City Hall
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Tumwater, WA 98501-6515
Phone: 360-754-5855
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MITIGATED DETERMINATION OF NON-SIGNIFICANCE
TUM-22-0038 and TUM-21-1895
Three Lakes Crossing

Description of Proposal: Construction of a 45 lot residential subdivision.

Applicant: Evan Mann, Copper Ridge LLC, PO Box 73790, Puyallup, WA 98373.

Representative: Sheri Green, AHBL, 2215 N. 30th Street #300, Tacoma, WA 98403

Location of Proposal: 6609 Henderson Blvd SE, Olympia, WA 98501. Section 01, Township 17N, Range 1W. W.M. Parcel # 12701320105.

Lead agency: City of Tumwater, Community Development Department.
The lead agency for this proposal has determined that, as conditioned, does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead-agency. This information is available to the public on request.

This MDNS assumes that the applicant will comply with all City ordinances and development standards governing the type of development proposed, including but not limited to, street standards, storm water standards, high groundwater hazard areas ordinance standards, water and sewer utility standards, critical areas ordinance standards, tree protection standards, zoning ordinance standards, land division ordinance standards, building and fire code standards, and level of service standards relating to traffic. These ordinances and standards provide mitigation for adverse environmental impacts of the proposed development.

Condition of Approval for mitigating environmental impacts:

Finding:
The project creates a new intersection at Henderson Road and 68th Ave. Intersection construction requires off site road improvements to align the new intersection along with the site improvements shown on the Preliminary Plat.

The Tumwater Boulevard/I-5 northbound ramps intersection currently operates at LOS F during both peak periods for the northbound left-turn movement. The project is projected to add several trips to this intersection. The City has recently developed a SEPA improvement project for the Tumwater Boulevard/I-5 interchange that include intersection improvements at the northbound I-5 ramps intersection, with a peak hour

per trip impact fee of $4,219 for each trip entering the interchange area.

Mitigation Measures:

1. The project shall construct a new intersection at Henderson Road and 68th Ave to assure safe traffic movements. Design shall be determined prior to and through site development and grading plan review.
2. Prior to issuance of the Building Permit:
    a. Construct a roundabout at the northbound Interstate 5 On/Off Ramp and Tumwater Boulevard intersection; or
    b. Voluntarily pay a mitigation fee of $4,219 per peak trip generated by this project under RCW 82.02.020 to be used as described herein: *Tumwater Boulevard/I-5 Interchange: The City's planned transportation improvements at the Tumwater Boulevard/I-5 interchange include converting the interchange to a roundabout diamond interchange by replacing the southbound on/off ramp signal and northbound stop controlled intersections with roundabouts.*

This MDNS is issued under WAC 197-11-350; the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted no later than May 27, 2022, by 5:00 p.m.

Date: May 13, 2022

Responsible Official:

Michael Matlock, AICP
Community Development Director

Contact person: Alex Baruch
555 Israel Road SW
Tumwater, WA 98501
tmerriman@ci.tumwater.wa.us

Appeals of this MDNS must be made to the City of Tumwater Community Development Department, no later than June 3, 2022, by 5:00 p.m. All appeals shall be in writing, be signed by the appellant, be accompanied by a filing fee of $175, and set forth the specific basis for such appeal, error alleged and relief requested.

CITY OF TUMWATER

555 ISRAEL RD. SW, TUMWATER, WA 98501

Email: cdd@ci.tumwater.wa.us

(360) 754-4180

TUM-22-0038

12/16/21

DATE STAMP

RECEIVED BY: Kelly

Any person proposing to develop in the incorporated limits of the City of Tumwater is required to submit an environmental checklist unless the project is exempt as specified in WAC 197-11-800 (Categorical Exemptions) of the State Environmental Policy Act Rules. **SUBMITTAL REQUIREMENTS** are as follows:

1. **A COMPLETE ENVIRONMENTAL CHECKLIST.** If the project is located within the Port of Olympia property, the checklist must also be signed by a representative of the Port.
2. **FEE OF $880.00 TO BE PAID UPON SUBMITTAL.** This includes the Public Notice fee.
3. **NAME AND ADDRESS LIST OF PROPERTY OWNERS WITHIN 300 FEET OF THE SUBJECT PROPERTY.**

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2015

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants: [help]

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impacts.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead

agency may exclude (for non-projects) questions in Part B - Environmental Elements – that do not contribute meaningfully to the analysis of the proposal.

A. Background

EVALUATION FOR AGENCY USE ONLY

1. Name of proposed project, if applicable:

   Three Lakes Crossing

2. Name of applicant:

   Sheri Greene, AHBL

3. Address and phone number of applicant and contact person:

   2215 N. 30th Street #300, Tacoma WA 98403

   (253) 383-2422

4. Date checklist prepared: **November 31, 2021**

5. Agency requesting checklist:

   City of Tumwater

6. Proposed timing or schedule (including phasing, if applicable):

   Construction will commence upon issuance of the site development permit.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

   No.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

   SEPA Checklist, Mazama Pocket Gopher study, Traffic Impact Analysis, Geotechnical study, Critical Areas Study

   Also cultural resource study.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

   No.

10. List any government approvals or permits that will be needed for your proposal, if known.

Preliminary Site Plan Approval, Final Site Plan Approval, Preliminary Plat with PUD approval, SEPA Determination, Site Development Permit, Demolition Permit, Building Permits, NPDES Permit

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

Project proposes subdividing 9.68 acres into 45 single family residential lots. The project proposes new roadways and the extension of water, sewer and dry utilities to the individual lots.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The project is located at 6609 and 6715 Henderson Blvd SE on Parcels 12701320105, 79300000100 and 79300000101, in the city of Tumwater, Thurston County, Washington.

EVALUATION FOR AGENCY USE ONLY

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site

☐ Flat ☒ Rolling ☐ Hilly ☐ Steep Slopes ☐ Mountainous

☐ Other: _____

b. What is the steepest slope on the site (approximate percent slope)?

The steepest slope is 56% in the center of the site.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

According the the NRCS Soil Survey, the site soils are predominately Indianola loamy sand, a somewhat excessively drained soil.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No, not to our knowledge.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

The site is in preliminary design but it is anticipated 19,000 cy of cut and 23,000 cy of fill, for a net 4,000 cy import.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Yes, some erosion could occur during the course of construction. A TESC plan will be submitted as part of the site development plans and BMPs recommended by the geotechnical engineer will be used during the course of construction.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

The project will meet the code requirements for maximum impervious surfaces. Lots will be limited to 70% impervious surface. The full development including roads and tracts will be approximately 60% impervious.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

A temporary erosion control plan will be submitted to the City prior to any site development and it will be implemented accordingly. Erosion potential will be mitigated in accordance with the City of Tumwater regulations.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed?

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If any, generally describe and give approximate quantities if known.

Unknown. Typical of a construction site. When the project is completed quantities will be typical of a residential neighborhood.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No, not to our knowledge.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Watering may be necessary during construction to control dust. Air quality is regulated by three agencies: The US Environmental Protection Agency (EPA), the Washington State Department of Ecology (DOE) and the Southwest Clean Air Agency. Each agency has established regulations that govern the concentration of pollutants and contaminant emissions from air pollution sources. Proposed construction of the project will be accordance with these regulations. `

3. **Water**

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. **There is an offsite wetland on the parcel to the south with it's buffer extending onto the southern portion of the project site. Susan Lake is approximately 0.18 miles east of the project site and Munn Lake is approximately 0.37 miles east of the project site.**

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. **Yes, the project may require work within 200 feet of the offsite wetland, however no work will be within the buffer area, and the buffer will remain undisturbed.**

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No fill or dredge material will be placed in or removed from the wetland.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and

EVALUATION FOR AGENCY USE ONLY

Confirmed on Preliminary Plat and other documentation.

approximate quantities if known.

There will be no surface water withdrawals.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

According to FEMA map panel 53067C0282F, the site lies outside of the 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

The project does not involve discharges of waste materials to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

The proposed project will not withdraw or discharge to groundwater. The site will connect to the City of Tumwater water system.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Waste materials will not be discharged into the ground. The project will connect to the City of Tumwater sewer system.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow?

Stormwater will be collected by a series of catch basins and routed to a treatment filter manhole/vault where it will be treated then conveyed to an onsite infiltration trench.

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Will this water flow into other waters? If so, describe.

No.

2) Could waste materials enter ground or surface waters? If so, generally describe **Minimal waste material (i.e., petroleum or other road fuel waste) will be generated from use of the proposed parking areas. The project design will include a surface water collection system intended to capture potential contaminates and runoff. Standard construction BMPs will include erosion and sediment control, and spill prevention countermeasures.**

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

No.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

Stormwater will be treated prior to discharge in accordance with the "Drainage Design and Erosion Control Manual for Tumwater (2018)". Stormwater quality and quantity measures will be provided on site. In addition, through the implementation of BMPs for this type of improvement work, the applicant will ensure that potential erosion resulting from construction activities is prevented. All catch basins will be protected with barriers to prevent sediment from entering the storm drainage system.

4. **Plants**

a. Check the types of vegetation found on the site:

- [X] deciduous tree: alder, maple, aspen, other
- [X] evergreen tree: fir, cedar, pine, other
- [X] shrubs
- [X] grass
- [ ] pasture
- [ ] crop or grain
- [ ] orchards, vineyards or other permanent crops.
- [ ] wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
- [ ] water plants: water lily, eelgrass, milfoil, other

other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

All of the vegetation within the project area will be removed.

c. List threatened and endangered species known to be on or near the site. **None known.**

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d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Perimeter landscaping and street trees will be provided in accordance with the City of Tumwater Municipal Code. Native vegetation within the wetland buffer and the open space tracts will remain undisturbed.

e. List all noxious weeds and invasive species known to be on or near the site.

Blackberries

5. **Animals**

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. Examples include:

- birds: hawk, heron, eagle, songbirds, other: **Crows**
- mammals: deer, bear, elk, beaver, other: **mice, rabbits**
- fish: bass, salmon, trout, herring, shellfish
- other:

b. List any threatened and endangered species known to be on or near the site

None known.

Confirmed with gopher study.

c. Is the site part of a migration route? If so, explain.

The site is within the Pacific Flyway for Migratory Birds.

d. Proposed measures to preserve or enhance wildlife, if any:

No special measures are proposed.

e. List any invasive animal species known to be on or near the site.

None known.

6. **Energy and natural resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electricity will be used for illumination and gas will be used for heating.

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b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No, not to our knowledge.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The project will be in compliance with the Washington State Energy Code and will utilize energy conservation features where possible.

EVALUATION FOR AGENCY USE ONLY

7. **Environmental health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

1) Describe any known or possible contamination at the site from present or past uses.

None known.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

None known.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

None known.

4) Describe special emergency services that might be required.

None anticipated.

5) Proposed measures to reduce or control environmental health hazards, if any:

In the event hazardous material is stored at the site, the project will comply with all health and safety codes.

b. **Noise**

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Most of the noise is from traffic along Henderson Blvd SE. It is not anticipated to affect the project.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Short term noise will be typical of construction activity. Long term noise will be passenger vehicles entering and leaving the site.

3) Proposed measures to reduce or control noise impacts, if any:

No special measures are proposed.

EVALUATION FOR AGENCY USE ONLY

8. **Land and shoreline use**

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe **The site is currently being used as a mix of retail, a single family residence, and several mobile homes.**

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

No, not to our knowledge.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

No, not to our knowledge.

c. Describe any structures on the site.

There is an older commercial building, a single family residence and several mobile homes.

d. Will any structures be demolished? If so, what?

All of the structures onsite will be demolished.

e. What is the current zoning classification of the site?

The western portion of the site is zoned Single-Family Low Density and eastern portion of the site is zoned Single-Family Medium Density.

f. What is the current comprehensive plan designation of the site?

Single-Family Low Density and Single-Family Medium Density

g. If applicable, what is the current shoreline master program designation of the site?

Not applicable.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

A small wetland to the south of the project was identified in the Critical Areas Report prepared by EnviroVector dated September 15, 2021. A 150 foot buffer is shown on the preliminary plat plans.

i. Approximately how many people would reside or work in the completed project?

Approximately 85 to 120 people may reside at the completed project.

j. Approximately how many people would the completed project displace?

None. The residents of the existing single family residence and mobile homes are voluntarily relocating.

k. Proposed measures to avoid or reduce displacement impacts, if any:

No special measures are proposed.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project meets the intended use for SFL and SFM zoning districts and existing and project land uses.

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

No special measures are proposed.

EVALUATION FOR AGENCY USE ONLY

Verified by report.

9. **Housing**

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a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

45 middle income housing units are proposed.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

Several mobile homes, a single family residence, and a small commercial building will be demolished. All of the structures are in poor condition.

c. Proposed measures to reduce or control housing impacts, if any:

No special measures are proposed.

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The exterior material will be wood. The tallest height will not exceed what is permitted in the SFL/SFM zone.

b. What views in the immediate vicinity would be altered or obstructed?

The view will transition from mobile homes, a single family residence and a small commercial building, to an attractive residential neighborhood.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Perimeter landscaping and interior roadway landscaping will reduce aesthetic impacts.

11. **Light and glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Lighting will be typical of a residential neighborhood and would likely occur at dusk.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No. Lighting will be directed downward so as not to interfere with views or provide glare.

c. What existing off-site sources of light or glare may affect your proposal?

There are no off-site sources of light or glare that will impact the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any:

Lighting fixtures will be shielded and lighting cast downward to reduce light and glare impacts. All lighting fixtures will meet City requirements for light spill.

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

Munn Lake is approximately 0.30 miles east of the site and offers fishing and boating opportunities. Tumwater High School is 1.20 miles west of the site and has ball fields and track available for public after school hours.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

No special measures are proposed.

13. **Historic and cultural preservation**

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe.

The existing house was constructed in 1921 and the commercial building was constructed in 1925, but neither structure is of historical value.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

No, not to our knowledge.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Department of Archeology and Historic Preservation WISAARDmapping was used to assess the property for historical preservation.

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Cultural resource study was completed after NOA and sent to DAHP and the tribes that requested the study. No resources were found in the study.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

If cultural or archeological objects are found during site preparation work, the Washington State Department of Archaeology and Historic Preservation will be notified, and appropriate measures will be taken.

14. **Transportation**

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Henderson Blvd SE abuts the east boundary of the project. The project proposes one access from Henderson Blvd SE.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

The nearest Intercity Transit stop is at the intersection of Israel Road and Capitol Blvd, approximately 1 mile west of the site.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

Each home will have a two car garage and parking available in the driveway.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

unknown at this time.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles).

According to the traffic impact analysis prepared by Heath and Associates dated October 2021, the project will generate 405 average trips per day, with 30 AM peak trips and 40 PM peak trips.

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Dedication of ROW along Henderson and 1/2 street improvements along Henderson as shown on the site plan.

What data or transportation models were used to make these estimates?

See traffic impact analysis prepared by Heath and Associates dated October 2021.

EVALUATION FOR AGENCY USE ONLY

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe:

No.

h. Proposed measures to reduce or control transportation impacts, if any:

Payment of traffic impact fees to the City of Tumwater.

15. **Public services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The proposed development would not create a significant new need for these services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Payment of impact fees to the City of Tumwater.

16. **Utilities**

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other:

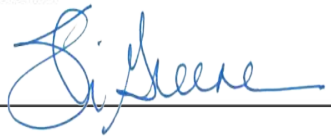
b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Water: City of Tumwater
Sewer: City of Tumwater
Garbage: LeMay
Cable: Comcast
Electricity and Gas: PSE

C. Signature

EVALUATION FOR AGENCY USE ONLY

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: 

Name of signee: Sheri Greene

Position: Assistant Project Manager

Agency/Organization: AHBL

Date Submitted: 12/8/2021

D. Signature – Property Owner's Review, Port of Olympia (if applicable)

I certify that I have reviewed the above environmental checklist prepared by the applicant and that the project is consistent with the tenant's lease for Port property. The Port's comments have been incorporated in the document as submitted or as noted.

Port of Olympia – Please Print: _____

Port of Olympia – Signature: _____

Date Submitted: _____

E. CITY OF TUMWATER

Reviewed by: Alex Baruch, Associate Planner

Date: May 9, 2022

F. Supplemental sheet for nonproject actions [help]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

EVALUATION FOR AGENCY USE ONLY

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Proposed measures to avoid or reduce such increases are:

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

3. How would the proposal be likely to deplete energy or natural resources?

Proposed measures to protect or conserve energy and natural resources are:

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

Proposed measures to protect such resources or to avoid or reduce impacts are:

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

Proposed measures to avoid or reduce shoreline and land use impacts are:

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Proposed measures to reduce or respond to such demand(s) are:

7. Identify, if possible, whether the proposal may conflict with local state, or federal laws or requirements for the protection of the environment.

EVALUATION FOR AGENCY USE ONLY

HENDERSON BOULEVARD PROPERTY

THURSTON COUNTY, WASHINGTON

CRITICAL AREAS REPORT

Prepared By:

Curtis Wambach, M.S.
Senior Biologist and Principal

EnviroVector
OPTIMIZE USABLE LAND

15 September 2021

360-790-1559

www.envirovector.com

HENDERSON BOULEVARD PROPERTY

CRITICAL AREAS REPORT

Prepared For:

Soundbuilt

Prepared By:

Curtis Wambach, M.S.,
Senior Biologist and Principal
EnviroVector
Olympia, WA 98502

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15 September 2021

Contents

1.0 INTRODUCTION

1.1 Purpose

The purpose of this Critical Areas Report is to identify and map Critical Areas on and within three hundred (300) feet of the subject property. This Critical Areas Report has been prepared to satisfy City of Tumwater reporting requirements.

1.2 Property Location

The 9.73-acre subject property is located in Tumwater, WA Section 02 Township 17 North and Range 2 West (**Figure 1; Table 1**).

Table 1. Parcels Comprising Subject Property

No#	Property Address	Parcel Number	Section Township Range	Property Size (Acres)
1	---	12701320105	Section 02 Township 17N Range 2W	0.34
2	---	79300000101		4.77
3	---	79300000100		4.62
3 Parcels	Total Size			9.73 acres

The permitting jurisdiction is City of Tumwater.

1.3 Site Evaluation

Critical Areas evaluations were performed on the subject property on 7 July 2021.

1.4 Subject Property

The site is made up of three (3) contiguous parcels (**Figures 2 & 3**). The eastern portion of the subject property contains building and internal roads (**Appendix A, Photos 5-8**). The western portion of the subject property is forested with a herbaceous understory (**Appendix A, Photos 1 & 3**). Maintained lawn and grassy areas are located throughout the property (**Appendix A, Photos 2, 4-8**). The parcel west of the subject property is currently under development (**Appendix A, Photos 9 & 10**).

The property is bordered by Henderson Blvd SE to the east, single family homes to the east and south, undeveloped single-family lots to the north. The property to the west is currently under construction. The neighboring properties include high intensity single-family lots smaller than one (1) acre in size.

2.0 METHODOLOGY

This report is based on a review of existing information and field investigations. The goal of these efforts is to collect and document existing information that reflects current site conditions for assessing potential impacts.

2.1 Review of Existing Literature

Prior to conducting fieldwork, and throughout the duration of project design, biologists reviewed existing information to identify wetlands, streams, vegetation patterns, topography, soils, wildlife habitats, and other natural resources in the project area. Existing data sources that were reviewed for this report included, but were not limited to, the following:

- Washington. U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) Soil Survey
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI), online wetlands mapper
- Washington Department of Fish and Wildlife (WDFW) Salmonscape Database
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species Database
- Washington State Department of Natural Resources (DNR) Natural Heritage Database
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies

2.2 Field Investigation

A wetland evaluation was performed on-site as well as off-site of the subject property to determine if wetlands, streams, or their buffers extend onto the subject property. The routine on-site determination method was used to identify potential wetlands using the procedures outlined in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the 2010 USACE Regional Wetland Supplement.

Under the Thurston County Code (TCC), wetlands are defined as areas that are inundated or saturated by ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway.

Wetlands may include those artificial wetlands intentionally created from non-wetland areas created to mitigate conversion of wetlands.

2.3 Wetland Identification

Prior to 2010, biologists delineated wetlands according to the methods specified in the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory 1987). At that time, these methods complied with those in the Washington State Wetland Identification and Delineation Manual (Washington State Department of Ecology [Ecology] 1997).

Following 2010, biologists evaluate wetlands according to the methods specified in the USACE's Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE 2010). These methods comply with those adopted by Washington State pursuant to Washington Administrative Code (WAC) 173-22-035, Revised Code of Washington (RCW) 90.58.380.

2.3.1 Vegetation

The dominant plants and their wetland indicator status were evaluated to determine whether the vegetation is hydrophytic. Hydrophytic vegetation is generally defined as vegetation adapted to prolonged saturated soil conditions. To meet the hydrophytic vegetation criterion, more than 50 percent of the dominant plants must be facultative, facultative wetland, or obligate, according to the plant indicator status category assigned to each plant species by the USACE National Wetland Plant List. **Insert 1** provides the definitions of the indicator status categories. The scientific and common names for plants follow the currently accepted nomenclature. Dominant plant species were observed and recorded.

Insert 1. Key to Plant Indicator Status Categories

Plant Indicator Status Category	Symbol	Description
Obligate Wetland Plants	OBL	Plants that almost always (>99% of the time) occur in wetlands but may rarely (<1% of the time) occur in non-wetlands
Facultative Wetland Plants	FACW	Plants that often (67% to 99% of the time) occur in wetlands but sometimes (1% to 33% of the time) occur in non-wetlands
Facultative Plants	FAC	Plants with a similar likelihood (33% to 66% of the time) of occurring in both wetlands and non-wetlands
Facultative Upland Plants	FACU	Plants that sometimes (1% to 33% of the time) occur in wetlands but occur more often (67% to 99% of the time) in non-wetlands
Upland Plants	UPL	Plants that rarely (<1% of the time) occur in wetlands and almost always (> 99% of the time) occur in non-wetlands

2.3.2 Soils

No test plots or soil samples were collected. No wetlands were identified on the subject property (See Results Section)

2.3.3 Hydrology

The project area was examined for evidence of hydrology. The U.S. Army Corps of Engineers (2005) provides a technical standard for monitoring hydrology on such sites. This standard requires fourteen (14) or more consecutive days of flooding or ponding, or a water table twelve (12) in. (thirty [30] cm) or less below the soil surface, during the growing season at a minimum frequency of five (5) years in 10 (fifty percent [50%] or higher probability). The USACE 2010 Regional Supplement provides a list of hydrology indicators to evaluate whether the hydrology standard is satisfied. If wetland hydrology, including pooling, ponding, and soil saturation, is not clearly evident, hydrological conditions may be observed through surface or soil indicators. Indicators of hydrological conditions include oxidized root channels, drainage patterns, drift lines, sediment deposition, watermarks, historic records, visual observation of saturated soils, and visual observation of inundation.

2.4 Wetland Classification and Rating

Delineated wetlands were classified according to the USFWS Classification of Wetlands and Deepwater Habitats of the United States. Hydrogeomorphic classifications were assigned to wetlands using USACE methods established in a Hydrogeomorphic Classification for Wetlands were rated using the revised Washington State Wetland Rating System for Western Washington.

3.0 STUDY RESULTS

3.1 Background Information

3.1.1 Thurston County Geodata Soils

No hydric soils are mapped on the subject property. Two (2) non-hydric soil types are mapped on the subject property by Thurston County Geodata (**Appendix B; Table 2**). Mukilteo muck is a hydric soil type mapped off-site immediately south of the subject property.

Table 2. Thurston County Geodata Soil Summary

Soil Unit	Hydric	Comments
Indianola loamy sand, 0 to 3% slopes	No	Covers eastern half of subject property
Indianola loamy sand, 3 to 15% slopes	No	Covers western half of subject property

3.1.2 Thurston County Geodata Wetlands & Streams

No wetlands are mapped on the subject property by Thurston County Geodata (**Appendix C**). Two (2) off-site wetlands are mapped five hundred sixty-five (565) feet west and three hundred sixty-two (362) feet to the east of the subject property across Henderson Boulevard SE.

3.1.3 WDFW Priority Habitats and Species (PHS) Database

No priority habitats or species are mapped on the subject property by the Washington Department of Fish and Wildlife (WDFW) PHS database (**Appendix D**). The Mazama pocket gopher is mapped directly south of subject property. Freshwater emergent wetland is mapped just over four hundred (400) feet west of the subject property. Freshwater Forested/shrub wetland is mapped just over three hundred (300) feet east of the subject property. The Big Brown bat and Townsend's bat is mapped in the township.

3.1.4 Clean Water Act 303(d) List

No 303(d) listed waterbodies are mapped on the subject property. One (1) 303(d) listed waterbody is mapped 0.27 miles north of the subject property by the Department of Ecology Water Quality Atlas Map (**Appendix E**). The site and surrounding basin drains to the south.

3.1.5 Total Maximum Daily Load (TMDL)

An approved TMDL is mapped on the subject property by the Department of Ecology Water Quality Atlas Map (**Appendix F**).

3.1.6 High Groundwater Hazard Area

No High Groundwater Hazard Area is mapped on the subject property by Thurston County Geodata (**Appendix G**).

3.1.7 FEMA Floodplain

No FEMA floodplain is mapped on the subject property by the Thurston County Geodata Center database (**Appendix H**). FEMA floodplains are mapped to over three hundred (300) feet the subject property east of Henderson Blvd (**Appendix H**).

3.2 Field Results

No wetlands or streams have been identified on the subject property during this study (**Figures 2 & 3; Table 3**). One (1) off-site wetland, labeled Wetland A, has been identified south of the subject property

Wetland A has not been delineated because it is located offsite. Permission was not obtained to delineate off-site wetlands.

No streams were identified onsite or within three hundred (300) feet of the subject property.

A summary of the Critical Areas study can be found in **Table 3**.

Table 3. Summary of Critical Areas Results

Wetlands						
Wetland	Area of Wetland		Cowardin Class	Buffer Condition	Habitat Features	Comments
	On-site	Total				
Wetland A	0 sf (0 acres)	44,753.00 sf (1.03 acres)	PSSC[1]	Upland vegetation at buffer	None Observed	Shallow depression

1. PSSC: Palustrine Scrub-shrub Seasonally-flooded

3.2.1 Wetland A

The off-site Wetland A is located south of the subject property. The wetland boundary is well-defined by skunk cabbage (

Wetland A is a shallow depression that holds water during the wet season (**Figures 2 & 3**). The Cowardin classification is Palustrine Scrub-shrub Seasonally flooded (PSSC). The Department of Ecology (DOE; 2014) Wetland Rating System describes vegetation classes and hydroperiods as emergent and seasonally ponded, respectively (**Figure 6**).

Wetland Conditions

Wetland A consists of a relatively undisturbed shallow topographic depression.

No potential sources of pollutants occur within one hundred fifty (150) feet as defined in the DOE (2014) Wetland Rating System (**Figure 7**). Habitat within one (1) kilometer is shown in **Figure 8**, and the wetland contributing basin is shown in **Figure 9**.

Hydrology

Hydrology derives from local precipitation and groundwater. Water accumulates and ponds in this shallow depression during the wet season. No outlet was identified during the site evaluation.

Vegetation

Dominant plant species identified in Wetland A include (**Appendix A, Photos 11-14 & 14-21**):

- Douglas spirea (*Spiraea douglasii*, FACW)
- Pacific crabapple (*Malus fusca*; FACW)
- Skunk cabbage (*Lysichiton americanus,* OBL)
- Slough sedge (*Carex obnupta*, OBL)
- Oregon Ash (*Fraxinus latifolia,* FACW)
- Salmonberry (*Rubus spectabilis*, FAC)
- Water parsley (*Oenanthe sarmentosa,* OBL)
- Red cedar (*Thuja plicata,* FAC)

Dominant upland plant species adjacent to wetland include (**Appendix A, Photo 914**):

- Bracken fern (*Pteridium aquilinum*, FACU)
- Queen Anne's Lace (*Daucus carota*, FACU)
- Oxeye daisy (*Leucanthemum vulgare*, FACU)
- Hawksbeard (*Crepis tectorum*, FACU)
- Hair cat's ear (*Hypochaeris radicata*, FACU)
- Ocean spray (*Holodiscus maxim*, FACU)
- Fox glove (*Digitalis purpurea*, FACU)
- Salal (*Gaultheria* shallon, FACU)
- Sweet vernal grass (*Anthoxanthum odoratum*, FACU)
- Sword fern (*Polystichum munitum*, FACU)
- Oregon grape (*Mahonia aquifolium*, FACU)
- Big leaf maple (*Acer macrophyllum*, FACU)

Soils

Soils were not excavated as the wetland is located on private property not controlled by the applicant. Thereby, no test plot data was collected.

Habitat Features

No habitat features were identified in Wetland A.

4.0 REGULATORY CONSIDERATIONS

Wetland regulatory considerations have been summarized in **Table 4** and illustrated in **Figures 4 & 5**.

Table 4. Summary of Regulatory Considerations

Wetlands								
Wetland	Area of Wetland		Category	Habitat Score	Land Use Intensity	Standard Buffer	Reduced Buffer	Comments
	Onsite	Total						
Wetland A	0 sf (0.00 acres)	44,753 sf (1.03 acres)	III	5 (L, M, M)	High	150 ft	110 ft	Off-site wetland, buffer extends onsite

4.1 Wetland A

Wetland A has been classified as a Category III wetland using the DOE (2014) Wetland Rating Form for Western Washington as required under Thurston County Code (TCC) Chapter 24.30.030---*Wetland categories*. The HGM class is depressional under the DOE (2014) Wetland Rating System.

Under Tumwater Municipal Code, Chapter 16.28.170 --- *Wetland buffers*, wetland buffers are calculated based on the habitat score determined by the DOE (2014) Wetland Rating System. The Habitat Functions score for Wetland A is "Low (L)" potential to provide habitat, "Medium (M)" landscape potential to support habitat, and "Medium (M)" potential value to society. Wetlands that rate as L, M, M (order of ratings are not important) for habitat receive a score of five (5) points for total habitat functions (**Appendix I**).

The standard buffer for wetlands that score five (5) points for Habitat Functions provided by the rating of L, M, M require a standard buffer width of one hundred fifty (150) feet (TMC 16.28.080---*Wetland buffers*) (**Figures 4 & 5; Table 5**).

4.2 Wetland Buffer Reduction

Under TMC Chapter 16.28.170---*Wetland buffers*, Subsection (C)---*Buffer Width Reduction*, the buffer widths recommended for land uses with high-intensity impacts to wetlands can be reduced to those widths recommended for moderate-intensity impacts under the following conditions:

1. For wetlands that score moderate or high for habitat (five points or more), the width of the buffer around the wetland can be reduced if both the following criteria are met:
    a. A relatively undisturbed vegetated corridor at least one hundred feet wide is protected between the wetland and any other priority habitats as defined by the Washington State Department of Fish and Wildlife. The corridor must be protected for the entire distance between the wetland and the priority habitat via some type of legal protection such as a conservation easement; and
    b. Measures to minimize the impacts of different land uses on wetlands, such as the examples summarized in Table 16.28.170(5), are applied (**Insert 2**).

Insert 2. Table 16.28.170(5): Measures to Minimize Impacts to Wetlands

Examples of Disturbance	Examples of Measures to Minimize Impacts	Activities That Cause the Disturbance
Lights	Direct lights away from wetland	Parking lots, warehouses, manufacturing, residential
Noise	Locate activity that generates noise away from wetland	Manufacturing, residential
Toxic runoff (1)	*Route all new runoff away from wetland while ensuring that wetland is not dewatered *Establish covenants limiting use of pesticides within 150 ft of wetland *Apply integrated pest management	Parking lots, roads, manufacturing, residential areas, application of agricultural pesticides, landscaping
Stormwater runoff	*Retrofit stormwater detention and treatment for roads and existing adjacent development *Prevent channelized flow from lawns that directly enters the buffer	Parking lots, roads, manufacturing, residential areas, commercial, landscaping
Change in water regime	Infiltrate or treat, detain, and disperse into buffer new runoff from impervious surfaces and new lawns	Impermeable surfaces, lawns, tilling
Pets and human disturbance	*Use privacy fencing *Plant dense vegetation to delineate buffer edge and to discourage disturbance using vegetation appropriate for the ecoregion *Place wetland and its buffer in a separate tract	Residential areas
Dust	Utilize best management practices to control dust	Tilled fields

The proposed project would reduce buffers in compliance with TMC Chapter 16.28.170---*Wetland buffers*, Subsection (C)---*Buffer Width Reduction* by 1) reducing the buffer from the one hundred fifty (150)-foot high land use intensity to the one hundred ten (110)-foot moderate land use intensity, 2) protect a relatively undisturbed vegetated corridor at least one hundred feet wide, and by 3) applying measures to minimize the impacts of different land uses on wetlands, such as the examples summarized in Table 16.28.170(5).

