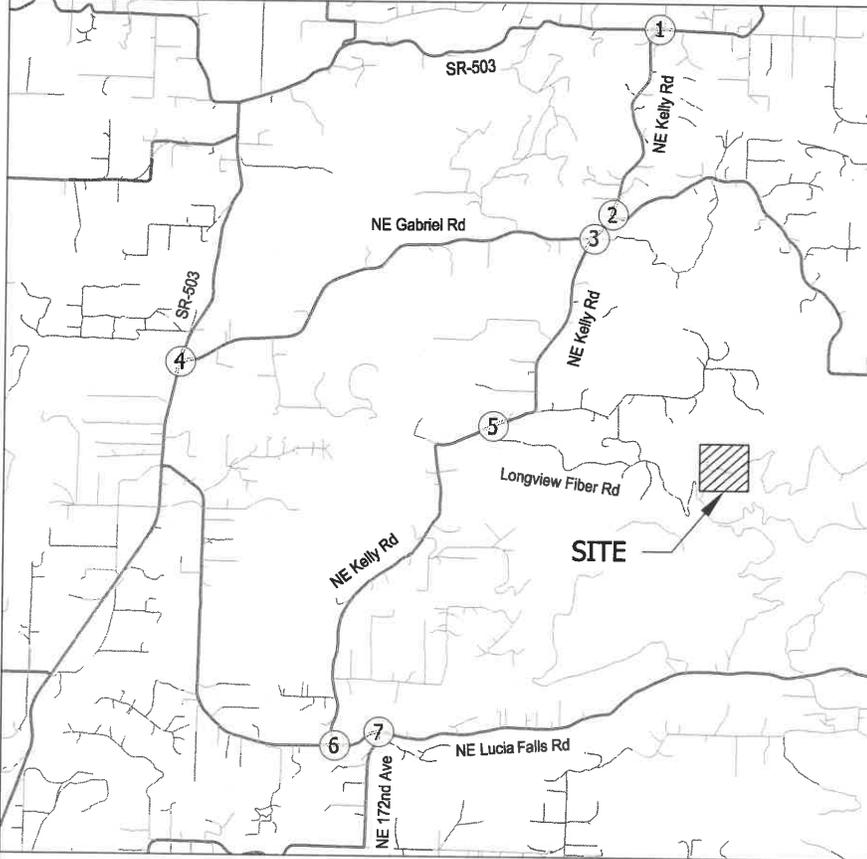
Figure
 11



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/
 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION DELAY(SIGNALIZED)/
 CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2037 Total Traffic Conditions
 (FR-80 Zoning)
 Weekday PM Peak Hour

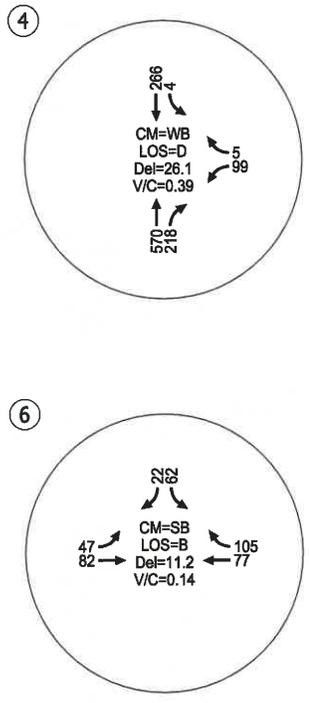
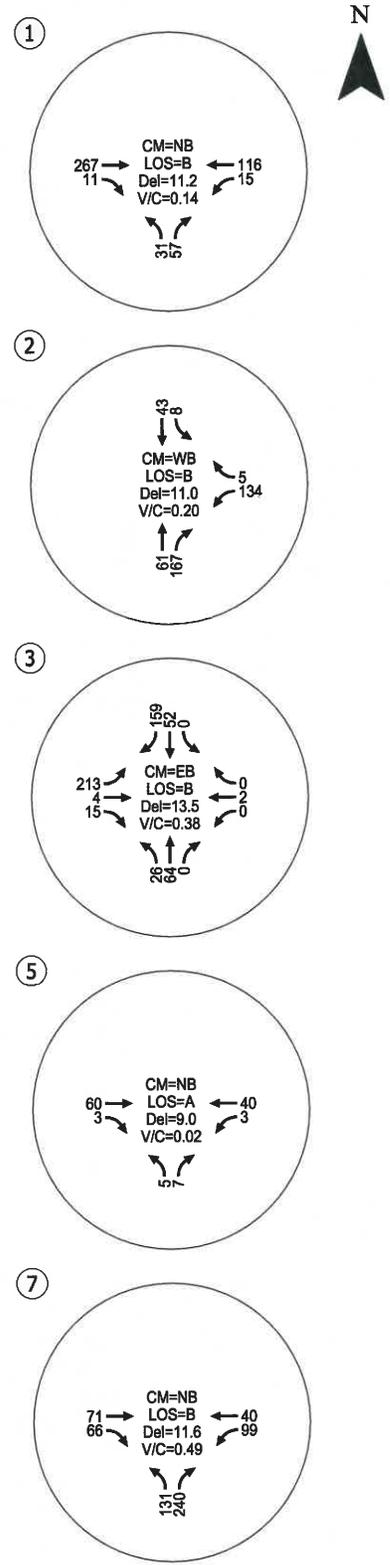
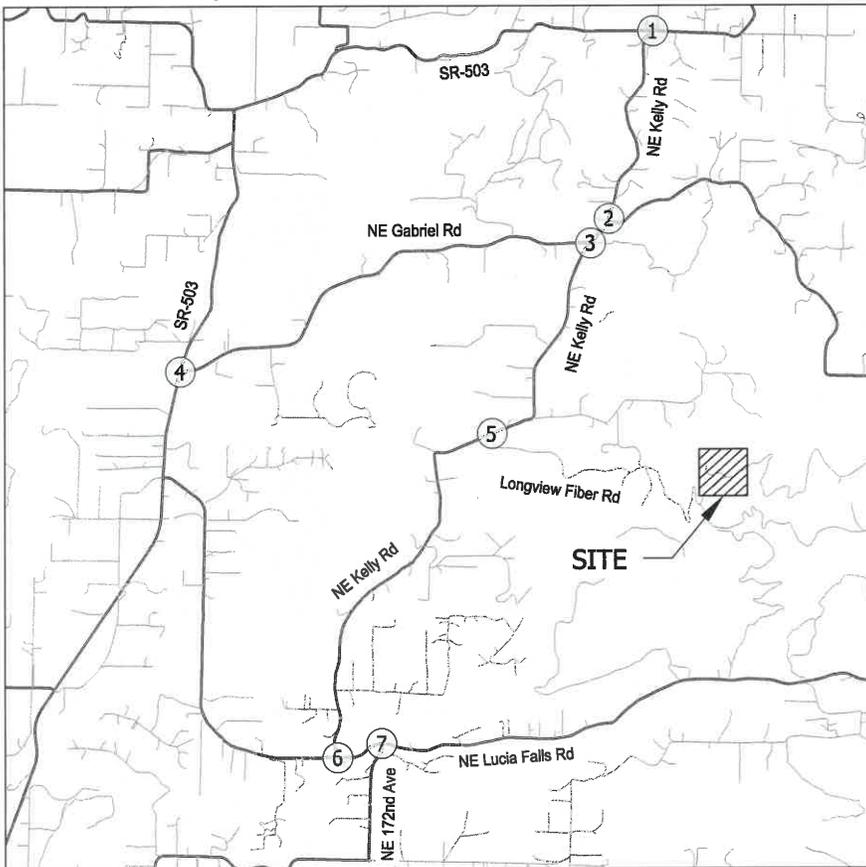
Figure
 12



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 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)
 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION DELAY (SIGNALIZED)
 CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2037 Total Traffic Conditions
 (Surface Mining Overlay Zoning)
 Weekday AM Peak Hour

Figure
 13



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/
 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION DELAY(SIGNALIZED)/
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 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**2037 Total Traffic Conditions
 (Surface Mining Overlay Zoning)
 Weekday PM Peak Hour**

**Figure
 14**

Intersection Operations (Surface Mining Overlay Scenario)

The operations analysis results for the proposed *Surface Mining Overlay* development scenario are shown in Figures 13 and 14 for the weekday AM and PM peak hours, respectively. Similar to the FR-80 zoning scenario results, all study intersections are forecast to operate acceptably during the weekday AM and PM peak hours per the applicable Clark County performance standards. Relative to the FR-80 zoning scenario, operations at the busier SR-503/NE Gabriel Road intersection are forecast to remain at LOS “D” during the weekday AM and PM peak hours. *Attachment “J” contains the year 2037 total traffic conditions worksheets for the proposed Surface Mining Overlay scenario.*

Concurrency Corridor V/C Ratios (FR-80 Zoning Scenario)

For the FR-80 zoning development scenario, year 2037 forecast traffic volumes along critical concurrency corridor segments were compared with adopted Clark County capacity thresholds to assess compliance with concurrency requirements. Table 6 shows forecast bi-direction traffic volumes and the single direction roadway capacity as specified under Clark County Code 40.350.020 Transportation Concurrency Management and Table 40.350.020-1. As shown in Table 6, one of the concurrency corridor segments is forecast to operate above a 0.90 V/C ratio, which exceeds the County standard of 0.90 or less.

Table 6: 2037 Concurrency Corridor V/C Ratios (FR-80 Zoning)

Count Location	Road Classification ¹	Single Direction Capacity/Hour ²	Maximum Volume (vph) ³	V/C Ratio
SR-503				
South of NE Gabriel Road (SB)	Rural Arterial (W)	800 ⁴	790 (AM)	0.99
South of NE Gabriel Road (NB)			788 (PM)	0.99
East of NE Kelly Road (EB)	Rural Arterial (W)	800 ⁴	323 (PM)	0.40
East of NE Kelly Road (WB)			290 (AM)	0.36

¹ Source: Clark County Arterial Atlas, 2013 (Reference 4)

² Per Clark County Code: For roadways not fully built-out to county standards, the capacity shall be determined based on the current roadway condition. For roadways with lane widths twelve (12) feet and greater, and with paved shoulder widths two (2) feet and greater, the lane capacity shall be eight hundred (800) vehicles per hour. For roadways with lane widths between eleven (11) and twelve (12) feet and with paved shoulder widths two (2) feet and greater, the lane capacity shall be seven hundred (700) vehicles per hour. For roadways with lane widths less than eleven (11) feet, the lane capacity shall be six hundred (600) vehicles per hour.

³ vph: vehicles per hour, based on turning movement counts collected at the study intersections.

⁴ Based on existing 2-lane cross-section

Concurrency Corridor V/C Ratios (Surface Mining Overlay Scenario)

For the Surface Mining Overlay development scenario, year 2037 forecast traffic volumes along critical concurrency corridor segments were again compared with adopted Clark County capacity thresholds to assess compliance with concurrency requirements. Table 7 contains the results of this comparison. As shown the same concurrency corridor segment along SR-503, south of SE Gabriel Road, is forecast to operate above a 0.90 V/C ratio, which exceeds the County standard of 0.90 or less.

