Exhibit A

KAYS SUBDIVISION OUTFALL
SHORELINE MASTER PROGRAM CONDITIONAL-USE PERMIT APPLICATION
La Center, Washington

Prepared for:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

Prepared by:
The Resource Company, Inc.
915 Broadway, Ste. 250
Vancouver, WA 98660
(360) 693-4555

April 30, 2015

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION

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CULTURAL RESOURCES REPORT

STORMWATER REPORT

WASHINGTON STATE
Joint Aquatic Resources Permit Application (JARPA) Form[1,2]

USE BLACK OR BLUE INK TO ENTER ANSWERS IN THE WHITE SPACES BELOW.

US Army Corps of Engineers ®
Seattle District

AGENCY USE ONLY

Date received:

Agency reference #: _____

Tax Parcel #(s): _____

_____

_____

Part 1–Project Identification

1. Project Name (A name for your project that you create. Examples: Smith's Dock or Seabrook Lane Development) [help]
Kays Subdivision (NWS-2013-739 - WARAC, LLC) Stormwater Outfall

Part 2–Applicant

The person and/or organization responsible for the project. [help]

2a. Name (Last, First, Middle)			
Nutter, Jerry			
2b. Organization (If applicable)			
WARAC, LLC			
2c. Mailing Address (Street or PO Box)			
7211 A NE 43rd Avenue			
2d. City, State, Zip			
Vancouver, WA 98661			
2e. Phone (1)	**2f.** Phone (2)	**2g.** Fax	**2h.** E-mail
(360) 573-2000	( )	(360) 576-8484	jnutter@nuttercorp.com

[1] Additional forms may be required for the following permits:

- If your project may qualify for Department of the Army authorization through a Regional General Permit (RGP), contact the U.S. Army Corps of Engineers for application information (206) 764-3495.
- If your project might affect species listed under the Endangered Species Act, you will need to fill out a Specific Project Information Form (SPIF) or prepare a Biological Evaluation. Forms can be found at http://www.nws.usace.army.mil/Missions/CivilWorks/Regulatory/PermitGuidebook/EndangeredSpecies.aspx.
- Not all cities and counties accept the JARPA for their local Shoreline permits. If you need a Shoreline permit, contact the appropriate city or county government to make sure they accept the JARPA.

[2] To access an online JARPA form with [help] screens, go to http://www.epermitting.wa.gov/site/alias__resourcecenter/jarpa_jarpa_form/9984/jarpa_form.aspx.

For other help, contact the Governor's Office of Regulatory Assistance at 1-800-917-0043 or help@ora.wa.gov.

Part 3–Authorized Agent or Contact

Person authorized to represent the applicant about the project. (Note: Authorized agent(s) must sign 11b of this application.) [help]

3a. Name (Last, First, Middle)			
Grosz, Kevin			
3b. Organization (If applicable)			
The Resource Company, Inc.			
3c. Mailing Address (Street or PO Box)			
915 Broadway, Ste. 250			
3d. City, State, Zip			
Vancouver, WA 98660			
3e. Phone (1)	**3f.** Phone (2)	**3g.** Fax	**3h.** E-mail
(360) 693-4555	( )	(360) 699-6242	kevin@trc-inc.org

Part 4–Property Owner(s)

Contact information for people or organizations owning the property(ies) where the project will occur. Consider both **upland and aquatic** ownership because the upland owners may not own the adjacent aquatic land. [help]

☐ Same as applicant. (Skip to Part 5.)

☐ Repair or maintenance activities on existing rights-of-way or easements. (Skip to Part 5.)

☐ There are multiple upland property owners. Complete the section below and fill out JARPA Attachment A for each additional property owner.

☐ Your project is on Department of Natural Resources (DNR)-managed aquatic lands. If you don't know, contact the DNR at (360) 902-1100 to determine aquatic land ownership. If yes, complete JARPA Attachment E to apply for the Aquatic Use Authorization.

4a. Name (Last, First, Middle)			
Sarvis, Jeff			
4b. Organization (If applicable)			
City of LaCenter, Public Works Department			
4c. Mailing Address (Street or PO Box)			
419 E. Cedars Avenue			
4d. City, State, Zip			
LaCenter, WA 98629			
4e. Phone (1)	**4f.** Phone (2)	**4g.** Fax	**4h.** E-mail
(360) 263-7665	( )	(360) 263-7666	jsarvis@lacenter.wa.us

Part 5–Project Location(s)

Identifying information about the property or properties where the project will occur. [help]

☐ There are multiple project locations (e.g. linear projects). Complete the section below and use JARPA Attachment B for each additional project location.

5a. Indicate the type of ownership of the property. (Check all that apply.) [help]

☐ Private
☐ Federal
☒ Publicly owned (state, county, city, special districts like schools, ports, etc.)
☐ Tribal
☐ Department of Natural Resources (DNR) – managed aquatic lands (Complete JARPA Attachment E)

5b. Street Address (Cannot be a PO Box. If there is no address, provide other location information in 5p.) [help]

West edge of W. 5th Street to the East Fork of the Lewis River

5c. City, State, Zip (If the project is not in a city or town, provide the name of the nearest city or town.) [help]

LaCenter, WA 98629

5d. County [help]

Clark

5e. Provide the section, township, and range for the project location. [help]

¼ Section	Section	Township	Range
NW	3	4N	1E

5f. Provide the latitude and longitude of the project location. [help]

- Example: 47.03922 N lat. / -122.89142 W long. (Use decimal degrees - NAD 83)

45.861594N, -122.678931W

5g. List the tax parcel number(s) for the project location. [help]

- The local county assessor's office can provide this information.

City Right-of-Way, no parcel number listed

5h. Contact information for all adjoining property owners. (If you need more space, use JARPA Attachment C.) [help]

Name	Mailing Address	Tax Parcel # (if known)
Eddie Barnhart	555 W. 5th Street LaCenter, WA 98629	611668-000, 62464-000 63510-000, 63520-000

5i. List all wetlands on or adjacent to the project location. [help]

Wetland C, at the bottom of the slope

5j. List all waterbodies (other than wetlands) on or adjacent to the project location. [help]

East Fork of the Lewis River

5k. Is any part of the project area within a 100-year floodplain? [help]

☒ Yes ☐ No ☐ Don't know

5l. Briefly describe the vegetation and habitat conditions on the property. [help]

The project areas consists of a forested area on the sidehill slope that transition into an open grassland area adjacent to the stream. Vegetation in the forested area consists of western red cedar (*Thuja plicata*), Oregon white oak and Douglas-fir (*Pseudotsuga menziesii*) overstory. The shrub layer consists of vine maple (*Acer circinatum*) and snowberry (*Symphoricarpos occidentalis*). Ground cover is predominantly sword fern (*Polystichum munitum*), blackberry (*Rubus* spp.) and stinging nettle (*Urtica dioica*). The small open grassland area that occurs immediately adjacent to the river is dominated by native and non-native grasses. See the habitat assessment report

5m. Describe how the property is currently used. [help]

Vacant pastureland

5n. Describe how the adjacent properties are currently used. [help]

Single family residential and pastureland

5o. Describe the structures (above and below ground) on the property, including their purpose(s) and current condition. [help]

None known

5p. Provide driving directions from the closest highway to the project location, and attach a map. [help]

From I-5 head east on NW LaCenter Road – cross the bridge on the East Fork of the Lewis River – head northwest on NW Pacific Hwy at W. 5th Street head west – the project area is located at the existing terminus of W. 5th Street and extends down to the East Fork of the Lewis River

Part 6–Project Description

6a. Briefly summarize the overall project. You can provide more detail in 6b. [help]

This project is to provide a stormwater outfall to the East Fork of the Lewis River for the Kays Subdivision

6b. Describe the purpose of the project and why you want or need to perform it. [help]

The applicant has pursued several alternatives for the stormwater outfall for the Kay's subdivision. This appears to be only viable alternative. The subdivision cannot be constructed without the capability of discharging the stormwater from the development site.

6c. Indicate the project category. (Check all that apply) [help]

- ☐ Commercial
- ☒ Residential
- ☐ Institutional
- ☐ Transportation
- ☐ Recreational
- ☐ Maintenance
- ☐ Environmental Enhancement

6d. Indicate the major elements of your project. (Check all that apply) [help]

- ☐ Aquaculture
- ☐ Bank Stabilization
- ☐ Boat House
- ☐ Boat Launch
- ☐ Boat Lift
- ☐ Bridge
- ☐ Bulkhead
- ☐ Buoy
- ☐ Channel Modification
- ☐ Culvert
- ☐ Dam / Weir
- ☐ Dike / Levee / Jetty
- ☐ Ditch
- ☐ Dock / Pier
- ☐ Dredging
- ☐ Fence
- ☐ Ferry Terminal
- ☐ Fishway
- ☐ Float
- ☐ Floating Home
- ☐ Geotechnical Survey
- ☐ Land Clearing
- ☐ Marina / Moorage
- ☐ Mining
- ☒ Outfall Structure
- ☐ Piling/Dolphin
- ☐ Raft
- ☐ Retaining Wall (upland)
- ☐ Road
- ☐ Scientific Measurement Device
- ☐ Stairs
- ☐ Stormwater facility
- ☐ Swimming Pool
- ☐ Utility Line

☐ Other:

6e. Describe how you plan to construct each project element checked in 6d. Include specific construction methods and equipment to be used. [help]

- Identify where each element will occur in relation to the nearest waterbody.
- Indicate which activities are within the 100-year floodplain.

All trenches will be excavated using a standard trackhoe. This equipment will be used to restore the trench area once installation has been completed. Areas within the 100-year floodplain are shown on the attached graphics.

6f. What are the anticipated start and end dates for project construction? (Month/Year) [help]

- If the project will be constructed in phases or stages, use JARPA Attachment D to list the start and end dates of each phase or stage.

As soon as all permits are obtained – construction will comply with the work water window for the Lewis River

Start date: _____ End date: _____ ☐ See JARPA Attachment D

6g. Fair market value of the project, including materials, labor, machine rentals, etc. [help]

$50,000.00

6h. Will any portion of the project receive federal funding? [help]

- **If yes**, list each agency providing funds.

☐ Yes ☒ No ☐ Don't know

Part 7–Wetlands: Impacts and Mitigation

☒ Check here if there are wetlands or wetland buffers on or adjacent to the project area.
(If there are none, skip to Part 8.) [help]

7a. Describe how the project has been designed to avoid and minimize adverse impacts to wetlands. [help]

☐ Not applicable

The project will temporarily impact 440 sq.ft. of a Category IV wetland at the base of the slope.

7b. Will the project impact wetlands? [help]

☒ Yes ☐ No ☐ Don't know

7c. Will the project impact wetland buffers? [help]

☒ Yes ☐ No ☐ Don't know

7d. Has a wetland delineation report been prepared? [help]

- **If Yes**, submit the report, including data sheets, with the JARPA package.

☒ Yes ☐ No

7e. Have the wetlands been rated using the Western Washington or Eastern Washington Wetland Rating System? [help]

- **If Yes**, submit the wetland rating forms and figures with the JARPA package.

☒ Yes ☐ No ☐ Don't know

7f. Have you prepared a mitigation plan to compensate for any adverse impacts to wetlands? [help]

- **If Yes**, submit the plan with the JARPA package and answer 7g.
- **If No, or Not applicable**, explain below why a mitigation plan should not be required.

☒ Yes ☐ No ☐ Not applicable

7g. Summarize what the mitigation plan is meant to accomplish, and describe how a watershed approach was used to design the plan. [help]

The mitigation will compensate for the 440 sq.ft. of temporary impacts to a Category IV wetland and 2,500 sq.ft. of associated buffer. A watershed approach was not used since this is basically a restoration of the temporarily impacted wetland and buffer once the construction has been completed.

7h. Use the table below to list the type and rating of each wetland impacted, the extent and duration of the impact, and the type and amount of mitigation proposed. Or if you are submitting a mitigation plan with a similar table, you can state (below) where we can find this information in the plan. [help]

Activity (fill, drain, excavate, flood, etc.)	Wetland Name[1]	Wetland type and rating category[2]	Impact area (sq. ft. or Acres)	Duration of impact[3]	Proposed mitigation type[4]	Wetland mitigation area (sq. ft. or acres)
Excavate	C	IV	440 s.ft.	1 week	E	807

[1] If no official name for the wetland exists, create a unique name (such as "Wetland 1"). The name should be consistent with other project documents, such as a wetland delineation report.
[2] Ecology wetland category based on current Western Washington or Eastern Washington Wetland Rating System. Provide the wetland rating forms with the JARPA package.
[3] Indicate the days, months or years the wetland will be measurably impacted by the activity. Enter "permanent" if applicable.
[4] Creation (C), Re-establishment/Rehabilitation (R), Enhancement (E), Preservation (P), Mitigation Bank/In-lieu fee (B)

Page number(s) for similar information in the mitigation plan, if available: _____

7i. For all filling activities identified in 7h, describe the source and nature of the fill material, the amount in cubic yards that will be used, and how and where it will be placed into the wetland. [help]

The trench will be restored once the pipe has been installed, therefore there will be no net fill in the wetland

7j. For all excavating activities identified in 7h, describe the excavation method, type and amount of material in cubic yards you will remove, and where the material will be disposed. [help]

Standard trackhoe – the trench will be restored to preconstruction contours any excess spoils will be removed from the wetland and floodplain area and disposed of in a non-environmentally sensitive area.

Part 8–Waterbodies (other than wetlands): Impacts and Mitigation

In Part 8, "waterbodies" refers to non-wetland waterbodies. (See Part 7 for information related to wetlands.) [help]

☒ Check here if there are waterbodies on or adjacent to the project area. (If there are none, skip to Part 9.)

8a. Describe how the project is designed to avoid and minimize adverse impacts to the aquatic environment. [help]

☐ Not applicable

The stormwater outfall is required to be located within the stream based on the City's Shoreline Master Plan. However, the design is such that a minimum required area or stream will be impacted by the placement of the outfall pipe.

8b. Will your project impact a waterbody or the area around a waterbody? [help]

☒ Yes ☐ No

8c. Have you prepared a mitigation plan to compensate for the project's adverse impacts to non-wetland

waterbodies? [help]

- **If Yes**, submit the plan with the JARPA package and answer 8d.
- **If No, or Not applicable,** explain below why a mitigation plan should not be required.

☒ Yes ☐ No ☐ Not applicable

8d. Summarize what the mitigation plan is meant to accomplish. Describe how a watershed approach was used to design the plan.

- If you already completed 7g you do not need to restate your answer here. [help]

Native trees and shrubs will be planted along the shoreline restore the construction area and help with long-term erosion control.

8e. Summarize impact(s) to each waterbody in the table below. [help]

Activity (clear, dredge, fill, pile drive, etc.)	Waterbody name[1]	Impact location[2]	Duration of impact[3]	Amount of material (cubic yards) to be placed in or removed from waterbody	Area (sq. ft. or linear ft.) of waterbody directly affected
Outfall Structure	East Fork Lewis River	In & adjacent	Permanent		Only outfall pipe area

[1] If no official name for the waterbody exists, create a unique name (such as "Stream 1") The name should be consistent with other documents provided.
[2] Indicate whether the impact will occur in or adjacent to the waterbody. If adjacent, provide the distance between the impact and the waterbody and indicate whether the impact will occur within the 100-year flood plain.
[3] Indicate the days, months or years the waterbody will be measurably impacted by the work. Enter "permanent" if applicable.

8f. For all activities identified in 8e, describe the source and nature of the fill material, amount (in cubic yards) you will use, and how and where it will be placed into the waterbody. [help]

The trench will be restored to preconstruction contours. The will be no net gain/loss of fill material

8g. For all excavating or dredging activities identified in 8e, describe the method for excavating or dredging, type and amount of material you will remove, and where the material will be disposed. [help]

A standard trackhoe will be used for excavating the trench and also restoring the trench to preconstruction contours.

Part 9–Additional Information

Any additional information you can provide helps the reviewer(s) understand your project. Complete as much of this section as you can. It is ok if you cannot answer a question.

9a. If you have already worked with any government agencies on this project, list them below. [help]

Agency Name	Contact Name	Phone	Most Recent Date of Contact
		( )	
		( )	
		( )	

9b. Are any of the wetlands or waterbodies identified in Part 7 or Part 8 of this JARPA on the Washington Department of Ecology's 303(d) List? [help]

- **If Yes,** list the parameter(s) below.
- If you don't know, use Washington Department of Ecology's Water Quality Assessment tools at: http://www.ecy.wa.gov/programs/wq/303d/.

☒ Yes ☐ No

Temperature, fecal coliform

9c. What U.S. Geological Survey Hydrological Unit Code (HUC) is the project in? [help]

- Go to http://cfpub.epa.gov/surf/locate/index.cfm to help identify the HUC.

17080002

9d. What Water Resource Inventory Area Number (WRIA #) is the project in? [help]

- Go to http://www.ecy.wa.gov/services/gis/maps/wria/wria.htm to find the WRIA #.

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9e. Will the in-water construction work comply with the State of Washington water quality standards for turbidity? [help]

- Go to http://www.ecy.wa.gov/programs/wq/swqs/criteria.html for the standards.

☒ Yes ☐ No ☐ Not applicable

9f. If the project is within the jurisdiction of the Shoreline Management Act, what is the local shoreline environment designation? [help]

- If you don't know, contact the local planning department.
- For more information, go to: http://www.ecy.wa.gov/programs/sea/sma/laws_rules/173-26/211_designations.html.

☐ Rural ☒ Urban ☐ Natural ☐ Aquatic ☒ Conservancy ☐ Other _____

9g. What is the Washington Department of Natural Resources Water Type? [help]

- Go to http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_watertyping.aspx for the Forest Practices Water Typing System.

☒ Shoreline ☐ Fish ☐ Non-Fish Perennial ☐ Non-Fish Seasonal

9h. Will this project be designed to meet the Washington Department of Ecology's most current stormwater manual? [help]

- **If No**, provide the name of the manual your project is designed to meet.

☒ Yes ☐ No

Name of manual: 2012 Stormwater Management Manual for Western Washington

9i. Does the project site have known contaminated sediment? [help]

- **If Yes**, please describe below.

☐ Yes ☒ No

9j. If you know what the property was used for in the past, describe below. [help]

Pasture, forestland

9k. Has a cultural resource (archaeological) survey been performed on the project area? [help]

- **If Yes**, attach it to your JARPA package.

☒ Yes ☐ No

9l. Name each species listed under the federal Endangered Species Act that occurs in the vicinity of the project area or might be affected by the proposed work. [help]

Chinook Salmon- Spring/Fall
Coho Salmon
Chum Salmon
Steelhead – Winter/Summer

9m. Name each species or habitat on the Washington Department of Fish and Wildlife's Priority Habitats and Species List that might be affected by the proposed work. [help]

Riparian habitat, Oregon white oak habitat

Part 10–SEPA Compliance and Permits

Use the resources and checklist below to identify the permits you are applying for.

- Online Project Questionnaire at http://apps.ecy.wa.gov/opas/.
- Governor's Office of Regulatory Assistance at (800) 917-0043 or help@ora.wa.gov.
- For a list of addresses to send your JARPA to, click on agency addresses for completed JARPA.

10a. Compliance with the State Environmental Policy Act (SEPA). (Check all that apply.) [help]

- For more information about SEPA, go to www.ecy.wa.gov/programs/sea/sepa/e-review.html.

☐ A copy of the SEPA determination or letter of exemption is included with this application.

☒ A SEPA determination is pending with _LaCenter____ (lead agency). The expected decision date is _____.

☐ I am applying for a Fish Habitat Enhancement Exemption. (Check the box below in 10b.) [help]

☐ This project is exempt (choose type of exemption below).

- ☐ Categorical Exemption. Under what section of the SEPA administrative code (WAC) is it exempt? _____
- ☐ Other: _____

☐ SEPA is pre-empted by federal law.

10b. Indicate the permits you are applying for. (Check all that apply.) [help]

LOCAL GOVERNMENT

Local Government Shoreline permits:

☒ Substantial Development ☒ Conditional Use ☐ Variance

☐ Shoreline Exemption Type (explain): _____

Other city/county permits:

☒ Floodplain Development Permit ☒ Critical Areas Ordinance

STATE GOVERNMENT

Washington Department of Fish and Wildlife:

☒ Hydraulic Project Approval (HPA) ☐ Fish Habitat Enhancement Exemption – Attach Exemption Form

Effective July 10, 2012, you must submit a check for $150 to Washington Department of Fish and Wildlife, unless your project qualifies for an exemption or alternative payment method below. **Do not send cash.**

Check the appropriate boxes:

☐ $150 check enclosed. (Check #_____)
Attach check made payable to Washington Department of Fish and Wildlife.

☐ Charge to billing account under agreement with WDFW. (Agreement #_____)

☐ My project is exempt from the application fee. (Check appropriate exemption)
- ☐ HPA processing is conducted by applicant-funded WDFW staff. (Agreement #_____)
- ☐ Mineral prospecting and mining.
- ☐ Project occurs on farm and agricultural land. (Attach a copy of current land use classification recorded with the county auditor, or other proof of current land use.)
- ☐ Project is a modification of an existing HPA originally applied for, prior to July 10, 2012. (HPA #_____)

Washington Department of Natural Resources:

☐ Aquatic Use Authorization
Complete JARPA Attachment E and submit a check for $25 payable to the Washington Department of Natural Resources. **Do not send cash.**

Washington Department of Ecology:

☒ Section 401 Water Quality Certification

FEDERAL GOVERNMENT

United States Department of the Army permits (U.S. Army Corps of Engineers):

☒ Section 404 (discharges into waters of the U.S.) ☒ Section 10 (work in navigable waters)

United States Coast Guard permits:

☐ General Bridge Act Permit ☐ Private Aids to Navigation (for non-bridge projects)

Part 11–Authorizing Signatures

Signatures are required before submitting the JARPA package. The JARPA package includes the JARPA form, project plans, photos, etc. [help]

11a. Applicant Signature (required) [help]

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities, and I agree to start work only after I have received all necessary permits.

I hereby authorize the agent named in Part 3 of this application to act on my behalf in matters related to this application. _____ (initial)

By initialing here, I state that I have the authority to grant access to the property. I also give my consent to the permitting agencies entering the property where the project is located to inspect the project site or any work related to the project. _____ (initial)

Applicant Printed Name	Applicant Signature	Date
		3-25-15

11b. Authorized Agent Signature [help]

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities and I agree to start work only after all necessary permits have been issued.

Authorized Agent Printed Name	Authorized Agent Signature	Date
Kevin L. Grosz	Kevin L. Grosz	March 24, 2015

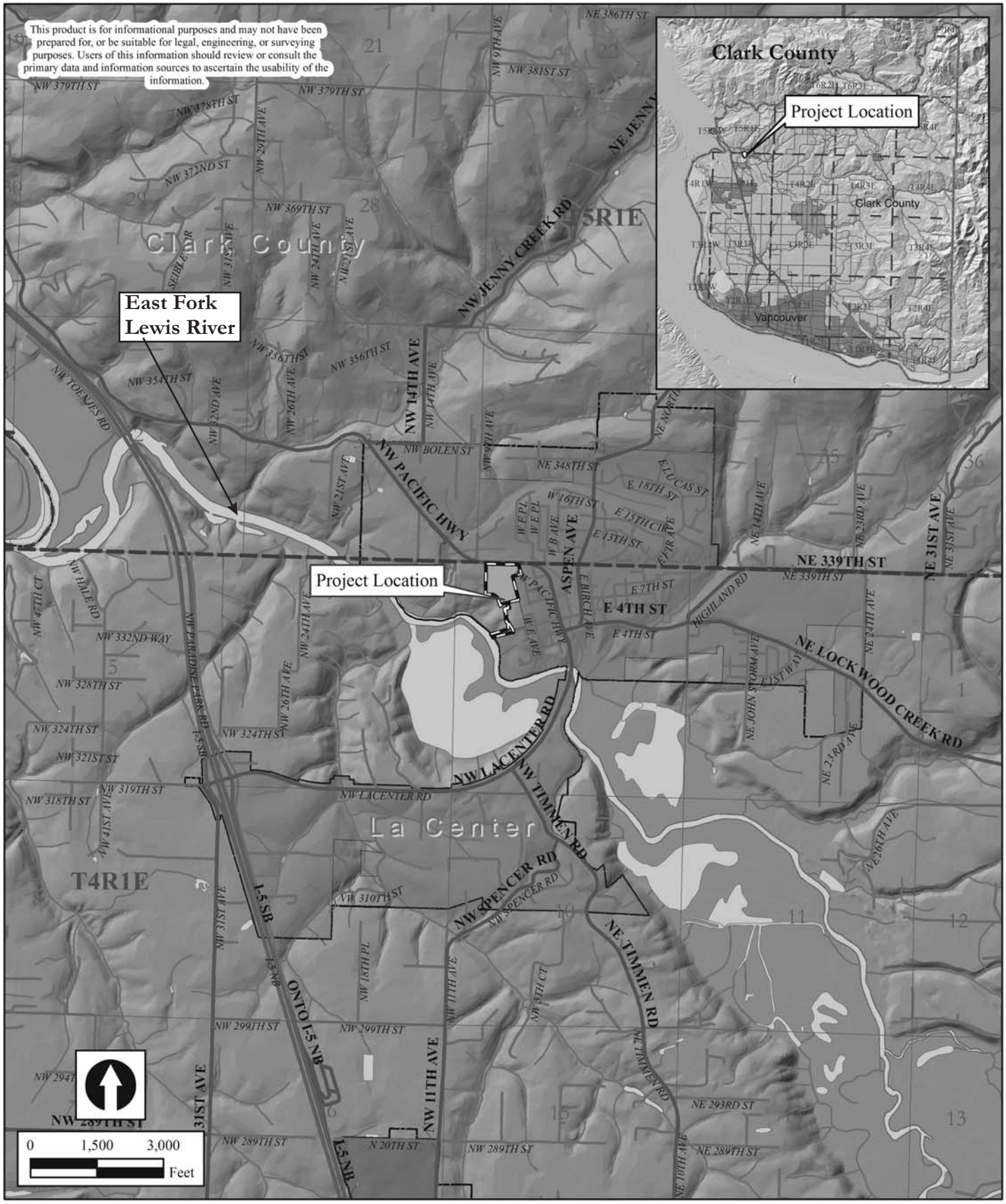
11c. Property Owner Signature (if not applicant). [help]
Not required if project is on existing rights-of-way or easements.

I consent to the permitting agencies entering the property where the project is located to inspect the project site or any work. These inspections shall occur at reasonable times and, if practical, with prior notice to the landowner.

Property Owner Printed Name	Property Owner Signature	Date
Jeffrey B. Sarvis	Jeff Sarvis for City of La Center	4-10-15

18 U.S.C §1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious, or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than 5 years or both.

If you require this document in another format, contact the Governor's Office of Regulatory Assistance (ORA) at (800) 917-0043. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call (877) 833-6341.
ORA publication number: ENV-019-09 rev. 06-12



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

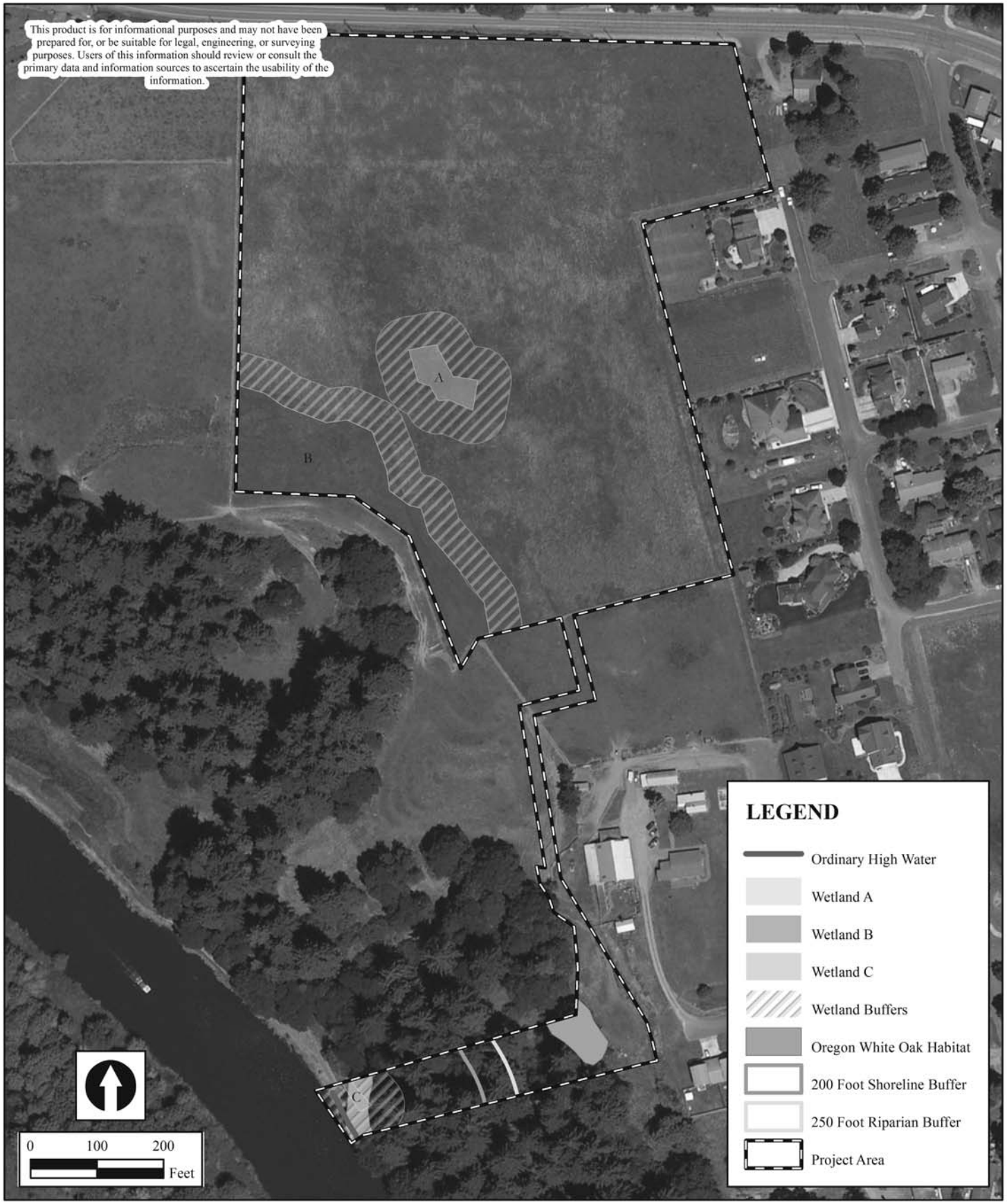
PURPOSE: JARPA Graphics

Project Location Map
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 1



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

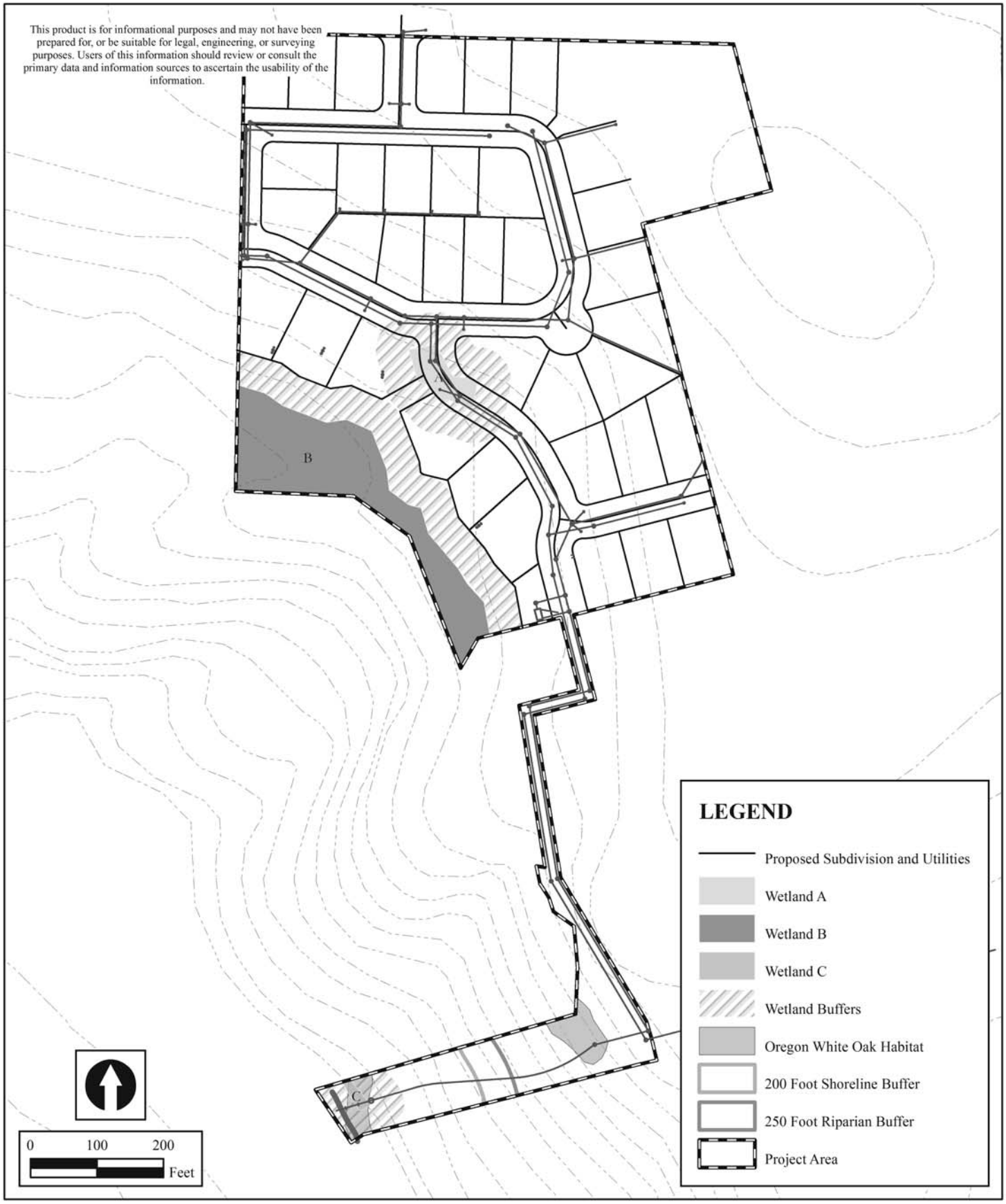
PURPOSE: JARPA Graphics

Existing Conditions
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 3



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

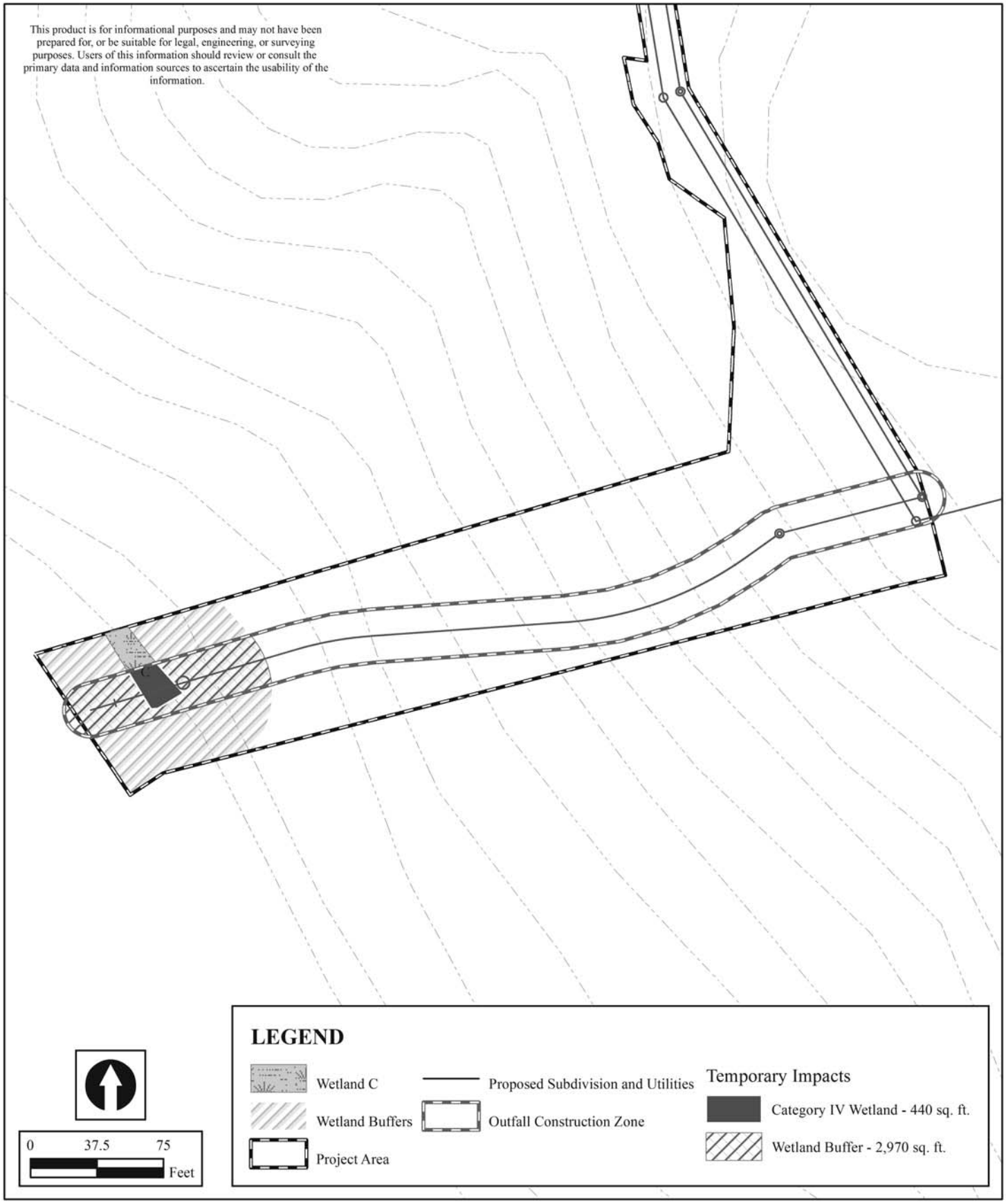
PURPOSE: JARPA Graphics

Proposed Site Plan
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 4



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: JARPA Graphics

Wetland C Temporary Impacts
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
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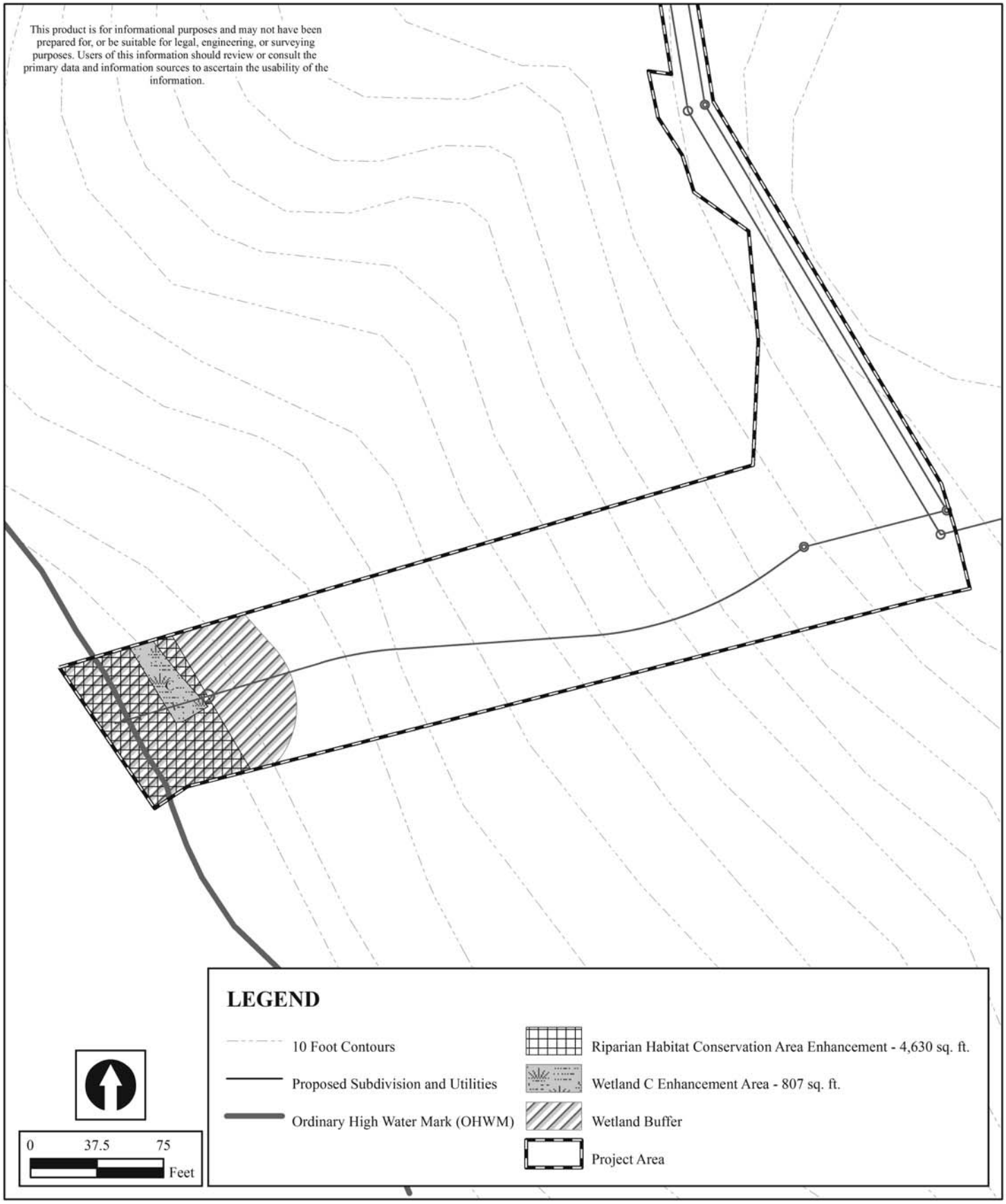
COUNTY: Clark County
DATE: March 4, 2015

Figure 8



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: JARPA Graphics

Wetland C and Riparian Enhancement
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

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E. Fork of the Lewis River Watershed
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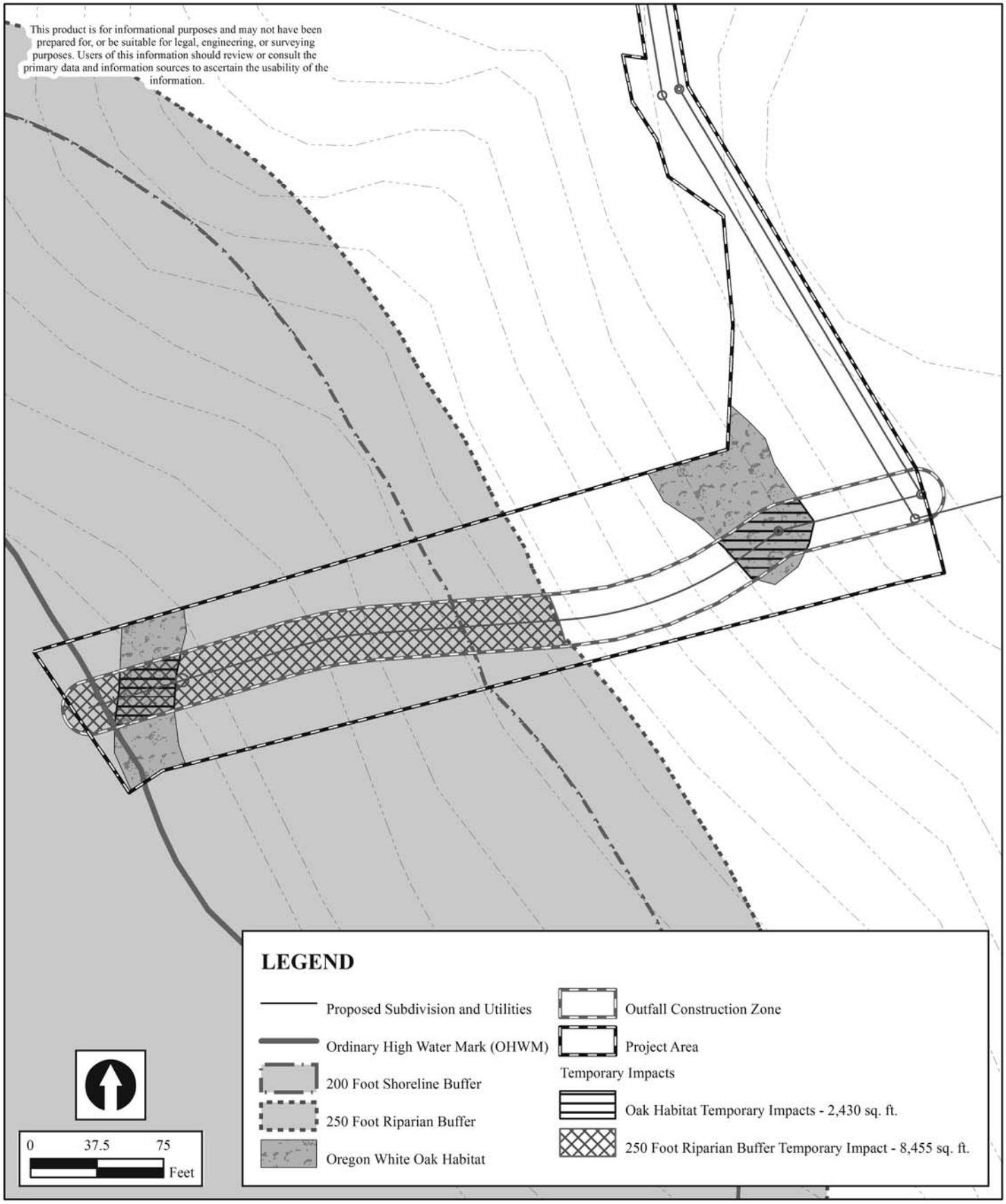
Figure 10



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: JARPA Graphics

Habitat Impacts - Stormwater Outfall
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

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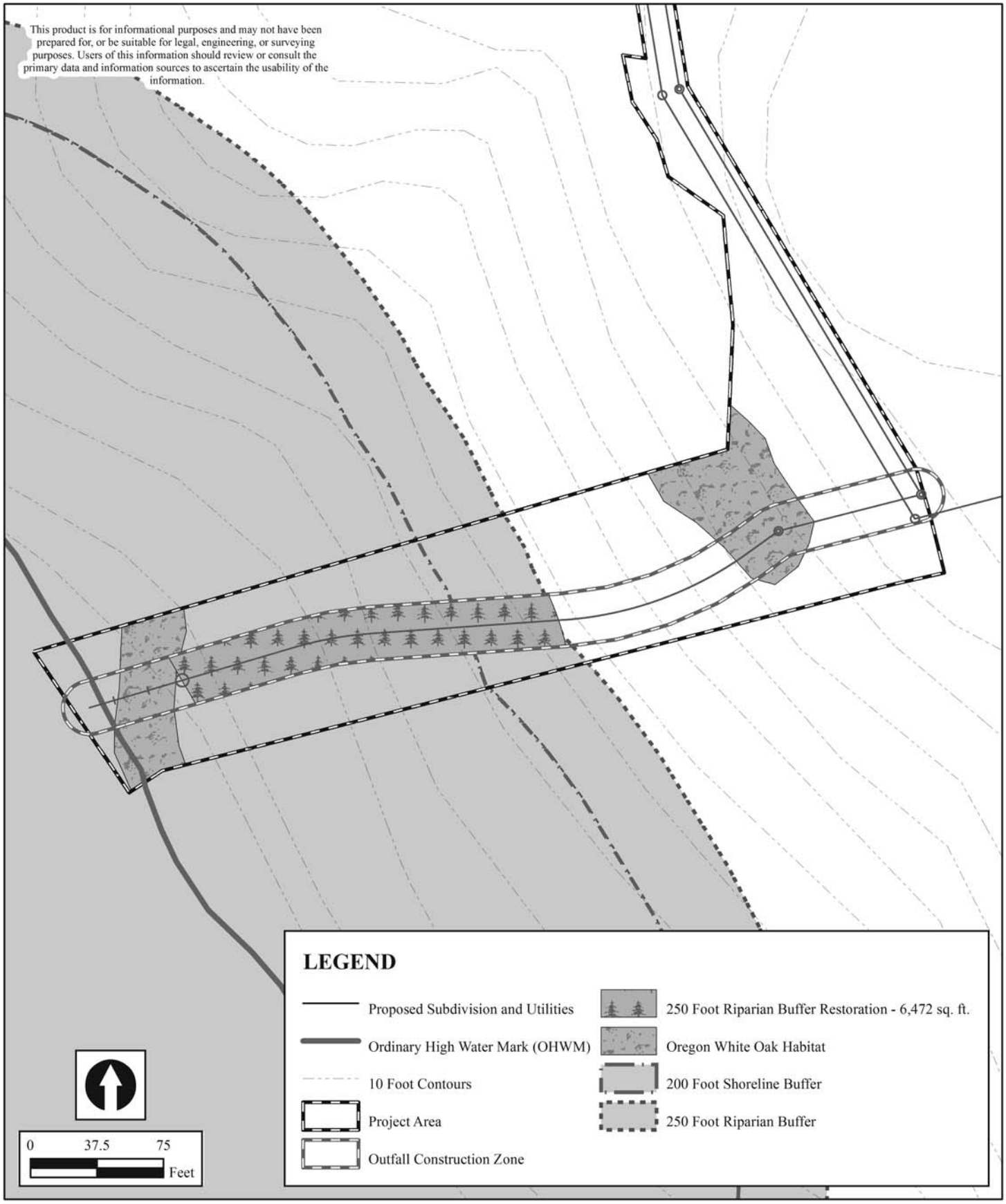
DATE: March 4, 2015

Figure 11



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: JARPA Graphics

Habitat Restoration Area - Stormwater Outfall
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
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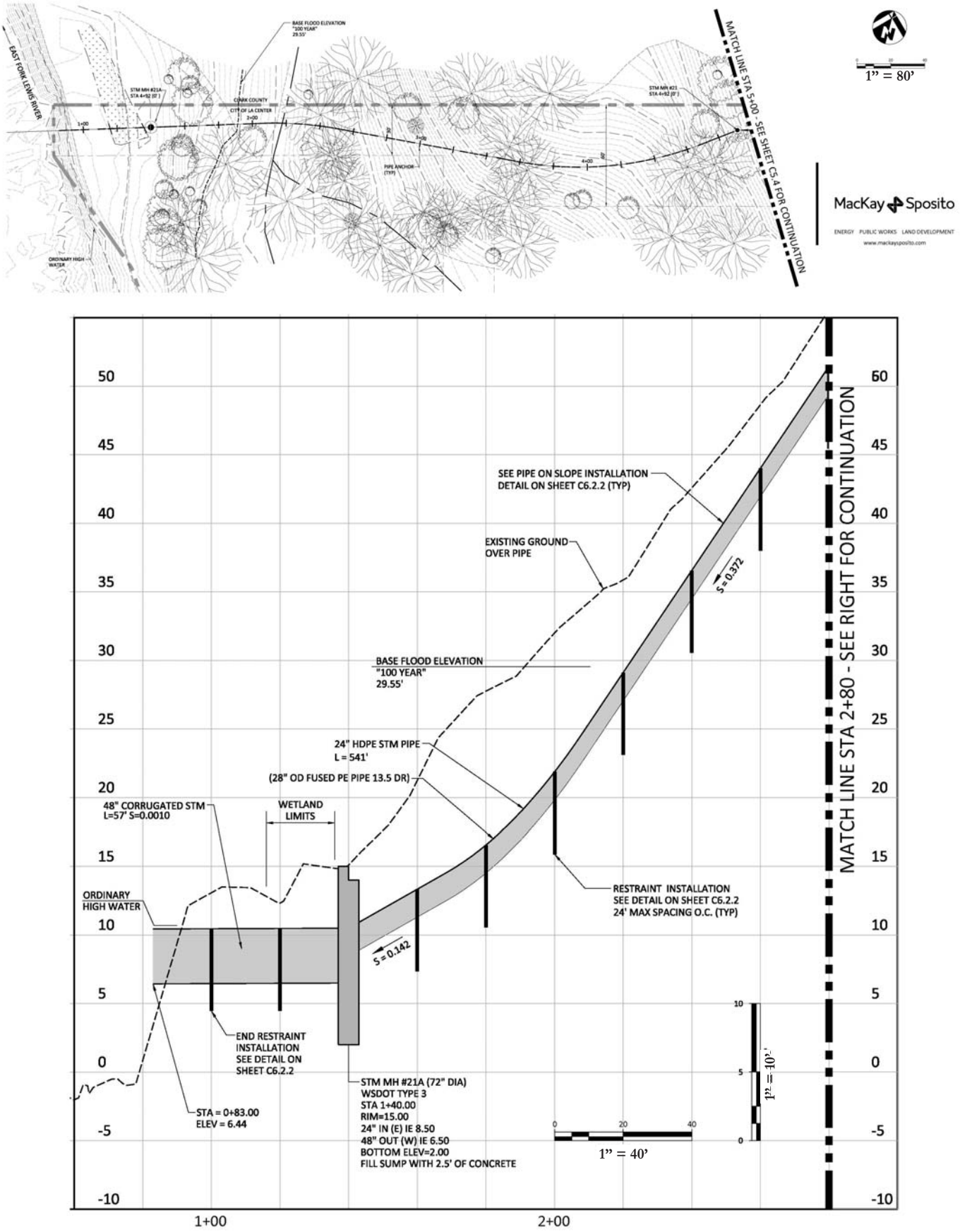
COUNTY: Clark County
DATE: March 4, 2015

Figure 12



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: JARPA Graphics

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
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915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

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LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
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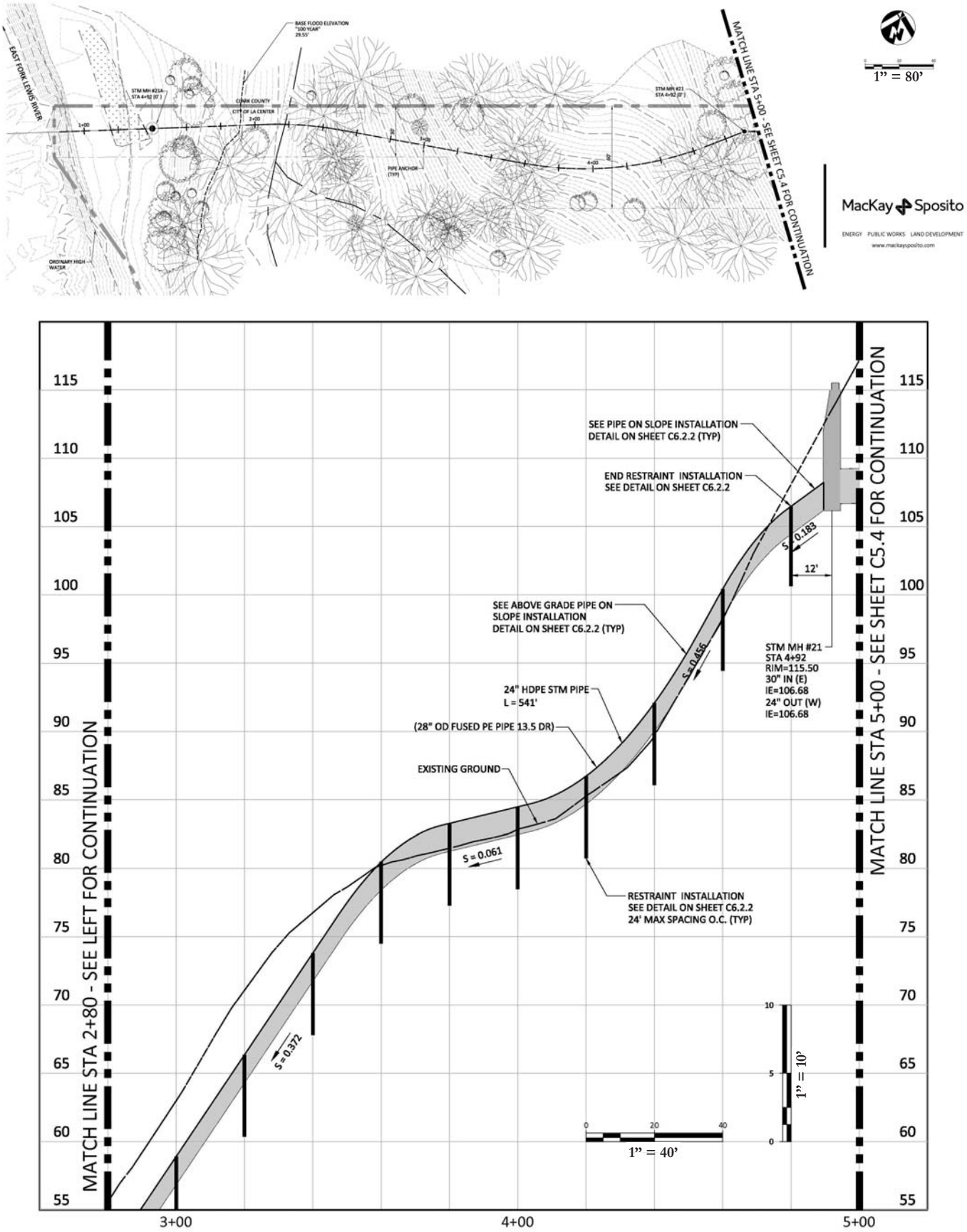
DATE: March 4, 2015

Figure 13



Corps Reference No.: NWS-2013-739
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WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: JARPA Graphics

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

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E. Fork of the Lewis River Watershed
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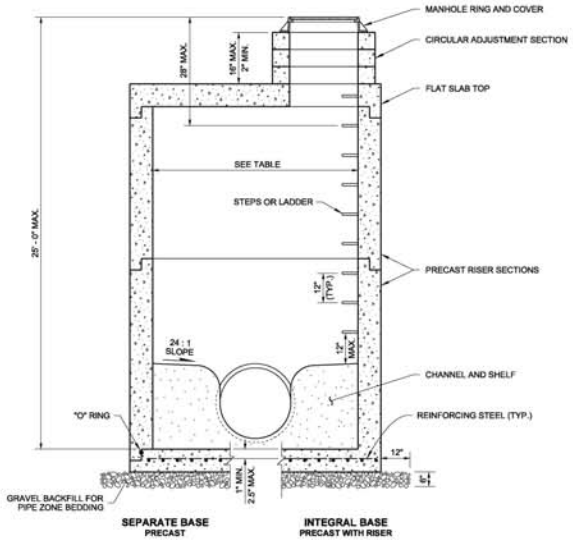
COUNTY: Clark County
DATE: March 4, 2015

Figure 14

DRAWN BY: LISA DYFORD



NOTES

1. Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum.
2. For pipe allowances, see **Standard Plan B-10.20.**
3. No steps are required when height is 4' or less.