4.3 Wetland Buffer Averaging

Under TMC Chapter 16.28.170---*Wetland buffers*, Subsection (E)---*Standard Wetland Buffer Width Averaging*, standard wetland buffer zones may be modified by averaging buffer widths if it will improve the protection of wetland functions, or if it is the only way to allow for reasonable use of a parcel. Averaging cannot be used in conjunction with the provisions for reductions in buffer widths. Wetland buffer width averaging shall be allowed to improve wetland protection only where a qualified wetlands professional demonstrates all of the following:

1. The wetland has significant differences in characteristics that affect its habitat functions, such as a wetland with a forested component adjacent to a degraded emergent component or a “dual-rated” wetland with a category I area adjacent to a lower rated area;

2. The buffer is increased adjacent to the higher functioning area of habitat or more sensitive portion of the wetland and decreased adjacent to the lower functioning or less sensitive portion;
3. The total area contained in the buffer area after averaging is not less than that which would be contained within the standard buffer; and
4. The buffer at its narrowest point is never less than three-fourths of the required width.

Under TMC Chapter 16.28.170---*Wetland buffers*, Subsection (F), averaging to allow reasonable use of a parcel may be permitted when all of the following are met:

1. There are no feasible alternatives to the site design that could be accomplished without buffer averaging;
2. The averaged buffer will not result in degradation of the wetland's functions and values as demonstrated in the critical area report;
3. The total buffer area after averaging is equal to the area required without averaging; and
4. The buffer at its narrowest point is never less than three-fourths of the required width.

4.4 Stormwater in Buffers

Under TMC 16.28.170--*Wetland buffers*, Subsection (H)---*Permitted Uses in a Wetland Buffer Zone*, surface level stormwater management facilities may be allowed in the outer twenty-five percent (25%) of the wetland buffer using best management practices; provided the community development director makes all of the following determinations:

a. No other location is feasible.
b. The location of such facilities will not degrade the functions or values of the wetland.

5.0 PROPOSED LAND USE

No land use is proposed at this time.

Recommendations include:

- Buffer reduction from one hundred fifty (150) feet to one hundred ten (110) feet with mitigation measures under TMC Chapter 16.28.170---*Wetland buffers*, Subsection (C)---*Buffer Width Reduction.*
- Stormwater management facilities can be located within the outer twenty-five percent (25%) of the wetland buffer. The lowest portion of the subject property.

6.0 CONCLUSION

No wetlands or streams have been identified on the subject property during this study. One (1) off-site wetland, labeled Wetland A, has been identified near the southern subject property boundary (**Figures 2 & 3**).

Wetland A has not been delineated because it is located offsite. Permission was not obtained to delineate off-site wetlands. The off-site Wetland A is located fifty-eight (58) feet south of the subject property. No streams were identified onsite or within three hundred (300) feet of the subject property.

Wetland A is a shallow depression that holds water during the wet season (**Figures 2 & 3**). The Cowardin classification is Palustrine Scrub-shrub Seasonally Flooded (PSSC). The Department of Ecology (DOE; 2014) Wetland Rating System describes vegetation classes and hydroperiods as scrub-shrub and seasonally flooded, respectively.

Wetland A has been classified as a Category III wetland using the DOE (2014) Wetland Rating Form for Western Washington as required under Thurston County Code (TCC) Chapter 24.30.030---*Wetland categories*. The HGM class is depressional under the DOE (2014) Wetland Rating System.

Under Tumwater Municipal Code, Chapter 16.28.170 --- *Wetland buffers*, wetland buffers are calculated based on the habitat score determined by the DOE (2014) Wetland Rating System. The Habitat Functions score for Wetland A is "Low (L)" potential to provide habitat, "Medium (M)" landscape potential to support habitat, and "Medium (M)" potential value to society. Wetlands that rate as L, M, M (order of ratings are not important) for habitat receive a score of five (5) points for total habitat functions.

The standard buffer for wetlands that score five (5) points for Habitat Functions provided by the rating of L, M, M require a standard buffer width of one hundred fifty (150) feet (TMC 16.28.080---*Wetland buffers*) (**Figures 4 & 5**).

Recommendations include:

- Buffer reduction from one hundred fifty (150) feet to one hundred ten (110) feet with mitigation measures under TMC Chapter 16.28.170---*Wetland buffers*, Subsection (C)---*Buffer Width Reduction.*
- Stormwater management facilities can be located within the outer twenty-five percent (25%) of the wetland buffer. The lowest portion of the subject property.

7.0 REFERENCES

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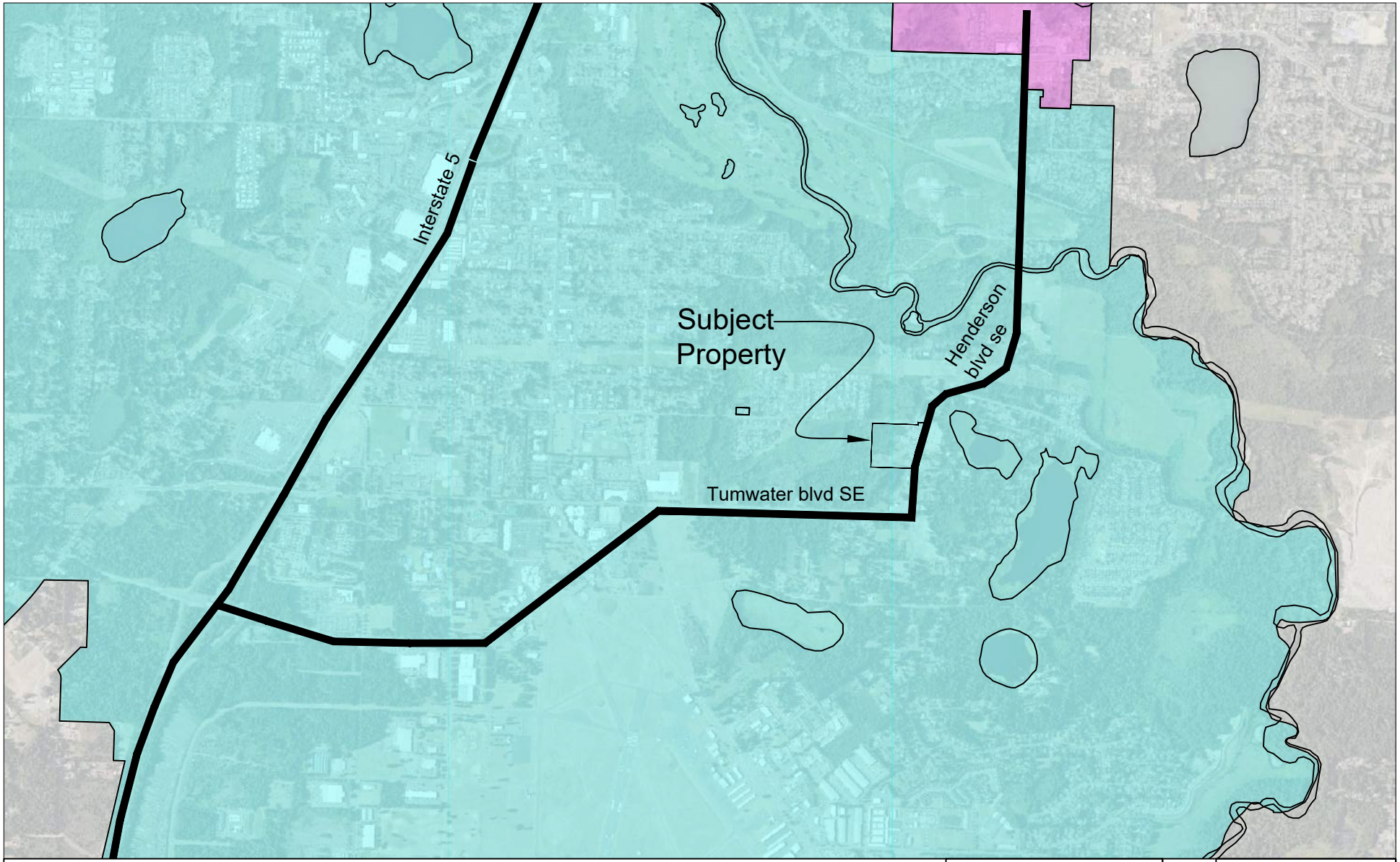
FIGURES



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City of Tumwater
City of Olympia

Figure 1

Henderson Property

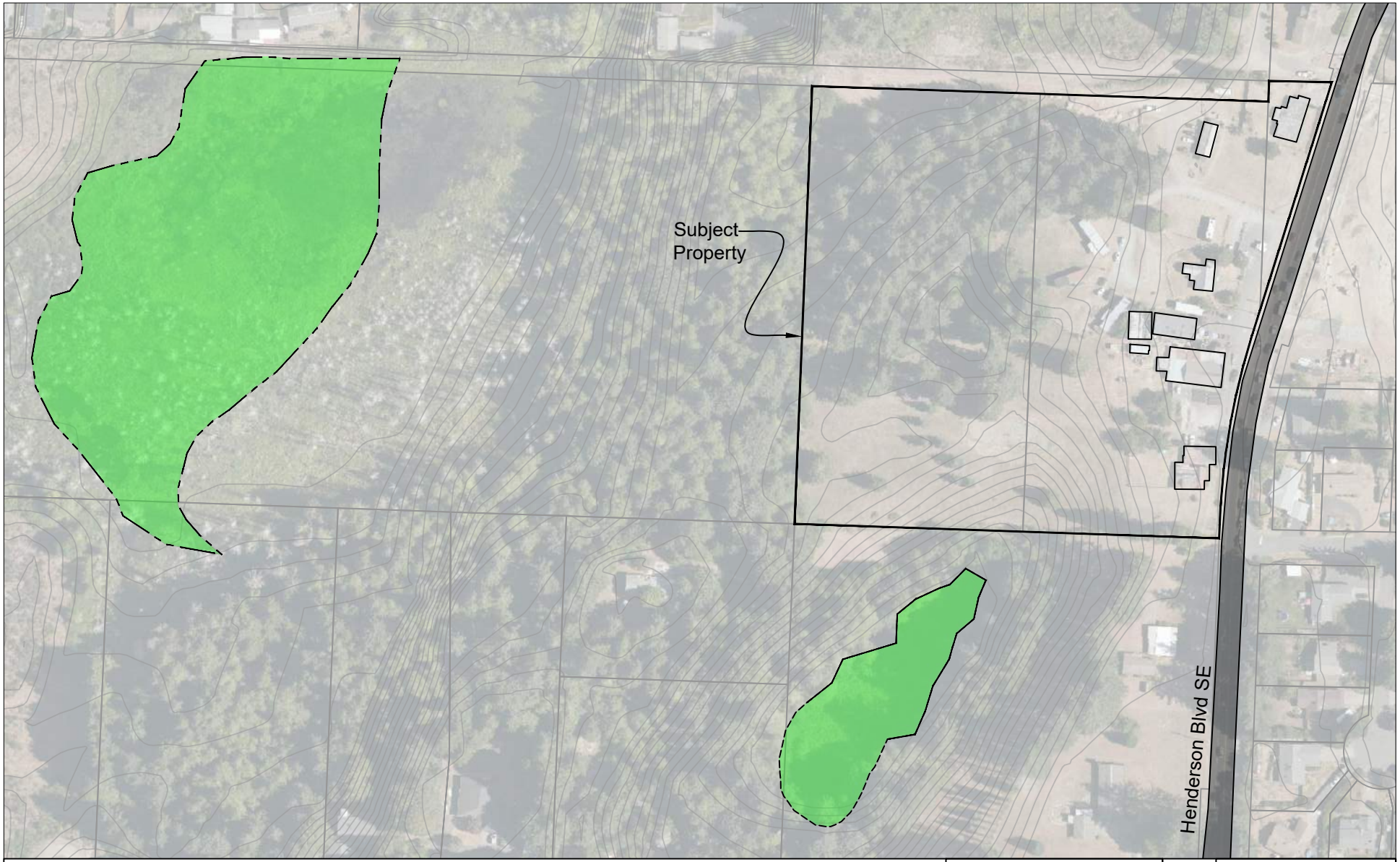
Vicinity Map

N

Scale: 1" = 2000'

0 2000'

15 September 2021



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Wetland (Verified)
Wetland (Potential)
Wetland (Thurston Co. Geodata)

Figure 2

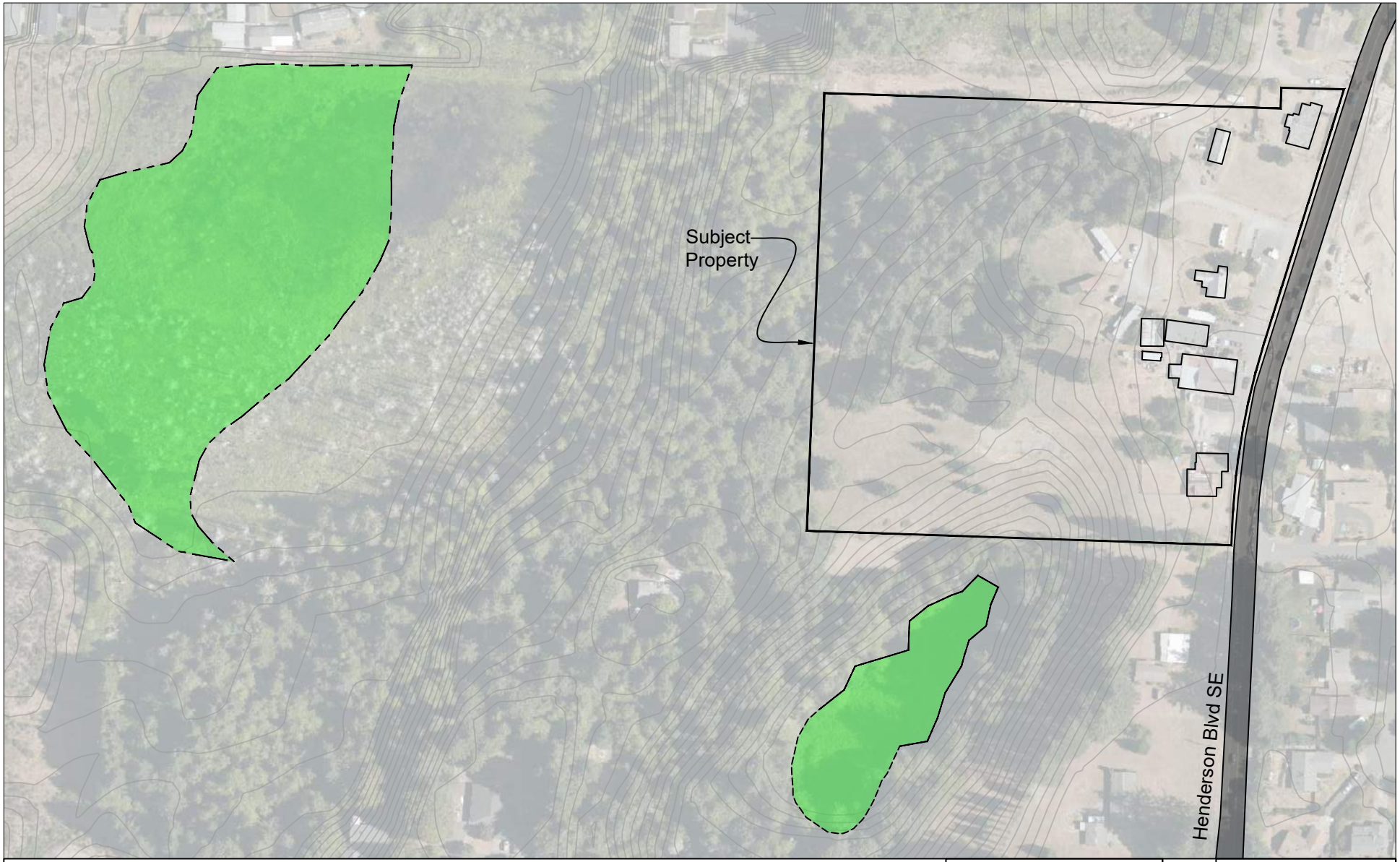
Henderson Property
Existing Conditions

N

Scale: 1" = 200'

0 200'

15 September 2021



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Wetland (Verified)
Wetland (Potential)
Wetland (Thurston Co. Geodata)

Figure 3

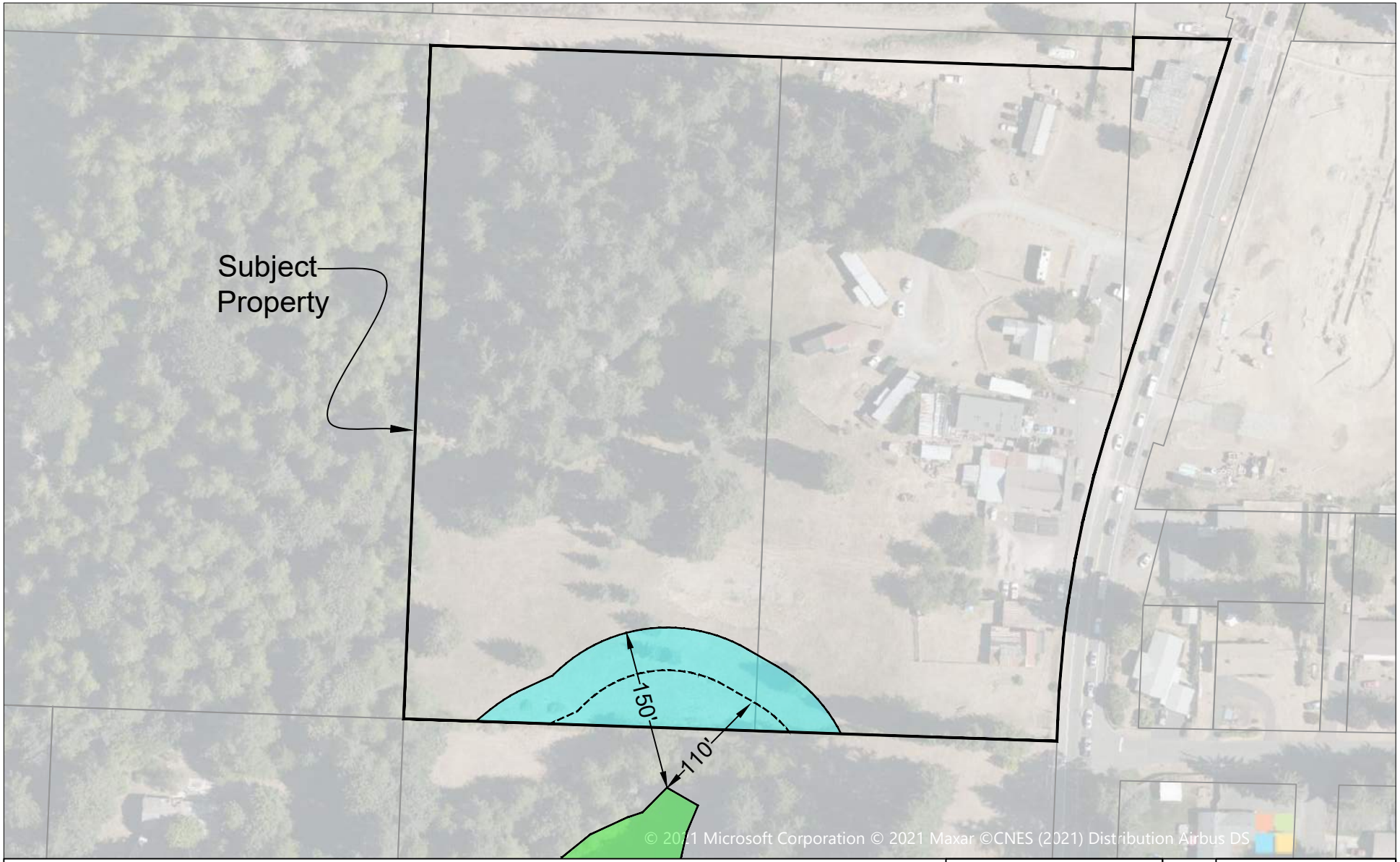
Henderson Property
Existing Conditions

N

Scale: 1" = 200'

0 200'

15 September 2021



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Wetland (Verified)
Wetland (Potential)
Wetland (Thurston Co. Geodata)
Wetland Buffers (150 feet)
Reducred Wetland Buffer (110 feet)

Figure 4

Henderson Property

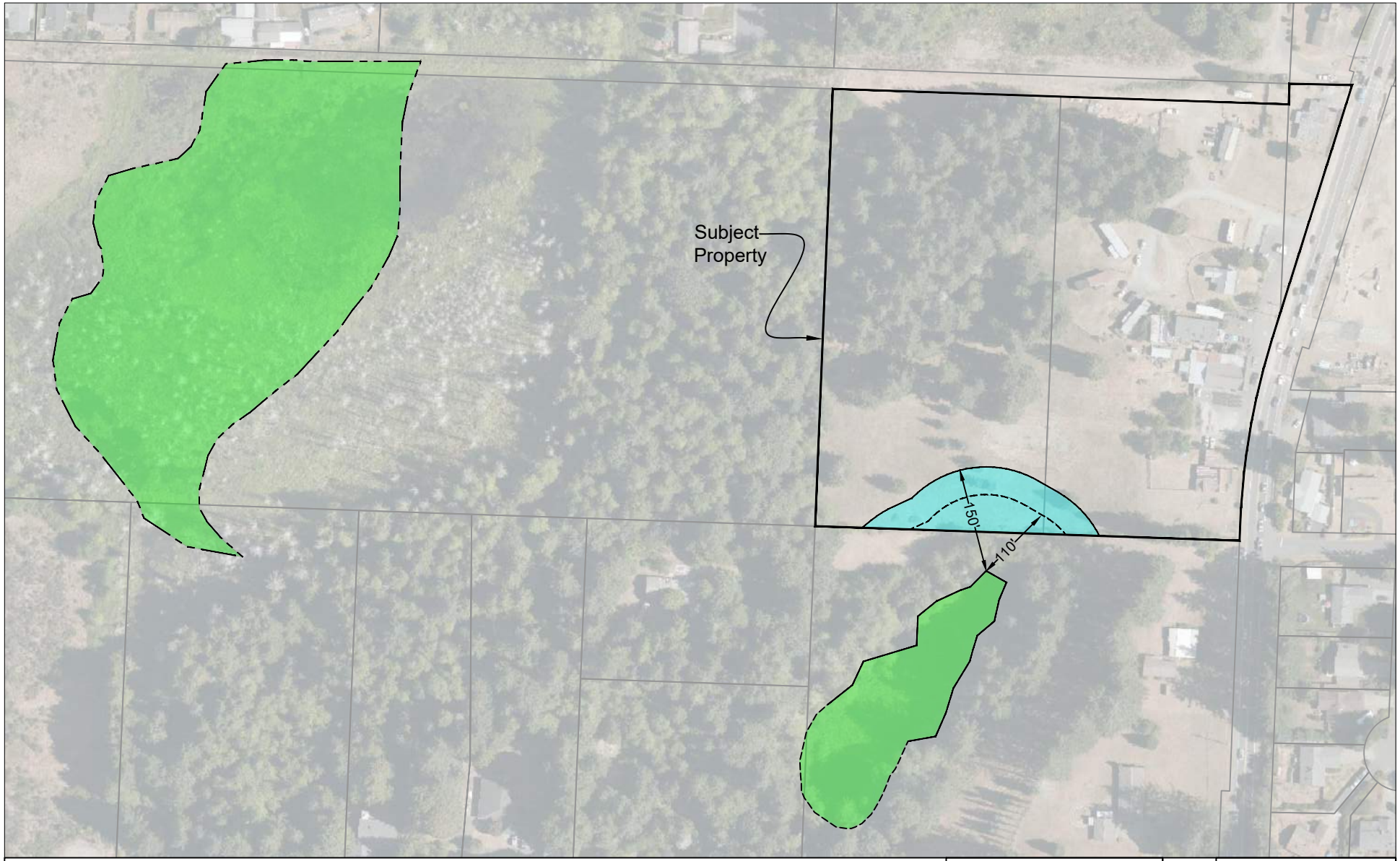
Critical Areas Buffers

N

Scale: 1" = 130'

0 130'

15 September 2021



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Wetland (Verified)
Wetland (Potential)
Wetland (Thurston Co. Geodata)
Wetland Buffers (150 feet)

Figure 5

Henderson Property

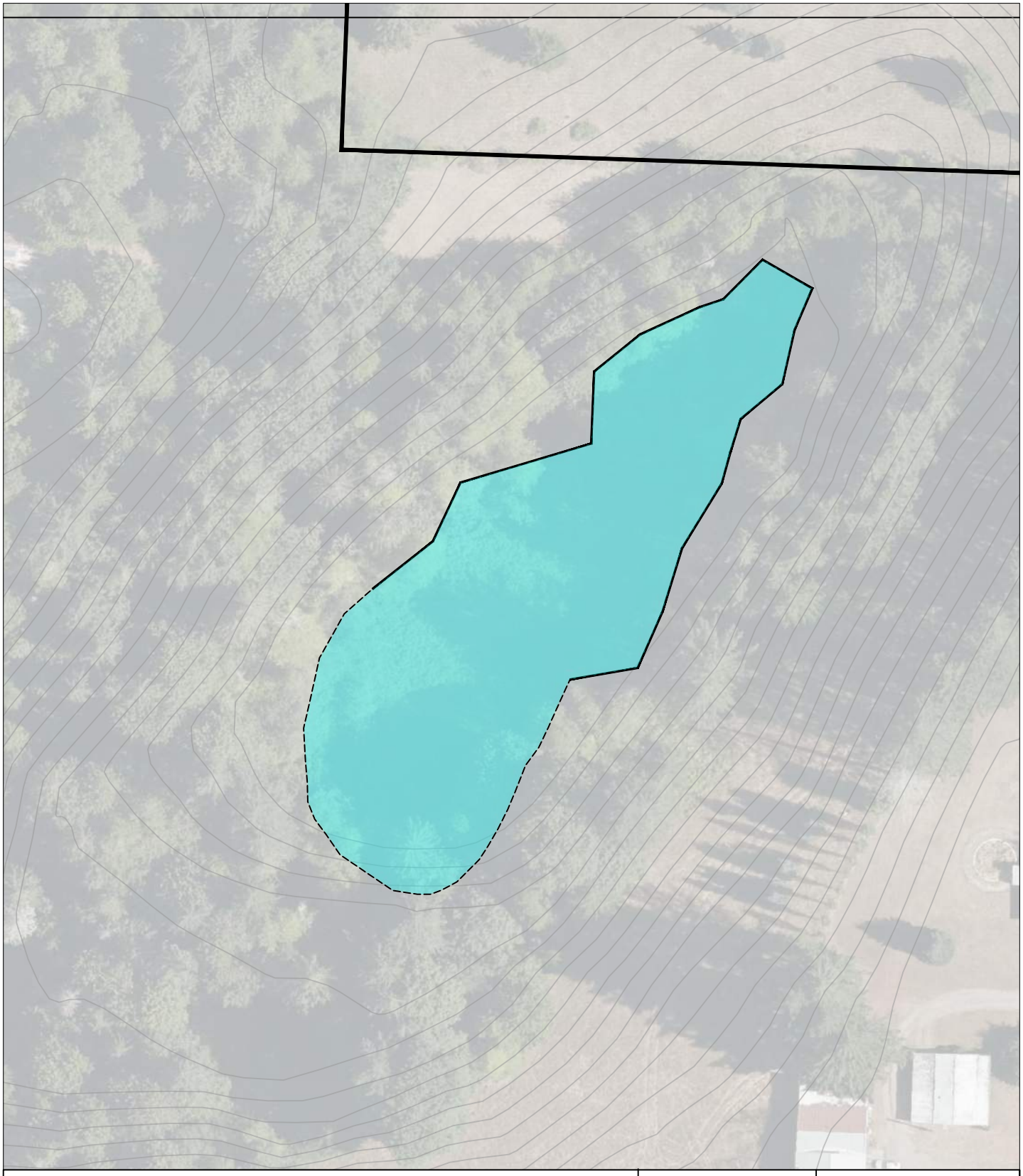
Critical Areas Buffers

N

Scale: 1" = 200'

0 200'

15 September 2021



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Scrub-shrub Seasonally-flooded

Figure 6

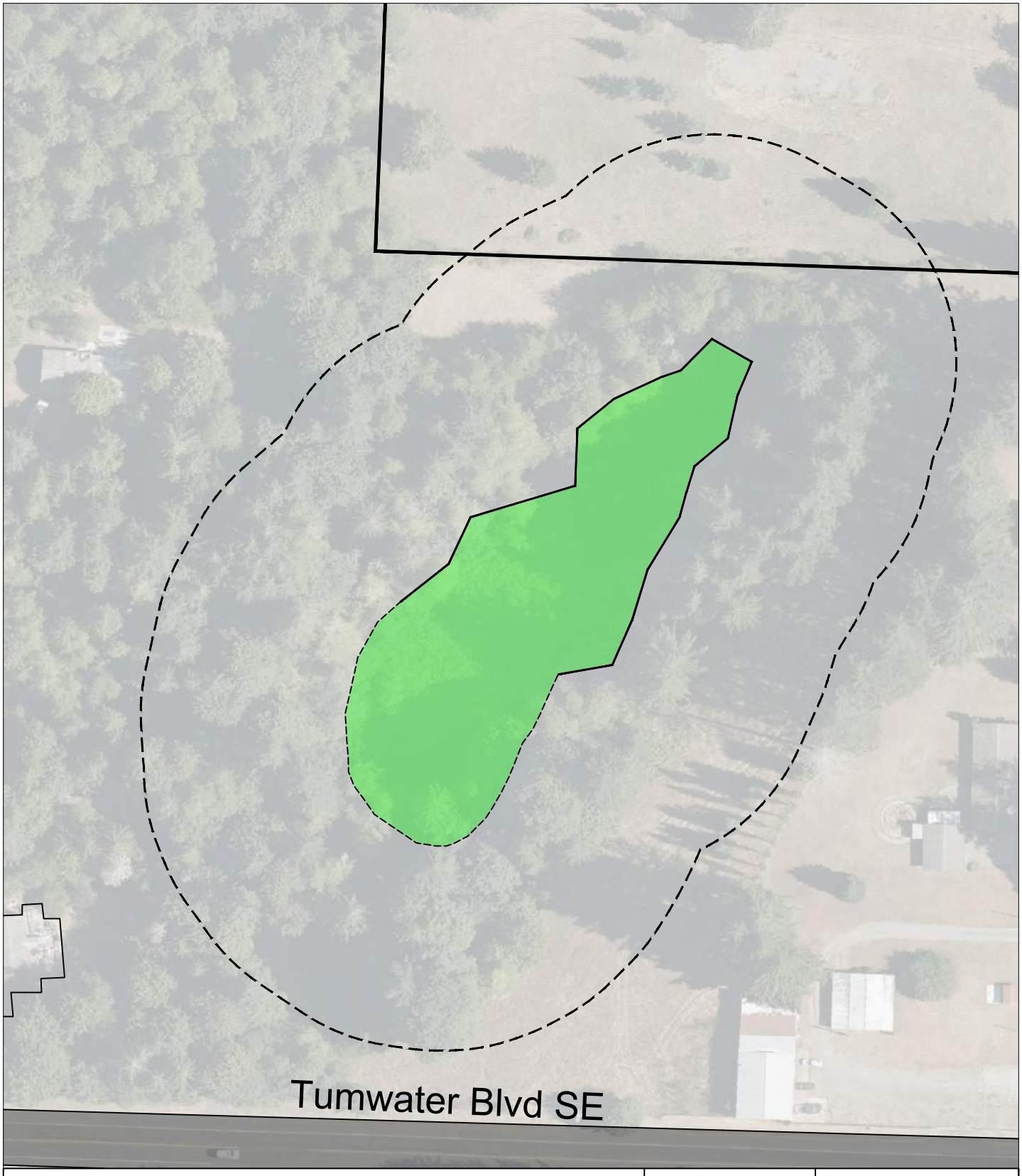
Henderson Property

Vegetation Classes & Hydroperiods

Scale: 1"= 80'

0 80'

15 September 2021



EnviroVector
OPTIMIZE USABLE LAND
curtis@envirovector.com
www.envirovector.com
360-790-1559

Potential Pollutants (0%)
150 ft Polygon (267916 sf)
Potential Pollutants (0 sf)
150-foot Polygon