Table 7: 2037 Concurrency Corridor V/C Ratios (Surface Mining Overlay)

Count Location	Road Classification ¹	Single Direction Capacity/Hour ²	Maximum Volume (vph) ³	V/C Ratio
SR-503				
South of NE Gabriel Road (SB)	Rural Arterial (W)	800 ⁴	794 (AM)	0.99
South of NE Gabriel Road (NB)			788 (PM)	0.99
East of NE Kelly Road (EB)	Rural Arterial (W)	800 ⁴	324 (PM)	0.41
East of NE Kelly Road (WB)			292 (AM)	0.37

¹ Source: Clark County Arterial Atlas, 2013 (Reference 4)

² Per Clark County Code: For roadways not fully built-out to county standards, the capacity shall be determined based on the current roadway condition. For roadways with lane widths twelve (12) feet and greater, and with paved shoulder widths two (2) feet and greater, the lane capacity shall be eight hundred (800) vehicles per hour. For roadways with lane widths between eleven (11) and twelve (12) feet and with paved shoulder widths two (2) feet and greater, the lane capacity shall be seven hundred (700) vehicles per hour. For roadways with lane widths less than eleven (11) feet, the lane capacity shall be six hundred (600) vehicles per hour.

³ vph: vehicles per hour, based on turning movement counts collected at the study intersections.

⁴ Based on existing 2-lane cross-section

A comparison of the results in Table 7 to those in Table 6 demonstrate that the proposed Surface Mining Overlay will not degrade the sub-standard v/c ratio performance of 0.99 forecast for the south leg of the SR-503/NE Gabriel Road intersection by any measureable amount. This is because the increase in site trips from the overlay expansion are small relative to development under the current FR-80 zoning. Nevertheless, if mitigation becomes necessary to achieve conformance with County standards or at least bring the v/c ratio back to conditions created under the FR-80 zoning scenario, there are two options. One would be to add additional capacity to the intersection by way of a northbound right-turn lane and/or a southbound left-turn lane. Or another alternative, which would be the preferred solution by the Applicant, would be to restrict vehicle trips generated by the parcels involved with the expanded *Surface Mining Overlay District*. This restriction, or trip cap, if enacted, should be limited to the amount of trips figured for the FR-80 zoning scenario.

VEHICLE QUEUING

Vehicle queuing conditions at all study intersections were reviewed to ensure vehicle queues can be accommodated by available lane storage under year 2037 traffic conditions involving the Surface Mining Overlay scenario. The review was conducted using the HCM output reports produced for the operations analyses. As demonstrated by the level of service worksheets provided in Attachment "J", all but 3 study intersections will have vehicle queues of one vehicle or less on the stop-controlled approaches during the weekday AM and PM peak hours. At the intersection of SR-503/NE Gabriel Road, queues up to 5 vehicles will develop on the westbound approach in the AM condition, with 2 vehicles during the PM condition. At the intersection of NE Lucia Falls Road/NE 172nd Avenue, up to 3 vehicles will develop on the westbound approach in the AM condition, and 2 vehicles will develop on the northbound approach in the PM condition. Lastly, at the NE Gabriel Road/NE Kelly Road intersection, a vehicle queue of 2 vehicles will develop on the eastbound approach. In all cases, these queues lengths can be accommodated by available lane storage capacity.

FINDINGS AND RECOMMENDATIONS

The results of the analysis indicated that the proposed land use amendment can occur while maintaining acceptable levels of traffic operations and safety at the study intersections assuming provision of the recommended mitigation measures. The findings of this analysis and our recommendations are discussed below.

Findings

- All study intersections currently operate at levels which meet the performance measures established by Clark County Concurrency standards during the weekday AM and PM peak hours.
- Regionally significant highway corridor segments along SR-503 currently meet Clark County's v/c ratio standards under weekday AM and PM peak hours.
- No apparent safety-hazards or safety mitigation measures appear necessary at the study intersections, based on a review of reported crashes over the past 5 years.
- All study intersections are forecast to continue operating at acceptable levels under future year 2037 weekday AM and PM peak hour conditions, with the current FR-80 zoning and with the proposed Surface Mining Overlay District expansion
- One highway concurrency corridor segment along SR-503 is forecast to operate above the County's v/c ratio standard of 0.90 in the year 2037. The south leg of the SR-503/NE Gabriel Road intersection is forecast to reach a v/c ratio of 0.99 under both the current FR-80 zoning and Surface Mining Overlay development scenarios.
- Vehicle queues will be short and adequately accommodated by available lane storage at all study intersections under year 2037 traffic conditions during the weekday AM and PM peak hours.

Recommendations

- If mitigation measures are necessary to address a perceived adverse impact on the future highway concurrency corridor v/c ratio deficiency identified at the SR-503/NE Gabriel Road intersection, the Applicant requests the County establish a trip cap, limiting vehicle trips generated by the parcels involved with the expanded *Surface Mining Overlay District* to the amount of trips allowed by the current FR-80 zoning.

We trust this letter report adequately addresses the traffic impacts associated with the proposed land use amendment associated with the Yacolt Mountain Quarry. Please contact us if you have any questions or comments regarding the contents of this report or the analyses performed.

Sincerely,
KITTELSON & ASSOCIATES, INC.



Brian J. Dunn, PE
Associate Engineer



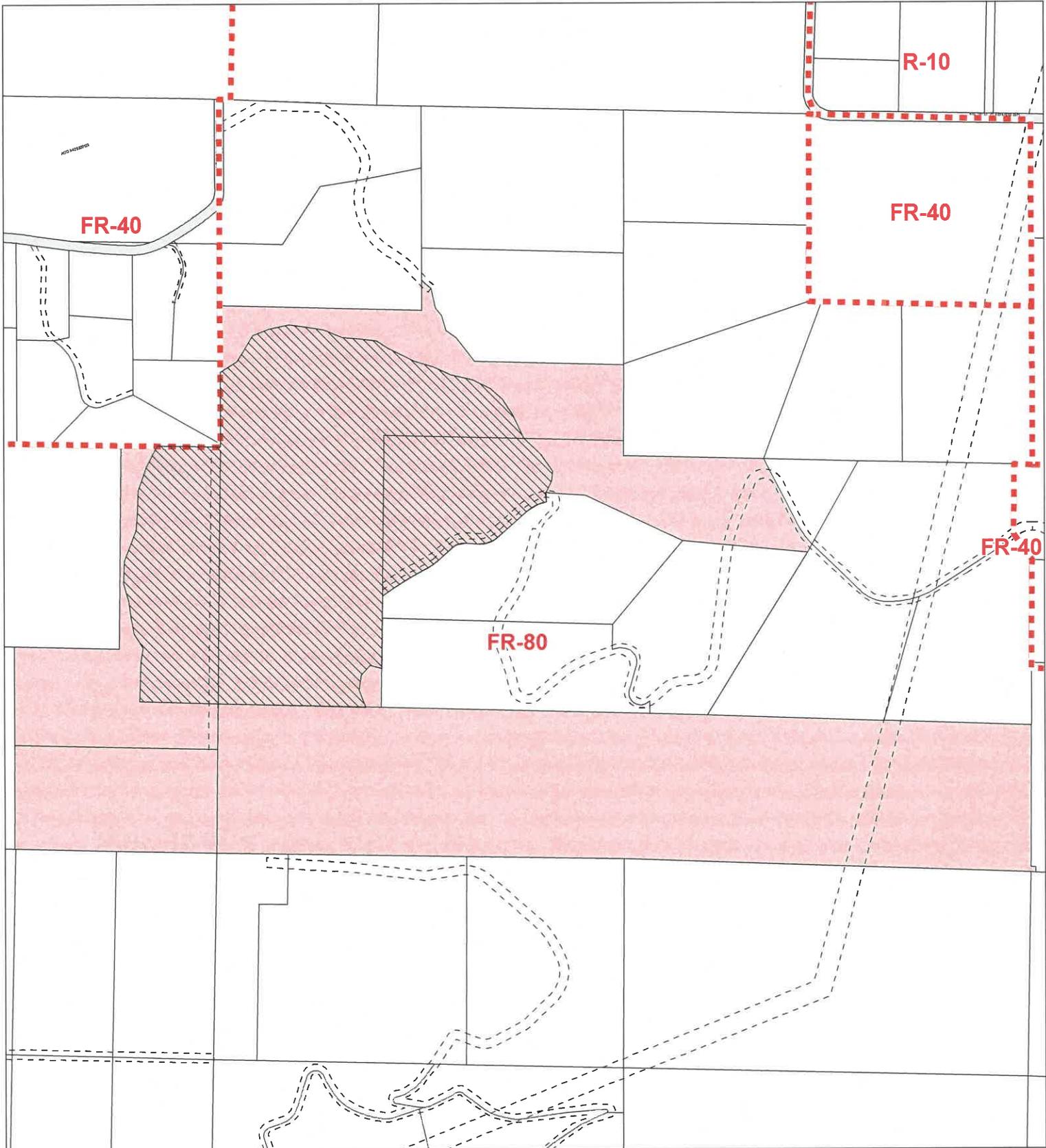
Caleb Cox
Transportation Analyst



REFERENCES

1. CTS Engineers, Inc. Traffic Analysis for Proposed Yacolt Mountain Quarry. November 15, 2001.
2. Transportation Research Board. *2010 Highway Capacity Manual*. 2010.
3. Washington State Department of Transportation. *2007-2026 Highway System Plan*. December 2007.
4. Clark County, Washington. *Arterial Atlas*. 2013.
5. Clark County Public Works. *2018-2023 Clark County Transportation Improvement Plan*. October 2017.
6. Southwest Washington Regional Transportation Council. *Regional Transportation Plan for Clark County*. 2014 Update.
7. Institute of Transportation Engineers. *Trip Generation Manual, 9th Edition*. 2012.

Attachment A Site Exhibits



Zoning Designations

Account: 230076000, 230301000, 230270000, 230061000
 Owner: ROTSCHY BRENT A & ROTSCHY HEIDI K
 Address: PO BOX 464
 C/S/Z: YACOLT, WA 98675