MANHOLE DIMENSION TABLE

DIAM.	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS
48"	4"	6"	36"	8"
54"	4.5"	8"	42"	8"
60"	5"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	42"	12"
144"	12"	12"	108"	12"

CASEY M. KRAMER STATE OF WASHINGTON 44035 REGISTERED PROFESSIONAL ENGINEER

MANHOLE TYPE 3

STANDARD PLAN B-15.60-0

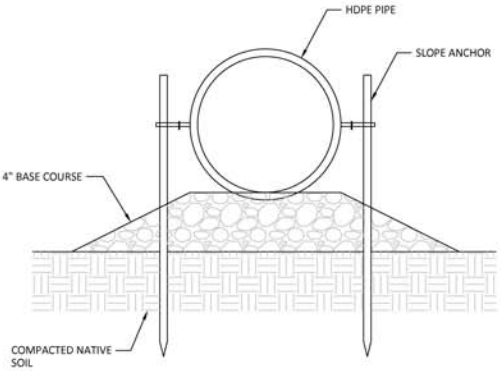
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III 02-07-12

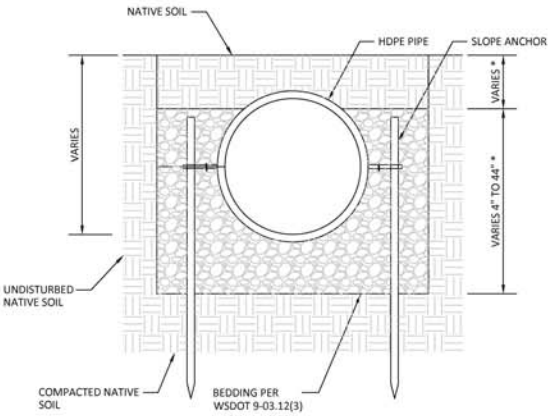
STATE DESIGN ENGINEER DATE

Washington State Department of Transportation



ABOVE GRADE PIPE ON SLOPE INSTALLATION DETAIL

NO SCALE



PIPE ON SLOPE INSTALLATION DETAIL

NO SCALE

* WHERE PIPE IS PARTIALLY EXPOSED, SOIL SURFACE SHALL MATCH EXISTING AND SOIL DEPTH ABOVE BEDDING SHALL BE 12 INCHES EXCEPT THAT SOIL SHALL NOT PRECLUDE THE LOWEST 4 INCHES OF BEDDING. WHERE PIPE IS NOT EXPOSED, SOIL SURFACE SHALL MATCH EXISTING (UNLESS OTHERWISE STATED ON PLANS) AND SOIL DEPTH ABOVE BEDDING SHALL BE 12 INCHES EXCEPT THAT BEDDING MATERIAL NEED NOT EXCEED 44 INCHES TOTAL THICKNESS.

FILE: W:\15472\CIVIL\DWG\SHEETS\15472_C6.2_C6.2.1_STM_DETAILS_C3D2012.DWG

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: JARPA Graphics

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
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PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
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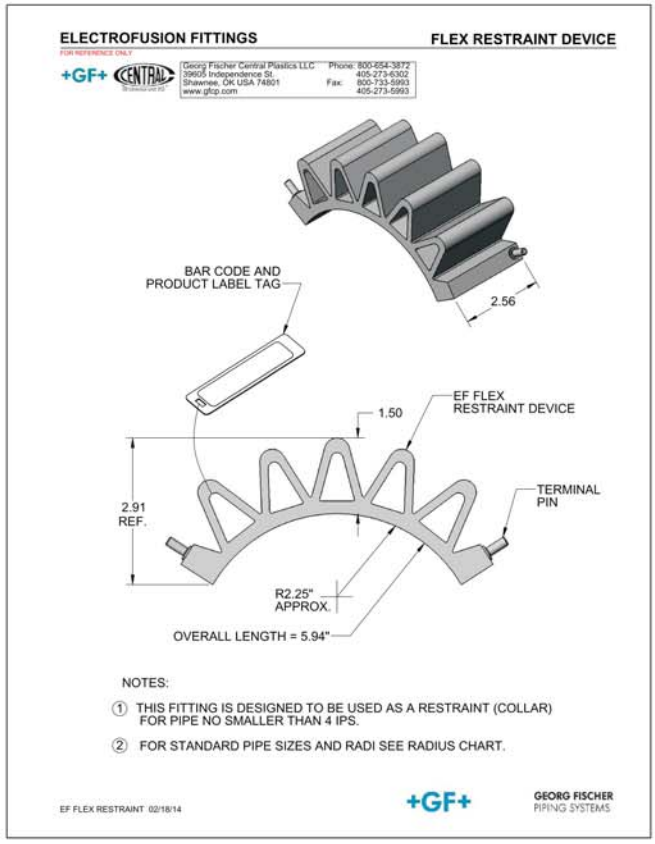
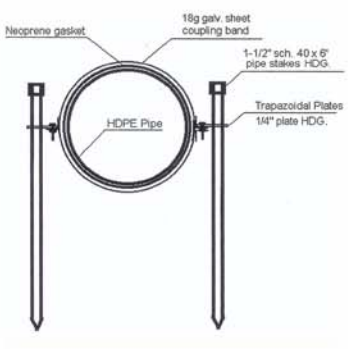
COUNTY: Clark County
DATE: March 4, 2015

Figure 15

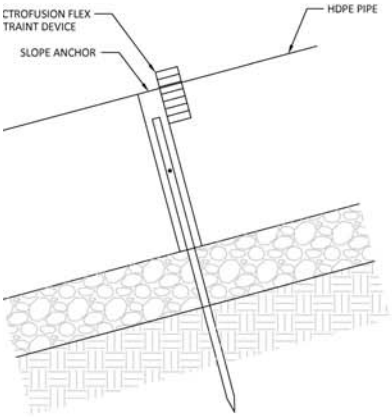


NOTE: INSTALL ELECTROFUSION FLEX RESTRAINT DEVICE PER MANUFACTURER'S RECOMMENDATIONS.



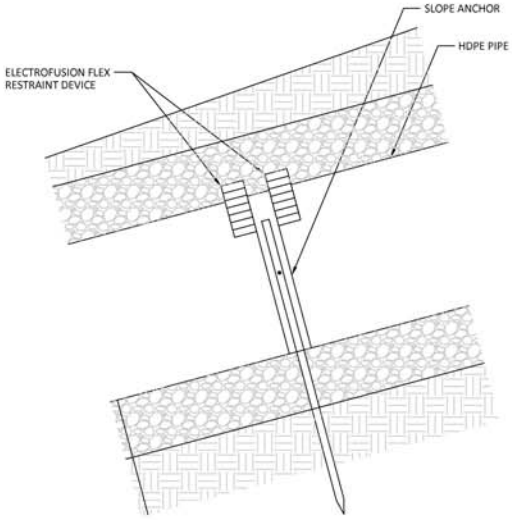
SLOPE ANCHOR

NO SCALE



RESTRAINT INSTALLATION DETAIL

NO SCALE



END RESTRAINT INSTALLATION DETAIL

NO SCALE

MacKay & Sposito
ENERGY PUBLIC WORKS LAND DEVELOPMENT
www.mackaysposito.com

KAY'S SUBDIVISION
LA CENTER, WASHINGTON

STORM DETAILS

REVISIONS:

JOB NO.:	15472/15695
DATE:	2/10/2015
SCALE:	NO SCALE
DESIGNED BY:	BT
DRAWN BY:	AJS
CHECKED BY:	

100% PLAN SET

C6.2.2

NO. 45 OF 52

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

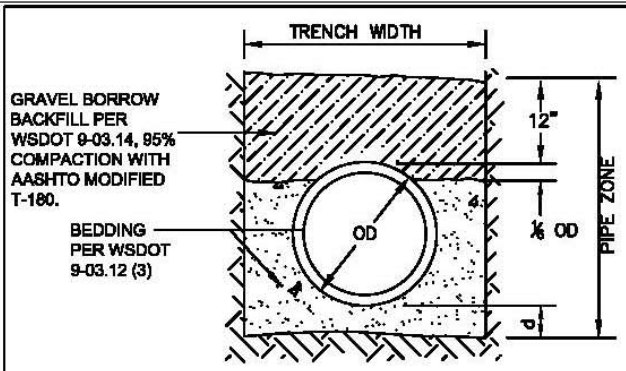
PURPOSE: JARPA Graphics

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 16



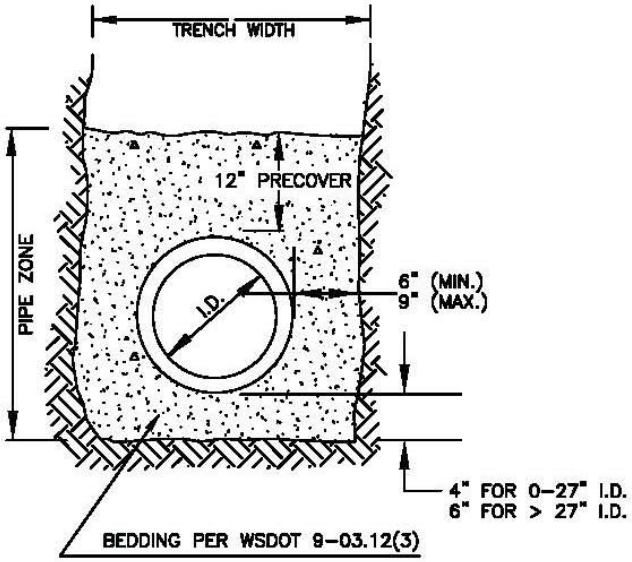
GRANULAR FOUNDATION

LEDGEND:

OD = OUTSIDE DIAMETER
ID = INSIDE DIAMETER
d = DEPTH OF BEDDING MATERIAL BELOW PIPE

DEPTH OF BEDDING MATERIAL BELOW PIPE	
ID	d (min)
18" & SMALLER	6"
LARGER THAN 18"	8"

RIGID PIPE



FLEXIBLE PIPE

NOTES:

1. WHERE DIRECTED BY THE PUBLIC WORKS DIRECTOR, GRANULAR TRENCH FOUNDATIO STABILIZATION SHALL BE PLACED PRIOR TO PLACEMENT OF THE BEDDING. SIZE AND DEPTH ARE DEPENDENT ON SOIL CONDITIONS.
2. BEDDING AND BACKFILL MATERIALS IN THE PIPE ZONE SHALL BE COMPACTED AS SPECIFIED PRIOR TO BACKFILLING THE REMAINDER OF THE TRENCH.
3. FOR ROCK AND OTHER INCOMPRESSIBLE MATERIALS, THE TRENCH SHALL BE OVER EXCAVATED A MINIMUM OF 6" AND REFILLED WITH GRANULAR MATERIALS AS DIRECTED BY THE PUBLIC WORKS DIRECTOR.
4. IMPORTED GRANULAR MATERIAL SHALL BE USED FOR UTILITY TRENCH BACKFILL. THE CONTACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO USE. THE PUBLIC WORKS DIRECTOR MAY APPROVE, REJECT OR REQUIRE LABORATORY TESTING OF THE MATERIAL.
5. TRENCH WIDTH SHALL NOT EXCEED ONE AND ONE-HALF THE INSIDE DIAMETER OF THE PIPE PLUS 18" AT THE TOP OF THE PIPE ZONE.
6. APPROVAL FOR SUCH ALTERNATE MATERIALS WILL BE GRANTEDUPON CONFIRMATION BY TEST OF ITS COMPLIANCE WITH THESE REQUIREMENTS.
7. ALTERNATIVE PRE-COVER MATERIALS ARE ALLOWABLE FROM PIPE CENTERLINE TO ONE FOOT ABOVE THE TOP OF THE PIPE FOR FLEXIBLE PIPE. ALTERNATE PRE-COVER MATERIALS MUST BE PREAPPROVED BY THE INSPECTOR AND MAY BE SAND, CRUSHER SCREENINGS, GRAVEL, OR OTHER CLEAN GRANULAR MATERIAL CONTAINING NO ROCK LARGER THAN 1-1/4" IN LENGTH.

PIPE BEDDING (RIGID AND FLEXIBLE PIPE)

PLAN #

CITY OF LA CENTER APPROVED

Bart Stupp, PE 7/23/09

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:

SS-5

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: JARPA Graphics

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
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DATE: March 4, 2015

Figure 17

East Fork Lewis Shoreline

East Fork Lewis Shoreline

Wetland C

Wetland C

Oregon White Oak Habitat

Oregon White Oak Habitat

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: JARPA Graphics

Project Photographs
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
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NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Photo Sheet 1

ENVIRONMENTAL CHECKLIST
(WAC 197-11-960)

***Purpose of checklist*:**

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

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 impact.

***Use of checklist for nonproject proposals*:**

For nonproject proposals complete this checklist and the supplemental sheet for nonproject actions (Part D). The lead agency may exclude any question for the environmental elements (Part B) which they determine do not contribute meaningfully to the analysis of the proposal.

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. Name of proposed project, if applicable:
   Kays Subdivision, Stormwater Outfall
2. Name of applicant:
   WARAC,LLC, Jerry Nutter
3. Address and phone number of applicant and contact person:
   7211 A NE 43rd Avenue, Vancouver,WA 98661
4. Date checklist prepared:
   13 MAR 15
5. Agency requesting checklist:
   City of La Center, Washington
6. Proposed timing or schedule (including phasing, if applicable):
   Summer of 2015
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.
   ESA Biological Assessment, Wetland Delineation & Mitigation, Habitat Assessment & Mitigation, Geologic Hazardous Areas Report Floodplain Report
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.
   Engineering with the City
10. List any government approvals or permits that will be needed for your proposal, if known.
    Corps of Engineers Section 404 & 10 permits, WDFW - HPA, City Shorelines including critical areas
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.) The project includes the stormwater outfall pipe from the Kays Subdivision which is proposed for 37 lots. The pipeline will exit the project cross private property and traverse through the City's Right-of-Way for W. 5th Street. Stormwater will outfall into the East Fork of the Lewis River
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.
    Right-of-Way for W. 5th Street down to the East Fork of the Lewis River. NW1/4, Sect. 3, T4N, R1E, Clark County, Washington Vicinity Map attached.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other.....

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

30

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 prime farmland.

Hillsboro silt loam

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

None known within the project area

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

No filling or grading proposed. The trench dug for the outfall pipe will be restored to preconstruction contours.

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

Yes, erosion could occur during installation of the stormwater pipe due to the steep slopes in portions of the project area.

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

None, the pipe will be buried within the shoreline area.

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

Erosion control BMP's that meet the City's Erosion Control requirements will be employed. Once the project has been completed the construction area will be planted with native ground cover to control erosion.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Emissions from construction equipment during the excavation and installation of the pipeline. None once the project has been completed.

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

None known

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

None

3. Water

a. Surface:

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.

Yes, the East Fork of the Lewis River and a small wetland along the bench above the river.

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 stormwater pipe be installed within 200 feet of the East Fork Lewis River and in the river,

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.

The stormwater pipe will cross a small wetland at the base of the hill, however, once installation of the pipe is completed, this area will be restored.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No

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

Yes

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.

No, just stormwater that has been pretreated on the project site

b. Ground:

1) Will groundwater be withdrawn, or will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

No

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.

None

c. Water runoff (including storm water):

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

N/A

2) Could waste materials enter ground or surface waters? If so, generally describe.

No

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

Erosion control BMP's

4. Plants

a. Check or circle 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
__X__ 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?

Grassland, shrubs and small trees, these areas will be restored and replanted once the pipe installation is completed

c. List threatened or endangered species known to be on or near the site.

None known

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

The shoreline area on the bench above the stream will be planted with native trees and shrubs as enhancement for the temporary impacts within the riparian zone

5. Animals

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

Birds: Hawk, heron, eagle, songbirds, other: _____
Mammals: Deer, bear, elk, beaver, other: coyote
Fish: Bass, salmon, trout, herring, shellfish, other: _____

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

Bull Trout, Chum, Coho, Steelhead, Chinook

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

Yes, it is part of the Pacific Flyway, which is a major migratory bird route

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

Native plantings on the shoreline of the East Fork

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.

None

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

No

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:

None

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.
No

1) Describe special emergency services that might be required.
None

2) Proposed measures to reduce or control environmental health hazards, if any:
None

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?
Construction equipment noise during the installation of the pipe. None once the project has been completed.

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.
Typical construction equipment noise from 8 am to 5 pm

3) Proposed measures to reduce or control noise impacts, if any:
None

8. Land and shoreline use

a. What is the current use of the site and adjacent properties?
Pasture/Forestland

b. Has the site been used for agriculture? If so, describe.
No

c. Des**c**ribe any structures on the site.
None within the project area

d. Will any structures be demolished? If so, what?
No

e. What is the current zoning classification of the site?
No zoning, City right-of-way

f. What is the current comprehensive plan designation of the site?
City Right-of-Way

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

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.
Yes, WDFW has designated portions of the area a Riparian Habitat Conservation Area and Non-Riparian Habitat Conservation Area

i. Approximately how many people would reside or work in the completed project?
None

j. Approximately how many people would the completed project?
None

k. Proposed measures to avoid or reduce displacement impacts, if any:
None

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:
None

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.
None

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.
None

c. Proposed measures to reduce or control housing impacts, if any:
None

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?
This is a pipeline that will be placed at the ground surface or will be underground

b. What views in the immediate vicinity would be altered or obstructed?
None

c. Proposed measures to reduce or control aesthetic impacts, if any:
None

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?
None

b. Could light or glare from the finished project be a safety hazard or interfere with views?
No

c. What existing offsite sources of light or glare may affect your proposal?
None

d. Proposed measures to reduce or control light and glare impacts, if any:
None

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?
Fishing, canoeing, kayaking

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:
None

13. Historic and cultural preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.
No

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.
None

c. Proposed measures to reduce or control impacts, if any:
None

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.
None

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?
No

c. How many parking spaces would the completed project have? How many would the project eliminate?
None

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).
No

e. Will the project 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? If known, indicate when peak volumes would occur.
None

g. Proposed measures to reduce or control transportation impacts, if any:
None

15. Public services

a. Would the project result in an increased need for public services (for example: Fire protection, police protection, health care, schools, other)? If so, generally describe.
No

b. Proposed measures to reduce or control direct impacts on public services, if any.
None

16. Utilities

a. Circle utilities currently available at the site: Electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.
None

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.
None

C. SIGNATURE

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: Kevin L. Grosz Date Submitted: 5/4/15

D. SUPPLEMENTAL SHEET FOR NONPROJECT 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.

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, flood plains, or prime farmlands?

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

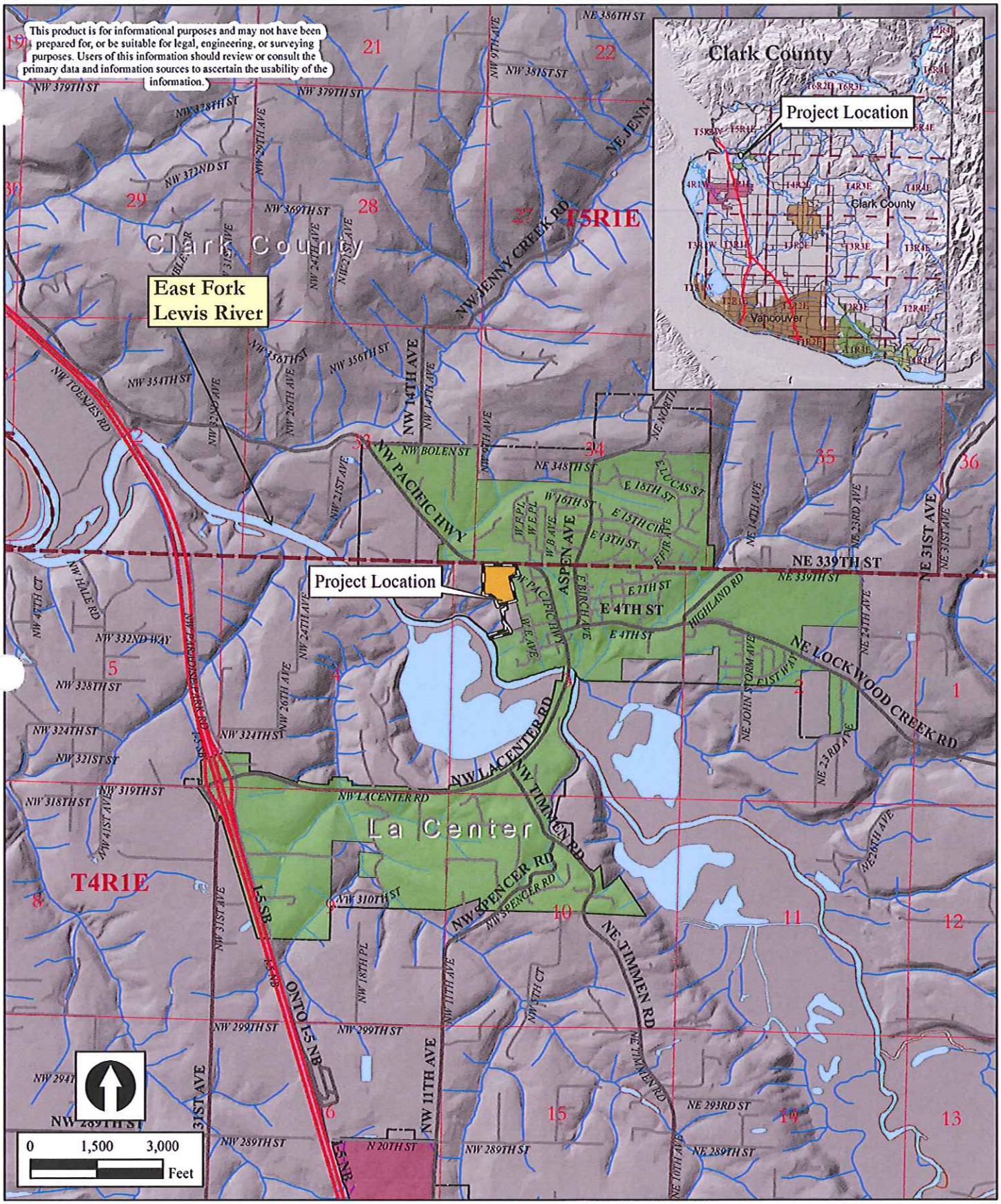
5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

   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.



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

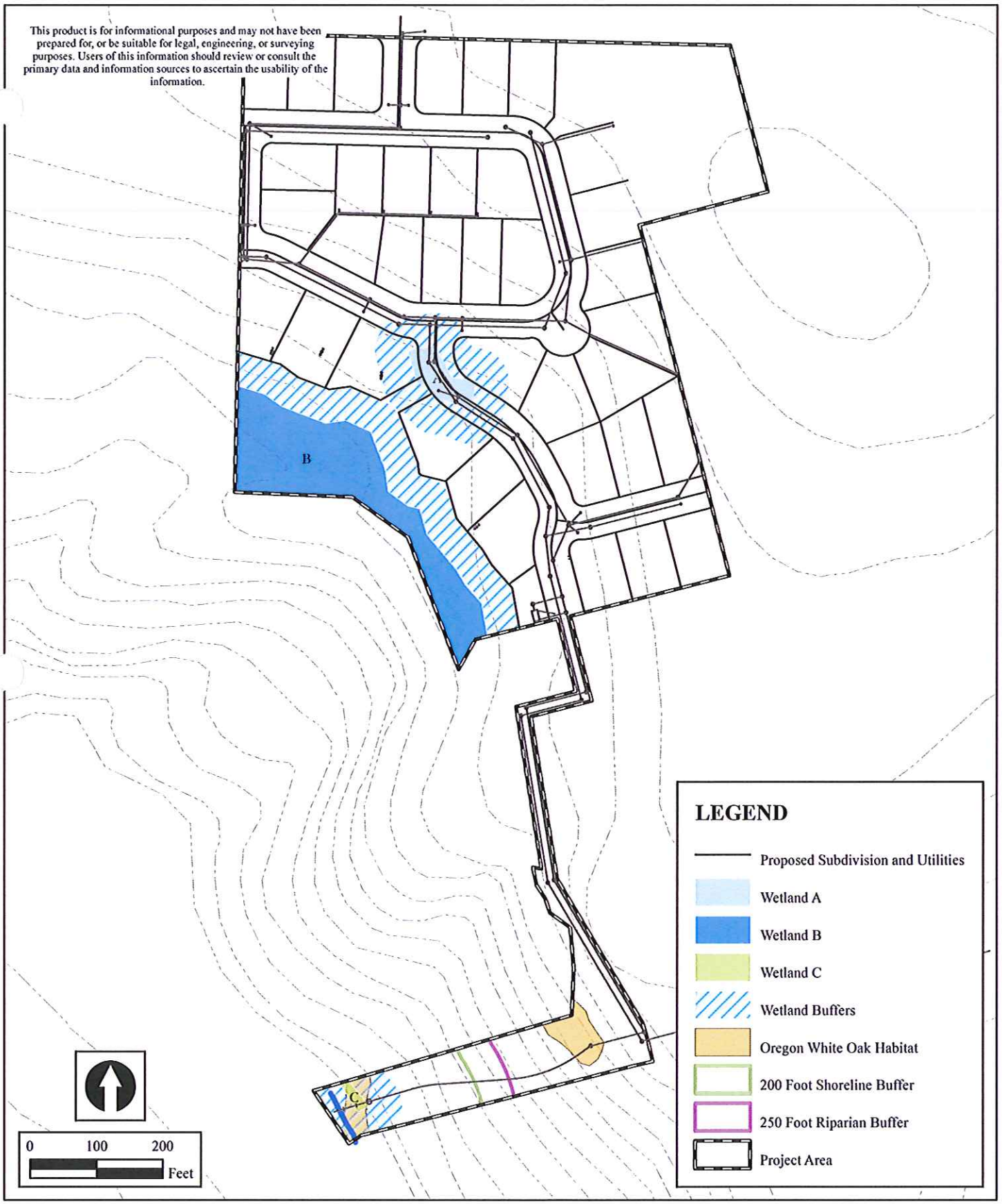
PURPOSE: SEPA Graphics

Project Location Map
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-693-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: May 5, 2015

Figure 1



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: SEPA Graphics

Site Plan
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-693-6242

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LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
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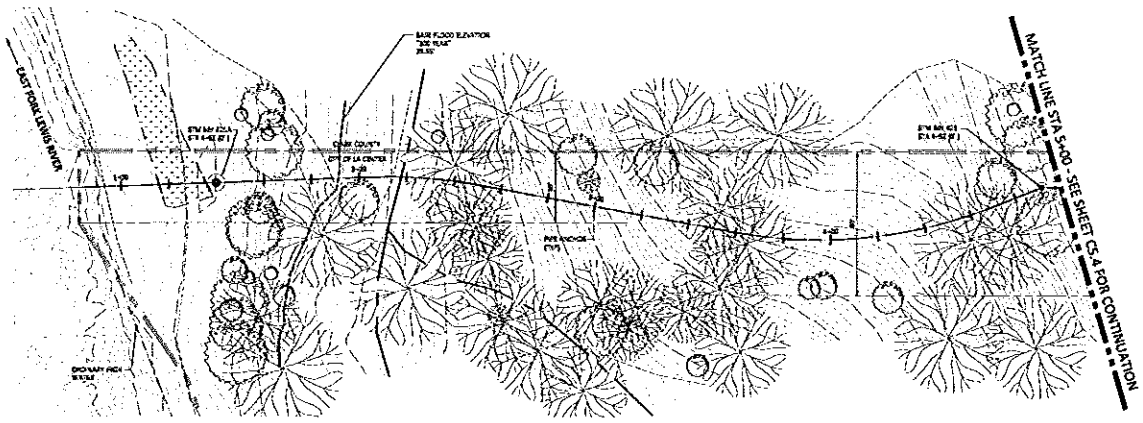
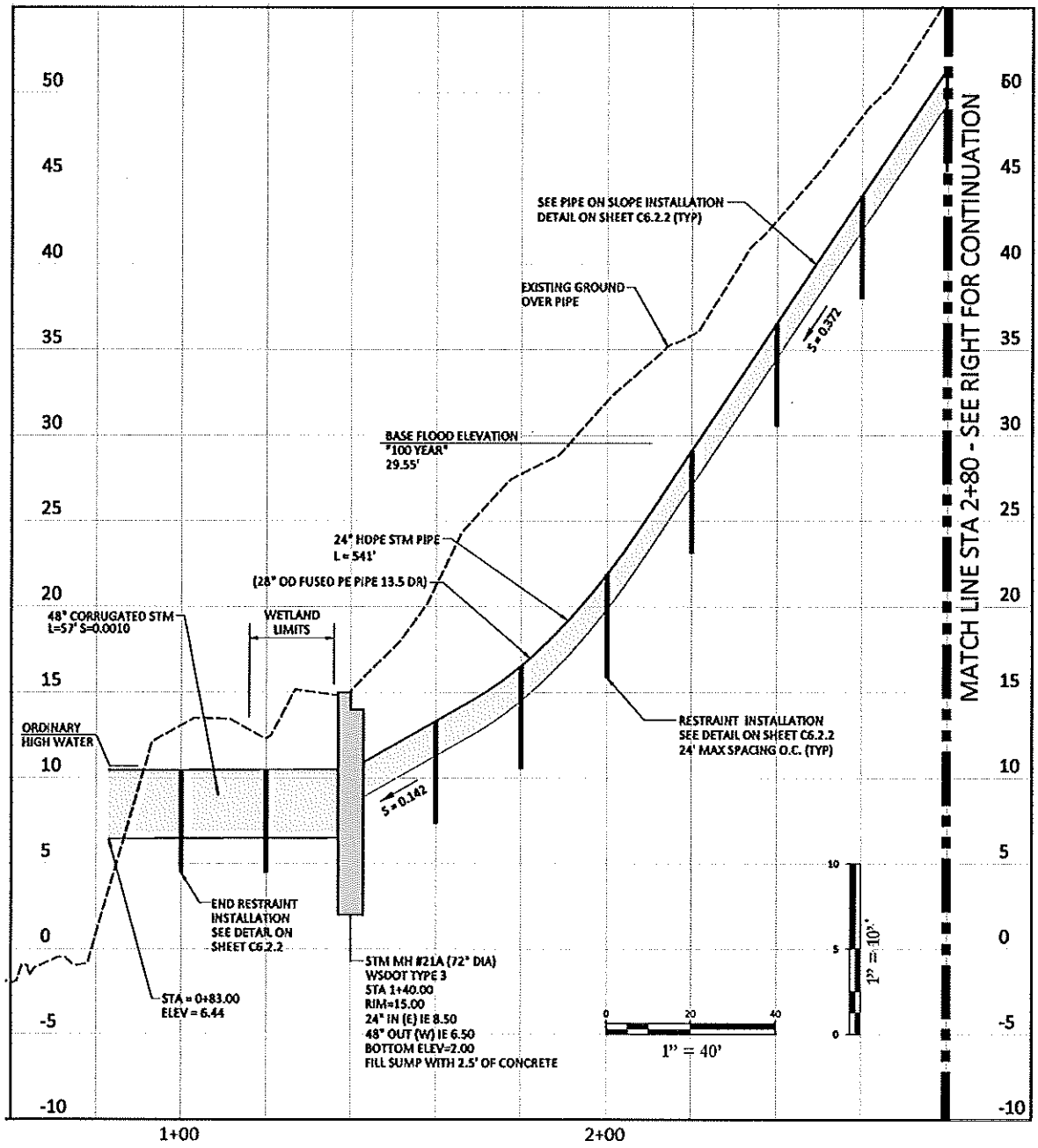
DATE: May 5, 2015
Figure 2



1" = 80'

MacKay Sposito

ENERGY PUBLIC WORKS LAND DEVELOPMENT



C[illegible]s Reference No.: NWS-2013-739
[illegible]AC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

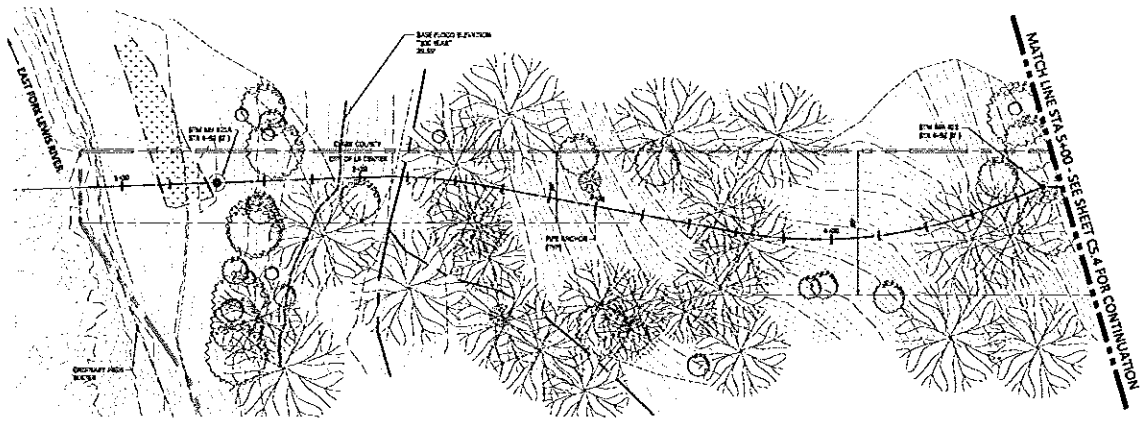
PURPOSE: SEPA Graphics

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-433-4555 fax: 360-433-4242

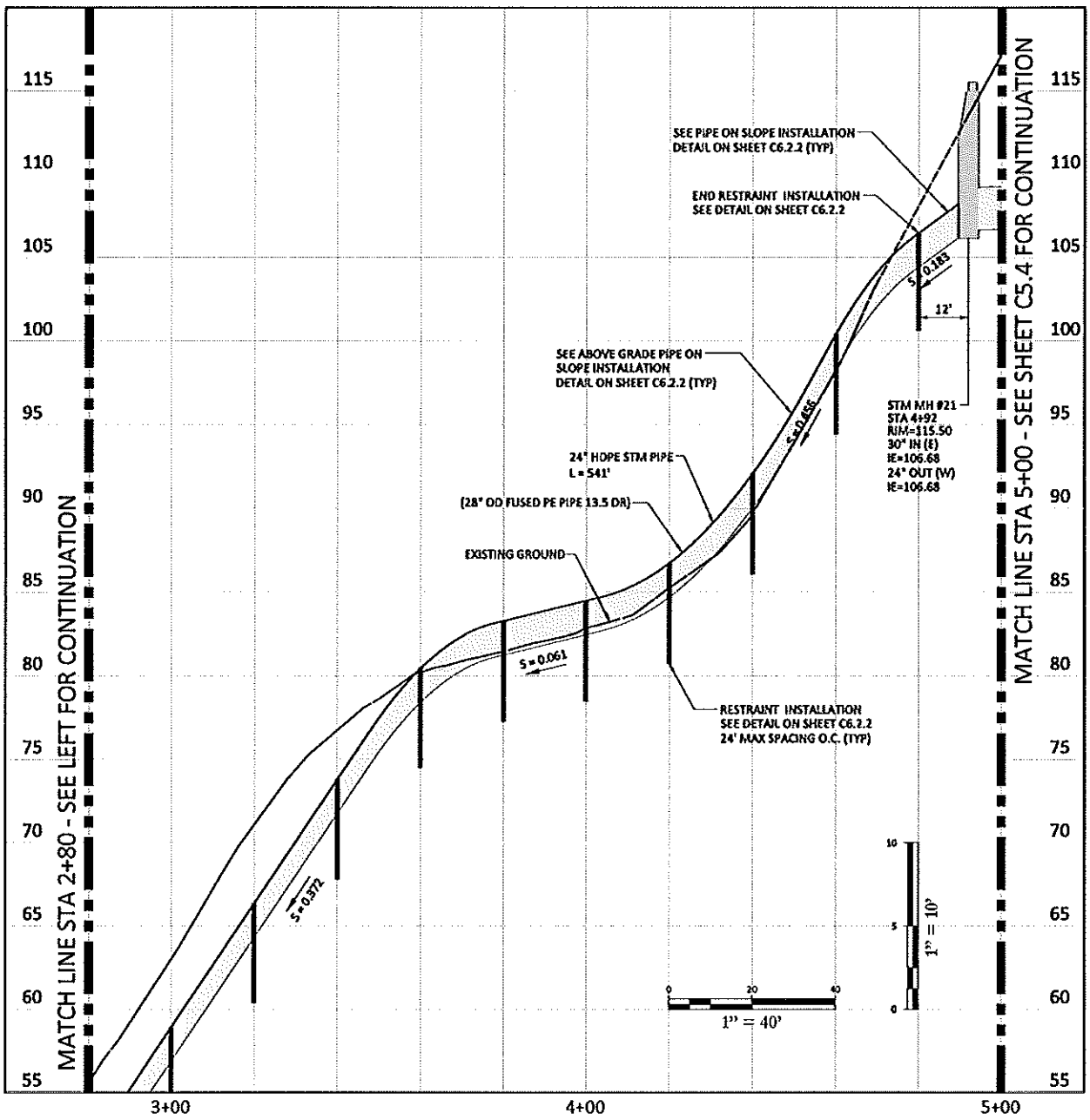
PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: May 5, 2015

Figure 3



1" = 80'

MacKay Sposito



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: SEPA Graphics

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
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915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-693-6242

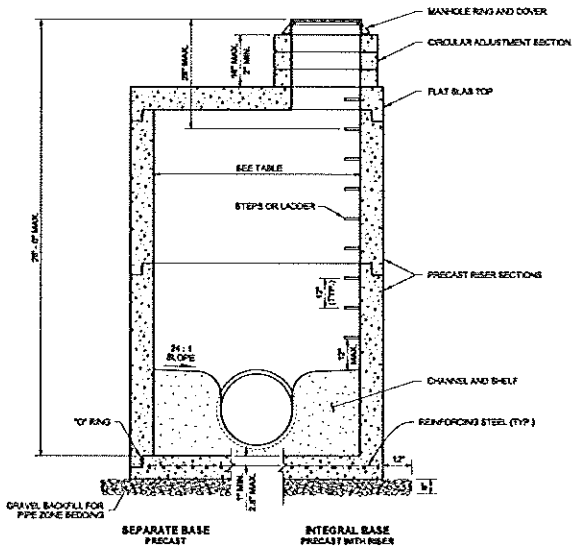
PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: May 5, 2015

Figure 4

DRAWN BY: LISA OYFORD

NOTES

1. Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum.
2. For pipe allowances, see Standard Plan B-10.20.
3. No steps are required when height is 4' or less



MANHOLE DIMENSION TABLE				
DIAM.	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS
48"	4"	8"	36"	8"
54"	4.5"	8"	42"	8"
60"	5"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	42"	12"
144"	12"	12"	108"	12"

CASEY H. ERAMER — STATE OF WASHINGTON — 44220 — REGISTERED PROFESSIONAL ENGINEER

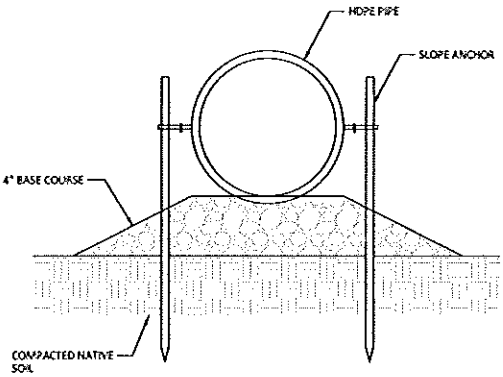
MANHOLE TYPE 3

STANDARD PLAN B-15.60-01

SHEET 1 OF 1 SHEET

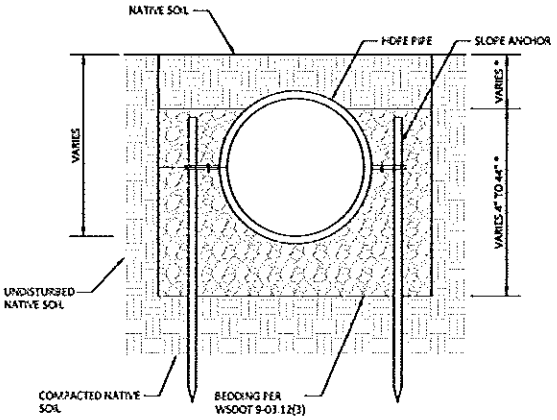
APPROVED FOR PUBLICATION

Pasco Bakotich III 02-07-12



ABOVE GRADE PIPE ON SLOPE INSTALLATION DETAIL

NO SCALE



PIPE ON SLOPE INSTALLATION DETAIL

NO SCALE

* WHERE PIPE IS PARTIALLY EXPOSED, SOIL SURFACE SHALL MATCH EXISTING AND SOIL DEPTH ABOVE BEDDING SHALL BE 12 INCHES EXCEPT THAT SOIL SHALL NOT PRECLUDE THE LOWEST 4 INCHES OF BEDDING. WHERE PIPE IS NOT EXPOSED, SOIL SURFACE SHALL MATCH EXISTING (UNLESS OTHERWISE STATED ON PLANS) AND SOIL DEPTH ABOVE BEDDING SHALL BE 12 INCHES EXCEPT THAT BEDDING MATERIAL NEED NOT EXCEED 44 INCHES TOTAL THICKNESS.

C[illegible]s Reference No.: NWS-2013-739
V[illegible]C, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: SEPA Graphics

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

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PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
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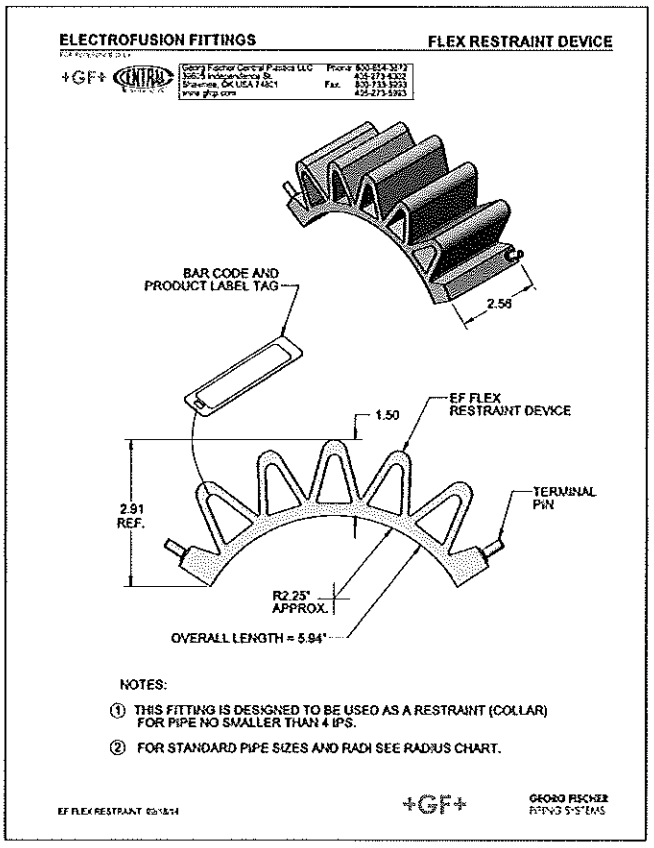
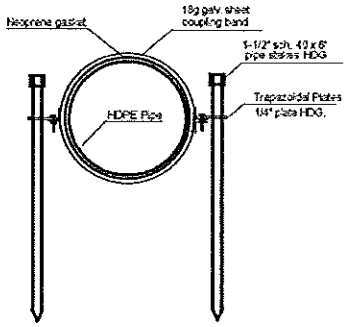
COUNTY: Clark County
DATE: May 5, 2015

Figure 5

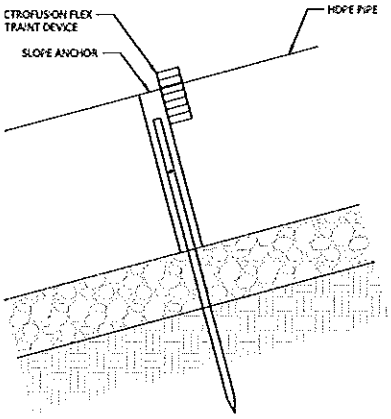


NOTE: INSTALL ELECTROFUSION FLEX RESTRAINT DEVICE PER MANUFACTURER'S RECOMMENDATIONS.



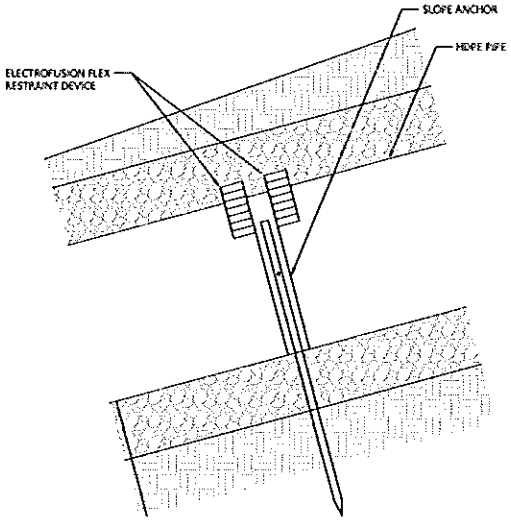
SLOPE ANCHOR

NO SCALE



RESTRAINT INSTALLATION DETAIL

NO SCALE



END RESTRAINT INSTALLATION DETAIL

NO SCALE

MacKay Sposito

ENERGY PUBLIC WORKS LAND DEVELOPMENT

www.mackaysposito.com

KAY'S SUBDIVISION

LA CENTER, WASHINGTON

STORM DETAILS

REVISIONS:

JOB NO.:	15472/15695
DATE:	2/10/2015
SCALE:	NO SCALE
DESIGNED BY:	BT
DRAWN BY:	AJS
CHECKED BY:	

100% PLAN SET

C6.2.2

NO. 45 OF 52

C[illegible]s Reference No.: NWS-2013-739
V[illegible]C, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: SEPA Graphics

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
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915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-693-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
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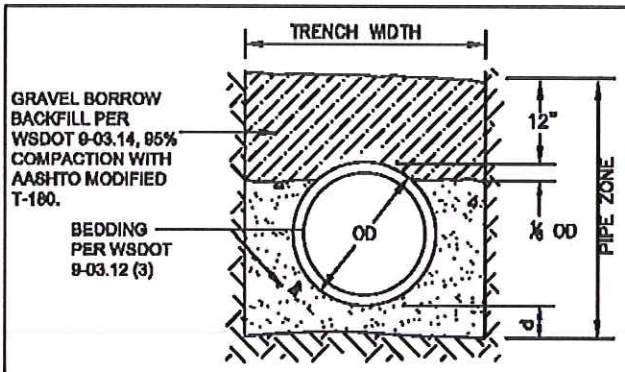
Figure 6



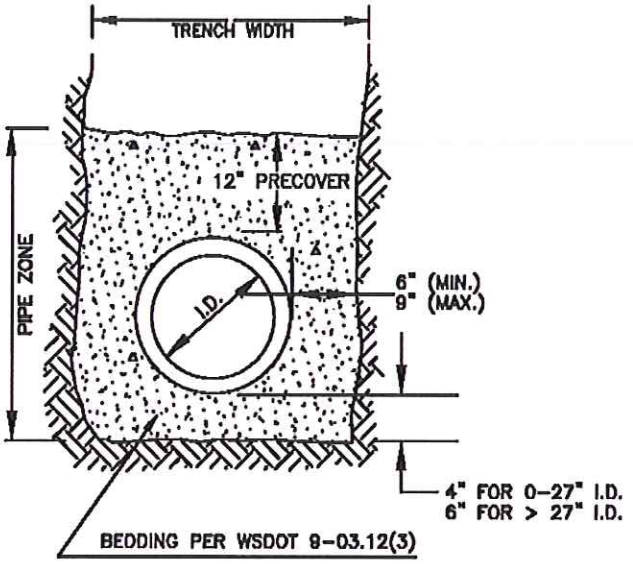
GRANULAR FOUNDATION

LEDGEND:

OD = OUTSIDE DIAMETER
ID = INSIDE DIAMETER
d = DEPTH OF BEDDING MATERIAL BELOW PIPE

DEPTH OF BEDDING MATERIAL BELOW PIPE	
ID	d (min)
18" & SMALLER	6"
LARGER THAN 18"	8"

RIGID PIPE



FLEXIBLE PIPE

NOTES:

1. WHERE DIRECTED BY THE PUBLIC WORKS DIRECTOR, GRANULAR TRENCH FOUNDATIO STABILIZATION SHALL BE PLACED PRIOR TO PLACEMENT OF THE BEDDING. SIZE AND DEPTH ARE DEPENDENT ON SOIL CONDITIONS.
2. BEDDING AND BACKFILL MATERIALS IN THE PIPE ZONE SHALL BE COMPACTED AS SPECIFIED PRIOR TO BACKFILLING THE REMAINDER OF THE TRENCH.
3. FOR ROCK AND OTHER INCOMPRESSIBLE MATERIALS, THE TRENCH SHALL BE OVER EXCAVATED A MINIMUM OF 6" AND REFILLED WITH GRANULAR MATERIALS AS DIRECTED BY THE PUBLIC WORKS DIRECTOR.
4. IMPORTED GRANULAR MATERIAL SHALL BE USED FOR UTILITY TRENCH BACKFILL. THE CONTACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO USE. THE PUBLIC WORKS DIRECTOR MAY APPROVE, REJECT OR REQUIRE LABORATORY TESTING OF THE MATERIAL.
5. TRENCH WIDTH SHALL NOT EXCEED ONE AND ONE-HALF THE INSIDE DIAMETER OF THE PIPE PLUS 18" AT THE TOP OF THE PIPE ZONE.
6. APPROVAL FOR SUCH ALTERNATE MATERIALS WILL BE GRANTEDUPON CONFIRMATION BY TEST OF ITS COMPLIANCE WITH THESE REQUIREMENTS.
7. ALTERNATIVE PRE-COVER MATERIALS ARE ALLOWABLE FROM PIPE CENTERLINE TO ONE FOOT ABOVE THE TOP OF THE PIPE FOR FLEXIBLE PIPE. ALTERNATE PRE-COVER MATERIALS MUST BE PREAPPROVED BY THE INSPECTOR AND MAY BE SAND, CRUSHER SCREENINGS, GRAVEL, OR OTHER CLEAN GRANULAR MATERIAL CONTAINING NO ROCK LARGER THAN 1-1/4" IN LENGTH.

PIPE BEDDING (RIGID AND FLEXIBLE PIPE)

PLAN #

CITY OF LA CENTER APPROVED

Bart Stapp, PE 7/23/09

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:

SS-5

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: SEPA Graphics

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-693-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: May 5, 2015

Figure 7

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: SEPA Graphics

Project Photographs
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-693-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: May 5, 2015

Photo Sheet 1

Substantial Shorelines Permit Application
For Kays Subdivision
La Center, Washington
Stormwater Outfall

Chapter I. Introduction

The Kays Subdivision is a 37 lot single family residential development proposed on 16 acres in the southwest portion of the City of La Center's Urban Growth Boundary (UGB). The Applicant for the project is WARAC, LLC. The property is located on vacant land that has historically been used for agricultural purposes, primarily domestic livestock grazing.

In conjunction with the subdivision, the Applicant is proposing constructing the stormwater outfall pipe and associated structures in the City's easement for West 5th Street. The southern one-third of the stormwater outfall pipe and the energy dissipater are located within the 200-foot shoreline buffer for the East Fork of the Lewis River. The City has designated the 200-foot shoreline area as Urban Conservancy. The outfall pipe and dissipater will have some minor (temporal and subsurface) impacts within the Shoreline and within wetland and habitat buffers during construction. The pipeline will be constructed perpendicular to the stream will require a Shoreline Substantial Development – Conditional Use Permit and Critical Lands reports that will be processed under the Shoreline permit. These Critical Lands are regulated under La Center Municipal Code (LCMC) 18.300 Fish and Wildlife Habitat Conservation Areas [LCMC 18.300.090(2)], Frequently Flooded Areas [LCMC 18.300.090(3)], Geologically Hazardous Areas [LCMC 10.300.090(4)], Slopes with 25 percent or Greater [LCMC 18.300.090(5)], and Wetlands [LCMC 18.300.090(6)]. Separate reports for each of these Critical Lands will be submitted along with the Shoreline Substantial Development Permit and are attached in the Appendices Section of this report.

Location and Existing Conditions

The proposed subdivision is located on vacant ground that currently is used to graze domestic livestock. The proposed stormwater line exits the subdivision at the southern terminus of West G Street, crosses the adjacent property to the south and travels southwest downhill (within the West 5th Street easement) to the East Fork of the Lewis River (EFLR). Only the lower portion of the stormwater line is located within the 200-foot shoreline buffer of the EFLR. The portion of the project within the shoreline buffer is predominantly forested except for the bench that sits above the river which is open grassland. Vegetation within the forested portion of the buffer is dominated by an Oregon white oak (*Quercus garryana*) and Douglas-fir (*Pseudotsuga meniziesii*) tree layer. The shrub layer is sparse and contains hazelnut (*Corylus cornuta*), vine maple (*Acer circinatum*) and snowberry (*Symphoricarpos albus*). Blackberry (*Rubus* spp.) occurs throughout the forested portion of the buffer. Vegetation in the open grassland segment of the buffer consists of native and non-native grasses and forbs. A small wetland occurs at the toe of the slope. This is a hydrogeomorphic (HGM) depressional class wetland dominated by meadow

foxtail (*Alopecurus pratensis*), creeping buttercup (*Ranuculus repens*) and slough sedge (*Carex obnupta*) herbaceous vegetation. The topography of the project site is relatively steep (20 to 60%) slopes in the forested section of the buffer and relatively flat in the area of the bench above the river.

The project is located on the following parcels:

Serial # of Parcel:	City Right-of-Way
Township/Range/Section:	NW1/4, Section 03, Township 04 North, Range 01 East, W.M.
Site Address:	No Site Address for the Easement
Owner Information:	City of La Center 419 E Cedar Avenue, Ste. A201 La Center, WA 98629

Chapter II. Applicability, Shoreline Permits and Exemptions

To be authorized, all uses and development activities in shorelines shall be planned and carried out in a manner consistent with this program and the policies of the Act as required by RCW 90.50.140(1), regardless of whether a shoreline permit, statement of exemption, shoreline variance, or shoreline conditional use is required.

II.B Shoreline Substantial Development Permit Required

1. Substantial development as defined by this program and RCW 90.58.030 shall not be undertaken by any person on the shorelines of the state without obtaining a substantial development permit from the Shoreline Administrator, unless the use or development is specifically identified as exempt from a substantial development permit, in which case a letter of exemption is required.

2. The Shoreline Administrator may grant a substantial development permit only when the development proposed is consistent with the policies and procedures of RCW 90.58 and the provisions of WAC 173-27

3. Within an urban growth area, a shoreline substantial development permit is not required on land that is brought under shoreline jurisdiction due to a shoreline restoration project creating landward shift in the OHWM.

Response: The proposed stormwater pipeline is an underground utility that will be constructed perpendicular to the EFLR within the shoreline buffer. According to Table 6-1 underground utilities that meet these conditions require a Substantial Development Conditional Use Permit.

Shoreline Use, Modification and Development Standards

Each Shoreline designation shall be managed in accordance with its designated purpose as described in SMP. Table 6-1 identifies those uses that are prohibited, may be permitted or permitted with a conditional use approval in each shoreline designation. Table 6-1 also summarizes general setbacks and heights for uses within each shoreline designation.

Response: The Applicant is proposing to install an underground stormwater pipeline perpendicular to the East Fork of the Lewis River within the 200-foot shorelines buffer. The utility line will have some minor impacts to the shoreline and the habitat buffer. All efforts were made to minimize impacts to the critical areas and only temporary impacts to a small wetland are anticipated for the installation of the pipeline. The use is a permitted use within the Urban Conservancy designation Table 6.1.

Chapter III. Shoreline Master Program Goals & Policies & Responses

This chapter describes overall program goals and policies. The general regulations in Chapter V and the specific use regulations in Chapter VI are the means by which these policies and goals are implemented.

III.A General Shoreline Goals

The general goals of this Program are to:
1. Use the full potential of shorelines in accordance with the opportunities presented by their relationship to the surrounding area, their natural resource values, and their unique aesthetic qualities offered by water, topography, and views; and
2. Develop a physical environment that is both ordered and diversified and which integrates water and shoreline uses while achieving a net gain of ecological function.

Response: The proposed utility line will not interfere with the normal public use of this shoreline, nor prohibit or minimize the potential for water related uses to be located in this area in the future. The stormwater sewer line will be placed below grade through the shoreline buffer area. The excavated trench will be backfilled with native soil once the pipeline has been installed. Erosion control best management practices (bmp's) will be employed. The trench will be re-vegetated upon completion of the work. The presence of the sewer line except for a man-hole cover (which will be at ground level) will be visually undetectable once the herbaceous cover on the restored trench matures. The proposed use is compatible with the area and will not impact any views, topography or negatively affect the ecological function of the Shoreline.

III.B Shorelines of Statewide Significance (SSWS)

Designated Shorelines of Statewide Significance (SSWS) are of value to the entire state as are other water bodies meeting the definition of shorelines of the state. The East Fork of the Lewis River, along with its associated shorelands is designated as a Shoreline of Statewide Significance. Its location along the southwest boundary of the current city limits and other shorelines of the state requires the preparation of this master program. In accordance with RCW 90.58.020, SSWS will be managed as follows:

1. Preferences shall be given to the uses that are consistent with the statewide interest in such shorelines. These are uses that:
    a. Recognize and protect the statewide interest over local interest;
    b. Preserve the natural character of the shoreline
    c. Result in long term over short term benefit;

    d. Protect the resources and ecological functions of the shoreline;
    e. Increase public access to publically owned areas of the shorelines;
    f. Increase recreational opportunities for the public in the shoreline; and
    g. Provide for other elements as defined in RCW 90.58.100 deemed appropriate or necessary.
2. Uses that are not consistent with these policies should not be permitted on SSWS.
3. Those limited shorelines containing unique, scarce and/or sensitive resources should be protected.
4. Development should be focused in already developed shoreline areas to reduce adverse environmental impacts and to preserve undeveloped shoreline areas. In general, SSWS should be preserved for future generations by;
    a. Restricting or prohibiting development that would irretrievably damage shoreline resources, and
    b. Evaluating the short-term economic gain or convenience of developments relative to the long-term and potentially costly impairments to the natural shoreline.

Response: The proposed utility line will not interfere with the normal public use of this shoreline, nor prohibit or minimize the potential for water related uses to be located in this area in the future. The stormwater sewer line will be placed below grade through the shoreline buffer area. The project has been designed using the most current engineering and geotechnical information to prevent irretrievable damage to the shoreline. The excavated trench will be backfilled with native soil once the pipeline has been installed. Erosion control best management practices (bmp's) will be employed. The trench will be re-vegetated upon completion of the work. The shoreline adjacent to the EFLR will be planted with native trees and shrubs to enhance and protect the shoreline area. The proposed use is compatible with the area and will not impact any views, topography or negatively affect the ecological function of the Shoreline.

III.C Archaeological, Historic, and Cultural Resources

III.C.1 Goal

The goal for archaeological, historic, and cultural resources is to preserve and prevent the destruction of or damage to any site having historic, cultural, scientific, or educational value. Such sites include those identified by affected Indian tribes, the Department of Archaeology and Historic Preservation, Clark County Historic Preservation Commission, and other appropriate authorities.

III.C.2 Policies

a. As part of every new development project, expansion of existing developments or development of a new use, every effort should be made to identify, protect, preserve, and restore important archaeological, historic, and cultural sites located in shorelands of the state for educational, scientific, and enjoyment of the general public.
b. Where appropriate, make access to such sites available to parties of interest, provided that access to such sites be designed and managed in a manner that protects the resource.
c. Encourage the acquisition of historical, cultural and archaeological sites by public or private entities in order to assure their protection and preservation.
d. Encourage projects and programs that foster a greater appreciation of shoreline management, local history, maritime activities, environmental conservation, and maritime history.

e. Continue to contribute to the state and local inventory of archaeological sites enhancing knowledge of local history and understanding of human activities.