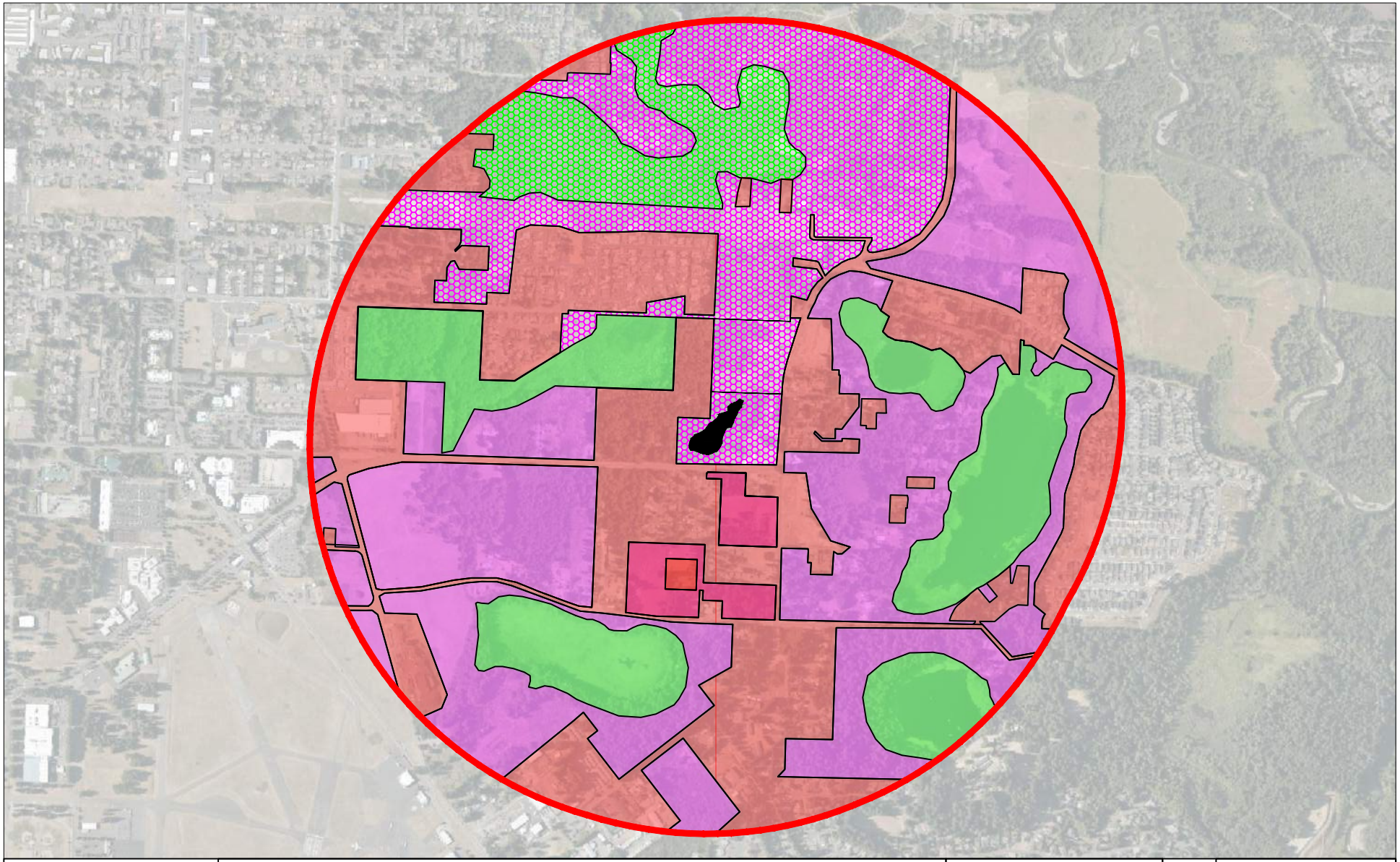
Figure 7

Henderson Property

Potential Pollutants within 150 ft of wetland

Scale: 1"= 100'
0 100'

15 September 2021



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360-790-1559

Accessible Habitat (2,272,993 sf, 52 acres, 6%)

Accessible Moderate to Low Intensity Land Use (6,237,797sf, 143 acres, 16%)

Total Undisturbed Habitat + Accessible Habitat (5,851,362 sf, 134 acres, 15%)

Low to Moderate Intensity Land Use + accessible Low to Moderate (18,670,333 sf, 429 acres, 48%)

High Intensity Land Use (11,738,338 sf, 270 acres, 31%)

1km Polygon 38,547,237 sf, 885 acres

H2.1: 5.9% + 44%/2 = 16% (1 points) H2.2: 21% + 48%/2 = 45% (1 point) H2.3: High Intensity = 31% (0 points)

Figure 8

Henderson Property

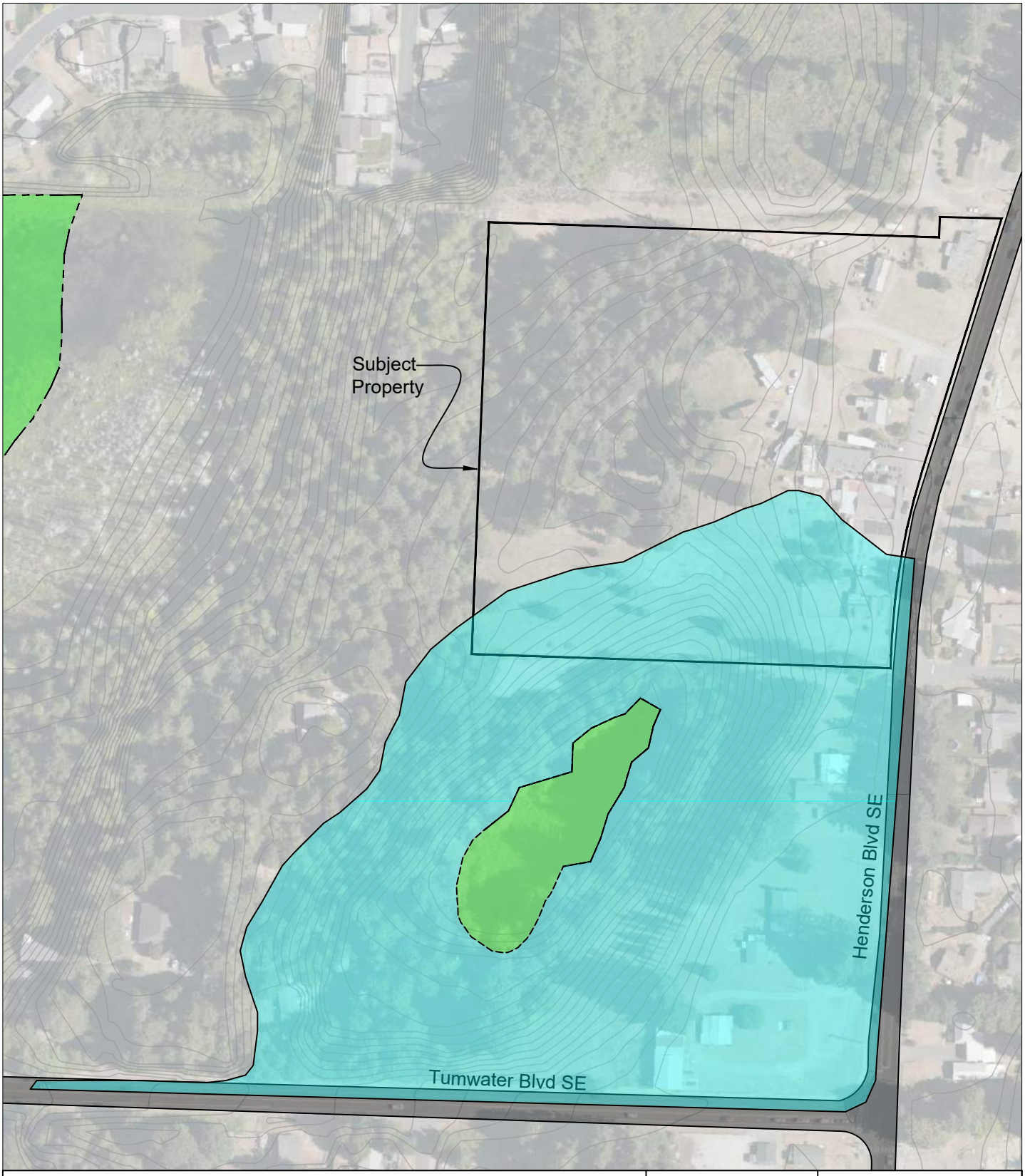
1 KM Polygon

N

Scale: 1" = 1200'

0 1200'

15 September 2021



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360-790-1559

Contributing Basin
<10x Wetlands A

Figure 9

Henderson
Property

Contributing Basin

Scale: 1"= 200'

0 200'

15 September 2021

APPENDIX A

Photographs

Subject Property and Vicinity

Photo 1. Western portion of subject property

Photo 2. Grassland on subject property

Photo 3. Area of bracken fern

Photo 4. Maintain grass lawn on subject property

Photo 5. Frontage of subject proeprty

Photo 6. Maintained lawn and fences on subject property

Photo 7. Internal roads on eastern portion of property

Photo 8. Eastern portion of subject property

Photo 9. Development east of subject property

Photo 10. Development occurring east of subject property

Wetland A

Photo 11. Skunk cabbage (OBL) in Wetland A

Photo 12. Water Parsley (OBL) in Wetland A

Photo 13. Wetland vegetation

Photo 14. Slough sedge (OBL) within wetland

Photo 15. Upland buffer area

Photo 16. Bare ground and hydric soil

Photo 17. Water parsley (OBL) and bare ground in wetland

Photo 18. Bare ground and hydric soil

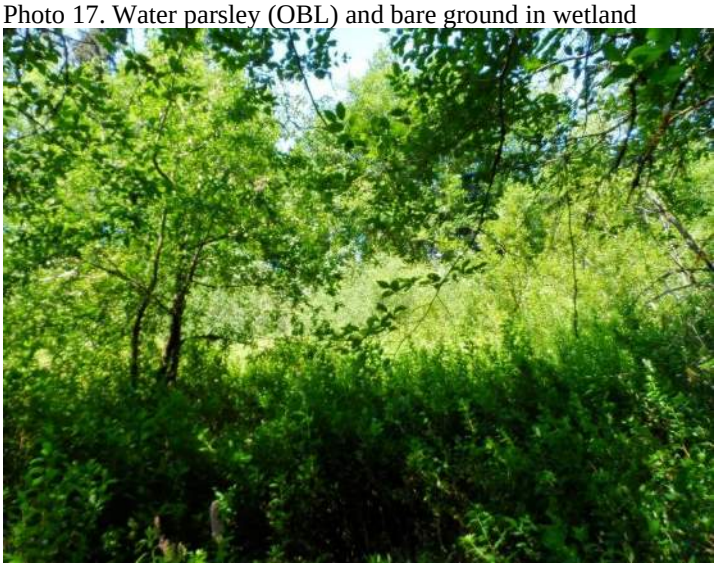


Photo 19. Douglas spirea (FACW) & pacific crabapple (FACW)

Photo 20. Water parsley (OBL) and pacific crabapple (FACW)

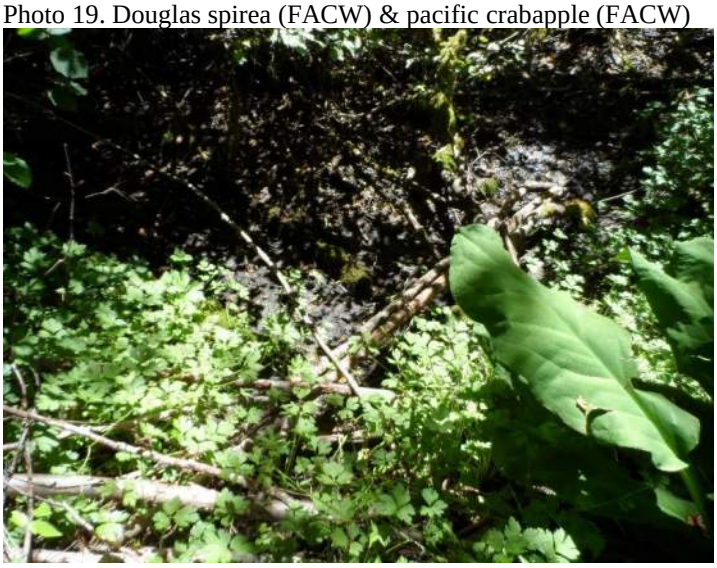
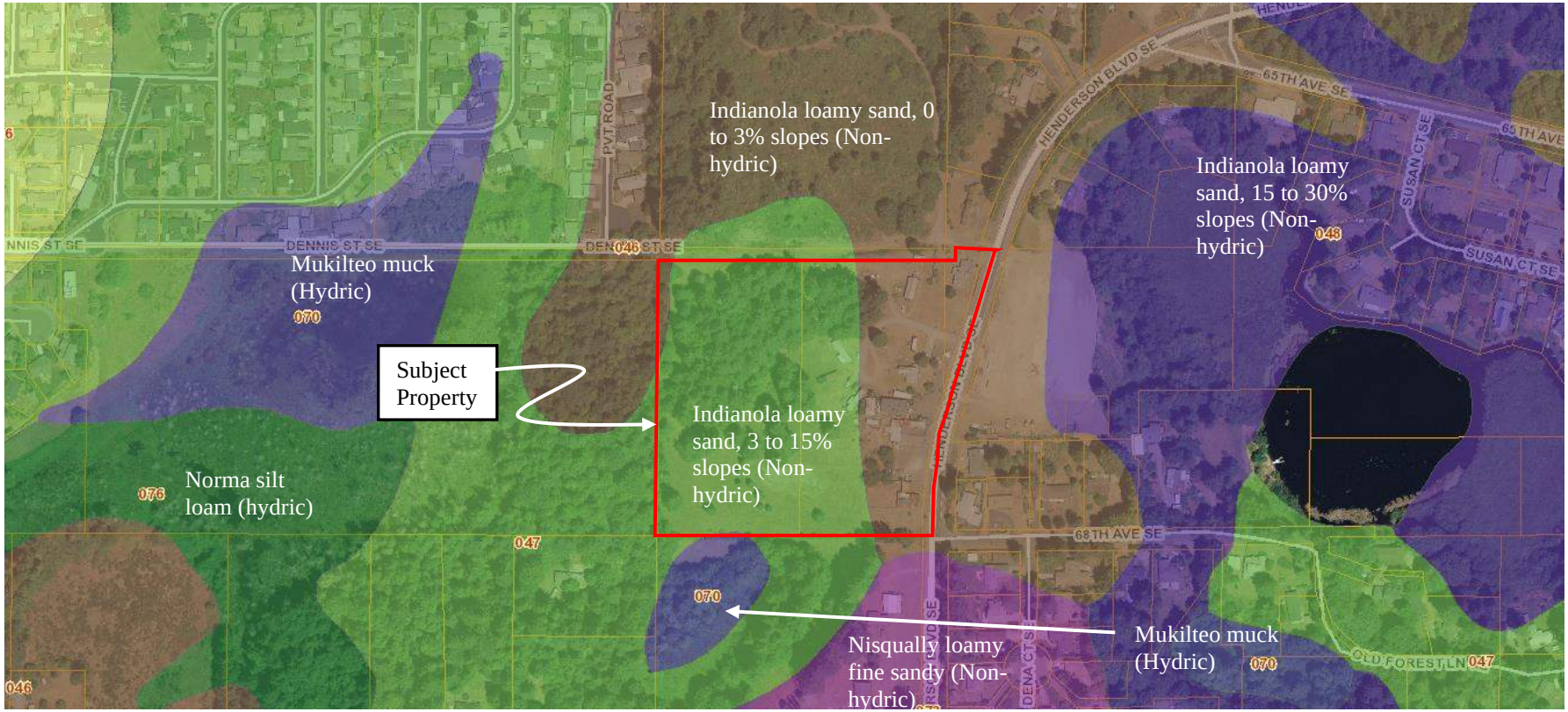


Photo 21. Creeping Buttercup (FAC) & skunk cabbage (OBL)

APPENDIX B

Thurston County Geodata

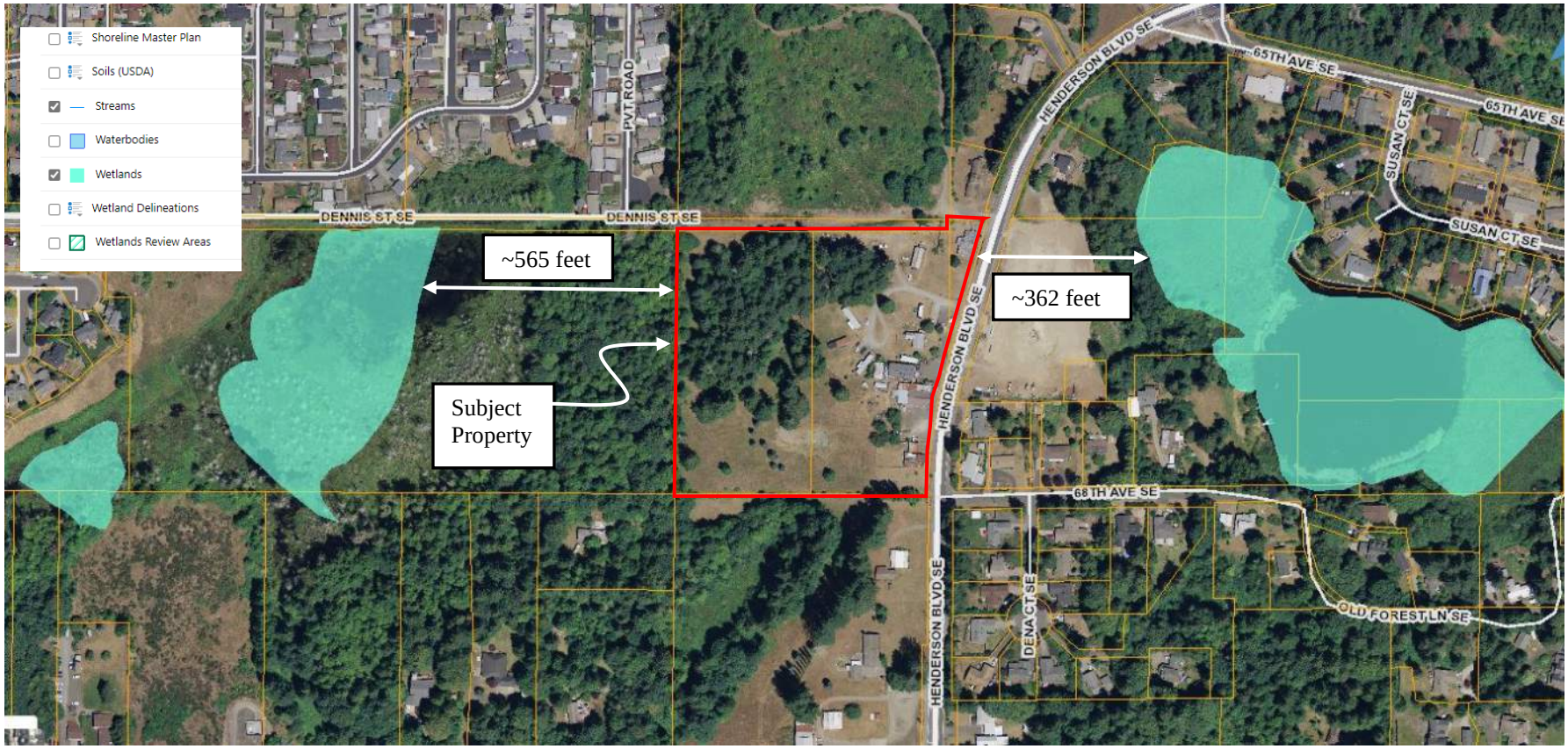
Soils


Indianola loamy sand, 0 to 3% slopes (Non-hydric)
Indianola loamy sand, 15 to 30% slopes (Non-hydric)
Mukilteo muck (Hydric)
Subject Property
Indianola loamy sand, 3 to 15% slopes (Non-hydric)
Norma silt loam (hydric)
Nisqually loamy fine sandy (Non-hydric)
Mukilteo muck (Hydric)
DENNIS ST SE
PVT ROAD
HENDERSON BLVD SE
65TH AVE SE
SUSAN CT SE
68TH AVE SE
OLD FOREST LN
070
047
046
048
076

APPENDIX C

Thurston County Geodata

Wetlands & Streams

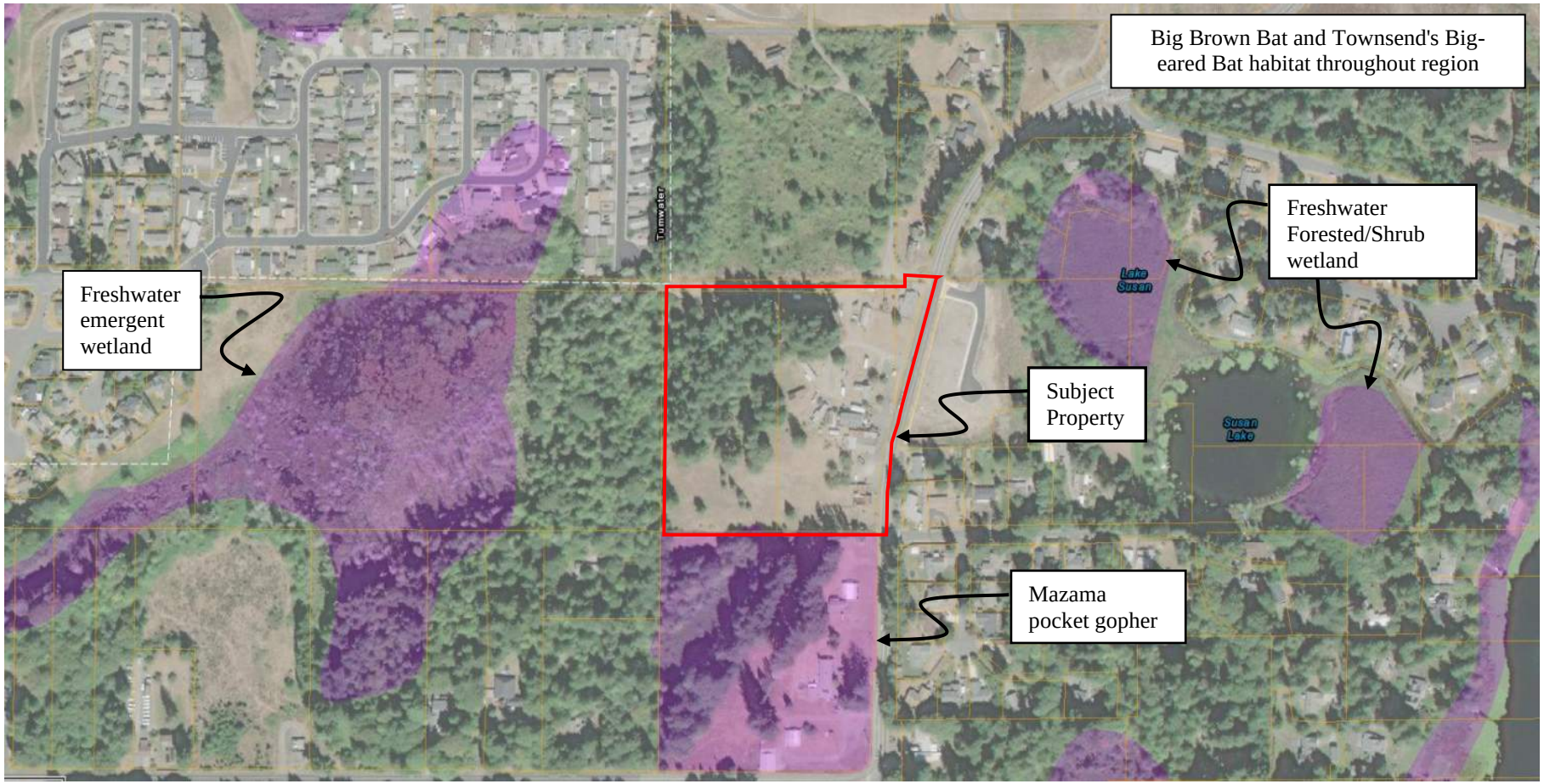

Shoreline Master Plan
Soils (USDA)
Streams
Waterbodies
Wetlands
Wetland Delineations
Wetlands Review Areas
DENNIS ST SE
DENNIS ST SE
PVT ROAD
HENDERSON BLVD SE
65TH AVE SE
65TH AVE SE
SUSAN CT SE
SUSAN CT SE
~565 feet
~362 feet
Subject Property
HENDERSON BLVD SE
HENDERSON BLVD SE
68TH AVE SE
DENA CT SE
OLD FOREST LN SE

APPENDIX D

Washington Department of Fish and Wildlife (WDFW)

Priority Habitats and Species (PHS)

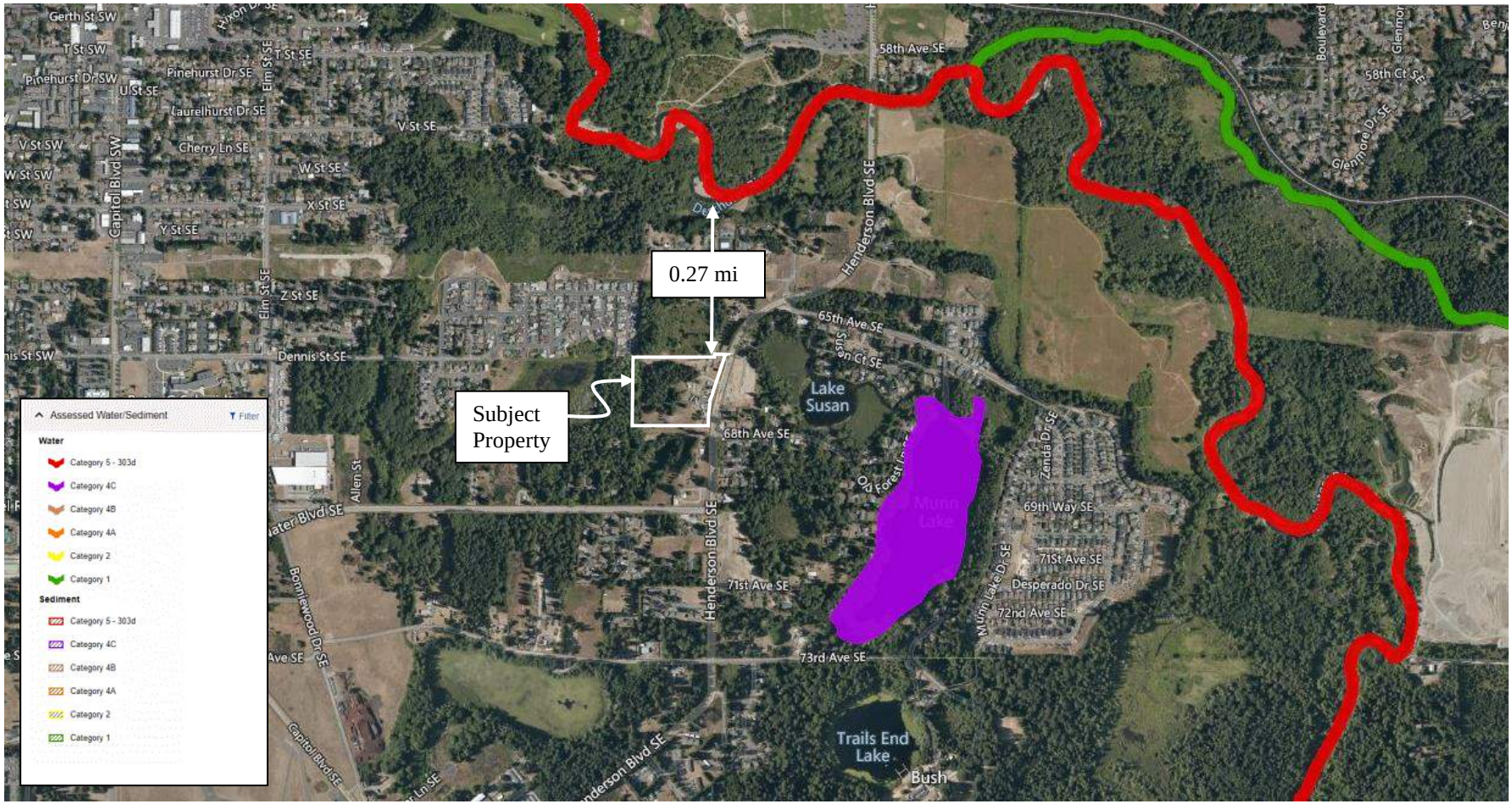
Database


Big Brown Bat and Townsend's Big-eared Bat habitat throughout region
Freshwater Forested/Shrub wetland
Freshwater emergent wetland
Subject Property
Mazama pocket gopher
Lake Susan
Susan Lake
Tumwater

APPENDIX E

Clean Water Act

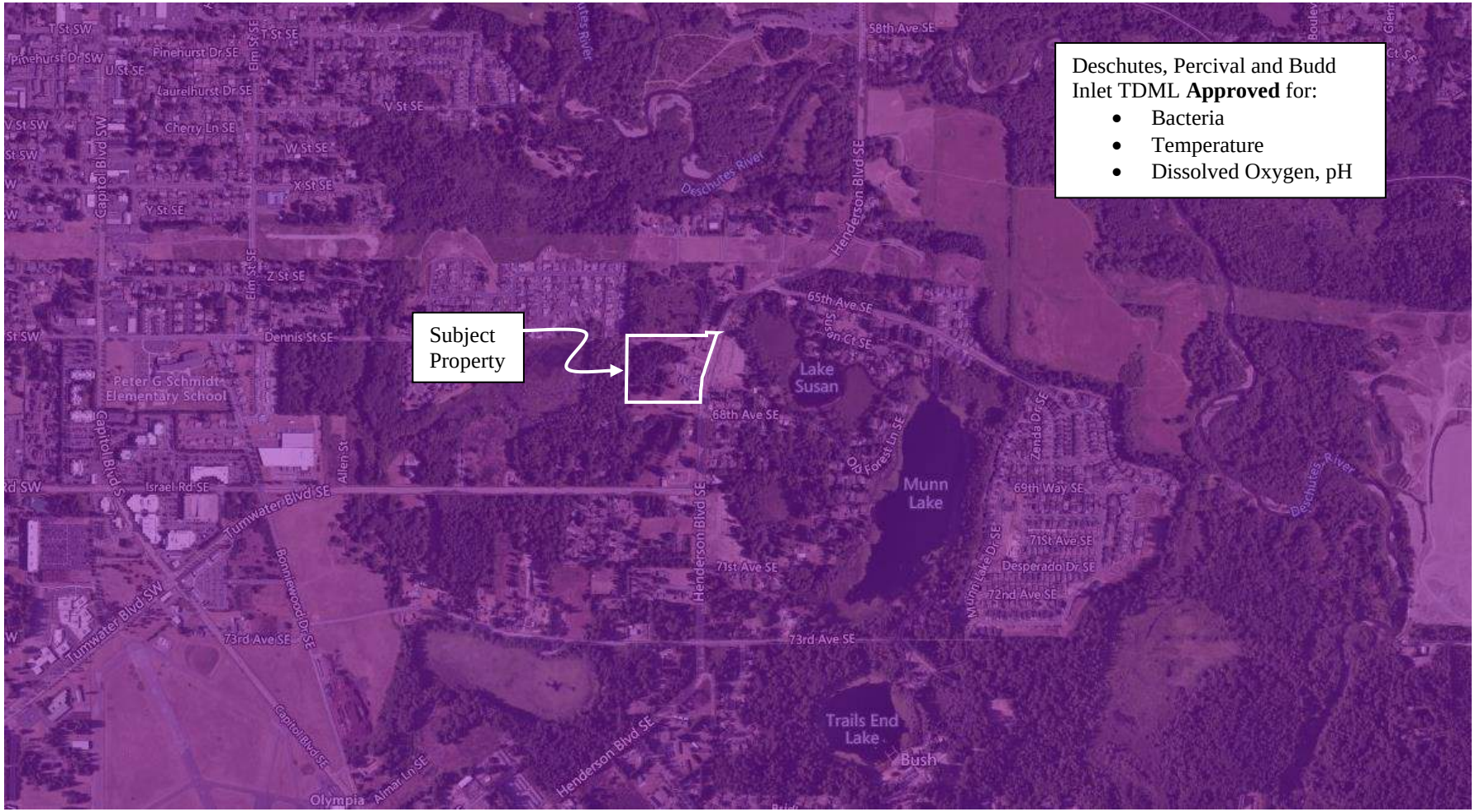
303(d) List


0.27 mi
Subject Property
Assessed Water/Sediment
Filter
Water
Category 5 - 303d
Category 4C
Category 4B
Category 4A
Category 2
Category 1
Sediment
Category 5 - 303d
Category 4C
Category 4B
Category 4A
Category 2
Category 1
Lake Susan
Munn Lake
Trails End Lake
Henderson Blvd SE
58th Ave SE
65th Ave SE
68th Ave SE
69th Way SE
71st Ave SE
72nd Ave SE
73rd Ave SE
Desperado Dr SE
Munn Lake Dr SE
Dennis St SE
Pinehurst Dr SE
Laurelhurst Dr SE
Cherry Ln SE
Capitol Blvd SW
Elm St SE
Allen St
Bonniewood Dr SE
Zenda Dr SE
Glenmore Dr SE
Gerth St SW
T St SW
T St SE
U St SE
V St SE
V St SW
W St SE
X St SE
Y St SE
Z St SE