Printed on: December 20, 2017



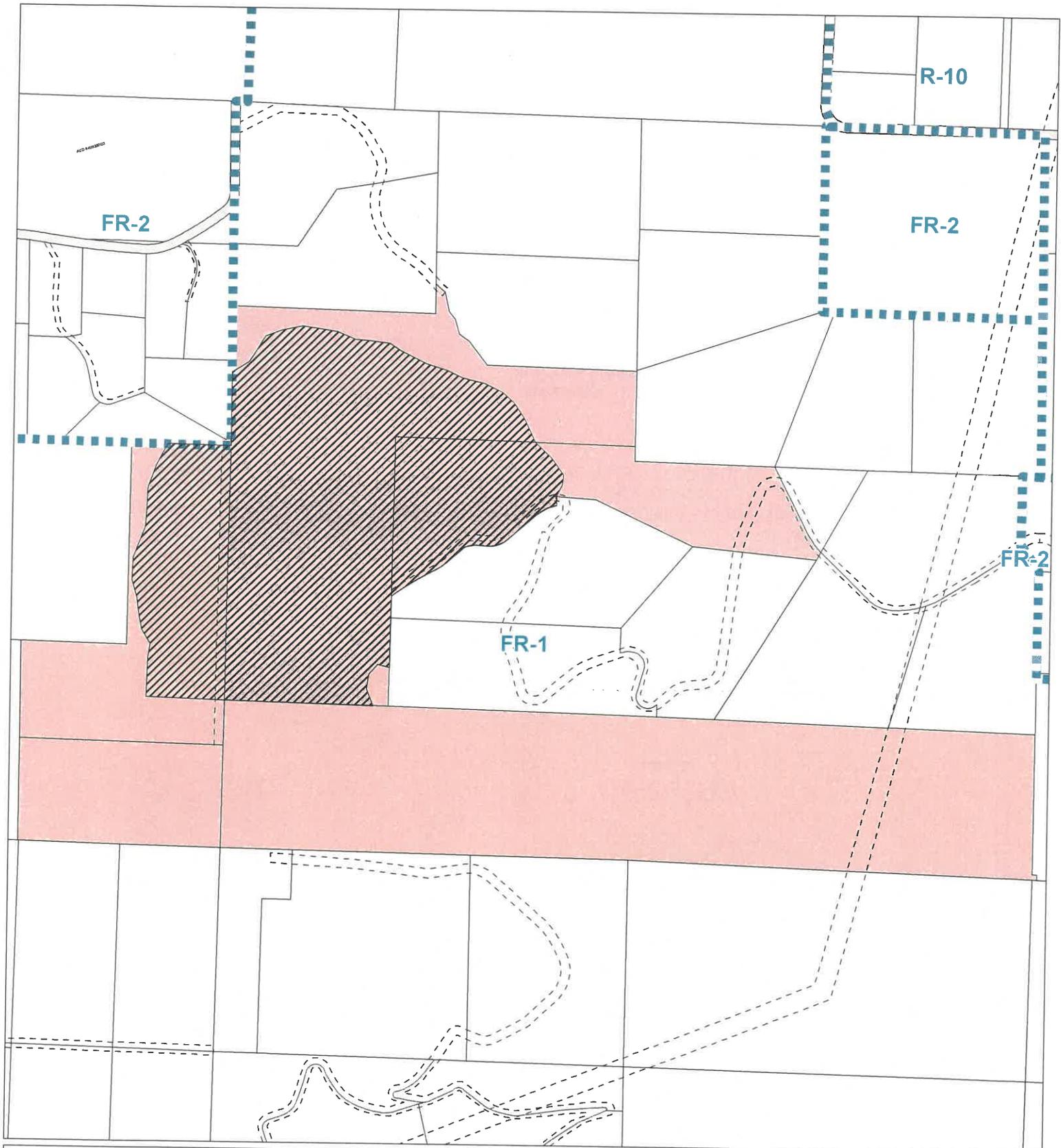
Geographic Information System



Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

- Subject Property(s)
- Public Road
- Transportation or Major Utility Easement
- Zoning Boundary
- Urban Holding - 10 (UH-10)
- Urban Holding - 20 (UH-20)
- Urban Holding - 40 (UH-40)
- Surface Mining Overlay District

53132	53133
43105	43104
43108	43109
43103	43110



0 200 400 Feet

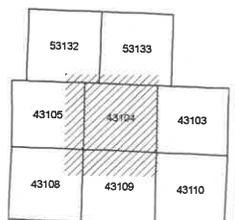
Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

Comprehensive Plan Designations

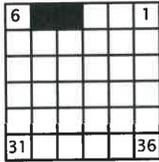
Account: 230076000, 230301000, 230270000, 230061000
 Owner: ROTSCY BRENTA & ROTSCY HEIDI K
 Address: PO BOX 464
 C/S/Z: YACOLT, WA 98675

- Subject Property(s)
- Industrial Reserve
- Public Road
- Railroad Industrial Reserve
- Transportation or Major Utility Easement
- Mining
- Comprehensive Plan Boundary
- Rural Center Mixed Use
- Columbia River Gorge Scenic Area
- Urban Reserve

Printed on: December 20, 2017



T 4 N



R 3 E

SITE COORDINATES:

LATITUDE: 45° 51' 23" N

LONGITUDE: 122° 27' 14" W

WESTERN WASHINGTON



LEGAL DESCRIPTION

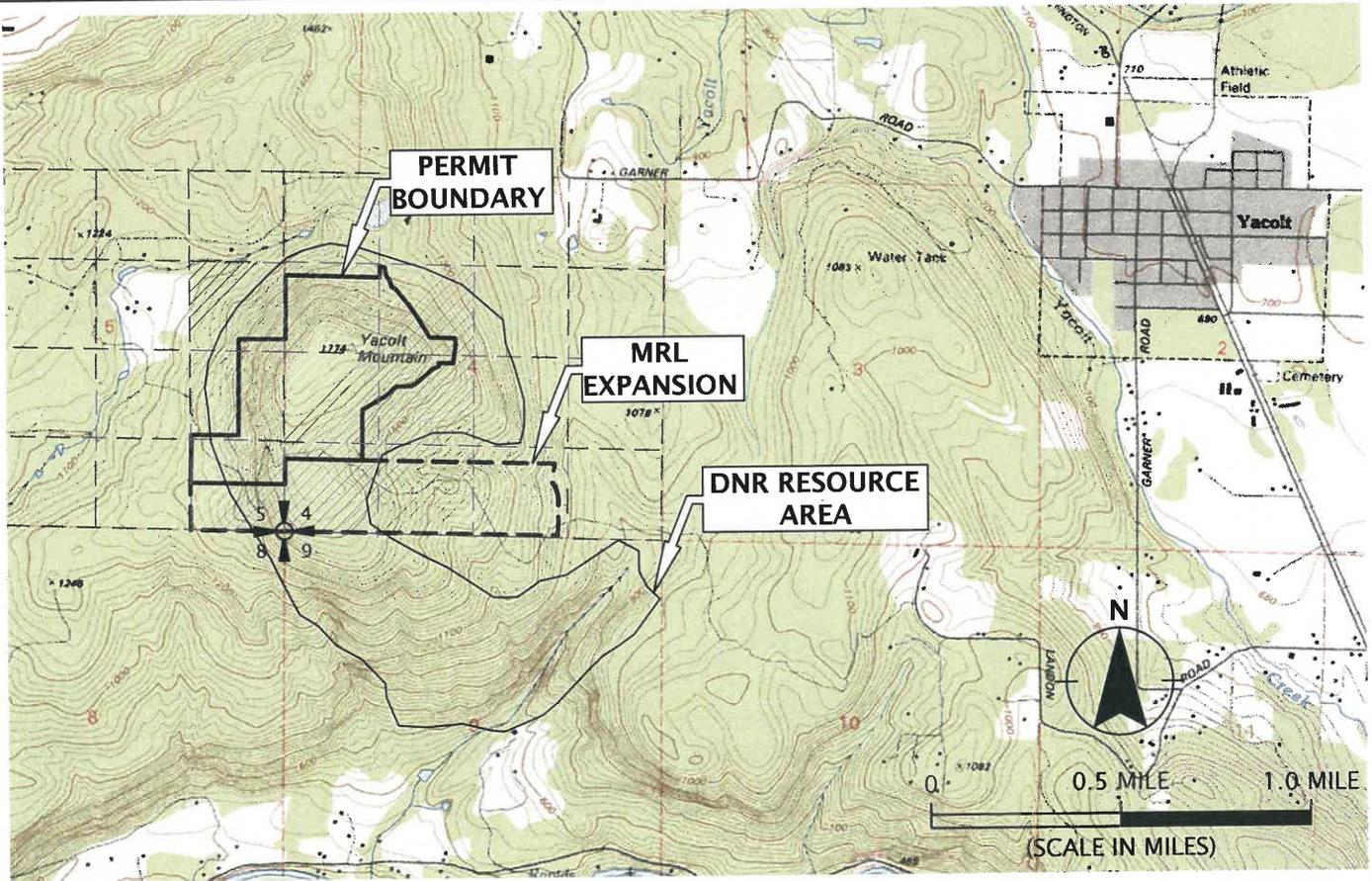
PARCEL 1 (230061000)

A TRACT OF LAND 30 FEET SQUARE IN THE SOUTHWEST CORNER OF THE SOUTHWEST QUARTER OF SECTION 3, TOWNSHIP 4 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN IN CLARK COUNTY, WASHINGTON. AND THE SOUTH 120 ACRES SOUTH HALF OF SECTION 4, TOWNSHIP 4 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN IN CLARK COUNTY, WASHINGTON.

PARCEL 2 (230301000)

THE SOUTH HALF OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 5, TOWNSHIP 4 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN IN CLARK COUNTY, WASHINGTON.

NOTE: USGS TOPOGRAPHIC QUADRANGLE MAP (YACOLT 1990) REPRODUCED USING MAPTECH TERRAIN NAVIGATOR PRO®.



Printed By: mmiller | Print Date: 1/2/2018 10:16:24 AM
File Name: J:\S-Z\Storedahl\Storedahl-15-01\Figures\CAD\Storedahl-15-01-VM02.dwg | Layout: FIGURE 1

GEODESIGN INC
1157 3rd Avenue - Suite 2208
Longview WA 98632
360.200.4803 www.geodesigninc.com

J.L. STOREDAHL & SONS

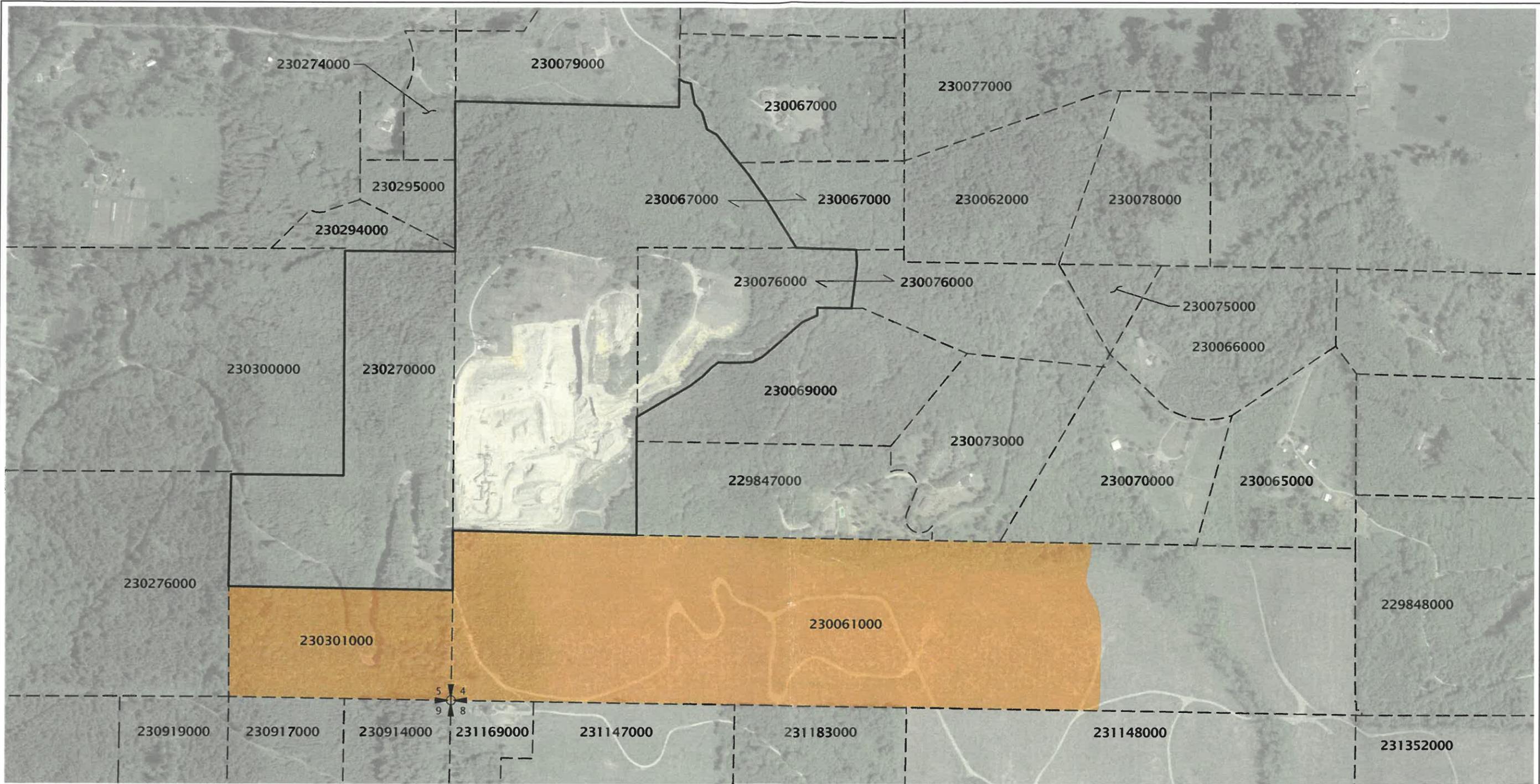
STOREDAHL-15-01
JANUARY 2018

VICINITY MAP
YACOLT MOUNTAIN TEMPORARY STOCKPILE AREA

CLARK COUNTY, WA
SECTIONS 3, 4, AND 5, TOWNSHIP 4N, RANGE 3E, W.M.