Response: A Cultural Resources Survey was conducted by Archeological Services, LLC in March 2015 as required by SMMP. Surface and subsurface investigations were conducted at that time. No cultural resources found during those investigations. A copy their full report in attached in the Appendices Section of this report. If any qualifying cultural resources are discovered during explorations or construction on the project site, work will be stopped and, before work recommences on that portion of the site, a professional archaeologist will assess the significance of any resources discovered and notify DAHP and affected Native American Tribes to determine the appropriate course of action.

III.D Conservation

III.D.1 Goal

The goal of conservation is to protect shoreline resources, vegetation, important shoreline features, shoreline ecological functions and the processes that sustain them to the maximum extent practicable.

III.D.2 Policies

a. Shorelines that support high value habitat or high quality associated wetlands should be considered for the highest level of protection to remain in an unaltered condition.
b. Impacts to critical areas should first be avoided, and where unavoidable, minimized and mitigated to result in no net loss of watershed processes and shorelines functions.
c. Management practices for natural resources in shoreline areas should be developed and implemented to ensure the preservation of non-renewable resources, including unique, scenic and ecologically sensitive features, wetlands, and wildlife habitat.
d. Every effort should be made to provide administrative and regulatory assistance to those proposals to create, restore or enhance habitat for priority species.
e. Regulatory, non-regulatory, and incentive programs should all be used for the protection and conservation of wildlife habitat areas and should emphasize policies and standards to protect and conserve critical areas as larger blocks, corridors or interconnected areas rather than in isolated parcels.
f. The retention of existing vegetation along shorelines should be encouraged and where removal is unavoidable for physical or visual access to the shoreline, limit alteration should be limited in such a manner that habitat connectivity is maintained, degraded areas are restored, and the health of remaining vegetation is not compromised.

Response: The project has been designed to avoid and minimize activity within the majority of the sensitive portions of the area. Minor temporary impacts to critical areas and their associated buffers are anticipated, but these minor impacts will be fully mitigated by re-vegetation of the surface of the pipeline trench. The pipeline will cross a small Category IV wetland at the base of the slope. However, this wetland impact will be temporary. The wetland will be restored and enhanced as part of the overall development project. A compensatory mitigation plan has been prepared to address the temporary wetland and habitat impacts caused by the installation of the stormwater pipeline. In

addition, erosion control BMP's will be employed that will ensure that no net loss of ecological function, ecological value or critical areas will occur.

III.F Flood Prevention and Flood Damage Minimization

III.F.1 Goal

The goal of flood prevention and flood damage minimization is prevent public and private losses from occurring, and where this proves to be impossible, to minimize them to the extent possible, and; to maintain and restore natural flow regimes.

III.F.2 Policies

a. All shoreline development should be located, designed, and constructed to prevent flood damage.

b. Flood management works should be located, designed, constructed and maintained to protect against the following:

i. Loss of life, injury or loss of property;
ii. Loss to physical integrity of the shoreline;
iii. Loss of water quality and natural ground water movement;
iv. Loss to fish and other life forms and their habitat and damage to vegetation;
v. Damage to recreational resources and aesthetic values and features including point and channel bars, islands and other shore features and scenery.

c. Non-structural flood hazard reduction measures are preferred to structural measures. Flood hazard reduction measures should be accomplished in a manner that ensures no net loss of ecological functions and ecosystem-wide processes.

d. Flood protection measures that result in channelization and/or reduction in shoreline function should be avoided.

e. An evaluation of alternate flood control measures, should consider the removal or relocation of structures in flood-prone areas.

f. New development or new uses in shoreline jurisdiction, including the subdivision of land, should not be allowed when it would be reasonably foreseeable that the development or use would require structural flood hazard reduction.

Response: The subsurface placement of the stormwater pipeline will not cause any reduction in flood storage capacity. Similarly, the outfall has been designed so that it will not alter the stream course or bank or any areas below the ordinary high water mark.

III.I Shoreline Modification and Stabilization

III.I.1 Goal

The goal for shoreline modification and stabilization is to avoid or minimize it to the maximum extent feasible. When shoreline modification is unavoidable, the methods used should be those that are least destructive to the shoreline environment, including associated waters.

III.I.2 Policies

a. New or expanded shore stabilization, including bulkheads, is allowed only where it is demonstrated to be necessary to protect an existing primary structure that is in danger of loss or substantial damage, and where such structures and structural stabilization would not cause a net loss of shoreline ecological functions and processes.

b. Proponents of new shoreline uses and development, including preferred uses and uses exempt from permits, should plan, design, locate, construct and maintain the use/development to avoid the need for structural shoreline armoring works using all methods available.
c. When necessary, natural, non-structural shoreline stabilization measures are preferred over structural stabilization measures. Alternatives for shoreline stabilization should be based on the following hierarchy of preference:

i. No action;
ii. Flexible stabilization works constructed of natural materials, including soft shore protection, bioengineering, beach nourishment, protective berms, or vegetative stabilization.
iii. Rigid works constructed of structural materials such as riprap or concrete.

d. Shoreline stabilization should be located and designed to accommodate the physical character and hydraulic energy potential of a specific shoreline reach, which may differ substantially from adjacent reaches.
e. Provisions for multiple use, restoration, and/or public shore access should be incorporated into the location, design and maintenance of shore stabilization for public or quasi-public developments whenever safely compatible with the primary purpose. Shoreline stabilization on publicly owned shorelines should not be allowed to decrease long-term public use of the shoreline.
f. Shoreline stabilization projects should be developed through coordination with affected property owners and public agencies.
g. Larger works such as jetties, breakwaters, weirs, or groin systems should be permitted only for water-dependent uses and where mitigated to provide no net loss of shoreline ecological functions and processes.
h. Lower impact structures, including floating, portable or submerged breakwater structures, or several smaller discontinuous structures, are preferred over higher impact structures.
i. Encourage and facilitate levee setback (including but not limited to, pulling back an existing levee to allow for a larger floodplain area contiguous to a water body), levee removal, and other shoreline enhancement projects.
j. Development and shoreline modifications that would result in interference with the process of channel migration that may cause significant adverse impacts to property or public improvements and/or result in a net loss of ecological functions with the rivers and streams should be limited.

Response: The Applicant is not proposing any stream bank modifications or stabilizations, such as armoring or re-channelization, with this project. The project will plant native trees and shrubs along the shoreline to stabilize the area surrounding the pipeline between the ordinary high water mark and the existing tree line.

III.J Shoreline Use and Development

III.J.1 Goal

The goal for shoreline use and development is to balance the preservation and development of shorelines in a manner that allows for mutually compatible uses.
Resulting land use patterns will be compatible with shoreline designations and sensitive to and compatible with ecological systems and other shoreline resources. To help with this balance, shoreline and water areas with unique attributes for specific long term uses such as commercial,

residential, industrial, water, wildlife, fisheries, recreational and open space shall be identified and reserved.

III.J.2 Policies

a. Uses in shorelines and water areas in priority order are: (1) water-dependent, (2) water-related, and (3) water-enjoyment

b. Uses, activities, and facilities should be located on shorelines in such a manner as to:

i. Retain or improve the quality of shoreline function;
ii. Respect the property rights of others;
iii. Ensure that proposed shoreline uses do not create risk or harm to neighboring or downstream properties; and
iv. Preserve and/or restore, to the maximum reasonable extent, the shoreline's natural features and functions in conjunction with any redevelopment or revitalization project.

c. The following are encouraged in shoreline areas:

i. Uses that enhance their specific areas or employ innovative features for purposes consistent with this program;
ii. The redevelopment of any area not suitable for preservation of natural features, based on its shoreline designation, with an emphasis on public access;
iii. Master planning for large sites or projects;
iv. Shared uses and joint use facilities in shoreline developments; and
v. Uses that allow for or incorporate restoration of shoreline areas that are degraded as a result of past activities or events.

d. Uses proposed on lands adjacent to but outside of immediate shoreline jurisdiction should be consistent with the intent of this program and should not adversely impact shoreline ecological functions.

Response: Underground utilities perpendicular to the shoreline are a conditional use permitted within the Urban Conservancy Shoreline area. There will be no reduction in the function of the shoreline due to the underground nature of the improvement and the restoration and re-vegetation of the utility trench. Temporary impacts will occur during the trench excavation, but these will be mitigated through the employment of best management practices for erosion control and re-vegetation of the trench surface on top of the native fill replaced in the trench. This project poses no risk of increased flooding or other damage to downstream properties as no decrease in flood storage will occur and no alteration of the stream bank will occur.

III.K Transportation, Utilities, and Essential Public Facilities

III.K.1 Goal

The goal for transportation, utilities, and essential public facilities is to provide for these facilities in shoreline areas without adverse effects on existing shoreline use and development or shoreline ecological functions and/or processes.

III.K.2 Policies

a. Transportation, utilities, and essential public facilities should be located outside of the shoreline jurisdiction to the maximum extent possible to reduce interference with natural shoreline functions and appropriate shoreline uses.

b. Circulation systems should be safe, reasonable, and adequate, and should be designed so that the routes will have the least possible adverse effect on shoreline function and existing ecological systems, while contributing to the visual enhancement of the shoreline.
c. Areas of shoreline transportation corridors that are unique, have historic significance or contribute significantly to the aesthetic quality of the shoreline should be protected, managed and enhanced.
d. Government bodies should devote roads within the shoreline jurisdiction to low volume local access routes and where practical, provide multiple use corridors as a part of shoreline transportation development.
e. Local utility and transportation corridors should be located to avoid creating barriers between adjacent uplands and the shoreline and to harmonize with the topography and other natural characteristics of the shoreline.
f. When new utility and transportation facilities are developed in the shoreline jurisdiction, there should be a combined effort by public and private interests to protect, enhance, and encourage development of physical and visual shoreline public access.
g. Where feasible, private and public entities (as applicable) should take steps to relocate existing utility and transportation facilities, such as transmission lines, rail lines, or freeways that limit public shoreline access or other shoreline uses and convert such rights-of-way to new public access routes.
h. Utilities and transportation facilities should be installed and facilities designed and located in a coordinated manner that protects the shorelands and water from contamination and degradation.
i. The siting of essential public facilities in the shoreline jurisdiction should be discouraged unless no practical alternatives exist.

Response: The utility line is perpendicular to the shoreline and will be constructed subsurface in the narrowest footprint possible to minimize temporary shoreline and critical land impacts. The only aspect of the stormwater line that will be visible once construction is completed is a manhole cover that will be at ground level. The project will not impact the aesthetic quality of the shoreline and there will be no loss of shoreline access. The applicant has looked at several alternatives for placement of the stormwater outfall pipeline. No other practical alternatives were found.

III.M Water Quality and Quantity

III.M.1 Goal

The goal for water quality and quantity is to protect and enhance the quality and quantity of the region's water resources to ensure there is safe, clean water for the public's needs and enjoyment, and; to maintain and restore natural flow regimes.

III.M.2 Policies

a. Encourage the location, construction, operation, and maintenance of shoreline uses, developments, and activities to be focused on maintaining or improving the quality and quantity of surface and ground water over the long term.
b. Strive to minimize, the inadvertent release of chemicals, activities that cause erosion, storm water runoff, and faulty on-site sewage through education, site planning, and best management practices
c. Encourage the use, maintenance and restoration of appropriate vegetative buffers along surface waters to improve water temperature and reduce the adverse effects of erosion and runoff.

d. Strive to maintain and restore natural flows.

Response: The Applicant's engineer has provided details on the erosion control methods proposed for the site. Typical erosion control BMPs will be used including silt fences, inlet protection, turbidity curtain, stabilized construction entrances, and stabilization of exposed soils. No new impervious surfaces will be created in the Shoreline or riparian areas with this proposal. Stormwater flowing through the pipeline will be treated within the subdivision and will meet the water quality standards of the 2012 Stormwater Management Manual for Western Washington and the La Center Municipal Code (LCMC).

Chapter IV. Shoreline Designations

IV.C Shoreline Designation

The City of La Center's Shoreline Master Program (SMP) includes a classification system consisting of shoreline designations that are consistent with and implement the Shorelines Act (RCW 90.58), the Shoreline Master Program Guidelines (WAC 173-26) and the City's Comprehensive Plan. These designations have been assigned consistent with the corresponding criteria provided for each shoreline designation. This project falls within the Urban Conservancy area designation as designated by the City of La Center. The purpose of the "Urban Conservancy" shoreline designation is to protect and restore ecological functions of open space, floodplains, and other sensitive lands, where they exist in urban and developed settings, while allowing a variety of compatible uses. The project requires a Shoreline Substantial Development Conditional Use Permit as outlined in the City's Shoreline Master Program.

Response: The Applicant will be constructing a stormwater outfall pipeline that is located perpendicular to the Shorelines area. The utility line will have some minor (temporal and subsurface) impacts within the Shoreline, a depressional wetland, a priority habitat area and riparian buffer. Only the lower portion of the outfall pipeline and associated energy dissipater will be located within the 200-foot shoreline buffer. These structures will be placed underground within the 200-foot shoreline buffer. These improvements should not result in any significant negative effects to the shoreline area or EFLR, as the impacts during construction are temporal and any permanent change to the area will be subsurface. All temporary impact areas will be restored and compensatory mitigation will be provided for wetland and habitat impacts within the shoreline buffer. There will be no net loss of ecological function, ecological value to the shoreline or critical areas.

IV.C.4 Urban Conservancy

The purpose of the Urban Conservancy shoreline designation is to protect and restore ecological functions of open space, floodplains, and other sensitive lands, where they exist alongside urban and developed settings, while allowing compatibles uses. In addition to the other applicable policies and regulations of the City of La Center SMP, the following Management Policies of Urban Conservancy shoreline designation shall apply as identified in 4.C.4.c.

i. Uses that preserve the natural character of the area or promote preservation of open space or critical areas are favored providing they are compatible with the Urban Conservancy setting.

Response: The underground nature of the utility line will not permanently impact open space, floodplain or other sensitive lands function. The temporary impacts during construction will be restored by filling in the trench and re-vegetating the construction area. In addition, the shoreline area within the City's easement between the tree line and ordinary high water mark will be planted with native trees and shrubs. The natural character of the shoreline will be preserved at completion of the project.

ii. Single family residential development shall ensure no net loss of shoreline ecological functions and preserve the existing character of the shoreline.

Response: The proposal does not include any single family homes.

iii. In order to preserve the natural character of the areas as mentioned above, thinning or removal of vegetation should be limited to that necessary to remove noxious vegetation and invasive species; provide physical or visual access to the shoreline; and to maintain or enhance and existing use.

Response: The 24 inch HDPE pipe used for the sloped portion of the project within the shoreline buffer is flexible and will allow the contractor to place the pipeline around existing trees. However, there may be the need to remove some smaller trees and shrubs within the construction area. Any trees and shrubs removed within the habitat area will be used to construct small brush piles within the riparian buffer of the EFLR. In addition, native trees and shrubs will be planted on the bench between the ohwm and the existing tree line. A mitigation plan that addresses that planting has been prepared as part of the Fish and Wildlife Habitat Conservation Areas documents. No Oregon white oak, which are listed as a priority habitat by Washington Department of Fish and Wildlife will be removed as part of this project.

iv. Low intensity water-oriented commercial uses may be permitted if compatible with surrounding uses, and

Response: The Applicant is not seeking to locate any low intensity water-oriented uses with this application.

v. Public access and public recreation objectives should be implemented whenever feasible and when significant ecological impacts can be mitigated.

Response: This is a utility line project that does not have public access or recreation components. However, the project will not restrict access or the use of the area for recreation. The project is providing mitigation within the shoreline, wetland, priority habitat and riparian zone, to compensate for insignificant shoreline impacts.

Chapter V. General Shoreline Use and Development Regulations

All uses and development activities in shorelines shall be subject to the following general regulations in addition to the applicable use-specific regulations in Chapter VI.

V.A General Shoreline Goals

1. Shoreline uses and development that are water-dependent shall be given priority.
2. WAC 173-26-201 (Process to Prepare or Amend "Shoreline Master Program's") requires that the SEPA "Mitigation" Sequence be incorporated into the "shoreline master programs" as follows:

a. "To assure no net loss of shoreline ecological functions, master programs shall include provisions that require proposed individual uses and developments to analyze environmental impacts of the proposal an d include measures to mitigate environmental impacts not otherwise avoided or mitigated by compliance with the master program and other applicable regulations. To the extent Washington's State Environmental Policy Act of 1971 (SEPA) chapter 43.21C RCW, is applicable, the analysis of such environmental impacts shall be conducted consistent with the rules implementing SEPA, which also address environmental programs shall indicate that, where required, mitigation measures shall be applied in the following sequence of steps listed in order of priority, with "(i) of this subsection being top priority."

i. "Avoiding the impact altogether by not taking a certain action or parts of an action;"
ii. "Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to avoid or reduce impacts;"
iii. "Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;"
iv. "Reducing or eliminating the impact over time by preservation and maintenance "operations";"
v. "Compensating for the impact by replacing, enhancing, or providing substitute resources or environments;" and
vi. "Monitoring the impact and the compensation projects and taking appropriate corrective measures."

Response: The project has been designed so that the temporary construction zone will have a minimal footprint within the shoreline buffer. All components of the pipeline within the shoreline buffer will be placed subsurface, except of the energy dissipater man-hale cover which will be located at the ground surface. The trench will be backfilled and restored by planting native herbaceous vegetation within the construction zone. Temporary wetland and habitat (riparian buffer) impacts will be further compensated by planting native trees and shrubs between the ordinary high water mark and the existing treeline within the easement area.

3. Shoreline uses and developments shall not cause impacts that require remedial action or loss of shoreline functions on other properties.

Response: The project will be constructed within the City's easement. Adjacent properties will not be impacted by the construction or installation of the pipeline.

4. Shoreline uses and developments shall be located and designed in a manner such that shoreline stabilization is not necessary at the time of development and would not be reasonably anticipated

as being necessary in the future, unless it can be demonstrated that stabilization is the only alternative to protecting public safety and existing primary structures.

Response: The project is designed so that no shoreline stabilization is necessary and none is anticipated in the future.

5. Land shall not be cleared, graded, filled, excavated or otherwise altered prior to issuance of the necessary permits and approvals for a proposed shoreline use or development to determine if environmental impacts have been avoided, minimized and mitigated to result in no net loss of ecological functions.

Response: Clearing, grading, filling, excavation, or any other alterations will not occur until all appropriate permits have been issued to ensure that there is a no net loss in ecological functions.

6. Non-water-oriented uses shall not adversely impact or displace water-oriented shoreline uses.

Response: The project is a non-water-oriented use, but due to its underground and temporary impact nature it will not impact or displace water-oriented shoreline uses.

7. Single-family residential uses shall be located, designed and used in accordance with applicable policies and regulations of this program. They are prohibited in the Aquatic shoreline designation, and may have a lower priority in some other designations.

Response: Single family residential uses are not proposed within the shoreline buffer for this project.

8. All uses and developments on or alongside navigable waters should be located and designed to minimize interference with surface navigation; consider impacts to public views and allow for the safe, unobstructed passage of fish and wildlife, particularly species dependent on migration.

Response: This project will not interfere with surface navigation, public views, and/or fish and wildlife passage.

9. Hazardous materials shall be disposed of in a manner which is in accordance with all applicable federal, state and local statutes, codes and ordinances, and the SMP itself. The handling and disposal of hazardous material will be accomplished in a way that protects the ecological integrity of the shoreline area.

Response: This project does not include the handling or disposal of hazardous materials. Fueling of vehicles will not occur within the shoreline buffer.

10. In-water work shall be scheduled to protect biological productivity, including fish runs and spawning, and in-water work shall not occur in areas used for commercial fishing during a fishing season.

Response: In-water work will conducted during time periods as outlined by Washington Department of Fish and Wildlife in their Hydraulic Project Approval (HPA) and U.S. Army Corps of Engineers in their Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Acts, respectively. A biological assessment is currently being prepared by The Resource Company to address in-water issues.

11. Previous approvals of master plans for projects in shoreline jurisdiction shall be accepted. New phases of project for which no master plan has yet been approved, or for which major changes are being proposed, or new projects for which master plans are being submitted should be subject to the policies and regulations of this program.

Response: Not Applicable

12. Within urban growth areas, WDOE may grant relief from use and development regulations of this program when:

a. A shoreline restoration project identified in the Clark Coalition SMP Restoration Plan causes or would cause a landward shift in the OHWM creating a hardship meeting specific criteria in RCW 90.58.580;
b. The proposed relief meets specific criteria in RCW 90.58.580; and
c. The application for relief is submitted to WDOE in writing requesting approval or disapproval as part of a normal review of a shoreline substantial development permit, conditional use WAC 173-26-201, or variance. If the proposal is not connected to a shoreline permit review, the City may provide a copy of a complete application to WDOE along with the applicant's request for relief.

Response: Not Applicable

V.B Archeological, Cultural and Historic Resources

1. When a shoreline use or development is in an area known or likely to contain archaeological artifacts and data based on Clark County's predictive model, the applicant shall provide for a site inspection and evaluation by a professional archaeologist prior to issuance or as a condition of any shoreline permit or approval as determined by the City. Work may not begin until the inspection and evaluation have been completed and the City has issued its permit or approval.
2. If any item of possible archaeological interest (including human skeletal remains) is discovered on site, all work shall immediately stop, and the City, State Department of Archaeology and Historic Preservation (DAHP), and affected Native American Tribes shall be notified of such finding. A stop-work order will be issued. The shoreline permit will be temporarily suspended. All applicable state and federal permits shall be secured prior to commencement of the activities they regulate and as a condition or resumption of development activities. Development activities may resume only upon receipt of City approval.
3. If the discovery includes human skeletal remains, the find must be secured and protected from further disturbance; the Clark County Medical Examiner and local law enforcement shall be notified in the most expeditious manner possible. The County Medical Examiner will assume jurisdiction over the site and the human skeletal remains, and will make a determination of whether they are crime-related. If they are not, DAHP will take jurisdiction over the remains and report them to the appropriate parties. The State Physical Anthropologist will make a determination of whether the remains are Native American and report that finding to the affected parties. DAHP will handle all consultation with the affected parties as to the preservation, excavation, and disposition of the remains.

Response: A Cultural Resources Survey was conducted by Archeological Services, LLC in March 2015 as required by SMMP. Surface and subsurface investigations were conducted at that time. No cultural resources found during those investigations. A copy their full report in attached in the Appendices Section of this report. If any qualifying cultural

resources are discovered during explorations or construction on the project site, work will be stopped and, before work recommences on that portion of the site, a professional archaeologist will assess the significance of any resources discovered and notify DAHP and affected Native American Tribes to determine the appropriate course of action.

V.C Critical Areas Protection

V.C.1 General Provisions.

a. Critical areas defined in Appendix C (LCMC 18.300) which are located within the shoreline jurisdiction are protected under this section.
b. Any allowed use, development or activity proposed on a parcel within a critical area located in the shoreline jurisdiction shall be regulated under the provisions of this program.
c. Any allowed use, development or activity meeting the definition of a development exempt from the shoreline substantial development permit process outline in WAC 173-27-040 and Section II.C of this program shall be consistent with the policies and provisions of this program for critical areas protection.
d. Provisions of the critical areas regulations that are not consistent with the Act and supporting WAC chapters shall not apply in shorelines jurisdiction.
e. Habitat that cannot be replaced or restored within twenty (20) years shall be preserved.
f. Where construction of a single-family residence is proposed, this activity is considered exempt from obtaining a shoreline substantial development permit when the construction is located landward of the ordinary high water mark and does not include placement of fill in wetlands. Construction of single-family residences requiring fill in wetlands must obtain a shoreline Substantial Development Permit in addition to other shoreline approvals as applicable.
g. Unless otherwise stated, no development shall be constructed, located, extended, modified, converted, or altered, or land divided without full compliance with this program and LCMC Title 18.
h. Reasonable use exceptions under LCMC 18.300.080 determination shall not apply in the shoreline jurisdiction.
i. Unless otherwise stated, critical area buffers within the shoreline jurisdiction shall be protected and/or enhanced in accordance with this program and LCMC Title 18.
j. Shoreline uses and developments and their associated structures and equipment shall be located, designed and operated using best management practices to protect critical areas.
k. The applicant shall demonstrate all reasonable efforts have been taken to avoid, and where unavoidable, minimize and mitigate impacts such that no net loss of critical area and shoreline ecological function is achieved. Mitigation shall occur in the following order of priority:

i. Avoiding the impact altogether by not taking a certain action or parts of an action;
ii. Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to avoid or reduce impacts;
iii. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
iv. Reducing or eliminating the impact over time by preservation and maintenance operations;
v. Compensating for the impacts by replacing, enhancing, or providing substitute resources or environments; and

vi. Monitoring the impacts and the compensation projects and taking appropriated corrective measures.

l. In addition to compensatory mitigation, unavoidable adverse impacts may be addressed through restoration efforts.

V.C.2 Applicable Critical Areas

For purposes of this program, the following critical areas will be protected under this program:
a. Critical Aquifer Recharge Areas, defined in LCMC 18.300.090(1) as adopted by Ordinance 2007-02, dated March 28, 2007;
b. Fish and Wildlife Habitat Conservation Areas, defined in LCMC 180300.090(2) as adopted by Ordinance 2007-02, dated March 28, 2007;
c. Frequently Flooded Areas, defined in LCMC 18.300.090(3) as adopted by Ordinance 2007-02, dated March 28,2007;
d. Geologically Hazardous Areas, defined in LCMC 18.300.090(4) as adopted by Ordinance 2007-02, dated March 28,2007;
e. Slopes with Gradients of 25 Percent or Greater, defined in LCMC 18.300.090(5) as adopted by Ordinance 2007-02, dated March 28, 2007;
f. Wetlands, defined in LCMC 18.300.090(6) as adopted by Ordinance 2007-02, dated March 28, 2007.

Response: The project area contains Frequently Flooded Areas, Fish and Wildlife Habitat Conservation Areas, Geologically Hazardous Areas, Slopes with Gradients of 25 Percent of Greater, and Wetlands. The Resource Company has prepared reports addressing the fish and wildlife issues and the wetlands issues. MacKay and Sposito prepared a response to the frequently flooded areas, and Columbia West Engineering has prepared a description of the geological hazardous areas and slopes with gradients of 25 percent or greater within the stormwater outfall alignment.

V.C.3 Fish and Wildlife Habitat Conservation Areas

Response: The Resource Company (TRC) has identified the EFLR as a Type S Stream. Type S streams are protected by a 250 riparian priority buffer under LCMC 18.300.090(2). In addition, an Oregon white oak (*Quercus garryana*) woodland occurs along the base of the slope within the 200-foot shoreline buffer. Oregon white oak woodlands are listed as a priority habitat by WDFW and as such it is regulated under the City's Critical Lands Ordinance. The project will have temporary impacts within the riparian priority buffer that will be restored once the stormwater pipe has been installed. The pipe used for this section of pipeline is flexible and can be shaped to avoid trees and tree removal. However, some small trees and shrubs may need to be removed for the construction of this project. Any trees and shrubs removed within the habitat area will be used to construct small brush piles within the riparian buffer of the EFLR. No Oregon white oak will be removed for the construction of this project, however, the route of the pipeline will be within the dripline of two trees. Due to the narrow footprint of the construction zone in this area, the excavation within the dripline is not anticipated to impact the trees.

Once the pipe installation has been completed the trench will be backfilled and planted with native herbaceous vegetation. In addition, native trees and shrubs will be planted in the easement between the OHWM and the existing treeline. TRC has prepared a compensatory habitat mitigation plan that addresses this enhancement.

V.C.4 Frequently Flooded Areas

Response: The project does not reduce the capacity of the floodplain. Excavation, backfill, and material placed over the outfall pipe will be restored to existing conditions resulting in no change in floodplain volume capacity. The proposed outfall structure (concrete manhole and buried pipe are below ground and not susceptible to water damage or forces involved with the low flow velocities. The project does not negatively impact the Base Flood Elevation. The outfall structure and pipe are below ground. After construction the site will be restored to match existing conditions resulting in negligible changes to floodway flow capacity.

V.C.5 Geologically Hazardous Areas/Slopes with Gradients of 25 Percent or Greater

Response: Columbia West Engineering conducted a field reconnaissance within the proposed outfall route in the fall of 2008. Their comments and recommendations follow: Based on topographic maps, the slope from the west end of W. 5th Street drops from an elevation of approximately 134 feet above mean sea level (amsl)) down to the east bank of the EFLR at approximately 10 feet amsl. Slopes vary from 5 to 60 percent within the project area. Soils within the project area are predominantly damp to wet, stiff clay. Bedrock which was observed along the bank of the EFLR was not encountered within other portions of the project area. Recommendations for construction of the outfall pipe within the project area are as follows:

1. **Pipes conveying stormwater over slope surfaces or buried within the slope should be fitted with flexible joints. The pipeline should be monitored periodically for leaks and proper water conveyance to prevent leaking pipes that may cause saturated subsurface conditions and reduced slope stability.**
2. **Stormwater should not be discharged over steep portions of the slope as shown in the map that accompanies their November 20, 2008 recommendations memo.**
3. **Trench backfill material within steep slope areas should consist of angular gravel, ballast, or similar interlocking material capable of achieving adjacent slope grades.**
4. **Adequate outfall protection is required.**

Columbia West reviewed sheet C5.3 *Offsite Storm Plan and Profile* dated February 10, 2015. The plan indicated the stormwater pipe will traverse steep slope areas above ground and will be restrained at regular intervals. The plan indicates the stormwater outfall will discharge beneath the ordinary high water elevation of EFLR. The plan appears to incorporate Columbia West's recommendations regarding stormwater utility construction in steep slope areas. Provided restraints, joints, and energy dissipation are designed and

constructed properly and incorporate Columbia West's recommendations, the construction of the planned stormwater pipeline is feasible.

V.C.5 **Wetlands**

Response: The construction of the pipeline will cross a small wetland and associated buffer located near the base of the slope. TRC conducted a wetland delineation and assessment and determined that it is a Category IV, HGM class depressional wetland that is temporarily flooded (see enclosed delineation report). Wetland vegetation is dominated by herbaceous cover and no trees or shrubs occur within the wetland. The pipeline construction will be a temporary impact to the wetland and a portion of the buffer that will be restored once the pipe has been installed. In addition to restoring the trench area of the wetland and buffer, the remainder of the wetland will be enhanced by planting native trees and shrubs. TRC has prepared a wetland mitigation plan to address the temporary impacts and compensation that is enclosed for review with this document.

V.D Flood Prevention and Flood Damage Minimization

1. Development in floodplains shall not significantly or cumulatively increase flood hazard or be inconsistent with an adopted comprehensive flood hazard management program.
2. New development or new uses in the shoreline jurisdiction, including subdivision of land, should not be established when it would be reasonably foreseeable that the development or used would require structural flood hazard reduction measures within the channel migration zone or floodway. The actual location of the channel migration zone on site must be delineated by a qualified professional.
3. New structural flood hazard reduction measures in the shoreline jurisdiction will be allowed only when it can be demonstrated by scientific and engineering analysis that they are necessary to protect existing development, that non-structural measures are not feasible, and that impacts to ecological function and priority species and habitat can be successfully mitigate so as to assure not net loss of shoreline ecological function.
4. In-stream structures shall be located, designed and maintained in such a manner that minimizes flood potential and the damage affected by flooding.
5. Fills are prohibited in floodplains unless the applicant clearly demonstrates that the geohydraulic characteristics will not be altered in a way that increases flood velocity or risk of damage to life or property; and flood storage capacity will not be reduced. See also Section V.G.2.
6. Fill shall be avoided in critical areas or buffers where possible. Pile or pier supports or other support methods shall be utilized instead of fills wherever feasible, particularly for permitted development in floodways or wetlands. See also Section V.G.2.
7. Dikes and leaves shall not be placed in the floodway except for current deflectors necessary for protection of bridges and roads.
8. Removal of gravel for flood management purposes shall be consistent with the adopted flood hazard reduction plan, and the provisions of this program. This removal will only be allowed after a biological and geomorphological study determines that the extraction has a long-term flood hazard reduction benefit and does not result in net loss of ecological functions.

9. Removal of beaver dams to control or limit flooding shall be avoided where feasible, and allowed only in coordination with WDFW and receipt of all applicable state permits.
10. Non-structural flood hazard reduction measures are preferred to structural measures. Flood hazard reduction measures should be accomplished in a manner that ensures no net loss of ecological functions and ecosystem-wide processes.
11. Flood protection measures that result in channelization and/or reduction in shoreline function should be avoided.

Response: The proposed housing development is outside the floodplain but results in a stormwater outfall that is within the floodplain. The outfall pipe and structures are below ground and will not result in any fill placed within the critical areas or buffers. The stormwater management design for this project is based on and complies with the stormwater requirements for the 2012 Stormwater Management Manual for Western Washington and the La Center Municipal Code (LCMC). The outfall to the East Fork Lewis River will be protected from erosion by reducing flows to non-erosive velocities of less than 3-fps using corrugated plastic pipe.

V.H Vegetation Conservation

1. Existing native vegetation within the shoreline jurisdiction shall be retained, and removal of such vegetation avoided. Where removal of native vegetation cannot be avoided, it shall be minimized to protect ecological functions.
2. Lost functions may be replaced by enhancing other functions if no net loss in overall functions is demonstrated and habitat connectivity is maintained. Mitigation shall be provided consistent with an approved mitigation plan.
3. Clearing of invasive on non-native shoreline vegetation or plants listed on the state Noxious Weed List using hand-held equipment is permitted in shoreline locations if native vegetation is promptly re-established in the disturbed area. In circumstances where the used of hand-held equipment is impractical or unreliable, the Shoreline Administrator may approve other methods of removal, such as the use of certain herbicides, providing such approval is obtained prior to the commencement of removal.
4. If non-native vegetation is to be removed, then it shall be replaced with native vegetation within the shoreline jurisdiction.
5. Thinning of trees is limited as follows:

    a. Removal of no more than twenty-five (25) percent of the canopy of any tree or group of trees (calculated based on the area of the crown , or upper portion(s) comprised of branches and leaves of as determined by a certified arborist) in any given five-years period.

    b. Pruning of trees that does not affect shoreline ecological functions. No more than twenty percent (20%) of the limbs on any single tree may be removed and no more than twenty percent (20%) of the canopy cover in any single stand of trees may be removed in a given five (5-) year period. Pruning shall comply with the National Arborist Association pruning standards, unless the tree is a hazard tree as defined in LCMC 18.350.070. New structures or development within a shoreline area should be sited to avoid the creation of future hazard trees.

6. Mitigation requirements for removal of vegetation shall be determined after review of a habitat management plan prepared by a qualified professional that assesses the cumulative impacts associated with removing riparian vegetation.
7. Topping of trees is prohibited.
8. Natural features such as snags, stumps, logs or uprooted trees, which do not intrude on the navigational channel or threaten public safety, and existing structures and facilities, shall be left undisturbed.
9. Natural in-stream features such as snags, uprooted trees, or stumps should be left in places unless it can be demonstrated that they are not enhancing shoreline function or are a threat to public safety.
10. Aquatic weed control shall only occur to protect native plant communities and associated habits or where an existing water-dependent use is restricted by the presence of weeds. Aquatic weed control shall occur in compliance with all other applicable laws and standards and shall be done by a qualified professional.
11. Unless otherwise stated, the vegetation conservation regulations of this program do not apply to commercial forest practices as defined by this program when such activities are covered under the Washington State Forest Practices Act (RCW 76.09) except where:

a. such activities are associated with an conversion to other uses or other forest practice activities over which local governments have authority; or to
b. flood control levees required to be kept free of vegetation that damages their structural integrity.

12. The conversion of forest lands to non-forestry uses shall not be considered a forest practice. Such conversions will be reviewed under the regulations for the new use, this program, and shall be limited to the minimum necessary to accommodate an approved use. For the purpose of the program, preparatory work associated with the conversion of land to non-forestry uses and/or developments shall not be considered a forest practice and shall be reviewed in accordance with the provisions for the proposed non-forestry use, the general provisions of this program, and shall be limited to the minimum necessary to accommodate an approved use.

Response: Only small trees and shrubs that can't be avoided will be removed within the shoreline buffer for this project. No oak trees will be removed. Any trees and shrubs removed within the habitat area will be used to construct small brush piles within the riparian buffer of the EFLR. In addition, the area between the ohwm and the existing treeline will be planted with native trees and shrubs. No thinning, pruning or topping of trees is proposed for this project. No stumps, logs, uprooted trees, or snags occur within the project area will be removed. Aquatic weeds do not exist within the project area and control will not be necessary. The Washington State Forest Practices Act will not be used for this project.

Chapter VI
Specific Shoreline Use Regulations
VI.A. General Provisions

1. This chapter contains the regulations that apply to specific uses, developments, and activities in the shoreline jurisdiction.

2. These regulations are intended to work in concert with all sections of this Program and in particular the Goals and Policies (Chapter III) and General Use and Development Regulations (Chapter V).

VI.B Shoreline Use, Modification, and Standards Table

1. Each shoreline designation shall be managed in accordance with its designated purpose as described in this program. Table 6-1 identifies those uses that are prohibited, may be permitted or permitted with a conditional use approval in each shoreline designation. In the event conflicts exist between the Table 6-1 and the text in this chapter, the text shall apply.

2. Table 6-1 also summarizes general setbacks and building heights for uses within each shoreline designation. No permit for any new or expanded building or structure of more than thirty-five feet above average grade level on shorelines of the state that will obstruct the view of a substantial number of residences on areas adjoining such shorelines except where a master program does not prohibit the same and then only when overriding considerations of the public interest will be served. These setbacks apply in conjunction with the requirements of the critical areas requirements established in Chapter V. In the event a conflict exists between Table 6-1 and the requirements of Chapter V, the most protective of shoreline functions shall apply.

3. In Table 6-1, setbacks are measured landward from the ordinary high water mark (OHWM). For transportation facilities and utilities, the setback from the OHWM pertains to the right of way and not the structure or pipeline. In the Aquatic shoreline designation, the setback is waterward of the OHWM. Building heights are calculated according to LCMC 18.40.010 and WAC 173-27-030(9).

The use is a permitted use within the Urban Conservancy designation table (6-1) as show shown below.

Table 6-1. Shoreline Use, Modification and Development Standards

Abbreviations P = Permitted; C = Conditional Use; X = Prohibited; N/A = Not Applicable; UNL = Unlimited.	AQ	NT	**UC**	MI	HI	RC-RD	RC-RL
Shoreline Designation	**Aquatic**	Natural	**Urban Conservancy**	Medium Intensity	High Intensity	RC - Residential	RC Resource Lands
Shoreline Uses							
Agriculture							
Agriculture	**N/A**	**X**	**C**	**P**	**P**	**P**	**P**
Setback	**N/A**	N/A	**100'**	100'	100'	10	100'
Height	**N/A**	N/A	**35'**	35'	35'	3	35'
Aquaculture							
Aquaculture, General	**P**	**X**	**C**	**C**	**C**	**C**	**C**
setback	**0'**	N/A	**50'**	50'	50'	5	50'
Boating Uses							
Motorized Boat Launches	**P**	**X**	**C**	**C**	**P**	**P**	**P**
Non-motorized Boat Launches	**P**	**C**	**P**	**P**	**P**	**P**	**P**
Marinas	**X**	**X**	**X**	**C**	**P**	**C**	**P**
Setback	**N/A**	**N/A**	**N/A**	**25'**	**25'**	**2**	**25'**

Height							
0-100' from OHWM	**N/A**	N/A	**N/A**	**25'**	**35'**	**2**	**35'**
>100' from OHWM	**N/A**	N/A	**N/A**	**35'**	**45'**	**3**	**45'**
Docks, Piers, Mooring Buoys	**P**	X	**P[1]**	**P[1]**	**P[1]**	**P**	**P**
Setback	**0'**	N/A	**0'**	0'	0'	0	0'
Commercial Uses							
Water-dependent	**X**	X	**X**	**P**	**P**	**C**	**C**
Setback	**0'**	N/A	**N/A**	0'	0'	0	0'
Height							
- 0 -100' from OHWM	**N/A**	N/A	**N/A**	35'	35'	3	35'
- >100' from OHWM	**N/A**	N/A	**N/A**	45'	45'	4	45'
Water-related, Water-enjoyment	**X**	X	**X**	**P**	**P**	**C**	**C**
Setback	**N/A**	N/A	**N/A**	25'	25'	2	25'
Height							
- 0' -100' from OHWM	**N/A**	N/A	**N/A**	25'	35'	3	35'
- >100' from OHWM	**N/A**	N/A	**N/A**	35'	45'	4	45'
Non-water-oriented	**X**	X	**X**	**C**	**C**	**X**	**X**
Setback	**N/A**	N/A	**N/A**	100'	100'	N/	N/A
Height	**N/A**	N/A	**N/A**	25'	25'	N/	N/A
Forestry							
Log Storage	**X**	X	**X**	**X**	**P**	**X**	**P**
Setback	**0'**	N/A	**N/A**	**N/A**	**50'**	**N/**	**50'**
Timber Harvest	**X**	X	**X**	**P**	**P**	**P**	**P**
Setback	**N/A**	N/A	**N/A**	100'	50'	10	50'
Industrial Uses							
Water-dependent	**X**	X	**X**	**X**	**P**	**X**	**X**
Setback	**0'**	N/A	**N/A**	N/A	0'	N/	N/A
Height							
- 0-100' from OHWM	**20'**	N/A	**N/A**	N/A	60'	N/	N/A
- >100 from OHWM	**20'**	N/A	**N/A**	N/A	60'	N/	N/A
Water-related	**X**	X	**X**	**X**	**P**	**X**	**X**
Setback	**N/A**	N/A	**N/A**	N/A	50'	N/	N/A
Height							
- 0-100' from OHWM	**N/A**	N/A	**N/A**	N/A	45'	N/	N/A
- >100 from OHWM	**N/A**	N/A	**N/A**	N/A	60'	N/	N/A
Non-water-oriented	**X**	X	**X**	**X**	**P**	**X**	**X**
Setback	**N/A**	N/A	**N/A**	N/A	100'	N/	N/A
Height	**N/A**	N/A	**N/A**	N/A	35'	N/	N/A
Institutional Uses							
Water-dependent	**C**	X	**C**	**P**	**P**	**C**	**C**
Setback	**N/A**	N/A	**0'**	0'	0'	0	0'
Height							
- 0-100' from OHWM	**N/A**	N/A	**25'**	35'	45'	3	35'
- >100 from OHWM	**N/A**	N/A	**35'**	45'	60'	'	45'
Water-related,	**X**	X	**X**	**P**	**P**	**C**	**X**
Setback	**N/A**	N/A	**N/A**	25'	25'	5	NA
Height							
- 0-100' from OHWM	**N/A**	N/A	**N/A**	35'	45'	3	N/A
- >100 from OHWM	**N/A**	N/A	**N/A**	45'	60'	3	N/A
Non-water-oriented	**X**	X	**X**	**C**	**C**	**X**	**X**
Setback	**N/A**	N/A	**N/A**	100'	100'	N	N/A
Height	**N/A**	N/A	**N/A**	35'	35'	N	N/A
Mining							
Gravel Mining	**X**	X	**X**	**X**	**C**	**C**	**C**
Setback	**N/A**	N/A	**N/A**	N/A	200'	20	200'
Hard Rock Mining	**X**	X	**X**	**X**	**C**	**C**	**C**
Setback	**N/A**	N/A	**N/A**	N/A	100'	10	50'

Parking							
Primary Use	**X**	X	**X**	X	X	X	X
Setback	**N/A**	N/A	**N/A**	N/	N/	N	N/A
Accessory Use	**X**	X	**P**	P	P	P	P
Setback	**N/A**	N/A	**100'**	100'	50'	10	100'
Height	**N/A**	N/A	**35'**	35'	35'	3	35'
Recreational Uses							
Water-dependent	**P**	P[2]	**P**	P	P	P	P
Setback	**0'**	0'	**0'**	0'	0'	0	0'
Height	**15'**	15'	**15'**	35'	35'	3	35'
Water-related/enjoyment (trails, accessory bldgs)	**C[2]**	C[2]	**P[3]**	P	P	P	P
Setback	**N/A**	50'[3]	**50'[3]**	50'	20'	2	20'
Height	**N/A**	15'	**15'**	35'	35'	3	35'
Non-water-oriented (golf courses, sports fields)	**X**	X	**C**	C	C	C	X
Setback	**N/A**	N/A	**100'**	100'	100'	20	N/A
Height	**N/A**	N/A	**25'**	25'	25'	1	N/A
Residential Uses							
Single-family	**X**	X	**P**	P	X	P	P
Setback	**N/A**	N/A	**100'**	50'	N/	10	100'
Height	**N/A**	N/A	**35'**	35'	N/	3	35'
Floating homes (new)	**X**	N/A	**N/A**	N/A	N/A	N	N/A
Height	**N/A**	N/A	**N/A**	N/	N/	N	N/A
Multifamily	**X**	X	**X**	P	P	X	X
Setback	**N/A**	N/A	**N/A**	35'	35'	N	N/A
Height	**N/A**	N/A	**N/A**	35'	35'	N	N/A
Signs [4]							
Fascia or Wall Signs	**X**	X	**X**	P	P	P	P
Free Standing Informational	**P**	P	**P**	P	P	P	P
Navigation Signs	**P**	P	**P**	P	P	P	P
Transportation Uses							
Highways, Arterials, Railroads (parallel to OHWM)	**C**	X	**P**	P	P	P	P
Right-of-Way Setback	**0'**	N/A	**200'**	100'	100'	200'	
Secondary/Public Access Roads (parallel to OHWM)	**X**	X	**P**	P	P	P	P
Right-of-Way Setback	**NA**	N/A	**100'**	50'	50'	100'	100'
Bridges (perpendicular to shoreline)	**C**	C	**C**	P	P	C	C
Setback	**0'**	0'	**0'**	0'	0'	0'	0'
Utility Uses							
Above-ground Utilities (parallel to shoreline)	**C**	C	**P**	P	P	P	P
Right-of-Way Setback	**0'**	200'	**100'**	50'	50	10	100'
Structure Height	**15'**	15'	**35'**	35'	UNL	1	15'
Distribution Pole Height	**0'**	45'	**45'**	45'	UNL	4	45'
Electrical Transmission Lines	**C**	C	**C**	C	C	C	C
Tower Height	**UNL**	UNL	**UNL**	UNL	UNL	U	UNL

Underground Utilities (parallel to shoreline)	**C**	C	**P**	P	P	P	P
Right-of-Way Setback	**0'**	200'	**100'**	50'	50	5	50'
Underground Utilities	**C**	C	**C**	C	C	C	C
Right-of-Way Setback	**0'**	0'	**0'**	0'	0	0	0'
Unclassified Uses							
Unclassified Uses	**C**	C	**C**	C	C	C	C
Setback	**0'**	200'	**100'**	100'	100'	10	100'
Height	**15'**	15'	**35'**	35'	35	3	35'
Shoreline Modification							
Dredging and Dredge Material Disposal							
Non-maintenance Dredging	**C**	N/A	**N/A**	N/	N/	N	N/A
Maintenance Dredging	**P**	N/A	**N/A**	N/	N/	N	N/A
Dredge Material Disposal	**C**	X	**X**	C	C	C	C
Dredging & Disposal Ecological Restoration/Enhancement	**P**	C	**P**	P	P	P	P
Fill	**C**	X	**P**	P	P	P	P
Flood Control Works and In-stream Structures							
Dams, Dikes, & Levees	**C**	X	**C**	C	P	C	C
In-stream structures	**C**	N/A	**N/A**	N/	N/	N	N/A
Shoreline Restoration							
Ecological Restoration / Enhancement /	**P**	P	**P**	P	P	P	P
Shoreline Stabilization							
Bioengineered/Non-Structural	**P**	P	**P**	P	P	P	P
Structural	**C**	X	**C**	C	C	C	C
Breakwaters, Jetties, Rock Weirs and Groins	**X**	X	**X**	C	C	C	C

VI.C Use Specific Development Regulations

VI.C.12 Utilities Uses

These provisions apply to services and facilities that produce, convey, store, or process power, gas, wastewater, communications, and similar services and functions. On-site utility features serving a primary use, such as a water, sewer or gas line to a residence or other approved use are "accessory utilities" and shall be considered a part of the primary use.

a. Utility features shall be located outside shoreline jurisdiction whenever feasible. Where distribution and transmission lines (except electrical transmission lines) must located in the shoreline jurisdiction they shall be located underground. Where overhead electrical transmission lines must be parallel to the shoreline, they shall be outside of the two hundred (200) foot shoreline environment unless topography or safety factors would make it unfeasible.

b. Utilities shall be designed, located and installed in such a way as to minimize impacts to scenic views and minimize conflicts with present and planned land and shoreline use.

c. Transmission, distribution and conveyance facilities shall be located in existing rights-of-way and corridors, or shall cross shoreline jurisdictional areas by the shortest, most direct route feasible, unless such route would cause significant environmental damage.

d. Utility production and processing facilities, such as power plants and wastewater treatment facilities or parts of those facilities that are non-water-oriented shall not be allowed in the

shoreline jurisdiction unless it can be demonstrated conclusively that no other feasible option is available.

Response: The applicant pursued other alternatives for the placement of the stormwater outfall and conveyance pipe. All of those considered either would require a shorelines permit in another area of the City adjacent to the EFLR or were not feasible due to Clark County shoreline regulations. All features proposed within the shoreline buffer will be underground and perpendicular to the EFLR. The proposed project is located within the City's easement for W. 5th Street.

VI.C.13 Stormwater Control Facilities

These are limited to detention/retention/treatment ponds media filtration facilities, and lagoons or infiltration basins.

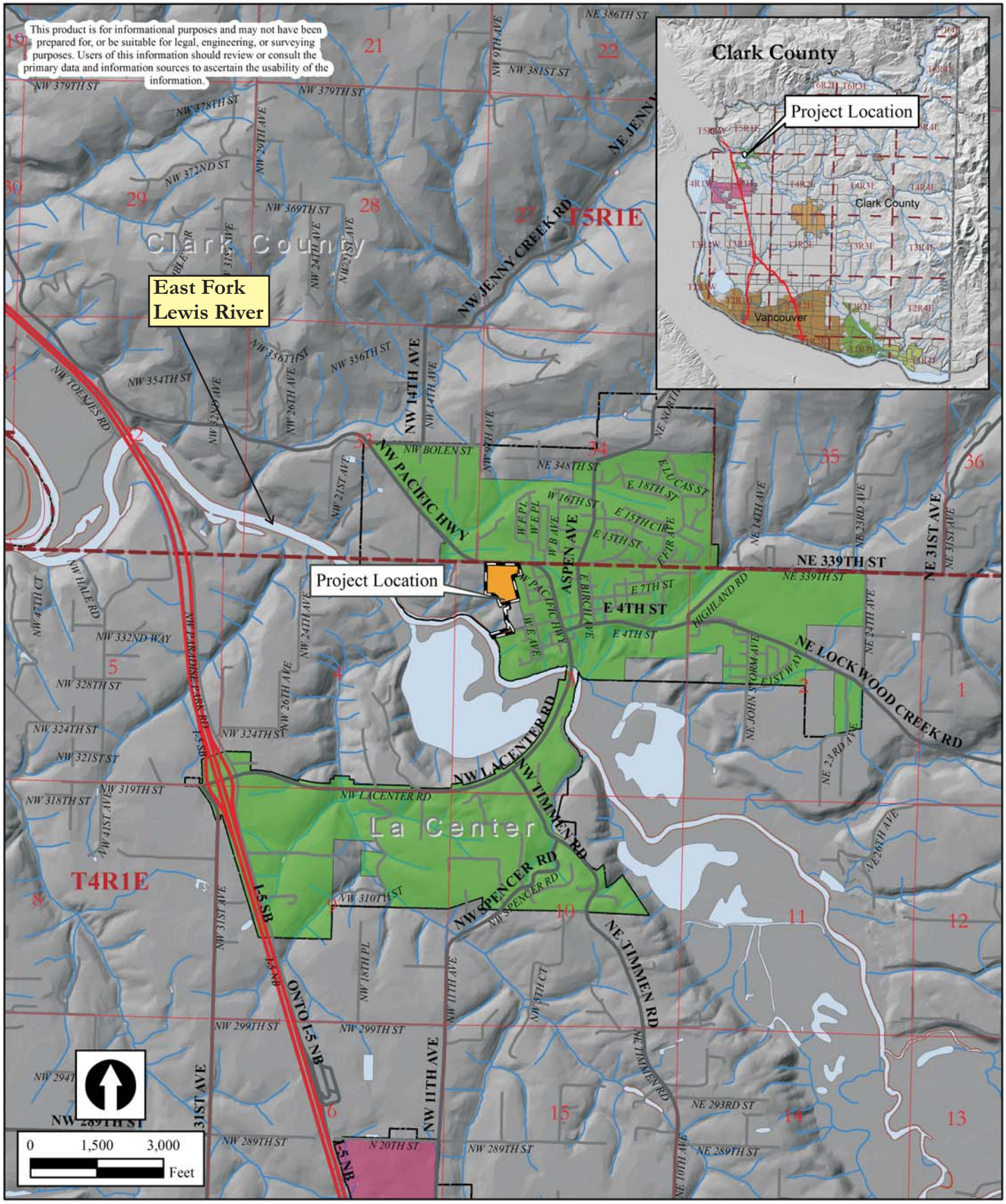
a. Within the shoreline jurisdiction they shall only be permitted under the following circumstances:
   i. The storm water facility is designed to mimic and resemble natural wetlands and meets applicable City or State storm water management standards and the discharge water meets state water quality standards;
   ii. Discharge water meets state water quality standards:
   iii. Low impact development approaches have been considered and implemented to the maximum extent feasible
b. Outfalls shall be designed and constructed to avoid impacts to existing native aquatic vegetation attached to or rooted in the substrate. In river and stream shorelines, stormwater outfall structures may require permanent bank hardening to prevent failure of the outfall structure or erosion of the shoreline. Diffusers or discharge points must be located offshore at a distance beyond the nearshore area to avoid impacts to those habitats.
c. Water reclamation discharge facilities such as injection wells or activities such as land application are prohibited in the shoreline jurisdiction, unless the discharge water meets State Department of Ecology Class A reclaimed water standards. Proponents for discharge of Class A reclaimed water in the shoreline jurisdiction shall demonstrate habitat benefits of such discharge.
d. Construction of underwater utilities or those within the wetland perimeter shall be scheduled to avoid major fish migratory runs or use construction methods that do not cause disturbance to the habitat or migration.
e. All underwater pipelines transporting liquids intrinsically harmful to aquatic life or potentially detrimental to water quality shall provide automatic shut off valves.
f. Upon completion of utility installation/maintenance projects on shorelines, banks shall, at a minimum, be restored to pre-project configuration, replanted and provided with maintenance care until the newly planted vegetation is fully established. Plantings shall be native species and/or be similar to vegetation in the surrounding area.

Response: The stormwater management design for this project is based on and complies with the stormwater requirements for the 2012 Stormwater Management Manual for Western Washington and the La Center Municipal Code (LCMC). The outfall to the East Fork Lewis River will be protected from erosion by reducing flows to non-erosive velocities

of less than 3-fps using corrugated plastic pipe. The outfall structure (manhole) has been placed to the furtherest extent feasible from the East Fork Lewis River.

Conclusion

The Applicant has designed the project minimize impacts into the shoreline buffer and critical areas that occur within the designated shoreline area. All impacts to these areas are temporary that will be restored once the pipeline has been installed. In addition, the habitat buffer adjacent to the ordinary high water mark and the wetland area will be enhanced through native tree and shrub plantings to provide increase ecological shoreline functions following the completion of the project.