APPENDIX F

Total Maximum Daily Load

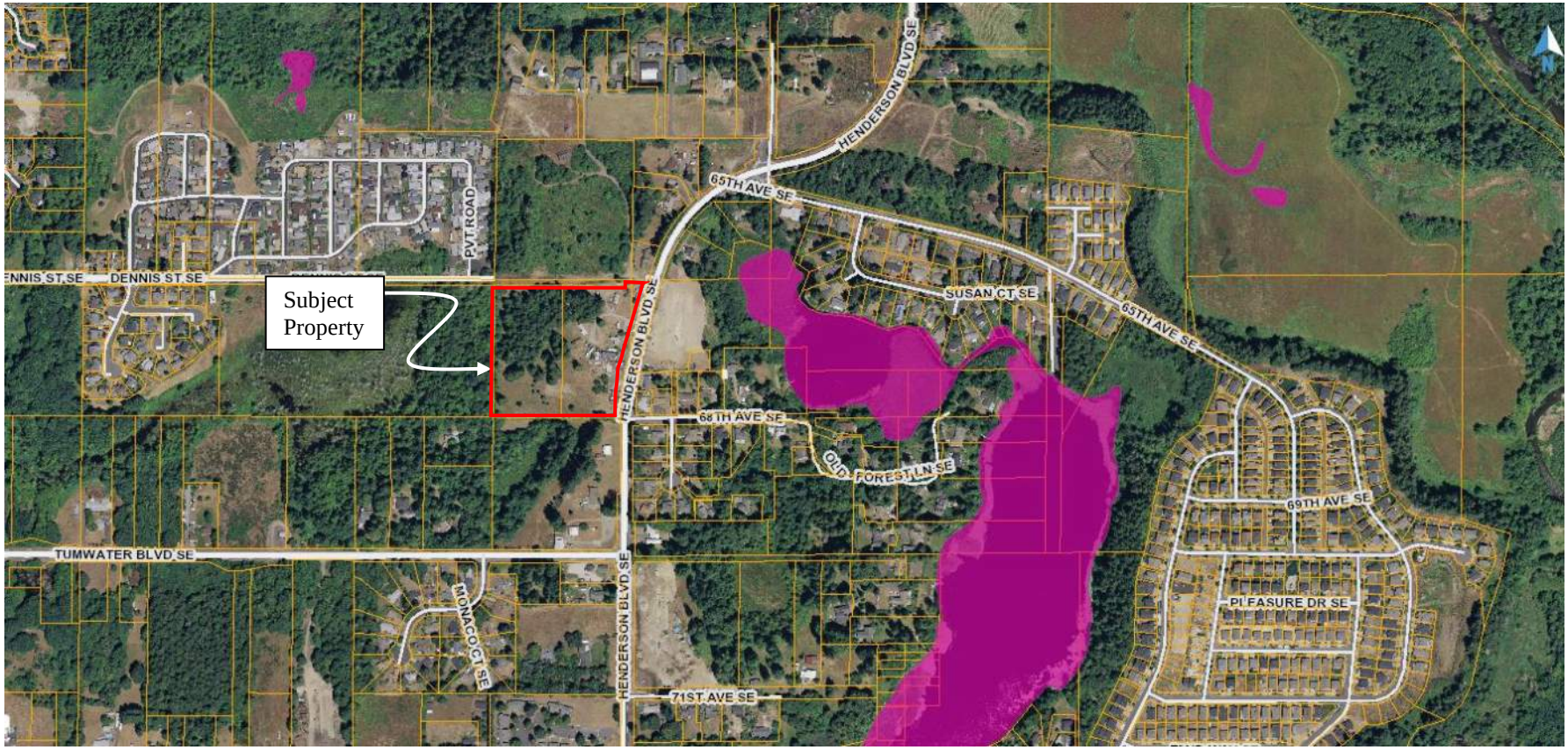
(TMDL)


Deschutes, Percival and Budd Inlet TDML **Approved** for:
• Bacteria
• Temperature
• Dissolved Oxygen, pH
Subject Property
Lake Susan
Munn Lake
Trails End Lake
Bush
Peter G Schmidt Elementary School
Deschutes River
Henderson Blvd SE
Capitol Blvd SW
Turnwater Blvd SE
Turnwater Blvd SW
Dennis St SE
Israel Rd SE
65th Ave SE
68th Ave SE
69th Way SE
71st Ave SE
72nd Ave SE
73rd Ave SE
Desperado Dr SE
Old Forest Ln SE
Munn Lake Dr SE
Zenda Dr SE
Allen St
Bonniewood Dr SE
Olympia
58th Ave SE

APPENDIX G

Thurston County Geodata

High Groundwater Hazard Area

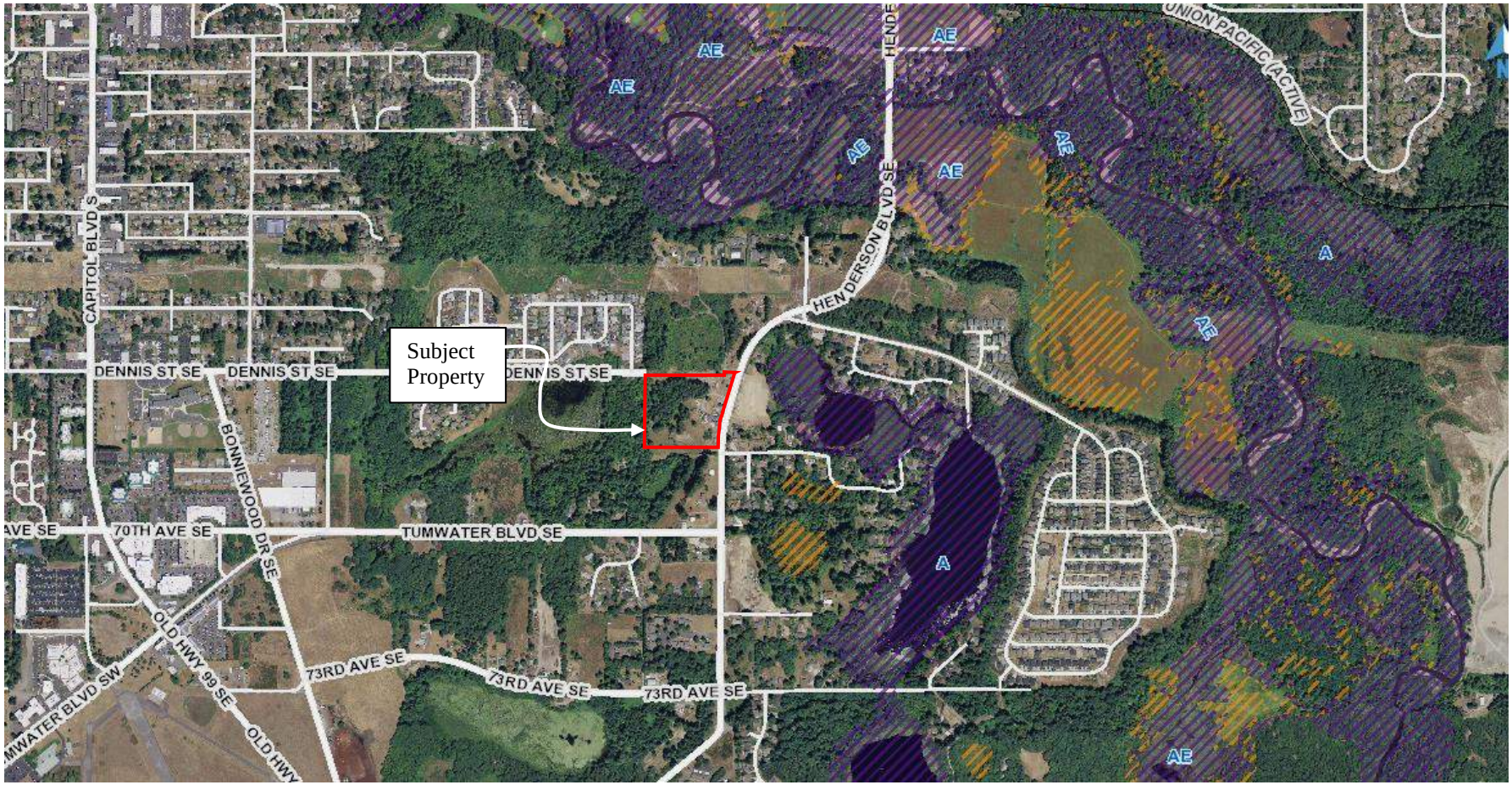


— High Groundwater Hazard Areas

High Groundwater Hazard Area

APPENDIX H

FEMA Floodplain


Subject Property
DENNIS ST SE
DENNIS ST SE
DENNIS ST SE
CAPITOL BLVD S
BONNIEWOOD DR SE
70TH AVE SE
TUMWATER BLVD SE
HENDERSON BLVD SE
73RD AVE SE
73RD AVE SE
73RD AVE SE
OLD HWY 99 SE
AE
A

APPENDIX I

Wetland Rating Forms

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A Date of site visit: 7-Jul-21

Rated by Curtis Wambach Trained by Ecology? ☑ Yes ☐ No Date of training Continual

HGM Class used for rating Depressional & Flats Wetland has multiple HGM classes? ☐ Yes ☑ No

NOTE: Form is not complete with out the figures requested (*figures can be combined*).
Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY III (based on functions ☐ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

_____ **Category I** - Total score = 23 - 27
_____ **Category II** - Total score = 20 - 22
X **Category III** - Total score = 16 - 19
_____ **Category IV** - Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	List appropriate rating (H, M, L)			
Site Potential	M	M	L	
Landscape Potential	M	M	M	
Value	H	L	M	**Total**
Score Based on Ratings	7	5	5	**17**

Score for each function based on three ratings (*order of ratings is not important*)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	Category
Estuarine	
Wetland of High Conservation Value	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	

Maps and Figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (*can be added to another figure*)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to another figure*)	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

HGM Classification of Wetland in Western Washington

For questions 1 -7, the criteria described must apply to the entire unit being rated.
If hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1 - 7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

☐ NO - go to 2 ☐ **YES** - the wetland class is **Tidal Fringe** - go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☐ **NO - Saltwater Tidal Fringe (Estuarine)** ☐ **YES - Freshwater Tidal Fringe**
*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

☐ NO - go to 3 ☐ **YES** - The wetland class is **Flats**
*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
☐ At least 30% of the open water area is deeper than 6.6 ft (2 m).

☐ NO - go to 4 ☐ **YES** - The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
☐ The wetland is on a slope (*slope can be very gradual*),
☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
☐ The water leaves the wetland **without being impounded.**

☐ NO - go to 5 ☐ **YES** - The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
☐ The overbank flooding occurs at least once every 2 years.

☐ NO - go to 6 ☐ **YES** - The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding.

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO - go to 7 ☐ **YES** - The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ NO - go to 8 ☐ **YES** - The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

NOTES and FIELD OBSERVATIONS:

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?		
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. ☐ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing ☐ Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 3 points = 2 points = 1 points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (*use NRCS definitions*).	Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area Wetland has persistent, ungrazed, plants > ½ of area Wetland has persistent, ungrazed plants > $^1/_{10}$ of area Wetland has persistent, ungrazed plants < $^1/_{10}$ of area	points = 5 points = 3 points = 1 points = 0	5
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland Area seasonally ponded is > ¼ total area of wetland Area seasonally ponded is < ¼ total area of wetland	points = 4 points = 2 points = 0	2
Total for D 1	Add the points in the boxes above	**10**

Rating of Site Potential If score is: ☐ **12 - 16 = H** ☑ **6 - 11 = M** ☐ **0 - 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?		
D 2.1. Does the wetland unit receive stormwater discharges?	Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland?	Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1 - D 2.3? Source	Yes = 1 No = 0	0
Total for D 2	Add the points in the boxes above	**2**

Rating of Landscape Potential If score is: ☐ **3 or 4 = H** ☑ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?		
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?	Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list?	Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)?	Yes = 2 No = 0	2
Total for D 3	Add the points in the boxes above	**4**

Rating of Value If score is: ☑ **2 - 4 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?		
D 4.1. Characteristics of surface water outflows from the wetland:		4
Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet	points = 2	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch	points = 1	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 0	
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.*		3
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
☑ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
☐ The wetland is a "headwater" wetland	points = 3	
Wetland is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 in)	points = 0	
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.*		3
☐ The area of the basin is less than 10 times the area of the unit	points = 5	
The area of the basin is 10 to 100 times the area of the unit	points = 3	
The area of the basin is more than 100 times the area of the unit	points = 0	
☐ Entire wetland is in the Flats class	points = 5	
Total for D 4	Add the points in the boxes above	**10**

Rating of Site Potential If score is: ☐ **12 - 16 = H** ☑ **6 - 11 = M** ☐ **0 - 5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic function of the site?		
D 5.1. Does the wetland unit receive stormwater discharges?	Yes = 1 No = 0	1
D 5.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?	Yes = 1 No = 0	0
Total for D 5	Add the points in the boxes above	**2**

Rating of Landscape Potential If score is: ☐ **3 = H** ☑ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?		
D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.*		0
The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):		
● Flooding occurs in a sub-basin that is immediately down-gradient of unit.	points = 2	
☐ ● Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
☐ Flooding from groundwater is an issue in the sub-basin.	points = 1	
☐ The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why	points = 0	
☑ There are no problems with flooding downstream of the wetland.	points = 0	
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	Yes = 2 No = 0	0

Total for D 6	Add the points in the boxes above	0

Rating of Value If score is: ☐ **2 - 4 = H** ☐ **1 = M** ☑ **0 = L** *Record the rating on the first page*

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

- ☐ Aquatic bed
- ☐ Emergent
- ☑ Scrub-shrub (areas where shrubs have > 30% cover)
- ☐ Forested (areas where trees have > 30% cover)

4 structures or more: points = 4
3 structures: points = 2
2 structures: points - 1
1 structure: points = 0

If the unit has a Forested class, check if:

- ☐ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

0

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

- ☐ Permanently flooded or inundated
- ☑ Seasonally flooded or inundated
- ☐ Occasionally flooded or inundated
- ☐ Saturated only

4 or more types present: points = 3
3 types present: points = 2
2 types present: points = 1
1 types present: points = 0

- ☐ Permanently flowing stream or river in, or adjacent to, the wetland
- ☐ Seasonally flowing stream in, or adjacent to, the wetland
- ☐ **Lake Fringe wetland** **2 points**
- ☐ **Freshwater tidal wetland** **2 points**

0

H 1.3. Richness of plant species

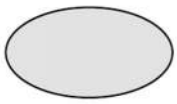
Count the number of plant species in the wetland that cover at least 10 ft^2.
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

If you counted:
- > 19 species — points = 2
- 5 - 19 species — points = 1
- < 5 species — points = 0

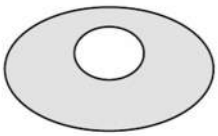
1

H 1.4. Interspersion of habitats

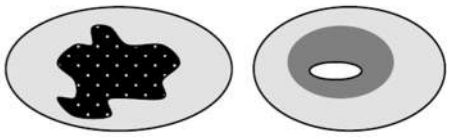
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



None = 0 points

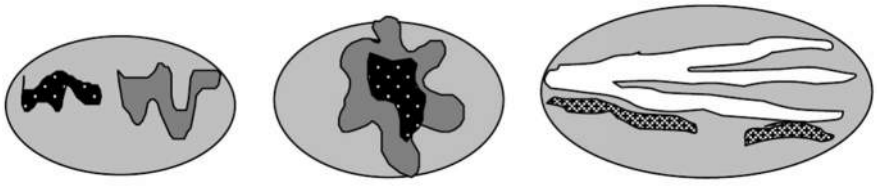


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **HIGH** = 3 points



0

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☑ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) ☑ Standing snags (dbh > 4 in) within the wetland ☐ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet weathered where wood is exposed*) ☑ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*) ☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	3
Total for H 1 Add the points in the boxes above	**4**

Rating of Site Potential If Score is: ☐ **15 - 18 = H** ☐ **7 - 14 = M** ☑ **0 - 6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat function of the site?	
H 2.1 Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* 5.9 % undisturbed habitat + (16 % moderate & low intensity land uses / 2) = 13.9% If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20 - 33% of 1 km Polygon points = 2 10 - 19% of 1 km Polygon points = 1 < 10 % of 1 km Polygon points = 0	1
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* 21 % undisturbed habitat + (48 % moderate & low intensity land uses / 2) = 45% Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3 Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (-2) ≤ 50% of 1km Polygon is high intensity points = 0	0
Total for H 2 Add the points in the boxes above	**2**

Rating of Landscape Potential If Score is: ☐ **4 - 6 = H** ☑ **1 - 3 = M** ☐ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated* . Site meets ANY of the following criteria: points = 2 ☐ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) with in 100m points = 1 Site does not meet any of the criteria above points = 0	1

Rating of Value If Score is: ☐ **2 = H** ☑ **1 = M** ☐ **0 = L** *Record the rating on the first page*

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp.
http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here:
http://wdfw.wa.gov/conservation/phs/list/

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE**: This question is independent of the land use between the wetland unit and the priority habitat.*

- ☐ **Aspen Stands**: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- ☐ **Herbaceous Balds**: Variable size patches of grass and forbs on shallow soils over bedrock.
- ☐ **Old-growth/Mature forests**: Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- ☐ **Oregon White Oak**: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).
- ☐ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- ☐ **Westside Prairies**: Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).
- ☐ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).
- ☐ **Caves**: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- ☐ **Cliffs**: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ☑ **Snags and Logs**: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are

addressed elsewhere.

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.*	Category
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes - Go to **SC 1.1** ☐ No = **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ Yes = **Category I** ☐ No - Go to **SC 1.2**	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina* , see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐ Yes = **Category I** ☐ No = **Category II**	
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐ Yes - Go to **SC 2.2** ☐ No - Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐ Yes = **Category I** ☐ No = **Not WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐ Yes - **Contact WNHP/WDNR and to SC 2.4** ☐ No = **Not WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐ Yes = **Category I** ☐ No = **Not WHCV**	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions*** . SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☐ Yes - Go to **SC 3.3** ☐ No - Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? ☐ Yes - Go to **SC 3.3** ☐ No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐ Yes = **Is a Category I bog** ☐ No - Go to **SC 3.4** **NOTE**: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed	

in Table 4 provide more than 30% of the cover under the canopy?

☐ Yes = **Is a Category I bog** ☐ No = **Is not a bog**

SC 4.0. Forested Wetlands

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

☐ Yes = **Category I** ☐ No = **Not a forested wetland for this section**

SC 5.0. Wetlands in Coastal Lagoons

Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks

☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)

☐ Yes - Go to **SC 5.1** ☐ No = **Not a wetland in a coastal lagoon**

SC 5.1. Does the wetland meet all of the following three conditions?

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).

☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.

☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2)

☐ Yes = **Category I** ☐ No = **Category II**

SC 6.0. Interdunal Wetlands

Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.***

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109

☐ Yes - Go to **SC 6.1** ☐ No = **Not an interdunal wetland for rating**

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?

☐ Yes = **Category I** ☐ No - Go to **SC 6.2**

SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?

☐ Yes = **Category II** ☐ No - Go to **SC 6.3**

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?

☐ Yes = **Category III** ☐ No = **Category IV**

Category of wetland based on Special Characteristics

If you answered No for all types, enter "Not Applicable" on Summary Form

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28 September 2021

Evan Mann
PO BOX 73790
Puyallup, WA 98373

Reference: Henderson Boulevard Property
Subject: Mazama Pocket Gopher Screening to Satisfy City of Tumwater Permitting Requirements

Dear Evan Mann:

At your request, EnviroVector prepared this report to satisfy City of Tumwater requirements for Mazama pocket gopher screenings on the Subject Property (**Table 1; Figure 1**).

Table 1. Parcels Comprising Subject Property

No#	Property Address	Parcel Number	Section Township Range	Property Size (Acres)
1	---	12701320105	Section 02 Township 17N Range 2W	0.34
2	---	79300000101		4.77
3	---	79300000100		4.62
3 Parcels	Total Size			9.73 acres

The permitting jurisdiction is City of Tumwater.

1.0 INTRODUCTION

The Mazama pocket gopher is a Federally Threatened species protected under the Endangered Species Act and the City of Tumwater Code. Mazama pocket gopher screenings were performed by a qualified biologist certified by the US Fish and Wildlife Service (USFWS) for the purpose of satisfying the City of Tumwater (2018) Site Inspection Protocol and Procedures: Mazama Pocket Gopher (**Appendix E**).

A Mazama pocket gopher screening is necessary to comply with City of Tumwater Code and the Endangered Species Act.

2.0 METHODOLOGY

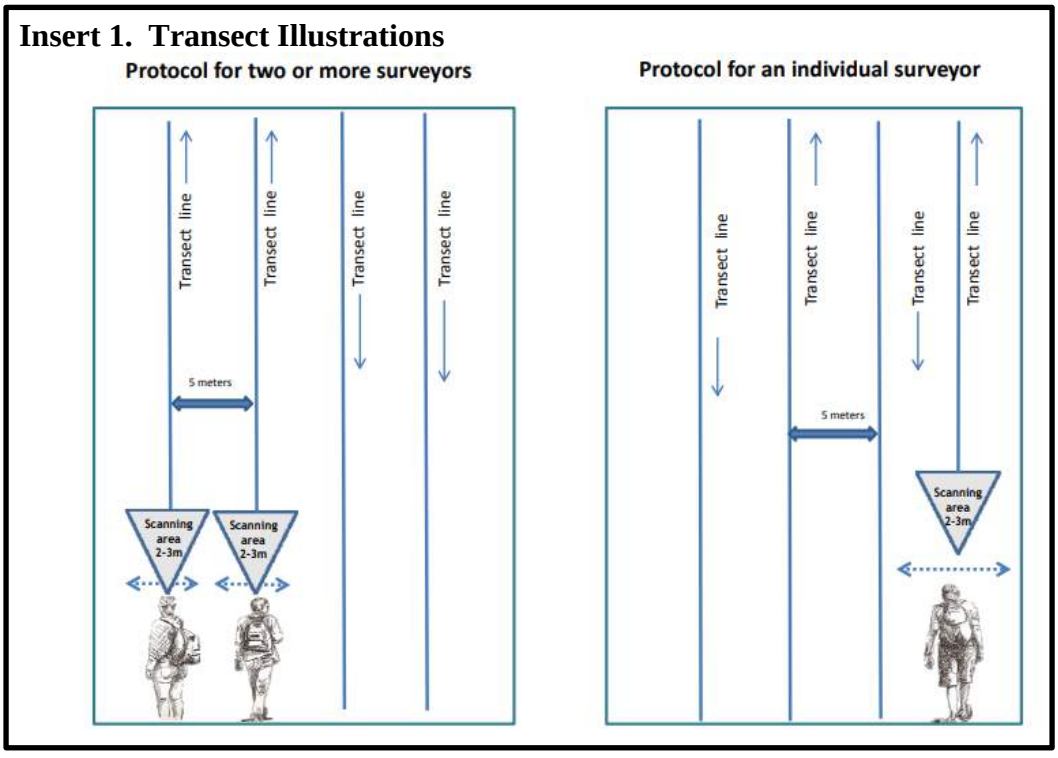
The Mazama pocket gopher screening was performed on 16 September 2020 and 27 October 2019 per City of Tumwater recommendations for two (2) site visits in compliance with the City of Tumwater (July 2018) Mazama Pocket Gopher Screening Protocol (**Appendix E**). The screening was performed within the USFWS prescribed survey window (June 1 through October 31).

In compliance with the USFWS and City of Tumwater (2018) Mazama Pocket Gopher Screening Protocols:

- The study has occurred during the prescribed work window of June 1 to October 31.
- A qualified biologist performed the screenings that has been trained and certified by the USFWS.
- The entire property was evaluated, not just the project footprint.
- The site was visited two (2) times at least thirty (30) days apart.
- Data was recorded on datasheets and provided in **Appendix F**.
- The areas of the property covered under the screening survey is illustrated in **Figure 2**.
- The ground was easily visible.

The site evaluation was conducted utilizing USFWS recommended protocol for one (1) surveyor (**Insert 1**). The search pattern had been performed along five (5) meter transects, including brushy and treed areas, examined for any evidence of mounding activity created by the Mazama pocket gopher.

Insert 1. Transect Illustrations



The detailed field methodology is in compliance with the City of Tumwater (2018) Site Inspection Protocol and Procedures: Mazama Pocket Gopher as follows:

1. The survey crew orients themselves with the layout of the property using aerial maps and strategizes their route for walking through the property.
2. Start GPS to record survey route.
3. Walk the survey transects methodically, slowly walking a straight line and scanning an area approximately 2-3 meters to the left and right as you walk, looking for mounds. Transects should be no more than five (5) meters apart when conducted by a single individual.
4. If the survey is performed by a team, walk together in parallel lines approximately 5 meters apart while you are scanning left to right for mounds.
5. At each mound found, stop and identify it as a MPG or mole mound. If it is a MPG mound, identify it as a singular mound or a group (3 mounds or more) on a data sheet to be submitted to the County.
6. Record all positive MPG mounds, likely MPG mounds, and MPG mound groups in a GPS unit that provides a date, time, georeferenced point, and other required information in County GPS data instruction for each MPG mound. Submit GPS data in a form acceptable to the County.
7. Photograph all MPG mounds or MPG mound groups. At a minimum, photograph MPG mounds or MPG mound groups representative of MPG detections on site.
8. Photos of mounds should include one that has identifiable landscape features for reference. In order to accurately depict the presence of gopher activity on a specific property, the following series of photos should be submitted to the County:
    a. At least one up-close photo to depict mound characteristics
    b. At least one photo depicting groups of mounds as a whole (when groups are encountered).
    c. At least one photo depicting gopher mounds with recognizable landscape features in the background, at each location where mounds are detected on a property
    d. Photos can be taken with the GPS unit or a separate, camera, preferably a camera with locational features (latitude, longitude)
    e. Photo point description or noteworthy landscape or other features to aid in relocation. Additional photos to be considered
    f. The approximate building footprint location from at least two cardinal directions.
    g. Landscape photos to depict habitat type and in some cases to indicate why not all portions of a property require gopher screening.
9. Describe and/or quantify what portion and proportion of the property was screened and record your survey route and any MPG mounds found on either an aerial or parcel map.

10. If MPG mounds are observed on a site, that day's survey effort should continue until the entire site is screened and all mounds present identified, but additional site visits are not required.
11. In order for the County to accurately review Critical Area Reports submitted in lieu of County field inspections the information collected in the field (GPS, data sheets, field notes, transect representations on aerial, etc.) shall be filed with the County. GPS information shall be submitted in a form approved by the County.

Soils known to be associated with the Mazama pocket gopher are listed in **Insert 2**.

Insert 2. Mazama pocket gopher soils

Table 1. Soils known to be associated with Mazama pocket gopher occupancy.

Mazama Pocket Gopher Preference	Soil Type
More Preferred (formerly High and Medium Preference Soils)	Nisqually loamy fine sand, 0 to 3 percent slopes Nisqually loamy fine sand, 3 to 15 percent slopes Spanaway-Nisqually complex, 2 to 10 percent slopes Cagey loamy sand Indianola loamy sand, 0 to 3 percent slopes Spanaway gravelly sandy loam, 0 to 3 percent slopes Spanaway gravelly sandy loam, 3 to 15% slopes
Less Preferred (formerly Low Preference Soils)	Alderwood gravelly sandy loam, 0 to 3 percent slopes Alderwood gravelly sandy loam, 3 to 15 percent slopes Everett very gravelly sandy loam, 0 to 3 percent slopes Everett very gravelly sandy loam, 3 to 15 percent slopes Indianola loamy sand, 3 to 15 percent slopes Kapowsin silt loam, 3 to 15 percent slopes McKenna gravelly silt loam, 0 to 5 percent slopes Norma fine sandy loam Norma silt loam Spana gravelly loam Spanaway stony sandy loam, 0 to 3 percent slopes Spanaway stony sandy loam, 3 to 15 percent slopes Yelm fine sandy loam, 0 to 3 percent slopes Yelm fine sandy loam, 3 to 15 percent slopes

3.0 BACKGROUND INFORMATION

3.1 Thurston County Geodatabase Soils

Two (2) soil types were identified on the subject property, Indianola loamy sand, 0 to 3 percent slopes, which is classified as "More preferred" gopher soils and Indianola loamy sand, 3 to 15 percent slopes "Less preferred" gopher soils (**Appendix B & C, Table 1**)

Table 1. Summary of Soil Preference

Soil Unit	Gopher Soil	Preference	Comments
Indianola loamy sand, 0 to 3% slopes	Yes	More preferred	Mapped on the eastern portion and the northwestern corner of the subject property
Indianola loamy sand, 3 to 15% slopes	Yes	Less preferred	Mapped on the ¾ of subject property

3.2 WDFW PHS Database

No priority habitats or species have been mapped on the subject property by the Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) database (**Appendix D**).

The Mazama pocket gopher has been mapped to occur south of the subject property.

4.0 FIELD RESULTS

4.1 Mazama Pocket Gopher Site Evaluation

No mounds exhibiting characteristics typically associated with the Mazama pocket gopher have been identified on the subject property during this study. Mole mounds were identified on the site (**Appendix A, Photos 3-9**). A summary of findings is provided in **Table 2**.

The site is made up of three (3) contiguous parcels. The eastern portion of the subject property contains building and internal roads. The western portion of the subject property is forested with herbaceous understory. Maintained lawn and grassy areas are located throughout the property (**Appendix A, Photos 1-12**). The parcel west of the subject property is currently under development (**Appendix A, Photos 3, 4, & 11**).

Mounds created by the Mazama pocket gopher: 1) are crescent or oddly-shaped, 2) contain a plugged tunnel opening that extends diagonally underground from the mound edge, 3) exhibit a fine texture, and are 4) typically in a scattered distribution.

Mole mounds have centrally-located tunnel entrances that extend vertically below the surface, blocky texture, an in-line distribution pattern, and have a conical shape.

Table 2. Summary of Results

Site Visit	Date of Visit	Gopher Occurrence Observed	Comments
1st	7 July 2021	No	Site consists of buildings, maintained grass lawn, and forest
2nd	9 August 2021	No	Site consists of buildings, maintained grass lawn, and forest

4.2 Mazama Pocket Gopher Habitat Evaluation

Potential Mazama pocket gopher habitat occurs on the subject property and in the vicinity. Areas of flat grassland dominated by European pasture grasses is mapped as gopher soils.

5.0 CONCLUSION

This Mazama pocket gopher summary report was prepared to satisfy the Thurston County Mazama pocket gopher screening requirements and to comply with the City of Tumwater (2018) Site Inspection Protocol and Procedures: Mazama Pocket Gopher.

The entire subject property was evaluated for the Mazama pocket gopher on 7 July 2021 and on 9 August 2021 in accordance with the latest version of City of Tumwater (2018) Site Inspection Protocol and Procedures: Mazama Pocket Gopher. The site evaluation was performed within the prescribed survey window (June 1 through October 31).