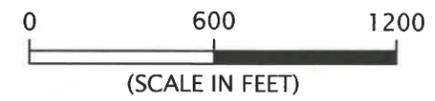
FIGURE 1

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 File Name: J:\5\Z\Store Dahl\15-01\Store Dahl\15-01\Figures\CAD\Store Dahl-15-01-SP07.dwg | Layout: FIGURE 2



LEGEND:

-  APPROXIMATE EXISTING PERMIT BOUNDARY
-  PROPOSED MINERAL OVERLAY EXPANSION AREA (~107 ACRES)
-  PROPERTY PARCEL BOUNDARY
- 230061000** PROPERTY IDENTIFICATION NUMBER
(SEE FIGURE 3 FOR PROPERTY OWNERSHIP INFORMATION)
-  SECTION CORNER



- NOTES:**
1. AERIAL PHOTOGRAPH (MAY 22, 2017) OBTAINED FROM GOOGLE EARTH PRO.
 2. PROPERTY INFORMATION OBTAINED FROM CLARK COUNTY ASSESSOR.

ADJACENT PROPERTY OWNERSHIP INFORMATION TABLE

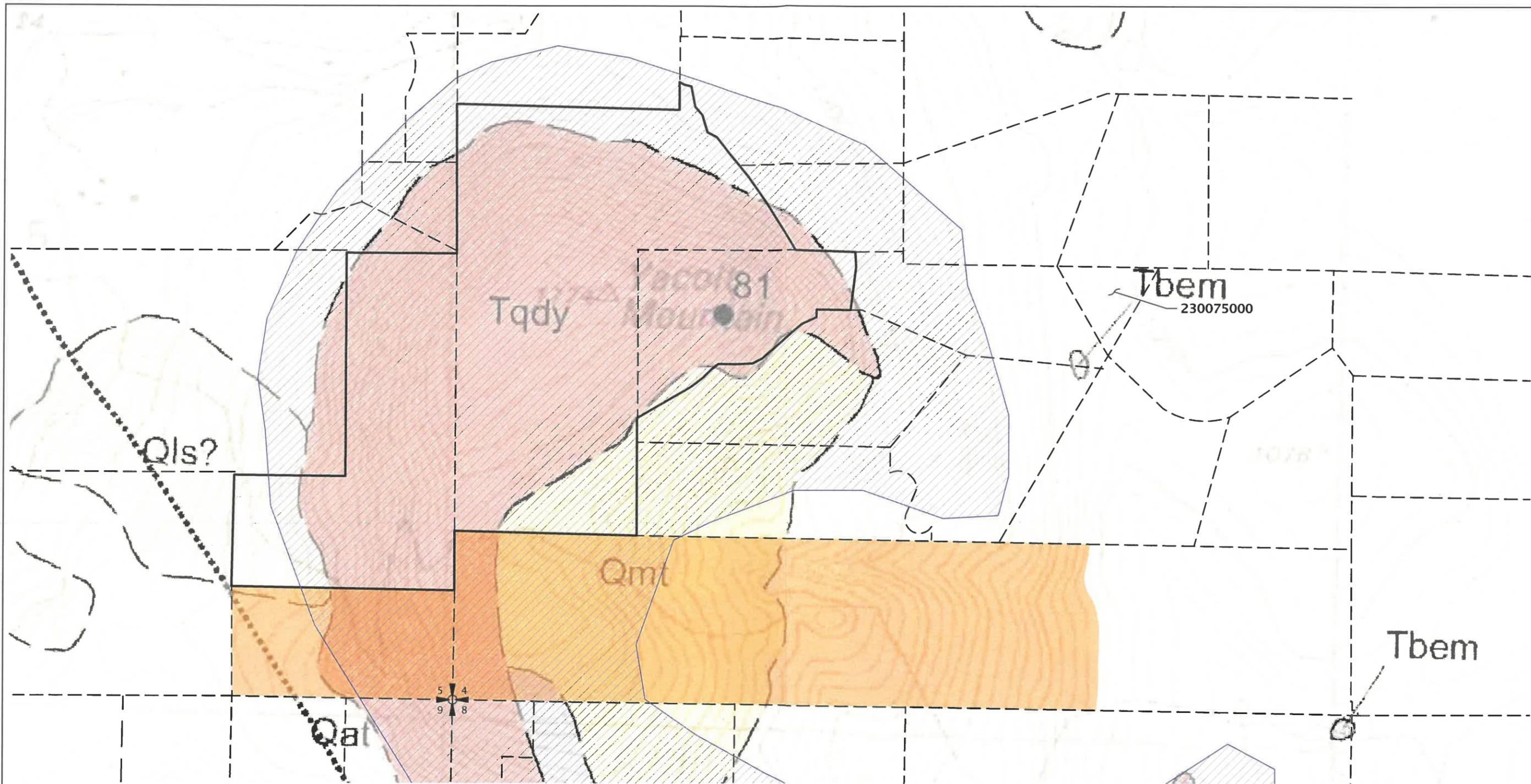
PARCEL NUMBER	OWNER NAME	OWNER ADDRESS
230919000 230917000 230914000	POMEROY-PLOWMAN RANCH LIMITED	20902 NE LUCIA FALLS RD YACOLT WA , 98675
231169000	BRUCE AND HEATHER BEARD	31808 NE 215TH AVE YACOLT WA , 98675
231147000	SCOTT JOHNS	PO BOX 65486 VANCOUVER WA , 98665
231183000	DAVID R & MARION L SWENDSEN	32214 NE RAILROAD AVE YACOLT WA , 98675
231148000 231352000	STOREDAHL PROPERTIES LLC	2233 TALLEY WAY KELSO WA , 98626
229848000	LEVI AND JENNIFER STENERSEN	PO BOX 429 YACOLT WA , 98675
230065000	MICHAEL AND JEAN WEST	PO BOX 452 YACOLT WA , 98675
230070000	JONATHAN LOVEGROVE AND NATTAMON CHANGKIEN	31821 NE MYSTIC DR YACOLT WA , 98675
230066000	JUDITH TODD	31714 NE MYSTIC DR YACOLT WA , 98675
230073000	GARY SOUTH	31110 NE MYSTIC DR YACOLT WA , 9867
229847000	GRANT AND SHANNON NELSON	PO BOX 415 YACOLT WA , 98675
230069000	DAVID AND SUSAN STIMES	2024 NE 90TH AVE VANCOUVER WA , 98664
230075000 230078000	GAYLORD AND CAROL STEPHENSON	39904 NE ROTSCHY RD YACOLT WA , 98675
230062000	PAULA G STEEPHENSON TRUSTEE	39904 NE ROTSCHY RD YACOLT WA , 98675
230077000	DENNIS AND KATHY STEPHENSON	39904 NE ROTSCHY RD YACOLT WA , 98675
230067000	YACOLT MOUNTAIN QUARRY LLC	PO BOX 464 YACOLT WA , 98675
230079000	DAN AND SONJA MASSIE	21115 NE YACOLT MOUNTAIN RD YACOLT WA , 98675
230274000	JAMES AND EILEEN KASKI	22011 NE 212TH AVE BATTLE GROUND WA , 98604
230295000 230294000	SAM AND CAROL SMITH	39513 NE 21ST AVE WOODLAND WA , 98674
230300000	JAMES AND LEAH MATILLA	PO BOX 447 BATTLE GROUND WA , 98604
230276000	CECIL AND MARIE ROTSCHY	34522 NE 225TH CT YACOLT WA , 98675

SUBJECT PROPERTY INFORMATION TABLE

PARCEL NUMBER	OWNER NAME	OWNER ADDRESS
230301000 230061000	STOREDAHL PROPERTIES LLC	2233 TALLEY WAY KELSO WA , 98626
230067000	YACOLT MOUNTAIN QUARRY LLC	PO BOX 464 YACOLT WA , 98675
230270000	CECIL AND MARIE ROTSCHY	34522 NE 225TH CT YACOLT WA , 98675
230076000	BRENT AND HEIDI ROTSCHY	PO BOX 464 YACOLT WA , 98675

NOTES:

1. PROPERTY OWNERSHIP INFORMATION OBTAINED FROM CLARK COUNTY ASSESSOR.
2. FOR PROPERTY LOCATIONS, SEE FIGURE 2.



LEGEND:

-  APPROXIMATE EXISTING PERMIT BOUNDARY
-  PROPOSED MINERAL OVERLAY EXPANSION AREA (~107 ACRES)
-  PROPERTY PARCEL BOUNDARY
-  DNR RESOURCE AREA (~489 ACRES)
-  SECTION CORNER

NOTE:
1. GEOLOGY MAP; USGS - EVARTS, 2006

TAZ 598

Yacolt Quarry

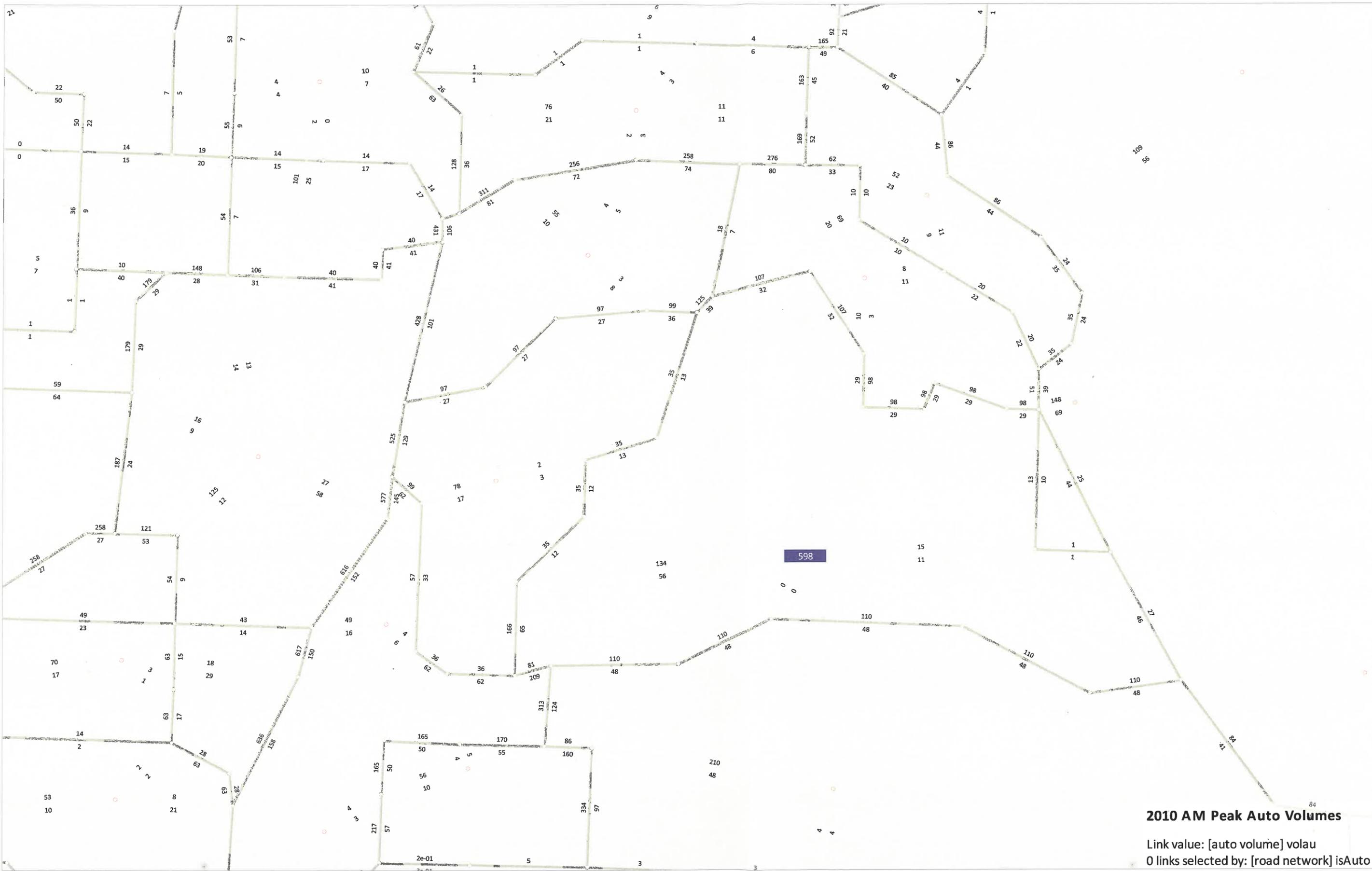
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Yr 2010: 348 0 192