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

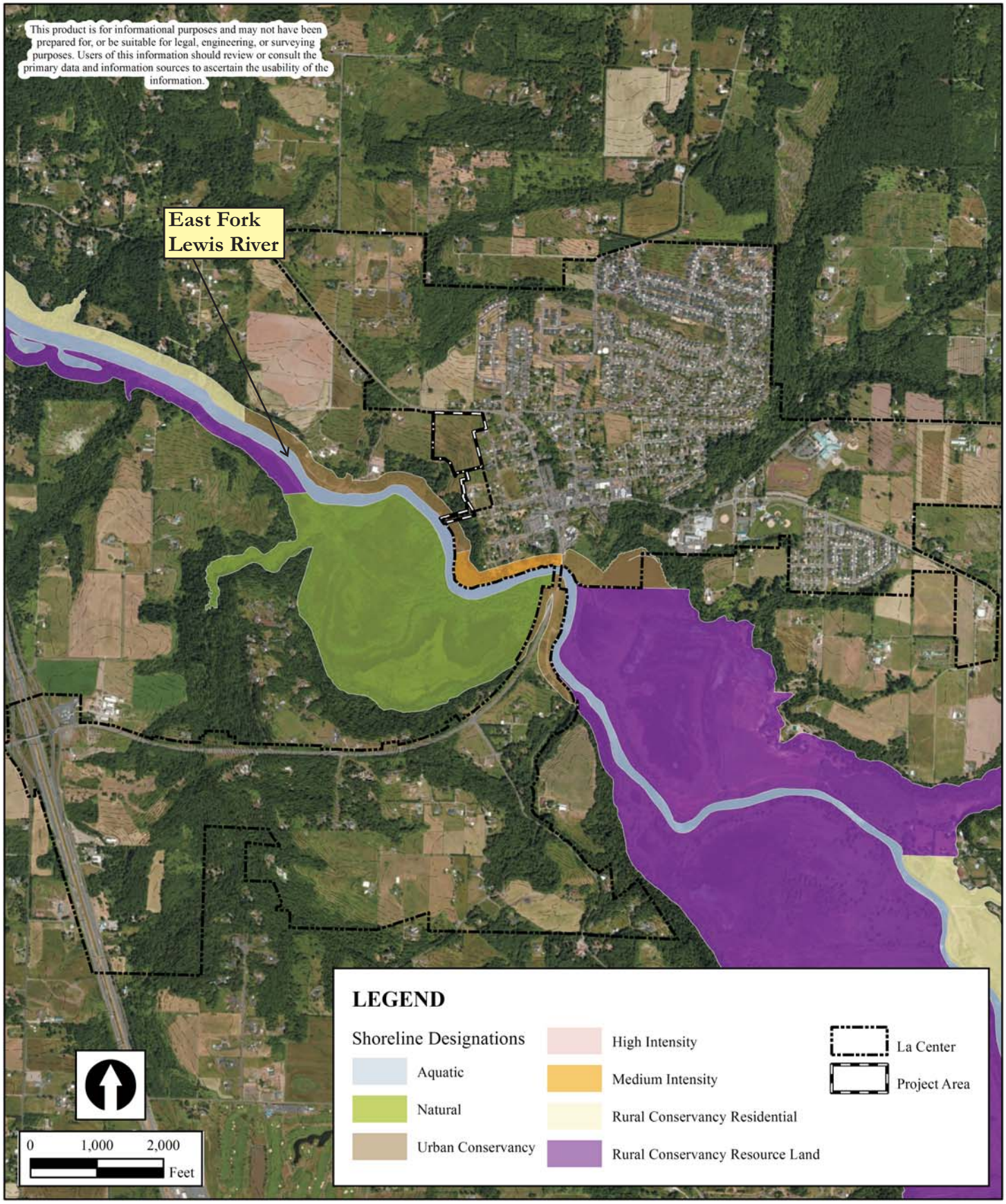
PURPOSE: Shorelines Permit

Project Location Map
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 1



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Shorelines Permit

Shoreline Designation
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

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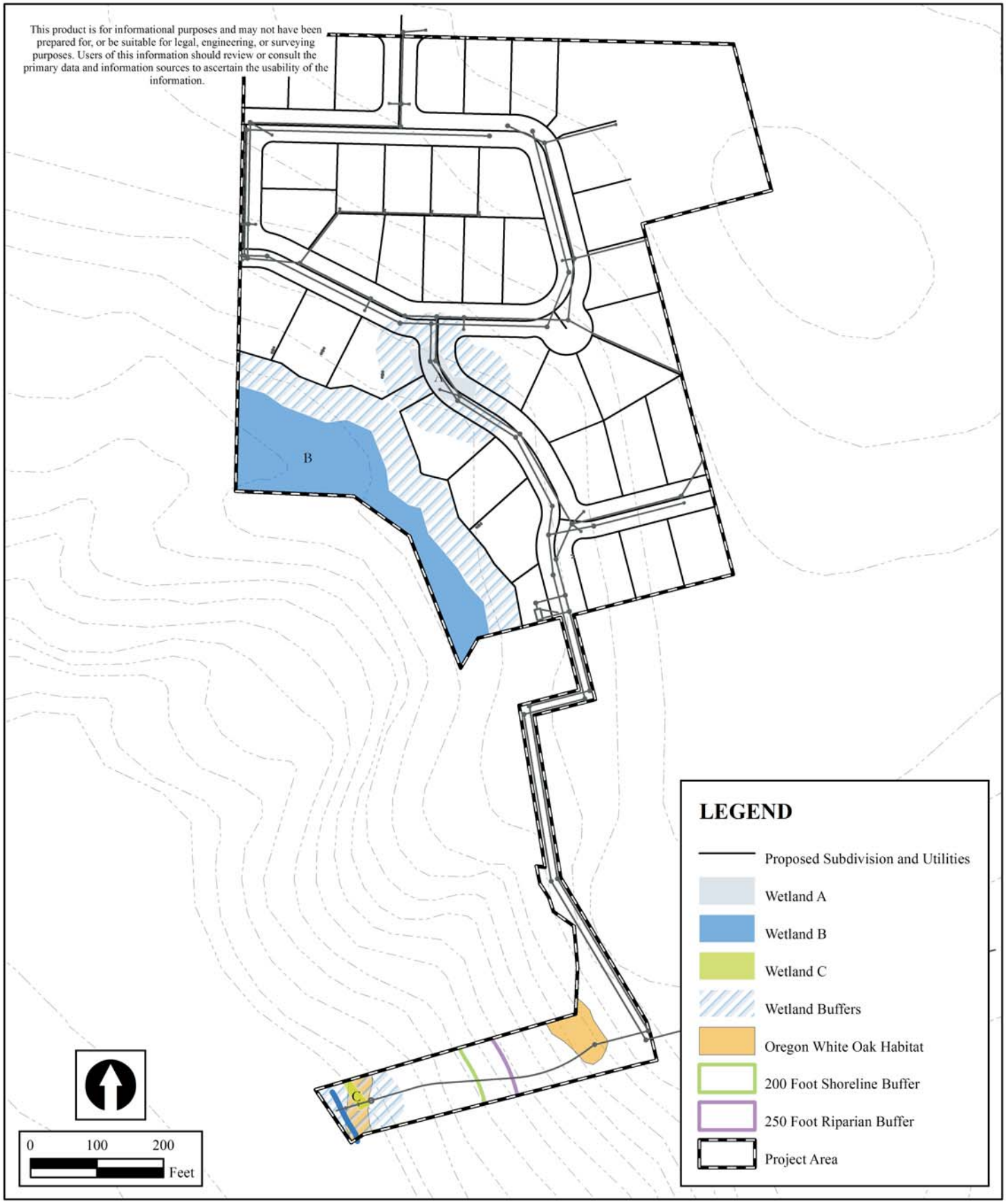
Figure 2



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Shorelines Permit

Site Plan
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

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E. Fork of the Lewis River Watershed
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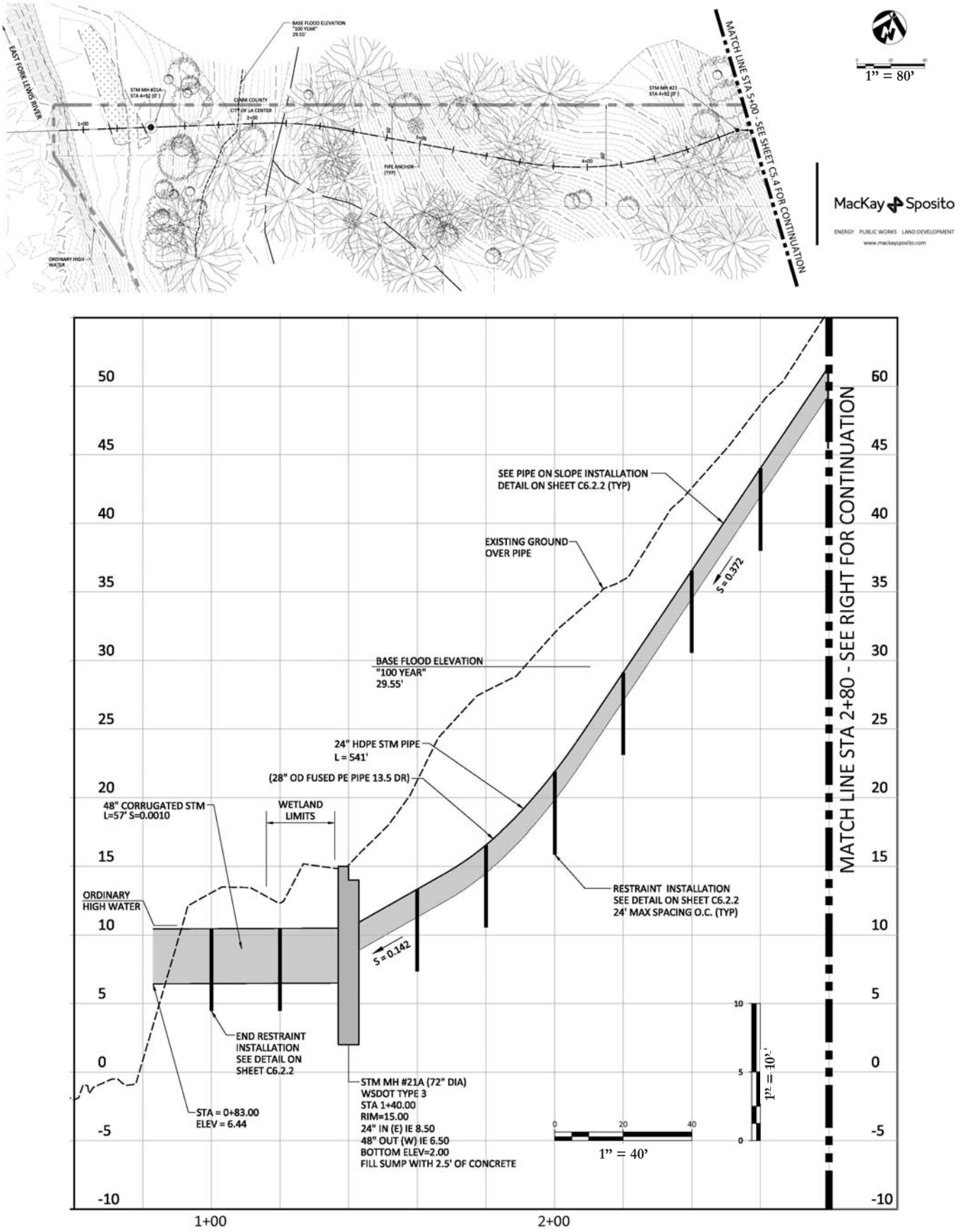
DATE: March 4, 2015

Figure 3



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Shorelines Permit

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

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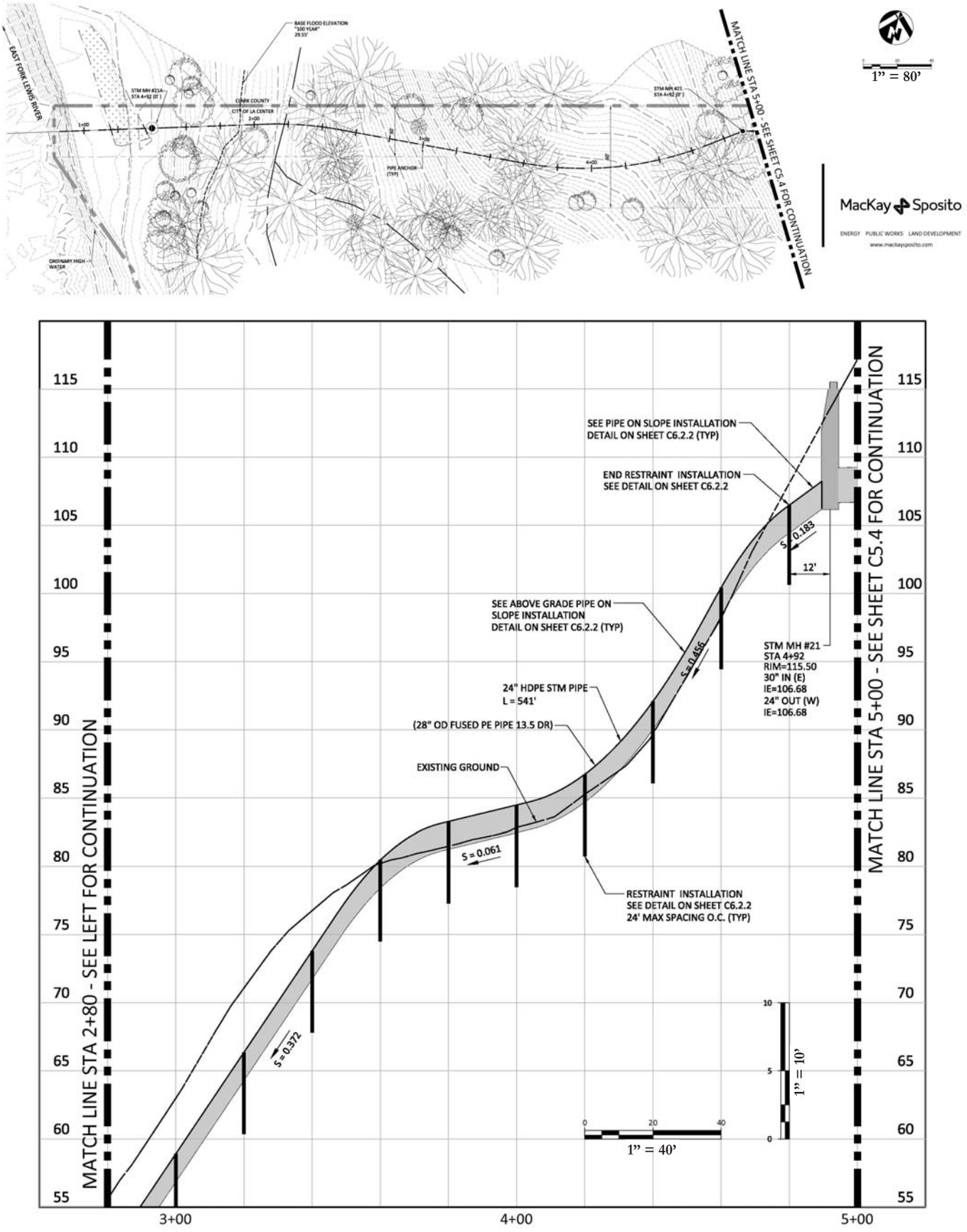
Figure 4



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Shorelines Permit

Stormwater Outfall Details
Kays Subdivision Project
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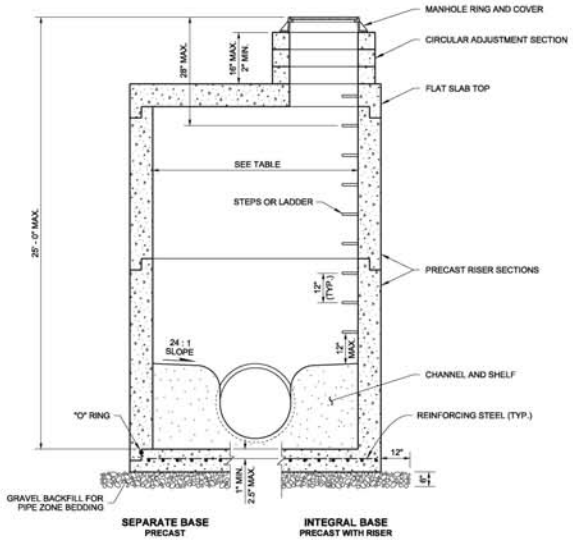
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 5

DRAWN BY: LISA DYFORD



NOTES

1. Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum.
2. For pipe allowances, see **Standard Plan B-10.20.**
3. No steps are required when height is 4' or less.

MANHOLE DIMENSION TABLE				
DIAM.	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS
48"	4"	6"	36"	8"
54"	4.5"	8"	42"	8"
60"	5"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	42"	12"
144"	12"	12"	108"	12"

CASEY M. KRAMER STATE OF WASHINGTON 44035 REGISTERED PROFESSIONAL ENGINEER

MANHOLE TYPE 3

STANDARD PLAN B-15.60-0

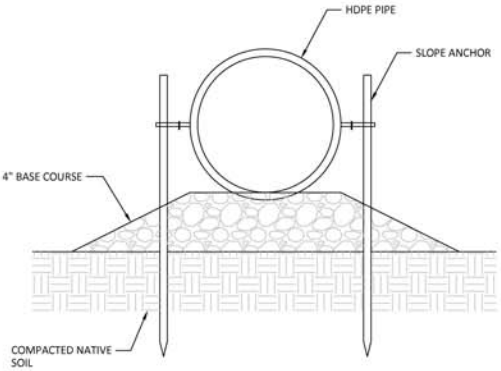
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III 02-07-12

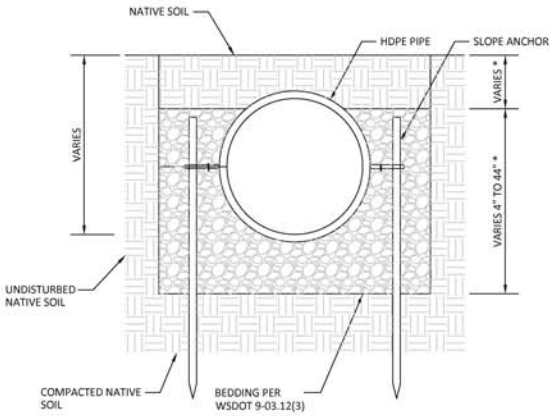
STATE DESIGN ENGINEER DATE

Washington State Department of Transportation



ABOVE GRADE PIPE ON SLOPE INSTALLATION DETAIL

NO SCALE



PIPE ON SLOPE INSTALLATION DETAIL

NO SCALE

* WHERE PIPE IS PARTIALLY EXPOSED, SOIL SURFACE SHALL MATCH EXISTING AND SOIL DEPTH ABOVE BEDDING SHALL BE 12 INCHES EXCEPT THAT SOIL SHALL NOT PRECLUDE THE LOWEST 4 INCHES OF BEDDING. WHERE PIPE IS NOT EXPOSED, SOIL SURFACE SHALL MATCH EXISTING (UNLESS OTHERWISE STATED ON PLANS) AND SOIL DEPTH ABOVE BEDDING SHALL BE 12 INCHES EXCEPT THAT BEDDING MATERIAL NEED NOT EXCEED 44 INCHES TOTAL THICKNESS.

FILE: W:\15472\CIVIL\DWG\SHEETS\15472_C6.2_C6.2.1_STM_DETAILS_C3D2012.DWG

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Shorelines Permit

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

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E. Fork of the Lewis River Watershed
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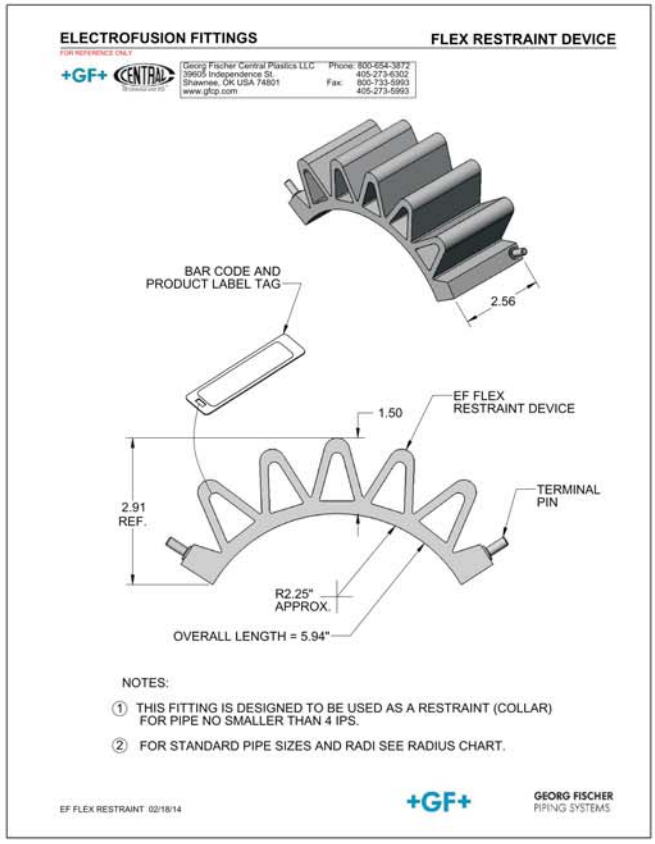
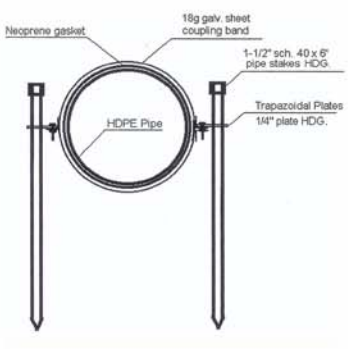
Figure 6

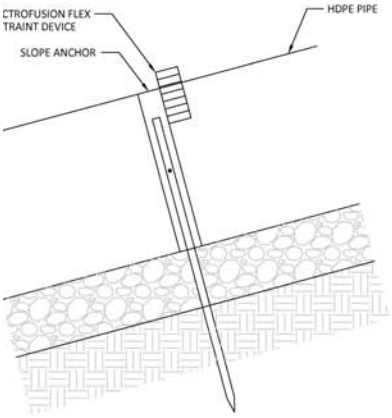


NOTE: INSTALL ELECTROFUSION FLEX RESTRAINT DEVICE PER MANUFACTURER'S RECOMMENDATIONS.



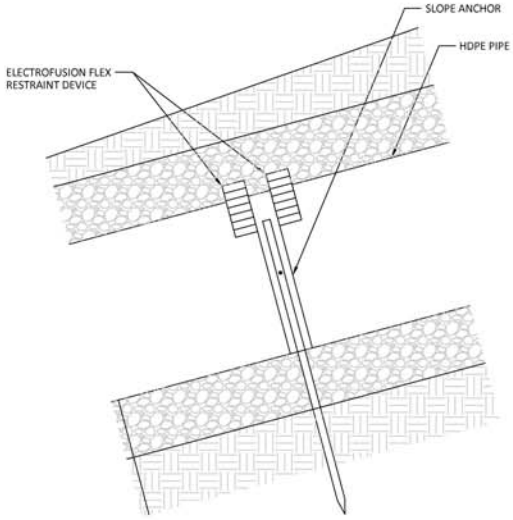
SLOPE ANCHOR

NO SCALE



RESTRAINT INSTALLATION DETAIL

NO SCALE



END RESTRAINT INSTALLATION DETAIL

NO SCALE

MacKay Sposito
ENERGY PUBLIC WORKS LAND DEVELOPMENT
www.mackaysposito.com

KAY'S SUBDIVISION
LA CENTER, WASHINGTON

STORM DETAILS

REVISIONS:

JOB NO.:	15472/15695
DATE:	2/10/2015
SCALE:	NO SCALE
DESIGNED BY:	BT
DRAWN BY:	AJS
CHECKED BY:	

100% PLAN SET

C6.2.2

NO. 45 OF 52

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

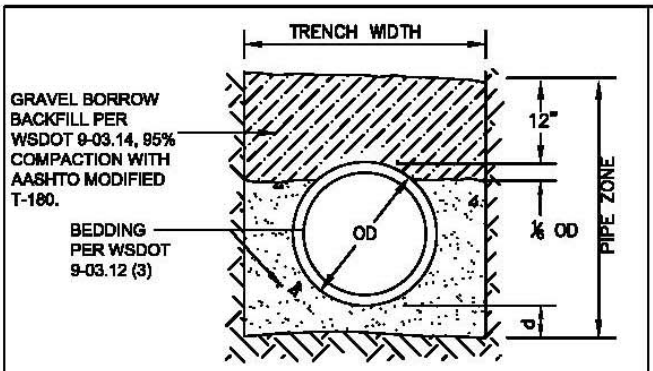
PURPOSE: Shorelines Permit

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 7



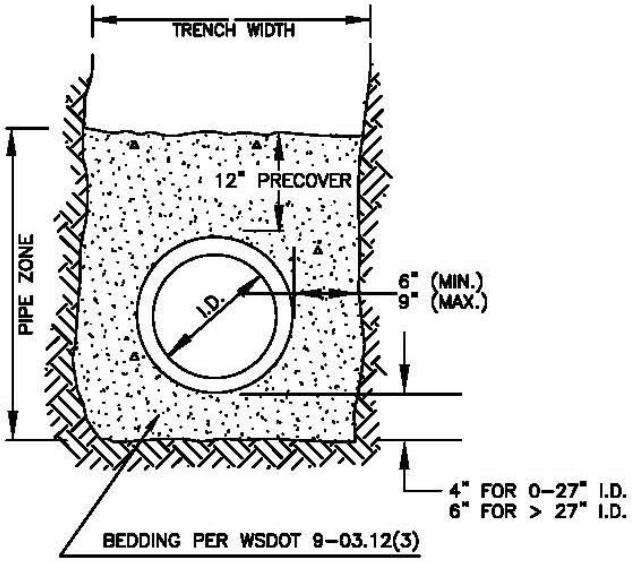
GRANULAR FOUNDATION

LEDGEND:

OD = OUTSIDE DIAMETER
ID = INSIDE DIAMETER
d = DEPTH OF BEDDING MATERIAL BELOW PIPE

DEPTH OF BEDDING MATERIAL BELOW PIPE	
ID	d (min)
18" & SMALLER	6"
LARGER THAN 18"	8"

RIGID PIPE



FLEXIBLE PIPE

NOTES:

1. WHERE DIRECTED BY THE PUBLIC WORKS DIRECTOR, GRANULAR TRENCH FOUNDATIO STABILIZATION SHALL BE PLACED PRIOR TO PLACEMENT OF THE BEDDING. SIZE AND DEPTH ARE DEPENDENT ON SOIL CONDITIONS.
2. BEDDING AND BACKFILL MATERIALS IN THE PIPE ZONE SHALL BE COMPACTED AS SPECIFIED PRIOR TO BACKFILLING THE REMAINDER OF THE TRENCH.
3. FOR ROCK AND OTHER INCOMPRESSIBLE MATERIALS, THE TRENCH SHALL BE OVER EXCAVATED A MINIMUM OF 6" AND REFILLED WITH GRANULAR MATERIALS AS DIRECTED BY THE PUBLIC WORKS DIRECTOR.
4. IMPORTED GRANULAR MATERIAL SHALL BE USED FOR UTILITY TRENCH BACKFILL. THE CONTACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO USE. THE PUBLIC WORKS DIRECTOR MAY APPROVE, REJECT OR REQUIRE LABORATORY TESTING OF THE MATERIAL.
5. TRENCH WIDTH SHALL NOT EXCEED ONE AND ONE-HALF THE INSIDE DIAMETER OF THE PIPE PLUS 18" AT THE TOP OF THE PIPE ZONE.
6. APPROVAL FOR SUCH ALTERNATE MATERIALS WILL BE GRANTEDUPON CONFIRMATION BY TEST OF ITS COMPLIANCE WITH THESE REQUIREMENTS.
7. ALTERNATIVE PRE-COVER MATERIALS ARE ALLOWABLE FROM PIPE CENTERLINE TO ONE FOOT ABOVE THE TOP OF THE PIPE FOR FLEXIBLE PIPE. ALTERNATE PRE-COVER MATERIALS MUST BE PREAPPROVED BY THE INSPECTOR AND MAY BE SAND, CRUSHER SCREENINGS, GRAVEL, OR OTHER CLEAN GRANULAR MATERIAL CONTAINING NO ROCK LARGER THAN 1-1/4" IN LENGTH.

PIPE BEDDING (RIGID AND FLEXIBLE PIPE)

PLAN #

CITY OF LA CENTER APPROVED

Bart Stupp, PE 7/23/09

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:

SS-5

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Shorelines Permit

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
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DATE: March 4, 2015

Figure 8

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Shorelines Permit

Project Photographs
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

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E. Fork of the Lewis River Watershed
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NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Photo Sheet 1

KAYS SUBDIVISION-
STORMWATER OUTFALL

WETLAND DELINEATION
AND ASSESSMENT

LaCenter, Washington

Prepared for:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

Prepared by:
The Resource Company, Inc.
915 Broadway, Ste. 250
Vancouver, WA 98660
(360) 693-4555

July 10, 2014

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION

TABLE OF CONTENTS

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3.0 SITE SPECIFIC METHODS **3**

4.0 RESULTS AND DISCUSSION **3**

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FIGURE 2 – TOPOGRAPHIC MAP

FIGURE 3 – LOCAL AND NATIONAL WETLANDS INVENTORY

FIGURE 4 – CLARK COUNTY SOIL SURVEY

FIGURE 5 – WETLAND BOUNDARIES

PHOTO SHEETS – SITE PHOTOGRAPHS

APPENDICES

APPENDIX A – WETLAND DETERMINATION DATA SHEETS

APPENDIX B – WETLAND RATING FORMS - WESTERN WASHINGTON

WETLAND DELINEATION & ASSESSMENT

Project: Kays Subdivision – Stormwater Outfall
Applicant: WARAC, LLC
Location: West of W 5th Street, LaCenter, Washington (Fig. 1)
Legal Description: NW ¼ of Sec. 03, T04N, R01E, W. M., Clark County
Serial Number(s): None Listed
Local Jurisdiction: City of LaCenter
Study Area: 1.63 acres
Project Type: Stormwater Outfall for Residential Development
Shoreline Designation: Urban Conservancy
Zoning: N/A
ComPlan: UL
Assessment by: Kevin Grosz, PWS
Site Visit: March 24, 2014
Report Date: July 10, 2004

1.0 INTRODUCTION

This report details the results of a wetland delineation and assessment conducted for the stormwater outfall route and energy dissipater area for Kays Subdivision located at 555 W. 5th Street, LaCenter, Washington by The Resource Company, Inc. (Fig. 1). The study area is located between W. 5th Street and the East Fork of the Lewis River (EFLR, Fig. 1). This report identifies the extent of any wetlands and associated buffers found within the study area as defined and regulated by the City of LaCenter Critical Areas Ordinance – Wetlands (18.300.090(6)).

The study area (1.63 acres) is within the easement that is an extension of W. 5th Street to the EFLR. Currently the study area is a steeply sloping hillside that flattens out to a bench adjacent to the river (Fig. 2). Through the course of the delineation one wetland near the river was identified. A portion of the study area is located within the 200-foot shoreline buffer of the EFLR, therefore, this critical area will be reviewed under the City's Shoreline Master Plan.

2.0 DELINEATION METHODS

The wetland delineation was conducted according to the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region (USACE, 2010) hereafter, referred to as the manual. According to the manual, jurisdictional wetlands are defined as:

> *Those areas that are inundated or saturated by surface or ground 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.

The manual uses three parameters in making wetland determinations: hydrophytic vegetation, hydric soils and wetland hydrology. Except in certain situations defined in the manual, evidence of a minimum of one positive indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland determination.

Hydrophytic vegetation are plants that due to morphological, physiological, and/or reproductive adaptations, have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions. Hydric soils are soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation. Wetland hydrology is present when an area is inundated or saturated to the surface for at least 5 percent of the growing season. The growing season is defined as the portion of the year when soil temperature at 19.7 inches below the soil surface is greater than biological zero (5 degrees C).

Except in certain situations defined in the manual, evidence of a minimum of one positive wetland indicator from each of the three parameters (hydrology, soil, and vegetation) must be found in order to make a positive wetland determination.

Prior to the on-site investigations, a review of existing information related to determination of wetland boundaries was conducted. This review included the NRCS Clark County Web Soil Survey, National Wetland Inventory maps, Clark County Wetland Inventory maps, Clark County LiDAR topographic maps, and aerial photographs.

Following the background information review, an on-site investigation was conducted on March 24, 2104. In order to delineate wetlands within the study area, observation points were selected to correspond with terrain features, vegetation, hydrology and mapped hydric soils identified on the site. At each observation point, the vegetation, soils and hydrology were characterized and this information was then used as the basis for making the wetland determinations.

To determine if hydrophytic vegetation was present, the vegetation on the site was compared to the Western Mountains, Valleys, and Coast 2012 Final Regional Plant List (Lichvar 2012) to determine plant wetland indicator status. This list places plants into four categories:

Wetland indicator status ratings and their ordinal rating categories, based on ecological descriptions. Indicator Status (abbreviation) Ecological Description*

Obligate (OBL) Almost always is a hydrophyte, rarely in uplands
Facultative Wetland (FACW) Usually is a hydrophyte but occasionally found in uplands
Facultative (FAC) Commonly occurs as either a hydrophyte or nonhydrophyte

Facultative Upland (FACU) Occasionally is a hydrophyte, but usually occurs in uplands
Upland (UPL) Rarely is a hydrophyte, almost always in uplands.
*Source: Lichvar and Minkin (2008)

The presence or absence of hydric soils was determined by digging soil pits to a depth of 18 inches and examining the soil for hydric soil indicators. Organic soils such as peats and mucks are considered hydric soils. Mineral hydric soils are generally either gleyed or have bright mottles and/or low matrix chroma immediately below the A-horizon or 10 inches (whichever is shallower). Soil colors are determined using the Munsell Soil Color Chart (Munsell Color System 2009).

The site was examined for standing water and/or saturated soils, which serve as primary indicators of wetland hydrology. The area was also checked for other wetland hydrologic characteristics such as watermarks, drift lines, wetland drainage patterns, and morphological plant adaptations.

3.0 SITE SPECIFIC METHODS

The Resource Company, Inc. conducted a wetland delineation of the study area on March 24, 2014 using the methodology found in the Regional Supplement to the Manual (USACE 2010). In addition, applicable guidance and any supporting technical guidance documents issued by the USACE, Washington Department of Ecology, and City of LaCenter were also utilized.

The entire site was first traversed by foot to observe any visible wetland conditions. Once the general location of the wetland boundaries were identified, paired data plots were taken in areas that represented the conditions of the uplands and wetlands, respectively. Five (5) foot radius plots were chosen in a uniform topographic position that was representative of a single plant community. The paired plots were located approximately 5 - 10 feet apart to minimize the margin of error. Soils at each sample plot were typically inspected to a depth of 16 inches (or more) to determine the presence or absence of hydric soil characteristics and/or wetland hydrology. Data sheets for the sample plots are attached in Appendix A.

The wetland boundary was associated with a change in plant communities, hydric soil and wetland hydrology indicators. The wetland boundary was determined based on the presence of hydric soils, the presence of wetland hydrology (i.e. oxidized rhizospheres along living roots, soil saturation), and a dominance of hydrophytic vegetation. It should be noted that only paired plots were recorded in the field, however, numerous unrecorded plots were dug to confirm wetland boundaries. The on-site wetlands were classified according the USFWS classification system (Cowardin et al. 1979) and the Hydrogeomorphic (HGM) Classification system (Adamus et al. 2001).

4.0 RESULTS AND DISCUSSION

The Local Wetland Inventory Map (Fig. 3) identifies wetlands along the shoreline of the river. The National Wetlands Inventory (NWI) map (Fig. 3) does not identify wetlands

the study area. The NWI map identifies the EFLR as a Riverine, Upper Perennial, Unconsolidated Bottom, Permanently Flooded (R3UBH) wetland. It should be noted that NWI and LWI maps are created through aerial photograph and topographic map interpretation and are not intended to represent the extent of jurisdictional wetlands. There may be unmapped wetland and waters subject to regulation and all wetlands and waters boundary mapping is approximate. In all cases, actual field conditions determine the presence, absence and boundaries of wetlands and waters.

The Clark County Soil Survey (NRCS Webpage 2014) (Fig. 4) identifies the following soil mapping units on this site:

> ***Hillsboro silt loam, 3 to 8 percent slopes (HoB), 8 to 15 percent slopes (HoC), & 20 to 30 percent slopes (HoE) Ultic Agrixeroll, Mollisol,*** occurs throughout the majority of the study area. This soil is the dominant soil in the southwestern part of the County. The relief is gently undulating. In most places, the slopes are short. In a typical profile, the surface layer dark-brown silt loam about 7 inches thick. In sequence from the top, the upper 17 inches is friable, dark-brown silt loam; the next 16 inches is friable, dark grayish-brown heavy silt loam; and the lower 15 inches is friable, dark grayish-brown silt loam. The next layer, to a depth of 86 inches, is dark grayish-brown silt loam. The soil is well drained, moderately permeable, and easily tilled. The available water capacity is very high. Fertility is moderately high. Surface runoff is slow, and erosion hazard is slight. Most of the acreage of this soil is cultivated or in urban fringe development. Nearly all of the crops suited to this area are grown. This soil is classified as **non-hydric** according to the Clark County hydric soils list but may contain hydric inclusions in sidehill seep areas.
>
> ***Sauvie silty clay loam,, 0 to 8 percent slopes (SpB), Fluventic Haplaquoll, Mollisol,*** occurs in the northwest corner of the study area. This soil which was formed in alluvium is found on bottom lands adjacent to the Columbia River. Typically, it is a very dark gray (10YR 3/2) silty clay loam with dark brown (10YR 3/3) concentrations in the upper 15 inches. It is somewhat poorly drained, permeability is moderately slow, surface runoff is slow, and the hazard erosion is slight. This soil is classified as **non-hydric** according to the Clark County hydric soils list.

Based on the review of existing information and the routine on-site delineation method described by the Army Corps of Engineers (USACE), one (1) wetland was identified and classified for this project. The area within the flagged boundary, which meets all three wetland criteria, was marked in the field with orange flagging with 'WETLAND BOUNDARY" written in black lettering. These flags were surveyed by MacKay and Sposito, Inc. The wetland boundaries are shown in Figure 5. A description of the wetlands and surrounding uplands is found below.

4.1 WETLANDS

Wetland A (808 ft² –within project area)

Wetland A meets the criteria of depressional hydrogeomorphic (HGM) wetland class. This wetland occurs adjacent to the East Fork of the Lewis River however the majority of

the hydrology is influenced by surface water runoff. A summary of the wetland information is given in Table 1 below.

Wetland A is a palustrine emergent-scrub/shrub, temporarily to seasonally inundated (PEMA) wetland. Vegetation in the wetlands is dominated by meadow foxtail (*Alopecurus pratensis* – FAC), creeping buttercup (*Ranuculus repens* – FAC) and slough sedge (*Carex obnupta* – OBL). Hydrologic indicators within the wetlands were water at 10 inches below the surface and oxidized rhizopheres along living root channels. Hydric soil characteristics generally include a silty sand that is dark grayish brown (10YR 4/2) with dark reddish brown (5YR 3/4) concentrations to a depth of at least 16 inches. Wetland A rated as a Category IV wetland according to the Western Washington Wetland Rating Form (WRF) (Table 2).

Table 1. Wetland A

<table>
<tr><th colspan="3">Wetland A – INFORMATION SUMMARY</th></tr>
<tr><td>Location:</td><td colspan="2"></td></tr>
<tr><td colspan="2" rowspan="10">  </td><td>Local Jurisdiction</td><td>LaCenter</td></tr>
<tr><td>WRIA</td><td>27</td></tr>
<tr><td>Ecology Rating (Hruby, 2004)</td><td>Category IV</td></tr>
<tr><td>LaCenter Rating</td><td>Category IV</td></tr>
<tr><td>LaCenter Buffer Width</td><td>150' – high intensity use</td></tr>
<tr><td>Wetland Size</td><td>808 ft², See Fig. 5</td></tr>
<tr><td>Cowardin Classification</td><td>PEMA</td></tr>
<tr><td>HGM Classification</td><td>Depressional</td></tr>
<tr><td>Wetland Data Sheet(s)</td><td>1</td></tr>
<tr><td>Upland Data Sheet (s)</td><td>2</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="2">Alopecurus pratensis, Carex obnupta, Ranuculus repens</td></tr>
<tr><td>Soils</td><td colspan="2">Low chroma matrix with streaking</td></tr>
<tr><td>Hydrology</td><td colspan="2">Water at the within 10” surface, oxidized rhizospheres</td></tr>
<tr><td>Rationale for Delineation</td><td colspan="2">meets all three wetland parameters.</td></tr>
<tr><td>Rationale for Local Rating</td><td colspan="2">Moderate for water quality, hydrology and habitat functions</td></tr>
<tr><td>Buffer Condition</td><td colspan="2">Grazed</td></tr>
</table>

4.2 NON-WETLANDS

The non-wetland portion of the study area is predominantly an open grassland pasture immediately surrounding the wetland and oak forest farther to the east. Vegetation surrounding the wetland is predominantly vernalgrass (*Anthoxanthum odoratum* – FACU), orchardgrass (*Dactylis glomerata* – FACU) and crane’s bill (*Geranium* sp.). Soils in the non-wetland portion of the site are generally a dark brown (10YR 3/3) silty

sand with no hydric indicators. No wetland hydrology indicators were observed in the non-wetland portions of the study area.

Photographs of the study and surrounding areas are shown in Photo-sheet 1.

5.0 WETLAND FUNCTIONAL ASSESSMENT

The on-site wetlands have been assessed using the Washington State Wetland Rating System for Western Washington (Hruby 2004). This rating system categorizes wetlands based on specific attributes such as rarity, sensitivity to disturbance, and functions. The system was designed to differentiate between wetlands based on their sensitivity to disturbance, their significance, their rarity, our ability to replace them, and the functions they provide. Through a series of questions, the wetland rating system will yield a number for water quality functions, hydrologic functions, and habitat function, which yield a total score for functions. Based on the total score, the wetland is categorized as a Category I, II, III, or IV wetland. Table 2 below summarizes the wetland type, total score for functions, and category.

Table 3. Wetland Function Rating

Wetland	Wetland Type	Water Quality Functions	Hydrologic Functions	Habitat Functions	Total Score	Wetland Category
A	Depressional	8	6	12	26	IV

6.0 REGULATORY ISSUES

The City of LaCenter Critical Areas Ordinance (18.300) provides for the protection of wetlands within the City's jurisdiction. The ordinance establishes protective buffers associated with wetlands and specifies that certain permits or approvals be obtained for projects containing wetlands or their respective buffers.

As mentioned above, the wetland was rated with the wetland rating system developed by Washington Department of Ecology for western Washington. Wetland A was rated as a Category IV wetland with habitat scores less than 20 (Table 3). According to Table 18.300.090(6)(h)(i)-1 of the critical areas ordinance, Category IV wetlands (A) with a habitat function score less than 20 are to be protected with a 50-foot buffer adjacent high intensity land-use to protect water quality functions.

In addition to the City's critical areas ordinance, jurisdictional wetlands are also regulated at the federal and state levels by the U.S. Army Corps of Engineers (USACE) and the Washington Department of Ecology (Ecology) under Sections 401 and 404 of the Clean Water Act, respectively. Any impacts to the wetlands may require notification and approval from the USACE and Ecology. It is recommended that the USACE and Ecology be contacted regarding current permit requirements before proceeding with any development activities that would impact wetlands on this site.

The wetland boundaries and classifications shown in this report have been determined using the most appropriate field techniques and best professional judgment of the environmental scientist. It should be noted that USACE and City of LaCenter have the final authority in determining the wetland boundaries and categories under their respective jurisdictions. It is recommended that this delineation report be submitted to these agencies for concurrence prior to starting any development or planning activities that would affect wetlands or buffers on this site.

7.0 LITERATURE CITED

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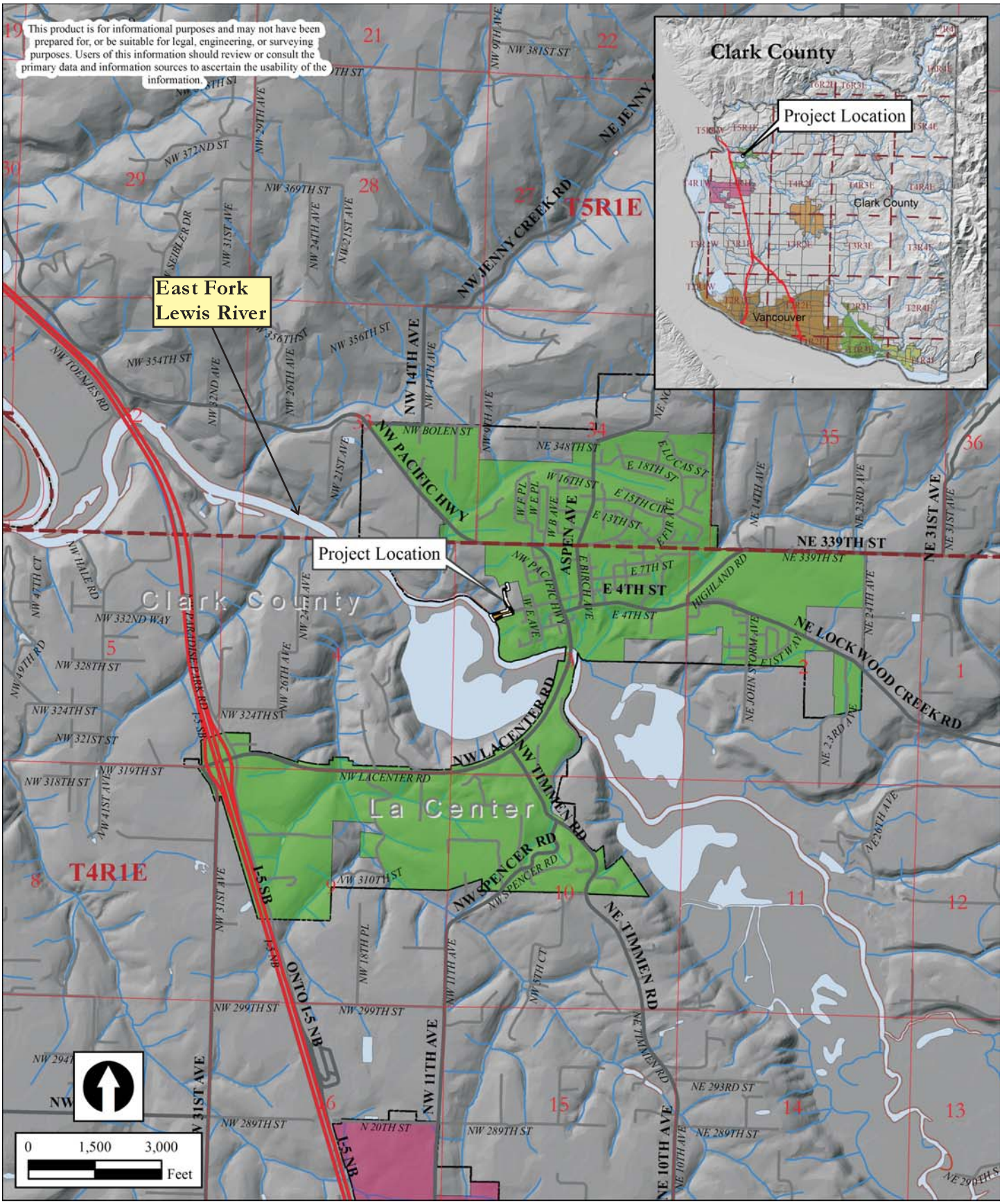
APPENDIX A –
WETLAND DETERMINATION DATA SHEETS

APPENDIX B –
WESTERN WASHINGTON WETLAND RATING FORM



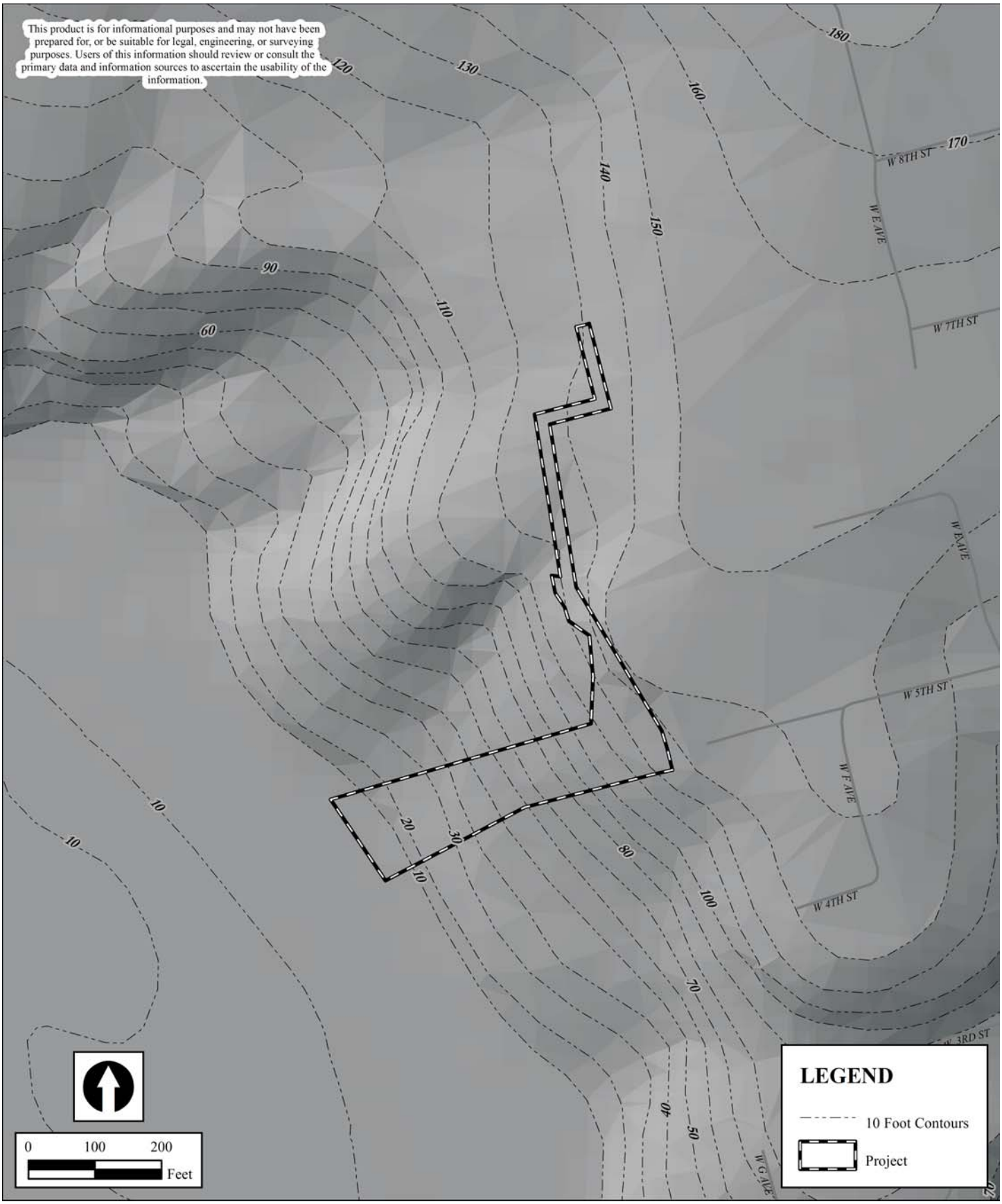
Project - Kays Subdivision Stormwater Outfall
APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661
PURPOSE: Wetland Delineation and Assessment

Project Location Map
Kays Subdivision Stormwater Outfall
Clark County, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
East Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
NEAR: La Center, WA
COUNTY: Clark County, WA
DATE: July 10, 2014

Figure 1



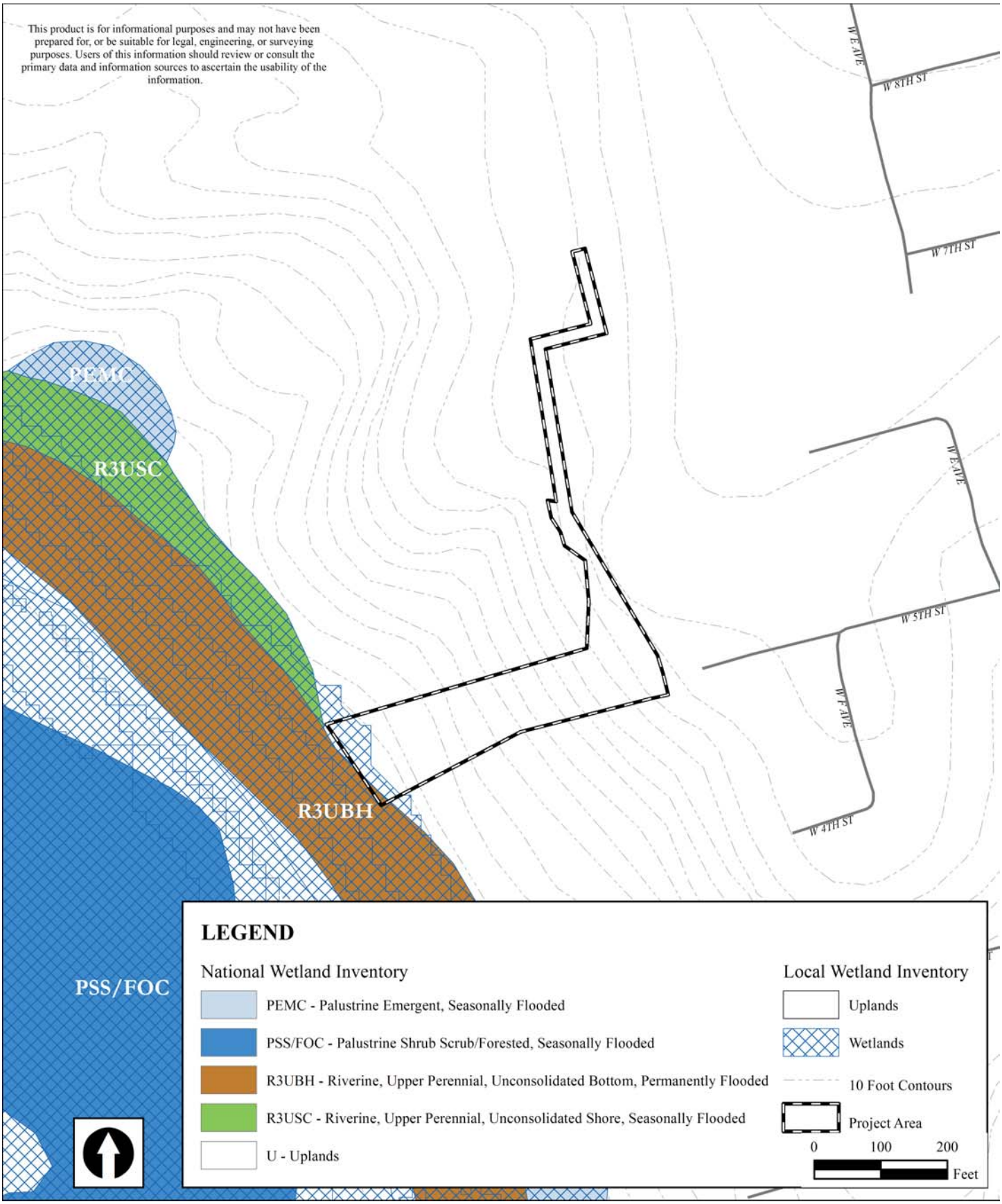
Project - Kays Subdivision Stormwater Outfall
APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661
PURPOSE: Wetland Delineation and Assessment

Clark County LiDAR Topography
Kays Subdivision Stormwater Outfall
Clark County, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
East Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
NEAR: La Center, WA
COUNTY: Clark County, WA
DATE: July 10, 2014

Figure 2



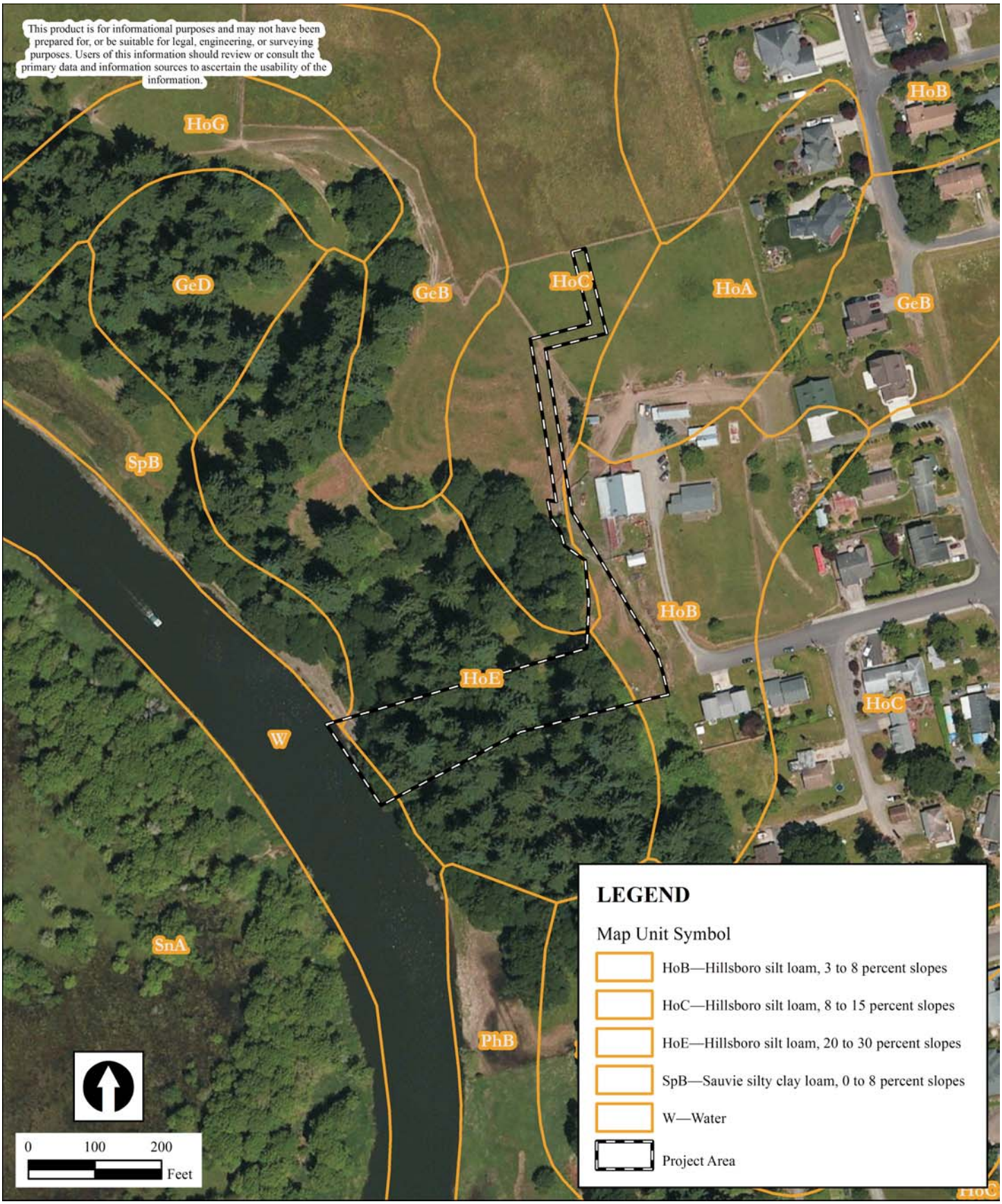
Project - Kays Subdivision Stormwater Outfall
APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661
PURPOSE: Wetland Delineation and Assessment

Local and National Wetland Inventories
Kays Subdivision Stormwater Outfall
Clark County, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
East Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
NEAR: La Center, WA
COUNTY: Clark County, WA
DATE: July 10, 2014

Figure 3



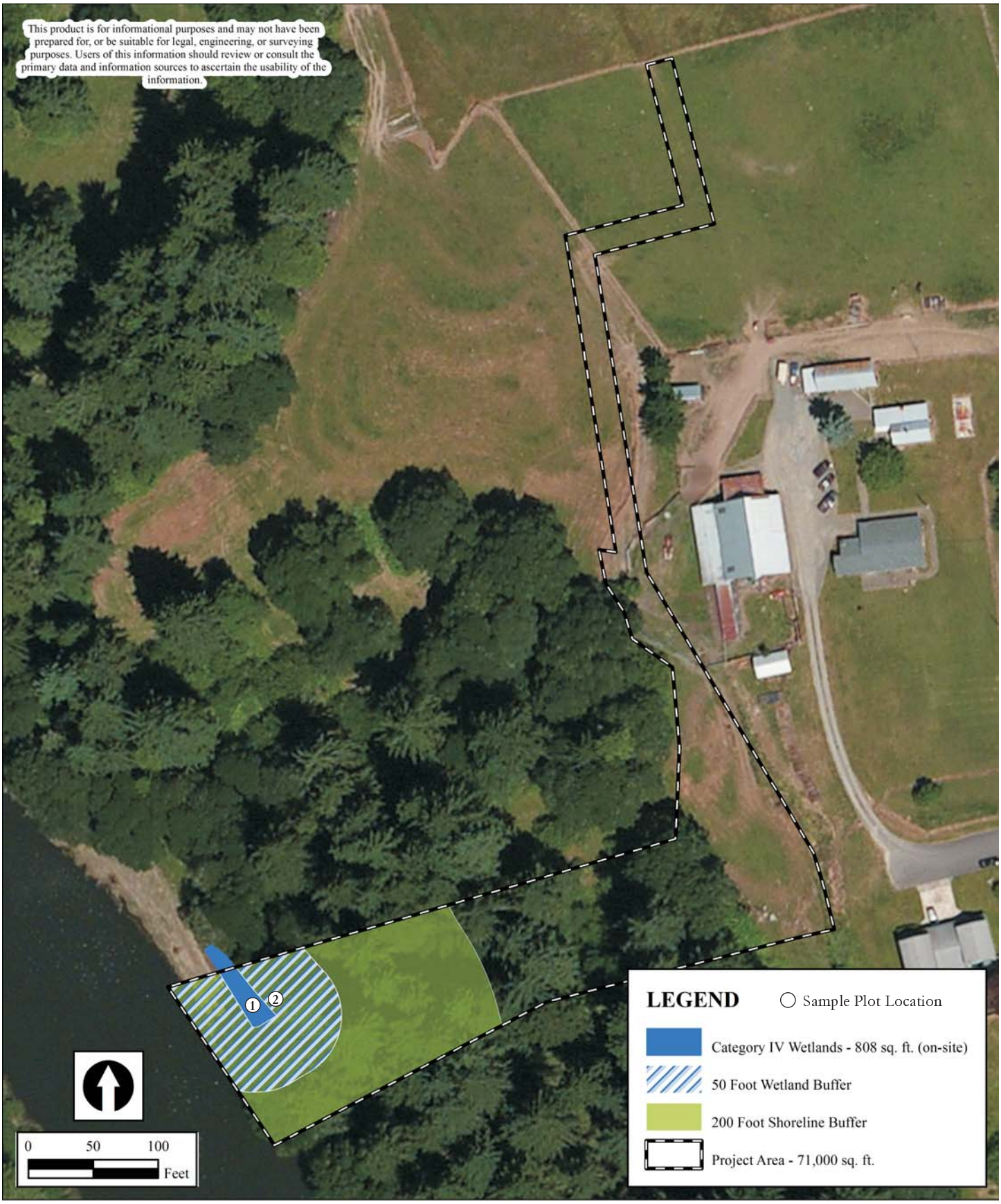
Project - Kays Subdivision Stormwater Outfall
APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661
PURPOSE: Wetland Delineation and Assessment

Clark County NRCS Soils
Kays Subdivision Stormwater Outfall
Clark County, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
East Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
NEAR: La Center, WA
COUNTY: Clark County, WA
DATE: July 10, 2014

Figure 4



Project - Kays Subdivision Stormwater Outfall
APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661
PURPOSE: Wetland Delineation and Assessment

Approximate Wetland Boundaries Kays Subdivision Stormwater Outfall Clark County, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
East Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
NEAR: La Center, WA
COUNTY: Clark County, WA
DATE: July 10, 2014

Figure 5

Project - Kays Subdivision Stormwater Outfall
APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661
PURPOSE: Wetland Delineation and Assessment

Project Photographs
Kays Subdivision Stormwater Outfall
Clark County, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
East Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
NEAR: La Center, WA
COUNTY: Clark County, WA
DATE: July 10, 2014

Photo Sheet 1

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

Project/Site: Kays - Stormwater Outfall City/County: LaCenter/Clark County Sampling Date: 03/24/2014

Applicant/Owner: WARAC, LLC. State: Washington Sampling Point: 1

Investigator(s): Kevin Grosz - The Resource Company, Inc. Section, Township, Range: NW 3, T04N, R01E, W.M.