Two (2) soil types were identified on the subject property, Indianola loamy sand, 0 to 3 percent slopes, which is classified as “More preferred” gopher soils and Indianola loamy sand, 3 to 15 percent slopes “Less preferred” gopher soils

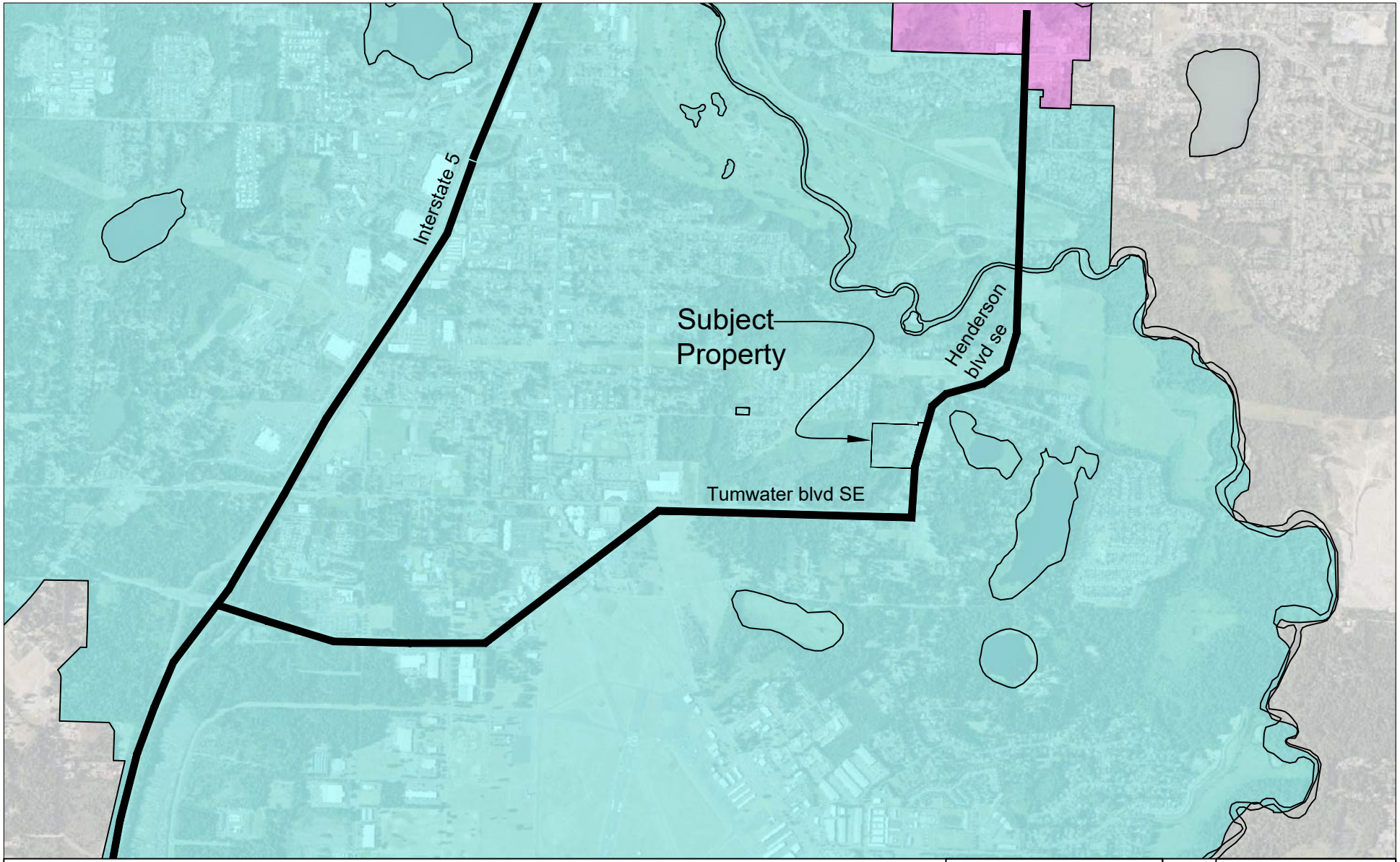
No mounds exhibiting characteristics typically associated with the Mazama pocket gopher have been identified on the subject property during this study.

If you have any questions or require further services, you can contact me at (360) 790-1559.

Sincerely,

Curtis Wambach, M.S.
Senior Biologist and Principal
EnviroVector

FIGURES



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OPTIMIZE USABLE LAND
curtis@envirovector.com
www.envirovector.com
360-790-1559

City of Tumwater

City of Olympia

Figure 1

Henderson Property

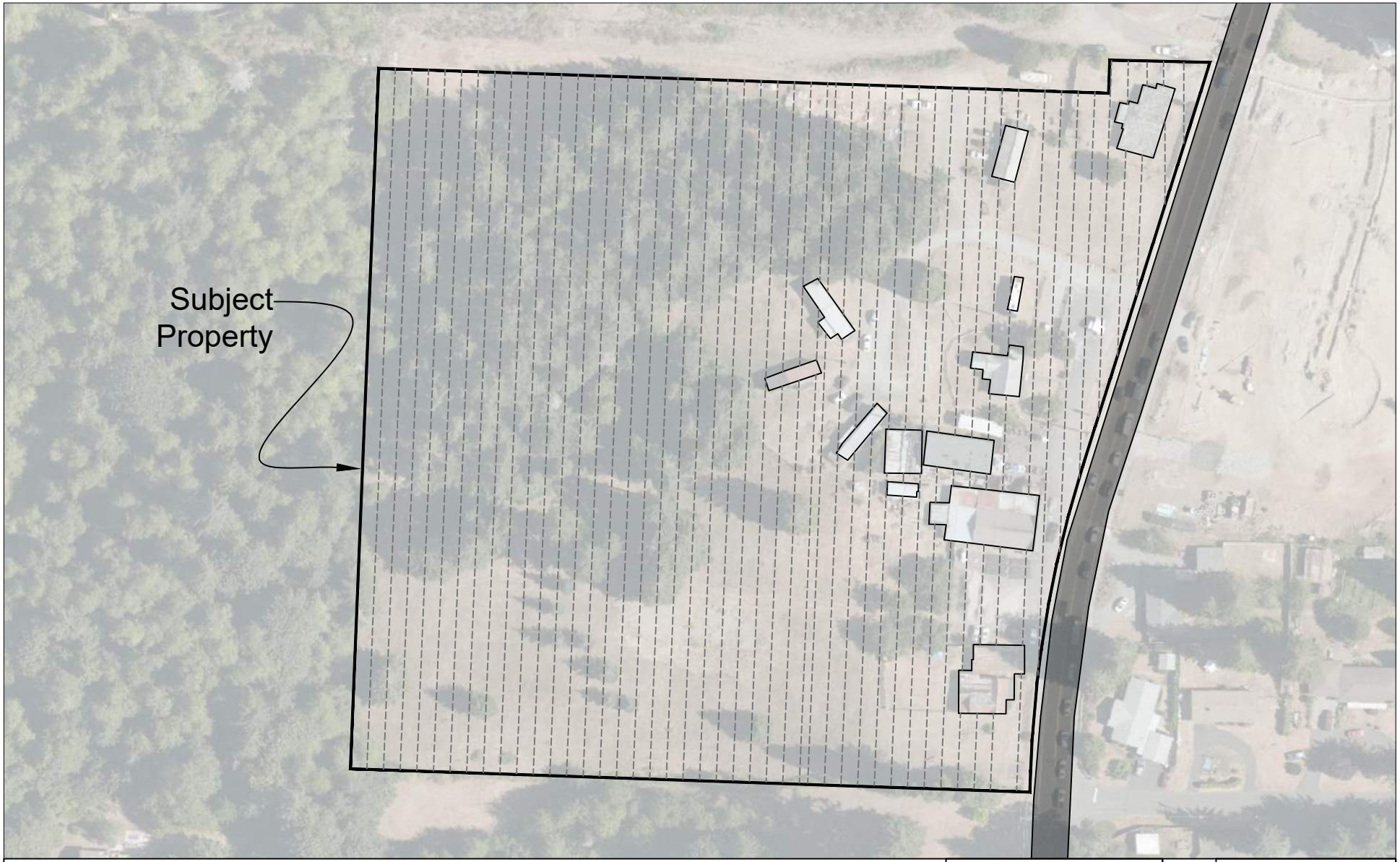
Vicinity Map

N

Scale: 1" = 2000'

0 2000'

6 October 2021



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----- Transects

Figure 2

Henderson Property

Gopher Screening

N

Scale: 1" = 125'

0 125'

6 October 2021

APPENDIX A

Photo Documentation

First Gopher Screening

Photo 1. A frontage of property

Photo 2. At frontage of property

Photo 3. Mole mound on western portion of property

Photo 4. Photo 3. Mole mound on western portion of property

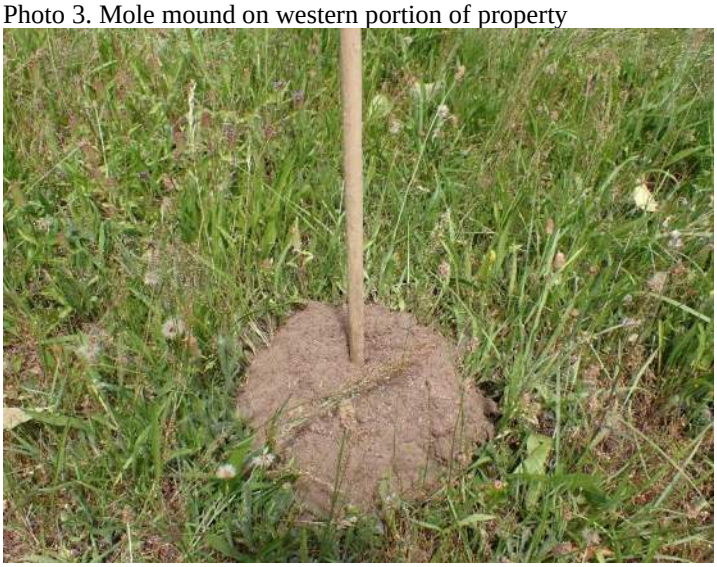


Photo 5. Fmole mound on proeprty

Photo 6. Distinctive mole mound on proeprty

Second Gopher Screening

Photo 7. Mole mounds at frontage of property

Photo 8. Mole mounds at frontage of property

Photo 9. Mole mound near existing building

Photo 10. Grass lawn area, no mounds

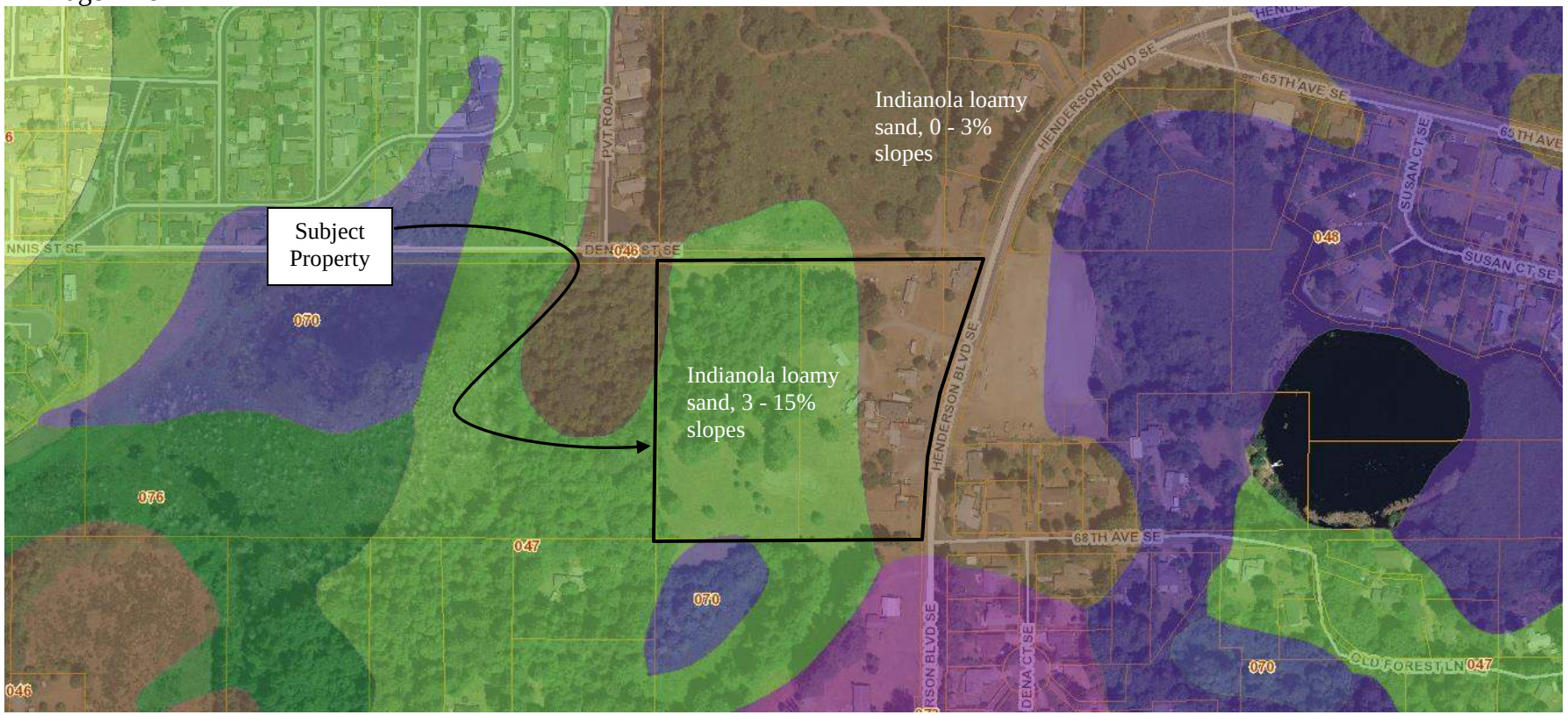
Photo 11. Western edge of property, near off-site development

Photo 12. Grass lawn area, no mounds

APPENDIX B

Thurston County Geodatabase

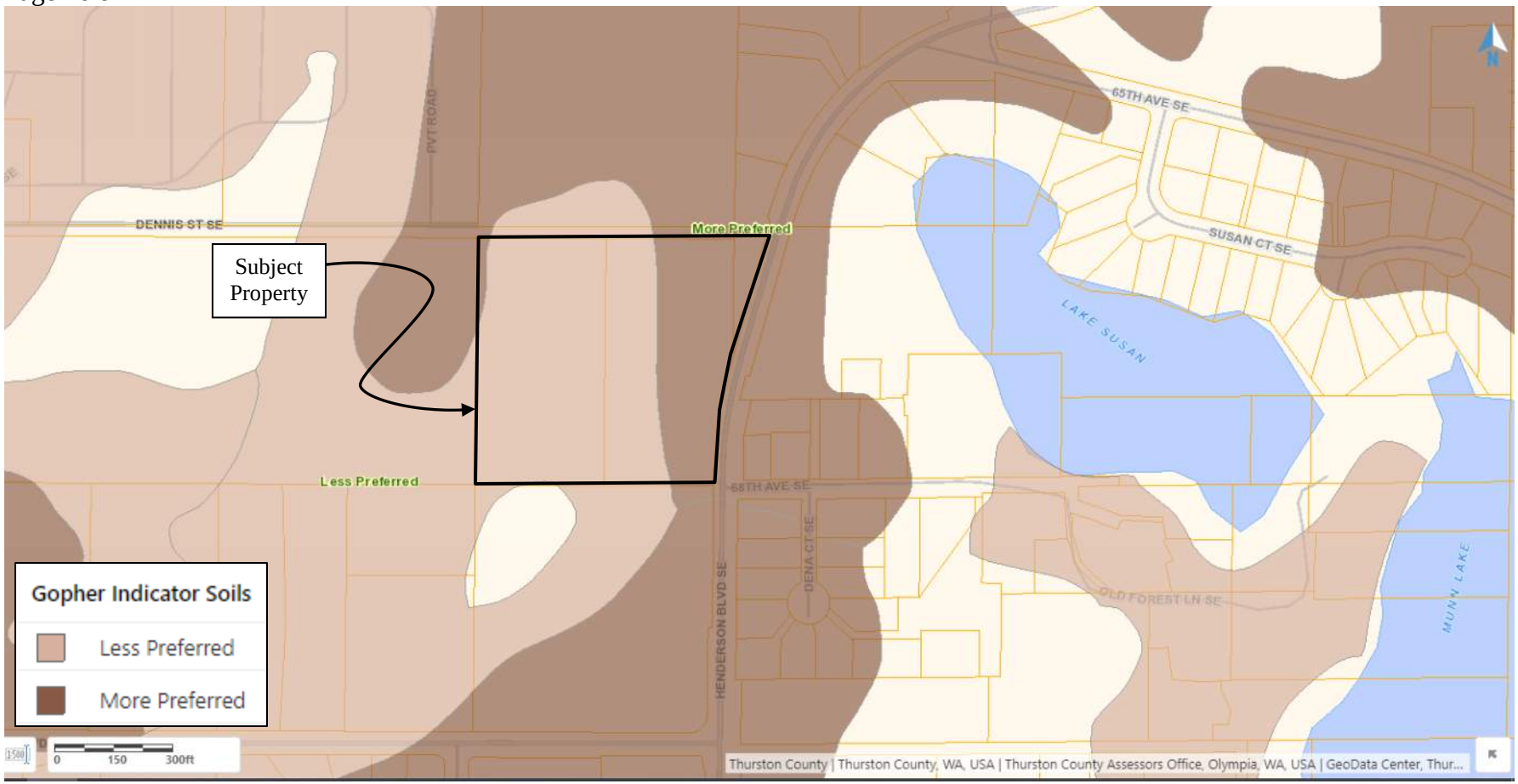
Soils


Subject Property
Indianola loamy sand, 0 - 3% slopes
Indianola loamy sand, 3 - 15% slopes
HENDERSON BLVD SE
65TH AVE SE
SUSAN CT SE
PVT ROAD
68TH AVE SE
OLD FOREST LN
070
076
047
046
048

APPENDIX C

Thurston County Geodatabase

Gopher Indicator Soils

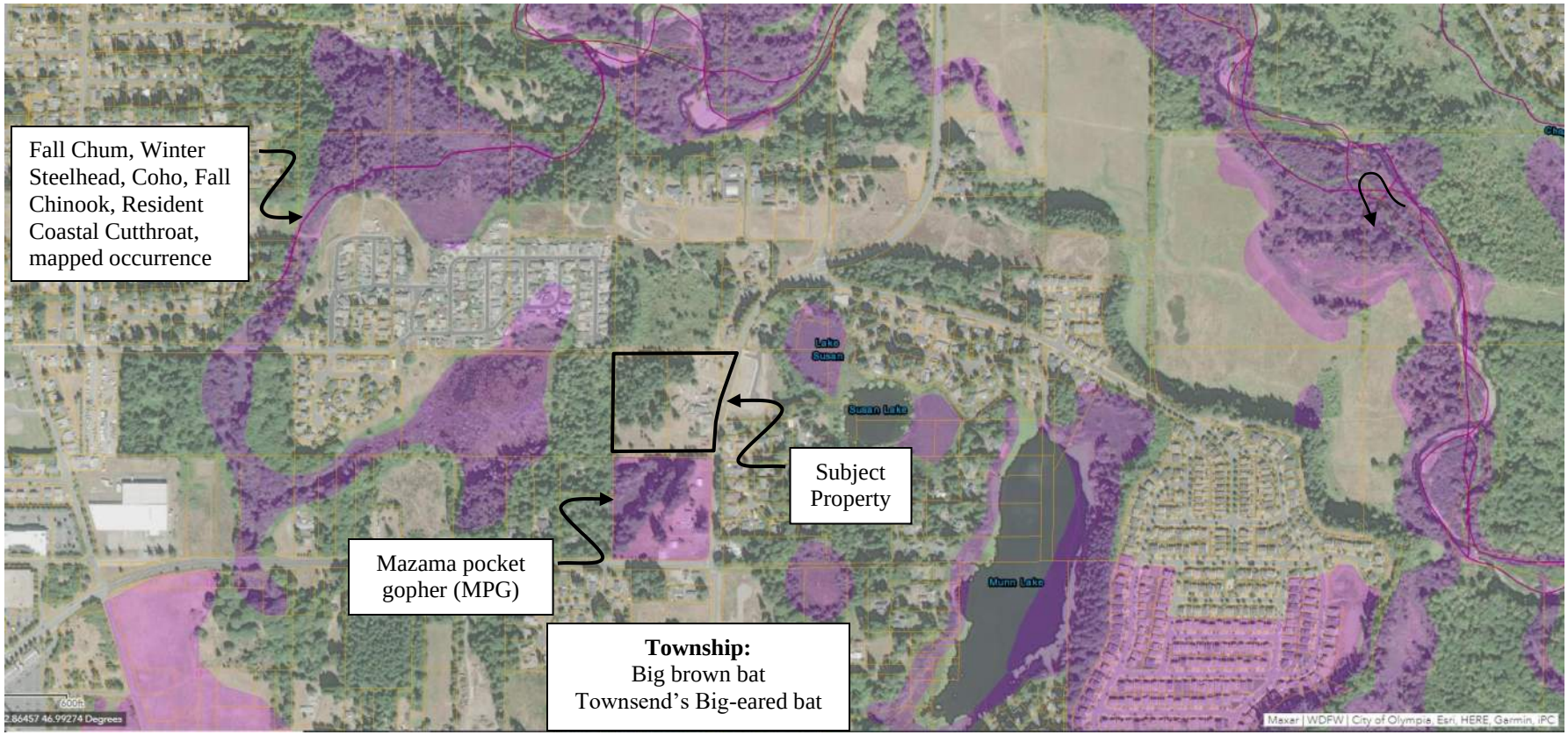

Subject Property
More Preferred
Less Preferred
DENNIS ST SE
PVT ROAD
65TH AVE SE
SUSAN CT SE
LAKE SUSAN
68TH AVE SE
DENA CT SE
HENDERSON BLVD SE
OLD FOREST LN SE
MUNN LAKE
Gopher Indicator Soils
Less Preferred
More Preferred
0
150
300ft
Thurston County | Thurston County, WA, USA | Thurston County Assessors Office, Olympia, WA, USA | GeoData Center, Thur...

APPENDIX D

Washington Department of Fish and Wildlife

Priority Habitat Species (PHS)

Database


Fall Chum, Winter Steelhead, Coho, Fall Chinook, Resident Coastal Cutthroat, mapped occurrence
Lake Susan
Susan Lake
Subject Property
Mazama pocket gopher (MPG)
Munn Lake
Township:
Big brown bat
Townsend's Big-eared bat
Maxar | WDFW | City of Olympia, Esri, HERE, Garmin, iPC

APPENDIX E

City of Tumwater

Site Inspection Protocol and Procedures:

Mazama Pocket Gopher

COMMUNITY DEVELOPMENT DEPARTMENT

ADMINISTRATIVE DETERMINATION

TOPIC: Mazama Pocket Gopher Screening

APPROVED: Michael Matlock DATE: 7/25/18

Michael Matlock, AICP
Community Development Director

BACKGROUND: The Mazama Pocket Gopher (MPG) became a federally listed endangered species in April 2014. This memo addresses the City regulatory structure. The Endangered Species Act (ESA) is a separate regulatory structure from the Growth Management Act, the State statute the City does implement, so compliance with City regulations does not necessarily mean an applicant complies with the ESA. While the City routinely addresses questions from property owners on how to comply with its local development regulations, it does not do so with respect to the ESA.[1] ESA compliance is the property owner's responsibility.

FINDINGS: In implementing the City's critical areas ordinance (CAO), and based on analysis prepared by qualified professionals, staff have found that projects in certain areas and with certain features lack gopher habitat, so do not require CAO review by a qualified professional. While the CAO governs these issues, the below summarizes what staff have found to date.

DETERMINATION: Based on the findings above, Tumwater summarizes assessment findings for MPG presence as follows:

1. **Geographic** – Due to lack of habitat, no properties in the City north of Trosper Road have required CAO review.
2. **Vegetative Cover** – Project Sites, parcels, or portions of these sites with 30% or greater forested cover have not required CAO review, although where there are adjacent unforested and undeveloped lots exceeding 7,600 square feet (SF) in area, CAO review may be needed.
3. **Project Use Level** –
   a. Single-family, manufactured homes, and duplexes for lots 7,600 SF or less
      1) New or additions to single-family, manufactured homes, and duplexes – CAO review has typically not been required on existing lots 7,600 SF

[1] For land owners seeking guidance on ESA compliance, while the City cannot assist, see USFWS Memorandum, Guidance on Trigger for an Incidental Take Permit Under Section 10(a)(1)(B) of the Endangered Species Act Where Occupied Habitat or Potentially Occupied Habitat is Being Modified, issued April 26, 2018.

or less in size. Unforested and undeveloped lots exceeding 7,600 SF may require CAO review.

2) Developed lots surrounded by existing development (homes, streets, storm ponds, sidewalks, etc.) that are of a similar size have not required CAO review. This would not exclude sites on the periphery areas where adjacent lands are not developed at an urban density level.

3) Single-family lots vested under RCW 58.17 and/or TMC 15.44.040 will likely not require CAO review.

b. Commercial/Industrial/Institutional

1) New or additions to buildings proposed in areas with 30% or greater forested coverage, existing impervious surfaces or significantly disturbed pervious areas (i.e. evidence of compacted gravel, formal landscape areas or other scenarios that would exclude the proposed developed area as being defined as habitat) have typically not required CAO review.

4. **Approved United States Fish and Wildlife Service (USFWS) Avoidance/Mitigation Strategy** – Any projects that have consulted with USFWS and have a documented avoidance/mitigation strategy that is acceptable to USFWS can typically proceed with normal permitting.

5. **Site Screening** – Properties may be screened by a qualified professional. Alternately, USFWS may screen properties by arrangement between the property owner and USFWS. At least two screenings, no less than 30 days apart, between June 1 and October 31, are consistent with best available science to determine the presence or absence of MPG.

PRIOR GUIDANCE: This Administrative Determination supersedes and replaces the City's prior Administrative Determination on Mazama Pocket Gopher Screening Protocol dated October 31, 2017.

APPEAL: This code determination shall become effective on the above date. Any person affected by this determination may appeal this decision to the Tumwater Hearing Examiner pursuant to Chapter 18.62 of the Tumwater Municipal Code.

APPENDIX F

Datasheets

Sample Mazama Pocket Gopher Screening Field Form

Site Visit Date: 7 July 2021

If 2nd or 3rd site visit, date(s) of previous visits: 9 August 2021

Site Information	**Parcel #:** #12701320105, 79300000101, 79300000100 **Site/Landowner:** Soundbuilt Homes	
How were the data collected? (circle the method for each)	**Transect:** **(GPS)** **Aerial** **Mounds:** **(GPS)** **Aerial** **Notes:**	
Field team names: (Note who filled out form and others conducting screening)	Curtis Wambach	
Others onsite (name/affiliation)		
Site visit # (CIRCLE all that apply)	**(1st)** **2nd** **3rd**	**Notes:**
Do onsite conditions throughout the entire parcel preclude the need for MPG surveys? **(CIRCLE and DESCRIBE)**	**Yes** **(No)** **Dense woody cover (trees/shrubs) that appears to preclude any MPG use** **Impervious Compacted Graveled Flooded Slope** **Other_____** **Notes:**	
Describe ground visibility for mound detection: (CIRCLE and DESCRIBE)	**Poor Fair (Good) Notes:**	

	MPG Mounds	**Indeterminate**	**Mole Mounds**
Quantify or describe amount of MPG mounds and approx. # of mounds or groups of mounds (specify whether count is individual mounds or groups)	0	0	25
	No MPG mounds observed (CIRCLE)		

Sample Mazama Pocket Gopher Screening Field Form

Does woody vegetation onsite match aerial photo? (CIRCLE and DESCRIBE)	**(Yes)** **No – describe differences and show on parcel map/aerial:**
What portion of the property was screened? (CIRCLE and DESCRIBE)	**(All)** **Part - describe and show on parcel map/aerial:**
Notes	
Team reviewed and agreed to data recorded on form? (CIRCLE, and EXPLAIN if "No")	**Yes No** **Reviewed by: ____ ____ ____ _____ _____** **Notes:**

Sample Mazama Pocket Gopher Screening Field Form

Site Visit Date: 7 July 2021

If 2nd or 3rd site visit, date(s) of previous visits: 9 August 2021

Site Information	**Parcel #:** #12701320105, 79300000101, 79300000100 **Site/Landowner:** Soundbuilt Homes	
How were the data collected? (circle the method for each)	**Transect:** **(GPS)** **Aerial** **Mounds:** **(GPS)** **Aerial** **Notes:**	
Field team names: (Note who filled out form and others conducting screening)	Julie Lewis/Curtis Wambach	
Others onsite (name/affiliation)		
Site visit # (CIRCLE all that apply)	**1st** **(2nd)** **3rd**	**Notes:**
Do onsite conditions <u>throughout the entire parcel</u> preclude the need for MPG surveys? **(CIRCLE and DESCRIBE)**	**Yes** **(No)** **Dense woody cover (trees/shrubs) that appears to preclude any MPG use** **Impervious Compacted Graveled Flooded Slope** **Other_____** **Notes:**	
Describe ground visibility for mound detection: (CIRCLE and DESCRIBE)	**Poor Fair (Good) Notes:**	

	MPG Mounds	**Indeterminate**	**Mole Mounds**
Quantify or describe amount of MPG mounds and approx. # of mounds or groups of mounds (specify whether count is individual mounds or groups)	0	5	14
	No MPG mounds observed (CIRCLE)		

Sample Mazama Pocket Gopher Screening Field Form

Does woody vegetation onsite match aerial photo? (CIRCLE and DESCRIBE)	**(Yes)** **No – describe differences and show on parcel map/aerial:**
What portion of the property was screened? (CIRCLE and DESCRIBE)	**(All)** **Part - describe and show on parcel map/aerial:**
Notes	
Team reviewed and agreed to data recorded on form? (CIRCLE, and EXPLAIN if "No")	**Yes No** **Reviewed by: ____ ____ ____ _____ _____** **Notes:**

THREE LAKES CROSSING
TRAFFIC IMPACT ANALYSIS

City of Tumwater, WA

12/10/2021

Prepared for: Mr. Evan Mann
Soundbuilt Homes
PO Box 73790
Puyallup, WA 98373

December 2021

THREE LAKES CROSSING
TRAFFIC IMPACT ANALYSIS

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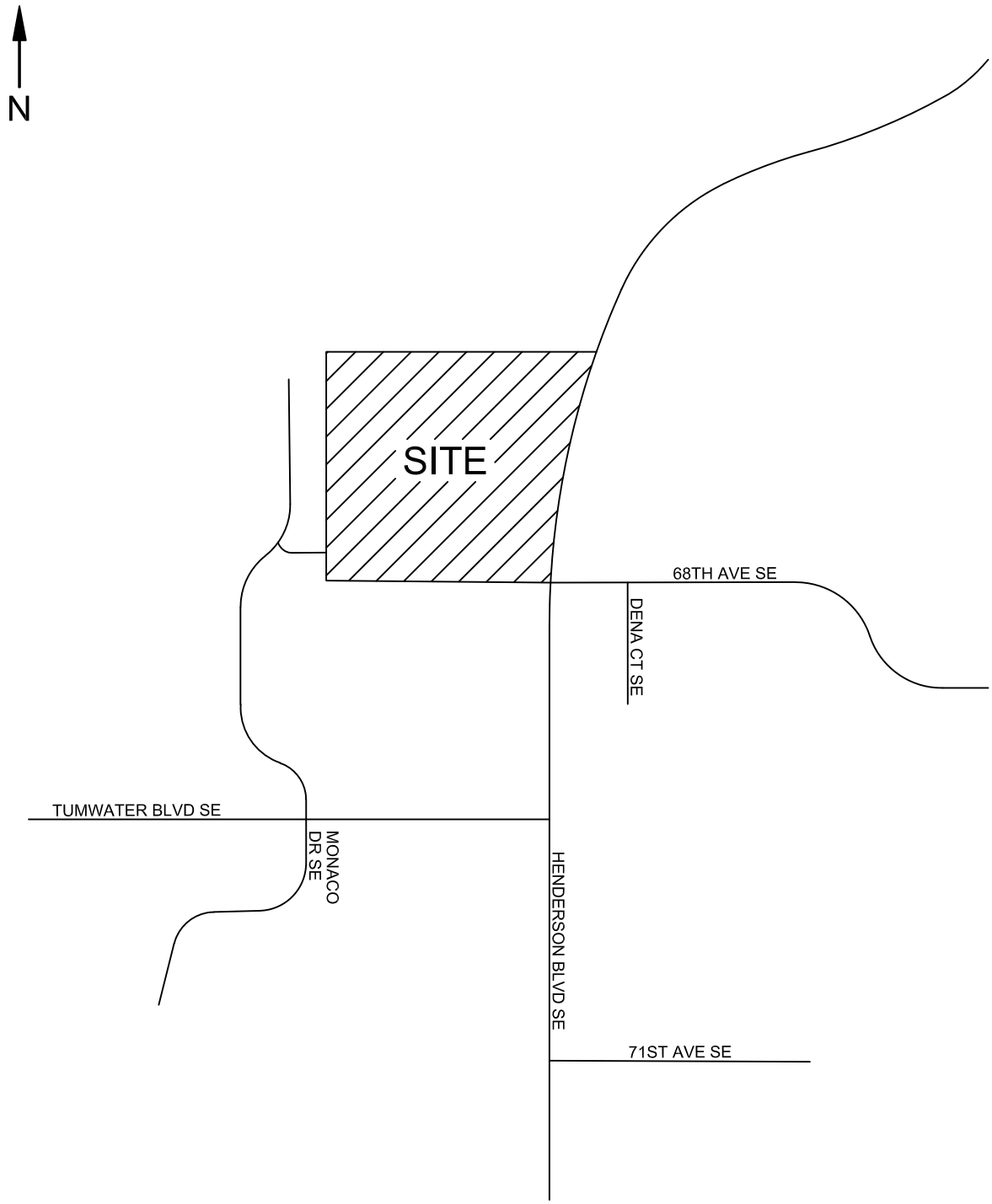
THREE LAKES CROSSING
TRAFFIC IMPACT ANALYSIS

1. INTRODUCTION

The main goals of this study focus on the analysis of existing roadway conditions and forecasts of newly generated project traffic. The first task includes the review of general roadway information on the adjacent street system, baseline vehicular volumes, and entering sight distance data. Forecasts of future traffic and dispersion patterns on the street system are then determined using established trip generation and distribution techniques. As a final step, appropriate conclusions and mitigation measures are defined.