Yr 2035: 497 60 132

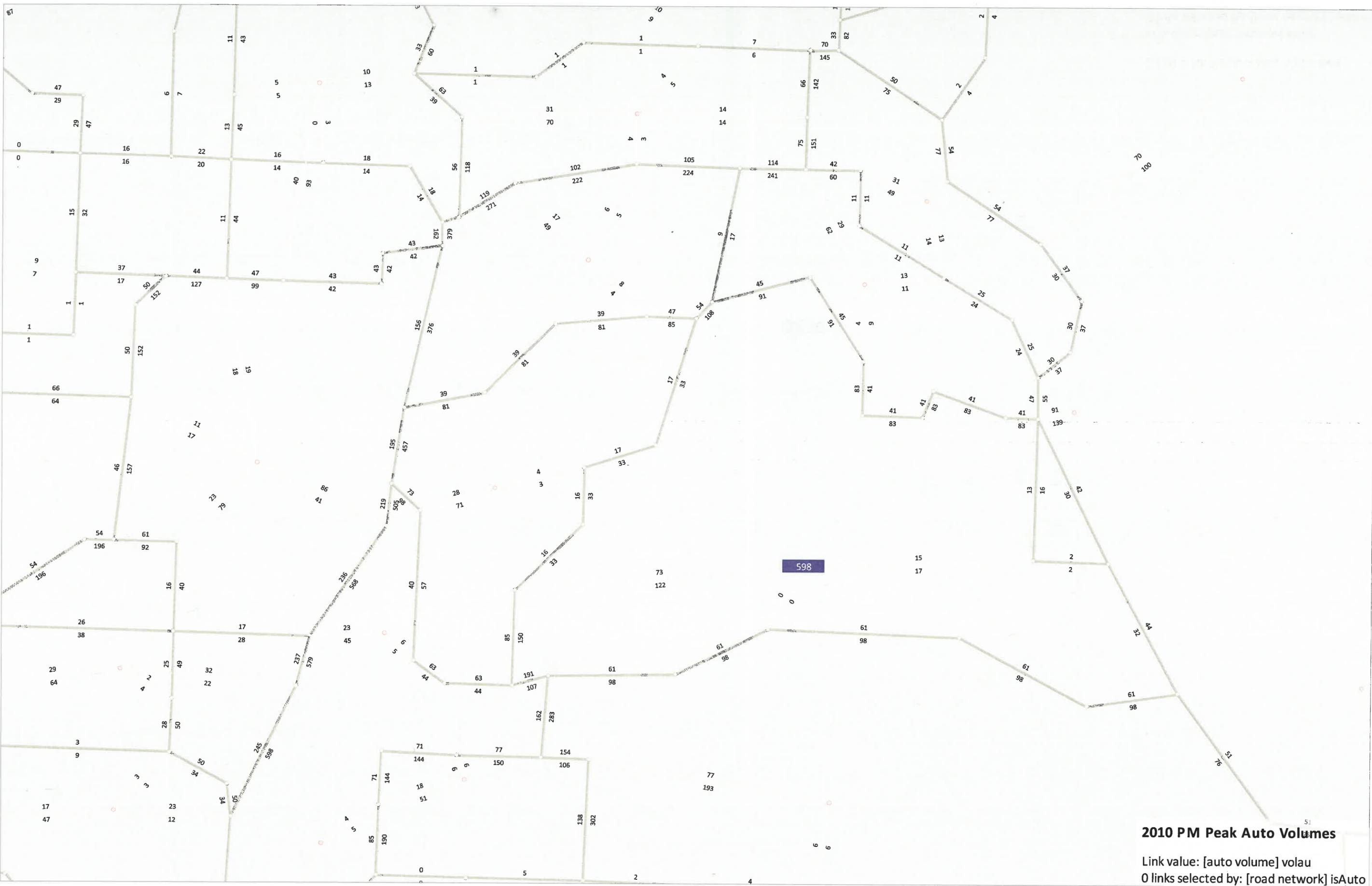
598	
FID	658
TAZ	598





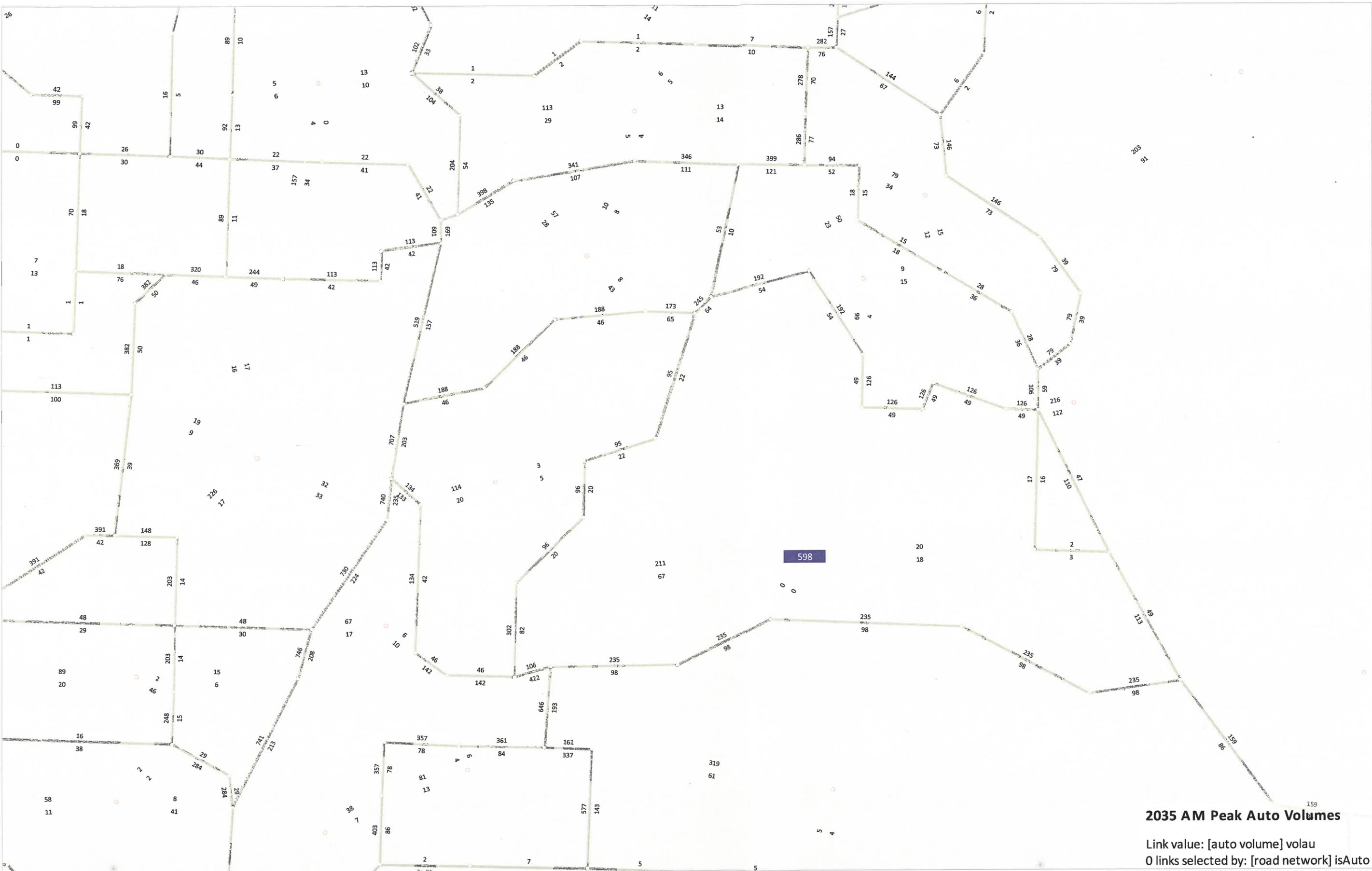
2010 AM Peak Auto Volumes

Link value: [auto volume] volau
 0 links selected by: [road network] isAuto



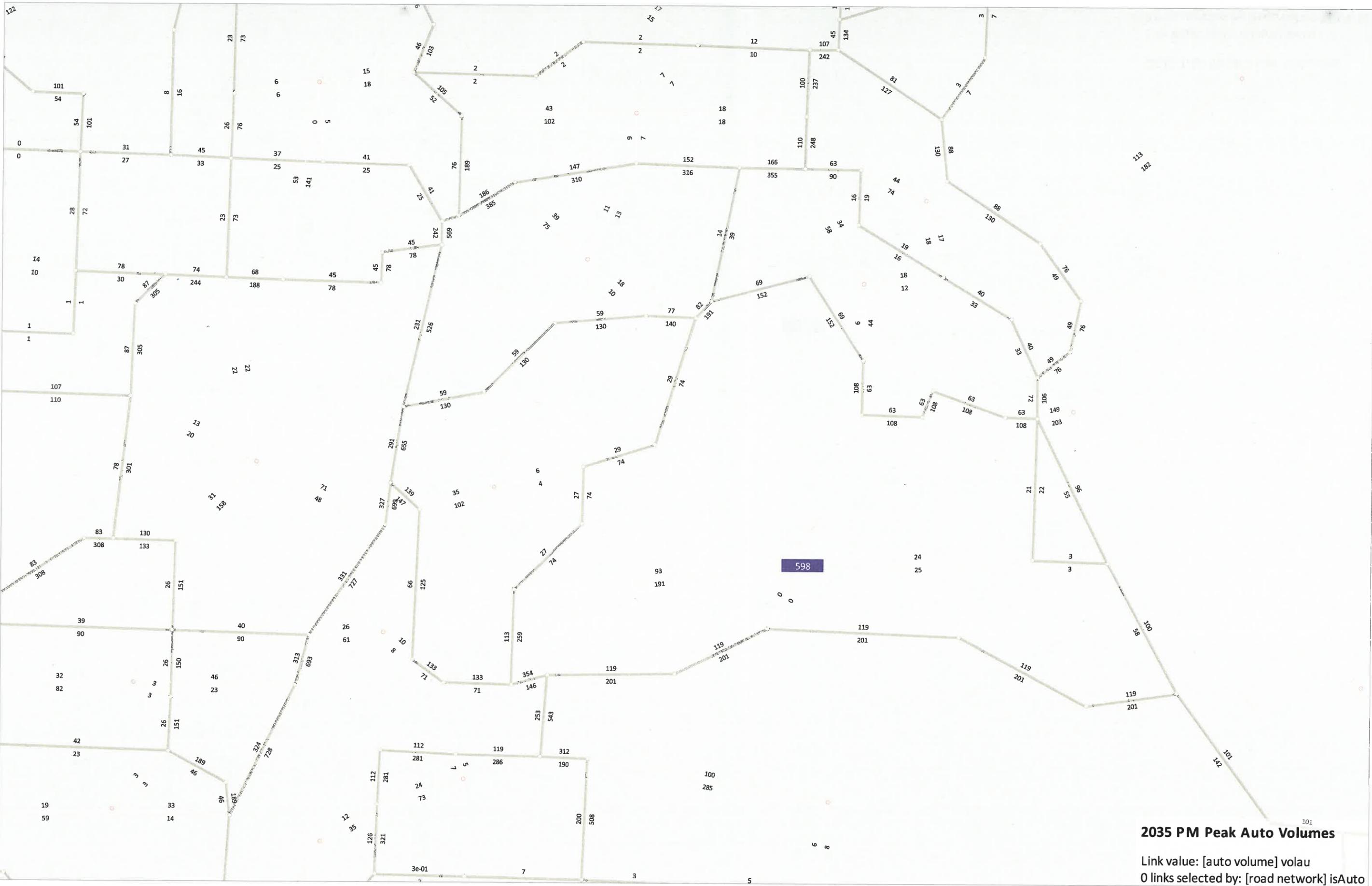
2010 PM Peak Auto Volumes

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2035 AM Peak Auto Volumes

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2035 PM Peak Auto Volumes

Link value: [auto volume] volau
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Estimation of Future Annual Traffic Growth Rates (Using RTC Model Data)

Intersection	AM TEV*				PM TEV*			
	2010 AM	2035 AM	Growth %	Annual %	2010 PM	2035 PM	Growth %	Annual %
SR 503/Gabriel Rd.	654	910	39%	1.6%	652	945	45%	1.8%
SR 503/Kelly Rd.	357	520	46%	1.8%	355	521	47%	1.9%
Kelly Rd./Garner Rd.	164	309	88%	3.5%	162	274	69%	2.8%
Kelly Rd./Gabriel Rd.	174	332	91%	3.6%	172	296	72%	2.9%
Kelly Rd./Longview Fiber Rd.	48	117	144%	5.8%	50	103	106%	4.2%
Kelly Rd./Lucia Falls Rd.	309	550	78%	3.1%	320	538	68%	2.7%
Lucia Falls Rd/172nd Ave.	443	850	92%	3.7%	451	808	79%	3.2%
			AVG	3.3%			AVG	2.8%

* Data from Clark County RTC traffic model.

** Historical data from Clark County's traffic count program indicates lower historical growth rates for subject roadways.

Comparison of 2000 and 2018 Traffic Counts (AM Peak Hour)

Intersection	2000 AM Peak TEV	2018 AM Peak TEV	% AM Growth (18 years)	Annual Growth Rate
SR 503/Gabriel Rd.	524	733	39.9%	2.2%
SR 503/Kelly Rd.	170	251	47.6%	2.6%
Kelly Rd./Garner Rd.	189	185	-2.1%	-0.1%
Kelly Rd./Gabriel Rd.	214	218	1.9%	0.1%
Kelly Rd./Longview Fiber Rd.	80	109	36.3%	2.0%
Kelly Rd./Lucia Falls Rd.	116	194	67.2%	3.7%
Lucia Falls Rd/172nd Ave.	215	339	57.7%	3.2%

Comparison of 2000 and 2018 Traffic Counts (PM Peak Hour)

Intersection	2000 PM Peak TEV	2018 PM Peak TEV	% PM Growth (18 years)	Annual Growth Rate
SR 503/Gabriel Rd.	846	860	1.7%	0.1%
SR 503/Kelly Rd.	283	303	7.1%	0.4%
Kelly Rd./Garner Rd.	280	251	-10.4%	-0.6%
Kelly Rd./Gabriel Rd.	301	266	-11.6%	-0.6%
Kelly Rd./Longview Fiber Rd.	125	68	-45.6%	-2.5%
Kelly Rd./Lucia Falls Rd.	173	233	34.7%	1.9%
Lucia Falls Rd/172nd Ave.	326	402	23.3%	1.3%

SR 503 (South of Gabriel Road)*

Year	NB ADT	SB ADT	Total ADT
2015	4852	4868	9720
2008	4476	4499	8975
2007	4488	4481	8969
2005	4781	4731	9513
2002	4264	4021	8286

* Historical data from SW Washington Regional Transportation Council

2002--2015 ADT Growth (Linear) 17.3%
Annual ADT Growth Rate (Linear) 1.3%

Attachment I Year 2037 Total Traffic
Conditions Worksheets
(FR-80 Zoning)

Intersection

Int Delay, s/veh	1.6
------------------	-----

Movement

	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	82	7	41	249	7	26
Future Vol, veh/h	82	7	41	249	7	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	18	0	12	6	0	31
Mvmt Flow	91	8	46	277	8	29

Major/Minor

	Major1	Major2	Minor1	Minor2
Conflicting Flow All	0	0	99	0
Stage 1	-	-	-	95
Stage 2	-	-	-	368
Critical Hdwy	-	-	4.22	-
Critical Hdwy Stg 1	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	5.4
Follow-up Hdwy	-	-	2.308	-
Pot Cap-1 Maneuver	-	-	1433	-
Stage 1	-	-	-	934
Stage 2	-	-	-	704
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	1433	-
Mov Cap-2 Maneuver	-	-	-	540
Stage 1	-	-	-	934
Stage 2	-	-	-	677

Approach

	EB	WB	NB
HCM Control Delay, s	0	1.1	9.8
HCM LOS			A

Minor Lane/Major Mvmt

	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	781	-	-	1433	-
HCM Lane V/C Ratio	0.047	-	-	0.032	-
HCM Control Delay (s)	9.8	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection

Int Delay, s/veh 5.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	146	3	32	65	2	60
Future Vol, veh/h	146	3	32	65	2	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	1	0	21	3	0	22
Mvmt Flow	174	4	38	77	2	71

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	153	77	0
Stage 1	77	-	-
Stage 2	76	-	-
Critical Hdwy	6.41	6.2	-
Critical Hdwy Stg 1	5.41	-	-
Critical Hdwy Stg 2	5.41	-	-
Follow-up Hdwy	3.509	3.3	-
Pot Cap-1 Maneuver	841	990	-
Stage 1	949	-	-
Stage 2	950	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	840	990	-