Landform (hillslope, terrace, etc.): stream trerrace Local relief (concave, convex, none): concave Slope (%): 0-3

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Sauvie silty clay loam, 0 to 8% slopes (SpB) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5ft)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Ranuculus repens	40	Yes	FAC
2. Alopecurus pratensis	40	Yes	FAC
3. Carex obnupta	15	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 5m)			
1.			
2.			
	= Total Cover		
% Bare Ground in Herb Stratum 0			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

SOIL

Sampling Point: 1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/2	80	5YR 3/4	20	C	M	Silty Sand	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

Water Table Present? Yes ☒ No ☐ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 6

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project/Site: Kays - Stormwater Outfall City/County: LaCenter/Clark County Sampling Date: 03/24/2014

Applicant/Owner: WARAC, LLC. State: Washington Sampling Point: 2

Investigator(s): Kevin Grosz - The Resource Company, Inc. Section, Township, Range: NW 3, T04N, R01E, W.M.

Landform (hillslope, terrace, etc.): stream trerrace Local relief (concave, convex, none): concave Slope (%): 0-3

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Hillsboro silt loam, 20 to 30% slopes, (HoE) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5ft)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Anthoxanthum odoratum	45	Yes	FACU
2. Dactylis glomerata	40	Yes	FACU
3. Geranuium sp.	15	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 5m)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks:

SOIL

Sampling Point: 2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/3	100					Silty Sand	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

Wetland name or number A

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Kays - Outfall Date of site visit: 3/24/14

Rated by Kevin Grosz Trained by Ecology? Yes X No___ Date of training 02/07

SEC NW 3 TWNSHP: 4N RNGE: 1E Is S/T/R in Appendix D? Yes___ No X

Map of wetland unit: Figure 5 Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	6
Score for Hydrologic Functions	8
Score for Habitat Functions	12
TOTAL score for Functions	26

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply___

Final Category (choose the "highest" category from above) IV

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		Depressional	X
Natural Heritage Wetland		Riverine	
Bog		Lake-fringe	
Mature Forest		Slope	
Old Growth Forest		Flats	
Coastal Lagoon		Freshwater Tidal	
Interdunal			
None of the above		Check if unit has multiple HGM classes present	

Wetland name or number A

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number A

Classification of Wetland Units in Western Washington

If the 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 (i.e. except during floods)?

NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*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 rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

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 both** of the following criteria?

___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (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**?

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 <3ft diameter and less than 1 foot deep).*

NO – go to 5 **YES** – The wetland class is **Slope**

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 two years.

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

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

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 clases. 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 your wetland. 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 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	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still 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.

Wetland name or number A

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* Provide photo or drawing	Figure ___ 3
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES points = 4 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure ___ 0
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	Figure ___ 0
D	**Total for D 1** *Add the points in the boxes above*	3
D	**D 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* X Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ YES multiplier is 2 NO multiplier is 1	*(see p. 44)* multiplier 2
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	6

Wetland name or number A

		Points (only 1 score per box)
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* points = 0	4
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland" points = 5 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 Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	0
D	D 3.3 Contribution of wetland unit 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.* The area of the basin is less than 10 times the area of 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 unit is in the FLATS class points = 5	0
D	**Total for D 3** *Add the points in the boxes above*	4
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems X Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 49)* multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number A

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)***	Figure ___
Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ⅓ acre or more than 10% of the area if unit is smaller than 2.5 acres.	
___Aquatic bed	
_X_Emergent plants	
____Scrub/shrub (areas where shrubs have >30% cover)	
____Forested (areas where trees have >30% cover)	
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	
Add the number of vegetation structures that qualify. If you have:	
4 structures or more points = 4	
Map of Cowardin vegetation classes — 3 structures points = 2	
2 structures points = 1	
1 structure points = 0	0
H 1.2. <u>Hydroperiods</u> ***(see p. 73)***	Figure ___
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 acre to count. (see text for descriptions of hydroperiods)	
____Permanently flooded or inundated — 4 or more types present points = 3	
____Seasonally flooded or inundated — 3 types present points = 2	
_X_Occasionally flooded or inundated — 2 types present point = 1	
____Saturated only — 1 type 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** Map of hydroperiods	0
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)***	
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)*	
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	
List species below if you want to: 5 - 19 species points = 1	
< 5 species points = 0	1

Total for page 1

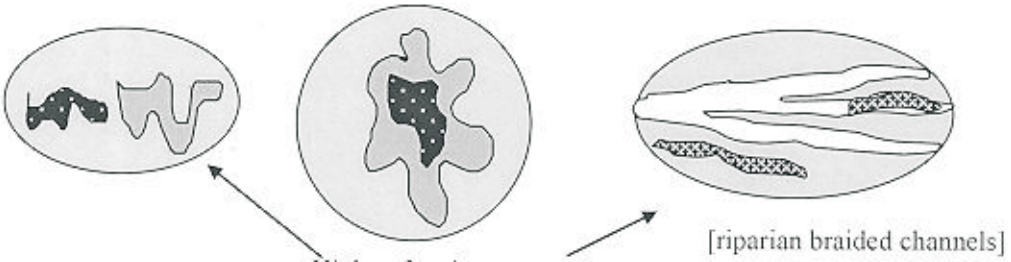
Wetland name or number A

H 1.4. Interspersion of habitats *(see p. 76)*

Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.

Figure ___

None = 0 points Low = 1 point Moderate = 2 points



High = 3 points [riparian braided channels]

NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes

1

H 1.5. Special Habitat Features: *(see p. 77)*

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).

____Standing snags (diameter at the bottom > 4 inches) in the wetland

____Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)

____Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)*

____At least ¼ acre of thin-stemmed persistent vegetation 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 each stratum of plants

NOTE: The 20% stated in early printings of the manual on page 78 is an error.

0

H 1. TOTAL Score - potential for providing habitat

Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

2

Comments

Wetland name or number A

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** X No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure 5 2
H 2.2 Corridors and Connections *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	1

Total for page 3

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)***

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.*

___**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

X **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 p. 152*).

___**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 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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.

X **Oregon white Oak:** Woodlands 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*).

X **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*).

___**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: pp. 167-169 and glossary in Appendix A).*

___**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 7.6 m (25 ft) high and occurring below 5000 ft.

___**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

If wetland has **3 or more** priority habitats = **4 points**
If wetland has **2** priority habitats = **3 points**
If wetland has **1** priority habitat = **1 point** No habitats = 0 points

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)

4

Wetland name or number A

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	10
TOTAL for H 1 from page 14	2
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	12

Wetland name or number A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit 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 X	
SC 1.1 Is the wetland unit 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	**Cat. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES = Category I NO = Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number A

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D ___ or accessed from WNHP/DNR web site ___ YES____ – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO X not a Heritage Wetland	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes – Is a bog for purpose of rating No - go to Q. 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No X Is not a bog for purpose of rating	**Cat. I**

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the 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/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO X not a forested wetland with special characteristics	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* 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 surface 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 X not a wetland in a coastal lagoon SC 5.1 Does the wetland meets 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 invasive plant species (see list of invasive species on p. 74). — 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number A

SC 6.0 Interdunal Wetlands *(see p. 93)* Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO X not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its 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 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. II** **Cat. III**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	N/A

Kays Subdivision –Stormwater Outfall

FISH & WILDLIFE HABITAT CONSERVATION AREAS ASSESSMENT

LaCenter, Washington

Prepared for:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

Prepared by:
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915 Broadway, Ste. 250
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July 14, 2014

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION

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PHOTO-SHEET 1 – PHOTOGRPAHS OF PROJECT AREA

FISH AND WILDLIFE HABITAT CONSERVATION AREAS ASSESSMENT

Project: Kays Subdivision – Stormwater Outfall
Applicant: WARAC, LLC
Location: West of W 5th Street, LaCenter, Washington (Fig. 1)
Legal Description: NW ¼ of Sec. 03, T04N, R01E, W. M., Clark County
Serial Number(s): None Listed
Local Jurisdiction: City of LaCenter
Study Area: 1.63 acres
Project Type: Stormwater Outfall for Residential Development
Shoreline Designation: Urban Conservancy
Zoning: N/A
ComPlan: UL
Assessment by: Kevin Grosz, PWS
Site Visit: March 24, 2014
Report Date: July 14, 2004

1.0 INTRODUCTION

This report details the results of a fish and wildlife habitat conservation areas assessment conducted for the stormwater outfall for the Kays Subdivision, by The Resource Company, Inc. (TRC). The study area is located in LaCenter, Washington between W. 5th Street and the East Fork of the Lewis River (EFLR, Fig. 1). This report identifies the extent of any fish and wildlife habitat conservation areas and associated buffers found within the study area as defined and regulated by the City of LaCenter Critical Areas Ordinance – Fish and Wildlife Habitat Conservation Areas (18.300.090(2)).

The study area (1.63 acres) is within the easement that is an extension of W. 5th Street to the EFLR. Currently the study area is a steeply sloping hillside that flattens out to a bench adjacent to the river (Fig. 2). Through the course of the assessment two habitat areas were identified that are regulated under 18.300.090(2). A portion of the study area is located within the 200-foot shoreline buffer of the EFLR, therefore, this critical area will be reviewed under the City's Shoreline Master Plan.

2.0 HABITAT ASSESSMENT

The habitat assessment was conducted in accordance with the LaCenter Critical Areas Ordinance (18.300) under Section 18.300.090(2) Fish and Wildlife Habitat Conservation Areas (FWHCA). The City has determined that critical areas, including FWHCA are valuable and fragile natural resources that provide many valuable social and ecological functions if maintained in their natural state. Buffers associated with these critical areas are essential to the maintenance and protection of the functions and values of these

natural features. Habitats/Species identified as needing protection under the FWHCA are outlined in (18.300.090(2)(a) as follows:

(i) Riparian – which are defined as those areas immediately adjacent to waterways that contain elements of both aquatic and terrestrial ecosystems that mutually influence each other;
(ii) Endangered or Threatened – Federally listed endangered fish and wildlife species or habitats that are associated with these species;
(iii) Local Habitat Areas – Species/habitats that are of local concern due to their population status or sensitively to habitat manipulation or are game species. These areas are nominated by the City or private citizens;
(iv) Priority Habitats/Species (PHS) Areas – Areas with primary associated with identified state/federally-listed monitor/candidate species as specified in Washington Department of Wildlife Policies 4802 and 4803.

Based on this criterion, TRC conducted a habitat survey and assessment within the project boundary. Riparian and habitat resource information provided by Clark County GIS Priority Habitat and Species Maps (Fig. 3) were reviewed to determine the potential habitats that may occur within the study area. The Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species program was also consulted to determine the presence of endangered, threatened, or rare (ETR) species within the vicinity of the study site. Additionally, the Washington Department of Natural Resources (DNR) - Natural Heritage Program (NHP) was referenced to determine the presence of endangered, threatened or rare plants that have been identified within the vicinity of the study site. DNR Water Type Maps were also referenced to determine if any mapped streams occur within the study area.

A visit was conducted on March 24, 2014 in which the entire site was traversed on foot to determine the presence or absence of any of the above listed fish and wildlife habitat conservation areas. Results from the in-office review and the on-site habitat assessment are detailed below.

3.0 RESULTS AND DISCUSSION

As discussed above, an in-office review of available fish, wildlife and plant data was conducted for areas within and near the project site prior to the site visit. This information was utilized to determine possible priority habitats and/or ETR species present within the study site and to aid in surveying for these habitats and species. Upon completion of the in-office review, a site visit was conducted to identify any priority habitat conservation areas and classify the habitat types. The results of the office review and on site investigation are discussed below.

3.1 RIPARIAN

Riparian habitat areas are those areas immediately adjacent to waterways that contain elements of both aquatic and terrestrial ecosystems that mutually influence each other.

WAC 222-16-031, relating stream classification, is the City's classification system for streams. Waters of the State includes lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington as classified in WAC 222-16-031. This classification system classifies waters as Type S (shoreline), Type F (fish bearing), Type Np (non fish bearing perennial) and Type Ns (non fish bearing seasonal) waterways.

The EFLR is identified as a Shoreline of the State (Type S) stream by DNR . The Clark County GIS Map indicates a riparian habitat conservation area in the western portion of the property (Fig. 3). The ordinary high water mark of the EFLR area was flagged as shown in Figure 5.

3.2 ENDANGERED AND THREATENED SPECIES

Threatened fish species listed under the Federal Endangered Species Act occur in the EFLR. These listed fish species are chum salmon (*Oncorhynchus keta*), Coho (*O kisutch*), Chinook (*O. tshawytscha*) and steelhead (*O. mykiss*).

3.3 LOCAL HABITAT AREAS

Locally important habitats and species areas are legislatively designated and mapped by the City. No locally important habitats or species are mapped within the study site.

3.4 PRIORITY HABITAT AND SPECIES

Priority Habitat and Species (PHS) areas are identified by and consistent with WDFW priority habitats criteria, including areas within one thousand feet of individual species point sites. The City defers to WDFW in regards to classification, mapping and interpretation of priority habitat and species.

The Clark County PHS maps were reviewed to determine the likelihood of priority habitats and sensitive species within the study site (Fig. 3). The WDFW was also contacted to determine if any known endangered, threatened, sensitive species, priority habitat, or priority species are known to occur within the study area. In addition to the riparian habitat buffer mentioned above, the majority of the study area is mapped as non-riparian habitat (Fig. 3). This non-riparian habitat area is representative of the Oregon white oak (*Quercus garryana*) woodland that occurs in this area. Oregon white oak is identified as a priority species by WDFW due to providing valuable habitat to a diversity of wildlife particularly wildlife species that are listed by the State as sensitive, threatened, endangered, or candidate.

The DNR Natural Heritage Program was reviewed to determine the presence of known ETR plant species within the project area. The review indicated that no known occurrences of any ETR plant species are located within Section 03 of Township 04 North, Range 01 East, W.M.

3.5 HABITAT TYPES

To assess the habitat functions and potential habitat present within the property, vegetative communities were classified into habitat types and assessments were made of each community. Two vegetative plant communities were observed within the study area - Westside Riparian Wetlands and Agriculture, Pasture and Mixed Environs. A summary of these habitat types found within the site is given below and a map of the habitat type is shown in Figure 4.

Table 1. Habitat Types within the Study Area.

Habitat Types (Johnson and O'Neil, 2001)	Acres within Study Area
Westside Riparian	1.06 acres
Agriculture, Pasture & Mixed Environs	0.57
Total	1.63 acres

Westside Riparian/Wetlands

Westside Riparian/Wetlands – occurs in the forested plant community adjacent to the EFLR (Fig. 4). Vegetation in this plant community consists of western red cedar (*Thuja plicata*), Oregon white oak and Douglas-fir (*Pseudotsuga menziesii*) overstory. The shrub layer consists of vine maple (*Acer circinatum*) and snowberry (*Symphoricarpos occidentalis*). Ground cover is predominantly sword fern (*Polystichum munitum*), blackberry (*Rubus* spp.) and stinging nettle (*Urtica dioica*). There is a small open grassland area that occurs immediately adjacent to the river. This area is dominated by native and non-native grasses. A small Palustine, Emergent, Temporarily Flooded (PEMA), Category IV wetland occurs on the bench above the stream within this habitat type.

Agriculture, Pasture and Mixed Environs

This habitat type occurs in the eastern portion of the study area within open grassland plant community. The majority of this habitat type is within an area that is used to graze domestic livestock. The plant community consists of native and non-native grasses and forbs.

3.6 RESIDENT WILDLIFE

Animals observed during the site visit included western scrub-jay (*Aphelocoma californica*), steller's jay (*Cyanocitta stelleri*), robin (*Turdus migratorius*), black-capped chickadee (*Poecile atricapilla*), and red-tailed hawk *(Buteo jamacicensis*). The forested potions of the site and adjacent property provide cover and nesting areas. Wildlife likely to utilize the site includes toads, salamanders, small fossorial mammals, larger migrating mammals, small mammals, snakes, and residential and migratory birds.

4.0 REGULATORY ISSUES

The City has implemented the FWHCA (18.300.090(2)) to provide protection for critical habitat areas within the City's jurisdiction. This ordinance establishes protective buffers

for critical areas and specifies that certain permits and approvals be obtained for projects containing habitat conservation areas or their associated buffers. Through the course of this study a riparian zone along the EFLR was identified as a priority habitat and Oregon white oak was identified as a priority species/habitat (Fig. 5). The river is designated a shoreline of the state (Type S) by DNR. Streams that are shorelines of the state are protected by a riparian buffer that is 250-feet wide (Fig. 5). For non-riparian priority habitats and species (Oregon white oak) the recommended buffer is 300 feet or the threshold set based on consultation with WDFW or through the City's peer review process.

The habitat boundaries and classifications shown in this report have been determined using the most appropriate field techniques and best professional judgment of the environmental scientist. It should be noted that the City and WDFW have the final authority in determining the habitat boundaries and categories under their respective jurisdictions. It is recommended that this habitat assessment report be submitted to these agencies for concurrence prior to starting any development or planning activities that would affect priority habitat found on this site.

5.0 LITERATURE CITED

Johnson, D. and T. O'Neil. 2001. Habitat Relationships of Oregon and Washington. Oregon State University Press, Corvallis, Oregon

Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 172pp.

Washington Department of Natural Resources. 2009. Natural Heritage Program. www.dnr.wa.gov/researchscience/topics/naturalheritage/pages/amp_nh.aspx.

Washington Department of Natural Resources. 2009. Forest Practice Water Typing Maps.www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_watertyping.aspx

ATTACHMENTS

FIGURE 1 – PROJECT LOCATION

FIGURE 2 – CLARK COUNTY LIDAR TOPOGRAPHIC MAP

FIGURE 3 – CLARK COUNTY GIS MAPPED PRIORITY HABITAT

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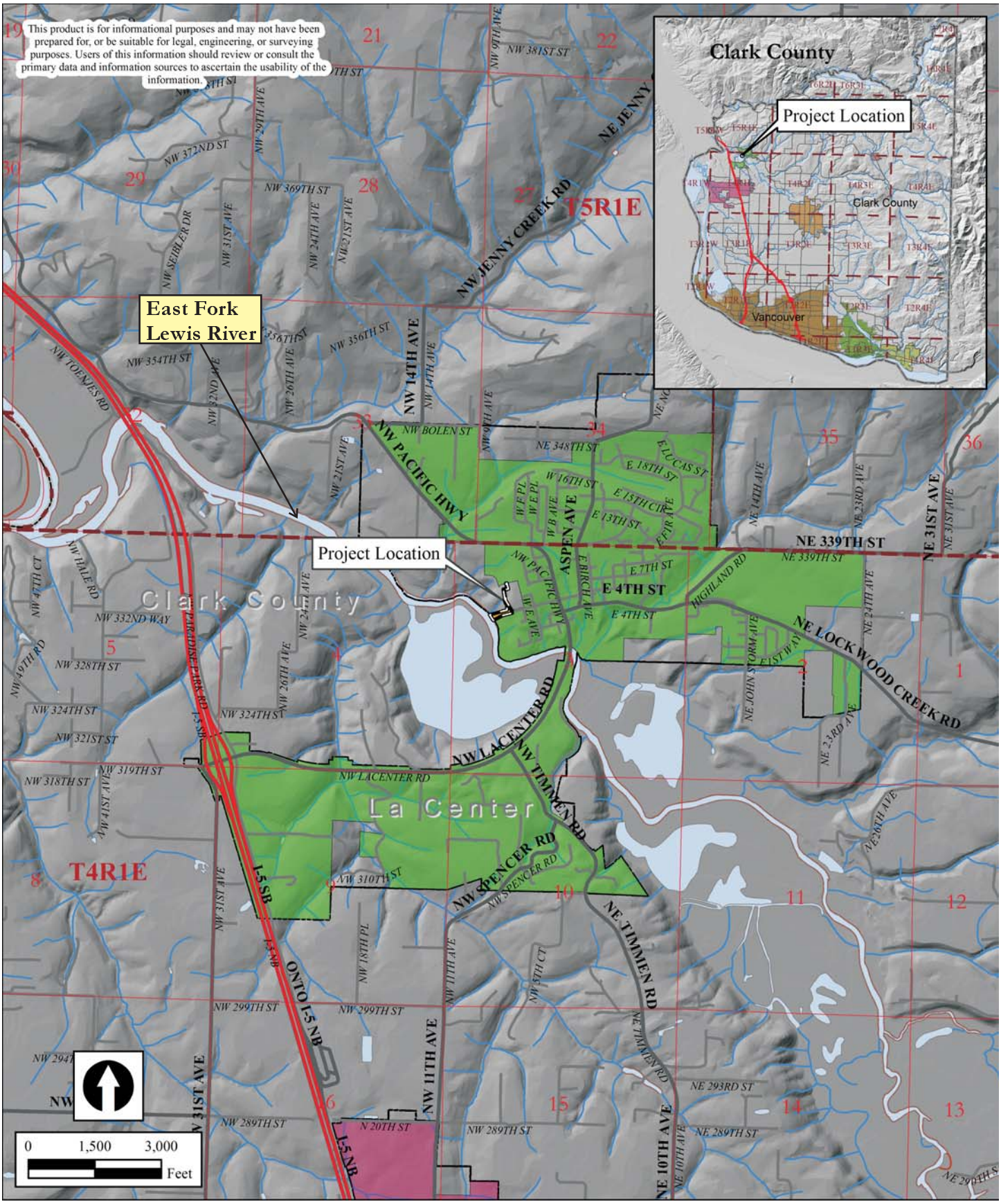
FIGURE 5 – OBSERVED PRIORITY HABITATS AND SPECIES MAP

PHOTO-SHEET 1 – PHOTOGRPAHS OF PROJECT AREA



Project - Kays Subdivision Stormwater Outfall

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661
PURPOSE: Habitat Assessment

Project Location Map
Kays Subdivision Stormwater Outfall
Clark County, Washington

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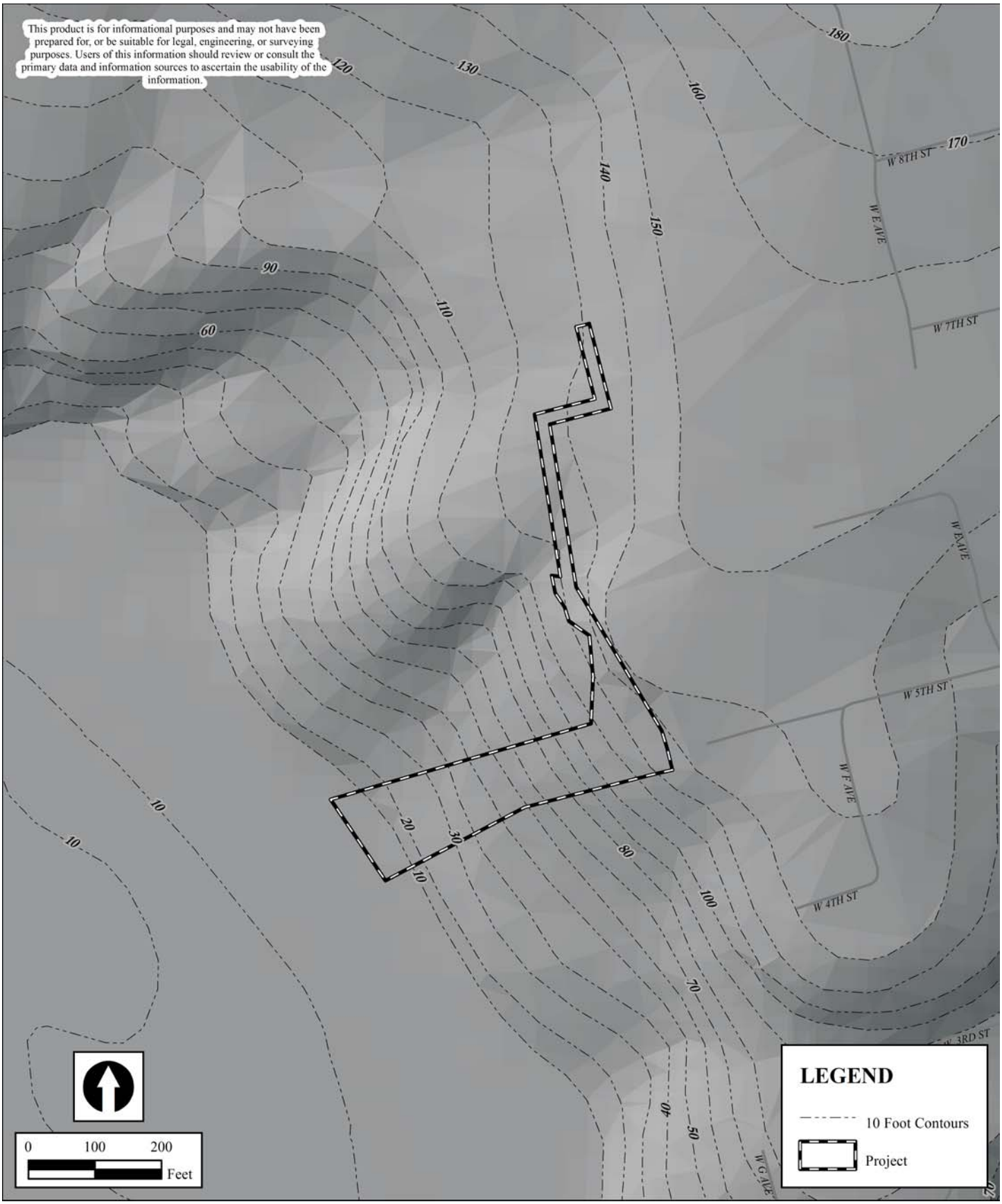
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
East Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: July 14, 2014

Figure 1



Project - Kays Subdivision Stormwater Outfall

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661
PURPOSE: Habitat Assessment

Clark County LiDAR Topography
Kays Subdivision Stormwater Outfall
Clark County, Washington

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PROPOSED ACTIVITIES IN:
East Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
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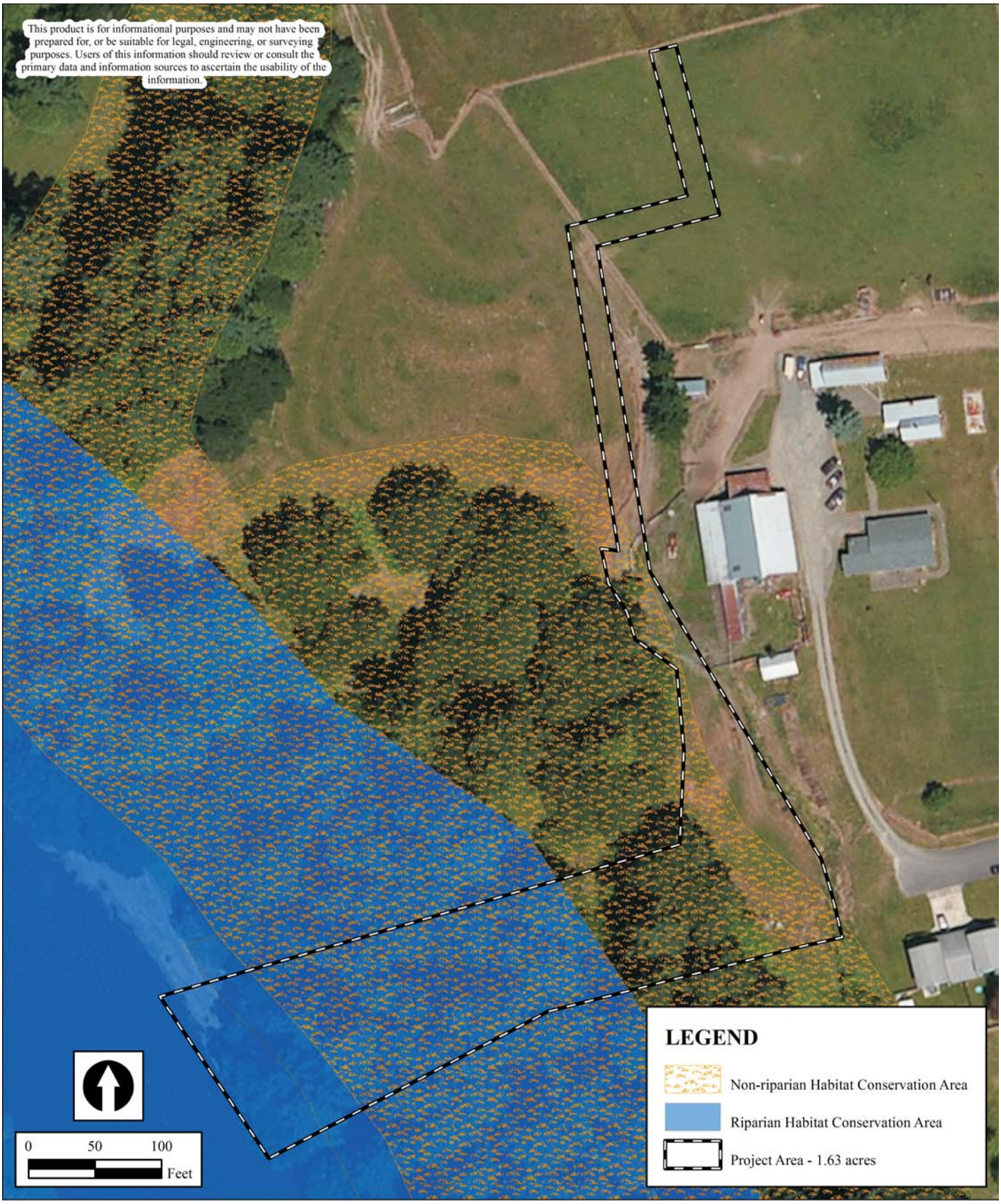
DATE: July 14, 2014

Figure 2



Project - Kays Subdivision Stormwater Outfall

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661
PURPOSE: Habitat Assessment

Clark County Priority Habitat and Species
Kays Subdivision Stormwater Outfall
Clark County, Washington

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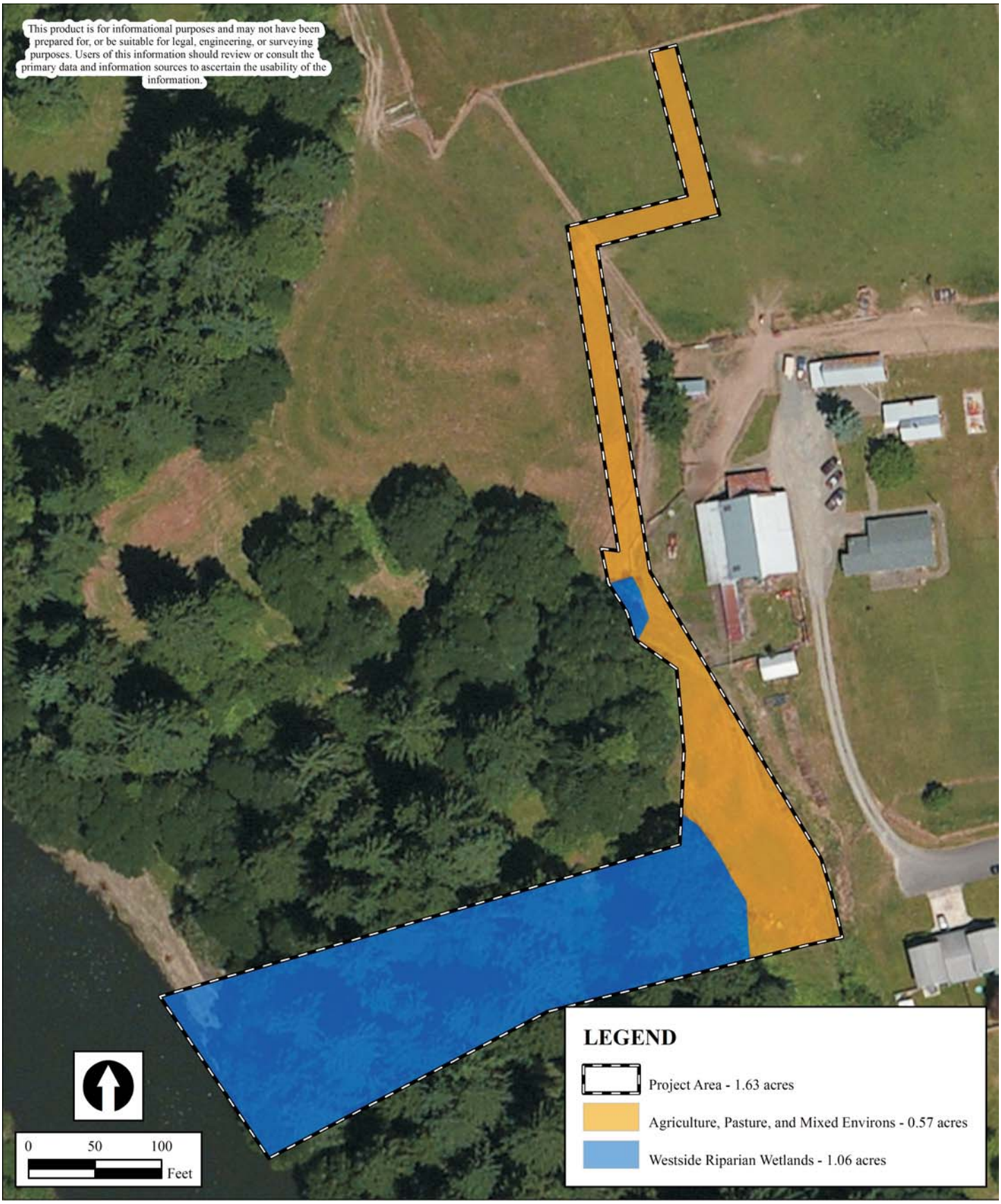
PROPOSED ACTIVITIES IN:
East Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: July 14, 2014

Figure 3



Project - Kays Subdivision Stormwater Outfall

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661
PURPOSE: Habitat Assessment

Observed Habitat Types
Kays Subdivision Stormwater Outfall
Clark County, Washington

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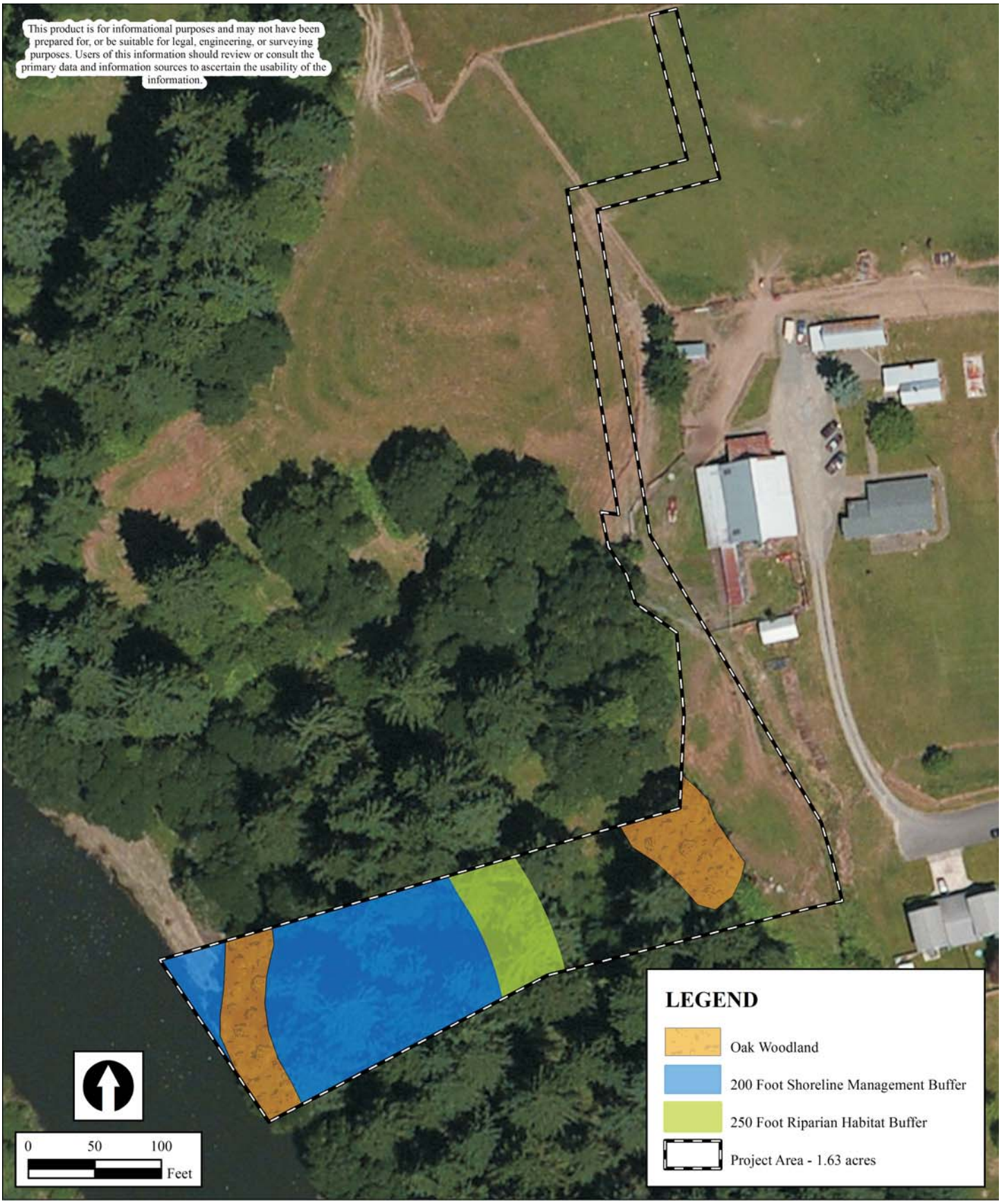
PROPOSED ACTIVITIES IN:
East Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: July 14, 2014

Figure 4



Project - Kays Subdivision Stormwater Outfall

APPLICANT:
WARAC, LLC
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Vancouver, WA 98661
PURPOSE: Habitat Assessment

Observed Priority Habitats and Species
Kays Subdivision Stormwater Outfall
LaCenter, Washington

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PROPOSED ACTIVITIES IN:
East Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: July 14, 2014

Figure 5

Project - Kays Subdivision Stormwater Outfall

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661
PURPOSE: Habitat Assessment

Project Photographs
Kays Subdivision Stormwater Outfall
Clark County, Washington

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PROPOSED ACTIVITIES IN:
East Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W.M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: July 14, 2014

Photo Sheet 1

KAYS SUBDIVISION

WETLAND AND HABITAT MITIGATION

La Center, Washington

USACE REFERENCE NO. – NWS-2013-739

Prepared for:
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March 4, 2015

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WETLAND AND HABITAT MITIGATION REPORT

Project:	**Kays Subdivision Project**
Applicant:	**WARAC, LLC**
Location:	**555 W 5th Street, La Center, Washington**
Legal Description:	**NW ¼ of Sec. 03, T04N, R01E, W. M., Clark County**
Project Type:	**Residential**
Jurisdiction:	**City of La Center**
Zoning:	**LDR-7.5**
ComPlan:	**UL**
Acreage:	**11.8 acres**
USACE Ref:	**NWS-2013-739**
Assessment by:	**Kevin Grosz, P.W.S.**
Delineation Report Date:	**December 12, 2012**
Preliminary Mitigation Report Date:	**March 4, 2015**

1.0 INTRODUCTION

This report details a revised wetland mitigation plan for the Kays subdivision and wetland/habitat mitigation plan for a stormwater outfall prepared by The Resource Company, Inc. (TRC). The project is proposing to construct a residential subdivision within the parcel identified as assessor's serial number 2094888-000 located at 555 W. 5th Street, La Center, Washington (Fig. 1). In addition, a stormwater pipeline will cross the property to the south and southwest and outfall to the East Fork of the Lewis River (EFLR). The stormwater pipe will be located in the City's Right-of Way (ROW) for W. 5th Avenue as it extends from near its current terminus to the EFLR. The project will impact a small Category IV wetland for a road crossing within the subdivision and temporarily impact a small wetland adjacent to the EFLR and riparian habitat for the installation of the stormwater outfall pipe.

An updated wetland delineation and a habitat assessment were completed in 2012 (enclosed). The initial wetland delineation was conducted in 2005 by TRC and a wetland mitigation plan was prepared by LDC Design Group in 2005. This revised wetland mitigation plan for the subdivision addresses minor changes in the wetland configuration and modifies the original plan to remove the proposed excavation within a wetland (for enhancement) that is located above a potential landslide area. In addition, this plan addresses the temporary impact of the wetland near the EFLR and riparian habitat for the installation of the stormwater outfall pipe.

The development and outfall areas contain three wetlands and critical habitat areas associated with the EFLR. This report addresses direct, indirect, and temporary impacts to the wetland and buffer areas and critical habitat as regulated by the City of La Center Critical Areas Ordinance – Wetlands (18.300.090(6)) and the Fish and Wildlife Habitat Conservation Areas (18.300.090(2)), as well as the Washington Department of Ecology

(Ecology) and U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act.

2.0 EXISTING CONDITIONS

Currently the properties proposed for the subdivision and outfall pipeline are vacant. Topography slopes moderately from northeast to southwest (Fig. 2) in the subdivision development area and relatively steeply where the stormwater pipe proceeds southwest to the EFLR. Three wetlands and two habitat areas were identified within the project area. The wetlands and habitat areas within the site are described below.

Wetland A (4,922 sq. ft.) – Wetland B (49,876 sq. ft. – within project area)

Wetlands A and B (Fig. 3) both meet the criteria of a slope hydrogeomorphic (HGM) wetland class. These wetlands are similar in vegetation, soils and hydrology, and therefore are described together. The wetlands are palustrine emergent, temporarily/seasonally inundated-saturated (PEMF/C) wetlands. Vegetation in the wetlands is dominated by reed canarygrass (*Phalaris arundinacea* – FACW), tall fescue (*Schedonorus arundinacea* – FAC), bird's foot trefoil (*Lotus corniculatus* – FAC), soft rush (*Juncus effusus* – FACW), bentgrass (*Agrostis stolonifera* – FAC), and creeping buttercup (*Ranuculus repens* – FAC). Hydrologic indicators within the wetlands were water at the surface. Oxidized rhizospheres were found along the root channels. Hydric soil characteristics generally include a silt loam that is very dark brown (10YR 3/2) in the top four (4) inches, below this to a depth greater than 16 inches is a very dark brown clayey silt loam with dark brown (7.5YR 3/4) redox concentrations. Wetlands A and B both rated as Category IV wetlands according to the Western Washington Wetland Rating Form (WRF). Wetland A was previously determined to be isolated by the USACE and not under their jurisdiction. However, under the current guidelines (likely overland or shallow subsurface connection) for isolated wetlands it was determined that this wetland is not isolated and is regulated by the USACE.

Wetland C (2,200 sq. ft. – within project area)

Wetland C (Fig. 3) meets the criteria of riverine/depressional hydrogeomorphic (HGM) wetland class. This wetland occurs adjacent to the EFLR and its hydrology is somewhat influenced by river flow. A summary of the wetland information is given below.

Wetland C is a palustrine emergent, temporarily inundated (PEMA) wetland. Vegetation in the wetlands is dominated by meadow foxtail (*Alopecurus pratensis* – FAC), creeping buttercup (*Ranuculus repens* – FAC) and slough sedge (*Carex obnupta* – OBL). Hydrologic indicators within the wetlands were water at 10 inches below the surface and oxidized rhizopheres along living root channels. Hydric soil characteristics generally include a silty sand that is dark grayish brown (10YR 4/2) with dark reddish brown (5YR 3/4) concentrations to a depth of at least 16 inches. Wetland C rated as a Category IV wetland according to the Western Washington Wetland Rating Form.

Wetland Functional Assessment

The on-site wetlands have been assessed using the Washington State Wetland Rating System for Western Washington (Hruby 2004). The system was designed to differentiate

between wetlands based on their sensitivity to disturbance, their significance, their rarity, our ability to replace them, and the functions they provide. Through a series of questions, the wetland rating system will yield a number for water quality functions, hydrologic functions, and habitat function, which yield a total score for functions. Based on the total score, the wetland is categorized as a Category I, II, III, or IV wetland. Table 1 below summarizes the wetland type, total score for functions, and category of the three wetlands identified on-site.

Table 1. Wetland Function Rating

Wetland	Wetland Type	Water Quality Functions	Hydrologic Functions	Habitat Functions	Total Score	Wetland Category
A	Slope	0	0	8	8	IV
B	Slope	2	8	4	14	IV
C	Depressional	8	6	12	26	IV

Non-Wetlands

The non-wetland portion surrounding Wetlands A and B is predominantly an open grassland pasture that was being grazed by cattle at the time of the delineation. Vegetation is dominated by a mixture of bentgrasses, tall fescue, clover (*Trifolim* spp.), and bird's foot trefoil. Vegetation surrounding Wetland C consists of Oregon white oak, big-leaf maple (*Acer macrophyllum* – FACU), Douglas-fir, hazelnut (*Corylus cornuta* – FACU), snowberry (*Symphoricapos alba*– FAC), reed canarygrass, and stinging nettle. Soils in the non-wetland portion of the site are generally a dark grayish brown (10YR 3/2) silt sand with no hydric indicators. No wetland hydrology indicators were observed in the non-wetland portions of the study area.

Riparian Habitat Conservation Area (RHCA) – 250-foot Riparian Buffer

The EFLR is a Type S (Shoreline of the State) stream. According to LCMC Table 18.300.090(2)(f) Type S streams are protected by a 250-foot riparian buffer (Figs. 3 & 4). The plant communities within the 250 riparian buffer are described as Westside Riparian/Wetlands habitat type. Vegetation in this plant community consists of western red cedar (*Thuja plicata*), Oregon white oak (*Quercus garryana*) and Douglas-fir (*Pseudotsuga menziesii*) overstory. The shrub layer consists of vine maple (*Acer circinatum*) and snowberry (*Symphoricarpos occidentalis*). Ground cover is predominantly sword fern (*Polystichum munitum*), blackberry (*Rubus* spp.) and stinging nettle (*Urtica dioica*). There is a small open grassland area that occurs immediately adjacent to the river. This area is dominated by native and non-native grasses. A small Palustrine, Emergent, Temporarily Flooded (PEMA), Category IV, depressional wetland (Wetland C) occurs on the bench above the stream within this habitat type (Figs. 3 & 4).

Oregon White Oak (*Quercus garryana*) Woodland

Oregon white oak, which is identified as a priority habitat by WDFW, is located along the southern edge of the tree line near the EFLR and at the top of the slope near the

existing terminus of W 5th Avenue (Fig. 3 & 4). Oregon white oak is designated as priority habitat due to providing valuable habitat to a diversity of wildlife, particularly wildlife species that are listed by the State as sensitive, threatened, endangered, or candidate.

Photographs of the study area are provided in Photo-Sheet 1.

3.0 AVOIDANCE AND MINIMIZATION

The project is proposing to fill Wetland A for a road crossing that will allow for traffic circulation within the subdivision. In addition, a stormwater pipeline will cross the property to the south and outfall near a wetland adjacent to the EFLR. A wetland on the bench at the toe of the slope will be temporarily impacted for the installation of the outfall pipe. The construction zone through the 250-foot RHCA will be located along the slope to avoid the removal of large trees. However, some small trees and shrubs that cannot be avoided will be removed. No Oregon white oak trees will be removed for the installation of the outfall pipe.

The following measures will be taken to avoid/minimize additional impacts to wetland and buffer areas:

1. All wetland, wetland buffer, and riparian buffer boundaries will be temporarily flagged in the field prior to construction.
2. Erosion control measures (e.g. straw bale sediment barriers or sediment fence) will be installed to prevent siltation from occurring in the critical areas during construction.
3. The erosion control measures will be removed once construction is completed and vegetation has become established.
4. The final wetland and buffer configuration will be placed in a conservation covenant that will restrict use and access to the critical areas

Any ground disturbance within the wetland/riparian buffer caused by the construction of the subdivision, associated roads and installation of the outfall pipe will be restored by seeding the following native grass seed mixture or a similar native seed mixture:

Blue wildrye (*Elymus glaucus*) 40%
California brome (*Bromus carinatus*) 40%
Native red fescue (*Festuca rubra*) 15%
Tufted hairgrass (*Deschampsia caespitosa*) 5%
The seeding rate for this mixture is: 1 lb./1000 sq. ft.

4.0 WETLAND/HABITAT IMPACTS

The Applicant is proposing to impact Wetland A for the subdivision road crossing as shown in Figures 4 and 5, and detailed in Figures 6 and 7. The entire wetland (4,922 ft²) will be directly or indirectly impacted for the construction of the roadway. A portion of Wetland C (440 ft²) will be temporarily impacted for the installation of the stormwater outfall pipe as shown in Figure 8. Wetland A and C impacts will be compensated as

outlined below (Figs. 9 and 10). In addition, installation of the stormwater pipeline will temporarily impact 8,455 ft² of the riparian conservation zone of the EFLR and is shown in Figure 11. This temporary impact will be restored and the riparian area within the City's ROW adjacent to EFLR will be enhanced (Figs. 10 and 12). Stormwater pipeline and outfall details are provided in Figures 13-17.

5.0 MITIGATION ACTIVITIES

Wetland A. The previously approved wetland mitigation plan (LDC 2005) called for excavating Wetland B to create an extended water regime and emergent, scrub/shrub and forested plant communities. Wetland B is situated on a ledge that sits above a historic landslide area. Creating an extended water regime within this area could aggravate the slide potential of that slope. Therefore, the excavation creating those ponded areas has been removed and Wetland B will be planted to a scrub/shrub/forested plant community. The proposed project will directly impact 0.11 acres (4,922 ft²) of Category IV wetlands (Fig. 5, Table 2). To compensate for the permanent wetland impacts (0.11 ac.), 0.64 acres (Fig. 9) of Wetland B will be enhanced through the planting of native wetland trees and shrubs (Table 3).

Wetland C. Wetland C will be temporarily impacted (440 ft²) during the excavation of the stormwater outfall pipe as shown in Figure 8. The trench area will be restored to preconstruction contours. The construction area and the remaining portion of Wetland C within the City's ROW (807 ft²) will be planted with native shrubs (Fig. 10).

Riparian Habitat Conservation Area. The installation of the outfall pipe within the 250-foot riparian habitat conservation area will temporarily impact 8,455 ft² of that critical area (Fig. 11). Once the installation has been completed this area will be restored to preconstruction contours and seeded with a native seed mixture listed above (Fig. 12). In addition, the non-forested section of the riparian area (4,630 ft²) adjacent to the OHWM of the EFLR will be planted with native willow as outlined in Table 3.

6.0 MITIGATION GOALS

The overall objective of this plan is to ensure no net loss of wetland functions and values within the watershed, and satisfy the requirements the City of La Center, Ecology, and the USACE. The Category IV direct wetland impacts will be compensated through enhancement at a 4:1 ratio as per the City's Critical Lands Table 18.300.090(6)(k). The total direct Category IV wetland impact for providing for lots and street (Wetland A) is 0.11 acres (4,922 ft²). The total temporary direct Category IV wetland impact (Wetland C) is 440 ft² for the excavation of the outfall pipeline. To compensate for impacts to Wetland A, Wetland B (0.64 ac.) will be enhanced and Wetland C (0.02 ac) will be restored and enhanced by planting native trees and shrubs (Figs. 8 and 10). Mitigation impacts and compensation are outlined in Table 2 below:

Table 2. Mitigation Accounting

Wetland	Impact Type	Impact	Impacts (FT^2)	Compensation (FT^2)					
				Reestablishment		Rehabilitation		Enhancement	
A - Category IV	Direct	Lots and street	4,922					27,872	5.7:1
C - Category IV	Direct/ Temporary	Stormwater Outfall pipe	440					807	1.8:1
Total Category IV	**Direct**		**5,362**					**28,679**	5.3:1

7.0 OBJECTIVES

Objective #1 The proposed mitigation will compensate for direct and temporary wetland impact areas (0.12 ac) by enhancing 0.66 acres of Category IV wetlands.

Objective #2 Compensatory mitigation will improve plant diversity by planting a total of 0.66 acres of wetlands with native trees and shrubs on-site. The predominantly open grassland wetlands will be replaced by native forest and shrub communities.

Objective #3 The compensatory mitigation will improve wetland functions through increasing the diversity and complexity of available wildlife habitat. The proposed project would ultimately provide a diversity of tree, shrub and ground cover habitat that will provide the opportunity for increased wildlife use.

8.0 PROJECT SCHEDULE

This project is proposed to begin construction as soon as the appropriate permits are received. Initial project grading and direct/indirect wetland impacts are tentatively scheduled to begin in the summer of 2015. Wetland enhancement activities will take place during the first planting season following wetland impacts.

9.0 PLANTING PLAN

To mitigate for the impacts described above the project proposes to complete the following mitigation measures. The wetland enhancement areas will be planted with native tree and shrub species at a ratio of 5 trees/10 shrubs per 1,000 ft^2 A total of 280 trees and 140 shrubs will be planted within 0.64 acres of wetland B enhancement area. A total of 22 shrubs will be planted within 807 ft^2 of Wetland C enhancement area and another 127 shrubs will be planted in the riparian habitat conservation area adjacent to the EFLR (Table 3). The planting of the wetland and buffer will provide for greater habitat structure and diversity and improved water quality. Plant species and numbers are presented in Table 3 below.

Table 3. Wetland Enhancement/Restoration Area Planting (Figs. 9 and 10).

Species	Plant Form	Minimum Size	Minimum Spacing	Required Number
Wetland B Enhancement Area (27,872 ft²)				
Shrubs				
Black twinberry *(Lonicera involucrata)*	Bare Root	24 - 36"	6'	40
Nootka rose *(Rosa nutkana)*	Bare Root	24 - 36"	6'	50
Scouler's willow *(Salix* spp.*)*	Bare Root	24 – 36"	6'	50
Red-osier dogwood *(Cornus alba)*	Bare Root	24 - 36"	6'	50
Douglas Hawthorne *(Crataegus douglasii)*	Bare Root	24 - 36"	6'	50
Pacific ninebark *(Physocarpus capitatus)*	Bare Root	24 - 36"	6'	40
			Total Shrubs	**280**
Trees				
Oregon ash *(Fraxinus latifolia)*	Bare Root	24 - 36"	6'	50
Quaking aspen *(Populous tremuloides)*	Bare Root	24 - 36"	6'	40
Pacific cascara *(Rhamnus purshiana)*	Bare Root	24 – 36"	6'	50
			Total Trees	**140**
Wetland C Enhancement Area (807 ft²)				
Shrubs				
Native willow *(Salix Sp.)*	Cuttings	24 – 36"	6'	22
Total Shrubs				**22**
Riparian Habitat Conservation Area (4,630 ft²)				
Native willow *(Salix Sp.)*	Cuttings	24 – 36"	6'	127
			Total Shrubs	**127**

Additional planting specifications applicable to this plan are listed below.

Source of Plant Materials. All plants will be obtained from nurseries specializing in plant materials native to the Pacific Northwest.

Planting Time**.** Bare-root shrubs and trees should be planted between December 1 and March 31, when plants are dormant. If planting is conducted outside this time period, containerized plant stock will be used and extra care and watering may be needed to ensure that plants become adequately established.

Schedule. The mitigation area will be planted within the same calendar year that the stormwater facility is installed.

Qualifications. The initial and all successive year plantings will be supervised by a qualified professional to ensure that correct planting procedures are followed and that plantings are done according to the planting scheme.

10.0 PERFORMANCE CRITERIA

The City requires a minimum of five (5) years of monitoring and maintenance, however, the USACE and Ecology require at least 10 years of these activities. The criteria listed below are intended to meet the requirements of both entities. Performance measures and standards are used to provide a basis for evaluating whether the project's goals and objectives are being met. In order to meet the goals and objectives, the mitigation must meet the following criteria:

1. Native Woody Species
    a. Performance Standard - Year 1 - Planted, native woody species in the (scrub-shrub, and/or forested) wetland at the mitigation site will achieve at least 100 percent survival one year after the site is planted. If dead plantings are replaced, the performance standard will be met.
    b. Performance Standard Years 2-4 – Native woody species (planted or volunteer) will achieve a density of a minimum of 6 shrubs and 3 trees per 1000 ft² in the wetland enhanced mitigation areas.
    c. Performance Standard Year 5 - at least 30 percent aerial coverage of native trees and shrubs
    d. Performance Standard Year 7 - at least 50 percent aerial coverage of native trees and shrubs
    e. Performance Standard Year 10 - Aerial cover of native woody species will be at least 75 percent in the wetland enhancement areas by the end of the monitoring period (year 10). Natural colonization can make it difficult to separate planted individuals from volunteer trees and shrubs. Therefore, naturally recruited species will be included in vegetation monitoring.

2. Native Woody Species Plant Diversity
    a. Performance Standard - By Year 3, at least 4 native, facultative or wetter, woody plant species will achieve a minimum 3 percent aerial cover for each species in the scrub-shrub (and/or forested) wetland at the mitigation site.
    b. Performance Standard - By Year 5, at least 4 native, facultative or wetter, woody plant species will achieve a minimum 10 percent aerial cover for each species in the scrub-shrub (and/or forested) wetland at the mitigation site.
    c. Performance Standard - By Year 10, at least 4 native, facultative or wetter, woody plant species will achieve a minimum 10 percent aerial cover for each species in the scrub-shrub (and/or forested) wetland at the mitigation site.

3. Invasive species (all years)
    a. Performance Standard - During All Years, non-native, invasive plant species, with the exception of reed canarygrass, will not exceed 20 percent aerial cover in the wetland and buffer area on the enhancement mitigation site.
    b. Performance Standard - Year 5, there will be a 30 percent reduction in reed canarygrass aerial cover compared to baseline conditions.
    c. Performance Standard - Year 7, there will be a 50 percent reduction in reed canarygrass aerial cover compared to baseline conditions.
    d. Performance Standard - Year 10, reed canarygrass aerial cover will not exceed 20 percent.