2. PROJECT DESCRIPTION

The Three Lakes Crossing project is a proposed residential development comprising up to 45 single-family dwelling units in the city of Tumwater. The subject site, bordered to the east by Henderson Boulevard SE, is located on a cumulative 16.66-acres within tax parcel #'s: 1270132-0105; 7930000-0100; & -0101. Access to the site is proposed via one new driveway extending west from Henderson Boulevard SE into the subject site. Moreover, internal connection is to be provided with a new development located south of the subject site, subsequently providing access to Tumwater Boulevard SE. All existing structures on-site are to be demolished prior to new construction. Figure 1 on the following page shows the aerial vicinity of the project. A conceptual site plan illustrating the proposed site layout including all access points is presented in Figure 2. A site aerial is provided below.



HEATH & ASSOCIATES

TRAFFIC AND CIVIL ENGINEERING

THREE LAKES CROSSING

VICINITY MAP & ROADWAY SYSTEM
FIGURE 1

HEATH & ASSOCIATES

TRAFFIC AND CIVIL ENGINEERING

THREE LAKES CROSSING

SITE PLAN
FIGURE 2

3. EXISTING CONDITIONS

3.1 Existing Roadway Characteristics

The major roadways and arterials serving the subject site are described below:

Tumwater Boulevard SE: is an east-west, two-lane minor arterial located south of the subject site. Travel lanes are approximately 12-feet in width. Paved shoulders approximately 7- to 11- feet in width are provided in the vicinity of the subject site along either side of the roadway. The posted speed limit is 35-mph.

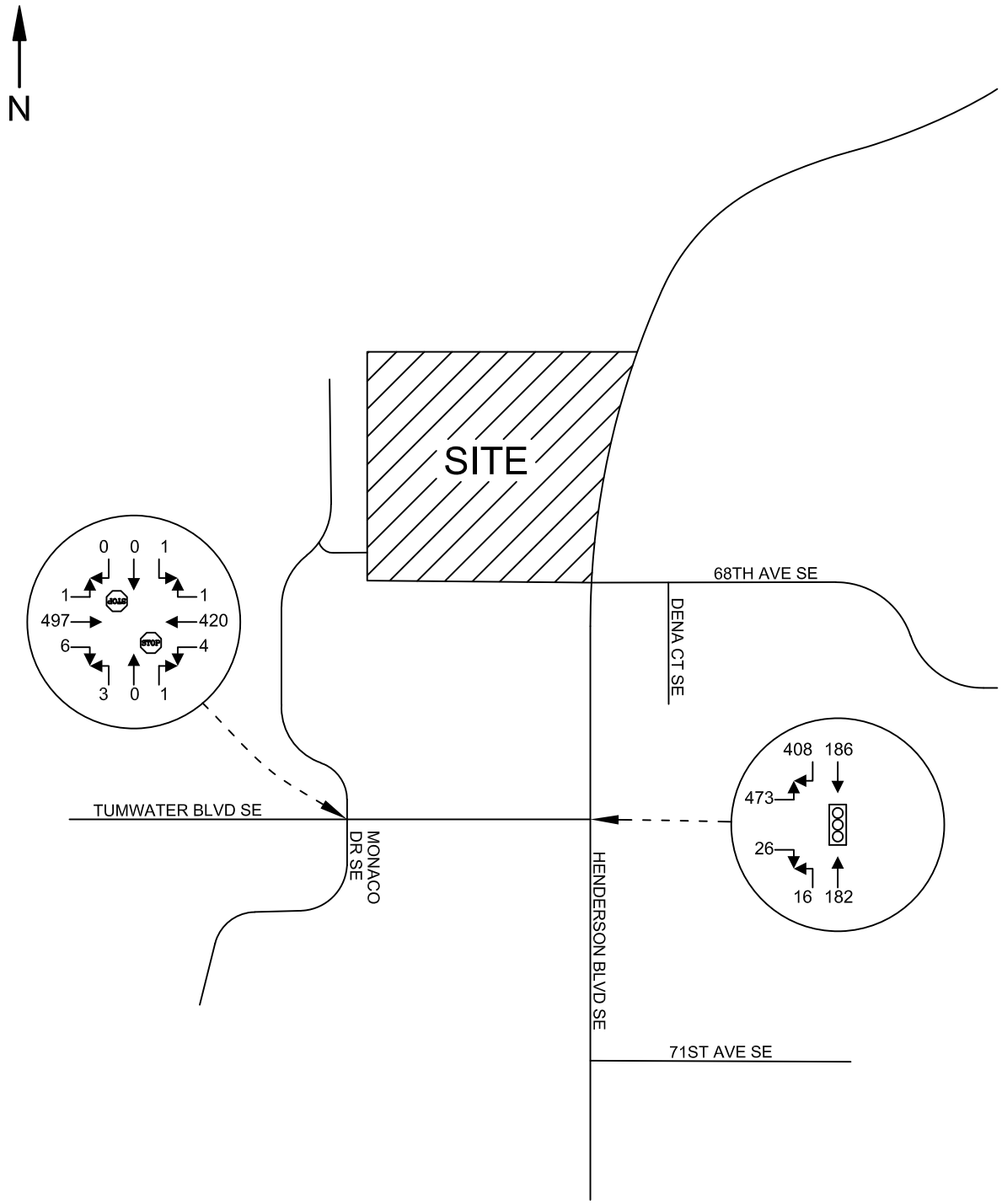
Henderson Boulevard SE: is a north-south, two-lane roadway that borders the subject site to the east. The roadway is designated as a minor arterial north of Tumwater Boulevard SE and an urban collector south of the intersection. Travel lanes are approximately 11- to 12-feet in width with additional turn-lanes provided at major intersections. Shoulder composition varies between paved segments varying in width to no formal treatment. The posted speed limit is 35-mph.

3.2 Non-Motorist Traffic

Non-motorist traffic was observed at the time of field counts. No non-motorist volumes were observed at the study intersection of Tumwater Boulevard SE & Henderson Boulevard SE during the PM peak hour. No pedestrians and three bicyclists were observed at Tumwater Boulevard SE & Monaco Drive SE during the PM peak hour. Non-motorist infrastructure is limited in the vicinity of the subject site. No significant increase in respect to non-motorist volumes is anticipated as a result of the proposed development.

3.3 Existing Peak Hour Volumes and Travel Patterns

Field data for this study was collected in September of 2021. Intersection data was collected at Tumwater Boulevard SE & Monaco Drive SE and Tumwater Boulevard SE & Henderson Boulevard SE. Data was obtained during the evening peak period between the hours of 4:00 PM – 6:00 PM, which generally translates to highest overall roadway volumes in a given 24-hour period. The one hour reflecting highest overall roadway volumes (peak hour) was then derived from these counts. Existing PM peak hour volumes observed on-site are illustrated in Figure 3. Full count sheets are attached in the appendix.



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TRAFFIC AND CIVIL ENGINEERING

THREE LAKES CROSSING

EXISTING PM PEAK HOUR VOLUMES

FIGURE 3

3.4 Level of Service

Baseline intersection delays were determined through the use of the *Highway Capacity Manual* 6th Edition. Capacity analysis is used to determine level of service (LOS) which is an established measure of congestion for transportation facilities. The range[1] for intersection level of service is LOS A to LOS F with the former indicating the best operating conditions with low control delays and the latter indicating the worst conditions with heavy control delays. Detailed descriptions of intersection LOS are given in the 2016 Highway Capacity Manual. Level of service calculations were made through the use of the *Synchro 11* analysis program. Delays presented represent overall weighted average delays for signalized control. For side-street, stop-controlled intersections, LOS is determined by the approach with the highest delay. Table 1 below portrays existing PM peak hour LOS delays for the key intersections of study.

Table 1: Existing PM Peak Hour Level of Service

Delays given in seconds per vehicle

Intersection	Control	LOS	Delay
Tumwater Blvd SE & Monaco Dr SE	Stop	A	6.2
Tumwater Blvd SE & Henderson Blvd SE	Signal	C	30.9

Existing PM peak hour delays are all shown to calculate within the LOS B or better range indicating stable operations during the critical peak hour of travel. All intersections meet the city of Tumwater's level of service standard of LOS D or better.

---

1 *Signalized Intersections - Level of Service*

Level of Service	Control Delay per Vehicle (sec)
A	≤10
B	> 10 and ≤20
C	> 20 and ≤35
D	> 35 and ≤55
E	> 55 and ≤80
F	> 80

Stop Controlled Intersections – Level of Service

Level of Service	Control Delay per Vehicle (sec)
A	≤10
B	> 10 and ≤15
C	> 15 and ≤25
D	> 25 and ≤35
E	> 35 and ≤50
F	> 50

Highway Capacity Manual, 6th Edition

3.5 Roadway Improvements

A review of the City of Tumwater's Six Year Transportation Improvement Program 2022-2027 indicates that improvement projects are planned in the vicinity. Descriptions and summaries of each project are provided in Table 2 below.

Table 2: Transportation Improvement Projects

Name	Location	Improvement	Cost
Henderson Blvd Bridge (Map ID# 5)	Henderson Blvd	Design stages for future bridge widening or replacement to add capacity/non-motorist facilities	$250,000
93rd Ave / Kimmie Street Intersection (Map ID# 6)	93rd Ave / Kimmie Street Intersection	ROW acquisition for future intersection improvements	$150,000
Old Highway 99 Corridor Improvements (Map ID# 7)	79th Ave to 73rd Ave	Design and construct urban road section and improvements determined from the Corridor Study. To include addition of traffic lanes, turn lanes, multi-modal facilities, etc.	$3,500,000
Tumwater Blvd Interchange (Map ID# 9)	I-5 SB Ramps to I-5 NB Ramps	Design, acquire ROW, and construct improvements to Interchange	$6,650,000
Deschutes Valley Trail (Map ID# 19-22)	E St to Pioneer Park	Construction of a paved walking / bicycling trail connection	$11,550,000

3.6 Transit Service

The Intercity Transit and TRPC regional bus schedules were reviewed in terms of transit available in the vicinity of the subject site. The nearest available transit service, provided 0.90 miles west at the intersection of Israel Road SE & Capitol Boulevard SE, is provided via Routes 2 and 12. Route 2 – Rainier, Tenino, Tumwater – provides service from Binghampton Street & Dakota Avenue to Tumwater Square from approximately 6:00 AM – 5:55 PM with 120-minute headways during peak travel hours. Route 12, L & I to Olympia Transit Center, provides service from the Olympia Transit Center to the Tumwater Labor & Industries Building. Other major destinations served by Route 12 include the Thurston County Courthouse and SPSCC. Weekday service is provided from approximately 5:39 AM to 8:25 PM with 30-minute headways during peak travel hours. Weekend service is provided from approximately 7:30 AM to 8:25 PM with approximately 30-minute headways. Refer to Intercity Transit and TRPC routes and schedules for more detailed information.

4. FUTURE TRAFFIC CONDITIONS

4.1 Trip Generation

Trip generation is defined as the number of vehicle movements that enter or exit a site during a designated time period such as a specific peak hour or an entire day. Data presented in this analysis was derived from the Institute of Transportation Engineer's (ITE) publication *Trip Generation,* 11th Edition. The proposed land use is to be defined as Single-Family Detached Housing (LUC 210). ITE average rates were used to determine trip ends with dwelling units used as the input variable. Table 3 below summarizes anticipated vehicular movements for the average weekday daily trips (AWDT), AM peak hour and PM peak hour. ITE Trip Generation sheets have been attached to the appendix for reference.

Table 3: Project Trip Generation

Land Use	Size	ADT	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
Single-Family Detached	45 dwelling units	424	8	23	**31**	26	16	**42**

Based on the data presented in Table 3, the project is anticipated to generate 424 new average weekday daily trips with 31 trips (8 in/23 out) occurring during the AM peak hour and 42 trips (26 in/16 out) occurring during the PM peak hour.

4.2 Trip Distribution and Assignment

Trip distribution describes the anticipated travel routes for inbound and outbound project traffic during the peak hour study period. The specific destinations and origins of the generated traffic primarily influences the key intersections, which will effectively receive the bulk of project impacts. Anticipated distribution percentages and travel routes for the PM peak hour are illustrated in Figure 4. Percentages are based on Thurston Regional Planning Council (TRPC) TAZ 232 Distribution Map. See appendix for complete TAZ map.

Moreover, project-generated trips anticipated to travel through the Tumwater I-5 Interchange to the south as identified from the TAZ 232 map are outlined in Figure A in the appendix. Approximately 2 project trips are identified to travel through the aforementioned interchanges during the critical PM peak hour.

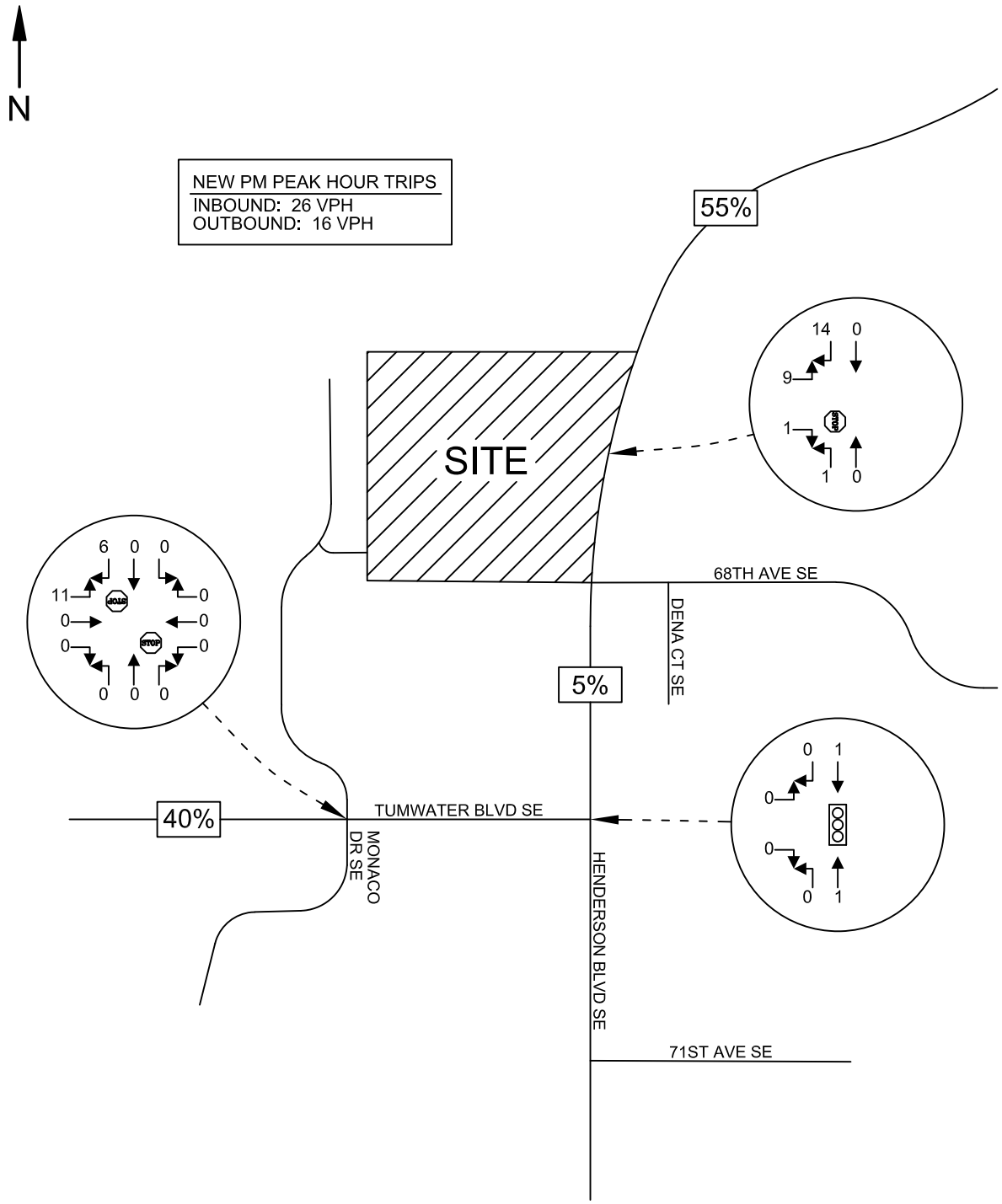
It should be noted that there is availability of access to the development by both the Tumwater Boulevard SE (via internal connection to southerly/westerly development) and Henderson Boulevard SE roadways.

4.3 Future Peak Hour Volumes

A 5-year horizon of 2026 was used for future traffic delay analysis. Forecast 2026 background traffic volumes were derived by applying a 1.5 percent compound annual growth rate to the existing volumes shown in Figure 3. This growth rate has been used for similar past projects in the area.

Moreover, pipeline volumes associated with the nearby Tumwater Boulevard Plat and Shinn Estates Plat projects were included in forecast analysis. It should be noted that Tumwater Boulevard Plat was under construction at the time of field counts. For this reason, trip generation associated with the proposed 26 single-family dwelling units was derived via ITE data and added to forecast volumes. PM peak hour pipeline volumes are illustrated in Figures 5A and 5B. Pipeline volumes illustrated in 5A are representative of forecast background volumes and do not include internal connection to the proposed Three Lakes Crossing development. Thereby, no access to Henderson Boulevard SE is illustrated. Pipeline volumes illustrated in Figure 5B include internal connection to the proposed project and redistribute traffic through the proposed Henderson Boulevard SE access.

Forecast 2026 PM peak hour volumes without and with project-generated traffic are illustrated in Figures 6 and 7.



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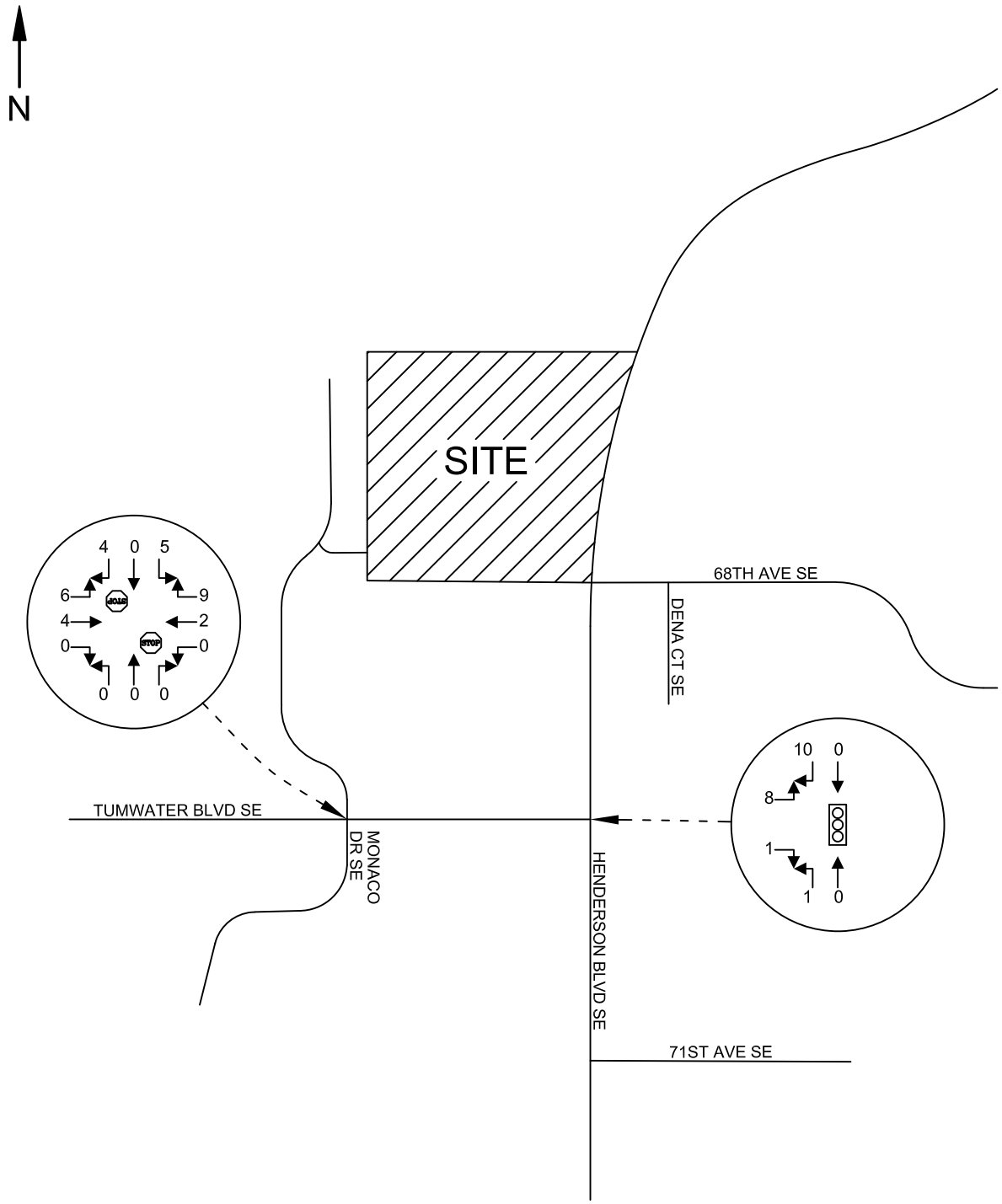
TRAFFIC AND CIVIL ENGINEERING

THREE LAKES CROSSING

PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 4



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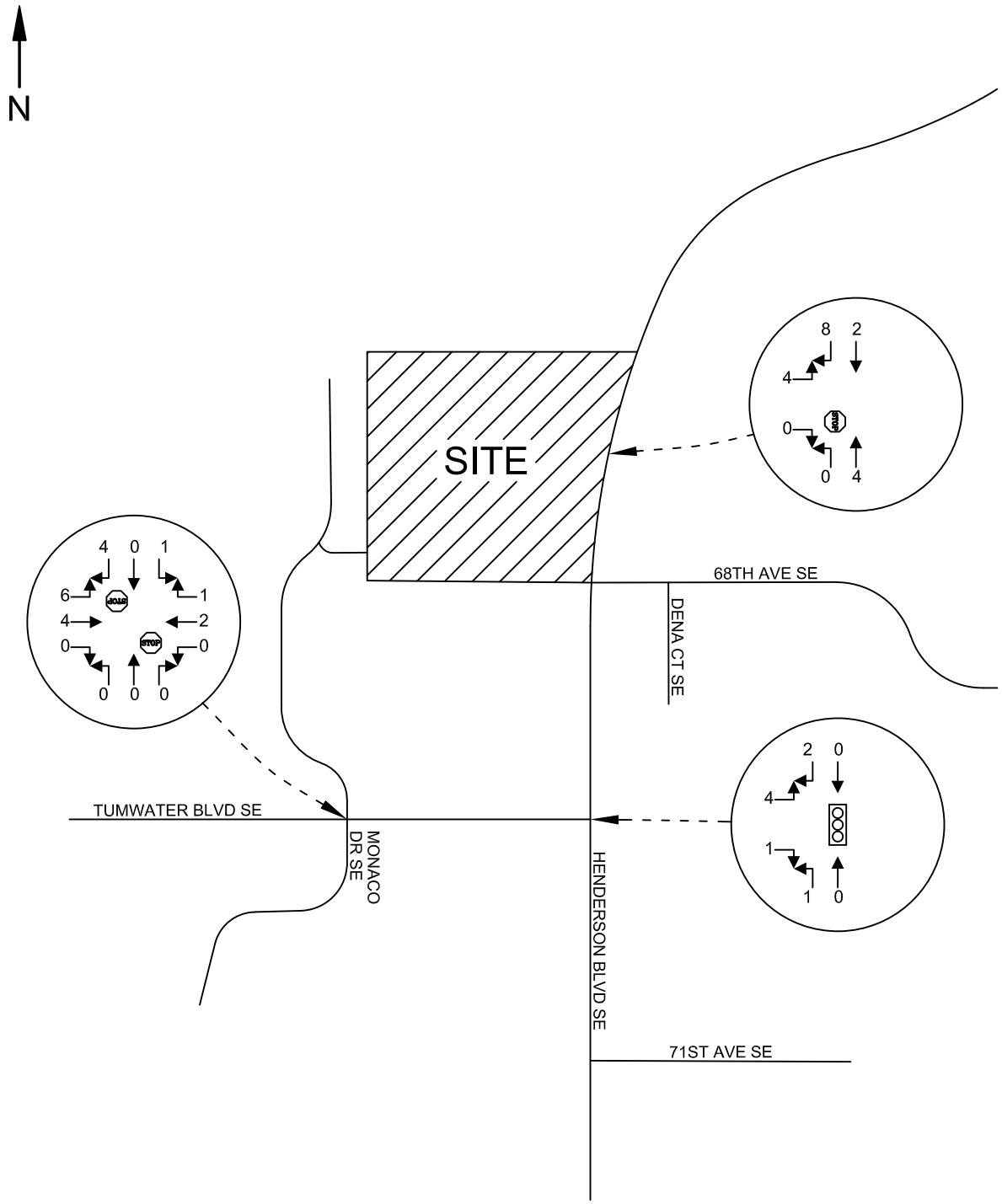
THREE LAKES CROSSING

PM PEAK HOUR PIPELINE VOLUMES: NO INTERNAL CONNECTION

FIGURE 5A



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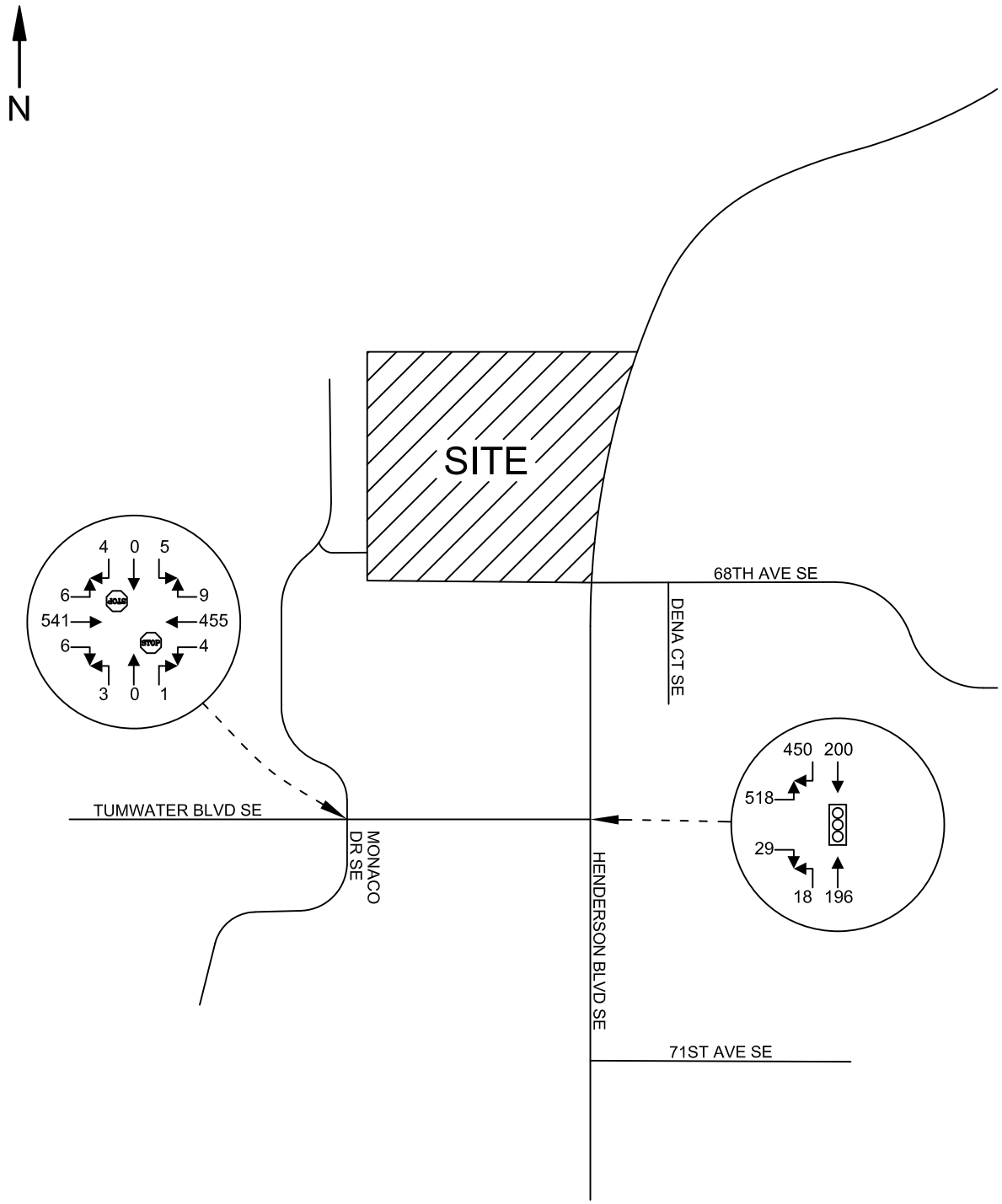
THREE LAKES CROSSING

PM PEAK HOUR PIPELINE VOLUMES: INTERNAL CONNECTION

FIGURE 5B



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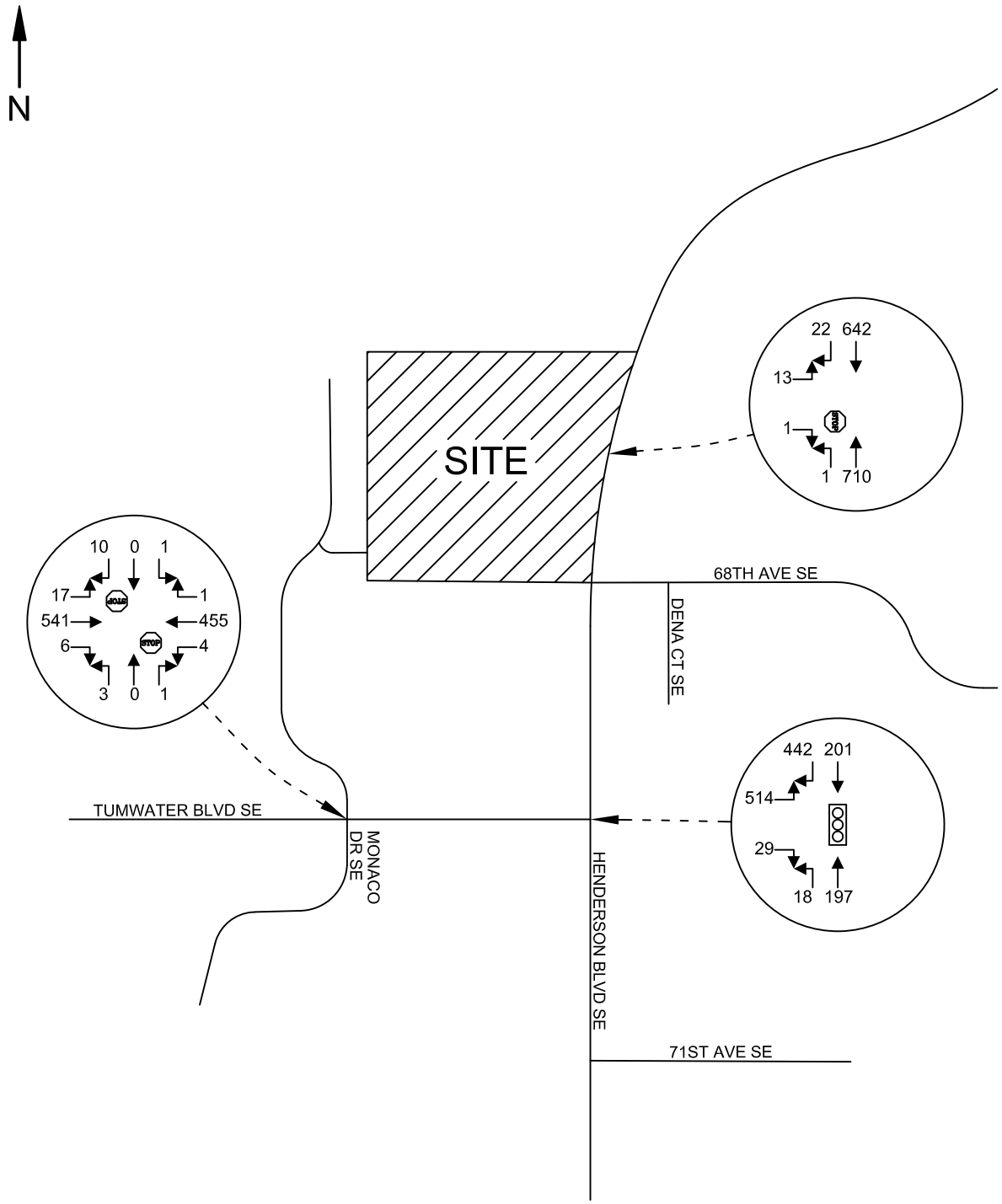
TRAFFIC AND CIVIL ENGINEERING

THREE LAKES CROSSING

FORECAST 2026 PM PEAK HOUR BACKGROUND VOLUMES

FIGURE 6



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TRAFFIC AND CIVIL ENGINEERING

THREE LAKES CROSSING

FORECAST 2026 PM PEAK HOUR VOLUMES WITH PROJECT

FIGURE 7

4.4 Future Level of Service

A level of service analysis was made of the future PM peak hour volumes without (background) and with project-generated trips. Results for intersection delay conditions were again determined using the *Synchro 11* analysis program. A summary of the results are shown in Table 4 for the forecast 2026 PM peak travel hour.