Mov Cap-2 Maneuver	840	-	-
Stage 1	949	-	-
Stage 2	949	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	843	1487
HCM Lane V/C Ratio	-	-	0.21	0.002
HCM Control Delay (s)	-	-	10.4	7.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0

Yacolt Mountain Quarry Expansion
 3: NE Kelly Rd & NE Gabriel Rd/Driveway

2037 FR-80 Zoning AM Peak Hour
 03/19/2018

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	79	0	21	0	0	0	32	36	0	0	66	179
Future Vol, veh/h	79	0	21	0	0	0	32	36	0	0	66	179
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	0	30	0	0	0	78	17	0	0	12	6
Mvmt Flow	91	0	24	0	0	0	37	41	0	0	76	206

Major/Minor	Minor2	Minor1		Major1		Major2						
Conflicting Flow All	294	294	179	306	397	41	282	0	0	41	0	0
Stage 1	179	179	-	115	115	-	-	-	-	-	-	-
Stage 2	115	115	-	191	282	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.5	6.5	7.1	6.5	6.2	4.88	-	-	4.1	-	-
Critical Hdwy Stg 1	6.15	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.57	3.5	4	3.3	2.902	-	-	2.2	-	-
Pot Cap-1 Maneuver	652	620	797	650	544	1036	946	-	-	1581	-	-
Stage 1	816	755	-	895	804	-	-	-	-	-	-	-
Stage 2	883	804	-	815	681	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	632	595	797	611	522	1036	946	-	-	1581	-	-
Mov Cap-2 Maneuver	632	595	-	611	522	-	-	-	-	-	-	-
Stage 1	783	755	-	859	772	-	-	-	-	-	-	-
Stage 2	848	772	-	790	681	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.6	0	4.2	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	946	-	-	661	-	1581	-	-
HCM Lane V/C Ratio	0.039	-	-	0.174	-	-	-	-
HCM Control Delay (s)	9	0	-	11.6	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	-	0	-	-

Intersection

Int Delay, s/veh 7.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			A
Traffic Vol, veh/h	221	5	119	66	3	569
Future Vol, veh/h	221	5	119	66	3	569
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	16	50	18	6	50	6
Mvmt Flow	233	5	125	69	3	599

Major/Minor

	Minor1	Major1	Major2		
Conflicting Flow All	765	160	0	0	195
Stage 1	160	-	-	-	-
Stage 2	605	-	-	-	-
Critical Hdwy	6.56	6.7	-	-	4.6
Critical Hdwy Stg 1	5.56	-	-	-	-
Critical Hdwy Stg 2	5.56	-	-	-	-
Follow-up Hdwy	3.644	3.75	-	-	2.65
Pot Cap-1 Maneuver	352	774	-	-	1137
Stage 1	836	-	-	-	-
Stage 2	519	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	351	774	-	-	1137
Mov Cap-2 Maneuver	351	-	-	-	-
Stage 1	836	-	-	-	-
Stage 2	517	-	-	-	-

Approach

	WB	NB	SB
HCM Control Delay, s	32.9	0	0
HCM LOS	D		

Minor Lane/Major Mvmt

	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	358	1137
HCM Lane V/C Ratio	-	-	0.665	0.003
HCM Control Delay (s)	-	-	32.9	8.2
HCM Lane LOS	-	-	D	A
HCM 95th %tile Q(veh)	-	-	4.6	0

Intersection

Int Delay, s/veh 1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↷	
Traffic Vol, veh/h	21	36	4	73	2	26
Future Vol, veh/h	21	36	4	73	2	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	8	96	100	5	100	100
Mvmt Flow	25	43	5	88	2	31

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	69
Stage 1	-	-	47
Stage 2	-	-	98
Critical Hdwy	-	5.1	7.4
Critical Hdwy Stg 1	-	-	6.4
Critical Hdwy Stg 2	-	-	6.4
Follow-up Hdwy	-	3.1	4.4
Pot Cap-1 Maneuver	-	1085	663
Stage 1	-	-	774
Stage 2	-	-	729
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1085	660
Mov Cap-2 Maneuver	-	-	660
Stage 1	-	-	774
Stage 2	-	-	725

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	790	-	-	1085	-
HCM Lane V/C Ratio	0.043	-	-	0.004	-
HCM Control Delay (s)	9.8	-	-	8.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection

Int Delay, s/veh 6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	40	45	84	18	89	49
Future Vol, veh/h	40	45	84	18	89	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	96	0	10	0	8	3
Mvmt Flow	53	59	111	24	117	64

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	134	0	0 286 122
Stage 1	-	-	- 122 -
Stage 2	-	-	- 164 -
Critical Hdwy	5.06	-	- 6.48 6.23
Critical Hdwy Stg 1	-	-	- 5.48 -
Critical Hdwy Stg 2	-	-	- 5.48 -
Follow-up Hdwy	3.064	-	- 3.572 3.327
Pot Cap-1 Maneuver	1030	-	- 692 926
Stage 1	-	-	- 889 -
Stage 2	-	-	- 851 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1030	-	- 655 926
Mov Cap-2 Maneuver	-	-	- 655 -
Stage 1	-	-	- 889 -
Stage 2	-	-	- 806 -