11.0 MONITORING AND MAINTENANCE PLANS

The following actions will be implemented as part of the wetland mitigation monitoring and maintenance plan on this site:

1. The initial and all successive year plantings will be supervised by a qualified professional to ensure that correct planting procedures are followed and that plantings are done according to the planting scheme and to determine if the enhancement areas are meeting the performance standards listed above.

2. Monitoring of all planted areas will commence the summer following the initial planting (year 1) and continue in the 2nd, 3rd, 4th and 5th years. In addition, to meet USACE and Ecology's requirements, monitoring will be conducted in years 7 and 10. Monitoring will be conducted by a qualified professional during the late spring or summer time period. For each year that monitoring is required, a report documenting the monitoring results will be submitted to the City of LaCenter, USACE, and Ecology. The report will identify deficiencies in the mitigation progress and any contingency measures that will be taken to correct those deficiencies. Photographs taken from established photo-stations will be included with these reports.

3. To ensure planting success, the Applicant will be responsible for performing minor maintenance over the monitoring period. This will include the selective removal of undesirable plant species such as blackberry (*Rubus* spp.) that may be hindering the growth and establishment of the favored plant stands. An area, 1-foot in diameter surrounding each planted woody species, will be kept free of competing vegetation. This can be accomplished either by scarifying the area by hand or through the use of weed-control rings.

4. Maintenance of the enhancement area may include irrigation of the planted stock. A watering schedule will be established during the dry months (June through September) so that the plants are watered on a weekly basis during this time

period. If necessary, a temporary above ground irrigation system capable of watering the entire enhanced wetland area will be installed.

5. Any maintenance that is required within the wetland area will be supervised by a qualified wetland professional familiar with this project.

12.0 ADAPTIVE MANAGEMENT PLANS

Adaptive management plans are designed to identify potential courses of action, and any corrective measures to be taken when monitoring indicates project goals are not being met. Table 4 summarizes the maintenance and contingency requirements for this project. In general, the contingency measures for this site are as follows:

1. Replacement Plantings—Replacement plantings will be made throughout the monitoring period if monitoring reveals that unacceptable plant mortality has occurred. Woody species will be re-planted to the original number of plants proposed in the accepted mitigation plan annually throughout the duration of the monitoring and maintenance period.

2. Planting Plan Modifications—Modifications to the planting plan (i.e., plant species and densities) will be made if monitoring identifies problems with the original planting scheme. For example, if annual monitoring identifies that plant mortality is attributed to an inappropriate hydrologic regime, the replacement plantings should be made using a more suitable plant species. Any recommended changes to the planting scheme will be documented in the annual monitoring report. The addition of any new plant species, not already included in this enhancement plan, must be approved by the City of La Center.

3. Soil Erosion—Any areas demonstrating soil erosion problems will be restored as soon as possible. If there does not appear to be a problem with the original design, the eroded areas will be restored by replacing any lost topsoil and replanted according to the original planting scheme.

Table 4. Maintenance and Adaptive Management Requirements

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Enhancement Areas	Trash and debris	Any trash or debris which exceeds 1 ft.^{3}/100ft^2 (equal to the volume of a standard size office garbage can). In general, there should be no evidence of dumping.	Trash and debris cleared from site.
Enhancement Areas	Erosion	Eroded damage >2 inches deep where cause of damage is still present or where there is potential for continued erosion.	Eroded areas should be stabilized with appropriate erosion control BMPs (e.g., seeding, mulching, rip rap).
Enhancement Areas	Plant mortality	Plant mortality jeopardizes attaining the required survival rate.	Plants should be replaced according to the planting plan. Modifications to the planting plan should be made if monitoring identifies problems with the original planting scheme.
Enhancement Areas	Invasion of undesirable plant species.	Undesirable plant species are hindering the growth and establishment of the favored plant stands.	Undesirable species removed by hand, or in accordance with recommendations of the Clark County Weed Control Board.

13.0 DEMARCATION

In accordance with the City's ordinance 18.300.090(6)(f)(vi) Permanent Marking of Buffer Area, a permanent physical demarcation along the upland boundary of the wetland buffer area shall be installed and thereafter maintained. Such demarcation may consist of logs, a tree or hedgerow, fencing, or other prominent physical marking approved by the hearings examiner. In addition, small signs shall be posted at an interval of one per lot or every 100 feet, whichever is less, and perpetually maintained at locations along the outer perimeter of the wetland buffer worded substantially as follows: "Wetland and Buffer – Please Retain in a Natural State."

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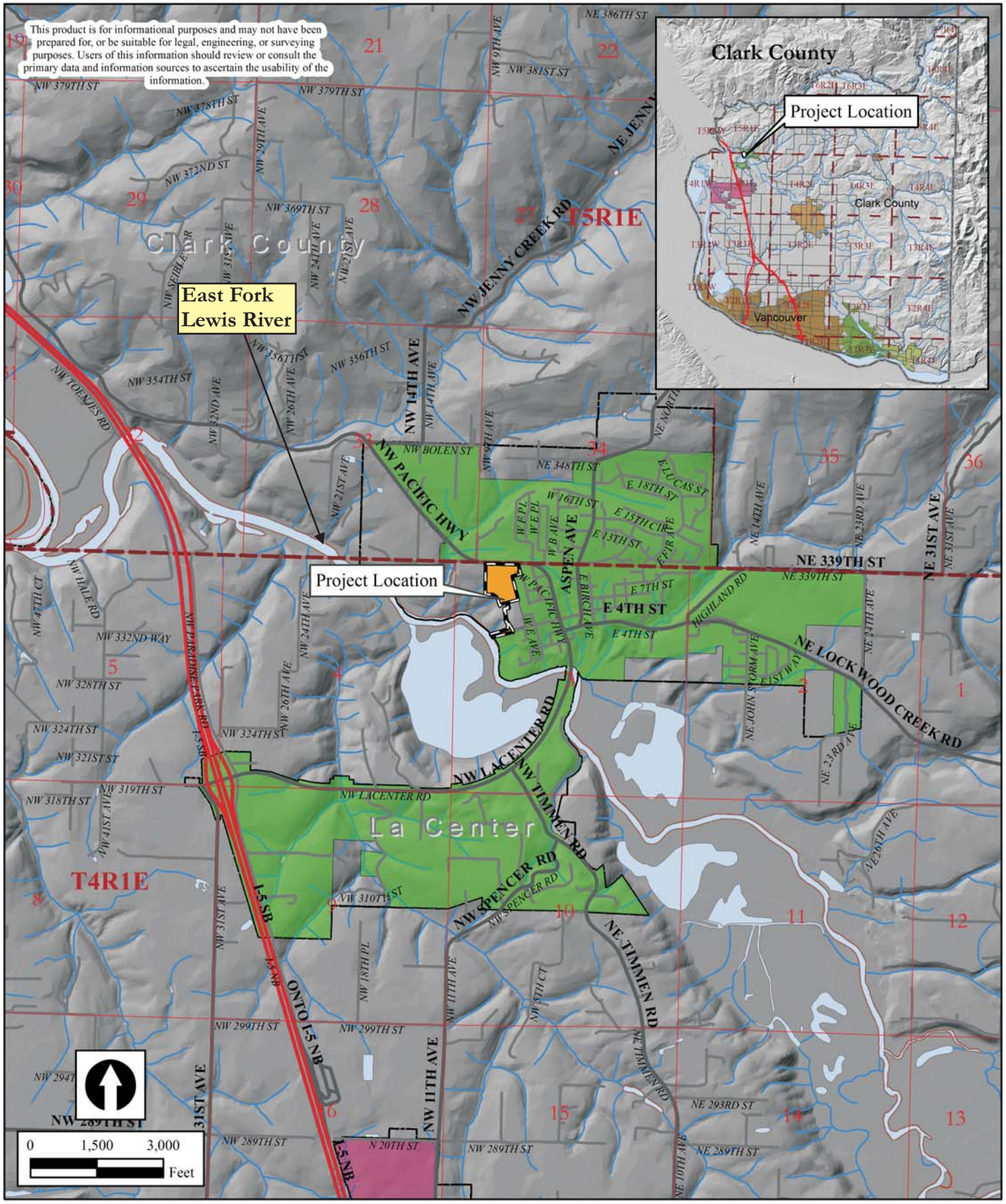
Photo-Sheet 1



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

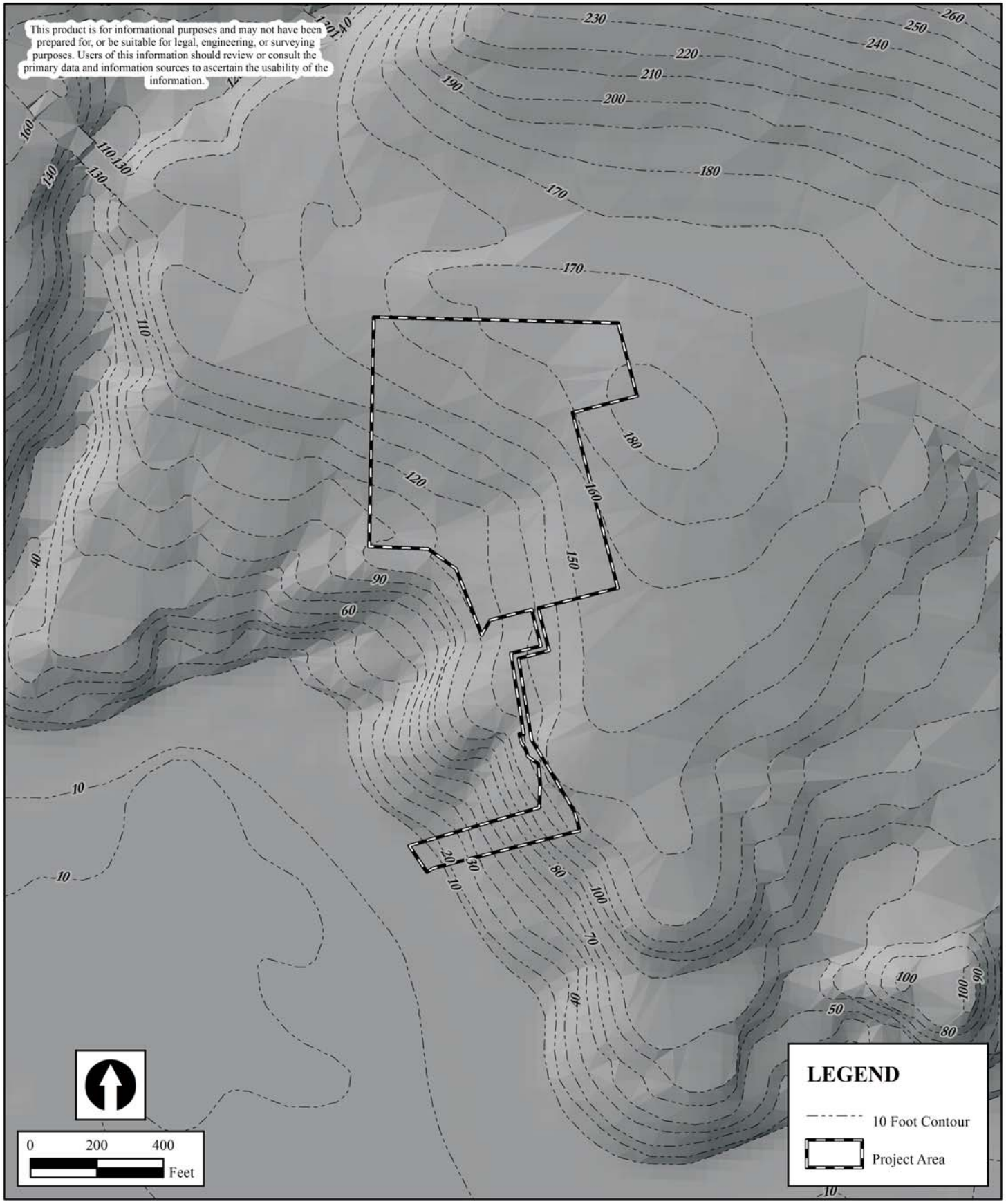
PURPOSE: Wetland Mitigation

Project Location Map
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 1



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Clark County LiDAR Topography
Kays Subdivision Project
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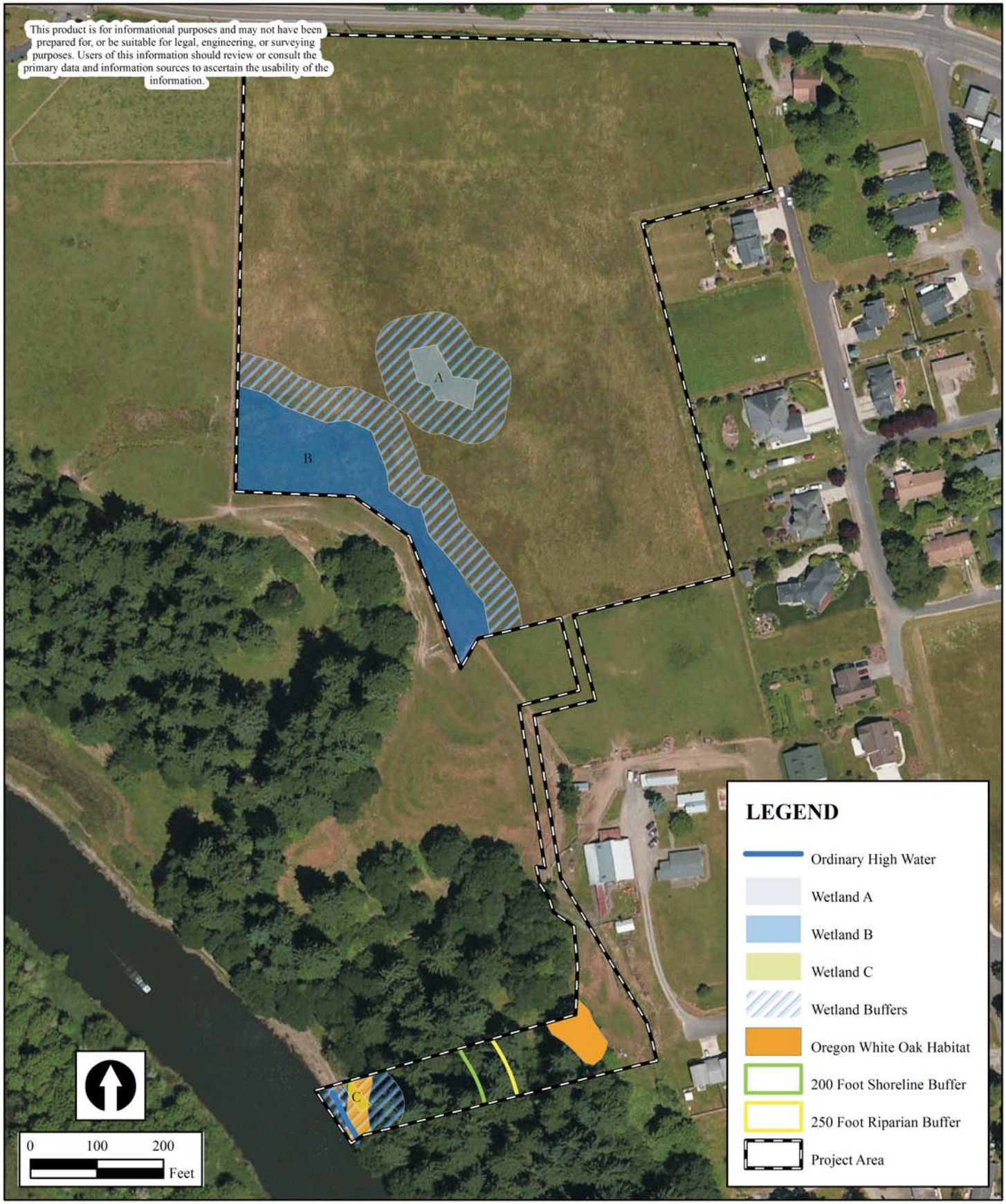
Figure 2



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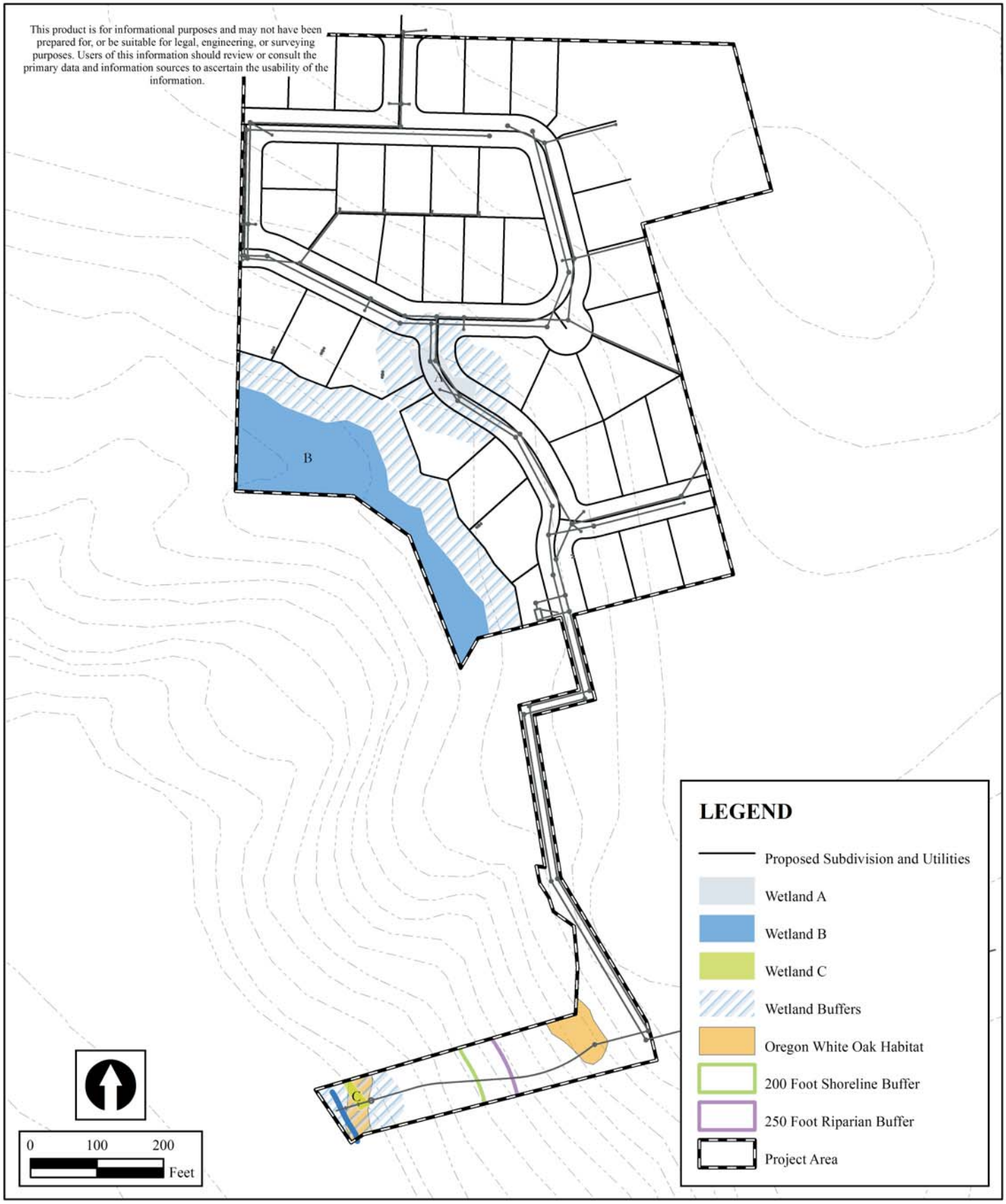

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Vancouver, WA 98661

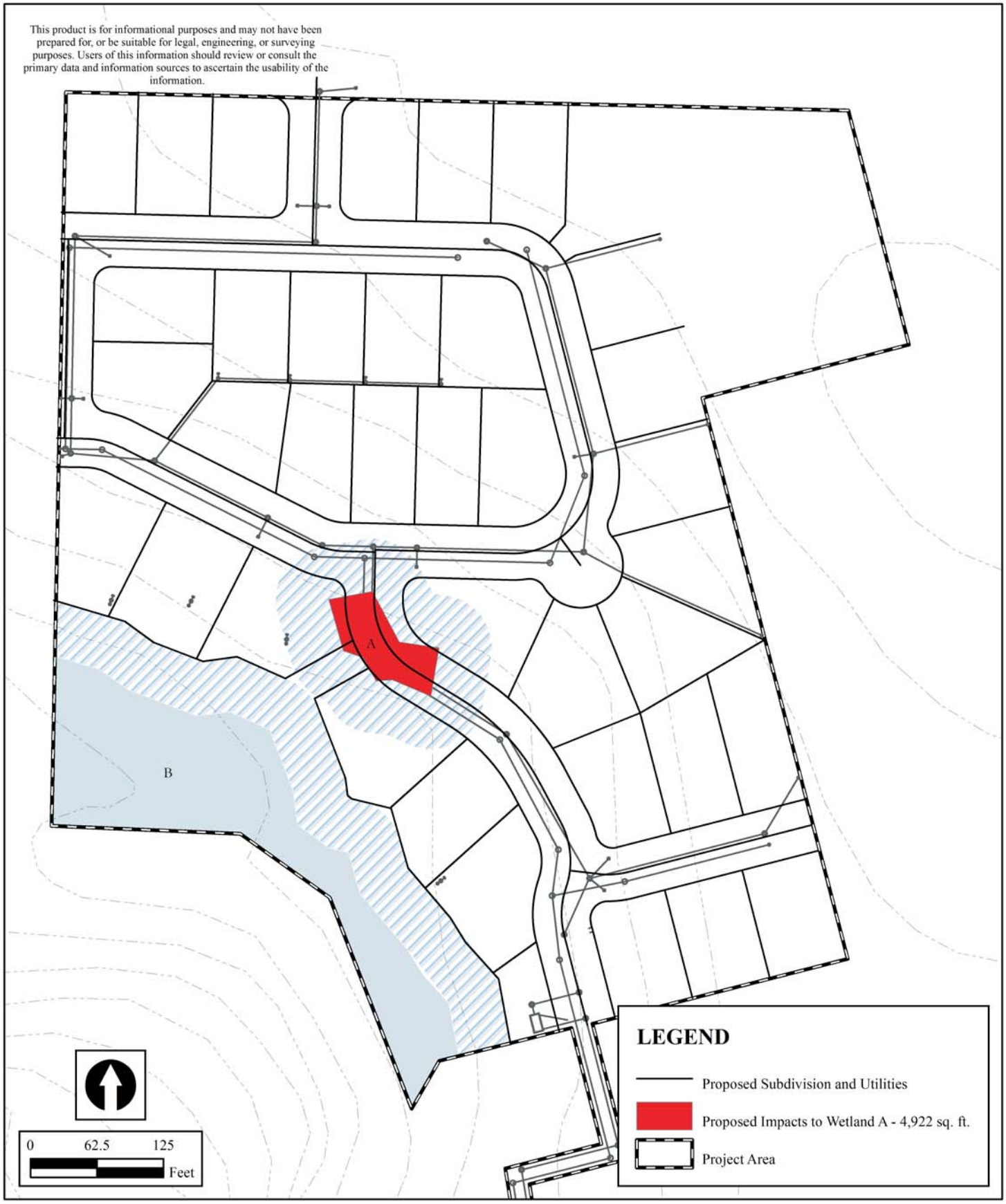
PURPOSE: Wetland Mitigation

Proposed Site Plan
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 4



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Wetland Mitigation

Proposed Impacts - Wetland A
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
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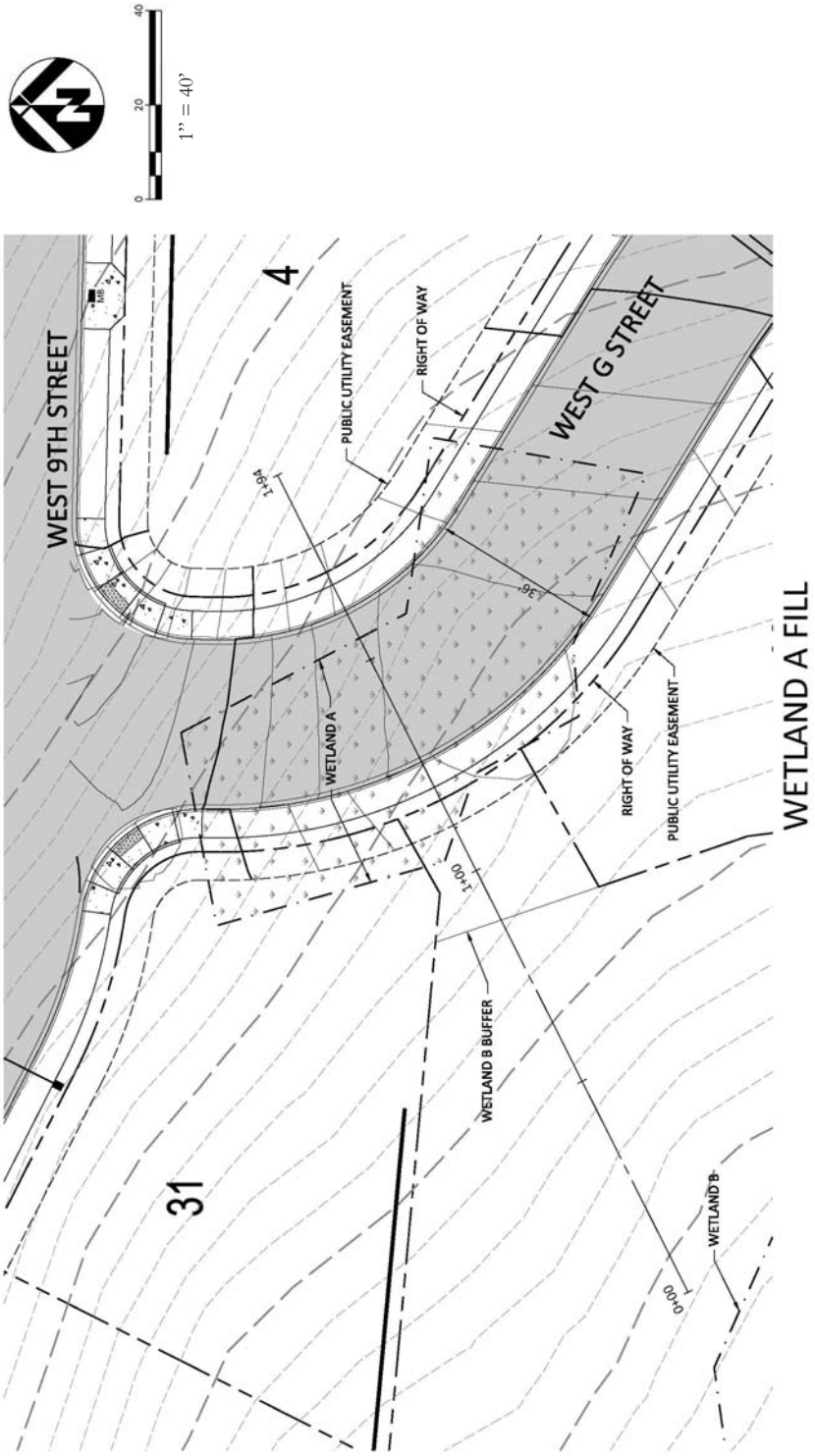
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 5



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

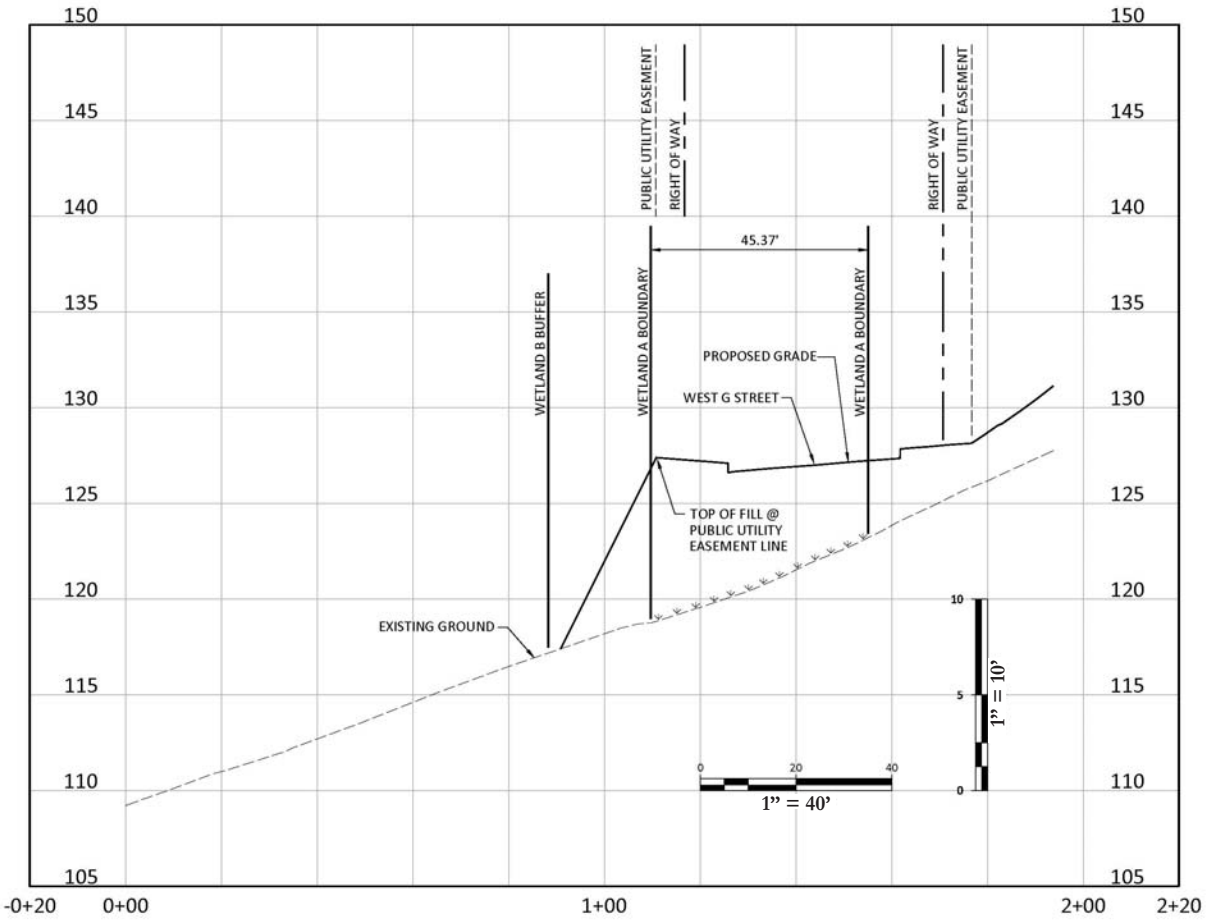
PURPOSE: Wetland Mitigation

Wetland A Roadway Fill Details
Kays Subdivision Project
LaCenter, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

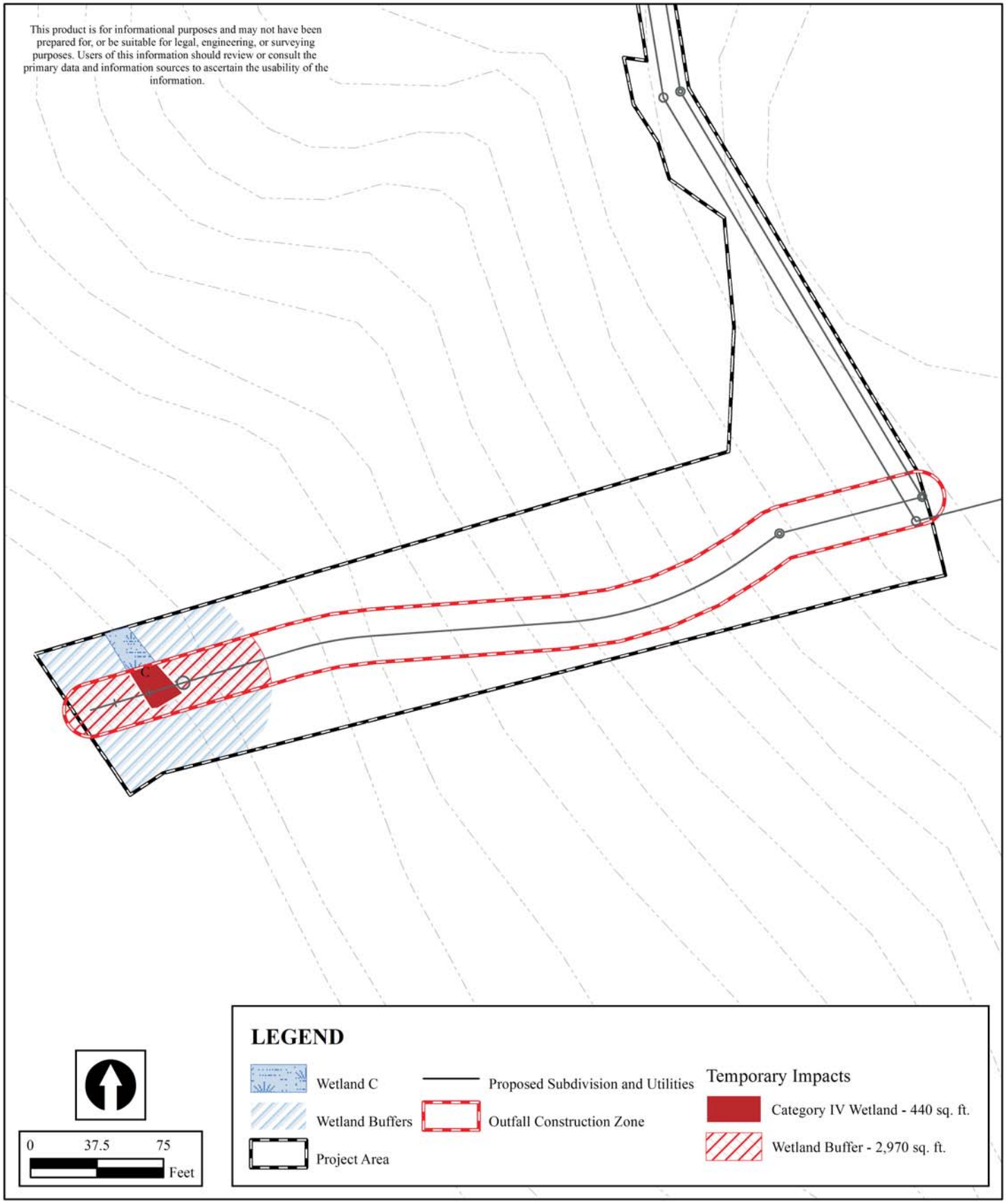
PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 6



WETLAND A FILL

Corps Reference No.: NWS-2013-739 **WARAC, LLC** **APPLICANT:** WARAC, LLC 7211 A NE 43rd Avenue Vancouver, WA 98661 **PURPOSE:** Wetland Mitigation	**Wetland A Roadway Fill Cross Section** **Kays Subdivision Project** **La Center, Washington** The Resource Company, Inc. ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION 915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242	**PROPOSED ACTIVITIES IN:** E. Fork of the Lewis River Watershed **LEGAL:** NW ¼ of Section 3, T4N, R1E, W. M., **NEAR:** La Center, Washington **COUNTY:** Clark County **DATE:** March 4, 2015 **Figure 7**



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

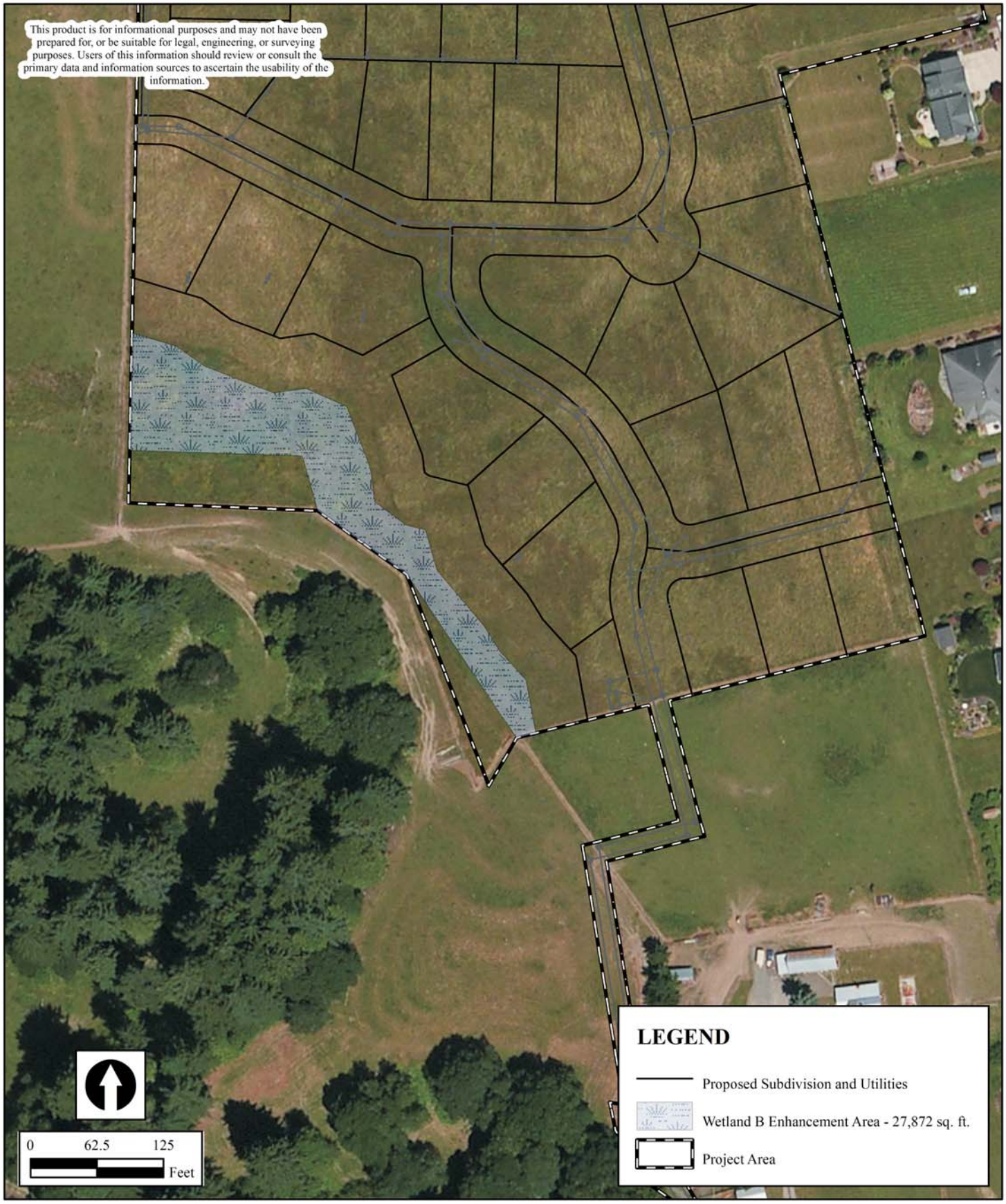
PURPOSE: Wetland Mitigation

Wetland C Temporary Impacts
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 8



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

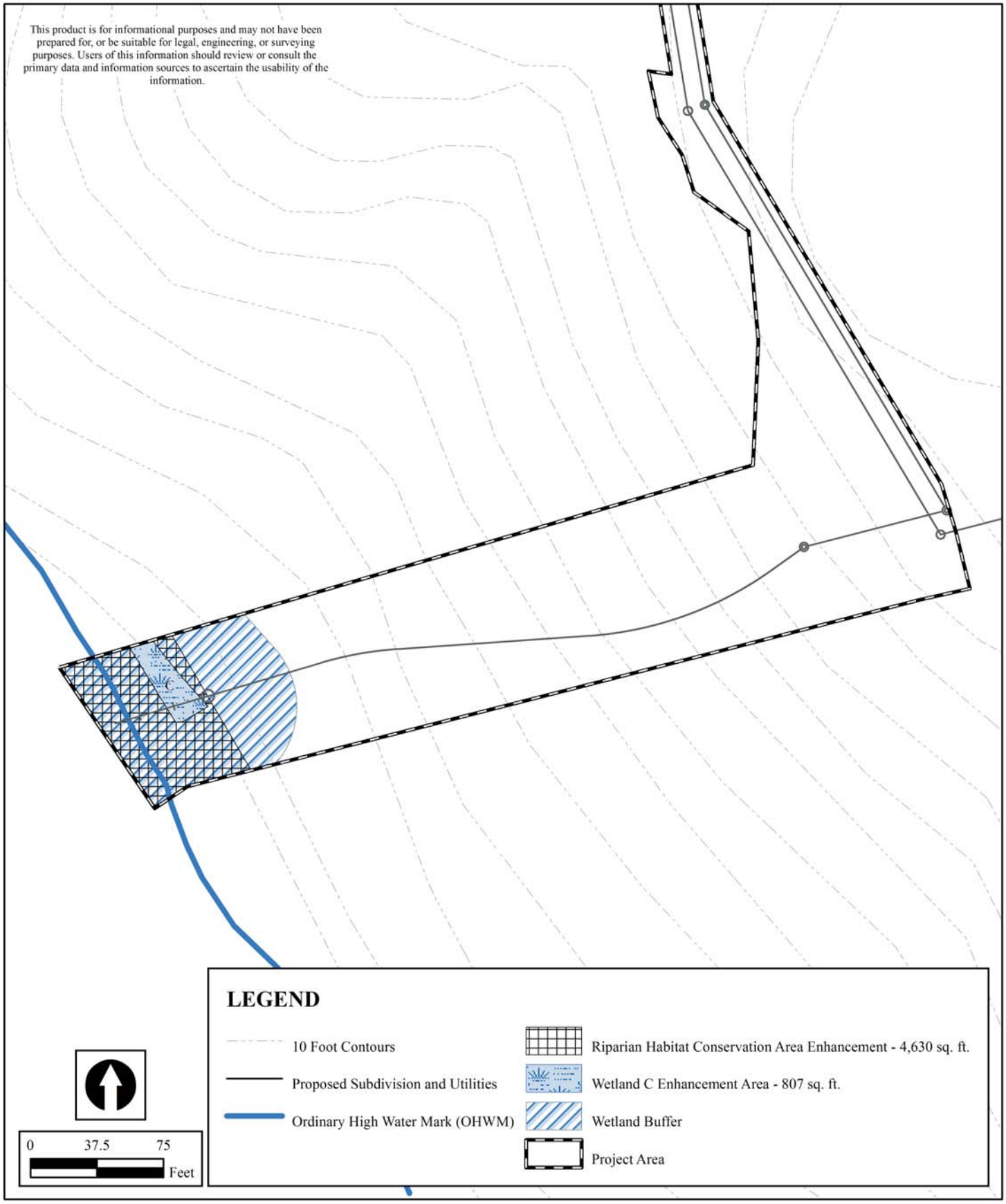
PURPOSE: Wetland Mitigation

Mitigation Wetland A - Enhance Wetland B
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 9



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

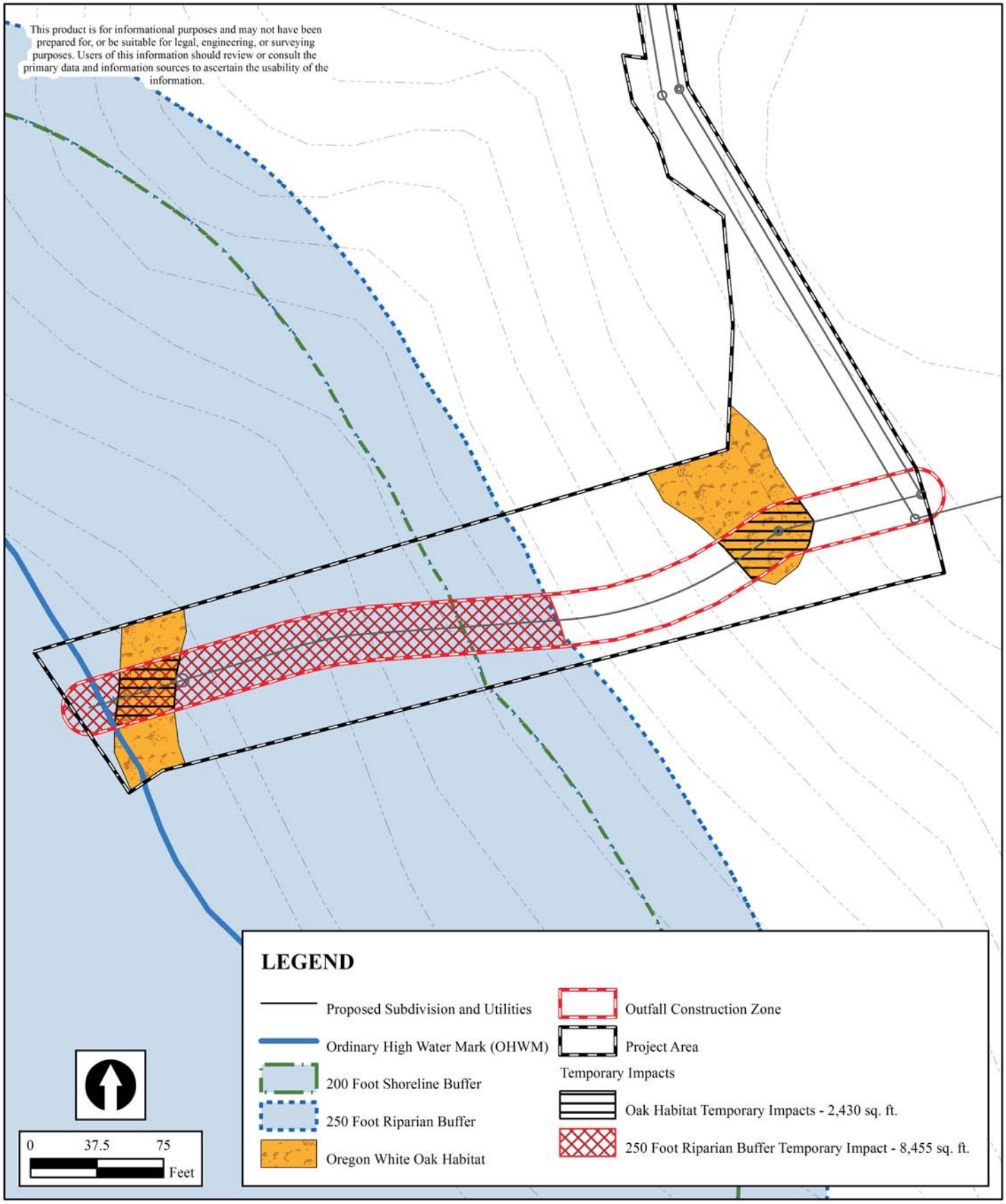
PURPOSE: Wetland Mitigation

Wetland C and Riparian Enhancement
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 10



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Wetland Mitigation

Habitat Impacts - Stormwater Outfall
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

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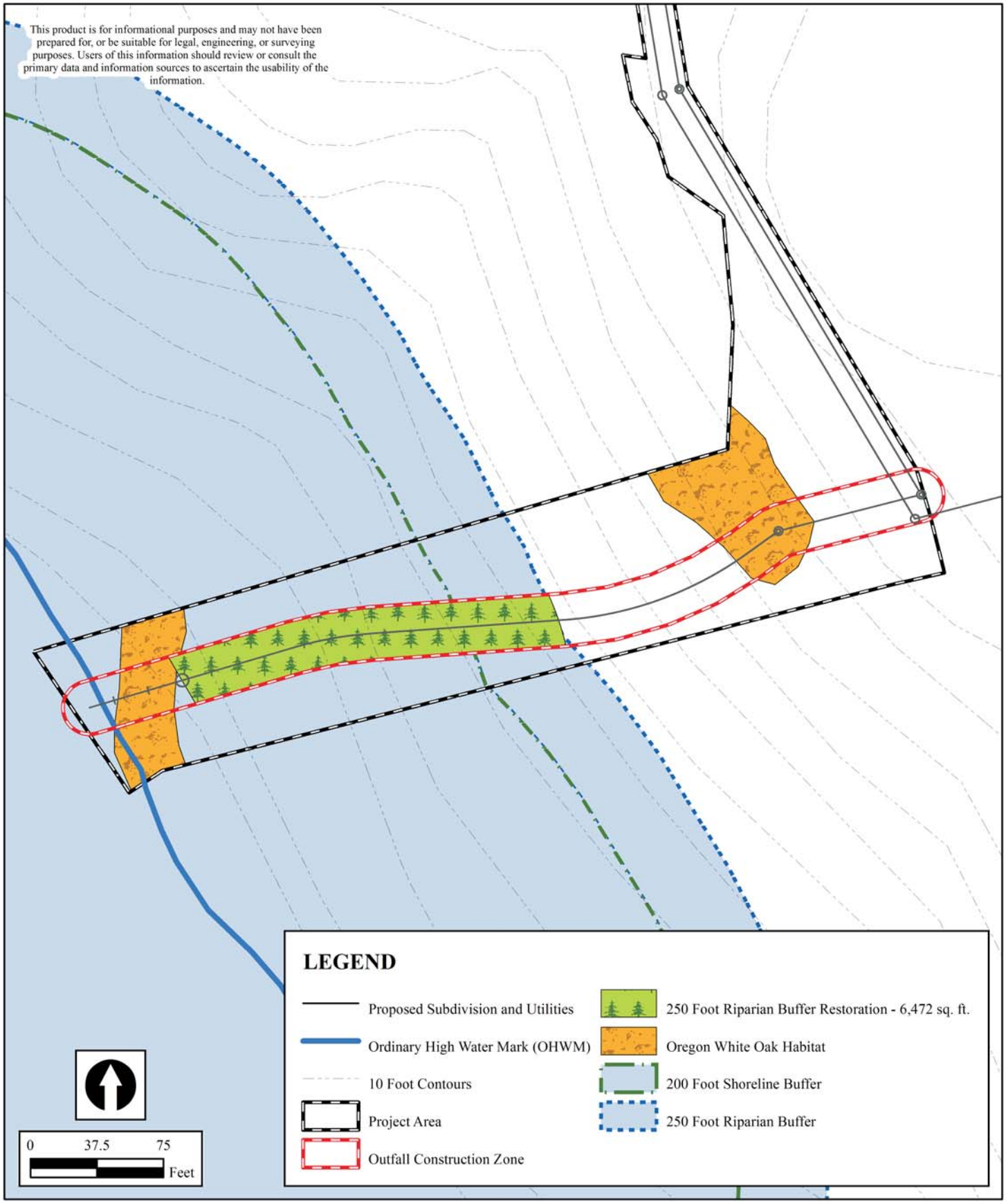
DATE: March 4, 2015

Figure 11



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

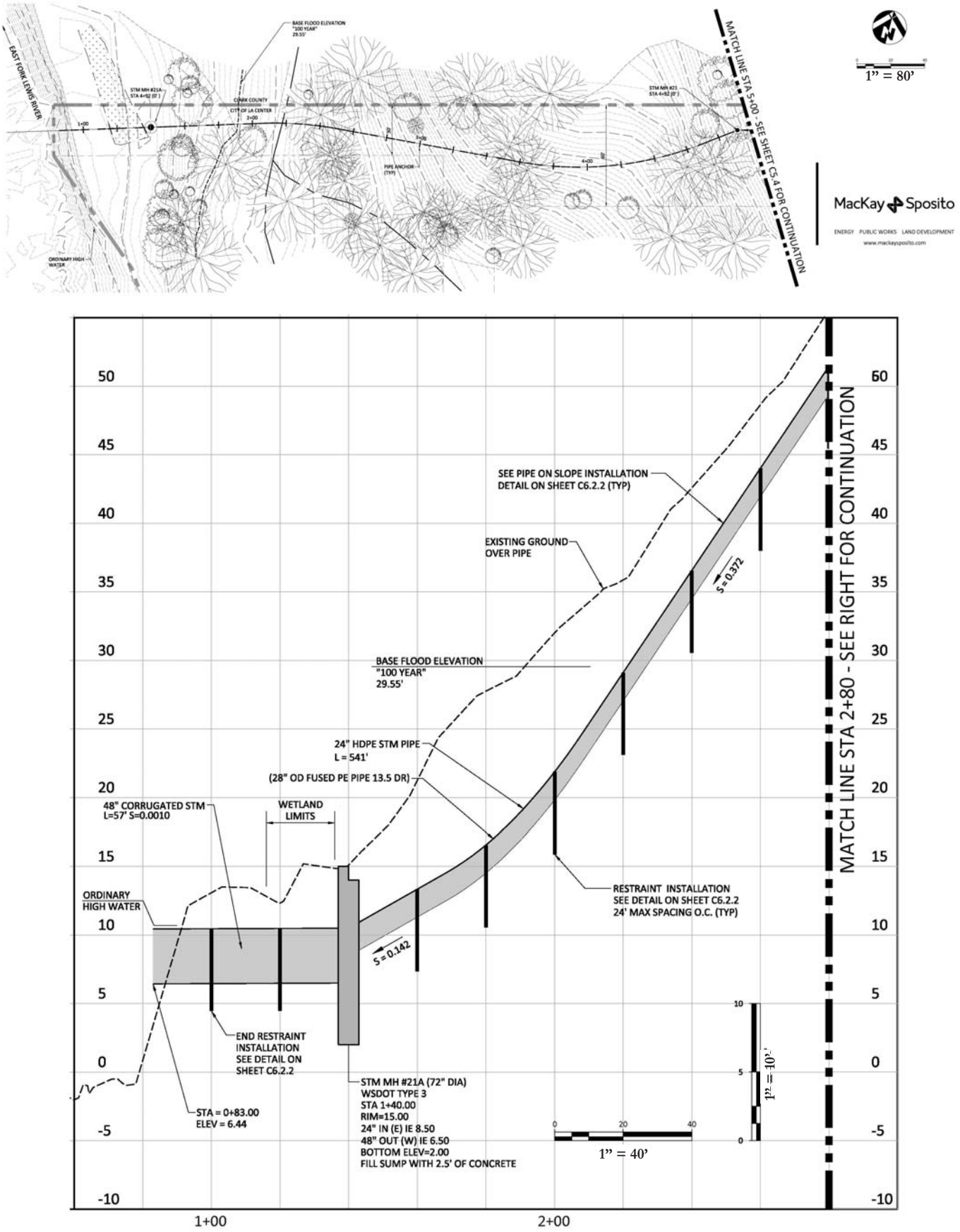
PURPOSE: Wetland Mitigation

Habitat Restoration Area - Stormwater Outfall
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 12



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Wetland Mitigation

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

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E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
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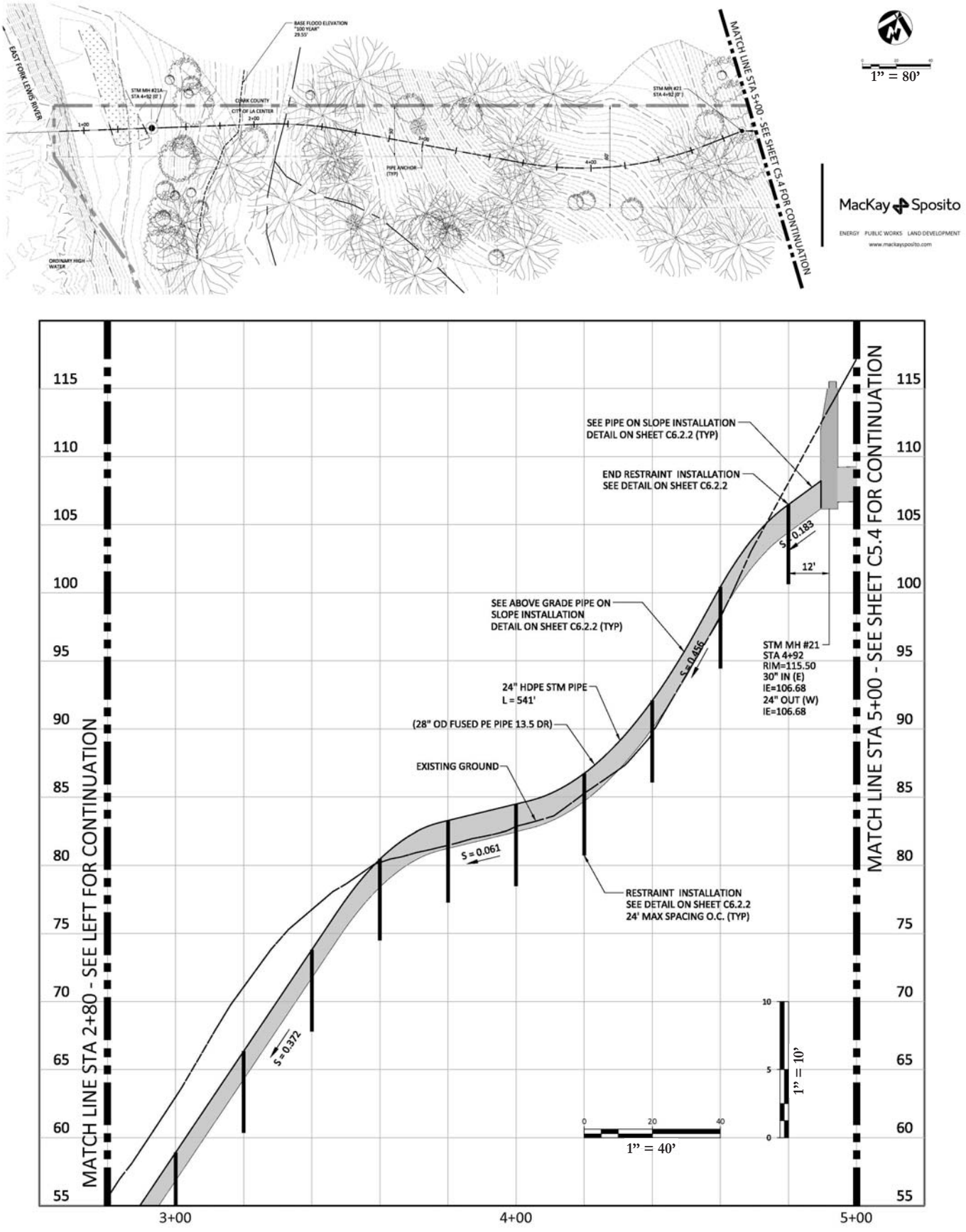
COUNTY: Clark County
DATE: March 4, 2015

Figure 13



Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Wetland Mitigation

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

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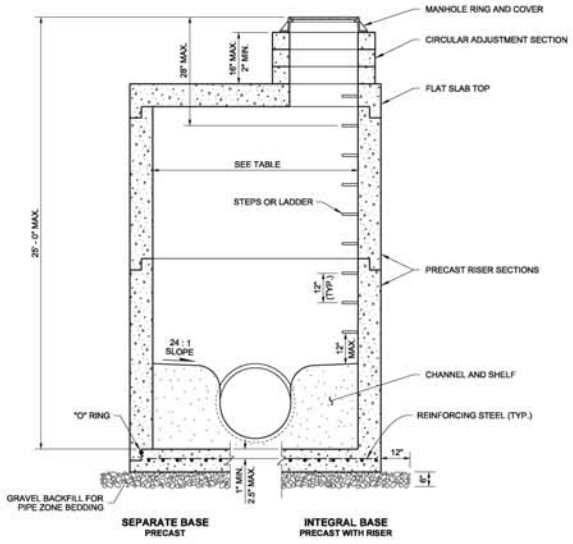
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 14

DRAWN BY: LISA DYFORD



NOTES

1. Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum.
2. For pipe allowances, see **Standard Plan B-10.20.**
3. No steps are required when height is 4' or less.