Table 4: Forecast 2026 PM Peak Hour Level of Service

Delays given in seconds per vehicle

		Background		*With Project*	
Intersection	**Control**	**LOS**	**Delay**	**LOS**	**Delay**
Tumwater Blvd SE & Monaco Dr SE	Stop	C	21.2	C	22.2
Tumwater Blvd SE & Henderson Blvd SE	Signal	D	48.4	D	45.5
Project Access & Henderson Blvd SE	Stop	-	-	D	32.9

Forecast 2026 PM peak hour delays are shown to operate at LOS D or better without or with the addition of project traffic. All intersections meet the city of Tumwater's level of service standard of LOS D or better.

It should be noted that Tumwater Boulevard SE & Henderson Boulevard SE is shown to operate with lesser delays with project-generated traffic than without. This is due to the diversion of a portion of pipeline traffic to the proposed project access on Henderson Boulevard SE, subsequently no longer traveling through the intersection.

4.5 Left Turn Lane Warrant

Left turn lanes are a means of providing necessary storage space for left turning vehicles at intersections. For this impact study, procedures prescribed by the WSDOT Design Manual Exhibit 1310-7a were used to ascertain storage requirements at the newly proposed access location on Henderson Boulevard SE and at Monaco Drive SE & Tumwater Boulevard SE. Based on forecast 2026 PM peak hour volumes with project traffic – a left turn lane *would not be warranted* at either intersection. Refer to the appendix for the warrant nomographs.

5. SUMMARY

The Three Lakes Crossing project proposes to construct 45 new single-family units within in the city of Tumwater. The subject site, bordered to the east by Henderson Boulevard SE, is located on a cumulative 16.66-acres within tax parcel #'s: 1270132-0105; 7930000-0100; & -0101. Access to the site is to be provided via one driveway extending west from Henderson Boulevard SE. Moreover, internal connection with the development to the southwest will provide access to Tumwater Boulevard SE. Refer to Figure 2 for the proposed access/roadway configuration and lot layout.

Based on ITE data the project would be anticipated to generate 424 new average weekday daily trips with 31 AM peak hour trips (8 in / 23 out) and 42 new PM peak hour trips (26 in / 16 out). Existing level of service (LOS) is summarized in Table 1 and indicates intersections operating with delays in the LOS C or better range. A five-year horizon of 2026 was utilized for forecast analyses, which included a compound annual growth rate of 1.5 percent and the addition of pipeline volumes. Forecast 2026 PM peak hour level of service without and with the addition of project generated traffic is provided in Table 4. All intersections of study are shown to operate with LOS D or better delays during the PM peak hour without or with the addition of project-generated traffic. All intersections are shown to meet the city of Tumwater's LOS standards.

Based on the analysis above, the following mitigation is required for the Three Lakes Crossing project.

1. Pay Traffic Impact Fees (TIF) as required by the city of Tumwater. Impact fees are collected at $3,918.63 per single-family dwelling unit in accordance to the City's 2021 Fee Resolution schedule. Therefore, the estimated TIF is collected at:

   45 units x $3,918.63 = $176,338.35

2. Pay Traffic Impact Fees (TIF) as required by the SEPA Mitigation Fee. Impact fees are collected at $4,219.00 per trip that travels through the I-5 Tumwater Interchanges located south of the subject site. Trip ends, as illustrated in Figure A in the appendix, were derived via the TRPC TAZ 232 Distribution Map. The estimated SEPA Mitigation Fee is collected at:

   2 trips x $4,219.00 = $8,438.00

No other mitigation is identified at this time.

THREE LAKES CROSSING
TRAFFIC IMPACT ANALYSIS

APPENDIX

Heath & Associates

PO Box 397
Puyallup, WA 98371

File Name : 4722b
Site Code : 00004722
Start Date : 9/8/2021
Page No : 1

Groups Printed- Passenger + - Heavy

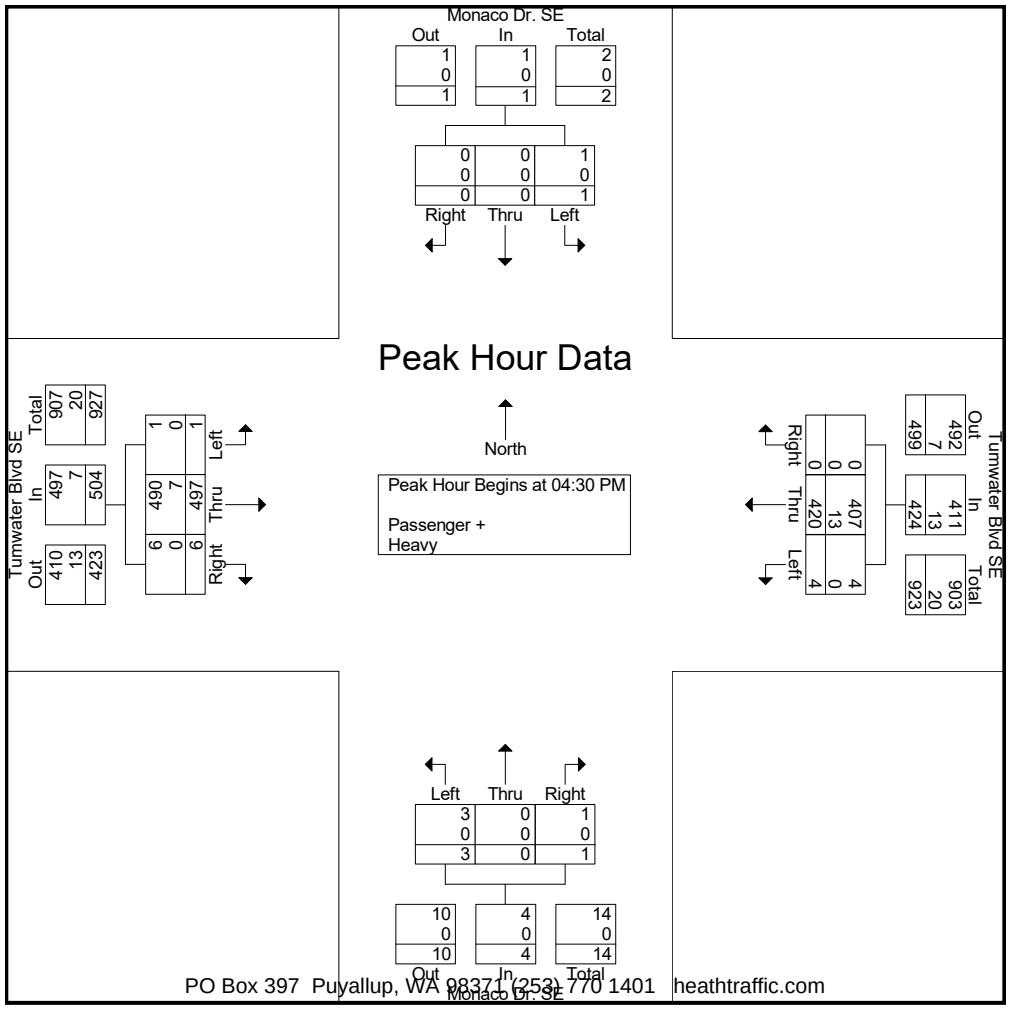
	Monaco Dr. SE Southbound				Tumwater Blvd SE Westbound				Monaco Dr. SE Northbound				Tumwater Blvd SE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:00 PM	0	0	1	1	0	88	0	88	0	0	0	0	2	88	0	90	179
04:15 PM	0	0	0	0	0	91	1	92	1	0	0	1	1	86	0	87	180
04:30 PM	0	0	0	0	0	101	1	102	0	0	2	2	1	114	0	115	219
04:45 PM	0	0	0	0	0	119	1	120	1	0	0	1	3	115	0	118	239
Total	0	0	1	1	0	399	3	402	2	0	2	4	7	403	0	410	817
05:00 PM	0	0	1	1	0	101	0	101	0	0	0	0	2	142	1	145	247
05:15 PM	0	0	0	0	0	99	2	101	0	0	1	1	0	126	0	126	228
05:30 PM	0	0	0	0	0	83	0	83	1	0	1	2	0	101	0	101	186
05:45 PM	0	0	0	0	0	85	1	86	0	0	0	0	1	82	0	83	169
Total	0	0	1	1	0	368	3	371	1	0	2	3	3	451	1	455	830
Grand Total	0	0	2	2	0	767	6	773	3	0	4	7	10	854	1	865	1647
Apprch %	0	0	100		0	99.2	0.8		42.9	0	57.1		1.2	98.7	0.1		
Total %	0	0	0.1	0.1	0	46.6	0.4	46.9	0.2	0	0.2	0.4	0.6	51.9	0.1	52.5	
Passenger +	0	0	1	1	0	746	6	752	3	0	4	7	10	841	1	852	1612
% Passenger +	0	0	50	50	0	97.3	100	97.3	100	0	100	100	100	98.5	100	98.5	97.9
Heavy	0	0	1	1	0	21	0	21	0	0	0	0	0	13	0	13	35
% Heavy	0	0	50	50	0	2.7	0	2.7	0	0	0	0	0	1.5	0	1.5	2.1

Heath & Associates

PO Box 397
Puyallup, WA 98371

File Name : 4722b
Site Code : 00004722
Start Date : 9/8/2021
Page No : 2

	Monaco Dr. SE Southbound				Tumwater Blvd SE Westbound				Monaco Dr. SE Northbound				Tumwater Blvd SE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	101	1	102	0	0	**2**	**2**	1	114	0	115	219
04:45 PM	0	0	0	0	0	**119**	1	**120**	**1**	0	0	1	**3**	115	0	118	239
05:00 PM	0	0	**1**	**1**	0	101	0	101	0	0	0	0	2	**142**	**1**	**145**	**247**
05:15 PM	0	0	0	0	0	99	**2**	101	0	0	1	1	0	126	0	126	228
Total Volume	0	0	1	1	0	420	4	424	1	0	3	4	6	497	1	504	933
% App. Total	0	0	100		0	99.1	0.9		25	0	75		1.2	98.6	0.2		
PHF	.000	.000	.250	.250	.000	.882	.500	.883	.250	.000	.375	.500	.500	.875	.250	.869	.944
Passenger +	0	0	1	1	0	407	4	411	1	0	3	4	6	490	1	497	913
% Passenger +	0	0	100	100	0	96.9	100	96.9	100	0	100	100	100	98.6	100	98.6	97.9
Heavy	0	0	0	0	0	13	0	13	0	0	0	0	0	7	0	7	20
% Heavy	0	0	0	0	0	3.1	0	3.1	0	0	0	0	0	1.4	0	1.4	2.1



Heath & Associates

PO Box 397
Puyallup, WA 98371

File Name : 4722a
Site Code : 00004722
Start Date : 9/8/2021
Page No : 1

Groups Printed- Passenger + - Heavy

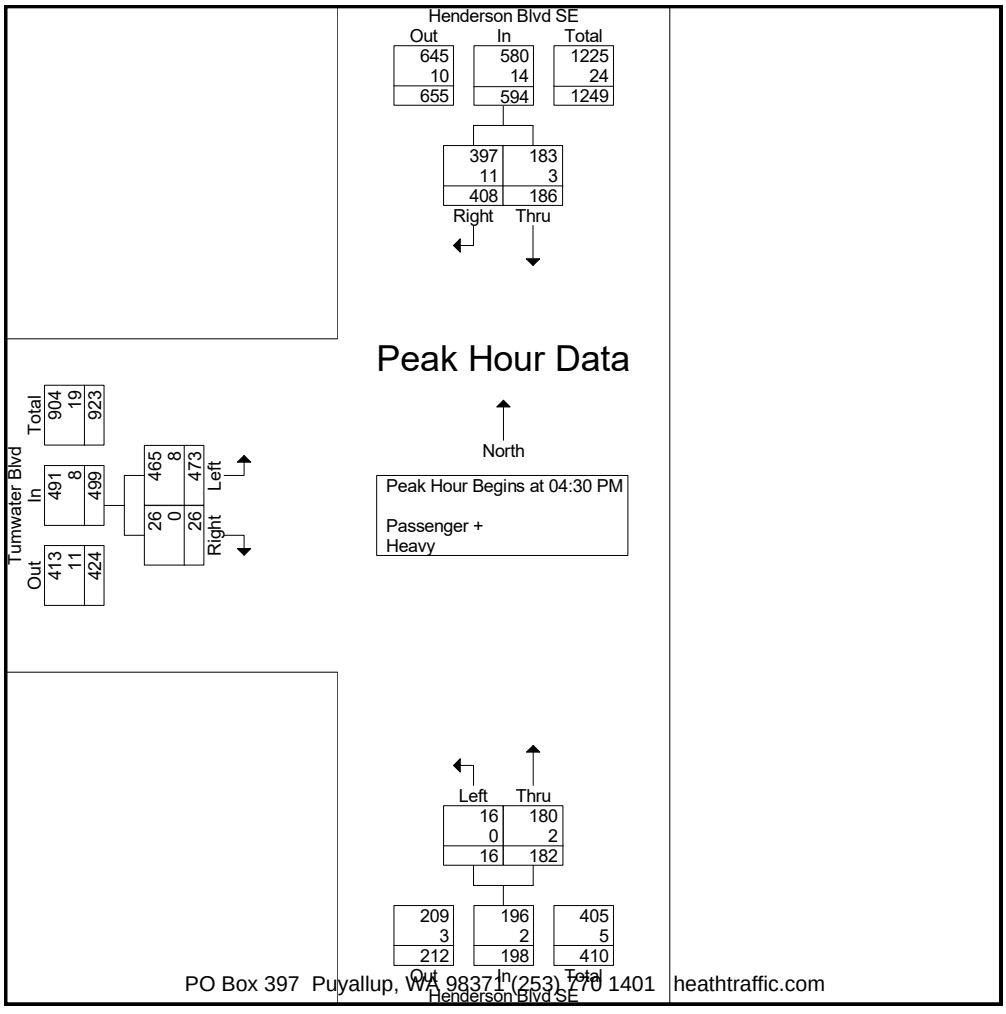
	Henderson Blvd SE Southbound			Henderson Blvd SE Northbound			Tumwater Blvd Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
04:00 PM	83	44	127	53	4	57	4	81	85	269
04:15 PM	92	37	129	48	1	49	0	84	84	262
04:30 PM	94	36	130	42	5	47	3	113	116	293
04:45 PM	114	53	167	42	6	48	6	102	108	323
Total	383	170	553	185	16	201	13	380	393	1147
05:00 PM	103	33	136	51	2	53	9	138	147	336
05:15 PM	97	64	161	47	3	50	8	120	128	339
05:30 PM	81	48	129	31	3	34	5	101	106	269
05:45 PM	79	35	114	41	4	45	4	73	77	236
Total	360	180	540	170	12	182	26	432	458	1180
Grand Total	743	350	1093	355	28	383	39	812	851	2327
Apprch %	68	32		92.7	7.3		4.6	95.4		
Total %	31.9	15	47	15.3	1.2	16.5	1.7	34.9	36.6	
Passenger +	729	344	1073	348	28	376	39	797	836	2285
% Passenger +	98.1	98.3	98.2	98	100	98.2	100	98.2	98.2	98.2
Heavy	14	6	20	7	0	7	0	15	15	42
% Heavy	1.9	1.7	1.8	2	0	1.8	0	1.8	1.8	1.8

Heath & Associates

PO Box 397
Puyallup, WA 98371

File Name : 4722a
Site Code : 00004722
Start Date : 9/8/2021
Page No : 2

	Henderson Blvd SE Southbound			Henderson Blvd SE Northbound			Tumwater Blvd Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	94	36	130	42	5	47	3	113	116	293
04:45 PM	**114**	53	**167**	42	**6**	48	6	102	108	323
05:00 PM	103	33	136	**51**	2	**53**	**9**	**138**	**147**	336
05:15 PM	97	**64**	161	47	3	50	8	120	128	**339**
Total Volume	408	186	594	182	16	198	26	473	499	1291
% App. Total	68.7	31.3		91.9	8.1		5.2	94.8		
PHF	.895	.727	.889	.892	.667	.934	.722	.857	.849	.952
Passenger +	397	183	580	180	16	196	26	465	491	1267
% Passenger +	97.3	98.4	97.6	98.9	100	99.0	100	98.3	98.4	98.1
Heavy	11	3	14	2	0	2	0	8	8	24
% Heavy	2.7	1.6	2.4	1.1	0	1.0	0	1.7	1.6	1.9



Single-Family Detached Housing
(210)

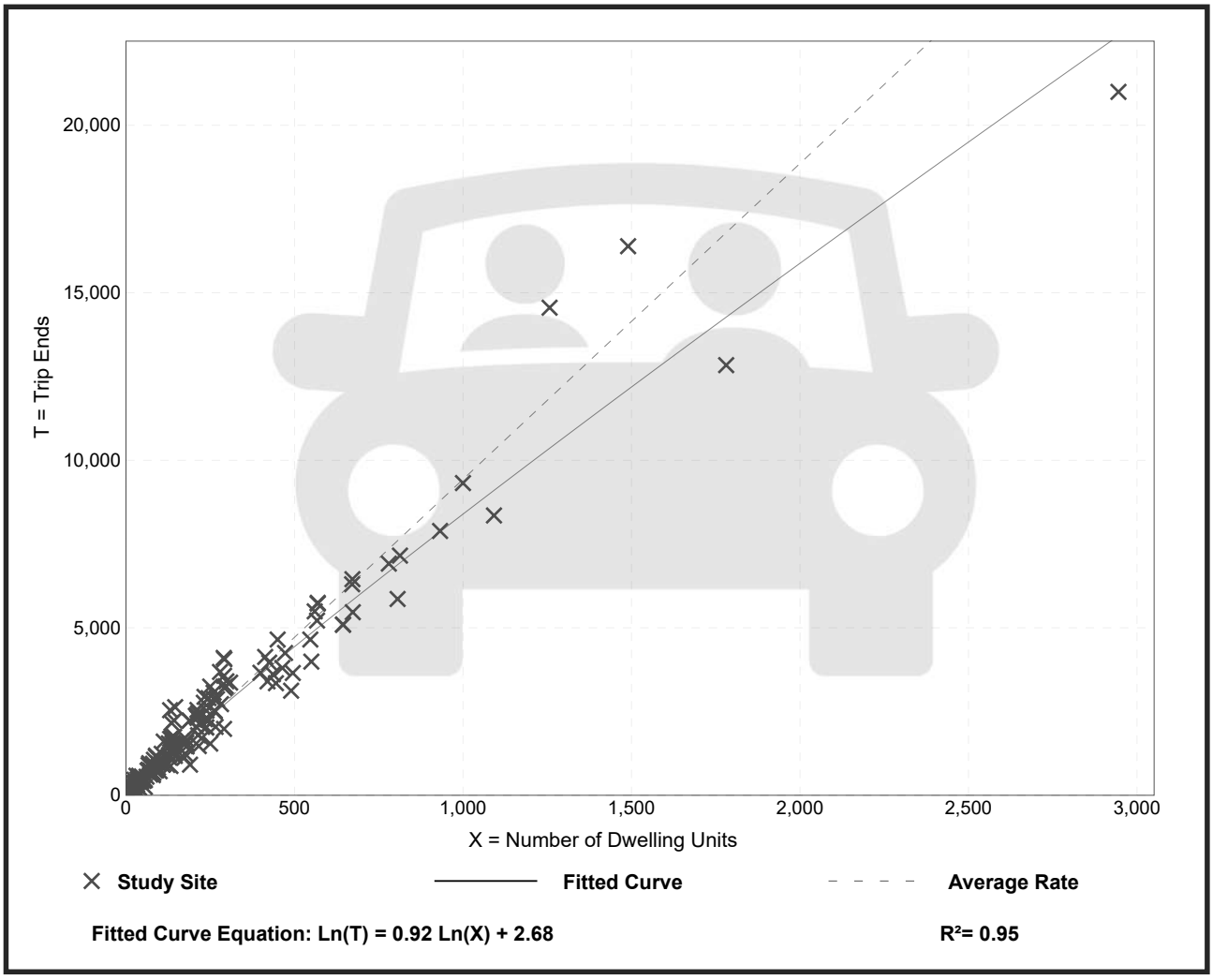
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



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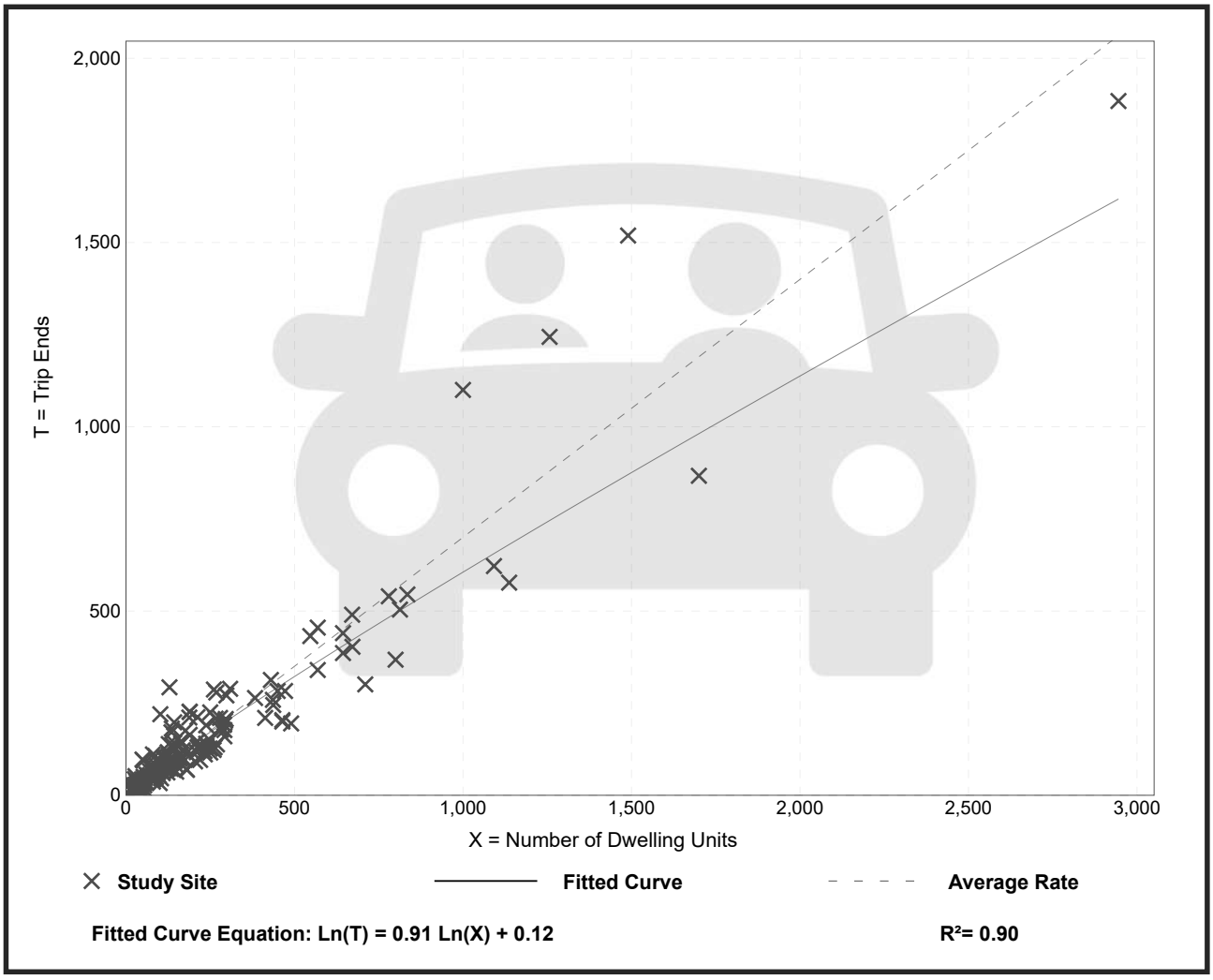
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 192
Avg. Num. of Dwelling Units: 226
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



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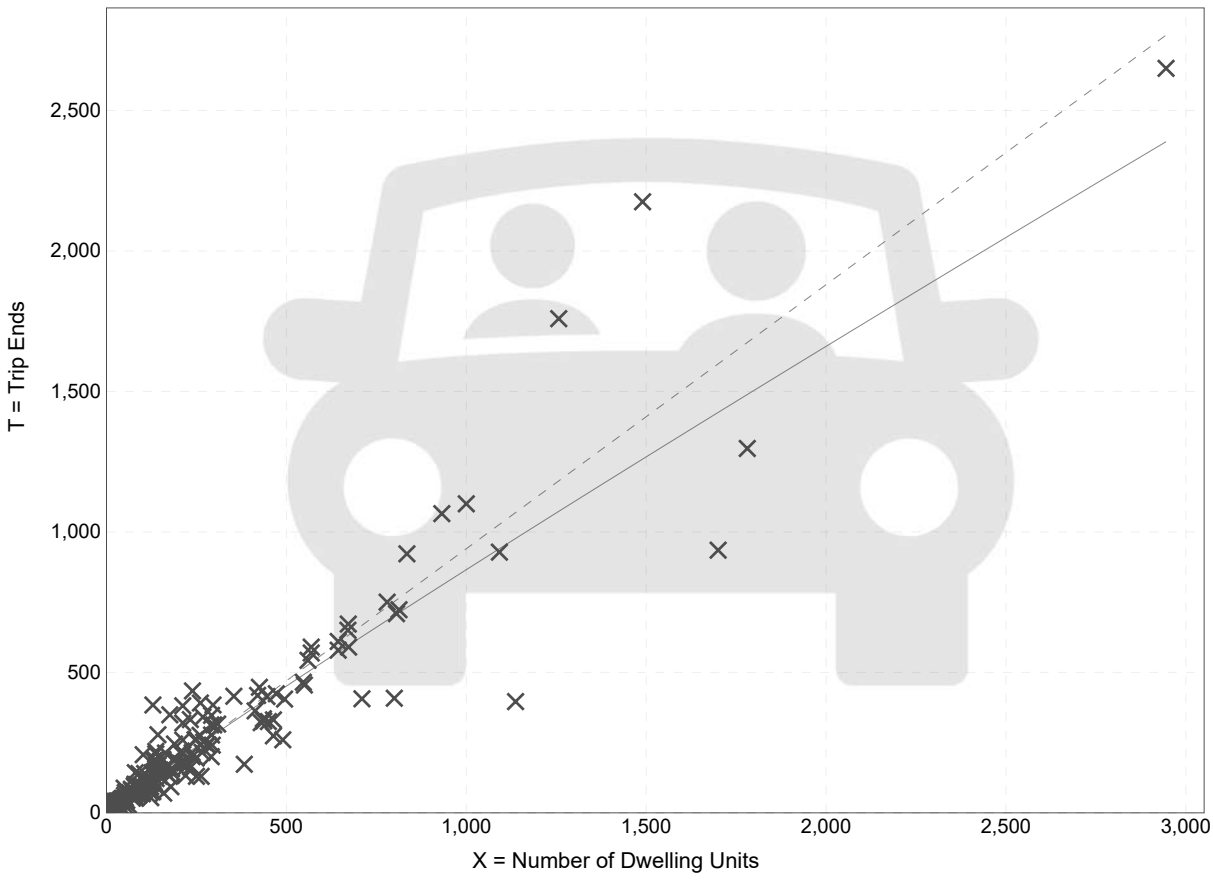
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 208
Avg. Num. of Dwelling Units: 248
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



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TAZ 232 Trip Distribution
Committed Project Network
2021-09-15

232

Disclaimer: This map is for general planning purposes only. Thurston Regional Planning Council makes no representation as to accuracy or fitness of the information for a particular purpose. Sep 15, 2021

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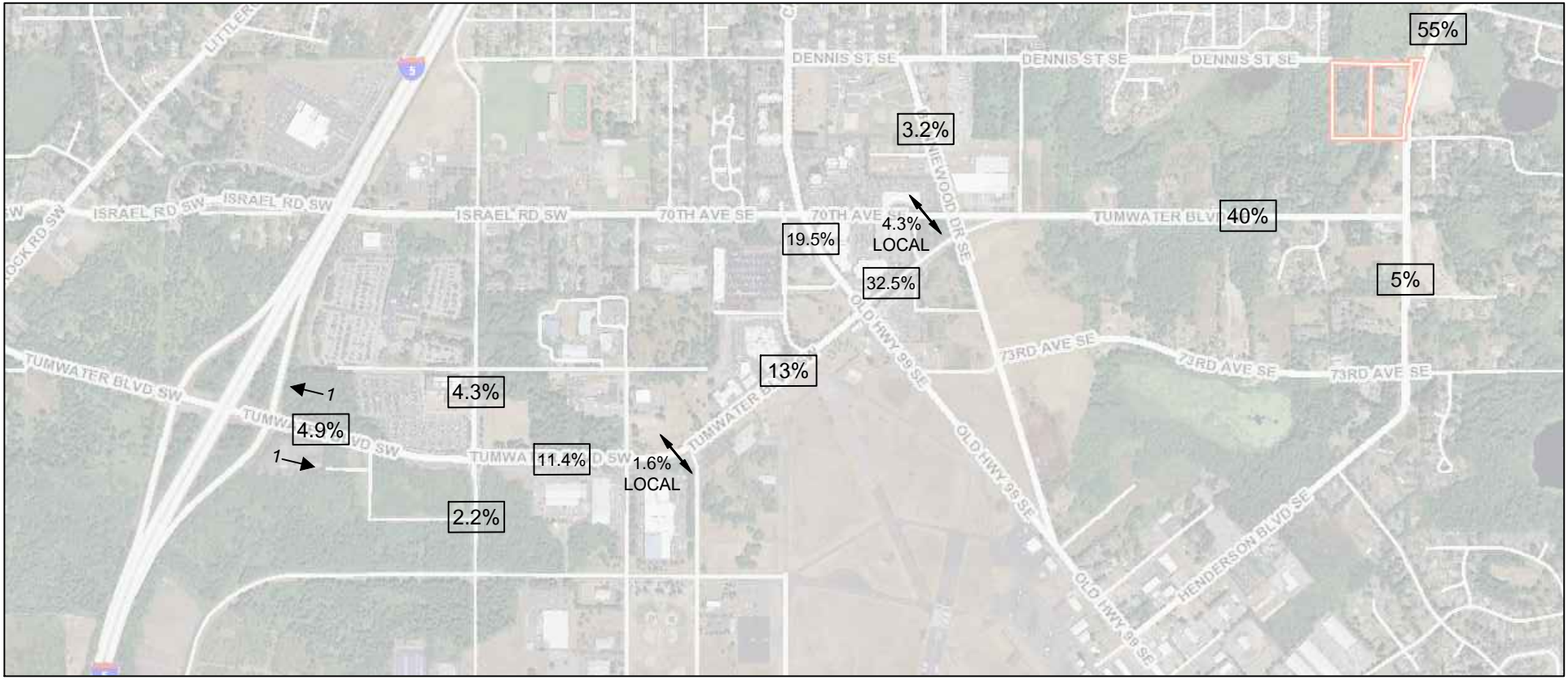
N