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1030	-	-	-	731
HCM Lane V/C Ratio	0.051	-	-	-	0.248
HCM Control Delay (s)	8.7	0	-	-	11.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	←			↑	↓	
Traffic Vol, veh/h	16	114	267	72	27	46
Future Vol, veh/h	16	114	267	72	27	46
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	6	5	4	18	17
Mvmt Flow	20	139	326	88	33	56
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8	12.4	9
HCM LOS	A	B	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	37%	0%	79%
Vol Thru, %	0%	12%	21%
Vol Right, %	63%	88%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	73	130	339
LT Vol	27	0	267
Through Vol	0	16	72
RT Vol	46	114	0
Lane Flow Rate	89	159	413
Geometry Grp	1	1	1
Degree of Util (X)	0.128	0.179	0.52
Departure Headway (Hd)	5.165	4.056	4.529
Convergence, Y/N	Yes	Yes	Yes
Cap	694	885	798
Service Time	3.204	2.084	2.555
HCM Lane V/C Ratio	0.128	0.18	0.518
HCM Control Delay	9	8	12.4
HCM Lane LOS	A	A	B
HCM 95th-tile Q	0.4	0.6	3.1

Intersection

Int Delay, s/veh 2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	267	11	15	116	31	56
Future Vol, veh/h	267	11	15	116	31	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	0	22	3	0	6
Mvmt Flow	281	12	16	122	33	59

Major/Minor

	Major1	Major2	Minor1		
Conflicting Flow All	0	0	293	0	441 287
Stage 1	-	-	-	-	287 -
Stage 2	-	-	-	-	154 -
Critical Hdwy	-	-	4.32	-	6.4 6.26
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.398	-	3.5 3.354
Pot Cap-1 Maneuver	-	-	1163	-	577 743
Stage 1	-	-	-	-	766 -
Stage 2	-	-	-	-	879 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1163	-	568 743
Mov Cap-2 Maneuver	-	-	-	-	568 -
Stage 1	-	-	-	-	766 -
Stage 2	-	-	-	-	866 -

Approach

	EB	WB	NB
HCM Control Delay, s	0	0.9	11.2
HCM LOS			B

Minor Lane/Major Mvmt

	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	670	-	-	1163	-
HCM Lane V/C Ratio	0.137	-	-	0.014	-
HCM Control Delay (s)	11.2	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Intersection

Int Delay, s/veh 3.8

Movement WBL WBR NBT NBR SBL SBT

Lane Configurations	W		T			
Traffic Vol, veh/h	134	5	60	166	8	43
Future Vol, veh/h	134	5	60	166	8	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	33	6	6	0	12
Mvmt Flow	146	5	65	180	9	47

Major/Minor Minor1 Major1 Major2

Conflicting Flow All	219	155	0	0	246	0
Stage 1	155	-	-	-	-	-
Stage 2	64	-	-	-	-	-
Critical Hdwy	6.46	6.53	-	-	4.1	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.597	-	-	2.2	-
Pot Cap-1 Maneuver	760	816	-	-	1332	-
Stage 1	864	-	-	-	-	-
Stage 2	949	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	755	816	-	-	1332	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	942	-	-	-	-	-

Approach WB NB SB

HCM Control Delay, s	10.9	0	1.2
HCM LOS	B		

Minor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT

Capacity (veh/h)	-	-	757	1332	-
HCM Lane V/C Ratio	-	-	0.2	0.007	-
HCM Control Delay (s)	-	-	10.9	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0	-

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	213	4	15	0	2	0	25	62	0	0	52	159
Future Vol, veh/h	213	4	15	0	2	0	25	62	0	0	52	159
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	0	0	0	0	0	25	10	0	0	4	8
Mvmt Flow	232	4	16	0	2	0	27	67	0	0	57	173

Major/Minor	Minor2		Minor1			Major1		Major2				
Conflicting Flow All	266	265	143	275	351	67	229	0	0	67	0	0
Stage 1	143	143	-	122	122	-	-	-	-	-	-	-
Stage 2	123	122	-	153	229	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.5	6.2	7.1	6.5	6.2	4.35	-	-	4.1	-	-
Critical Hdwy Stg 1	6.15	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.3	3.5	4	3.3	2.425	-	-	2.2	-	-
Pot Cap-1 Maneuver	681	644	910	681	577	1002	1215	-	-	1547	-	-
Stage 1	853	782	-	887	799	-	-	-	-	-	-	-
Stage 2	874	799	-	854	718	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	667	629	910	654	564	1002	1215	-	-	1547	-	-
Mov Cap-2 Maneuver	667	629	-	654	564	-	-	-	-	-	-	-
Stage 1	833	782	-	867	781	-	-	-	-	-	-	-
Stage 2	852	781	-	834	718	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.4	11.4	2.3	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1215	-	-	678	564	1547	-	-
HCM Lane V/C Ratio	0.022	-	-	0.372	0.004	-	-	-
HCM Control Delay (s)	8	0	-	13.4	11.4	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.7	0	0	-	-

Intersection

Int Delay, s/veh 2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Vol, veh/h	99	4	570	218	4	266
Future Vol, veh/h	99	4	570	218	4	266
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	0	5	3	0	4
Mvmt Flow	104	4	600	229	4	280

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1003	715	0
Stage 1	715	-	-
Stage 2	288	-	-
Critical Hdwy	6.43	6.2	-
Critical Hdwy Stg 1	5.43	-	-
Critical Hdwy Stg 2	5.43	-	-
Follow-up Hdwy	3.527	3.3	-
Pot Cap-1 Maneuver	267	434	-
Stage 1	483	-	-
Stage 2	759	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	265	434	-
Mov Cap-2 Maneuver	265	-	-
Stage 1	483	-	-
Stage 2	754	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.2	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	276	811
HCM Lane V/C Ratio	-	-	0.393	0.005
HCM Control Delay (s)	-	-	26.2	9.5
HCM Lane LOS	-	-	D	A
HCM 95th %tile Q(veh)	-	-	1.8	0

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	60	2	3	40	2	4
Future Vol, veh/h	60	2	3	40	2	4
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	5	100	0	8	0	0
Mvmt Flow	81	3	4	54	3	5

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	85	0	145
Stage 1	-	-	-	-	83
Stage 2	-	-	-	-	62
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1524	-	852
Stage 1	-	-	-	-	945
Stage 2	-	-	-	-	966
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1524	-	849
Mov Cap-2 Maneuver	-	-	-	-	849
Stage 1	-	-	-	-	944
Stage 2	-	-	-	-	963

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	933	-	-	1524	-
HCM Lane V/C Ratio	0.009	-	-	0.003	-
HCM Control Delay (s)	8.9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Vol, veh/h	47	82	77	104	59	22
Future Vol, veh/h	47	82	77	104	59	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	11	4	9	5	9	0
Mvmt Flow	52	90	85	114	65	24

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	199	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.21	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.299	-	-
Pot Cap-1 Maneuver	1321	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1321	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1321	-	-	-	679
HCM Lane V/C Ratio	0.039	-	-	-	0.131
HCM Control Delay (s)	7.8	0	-	-	11.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Intersection

Intersection Delay, s/veh	10.6
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	70	64	99	40	130	240
Future Vol, veh/h	70	64	99	40	130	240
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	5	8	11	12	6	3
Mvmt Flow	74	68	105	43	138	255
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9	9.9	11.5
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	35%	0%	71%
Vol Thru, %	0%	52%	29%
Vol Right, %	65%	48%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	370	134	139
LT Vol	130	0	99
Through Vol	0	70	40
RT Vol	240	64	0
Lane Flow Rate	394	143	148
Geometry Grp	1	1	1
Degree of Util (X)	0.482	0.19	0.218
Departure Headway (Hd)	4.41	4.808	5.316
Convergence, Y/N	Yes	Yes	Yes
Cap	815	741	671
Service Time	2.45	2.873	3.381
HCM Lane V/C Ratio	0.483	0.193	0.221
HCM Control Delay	11.5	9	9.9
HCM Lane LOS	B	A	A
HCM 95th-tile Q	2.7	0.7	0.8

Attachment J Year 2037 Total Traffic
Conditions Worksheets
(Surface Mining Overlay)

Intersection

Int Delay, s/veh 1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	82	7	43	249	7	29
Future Vol, veh/h	82	7	43	249	7	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	18	0	12	6	0	31
Mvmt Flow	91	8	48	277	8	32

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	99	0	467 95
Stage 1	-	-	-	-	95 -
Stage 2	-	-	-	-	372 -
Critical Hdwy	-	-	4.22	-	6.4 6.51
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.308	-	3.5 3.579
Pot Cap-1 Maneuver	-	-	1433	-	558 888
Stage 1	-	-	-	-	934 -
Stage 2	-	-	-	-	702 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1433	-	536 888
Mov Cap-2 Maneuver	-	-	-	-	536 -
Stage 1	-	-	-	-	934 -
Stage 2	-	-	-	-	674 -

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	787	-	-	1433	-
HCM Lane V/C Ratio	0.051	-	-	0.033	-
HCM Control Delay (s)	9.8	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Intersection						
Int Delay, s/veh	5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Vol, veh/h	150	3	35	70	2	62
Future Vol, veh/h	150	3	35	70	2	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	1	0	21	3	0	22
Mvmt Flow	179	4	42	83	2	74

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	162	83	0	0	125
Stage 1	83	-	-	-	-
Stage 2	79	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1
Critical Hdwy Stg 1	5.41	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2
Pot Cap-1 Maneuver	831	982	-	-	1474
Stage 1	943	-	-	-	-
Stage 2	947	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	830	982	-	-	1474
Mov Cap-2 Maneuver	830	-	-	-	-
Stage 1	943	-	-	-	-
Stage 2	946	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	833	1474
HCM Lane V/C Ratio	-	-	0.219	0.002
HCM Control Delay (s)	-	-	10.5	7.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0

Intersection

Int Delay, s/veh 4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	79	0	27	0	0	0	63	44	0	0	72	179
Future Vol, veh/h	79	0	27	0	0	0	63	44	0	0	72	179
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	0	30	0	0	0	78	17	0	0	12	6
Mvmt Flow	91	0	31	0	0	0	72	51	0	0	83	206

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	381	381	186	396	484	51	289	0	0	51	0	0
Stage 1	186	186	-	195	195	-	-	-	-	-	-	-
Stage 2	195	195	-	201	289	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.5	6.5	7.1	6.5	6.2	4.88	-	-	4.1	-	-
Critical Hdwy Stg 1	6.15	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.57	3.5	4	3.3	2.902	-	-	2.2	-	-
Pot Cap-1 Maneuver	571	555	789	568	486	1023	940	-	-	1568	-	-
Stage 1	809	750	-	811	743	-	-	-	-	-	-	-
Stage 2	800	743	-	805	677	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	536	511	789	513	448	1023	940	-	-	1568	-	-
Mov Cap-2 Maneuver	536	511	-	513	448	-	-	-	-	-	-	-
Stage 1	745	750	-	747	684	-	-	-	-	-	-	-
Stage 2	737	684	-	773	677	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.8	0	5.4	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	940	-	-	584	-	1568	-
HCM Lane V/C Ratio	0.077	-	-	0.209	-	-	-
HCM Control Delay (s)	9.1	0	-	12.8	0	0	-
HCM Lane LOS	A	A	-	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.8	-	0	-

Intersection

Int Delay, s/veh 8.1

Movement WBL WBR NBT NBR SBL SBT

Lane Configurations	W	R	T	R	L	T
Traffic Vol, veh/h	225	8	119	70	5	569
Future Vol, veh/h	225	8	119	70	5	569
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	16	50	18	6	50	6
Mvmt Flow	237	8	125	74	5	599