MANHOLE DIMENSION TABLE

DIAM.	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS
48"	4"	6"	36"	8"
54"	4.5"	8"	42"	8"
60"	5"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	42"	12"
144"	12"	12"	108"	12"

CASEY M. KRAMER STATE OF WASHINGTON 44035 REGISTERED PROFESSIONAL ENGINEER

MANHOLE TYPE 3

STANDARD PLAN B-15.60-0

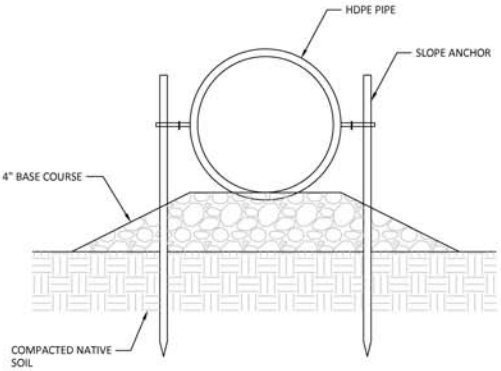
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III 02-07-12

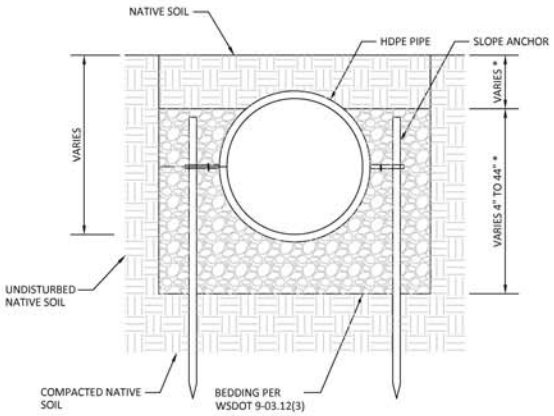
STATE DESIGN ENGINEER DATE

Washington State Department of Transportation



ABOVE GRADE PIPE ON SLOPE INSTALLATION DETAIL

NO SCALE



PIPE ON SLOPE INSTALLATION DETAIL

NO SCALE

* WHERE PIPE IS PARTIALLY EXPOSED, SOIL SURFACE SHALL MATCH EXISTING AND SOIL DEPTH ABOVE BEDDING SHALL BE 12 INCHES EXCEPT THAT SOIL SHALL NOT PRECLUDE THE LOWEST 4 INCHES OF BEDDING. WHERE PIPE IS NOT EXPOSED, SOIL SURFACE SHALL MATCH EXISTING (UNLESS OTHERWISE STATED ON PLANS) AND SOIL DEPTH ABOVE BEDDING SHALL BE 12 INCHES EXCEPT THAT BEDDING MATERIAL NEED NOT EXCEED 44 INCHES TOTAL THICKNESS.

FILE: W:\15472\CIVIL\DWG\SHEETS\15472_C6.2_C6.2.1_STM_DETAILS_C3D2012.DWG

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Wetland Mitigation

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
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915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
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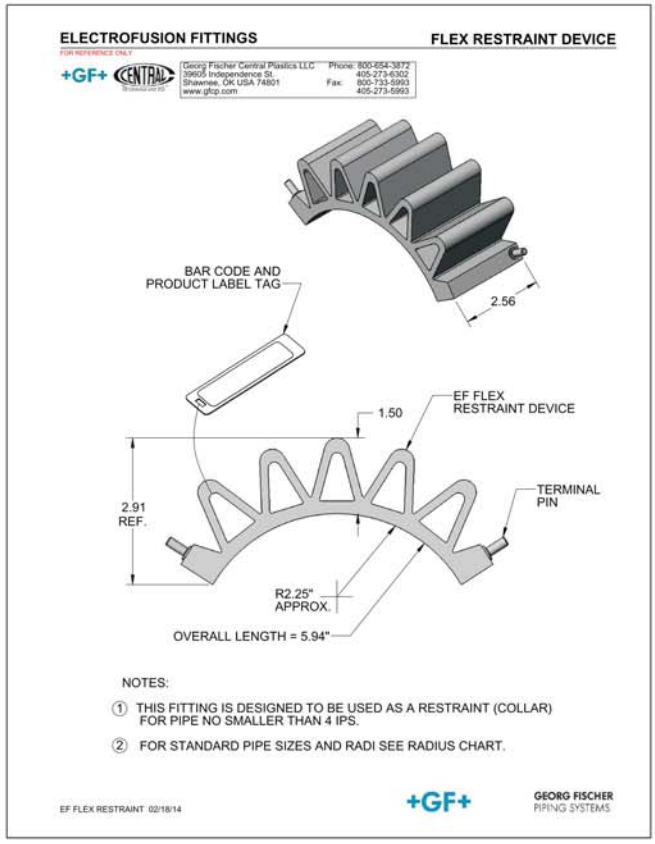
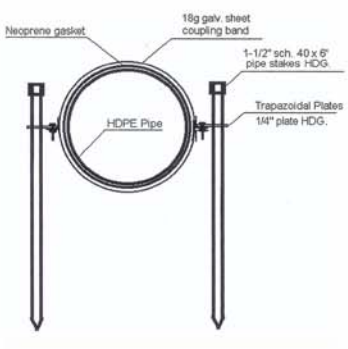
COUNTY: Clark County
DATE: March 4, 2015

Figure 15

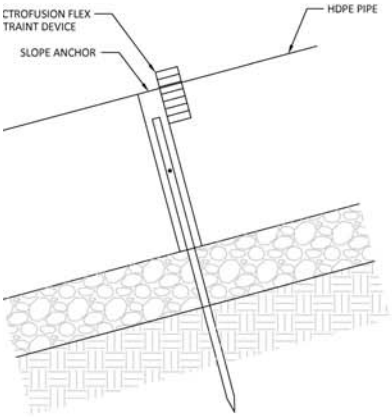


NOTE: INSTALL ELECTROFUSION FLEX RESTRAINT DEVICE PER MANUFACTURER'S RECOMMENDATIONS.



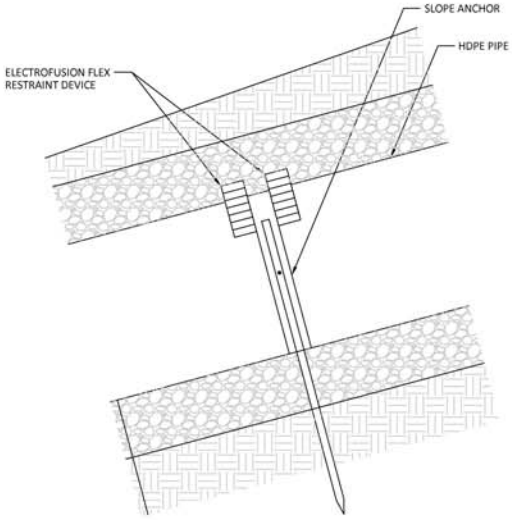
SLOPE ANCHOR

NO SCALE



RESTRAINT INSTALLATION DETAIL

NO SCALE



END RESTRAINT INSTALLATION DETAIL

NO SCALE

MacKay Sposito
ENERGY PUBLIC WORKS LAND DEVELOPMENT
www.mackaysposito.com

KAY'S SUBDIVISION
LA CENTER, WASHINGTON

STORM DETAILS

REVISIONS:

JOB NO.:	15472/15695
DATE:	2/10/2015
SCALE:	NO SCALE
DESIGNED BY:	BT
DRAWN BY:	AJS
CHECKED BY:	

100% PLAN SET

C6.2.2

NO. 45 OF 52

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

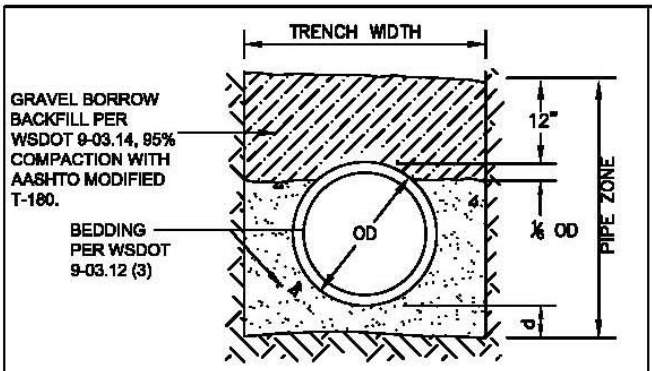
PURPOSE: Wetland Mitigation

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
915 Broadway, Suite 250, Vancouver, WA 98660 ph: 360-693-4555 fax: 360-699-6242

PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 16



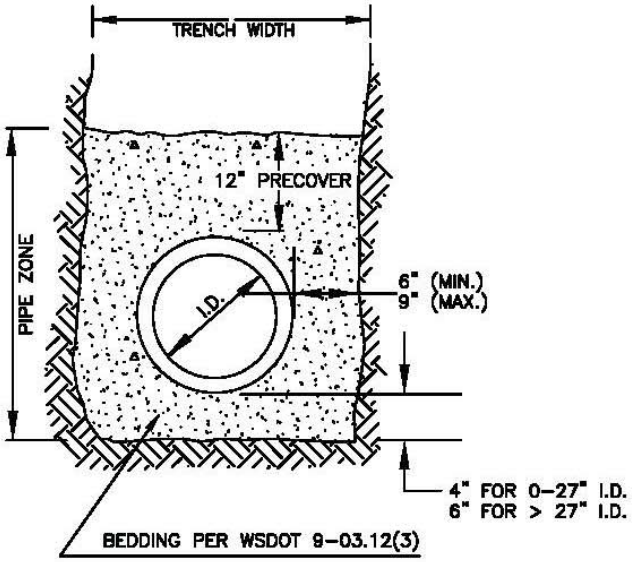
GRANULAR FOUNDATION

LEDGEND:

OD = OUTSIDE DIAMETER
ID = INSIDE DIAMETER
d = DEPTH OF BEDDING MATERIAL BELOW PIPE

DEPTH OF BEDDING MATERIAL BELOW PIPE	
ID	d (min)
18" & SMALLER	6"
LARGER THAN 18"	8"

RIGID PIPE



FLEXIBLE PIPE

NOTES:

1. WHERE DIRECTED BY THE PUBLIC WORKS DIRECTOR, GRANULAR TRENCH FOUNDATIO STABILIZATION SHALL BE PLACED PRIOR TO PLACEMENT OF THE BEDDING. SIZE AND DEPTH ARE DEPENDENT ON SOIL CONDITIONS.
2. BEDDING AND BACKFILL MATERIALS IN THE PIPE ZONE SHALL BE COMPACTED AS SPECIFIED PRIOR TO BACKFILLING THE REMAINDER OF THE TRENCH.
3. FOR ROCK AND OTHER INCOMPRESSIBLE MATERIALS, THE TRENCH SHALL BE OVER EXCAVATED A MINIMUM OF 6" AND REFILLED WITH GRANULAR MATERIALS AS DIRECTED BY THE PUBLIC WORKS DIRECTOR.
4. IMPORTED GRANULAR MATERIAL SHALL BE USED FOR UTILITY TRENCH BACKFILL. THE CONTACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO USE. THE PUBLIC WORKS DIRECTOR MAY APPROVE, REJECT OR REQUIRE LABORATORY TESTING OF THE MATERIAL.
5. TRENCH WIDTH SHALL NOT EXCEED ONE AND ONE-HALF THE INSIDE DIAMETER OF THE PIPE PLUS 18" AT THE TOP OF THE PIPE ZONE.
6. APPROVAL FOR SUCH ALTERNATE MATERIALS WILL BE GRANTEDUPON CONFIRMATION BY TEST OF ITS COMPLIANCE WITH THESE REQUIREMENTS.
7. ALTERNATIVE PRE-COVER MATERIALS ARE ALLOWABLE FROM PIPE CENTERLINE TO ONE FOOT ABOVE THE TOP OF THE PIPE FOR FLEXIBLE PIPE. ALTERNATE PRE-COVER MATERIALS MUST BE PREAPPROVED BY THE INSPECTOR AND MAY BE SAND, CRUSHER SCREENINGS, GRAVEL, OR OTHER CLEAN GRANULAR MATERIAL CONTAINING NO ROCK LARGER THAN 1-1/4" IN LENGTH.

PIPE BEDDING (RIGID AND FLEXIBLE PIPE)

PLAN #

CITY OF LA CENTER APPROVED

Bart Stupp, PE 7/23/09

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:

SS-5

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Wetland Mitigation

Stormwater Outfall Details
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
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PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
LEGAL: NW ¼ of Section 3, T4N, R1E, W. M.,
NEAR: La Center, Washington
COUNTY: Clark County
DATE: March 4, 2015

Figure 17

Wetland A

Wetland A

Wetland B

Wetland B

Wetland C

Wetland C

Corps Reference No.: NWS-2013-739
WARAC, LLC

APPLICANT:
WARAC, LLC
7211 A NE 43rd Avenue
Vancouver, WA 98661

PURPOSE: Wetland Mitigation

Project Photographs
Kays Subdivision Project
La Center, Washington

The Resource Company, Inc.
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION
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PROPOSED ACTIVITIES IN:
E. Fork of the Lewis River Watershed
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DATE: March 4, 2015

Photo Sheet 1

Information regarding Frequently Flooded Areas

The project does not reduce the capacity of the floodplain. Excavation, backfill, and material placed over the outfall pipe provides a net increase of approximately 2 cubic yards for the pipe. For the outfall structure and the channel that connects the outfall structure to the main river channel, the excavation, structure placement, and riprap placement entails 5 cubic yards of net removal for the outfall. The combined effect is a reduction of material (by approximately 3 cubic yards) and a corresponding increase in floodplain volume capacity.

The proposed outfall structure (concrete stilling well, riprap-lined channel, and anchored and partially buried pipe, are not susceptible to water damage and are designed to withstand the forces involved with the low flood velocities.

The project does not negatively impact the Base Flood Elevation. In cross section, the minor amount of fill represents a blockage of 0.02% of the floodway area at low river flow velocities (less than 1 foot per second) and submerged water depth of 15 feet. This is coupled with a 0.03% increase an open area in the floodway section (for the same velocity and depth range) for the corresponding proposed outfall channel. The net effect is a negligible increase in floodway flow capacity.

Kays Subdivision
15695/15472
Floodway values extrapolation
FEMA FIRM 53011C0206D, September 5, 2012
FEMA FIS 53011CV001A "Clark County, Washington and Incorporated Areas", September 5, 2012

East Fork Lewis River

Source	Cross Section	Distance (miles)	Width (ft)	Section Area (sq ft)	Mean Velocity (fps)	1% Annual Chance Flood Water Surface Elevation (Regulatory, NAVD88) (ft)
FEMA FIS	D	2.39	1020	21460	1.3	33.2
FEMA FIRM and Extrapolation	West 5th St	2.63	1670	34469	0.7	33.3
FEMA FIS	E	2.83	1535	31767	0.8	33.3

Notes:
Distance measured from FIRM.
Width measured from FIRM.
Section Area linearly extrapolated from Section Areas and Widths of adjacent sections.
Mean Velocity linearly extrapolated from Mean Velocities and Section Areas of adjacent sections.
WSE linearly interpolated from Distance and WSE of adjacent sections.

CITY OF LA CENTER
530248

MAP SCALE 1" = 500'
250 0 500 1000
FEET
METERS

T. 5N.
T. 4N.

Kay's Subdivision

EAST FORK LEWIS RIVER
ZONE X

Storm Outfall

ZONE AE
ZONE X
Mccormick Creek
Bridge
Brezee Creek
CITY OF LA CENTER
CLARK COUNTY

JOINS PANEL 0202

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0206D

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, WASHINGTON AND INCORPORATED AREAS

PANEL 206 OF 600
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	530024	0206	D
LA CENTER, CITY OF	530248	0206	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
53011C0206D

EFFECTIVE DATE
SEPTEMBER 5, 2012

Federal Emergency Management Agency

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

MAP SCALE 1" = 500'

250 0 500 1000

FEET

METERS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line

23 - - - - - 23 — Transect line

45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere

3100000 FT — 5000-foot ticks: Washington State Plane South Zone (FIPS Zone 4602), Lambert Conformal Conic projection

4989000m N — 1000-meter Universal Transverse Mercator grid values, zone 10

DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 — River Mile

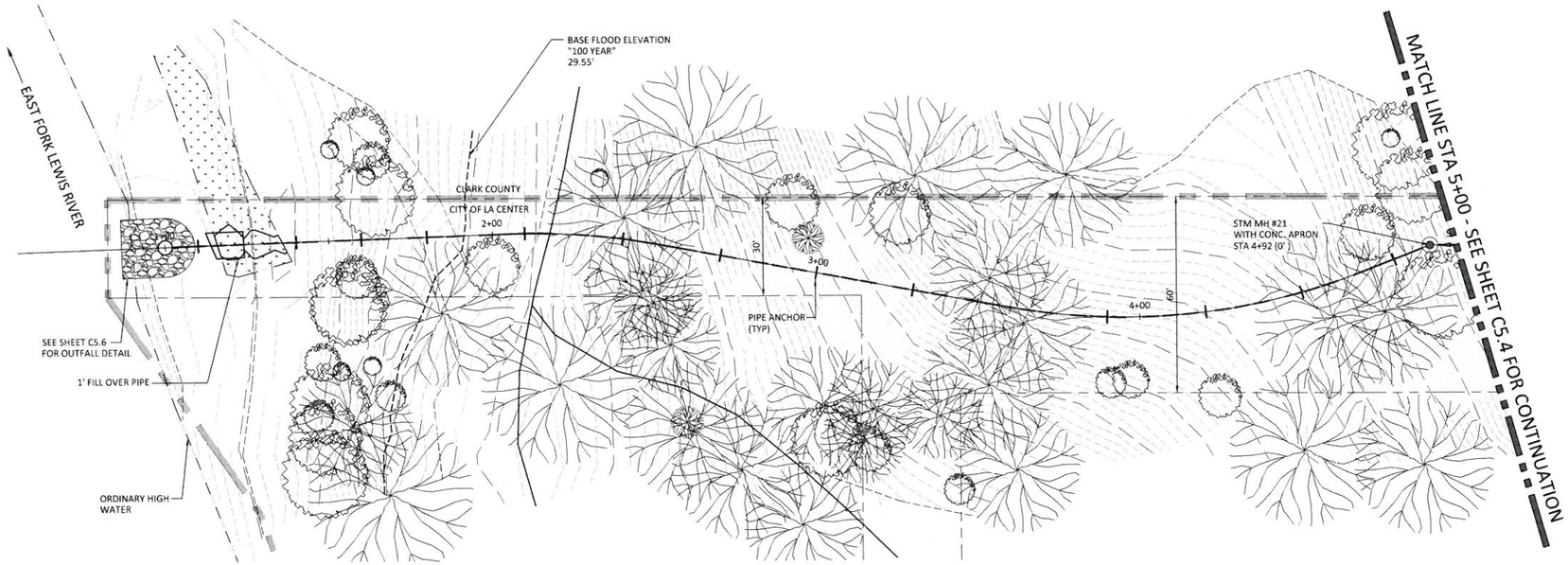
MAP REPOSITORIES
Refer to Map Repositories list on Map Index

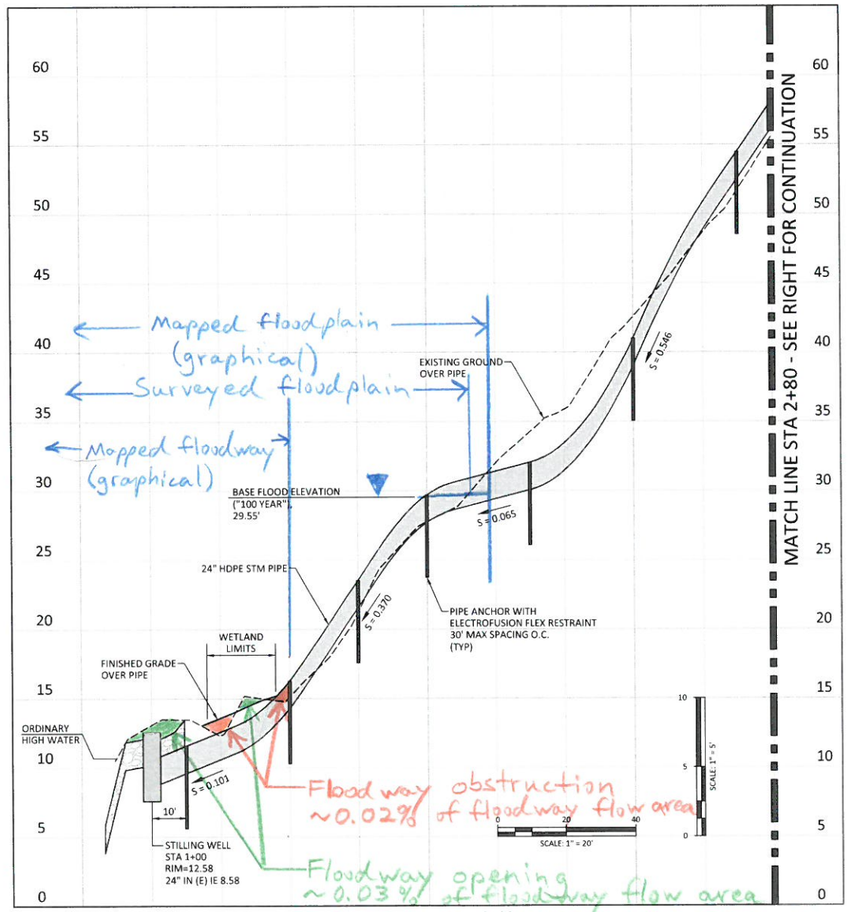
EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
September 5, 2012

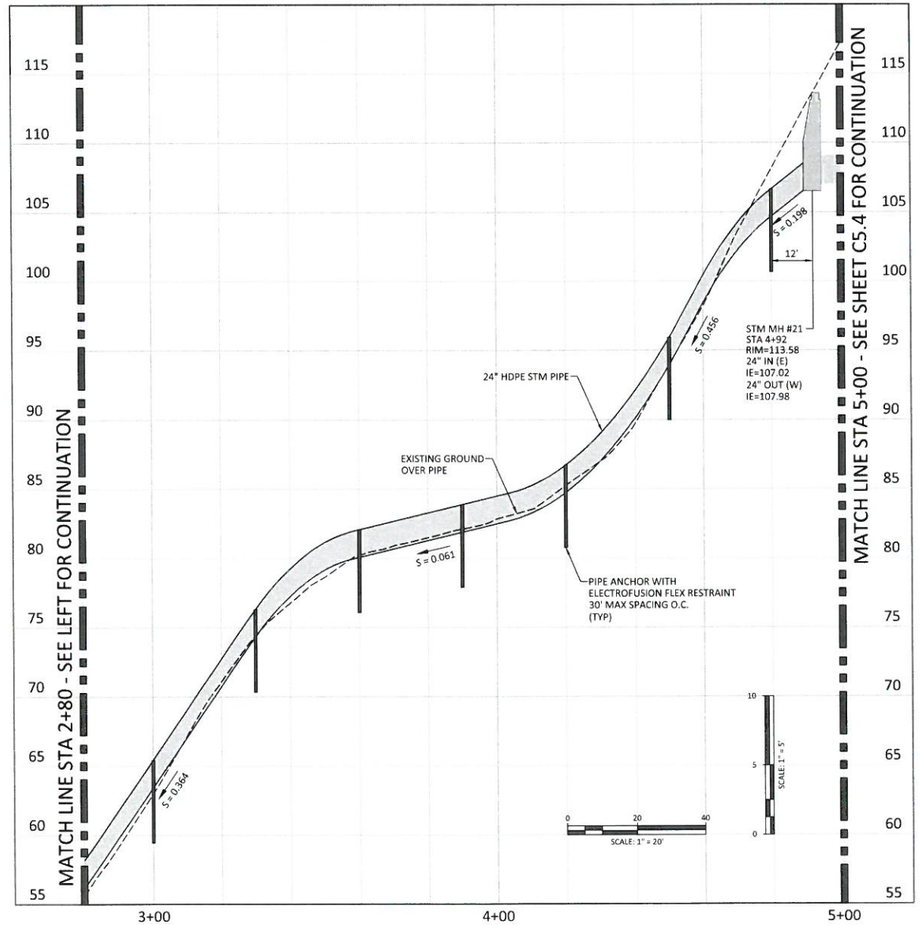
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.







NUTTER CORPORATION

MacKay Sposito

ENERGY PUBLIC WORKS LAND DEVELOPMENT

www.mackaysposito.com

PRELIMINARY NOT FOR CONSTRUCTION

ROBERT J. TAYLOR 43094 PROFESSIONAL ENGINEER

KAY'S SUBDIVISION

LA CENTER, WASHINGTON

OFFSITE STORM PLAN AND PROFILE

REVISIONS:

JOB NO.:	15472/15695
DATE:	8/14/2014
SCALE:	H: 1"=20' - V: 1"=5'
DESIGNED BY:	BT
DRAWN BY:	AJS
CHECKED BY:	

90% PLAN SET

C5.3

NO. 34 OF 50

FILE: W:\15472\CIVIL\DWG\SHEETS\15472_C5.3_C5.5_OFFSITE_STM_C3D2012.DWG

FLOOD INSURANCE STUDY

VOLUME 1 OF 2

CLARK COUNTY, WASHINGTON
AND INCORPORATED AREAS

Selected pages

COMMUNITY NAME	COMMUNITY NUMBER
BATTLE GROUND, CITY OF	530025
CAMAS, CITY OF	530026
CLARK COUNTY (UNINCORPORATED AREAS)	530024
LA CENTER, CITY OF	530248
RIDGEFIELD, CITY OF	530298
VANCOUVER, CITY OF	530027
WASHOUGAL, CITY OF	530028
YACOLT, TOWN OF	530269

CLARK COUNTY

EFFECTIVE DATE: SEPTEMBER 5, 2012

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
53011CV001A

Table 4 – Summary of Discharges

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGES (cfs) 10%-ANNUAL-CHANCE	2%-ANNUAL-CHANCE	1%-ANNUAL-CHANCE	0.2%-ANNUAL-CHANCE
Burnt Bridge Creek					
At mouth	22.5	115	220	255	330
At USGS Gage	19.8	120	230	270	340
At N.E. 112th Avenue	5.0	55	110	135	180
China Ditch					
At mouth	8.9	495	665	740	915
Curtin Creek					
At mouth	11.0	335	460	520	670
At NE 109th Street	4.5	225	360	405	530
At NE 83rd Street	1.0	60	85	95	130
East Fork Lewis River					
At mouth	212.0	19,200	24,400	26,900	32,000
Upstream of confluence with Lockwood Creek	185.0	17,000	21,700	23,800	28,300
Approximately 17,000 feet downstream of Daybreak Road	165.0	20,650	28,630	32,200	40,900
At Daybreak Road	152.0	18,600	26,050	29,300	37,210
At Lewisville Park	150.0	15,300	19,400	21,400	25,400
Fifth Plain Creek					
At mouth	20.2	1,280	1,750	1,960	2,460
Upstream of China Ditch	9.0	650	895	1,000	1,260
Upstream of Shanghai Creek	4.6	360	495	555	700
At 119th Street	2.6	225	315	350	445
Gee Creek					
At Burlington Northern Railroad	13	850	1,010	1,080	1,260
At County Road	9	580	695	745	870
Lacamas Creek					
At Goodwin Road	52.8	4,170	5,740	6,430	8,080
At Fourth Plain Road	22.7	1,990	2,740	3,060	3,850

Project is between these two.

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F. P. S.)	REGULATORY (NAVD88)	WITHOUT FLOODWAY (NAVD88)	WITH FLOODWAY (NAVD88)	INCREASE
EAST FORK LEWIS RIVER								
A	0.78	539	10,656	2.5	32.6	32.6	33.0	0.4
B	0.92	370	7,995	3.4	32.6	32.6	33.0	0.4
C	1.72	355	7,898	3.4	33.0	253.5	33.5	0.5
D	2.39 2.63 (map)	1,020 1,670 (map)	21,460 34,418 (6)	1.3 0.7 (6)	33.2 33.8 (6)	33.2 33.3 (6)	33.7 33.8 (6)	0.5 0.5 (6)
E	2.83	1,535	31,767	0.8	33.3	33.3	33.8	0.5
F	3.13	433	11,443	2.4	33.3	33.3	33.8	0.5
G	3.24	760	11,527	2.3	33.3	33.3	33.8	0.5
H	3.50	1,230	21,782	1.2	33.5	33.5	34.1	0.6
I	3.75	1,300	25,095	1.1	33.5	33.5	34.1	0.6
J	4.03	1,400	24,901	1.1	33.5	33.5	34.1	0.6
K	4.64	1,400	24,960	0.1	33.6	33.6	34.3	0.7
L	5.23	2,120	33,838	0.7	33.6	33.6	34.4	0.8
M	5.61	2,000	25,892	0.9	33.6	33.6	34.4	0.8
N	6.02	3,450	49,595	0.6	33.7	33.7	34.5	0.8
O	6.24	2,650	29,227	0.6	33.7	33.7	34.5	0.8
P	6.46	2,650	20,849	1.1	33.7	33.7	34.5	0.8
Q	6.78	3,500	25,699	1.3	35.0	35.0	35.7	0.7
R	7.28	3,702	27,036	1.2	35.3	35.3	36.0	0.7
S	7.53	3,162	18,332	1.6	35.5[2] / 35.6[3]	35.5	36.2	0.7
T	7.74[4]	872	10,277	3.3	35.8[2] / 35.9[3]	35.9	36.6	0.7
U	7.89[4]	825	3,086	4.4	36.7[2] / 36.8[3]	36.7	37.3	0.6
V[5]								
W	8.00[4]	606	3,550	3.8	38.1[2] / 38.3[3]	38.1	38.6	0.5
X	8.24[4]	1,318	4,073	3.3	41.3[2] / 41.6[3]	41.3	41.7	0.4
Y	8.41	2,000	8,206	3.6	45.4[2] / 45.7[3]	45.4	45.7	0.3
Z	8.66	1,541	6,739	4.4	52.1[2] / 52.2[3]	52.1	52.3	0.2

→ West 5th Street Location ←

[1] Stream distance in miles above mouth

[2] Elevations calculated without consideration of ridge along right overbank

[3] Elevations computed with consideration of ridge along right overbank

[4] Measured along profile baseline of East Fork Lewis River Path 1

[5] Cross section does not cross East Fork Lewis River Path 1

(6) Interpolated / extrapolated value. See worksheet.

TABLE 6

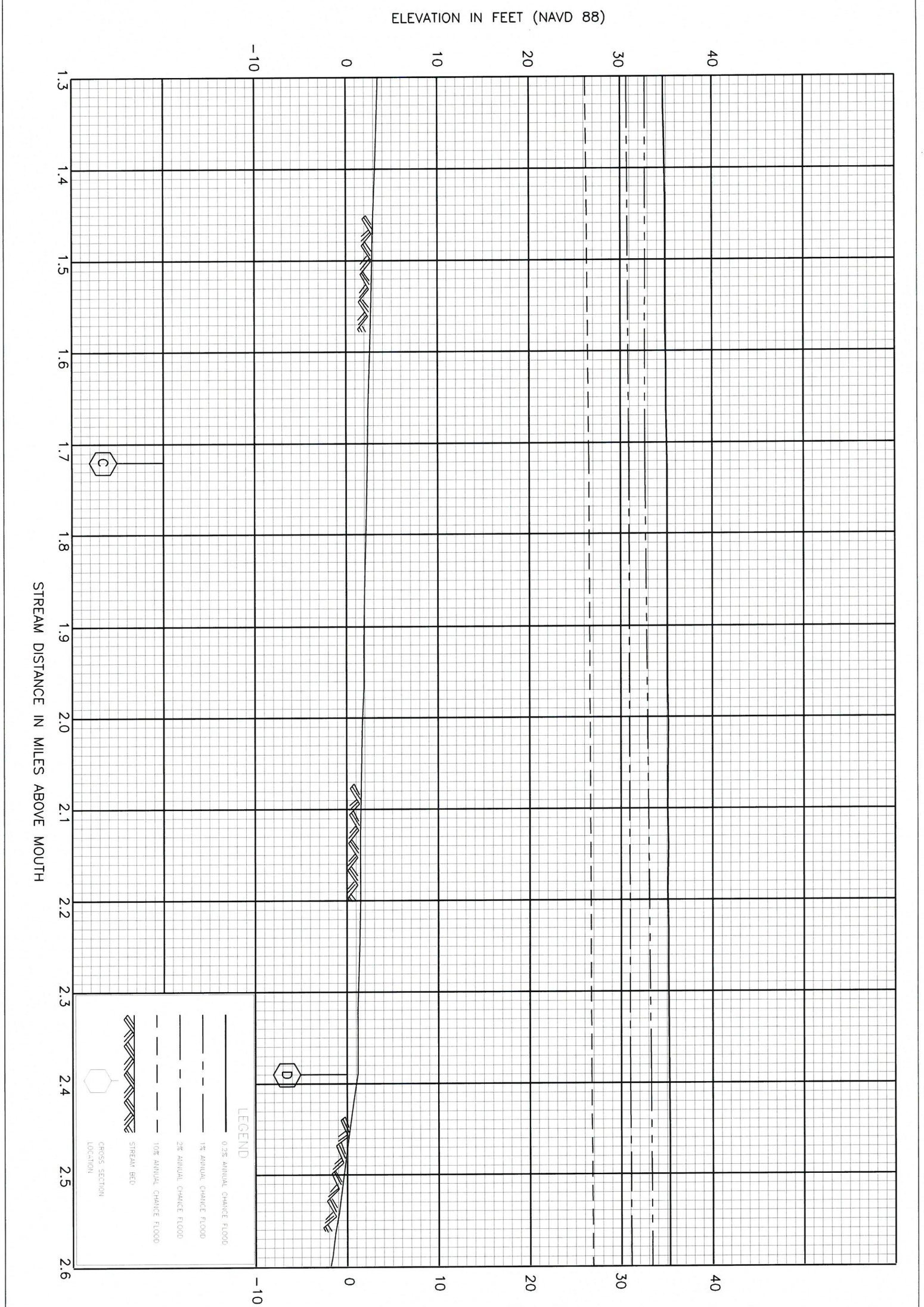
FEDERAL EMERGENCY MANAGEMENT AGENCY

CLARK COUNTY, WASHINGTON

AND INCORPORATED AREAS

FLOODWAY DATA

EAST FORK LEWIS RIVER

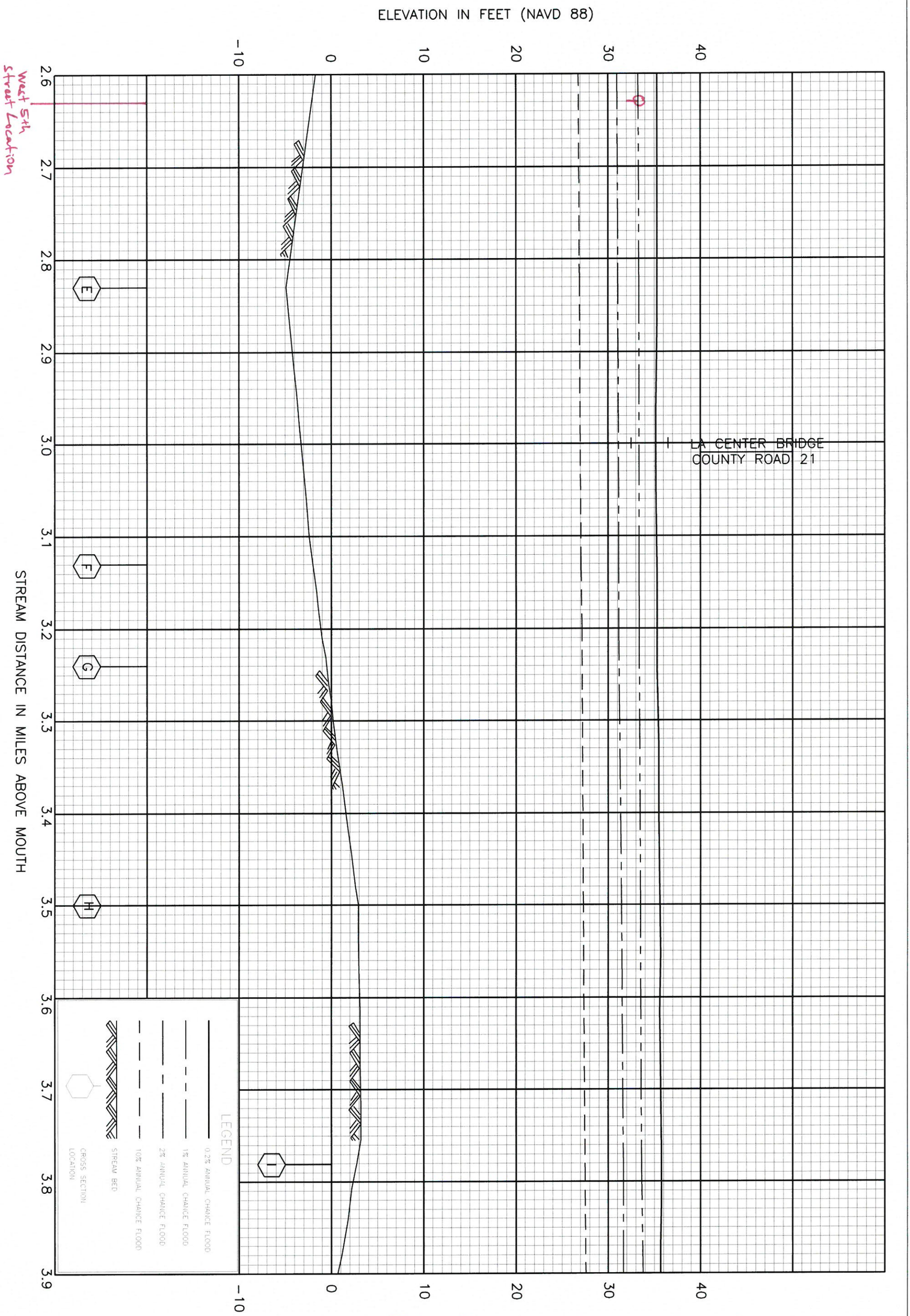


FEDERAL EMERGENCY MANAGEMENT AGENCY

CLARK COUNTY, WA
AND INCORPORATED AREAS

FLOOD PROFILES

EAST FORK LEWIS RIVER



FEDERAL EMERGENCY MANAGEMENT AGENCY

CLARK COUNTY, WA
AND INCORPORATED AREAS

FLOOD PROFILES

EAST FORK LEWIS RIVER

Columbia West Engineering, Inc.

November 20, 2008

WARAC, LLC
Mr. Tim Lapsley
7211 A NE 43rd Avenue
Vancouver, Washington 98661

Re: Geotechnical Recommendations for Proposed Stormwater Discharge
Kay's Subdivision
La Center, Washington
CWE W.O. No. 07197

Dear Mr. Lapsley:

Columbia West Engineering, Inc. is pleased to present this letter regarding the proposed off-site stormwater alignment for the above-referenced site. The purpose of this letter is to present observations from brief off-site investigation and geotechnical recommendations for stormwater management and discharge in proximity to sloped areas. Columbia West previously prepared and submitted a *Geotechnical Site Investigation Report* [1] for the subject site on May 19, 2008.

Background

Kay's Subdivision is a proposed 37-lot residential development located in La Center, Washington. Columbia West's site-specific geotechnical investigation identified a historic landslide on adjacent property south of the proposed subdivision. Recommendations for development near the historic slide included diverting increased runoff away from the slide mass. To limit the potential for increased instability of the slide area, stormwater management for the proposed subdivision may include routing stormwater off-site via hardpipe through the City of La Center's undeveloped W 5th Street easement and discharging the water near the toe of slope at a suitably protected outfall.

Investigation

To evaluate the feasibility of the proposed off-site stormwater alignment and discharge location, Columbia West conducted field reconnaissance and limited subsurface exploration of the City of La Center's easement extending west of W 5th Street toward the East Fork Lewis River. Review of topographic maps indicates the site slopes toward the west from an elevation at the end of asphalt for W 5th Street of approximately 134 feet above mean sea level (amsl) to approximately 10 feet amsl at the bank of the East Fork Lewis River. Electronic hand-held inclinometer measurements indicate slope gradients within the alignment vary from approximately 5 to 60 percent.

Field exploration consisted of four hand-auger borings. Depth of borings varied from approximately 4 to 10 feet below ground surface. Hand-auger locations are indicated on Figure 2. Soil conditions within the proposed alignment consisted of damp to wet, stiff clay. According to the *Geologic Map of the Ridgefield Quadrangle, Clark and Cowlitz Counties, Washington (Evarts, USGS Scientific Investigations Map 2844, United States Geological Survey [USGS, 2004)* near-surface soils are expected to consist of Pleistocene or Pliocene semi-consolidated pebble and cobble gravel conglomerate (QTc), and Miocene Sentinal Bluffs basalt (Tgsb). Although some cobbles and boulders were observed on the ground surface and one hand-auger was terminated due to refusal, massive crystalline bedrock was not encountered within the explorations. Exposures of bedrock were observed along the bank of the East Fork Lewis River.

Recommendations

Columbia West's observations and exploration indicate the proposed stormwater alignment and discharge location is feasible if the recommendations presented below are followed.

To reduce potential serviceability problems due to soil creep, pipes conveying stormwater over slope surfaces or buried within the slope should be fitted with flexible joints. Periodic observation and

maintenance is recommended to minimize the potential for leaks and ensure proper conveyance of stormwater to the approved discharge structure. Leaking pipes may lead to saturated subsurface conditions and reduced slope stability.

Stormwater should not be discharged over steep portions of the slope. These areas are indicated on Figure 2. Stormwater may be discharged over lower shallow-gradient portions of the slope provided properly sized discharge facilities are installed and erosion of downgradient soil is controlled. The discharge facility should be located as far down slope as feasible and be designed in accordance with the *Stormwater Management Manual for Western Washington (revised 2005)*. Even with a properly designed discharge facility, additional measures may be required to avoid potential erosion of soil from the toe of slope. This may include geotextile fabric, reducing the channel slope, level-spreaders, rip-rap armoring, or other energy dissipating measures. These measures should be monitored for effectiveness. If erosion is observed additional mitigation may be required. Final location and plans for the discharge facility should be reviewed by the geotechnical engineer prior to approval.

Based upon correspondence with the site plan engineer, grading may be required to maintain discharged stormwater flow within the City of La Center's easement. Grading within the proposed alignment should follow recommendations provided within the geotechnical report. Reducing gradients by cutting from the top of slope and placing fill on shallow gradients near or at the toe is also recommended. Construction activities within sloped areas should be observed and documented by the site geotechnical engineer or designated representative.

Conclusion

Columbia West's observations and limited subsurface investigation indicate stormwater conveyance and discharge within the proposed off-site alignment is feasible provided the requirements presented herein are followed. This letter is contingent upon review of the final stormwater and grading plans by Columbia West prior to project approval. Construction improvements in sloped areas should be observed and documented by Columbia West. Directing water toward slopes may present significant risks if not designed and constructed properly. Therefore, the recommendations presented in this letter should be implemented to the full extent.

Columbia West appreciates this opportunity to provide geotechnical engineering services. Please call me at 360-823-2900 if you have any questions or need additional information.

Sincerely,

COLUMBIA WEST ENGINEERING, Inc.

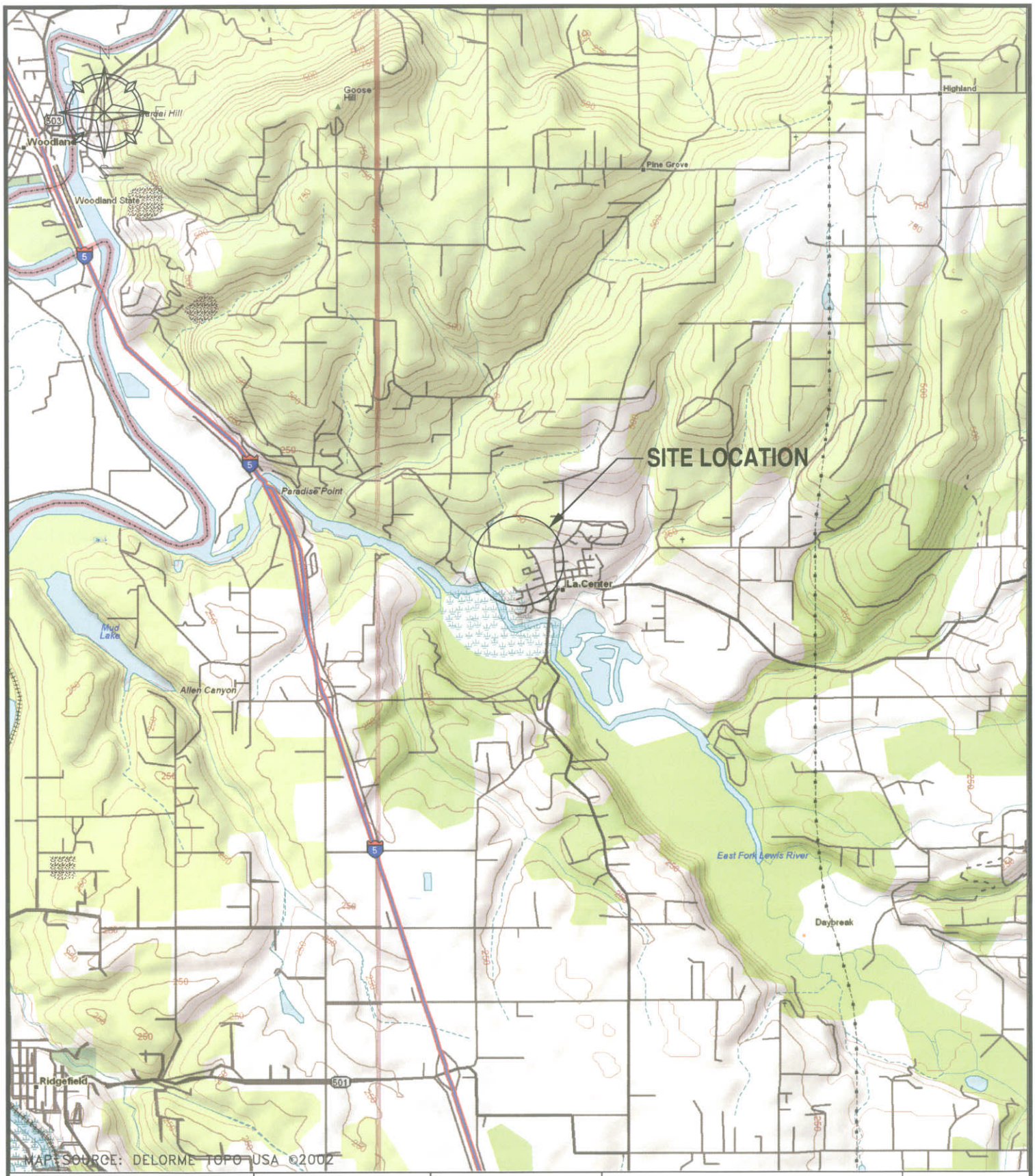
Lance V. Lehto, PE, MS
President

LVL:JLO

Attachments: Figures 1 and 2

cc: Henry Diaz, MacKay & Sposito, Inc.

[1] Columbia West Engineering, Inc., (May 19, 2008) *Geotechnical Site Investigation, Kay's Subdivision, La Center, Washington.* CWE W.O. No. 07197.



Columbia West Engineering, Inc.
11917 NE 95th Street
Vancouver, Washington 98682
p: 360-823-2900 f: 360-823-2901

Design:	Drawn: JLO			
Checked: LVL	Date: 11/17/08			
Client: WARAC	Rev	By	Date	
Job No.: 07197				
CAD File: FIGURE 1				
Scale: 1:50,000				

SITE LOCATION MAP

KAY'S SUBDIVISION
LA CENTER, WASHINGTON

FIGURE 1

APPROXIMATE LOCATION OF STEEP SLOPES

APPROXIMATE HAND AUGER LOCATION

NOTES:
1. DRAWING IS NOT TO SCALE.
2. BASE MAP PROVIDED BY CLARK COUNTY GIS.
3. HAND AUGER LOCATIONS ARE APPROXIMATE AND NOT SURVEYED.
4. ALL HAND AUGER EXPLORATIONS BACKFILLED LOOSELY WITH ON-SITE SOIL ON 11-14-08.

Columbia West Engineering, Inc.
1917 NE 95th Street
Vancouver, WA 98682
p: 360-829-2900
f: 360-829-2901

Design:	Drawn: ASR			HAND AUGER LOCATION MAP
Checked: LVL	Date: 11/17/08			
Client: WARAC, LLC	Rev	By	Date	KAY'S SUBDIVISION LA CENTER, WASHINGTON
Job No: 07197				
CAD File: FIGURE 2				
Scale: NONE				

FIGURE 2

CULTURAL RESOURCES REPORT COVER SHEET

Author: Dana L. Holschuh

Title of Report: Cultural Resources Survey of the Kays Subdivision Stormwater Outfall Project Area, La Center, Clark County, Washington

Date of Report: 3/22/15

County(ies): Clark Section: 3 Township: 4 North Range: 1 East E/W

Quad: Ridgefield, WA Acres: approximately 1.6

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☐ Yes ☒ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☐ Yes ☒ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:

_____
_____
_____
_____
_____
_____
_____
_____
_____

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

CULTURAL RESOURCES SURVEY OF THE KAYS SUBDIVISION STORMWATER OUTFALL PROJECT AREA, CLARK COUNTY, WASHINGTON

By
Dana L. Holschuh, M.A.

Report Prepared for:
WARAC, LLC
7211 NE 43rd Ave.
Vancouver, WA 98771

County: Clark
Township: 4 North
Range: 1 East
Section: NW ¼ of Section 3
USGS Quad.: Ridgefield, WA
Project Acreage: 1.6 acres
Permit: N/A
Result: Negative

March 22nd, 2015

Archaeological Services Report No. 15194

ARCHAEOLOGICAL SERVICES LLC
5305 E 18th Street, Suite 101 Vancouver, WA 98661 (360) 260-8614 www.archaeologicalservices.com

Applicant's Name: WARAC, LLC
Property Owner: Eddie Barnhart
File/Permit Number: ASCC # 15194
Date Received: 2/22/15
Location: 555 W 5th Street La Center, Clark County, WA
Quadrangle: USGS, Ridgefield, WA, 7.5-minute Series, 1990
Township/Range/Section/Quarter Section: T4N, R1E, NW ¼ of Section 3, Willamette Meridian.
Number of Acres: 1.6 acres
Purpose of Survey: To assess the impact of a proposed stormwater outfall associated with the Kays Subdivision (proposed).

FINDINGS	
POSITIVE	☐
NEGATIVE	■

Description of the Project

Archaeological Services LLC (ASCC) carried out a literature review, surface and subsurface investigation of the Kays Subdivision Stormwater Outfall project area. The project area is situated in southwestern Washington in the northwestern portion of Clark County, within the town of La Center. The project area is irregularly-shaped and measures approximately 1.6 acres within a larger residential parcel located at the western terminus of W 5th Street. It lies on the eastern bank of the East Fork Lewis River, approximately 0.39 miles (0.72 km) west/northwest of its confluence with Breeze Creek, approximately 1.26 miles (2.02 km) east of Interstate-5 and approximately 1.52 miles (2.45 km) southeast of Paradise Point (Figure 1).

As currently planned, the project entails the installation of a stormwater outfall system leading from the proposed 37-lot Kays Subdivision development down to the East Fork Lewis River. The lower portion of the proposed outfall will be located within the 200-foot shoreline buffer of the East Fork (Figure 2); this portion of the outfall pipe will be underground as required by the City's Shoreline Master Plan.

The project will require permitting from the U.S. Army Corps of Engineers (USACE). As the project's federal nexus, the involvement of the USACE triggers project compliance with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires consideration of the project's potential effects upon cultural resources that are listed on, or eligible for listing on, the National Register of Historic Places (NRHP). To that end, the current investigation is designed to identify any historic properties, i.e. archaeological and above-ground resources, which may be adversely affected by the proposed project. The APE for this project, as defined by 36 CFR 800.16 (d), consists of:

> the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking. (36 CFR 800.16)

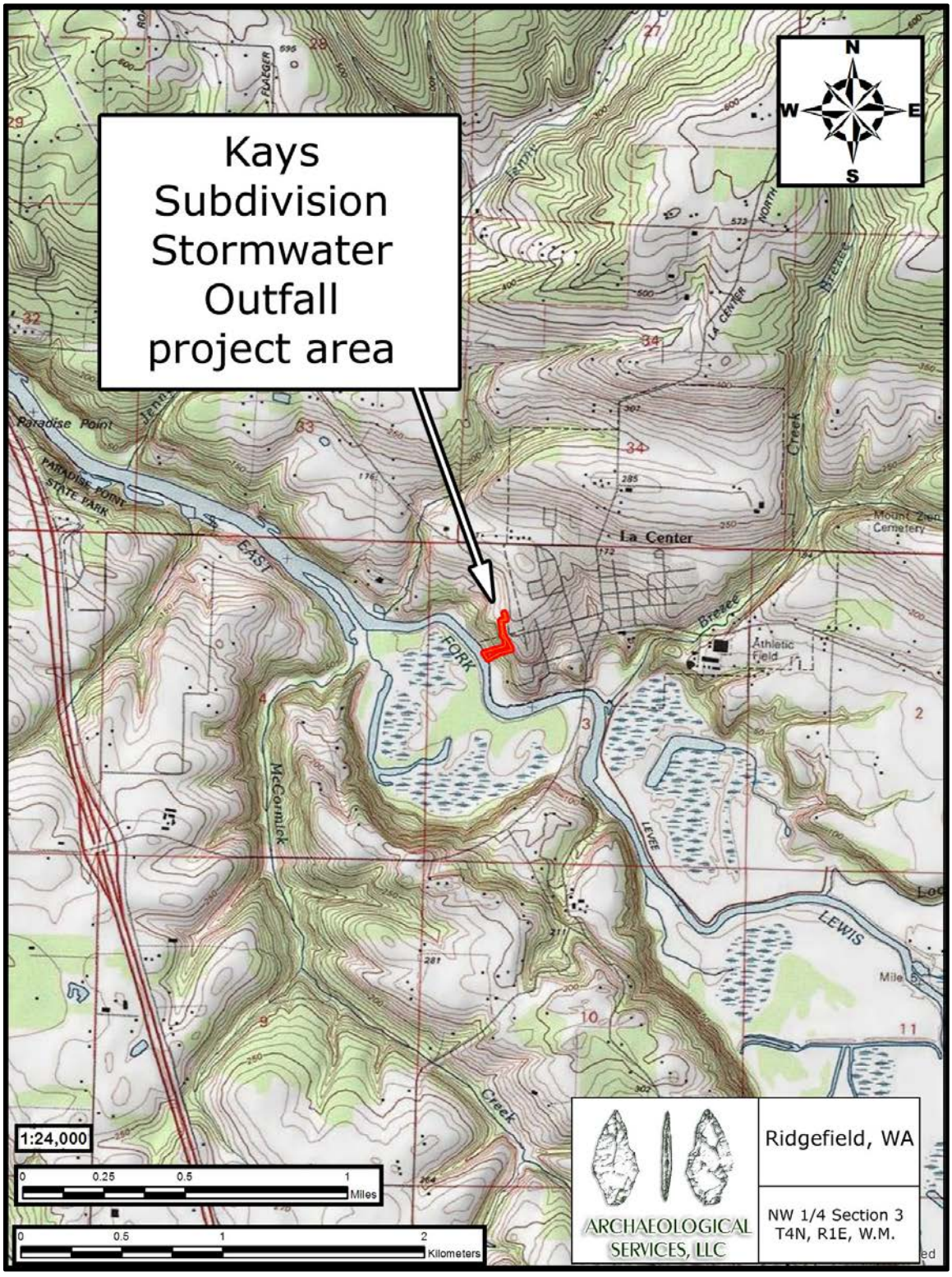


Figure 1. Portion of the Ridgefield, WA 7.5-minute USGS quadrangle indicating the location of the Kays Subdivision Stormwater Outfall project area.

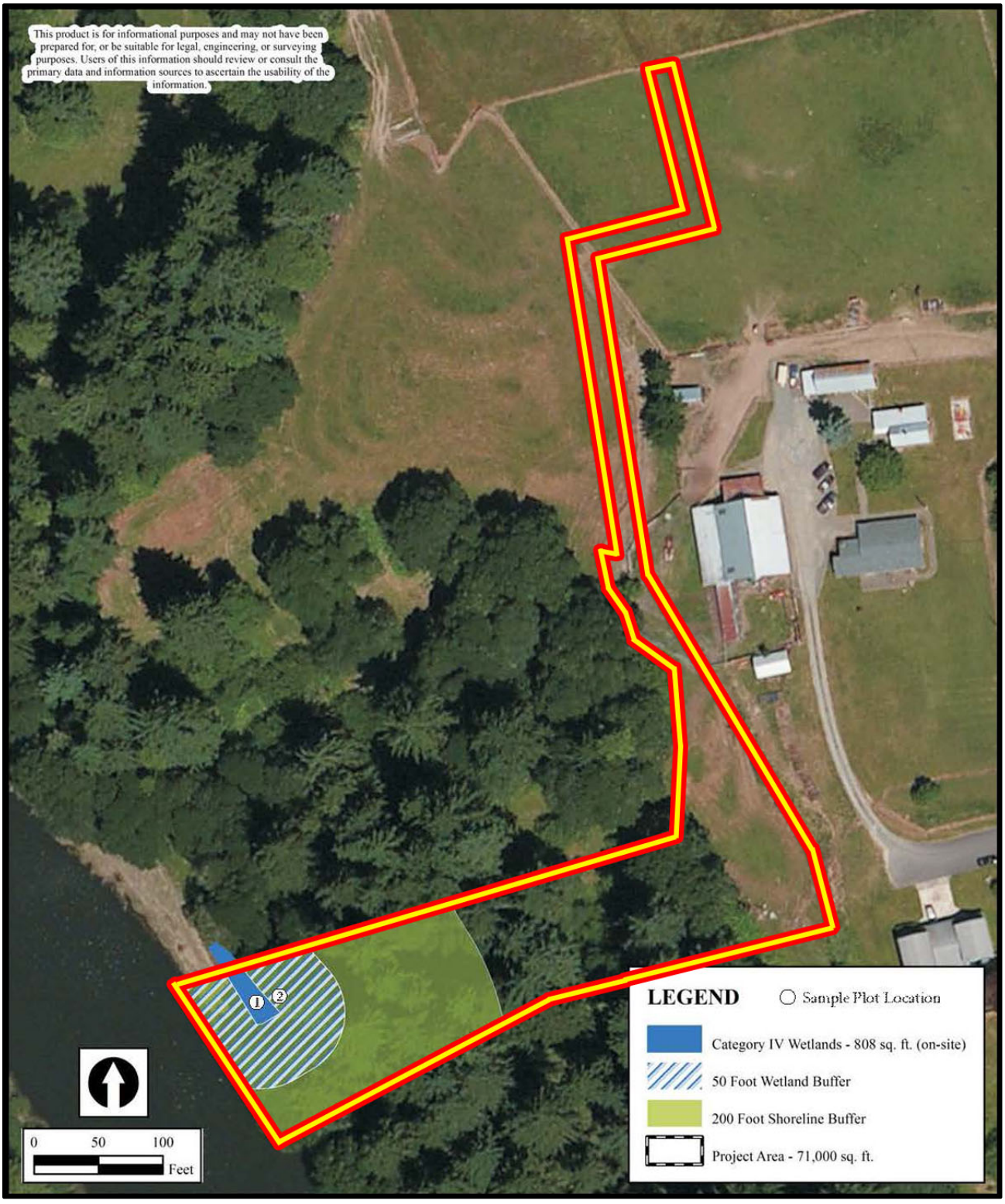


Figure 2. Aerial photomap of the project area showing current conditions.