NEW PM PEAK HOUR TRIPS
INBOUND: 26 VPH
OUTBOUND: 16 VPH



HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

THREE LAKES CROSSING
PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE A

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	497	6	4	420	0	3	0	1	1	0	0
Future Vol, veh/h	1	497	6	4	420	0	3	0	1	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	1	3	1	1	1	1	1	1	1
Mvmt Flow	1	529	6	4	447	0	3	0	1	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	447	0	0	535	0	0	989	989	532	990	992	447
Stage 1	-	-	-	-	-	-	534	534	-	455	455	-
Stage 2	-	-	-	-	-	-	455	455	-	535	537	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1119	-	-	1038	-	-	227	248	549	226	247	614
Stage 1	-	-	-	-	-	-	532	526	-	587	570	-
Stage 2	-	-	-	-	-	-	587	570	-	531	524	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1119	-	-	1038	-	-	226	247	549	224	246	614
Mov Cap-2 Maneuver	-	-	-	-	-	-	226	247	-	224	246	-
Stage 1	-	-	-	-	-	-	531	525	-	586	567	-
Stage 2	-	-	-	-	-	-	584	567	-	529	523	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	18.8	21.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	265	1119	-	-	1038	-	-	224
HCM Lane V/C Ratio	0.016	0.001	-	-	0.004	-	-	0.005
HCM Control Delay (s)	18.8	8.2	0	-	8.5	0	-	21.1
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

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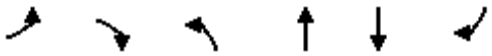

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	473	26	16	182	186	408
Future Volume (veh/h)	473	26	16	182	186	408
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1885	1885	1885	1870	1856
Adj Flow Rate, veh/h	498	27	17	192	196	429
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	1	2	3
Cap, veh/h	568	31	23	261	549	462
Arrive On Green	0.34	0.34	0.15	0.15	0.29	0.29
Sat Flow, veh/h	1676	91	153	1725	1870	1572
Grp Volume(v), veh/h	526	0	209	0	196	429
Grp Sat Flow(s),veh/h/ln	1770	0	1878	0	1870	1572
Q Serve(g_s), s	17.4	0.0	6.6	0.0	5.2	16.5
Cycle Q Clear(g_c), s	17.4	0.0	6.6	0.0	5.2	16.5
Prop In Lane	0.95	0.05	0.08			1.00
Lane Grp Cap(c), veh/h	600	0	284	0	549	462
V/C Ratio(X)	0.88	0.00	0.74	0.00	0.36	0.93
Avail Cap(c_a), veh/h	1099	0	587	0	549	462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	0.0	25.3	0.0	17.4	21.4
Incr Delay (d2), s/veh	4.3	0.0	3.7	0.0	0.4	25.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.0	3.1	0.0	2.1	8.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.7	0.0	29.0	0.0	17.8	46.8
LnGrp LOS	C	A	C	A	B	D
Approach Vol, veh/h	526			209	625	
Approach Delay, s/veh	23.7			29.0	37.7	
Approach LOS	C			C	D	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		13.9		25.6		22.8
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		19.5		38.7		18.3
Max Q Clear Time (g_c+I1), s		8.6		19.4		18.5
Green Ext Time (p_c), s		0.8		1.7		0.0

Intersection Summary		
HCM 6th Ctrl Delay		30.9
HCM 6th LOS		C

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Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	541	6	4	455	9	3	0	1	5	0	4
Future Vol, veh/h	6	541	6	4	455	9	3	0	1	5	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	1	3	1	1	1	1	1	1	1
Mvmt Flow	6	576	6	4	484	10	3	0	1	5	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	494	0	0	582	0	0	1090	1093	579	1089	1091	489
Stage 1	-	-	-	-	-	-	591	591	-	497	497	-
Stage 2	-	-	-	-	-	-	499	502	-	592	594	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1075	-	-	997	-	-	193	215	517	194	216	581
Stage 1	-	-	-	-	-	-	495	496	-	557	546	-
Stage 2	-	-	-	-	-	-	555	544	-	494	495	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1075	-	-	997	-	-	190	212	517	191	213	581
Mov Cap-2 Maneuver	-	-	-	-	-	-	190	212	-	191	213	-
Stage 1	-	-	-	-	-	-	491	492	-	553	543	-
Stage 2	-	-	-	-	-	-	548	541	-	489	491	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	21.2	18.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	226	1075	-	-	997	-	-	272
HCM Lane V/C Ratio	0.019	0.006	-	-	0.004	-	-	0.035
HCM Control Delay (s)	21.2	8.4	0	-	8.6	0	-	18.7
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

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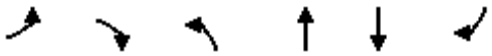

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	518	29	18	196	200	450
Future Volume (veh/h)	518	29	18	196	200	450
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1885	1885	1885	1870	1856
Adj Flow Rate, veh/h	545	31	19	206	211	474
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	1	2	3
Cap, veh/h	610	35	25	270	514	432
Arrive On Green	0.36	0.36	0.16	0.16	0.27	0.27
Sat Flow, veh/h	1672	95	159	1719	1870	1572
Grp Volume(v), veh/h	577	0	225	0	211	474
Grp Sat Flow(s),veh/h/ln	1770	0	1877	0	1870	1572
Q Serve(g_s), s	20.4	0.0	7.6	0.0	6.1	18.3
Cycle Q Clear(g_c), s	20.4	0.0	7.6	0.0	6.1	18.3
Prop In Lane	0.94	0.05	0.08			1.00
Lane Grp Cap(c), veh/h	646	0	295	0	514	432
V/C Ratio(X)	0.89	0.00	0.76	0.00	0.41	1.10
Avail Cap(c_a), veh/h	1024	0	556	0	514	432
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	26.8	0.0	19.7	24.1
Incr Delay (d2), s/veh	6.5	0.0	4.1	0.0	0.5	71.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	0.0	3.6	0.0	2.6	14.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.4	0.0	30.9	0.0	20.2	96.0
LnGrp LOS	C	A	C	A	C	F
Approach Vol, veh/h	577			225	685	
Approach Delay, s/veh	26.4			30.9	72.6	
Approach LOS	C			C	E	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		15.0		28.8		22.8
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		19.7		38.5		18.3
Max Q Clear Time (g_c+I1), s		9.6		22.4		20.3
Green Ext Time (p_c), s		0.8		1.8		0.0

Intersection Summary		
HCM 6th Ctrl Delay		48.4
HCM 6th LOS		D

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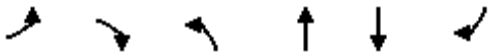
Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	17	541	6	4	455	1	3	0	1	1	0	10
Future Vol, veh/h	17	541	6	4	455	1	3	0	1	1	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	1	3	1	1	1	1	1	1	1
Mvmt Flow	18	576	6	4	484	1	3	0	1	1	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	485	0	0	582	0	0	1113	1108	579	1109	1111	485
Stage 1	-	-	-	-	-	-	615	615	-	493	493	-
Stage 2	-	-	-	-	-	-	498	493	-	616	618	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1083	-	-	997	-	-	187	211	517	188	210	584
Stage 1	-	-	-	-	-	-	480	484	-	560	549	-
Stage 2	-	-	-	-	-	-	556	549	-	480	482	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1083	-	-	997	-	-	179	205	517	183	204	584
Mov Cap-2 Maneuver	-	-	-	-	-	-	179	205	-	183	204	-
Stage 1	-	-	-	-	-	-	468	472	-	546	546	-
Stage 2	-	-	-	-	-	-	543	546	-	467	470	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	22.2	12.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	214	1083	-	-	997	-	-	487
HCM Lane V/C Ratio	0.02	0.017	-	-	0.004	-	-	0.024
HCM Control Delay (s)	22.2	8.4	0	-	8.6	0	-	12.6
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.1



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	514	29	18	197	201	442
Future Volume (veh/h)	514	29	18	197	201	442
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1885	1885	1885	1870	1856
Adj Flow Rate, veh/h	541	31	19	207	212	465
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	1	2	3
Cap, veh/h	606	35	25	272	516	434
Arrive On Green	0.36	0.36	0.16	0.16	0.28	0.28
Sat Flow, veh/h	1671	96	158	1719	1870	1572
Grp Volume(v), veh/h	573	0	226	0	212	465
Grp Sat Flow(s),veh/h/ln	1770	0	1877	0	1870	1572
Q Serve(g_s), s	20.2	0.0	7.6	0.0	6.1	18.3
Cycle Q Clear(g_c), s	20.2	0.0	7.6	0.0	6.1	18.3
Prop In Lane	0.94	0.05	0.08			1.00
Lane Grp Cap(c), veh/h	642	0	297	0	516	434
V/C Ratio(X)	0.89	0.00	0.76	0.00	0.41	1.07
Avail Cap(c_a), veh/h	1027	0	557	0	516	434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	26.7	0.0	19.6	24.0
Incr Delay (d2), s/veh	6.3	0.0	4.0	0.0	0.5	63.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	0.0	3.6	0.0	2.6	14.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.3	0.0	30.8	0.0	20.1	87.8
LnGrp LOS	C	A	C	A	C	F
Approach Vol, veh/h	573			226	677	
Approach Delay, s/veh	26.3			30.8	66.6	
Approach LOS	C			C	E	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		15.0		28.6		22.8
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		19.7		38.5		18.3
Max Q Clear Time (g_c+I1), s		9.6		22.2		20.3
Green Ext Time (p_c), s		0.8		1.8		0.0

Intersection Summary		
HCM 6th Ctrl Delay		45.5
HCM 6th LOS		D

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	1	1	710	642	22
Future Vol, veh/h	13	1	1	710	642	22
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, %	2	2	2	2	2	2
Mvmt Flow	14	1	1	772	698	24

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1484	710	722	0	-	0
Stage 1	710	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	137	434	880	-	-	-
Stage 1	487	-	-	-	-	-
Stage 2	455	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	137	434	880	-	-	-
Mov Cap-2 Maneuver	137	-	-	-	-	-
Stage 1	486	-	-	-	-	-
Stage 2	455	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	32.9	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	880	-	144	-	-
HCM Lane V/C Ratio	0.001	-	0.106	-	-
HCM Control Delay (s)	9.1	0	32.9	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Exhibit 1310-7a Left-Turn Storage Guidelines: Two-Lane, Unsignalized

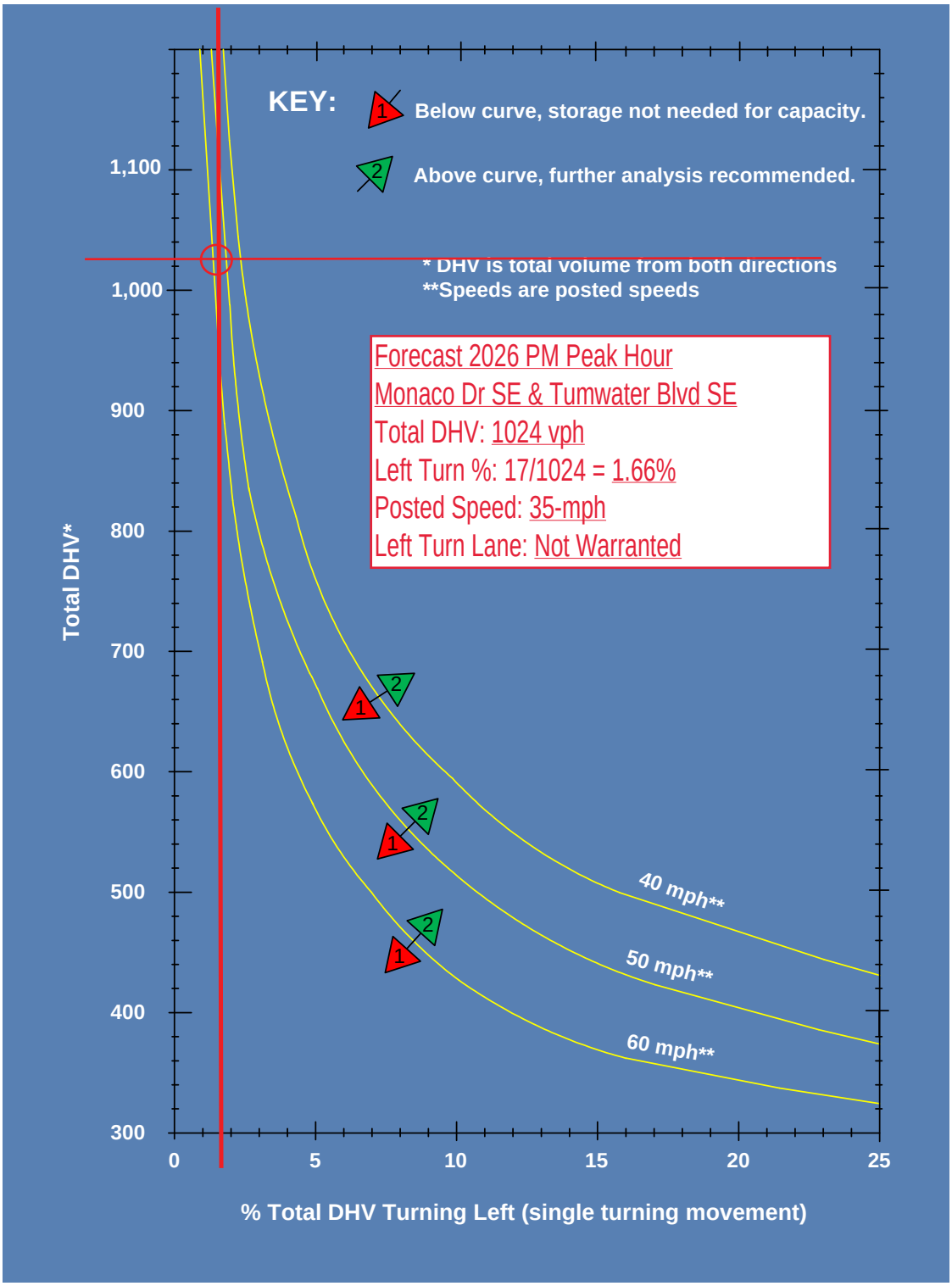
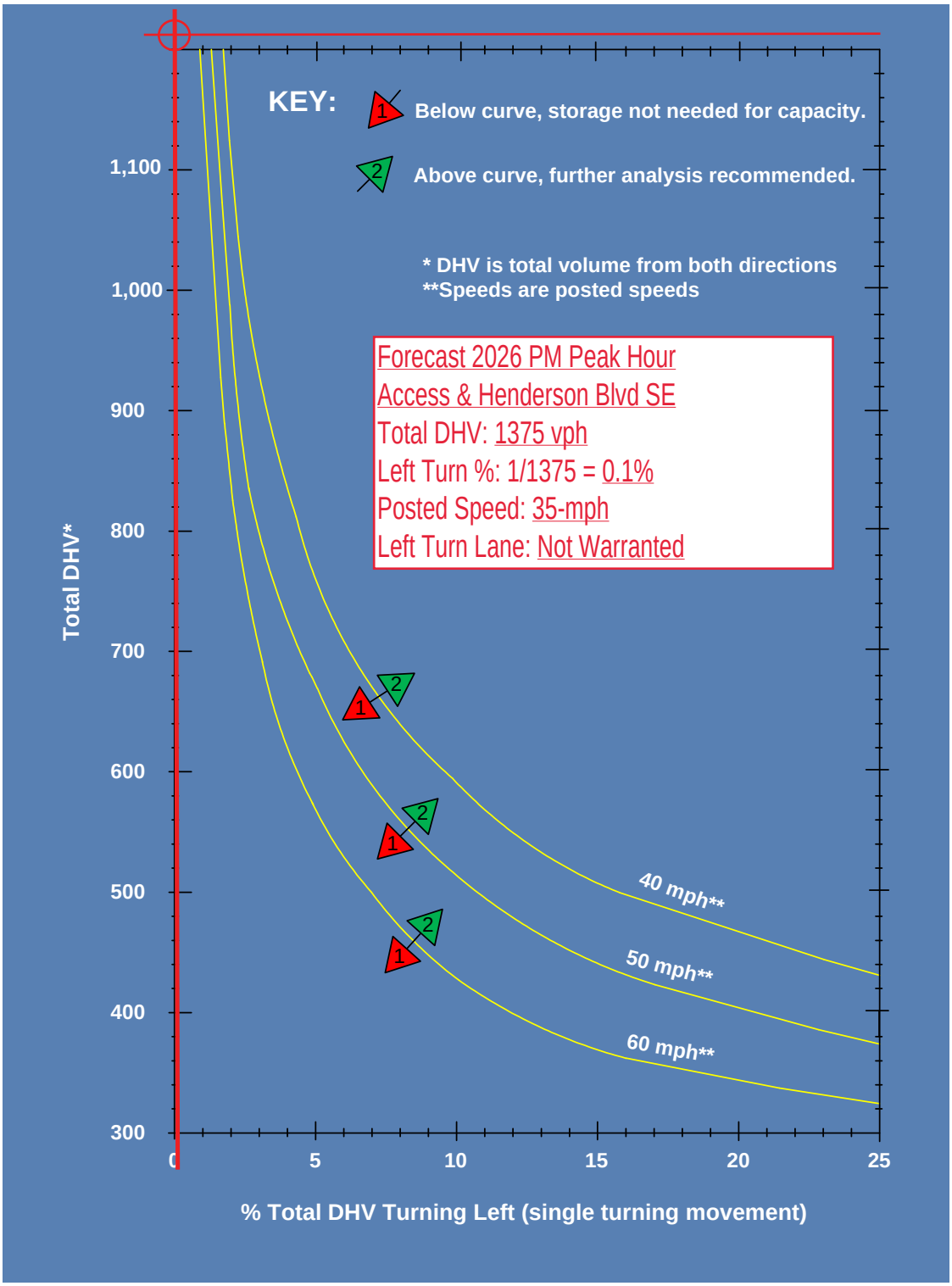


Exhibit 1310-7a Left-Turn Storage Guidelines: Two-Lane, Unsignalized



Date: December 10, 2021

To: Evan Mann
SoundBuilt Homes

From: Aaron Van Aken, PE, PTOE

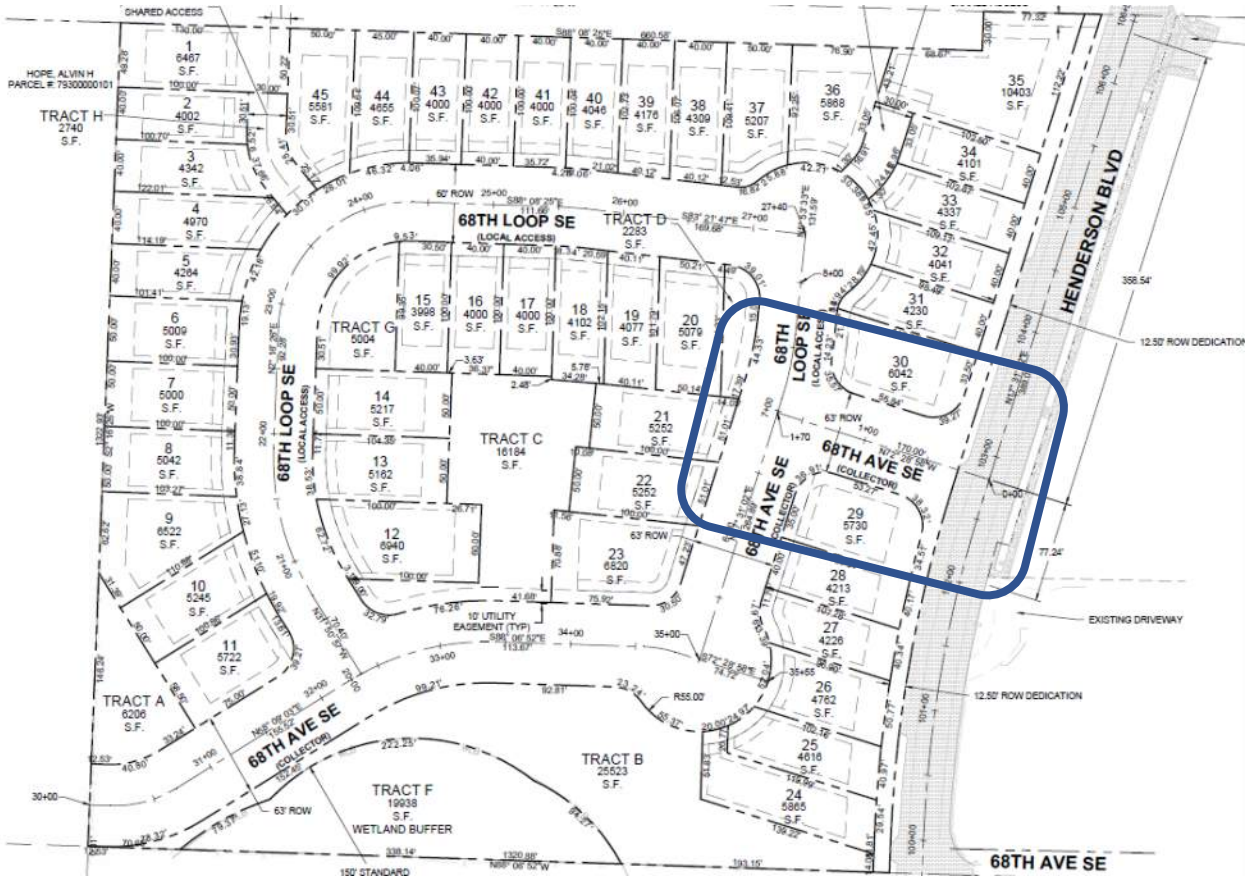
Subject: Three Lakes Crossing Queuing Analysis

The intent of this technical memorandum serves to evaluate queuing demands at the proposed access intersection to Henderson Boulevard SE for the proposed Three Lakes Crossing development. This evaluation uses data and information from the updated *Three Lakes Crossing* (12/10/2021) Transportation Impact Analysis (TIA). Below is a project summary and projected queuing estimates.

PROJECT DESCRIPTION

Three Lakes Crossing is a proposed 45-unit single-family development located in the city of Tumwater. The subject properties are situated on the west side of Henderson Blvd SE and just north of Tumwater Blvd SE. Access to and from the site is proposed via a new roadway extending west from Henderson Blvd SE and a connection to an adjacent property on the southwest corner of the site. According to the TIA, this project is estimated to generate 42 new trips in the PM peak hour (26 inbound / 16 outbound).

Figure 1: Site Plan



Shown above is the proposed site plan with proposed accesses and internal roadway configuration. This evaluation will focus on queuing at the primary access intersection with Henderson Blvd SE. Approximately 145 feet of spacing is available from Henderson Blvd SE to the internal intersection as shown the image above.

To evaluate peak hour queues, forecast 2026 PM peak hour projected volumes were applied (see attached figure from TIA). Queues were estimated using *SimTraffic* and *Synchro 11* modeling programs. Five peak hour simulations were performed in order to establish an average queue at the access intersection.

QUEUING

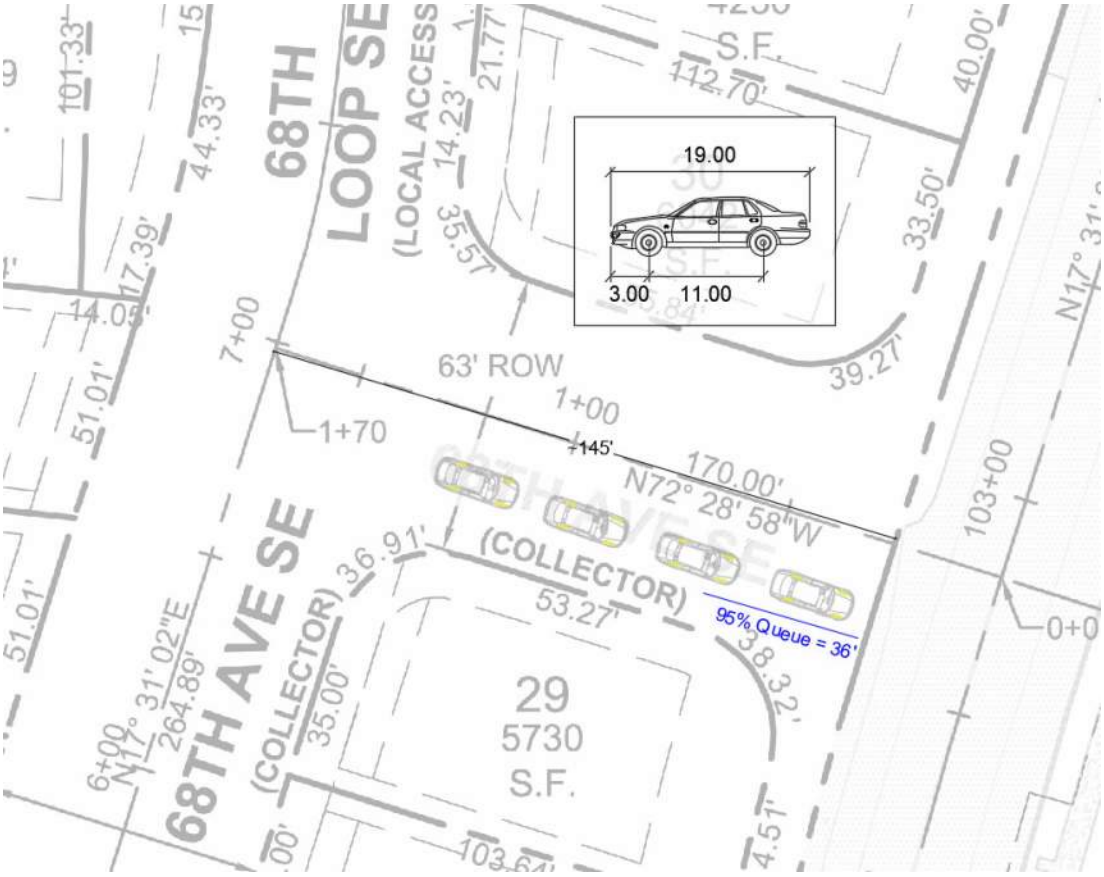
A total of five peak hour simulations were performed. The table below summarizes the aggregated findings. See appendix for detailed report sheets.

Table 1: Forecast 2026 PM Peak Hour Queues & Delays

Delays Given in Seconds per Vehicle

Intersection	Control	Movement	95th% Queue	Delay
Access & Henderson Blvd	Stop	Eastbound	36 ft	17.7 sec

Based on the modeling outputs, maximum queues are estimated to be up to 36 feet (1-2 vehicle lengths) during the critical peak travel hour. In other words, vehicles waiting to leave the subject site and enter Henderson Blvd SE are estimated to be up to two vehicles for all but the rarest events. With approximately 145-foot spacing to the internal intersection, no blockage or queue spillover is estimated to occur. Shown in the image below in blue is the calculated 95th percentile queuing distance (36'). Up to four vehicle lengths can comfortably stack up before the internal intersection indicating sufficient spacing availability.

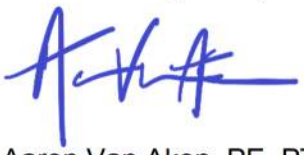


CONCLUSION

Three Lakes Crossing, a proposed 45-unit single-family development located in the city of Tumwater, has been evaluated in terms of queuing and operations at the proposed access off Henderson Boulevard SE. This memo uses information and builds upon the *Three Lakes Crossing* TIA (12/10/2021).

Using the 2026 PM peak hour traffic volume estimates from the original TIA in conjunction with additional traffic modeling and simulations, queues at the primary access intersection were calculated. Based on the simulations, a 95th percentile queue of 36 feet (one to two vehicles) was derived for the eastbound approach waiting to enter Henderson Blvd. On average, one vehicle or less would typically be waiting to leave the subject property. Based on the queuing assessments provided herein, no conflict with respect to the 145-foot spacing from Henderson Blvd to the internal plat intersection is expected.

Please call if you require additional information.

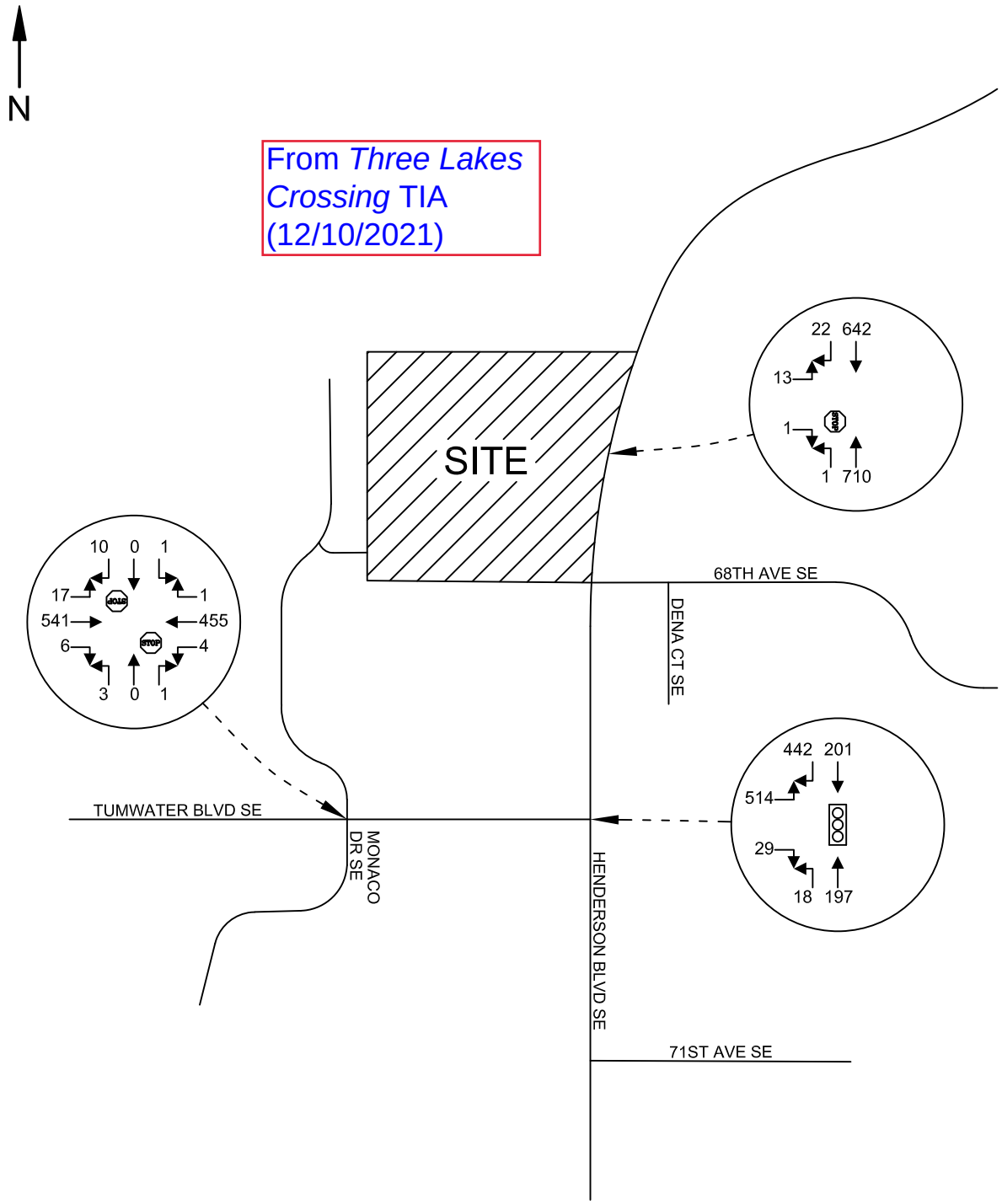


Aaron Van Aken, PE, PTOE

THREE LAKES CROSSING

QUEUING MEMO

APPENDIX



HEATH & ASSOCIATES

TRAFFIC AND CIVIL ENGINEERING

THREE LAKES CROSSING

FORECAST 2026 PM PEAK HOUR VOLUMES WITH PROJECT

FIGURE 7

3: Henderson Blvd SE & Access Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.5	0.3
Total Del/Veh (s)	17.7	2.4	0.6	1.7

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Intersection: 3: Henderson Blvd SE & Access

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	39	69	4
Average Queue (ft)	11	4	0
95th Queue (ft)	36	44	3
Link Distance (ft)	636	875	372
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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