Major/Minor Minor1 Major1 Major2

Conflicting Flow All	771	162	0	0	199	0
Stage 1	162	-	-	-	-	-
Stage 2	609	-	-	-	-	-
Critical Hdwy	6.56	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.56	-	-	-	-	-
Critical Hdwy Stg 2	5.56	-	-	-	-	-
Follow-up Hdwy	3.644	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	349	772	-	-	1133	-
Stage 1	834	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	347	772	-	-	1133	-
Mov Cap-2 Maneuver	347	-	-	-	-	-
Stage 1	834	-	-	-	-	-
Stage 2	513	-	-	-	-	-

Approach WB NB SB

HCM Control Delay, s	34.5	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT

Capacity (veh/h)	-	-	357	1133	-
HCM Lane V/C Ratio	-	-	0.687	0.005	-
HCM Control Delay (s)	-	-	34.5	8.2	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	4.9	0	-

Intersection

Int Delay, s/veh	4.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Vol, veh/h	21	45	16	73	13	89
Future Vol, veh/h	21	45	16	73	13	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	8	96	100	5	100	100
Mvmt Flow	25	54	19	88	16	107

Major/Minor

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	80	0	179
Stage 1	-	-	-	-	52
Stage 2	-	-	-	-	127
Critical Hdwy	-	-	5.1	-	7.4
Critical Hdwy Stg 1	-	-	-	-	6.4
Critical Hdwy Stg 2	-	-	-	-	6.4
Follow-up Hdwy	-	-	3.1	-	4.4
Pot Cap-1 Maneuver	-	-	1073	-	631
Stage 1	-	-	-	-	770
Stage 2	-	-	-	-	705
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1073	-	619
Mov Cap-2 Maneuver	-	-	-	-	619
Stage 1	-	-	-	-	770
Stage 2	-	-	-	-	692

Approach

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	10.6
HCM LOS			B

Minor Lane/Major Mvmt

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	768	-	-	1073	-
HCM Lane V/C Ratio	0.16	-	-	0.018	-
HCM Control Delay (s)	10.6	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-

Intersection						
Int Delay, s/veh	6.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	40	45	84	27	100	49
Future Vol, veh/h	40	45	84	27	100	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	96	0	10	0	8	3
Mvmt Flow	53	59	111	36	132	64

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	146	0	-	0	292
Stage 1	-	-	-	-	128
Stage 2	-	-	-	-	164
Critical Hdwy	5.06	-	-	-	6.48
Critical Hdwy Stg 1	-	-	-	-	5.48
Critical Hdwy Stg 2	-	-	-	-	5.48
Follow-up Hdwy	3.064	-	-	-	3.572
Pot Cap-1 Maneuver	1018	-	-	-	686
Stage 1	-	-	-	-	883
Stage 2	-	-	-	-	851
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1018	-	-	-	649
Mov Cap-2 Maneuver	-	-	-	-	649
Stage 1	-	-	-	-	883
Stage 2	-	-	-	-	805

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1018	-	-	-	718
HCM Lane V/C Ratio	0.052	-	-	-	0.273
HCM Control Delay (s)	8.7	0	-	-	11.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.1

Intersection

Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↕	↕	
Traffic Vol, veh/h	19	122	267	74	34	46
Future Vol, veh/h	19	122	267	74	34	46
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	6	5	4	18	17
Mvmt Flow	23	149	326	90	41	56
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.1	12.6	9.2
HCM LOS	A	B	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	42%	0%	78%
Vol Thru, %	0%	13%	22%
Vol Right, %	57%	87%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	80	141	341
LT Vol	34	0	267
Through Vol	0	19	74
RT Vol	46	122	0
Lane Flow Rate	98	172	416
Geometry Grp	1	1	1
Degree of Util (X)	0.142	0.196	0.528
Departure Headway (Hd)	5.247	4.099	4.571
Convergence, Y/N	Yes	Yes	Yes
Cap	682	875	790
Service Time	3.29	2.128	2.598
HCM Lane V/C Ratio	0.144	0.197	0.527
HCM Control Delay	9.2	8.1	12.6
HCM Lane LOS	A	A	B
HCM 95th-tile Q	0.5	0.7	3.1

Intersection						
Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Vol, veh/h	267	11	15	116	31	57
Future Vol, veh/h	267	11	15	116	31	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	0	22	3	0	6
Mvmt Flow	281	12	16	122	33	60

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	293	0	441 287
Stage 1	-	-	-	-	287 -
Stage 2	-	-	-	-	154 -
Critical Hdwy	-	-	4.32	-	6.4 6.26
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.398	-	3.5 3.354
Pot Cap-1 Maneuver	-	-	1163	-	577 743
Stage 1	-	-	-	-	766 -
Stage 2	-	-	-	-	879 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1163	-	568 743
Mov Cap-2 Maneuver	-	-	-	-	568 -
Stage 1	-	-	-	-	766 -
Stage 2	-	-	-	-	866 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	670	-	-	1163	-
HCM Lane V/C Ratio	0.138	-	-	0.014	-
HCM Control Delay (s)	11.2	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Intersection

Int Delay, s/veh	3.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Vol, veh/h	134	5	61	167	8	43
Future Vol, veh/h	134	5	61	167	8	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	33	6	6	0	12
Mvmt Flow	146	5	66	182	9	47

Major/Minor

	Minor1	Major1	Major2		
Conflicting Flow All	221	157	0	0	248
Stage 1	157	-	-	-	-
Stage 2	64	-	-	-	-
Critical Hdwy	6.46	6.53	-	-	4.1
Critical Hdwy Stg 1	5.46	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-
Follow-up Hdwy	3.554	3.597	-	-	2.2
Pot Cap-1 Maneuver	758	813	-	-	1330
Stage 1	862	-	-	-	-
Stage 2	949	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	753	813	-	-	1330
Mov Cap-2 Maneuver	753	-	-	-	-
Stage 1	862	-	-	-	-
Stage 2	942	-	-	-	-

Approach

	WB	NB	SB
HCM Control Delay, s	11	0	1.2
HCM LOS	B		

Minor Lane/Major Mvmt

	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	755	1330
HCM Lane V/C Ratio	-	-	0.2	0.007
HCM Control Delay (s)	-	-	11	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.7	0

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	213	4	15	0	2	0	26	64	0	0	52	159
Future Vol, veh/h	213	4	15	0	2	0	26	64	0	0	52	159
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	0	0	0	0	0	25	10	0	0	4	8
Mvmt Flow	232	4	16	0	2	0	28	70	0	0	57	173

Major/Minor	Minor2		Minor1			Major1		Major2				
Conflicting Flow All	270	269	143	279	355	70	229	0	0	70	0	0
Stage 1	143	143	-	126	126	-	-	-	-	-	-	-
Stage 2	127	126	-	153	229	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.5	6.2	7.1	6.5	6.2	4.35	-	-	4.1	-	-
Critical Hdwy Stg 1	6.15	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.3	3.5	4	3.3	2.425	-	-	2.2	-	-
Pot Cap-1 Maneuver	676	641	910	677	574	998	1215	-	-	1544	-	-
Stage 1	853	782	-	883	796	-	-	-	-	-	-	-
Stage 2	870	796	-	854	718	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	662	626	910	649	560	998	1215	-	-	1544	-	-
Mov Cap-2 Maneuver	662	626	-	649	560	-	-	-	-	-	-	-
Stage 1	833	782	-	862	777	-	-	-	-	-	-	-
Stage 2	847	777	-	834	718	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.5	11.5	2.3	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1215	-	-	673	560	1544	-	-
HCM Lane V/C Ratio	0.023	-	-	0.375	0.004	-	-	-
HCM Control Delay (s)	8	0	-	13.5	11.5	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.7	0	0	-	-

Intersection

Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Vol, veh/h	99	5	570	218	4	266
Future Vol, veh/h	99	5	570	218	4	266
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	0	5	3	0	4
Mvmt Flow	104	5	600	229	4	280

Major/Minor

	Minor1	Major1	Major2		
Conflicting Flow All	1003	715	0	0	829
Stage 1	715	-	-	-	-
Stage 2	288	-	-	-	-
Critical Hdwy	6.43	6.2	-	-	4.1
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.3	-	-	2.2
Pot Cap-1 Maneuver	267	434	-	-	811
Stage 1	483	-	-	-	-
Stage 2	759	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	265	434	-	-	811
Mov Cap-2 Maneuver	265	-	-	-	-
Stage 1	483	-	-	-	-
Stage 2	754	-	-	-	-

Approach

	WB	NB	SB
HCM Control Delay, s	26.1	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt

	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	278	811
HCM Lane V/C Ratio	-	-	0.394	0.005
HCM Control Delay (s)	-	-	26.1	9.5
HCM Lane LOS	-	-	D	A
HCM 95th %tile Q(veh)	-	-	1.8	0

Intersection

Int Delay, s/veh 1.1

Movement EBT EBR WBL WBT NBL NBR

Lane Configurations	↕			↕	↕	
Traffic Vol, veh/h	60	3	3	40	5	7
Future Vol, veh/h	60	3	3	40	5	7
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	5	100	0	8	0	0
Mvmt Flow	81	4	4	54	7	9

Major/Minor Major1 Major2 Minor1

Conflicting Flow All	0	0	86	0	146	84
Stage 1	-	-	-	-	84	-
Stage 2	-	-	-	-	62	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1523	-	851	981
Stage 1	-	-	-	-	944	-
Stage 2	-	-	-	-	966	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1523	-	848	980
Mov Cap-2 Maneuver	-	-	-	-	848	-
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	963	-

Approach EB WB NB

HCM Control Delay, s	0	0.5	9
HCM LOS			A

Minor Lane/Major Mvmt NBLn1 EBT EBR WBL WBT

Capacity (veh/h)	920	-	-	1523	-
HCM Lane V/C Ratio	0.018	-	-	0.003	-
HCM Control Delay (s)	9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection

Int Delay, s/veh 3.3

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	47	82	77	105	62	22
Future Vol, veh/h	47	82	77	105	62	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	11	4	9	5	9	0
Mvmt Flow	52	90	85	115	68	24

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	200	0	-	0	335	142
Stage 1	-	-	-	-	142	-
Stage 2	-	-	-	-	193	-
Critical Hdwy	4.21	-	-	-	6.49	6.2
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	2.299	-	-	-	3.581	3.3
Pot Cap-1 Maneuver	1320	-	-	-	646	911
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	823	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1320	-	-	-	620	911
Mov Cap-2 Maneuver	-	-	-	-	620	-
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	789	-

Approach EB WB SB

HCM Control Delay, s	2.9	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1320	-	-	-	677
HCM Lane V/C Ratio	0.039	-	-	-	0.136
HCM Control Delay (s)	7.8	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Vol, veh/h	71	66	99	40	131	240
Future Vol, veh/h	71	66	99	40	131	240
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	5	8	11	12	6	3
Mvmt Flow	76	70	105	43	139	255
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.1	9.9	11.6
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	35%	0%	71%
Vol Thru, %	0%	52%	29%
Vol Right, %	65%	48%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	371	137	139
LT Vol	131	0	99
Through Vol	0	71	40
RT Vol	240	66	0
Lane Flow Rate	395	146	148
Geometry Grp	1	1	1
Degree of Util (X)	0.485	0.195	0.219
Departure Headway (Hd)	4.421	4.811	5.324
Convergence, Y/N	Yes	Yes	Yes
Cap	813	740	670
Service Time	2.462	2.878	3.392
HCM Lane V/C Ratio	0.486	0.197	0.221
HCM Control Delay	11.6	9.1	9.9
HCM Lane LOS	B	A	A
HCM 95th-tile Q	2.7	0.7	0.8