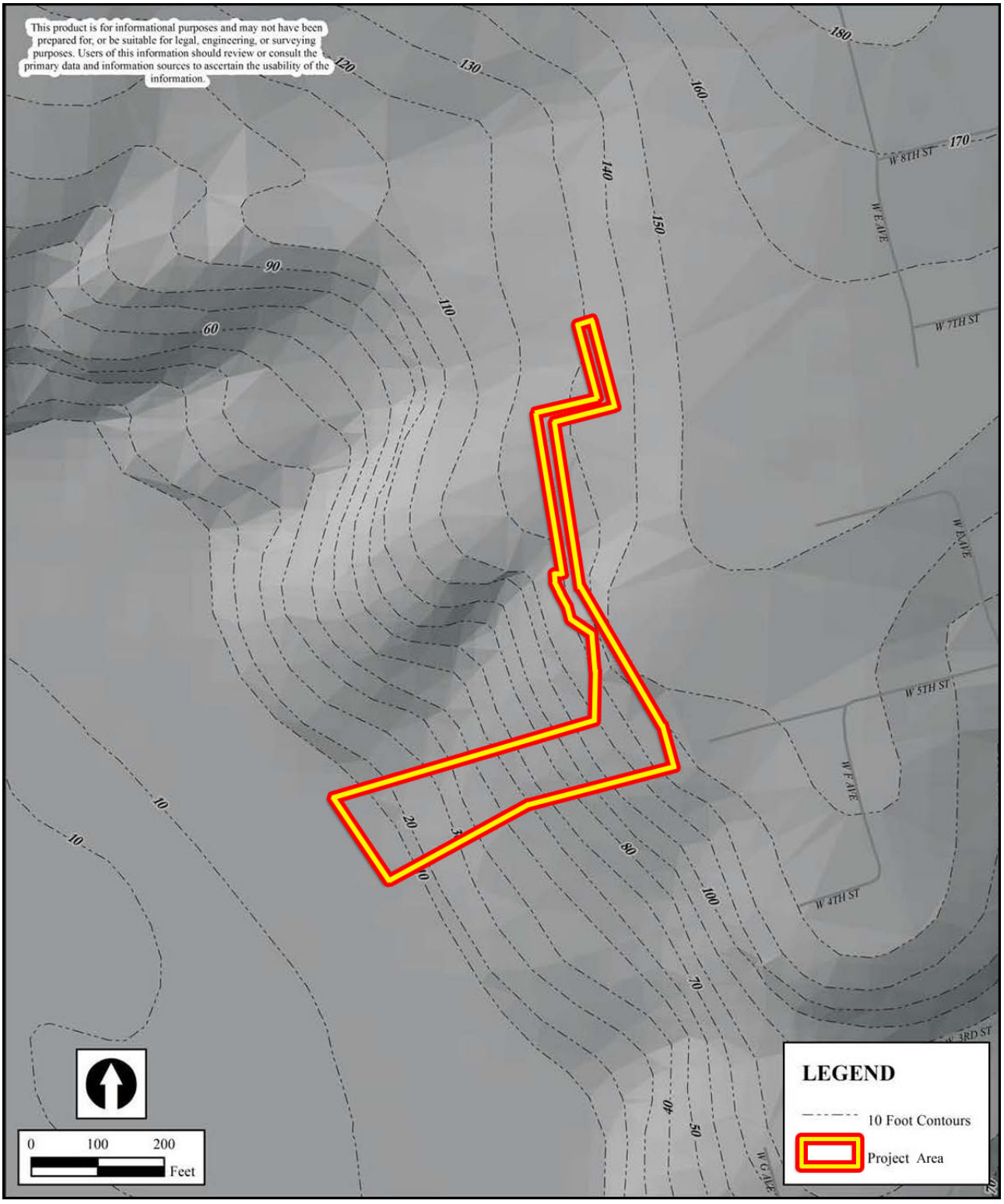


Figure 3. Topographic map of the project area.

Project Area Description and Environment

The irregularly-shaped project area is located on the eastern shore of the East Fork Lewis River (Figures 2 and 3). The northern portion is situated within a pasture currently used for cow and horse grazing. From the fence line, the project area leads south and turns west into an adjacent pasture (Figures 4 and 5).

Figure 4. Photograph of the northern boundary of the project area, looking north.

Figure 5. Photograph of the northern portion of the project area, looking west toward the adjacent cow pasture.

In the central portion of the project area, the stormwater outfall corridor runs south along the eastern margin of the pasture characterized by grassy pasture lands with abundant soil visibility from cattle trampling (Figure 6). This portion of the project area cuts south, across a western-facing hillside characterized by many informal cow paths that follow the contours of the landform (Figures 6 and 7). Mature trees are located along the western edge of the project area as it widens into the southern portion (Figures 6-8).

Figure 6. Photograph of the stormwater outfall corridor, looking south along the eastern edge of the pasture.

Figure 7. Photograph of cow paths on hillside in central portion of the project area, looking south.

Figure 8. Photograph of mature white oak tree adjacent to the central portion of the outfall corridor (on right).

The southern portion of the project area widens and turns west, continuing down the hill to the river. The landform encompasses three flattened benches above the river's edge. The grassy upper bench is located adjacent to the farm buildings on the property and is currently the location of a bulldozer (Figure 9).

Figure 9. Photograph of grassy upper bench, looking west, bulldozer on left, lower bench visible in background.

A dirt roadway has been cut into the hillside between the upper and middle benches (Figure 10). This slope descends to the middle bench, a flat, grassy area with mature trees at the perimeter where piping is currently stored (Figures 11 and 12).

Figure 10. Photograph of the dirt roadway that has been cut into the hillside below the upper bench, looking south from middle brnch.

Figure 11. Photograph along the roadway, looking north with upper bench on right and middle bench visible in background.

Figure 12. Photograph of the middle bench, looking west toward slope to the lower terrace, pipe on right, disturbance visible on left and in foreground.

The landform descends a moderate to steep wooded slope from this middle bench to the first terrace above the river (Figures 13 and 14). This terrace is partially wooded, opening to a flat grassy field along the river's eastern shore. Cows graze throughout this area, including the upper and middle benches and the shoreline (Figures 14 and 15).

Figure 13. Photograph of the wooded slope between the middle bench (atop hill) and the lower terrace (in foreground), looking east/uphill.

Figure 14. Photograph of cows grazing on the partially-wooded lower terrace, East Fork Lewis River in background on right.

Figure 15. Photograph of the eastern bank of the East Fork Lewis River, looking south with the grassy terrace on left.

Topography varies greatly across the project area (Figure 16), from a high point along the northern border of 134 feet above mean sea level (amsl), to approximately 16 feet amsl on the river's edge.

Figure 16. Photograph of upper and middle benches, looking east with roadway descending hillside from the right.

Environmental Context

The project area is located on the northern margin of the Portland Basin, a structural depression centered on the confluence of the Willamette and Columbia Rivers. The basin is part of the larger Puget-Willamette Lowland, which represents the southern end of a coastal trough running from southeastern Alaska to the south end of the Willamette Valley (Ames 1994:5). As the Columbia River exits the Columbia Gorge from the east and enters the Portland Basin, the river becomes marked by extensive alluvial bottomlands, sloughs, lakes, and islands composed of low-lying alluvium. Similarly, the lower reach of the East Fork Lewis River is marked by extensive meanders and a broad flood plain. The point at which the Lewis River converges with the Columbia River marks the northern margin of the Portland Basin. Away from the river, Clark County has a climate similar to that of the Willamette Valley in Oregon—relatively mild temperatures with cool, wet winters and warm, dry summers (Franklin and Dyrness 1988: 45).

Hydrologically, the project area is located adjacent to the eastern shore of the East Fork Lewis River. The East Fork Lewis River flows out of the southwest corner of the Gifford Pinchot National Forest and travels west for 43 miles from its source near Cougar Rock and Lookout Mountain, through the entirety of Clark County, roughly splitting the county in half. Ethnographically and historically, the river supported very large runs of anadromous fish. The river continues to support sustainable runs of salmon and steelhead. The lower reach of the East

Fork Lewis River also contains sturgeon. Unlike most other rivers of its size in the region, the East Fork Lewis River is free flowing with no dams, making it important for salmon restoration. The river is known to contain archaeological sites along its banks, particularly upstream in the vicinity of Lucia Falls (Wilson 1997).

The project area is located in Franklin and Dyrness's (1988) regional Western Hemlock *(Tsuga heterophylla)* vegetation zone. This zone encompasses woodlands between the Pacific Ocean and the Cascade Mountains up to roughly 700 m (2296 ft.) amsl. Dominant elements of this forest community include Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and western red cedar (*Thuja plicata*) with few hardwood species. In specialized habitats, such as riparian zones or recently disturbed areas, red alder (*Alnus rubra*), bigleaf maple (*Acer macrophyllum*), and golden chinquapin (*Castanopsis chrysophlla*) are widespread. Along major watercourses, black cottonwood (*Populus trichocarpa*) and Oregon ash (*Fraxinus latifolia*) are dominant woodland species. Oregon white oak (*Quercus garryana*) is commonly found in drier soils, often thriving in areas too fire-damaged for evergreen species. Common forest understory plants throughout the zone include vine maple (*Acer circinatum*), hawthorn (*Crataegus douglasii*), wild rose (*Rosa gymnocarpa*), blackberry (*Rubus ursinus*), thimbleberry (*Rubus parviflorus*), and snowberry (*Symphoricarpos albus*) (Franklin and Dyrness 1988).

Vegetation within the project area includes, but is not limited to, white oak, Douglas fir, holly, apple, and various grasses and forbs.

The following soil descriptions are given in *Soil Survey of Clark County* (McGee 1972). Soils within the project area are mapped as three variants of the Hillsboro series. This series consists of deep, well-drained soils on terraces. These are medium-textured soils that developed in deposits of old Columbia River alluvium. Most areas are nearly level to gently sloping, but strongly sloping to very steep areas along drainageways and streams. Most areas are in the southwestern, central, and south-central parts of the county (McGee 1972).

Soils within the northern portion of the project area are mapped as HoC, or Hillsboro silt loam on 8 to 15% slopes. This soil typically consists of a surface layer of dark brown silt loam about 5 inches (12.7 cm) thick, with friable, dark brown silt loam below.

To the south of this, in the vicinity of the residences, soils are mapped as HoB, Hillsboro silt loam on 3 to 8% slopes. This is the dominant soil in the southwestern part of the county. The relief is gently undulating and in most places the slopes are short. In a typical profile the surface layer is dark brown silt loam about 7 inches (17.78 cm) thick. The next layer is about 48 inches (121.92 cm) thick with the top 17 inches (43.18 cm) consisting of a dark-brown silt loam followed by a dark grayish-brown silt loam.

The southernmost portion of the project area is mapped as HoE, or Hillsboro silt loam on 20 to 30% slopes. This soil is along Salmon Creek, Whipple Creek, and other major drainageways in the western part of Clark County. It typically consists of a surface layer of dark brown silt loam about 3 to 4 inches thick, with friable, dark brown silt loam below (McGee 1972).

Background Research and Literature Review

ASCC carried out ethnographic, historic, and archaeological background research using materials from the Washington State Department of Archaeology and Historic Preservation (DAHP) as well as resources located at the ASCC library and online. These materials included Washington State Archaeological Site Inventory files, cultural resource survey reports, General Land Offices (GLO) survey maps, various county road maps, tax assessor maps, and the Washington Information System for Architectural and Archaeological Records Data (WISAARD). ASCC used this background research to assess the archaeological probability of the project area and to establish an interpretive context for any materials encountered in the field.

Ethnographic Overview

The project is located within territory historically occupied by native Cowlitz and Chinook peoples of the Lower Columbia River. The term "Chinook" refers to both a linguistic classification as well as a cultural one (Ruby and Brown 1976). Early on, Euro-American traders used the term to refer to the indigenous people living on the Pacific shore from Willapa Bay to Tillamook Head, along the Columbia River from its mouth to The Dalles, and a short distance up the Willamette to its falls (Silverstein 1990). Traits common to Chinookan-speaking groups include a reliance on aquatic resources (primarily anadromous fish), woodworking (exemplified by planked houses and dugout canoes), twined basketry, untailored clothing, a distinctive art style, and a social emphasis on rank, including the practice of slavery (ibid.). A division of the Chinook considered culturally, geographically and linguistically as the Multnomah tribe traditionally inhabited the area around present-day Woodland, to the west of the project area. Ethnographies also place the Lewis River Cowlitz in this area at the time of European contact.

Chinookan speakers can be divided into the Lower Chinook, who lived near the Pacific coast, and the Upper Chinook, who lived farther inland along the Columbia River and its tributaries. The Multnomah sub-group of the Upper Chinook occupied the Columbia River from near Deer Island to just east of the Washougal River (Silverstein 1990).

Multnomah villages were recorded on both sides of the Columbia River. The first recorded Multnomah villages include the settlements on Wappato Island, now Sauvie Island (recorded in William Broughton's trip log, 1792) (Jones 1972), and two settlements recorded by Lewis and Clark: *Shoto*, located along Vancouver Lake, and *Cathlapottle*, located near the mouths of Lake River and the Lewis River (Silverstein 1990). The names of the villages also refer to smaller ethnic and political subgroups within the Multnomah linguistic group.

By the late 18th century, the Chinookan peoples of the Lower Columbia had come into contact with Euro-American traders who plied the Northwest Coast trading with the natives, primarily in furs. Diseases carried by the newcomers devastated the Chinook, essentially destroying their traditional lifeways within a single generation. Smallpox, dysentery, and malaria reduced the population by as much as 75% to 90% by some estimates (Hajda as cited in Ames 1994).

While the Chinookan peoples were the most obvious indigenous inhabitants of Clark County, other Native American groups were present during late prehistoric times. Occupying the upper

portions of the Lewis River and Cowlitz River drainages were speakers of Ichishkíin Sínwit (also known as Sahaptin), a language primarily spoken to the east of the Cascades by plateau cultures such as the Yakama, Palouse, and Umatilla. Euro-American observers used the generic term "Klikitat" to describe Sahaptin-speaking peoples living west of the Cascades (Ray 1936). Along the upper Lewis and Cowlitz Rivers, these peoples were generally referred to as the Taitnapam, or Western Klikitat. It is generally thought that the Klikitat began arriving in western Washington when the Chinook, devastated by Euro-American diseases, abandoned many of their traditional territories (Hajda 1994).

The Klikitat subsistence pattern was oriented largely around open grasslands and prairies, which contained animal and plant resources and served as inland lines of communication and commerce (Norton et al. 1999). Klikitat peoples are thought to have maintained the open grasslands and prairies through periodic burning. The Klikitat wintered in the valleys of the Klikitat, White Salmon, Little White Salmon, Wind, and Lewis Rivers (Curtis 1911). With the ripening of the first roots and greens in spring, small groups would move to seasonal camps associated with a particular resource and stay, dependent on the availability of the resource. Like their Chinookan-speaking neighbors to the south and west, the Klikitat would converge in great numbers at fisheries during the heights of the spring and summer salmon runs. As the summer progressed into fall, the people would move higher into the uplands to take advantage of ripening berries and available game. With the end of the berry season, the people would reunite in social gathering locations before dispersing to their respective winter village sites. Movement between resource concentrations was quite fluid depending on need and resource availability (Boyd and Hajda 1987).

Moving into former Chinookan territories such as the Lewis River Basin, Sahaptin-speaking newcomers such as the Taitnapam may have adopted many of the practices of neighboring riverine groups such as the Cowlitz, an interior, Salish-speaking people who lived to the north of the project area along the Cowlitz River and its tributaries (Hajda 1990). The Cowlitz centered their tribal territories on major salmon streams, but they also harvested resources from the productive inland prairies (Hajda 1990, Boyd, ed. 1999). In the winter, the Cowlitz lived in cedar longhouses. In the spring, families moved to the prairies to dig wapato and camas, and they also traveled to the mountains to seek game and berries. Men would hunt both large and small game, and women would gather various berries. During resource-gathering excursions, the Cowlitz would occupy temporary camps (Hajda 1994).

The Cowlitz traveled by both trail and river to participate in trade with neighboring tribes, including trading surplus camas for sturgeon and other maritime staples with the Lower Chehalis, the Quinault, and groups along the Columbia River (Hajda 1990). Dentalium shells served as the primary medium of exchange when direct goods-for-goods trading was not an option. Intermarriage between the groups encouraged such productive relationships, though conflict sometimes disrupted these relationships (Hajda 1990). Several authors have pointed out the difficulty in assigning "tribal" boundaries within the Portland Basin (Boyd and Hajda 1987). The difficulty arises from the political independence of villages, seasonal population movements, trading patterns and village exogamy whereby travel and marriage between villages was the rule rather than the exception.

Historic Overview

The first undisputed European contact with the Pacific Northwest's indigenous people is recorded in 1792, when British naval officer George Vancouver explored Puget Sound. Ensuing decades saw more Euro-American incursions to the region, often under the banner of the Hudson's Bay Company (HBC), the vast British fur trading concern. In 1825, the HBC established Fort Vancouver, the first permanent non-native settlement in the Pacific Northwest. As the nexus of the Pacific Northwest fur trade, the fort served as an important foothold for further Euro-American settlement. Under the 1846 Oregon Treaty, the land on which Fort Vancouver stood changed from British to American control.

The growing Euro-American population in the Pacific Northwest led in 1848 to the creation by U.S. Congress of Oregon Territory, which included the present states of Washington, Oregon, and Idaho. Euro-American settlement of the region was spurred on by the Donation Land Claim Act of 1850, which granted acreage to eligible adult U.S. citizens who were able to homestead the land.

The earliest map of the project area is the 1854 General Land Office (GLO) cadastral map of Township 4 North, Range 1 East (Figure 17). This map depicts the project area amid unclaimed land on the northern shore of the East Fork Lewis River, labeled here as "South Fork Cattlepootle River", at the northern margin of an area labeled "Low rich bottomlands subject to inundation". To the south of the river, survey notes describe the environment at that time: "Land level and gently rolling. Soil 2nd rate clay loam, gravelly in places. Timber fir, cedar, maple, hemlock &c (sic), mostly burnt and dead & partly fallen with thick undergrowth" (GLO 1854).

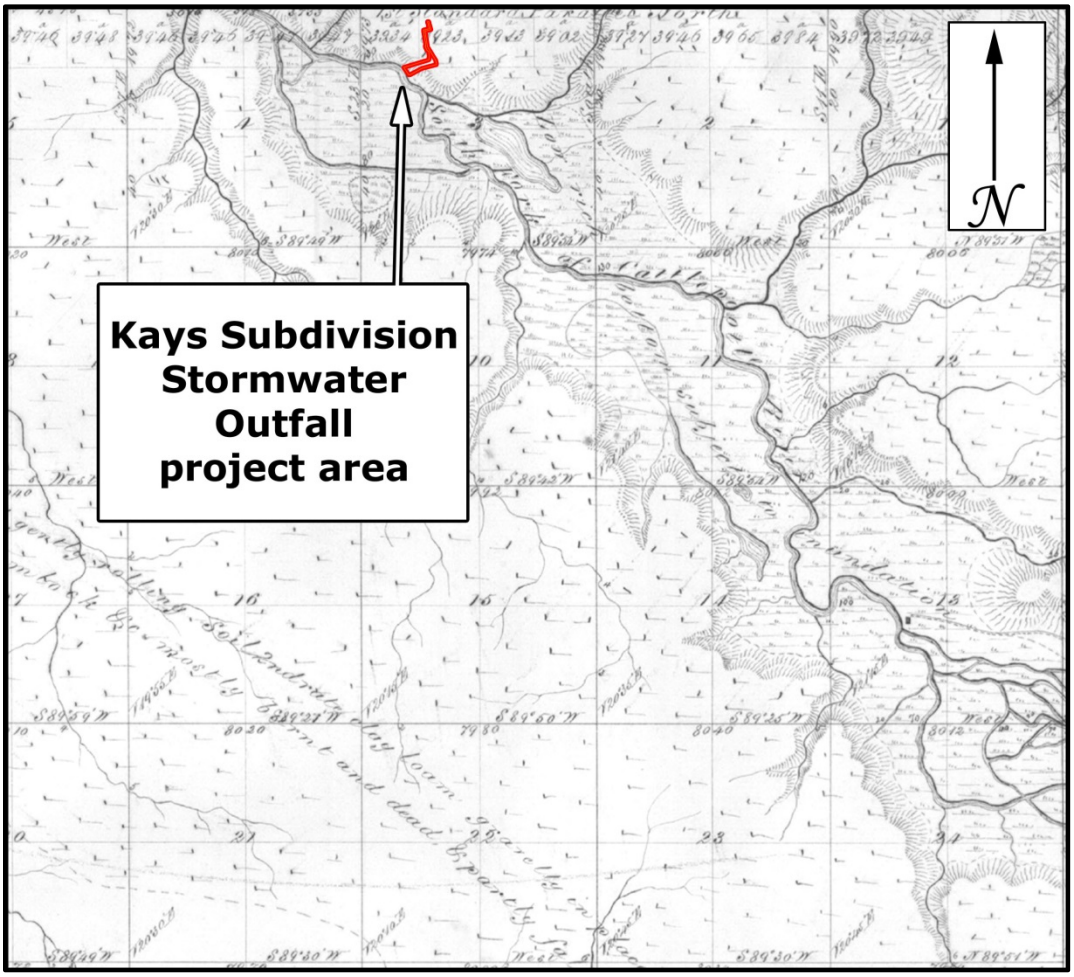


Figure 10. 1854 GLO cadastral map overlaid with the approximate location of the project area.

GLO maps from 1863 depict no ownership for the lands in the vicinity of the project area. According to a history of La Center, the first individual to stake a claim along the East Fork Lewis River was John Pollack in 1849 (Reilly 1979). Another account states that "the earliest settlements in the vicinity of the town of La Center were made in 1852. In that year John H. Timmen and Aurelius Wilkens took up claims about five miles above the present town site…while about the same time John Pollack, and his brother, located on the south side of the Lewis River" (Alley and Monroe-Fraser 1885:178).

These early homesteaders cleared farms and grazed cattle. By 1870, sternwheelers (or lighter boats, when the water was low) plied the East Fork Lewis River trading dry goods and groceries for cash, butter, eggs and honey. In 1872, at the site of present-day La Center, sternwheeler captain William G. Weir built a house and opened a store and a post office (Caldbick 2010). In 1874 or 1875, the town's first plat was filed by John H. Zimmen, who changed the community's name from "Podunk" to "Timmen's Landing" (Ibid.).

The region's first commercial logging operations were underway by 1876. As sawmills were built on the East Fork and its tributaries, the settlement of Timmen's Landing grew. By the mid-1880s the town included two hotels, a Methodist church, a grist mill, a brickyard, a post of the Grand American Army of the Republic, and a grange hall. Built in 1874 by H. M. Knapp, a Deputy Grand Master of the Masonic "Patrons of Husbandry," the town grange was reputedly the first in the Washington Territory (Caldbick 2010).

The town's name change to "La Center" evidently occurred by 1888, as the town is labeled as such on that year's Map of Clarke [sic] County. This map, depicting ownership but not structures, reflects the rapid growth of the region. This map also depicts a road heading north from La Center, splitting east and west about a quarter-mile north of the town. The western spur travels along the midline of Section 33, corresponding to today's Bolen Street (Habersham 1888).

In 1907, La Center's dairying, mixed farming, logging, and milling supported a population of about 300. Eight sawmills operated within five miles of town, turning out tens of thousands of railroad ties for the Northern Pacific Railroad, which stopped at Ridgefield roughly ten miles away (Caldbick 2010). Within town were four general stores, one drugstore, two hotels, one restaurant, one livery stable, two blacksmith shops, one saloon, one hospital, one furniture store and one pool room.

La Center became formally incorporated in 1909, by which time the depletion of the surrounding timber was becoming apparent. A writer for the April, 1909 issue of *The Coast* magazine reported that, within the span of a few years, "about one-half of this forest has been marketed, and the logged-off lands are used for grazing and general farming" (Fanning 1909, cited in Caldbick 2010). As the forests around La Center were logged out, the town's population leveled off, remaining at or below 300 for the next sixty years (Caldbick 2010).

The 1910 Map of Clark County (National Map and Publishing Company 1910), which does not show ownership or structures, depicts the road that is today's Bolen Street. In 1918, the Pacific Highway was routed through La Center (Caldbick 2010). Although properties changed hands throughout the 20th century, La Center as a whole changed little. It remained small and rural, sustained largely by dairy farming. Its population dipped below 200 in the 1920s and again in the 1940s (Caldbick 2010).

The 1937 Metsker's Atlas of Clark County depicts Pacific Highway in its current configuration, running roughly north-south to the east of the project area, which is within land attributed to Rose L. Barnhart (Metsker 1937). The 1943 Mestker's Map shows the project area within land attributed to C.R. Barnhart. The town of La Center is platted to the immediate east of this land, with a road running roughly north-south, labeled "to Woodland" in the approximate configuration of Pacific Highway (Metsker 1943). Little has changed on the 1961 map, which shows the project area within land that is still attributed to C.R. Barnhart, although the holdings now extend to the opposite bank of the river. This map is the first to show W 5th Street (Metsker 1961). The 1974 Metsker's Map is the first to depict Interstate-5 to the west of the project area, which is now within land attributed to B. Barnhart (Metsker 1974).

In 1985, facing possible bankruptcy, La Center became the first community in Clark County to legalize card-room gambling. With a ten percent gambling tax bolstering the economy, the town went through a dramatic turnaround, its population growing roughly 500% between 1990 and 2010 (Caldbick 2010). Housing developments and other projects boomed, and gambling remains the town's largest source of revenue. The 1993 Metsker's Map shows W 5th Street extended to its current location, with the project area at the western terminus, within land attributed to Leigh, J. The town is divided into various additions, including La Center, Breezee's, McCann's and Rasmussen's (Metsker 1993). This map labels NW Timmon and Spencer Roads, as well as Pacific Highway, which passes to the east of the project area.

Aerial photomaps of the project area dating back to 1955 show that the residence and farm complex has been in its current location since this time, with a second residence constructed in 1992 (Clark County 2015).

Previous Archaeology

ASCC reviewed records from the DAHP and the ASCC library in order to establish an archaeological context for the region, focusing on studies within a one-mile radius of the project area. This review indicated that at least 14 previous cultural resource surveys have taken place within this radius (Cooper 2001; Mills 2002a; Wilson 2005; Bryant 2006a; Gall 2006a, 2006b; Holschuh 2006a; Easton 2007a; Hudson 2008; Lloyd-Jones 2008; Solimano 2008; Gall 2009; Freed 2011; Gall 2011). The majority of these are predetermination surveys designed to satisfy Clark County's archaeological ordinance, the nearest of which was performed on the pasture directly north of the Kays Subdivision Stormwater Outfall project area (Easton 2007a).

There have been seven archaeological sites or isolates recorded within one mile of the project area. The nearest of these is 45CL743, a single flaked quartzite cobble recorded as an isolate on the eastern margin of the pasture immediately north, approximately 450 feet (123 m) north/northeast of the northern terminus of the current project area (Easton 2007b).

Site number 45CL532 is located approximately 0.31 miles (0.5 km) east of the project area, along the south side of W 4th Street. This site is a historic debris scatter consisting of ceramics, glass, brick, cement, butchered bone, and metal fragments, is the result of building debris pushed over the edge of the terrace after two fires in the town of La Center in the early 1930s. Artifacts are datable to the 1920s and 1930s (Mills 2002b).

Three lithic isolates are recorded to the north and northwest of the project area, in the fields to the north of NW Pacific Highway. Isolate 45CL692 is located approximately 0.39 miles (0.62 km) north of the project area. The isolate consists of four cryptocrystalline silicate (CCS) flakes found in three positive shovel test probes (STPs) excavated during a predetermination survey (Bryant 2006a, 2006b). This isolate would be considered a site if recorded today, as currently DAHP defines a site as anything more than one artifact. A second isolate was recorded in the northern portion of the same study area, approximately 0.44 miles (0.71 km) north/northwest of the current project area (Bryant 2006a). This isolate, 45CL693, is a single CCS flake (Bryant

2006c). The third isolate, also a single CCS flake, is located approximately 0.73 miles (1.18 km) northwest of the northern terminus of the current project area (Holschuh 2006b). Approximately 0.8 miles (1.23 km) northwest of the project area is site number 45CL674, which consists of a small-scale lithic scatter recorded following a predetermination and survey on a terrace above Jenny Creek (Gall 2006a, 2006b, 2006c). The predetermination resulted in four CCS and one quartzite flakes, as well as a possible core (Gall 2006a). The subsequent survey recovered an additional 22 lithic flakes and two tools- a core and a biface fragment (Gall 2006b, 2006c).

Site 45CL54 is located approximately 0.63 miles (1.02 km) southwest of the shoreline of the current project area. There is little information recorded on this site, other than a rough location (Anonymous n.d.). A 1958-1959 article in *Tebiwa* describes the artifacts recovered from the site, including choppers, hammerstones, pecked and ground stone, edge-ground cobbles, manos, and projectile points or point fragments (Tuohy and Bryan 1958-1959:30). The authors also report inspecting an artifact collection belonging to a nearby property owner. This collection, probably from 45CL54, included 26 girdled cobbles, four stone bowls, a cobble with a pecked design, a perforated sinker, pestles, a stone pipe fragment, and over 60 projectile points (Tuohy and Bryan 1958-1959:29-30).

Although none of the sites and isolates recorded within one mile of the project area has been evaluated for inclusion on the NRHP, Solimano (2008) expresses the opinion that site number 45CL54 is a significant site. He states that the recorders identify at least 12 different tool classes, including groundstone, and features, and postulates that the site's age may span close to 8,000 years, as indicated by the assemblage (Solimano 2008).

Historic Properties

According to WISAARD, the nearest historic property included on the National Register of Historic Places is the Judge Lancaster House, located approximately 3.41 miles (5.39 km) west of the project area. The house was nominated in 1974 for its architecture- it is a good example of the Greek Revival style, and possibly one of the earliest frame houses in the Washington Territory (Richards 1974). It is also eligible as the residence of Columbia Lancaster, an early politician in Washington Territory. Lancaster arrived in the northwest in 1847 and was appointed as Chief Justice of the Provisional Supreme Court of Oregon. He later went on to serve as Joint Councilman in the Territorial Legislature and as the first delegate to congress from the Washington Territory (Richards 1974).

Methods

ASCC carried out fieldwork at the project area on March 10th, 2015. This field research consisted of a surface and subsurface investigation, conducted by Don Tatum, B.A. and Dana Holschuh, M.A. Weather was fair, with foggy skies that cleared to sun and temperatures in the 50s.

Visual Impact Assessment

A visual impact assessment was conducted for the project area in order to determine the likelihood that historic properties listed on, or eligible for listing on the National Register of Historic Places would be impacted by the proposed construction. As part of the visual impact assessment, digital photographs were taken in and around the project area. No clear line of sight between the project area and the Judge Lancaster House, site 45CL54, or any other properties listed on the NRHP was observed during the visual impact assessment (see *Previous Archaeology*).

Surface Investigation

During the surface investigation, ASCC walked the entire project area in parallel, adjacent transects spaced no more than 10 meters apart (Figure 18). The pedestrian survey was carried out in order to inspect exposed soils for the presence of archaeological materials, to assess the extent of historic/modern ground disturbance, to assess landforms in terms of archaeological probability, to identify historic features or properties, and to generally determine the likelihood that cultural resources are present within the project area.

Approximately 25-30% of the soils within the project area were exposed to ASCC's inspection. Areas of increased soil visibility were observed within areas that had been trampled by cattle (Figures 19 and 20), on the middle bench as a result of equipment movement (Figure 21) and within the road leading from the upper to the middle bench (Figure 22). No cultural materials were observed during the surface investigation.

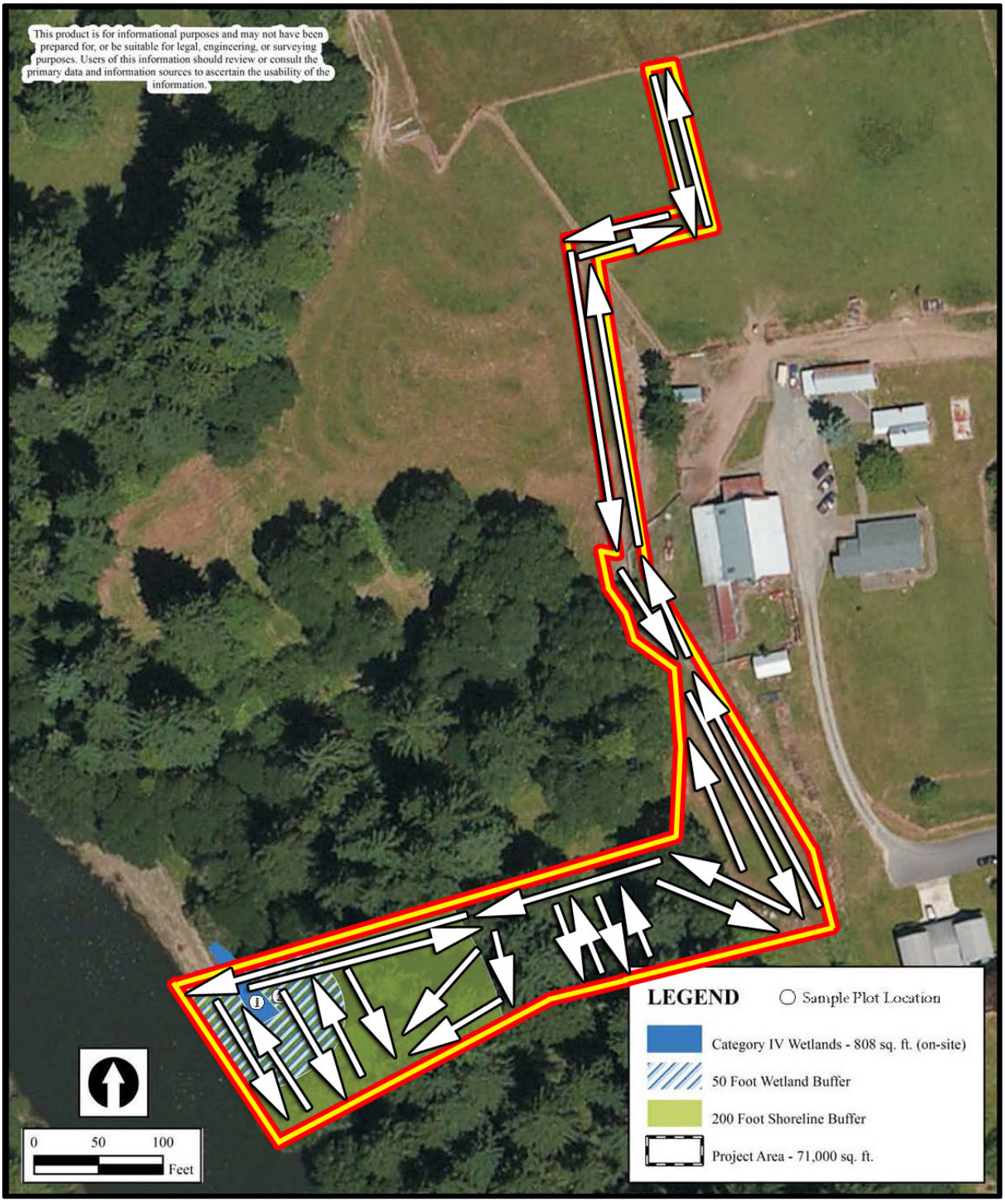


Figure 11. Aerial photomap of the project area showing the extent and orientation of the transects walked by ASCC during the surface investigation.

Figure 19. Photograph showing the increased soil visibility within the cow pasture area, looking north.

Figure 20. Photograph showing increased soil visibility within informal cow paths in the central portion of the project area, looking south.

Figure 21. Photograph showing the increased soil visibility on the lower terrace, looking south toward STP-1 (in background).

Figure 22. Photograph showing the increased soil visibility within the road leading down the hill between the upper and lower terraces.

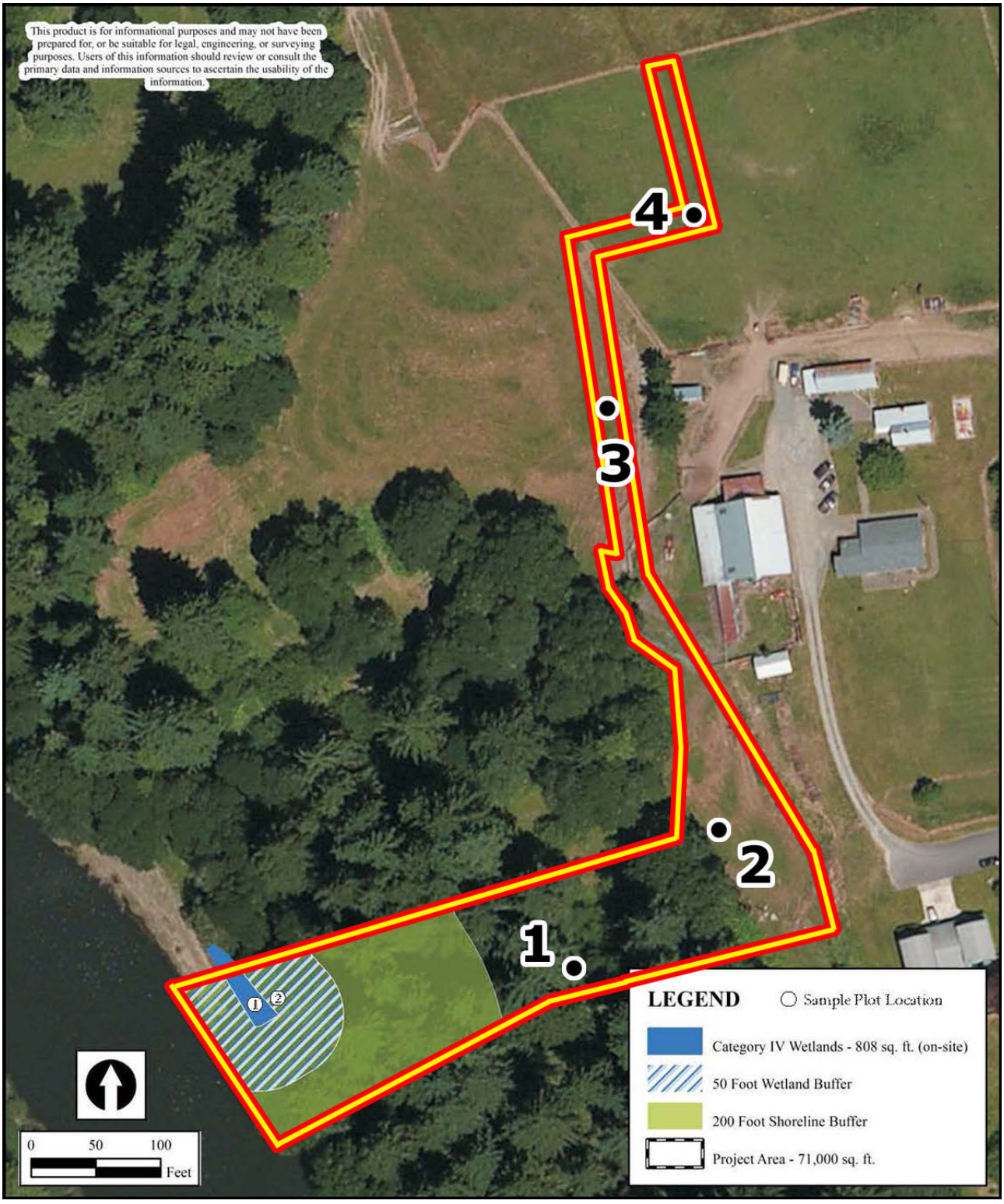


Figure 23. Aerial photomap showing locations of the four negative STPs excavated during the subsurface investigation.

During the subsurface investigation, ASCC excavated four shovel test probes within the project area (Figure 23). All of the STPs were excavated by shovel as cylindrical holes measuring roughly 50 cm in diameter at the surface. They were placed on stable soils in order to sample the various landforms across the project area. All excavated soils were processed through nested 1/4-inch (6mm) and 1/8-inch (3mm) stainless steel mesh. Detailed notes on the subsurface investigation, including location information, descriptions of soil types, texture, color, and the presence or absence of cultural materials, were kept in field notes which are on file at ASCC's office, in Vancouver.

Figure 24. Photograph of the soil profile observed in STP-3.

Figure 25. Photograph of the soil profile observed in STP-4.

Figure 26. Photograph of the soil profile observed in STP-2.

Figure 27. Photograph of the soil profile observed in STP-1, auger hole visible at base.

Soils observed during the subsurface investigation were consistent with the descriptions of three variants of Hillsboro silt loam given by McGee (1972). ASCC observed dark brown silt loam to a depth between 25 (STP-1) and 45 (STP-4) cm below ground surface (bgs). Below this was a dark yellowish brown silty loam or silty clay loam, interpreted to represent subsoil (Figures 24-27). ASCC augered STP-4 to a depth of approximately 120 cm bgs in order to sample deeper sediments on this lower terrace above the East Fork Lewis River. No cultural resources were observed in any of the STP excavated during the subsurface investigation.

Results and Recommendations

ASCC found no cultural resources within the project area, and has established that no previously recorded archaeological sites or other historic properties are visible from the project area. **It is therefore ASCC's opinion that the proposed Kays Subdivision Stormwater Outfall project will have no effect on historic properties, including archaeological deposits, listed on, or eligible for listing on, the NRHP. No further archaeological work is necessary.**

Project coordinators should bear in mind that a survey is, by definition, a sampling process that cannot completely rule out the presence of archaeological materials. To prepare for the possibility that archaeological resources are discovered during project activities, ASCC recommends that project coordinators develop inadvertent discovery language, such as that included below.

Sample Inadvertent Discovery Language

In the unlikely event of an inadvertent discovery of potentially significant archaeological materials (bones, shell, stone tools, hearths, etc.) and/or human remains during project activities, all work in the immediate vicinity should stop, the area must be secured, and the discovery must be reported to the Department of Archaeology and Historic Preservation (DAHP) (360-586-3065) and all relevant Native American tribes. In the event human remains are identified, local law enforcement, the county medical examiner, State Physical Anthropologist at DAHP (360-586-3534), the Clark County planning office, and the affected Tribes should be contacted immediately. Compliance with all applicable laws pertaining to archaeological resources (RCW27.53, 27.44 and WAC 25-48) and human remains (RCW 68.50) is required.

ascc/dh15194

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CULTURAL RESOURCES REPORT COVER SHEET

Author: Dana L. Holschuh

Title of Report: Cultural Resources Survey of the Kays Subdivision Stormwater Outfall Project Area, La Center, Clark County, Washington

Date of Report: 3/22/15

County(ies): Clark Section: 3 Township: 4 North Range: 1 East E/W

Quad: Ridgefield, WA Acres: approximately 1.6

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☐ Yes ☒ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☐ Yes ☒ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:

_____
_____
_____
_____
_____
_____
_____
_____
_____

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

CULTURAL RESOURCES SURVEY OF THE KAYS SUBDIVISION STORMWATER OUTFALL PROJECT AREA, CLARK COUNTY, WASHINGTON

By
Dana L. Holschuh, M.A.

Report Prepared for:
WARAC, LLC
7211 NE 43rd Ave.
Vancouver, WA 98771

County: Clark
Township: 4 North
Range: 1 East
Section: NW ¼ of Section 3
USGS Quad.: Ridgefield, WA
Project Acreage: 1.6 acres
Permit: N/A
Result: Negative

March 22nd, 2015

Archaeological Services Report No. 15194

ARCHAEOLOGICAL SERVICES LLC
5305 E 18th Street, Suite 101 Vancouver, WA 98661 (360) 260-8614 www.archaeologicalservices.com

Applicant's Name: WARAC, LLC
Property Owner: Eddie Barnhart
File/Permit Number: ASCC # 15194
Date Received: 2/22/15
Location: 555 W 5th Street La Center, Clark County, WA
Quadrangle: USGS, Ridgefield, WA, 7.5-minute Series, 1990
Township/Range/Section/Quarter Section: T4N, R1E, NW ¼ of Section 3, Willamette Meridian.
Number of Acres: 1.6 acres
Purpose of Survey: To assess the impact of a proposed stormwater outfall associated with the Kays Subdivision (proposed).

FINDINGS	
POSITIVE	☐
NEGATIVE	■

Description of the Project

Archaeological Services LLC (ASCC) carried out a literature review, surface and subsurface investigation of the Kays Subdivision Stormwater Outfall project area. The project area is situated in southwestern Washington in the northwestern portion of Clark County, within the town of La Center. The project area is irregularly-shaped and measures approximately 1.6 acres within a larger residential parcel located at the western terminus of W 5th Street. It lies on the eastern bank of the East Fork Lewis River, approximately 0.39 miles (0.72 km) west/northwest of its confluence with Breeze Creek, approximately 1.26 miles (2.02 km) east of Interstate-5 and approximately 1.52 miles (2.45 km) southeast of Paradise Point (Figure 1).

As currently planned, the project entails the installation of a stormwater outfall system leading from the proposed 37-lot Kays Subdivision development down to the East Fork Lewis River. The lower portion of the proposed outfall will be located within the 200-foot shoreline buffer of the East Fork (Figure 2); this portion of the outfall pipe will be underground as required by the City's Shoreline Master Plan.

The project will require permitting from the U.S. Army Corps of Engineers (USACE). As the project's federal nexus, the involvement of the USACE triggers project compliance with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires consideration of the project's potential effects upon cultural resources that are listed on, or eligible for listing on, the National Register of Historic Places (NRHP). To that end, the current investigation is designed to identify any historic properties, i.e. archaeological and above-ground resources, which may be adversely affected by the proposed project. The APE for this project, as defined by 36 CFR 800.16 (d), consists of:

> the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking. (36 CFR 800.16)

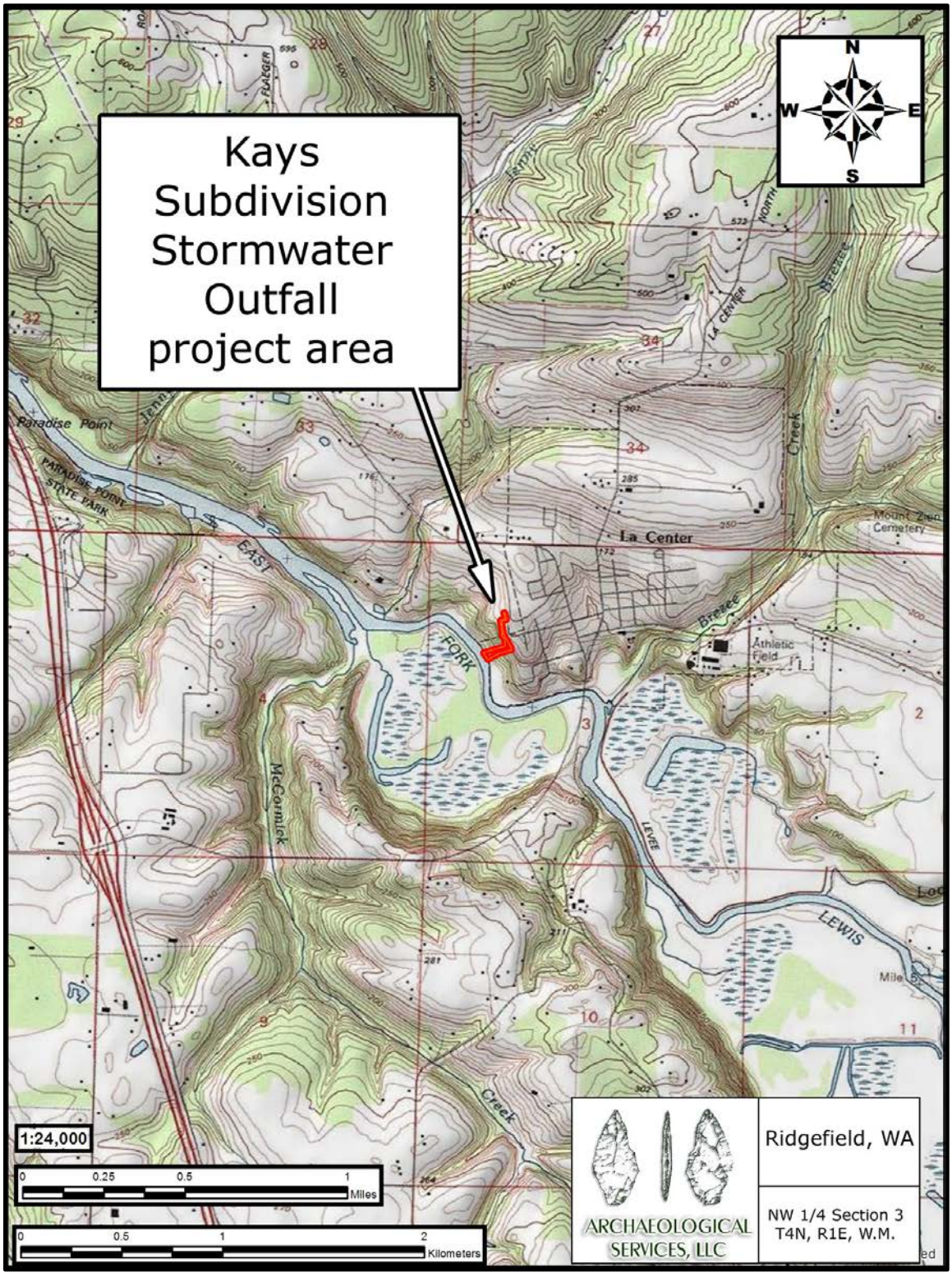

Figure 1. Portion of the Ridgefield, WA 7.5-minute USGS quadrangle indicating the location of the Kays Subdivision Stormwater Outfall project area.

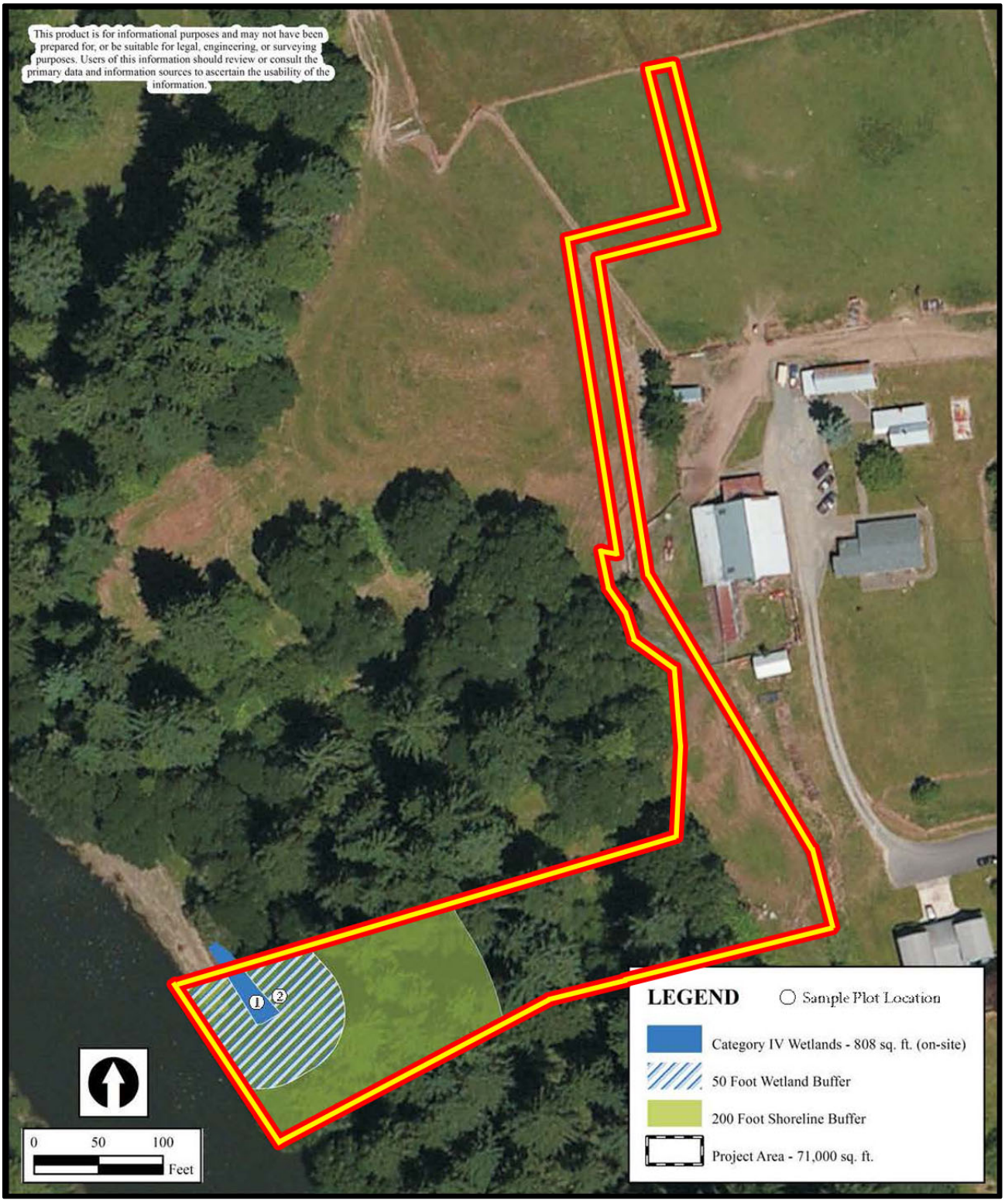

Figure 2. Aerial photomap of the project area showing current conditions.

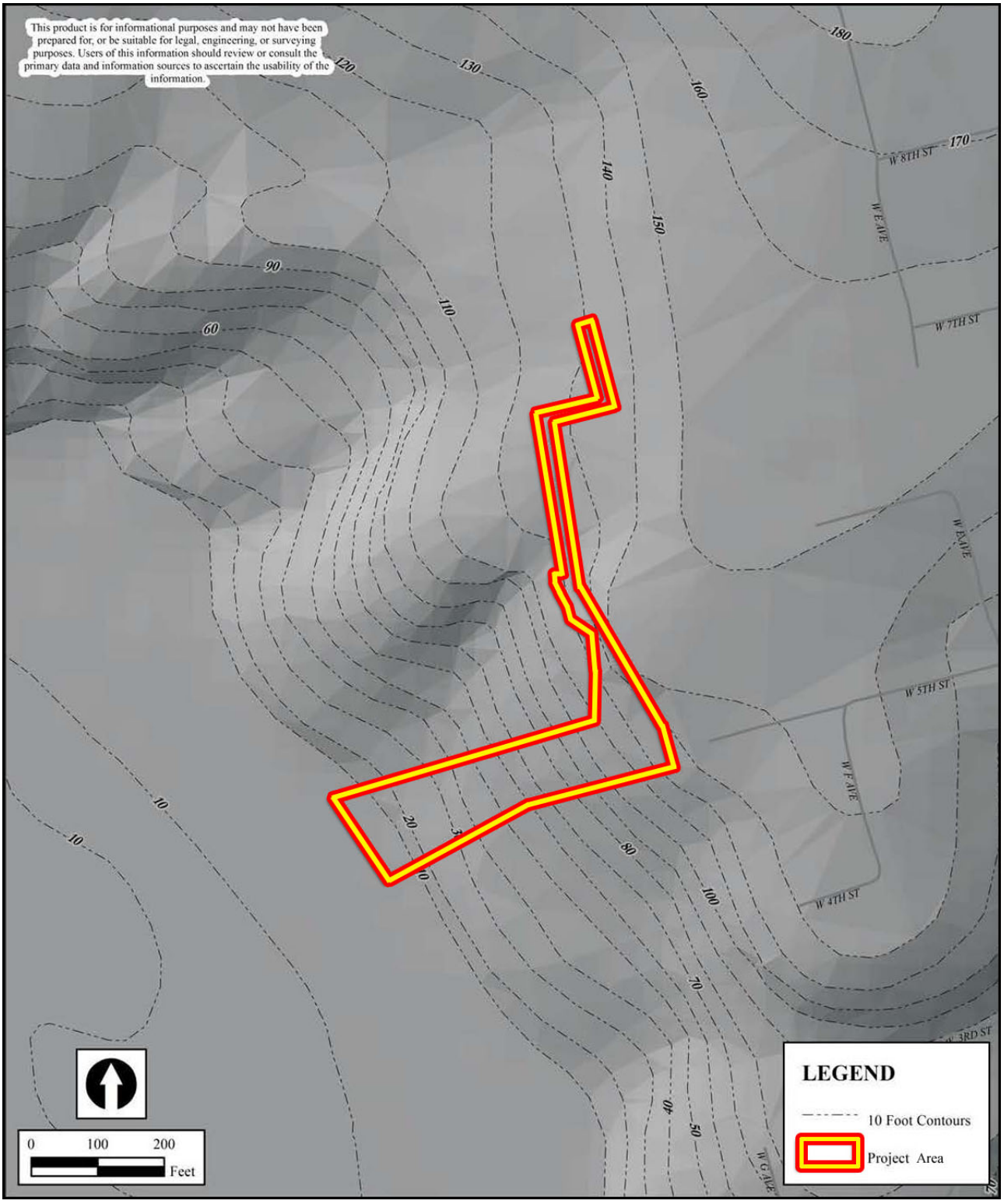

Figure 3. Topographic map of the project area.

Project Area Description and Environment

The irregularly-shaped project area is located on the eastern shore of the East Fork Lewis River (Figures 2 and 3). The northern portion is situated within a pasture currently used for cow and horse grazing. From the fence line, the project area leads south and turns west into an adjacent pasture (Figures 4 and 5).

Figure 4. Photograph of the northern boundary of the project area, looking north.

Figure 5. Photograph of the northern portion of the project area, looking west toward the adjacent cow pasture.

In the central portion of the project area, the stormwater outfall corridor runs south along the eastern margin of the pasture characterized by grassy pasture lands with abundant soil visibility from cattle trampling (Figure 6). This portion of the project area cuts south, across a western-facing hillside characterized by many informal cow paths that follow the contours of the landform (Figures 6 and 7). Mature trees are located along the western edge of the project area as it widens into the southern portion (Figures 6-8).

Figure 6. Photograph of the stormwater outfall corridor, looking south along the eastern edge of the pasture.

Figure 7. Photograph of cow paths on hillside in central portion of the project area, looking south.

Figure 8. Photograph of mature white oak tree adjacent to the central portion of the outfall corridor (on right).

The southern portion of the project area widens and turns west, continuing down the hill to the river. The landform encompasses three flattened benches above the river's edge. The grassy upper bench is located adjacent to the farm buildings on the property and is currently the location of a bulldozer (Figure 9).

Figure 9. Photograph of grassy upper bench, looking west, bulldozer on left, lower bench visible in background.

A dirt roadway has been cut into the hillside between the upper and middle benches (Figure 10). This slope descends to the middle bench, a flat, grassy area with mature trees at the perimeter where piping is currently stored (Figures 11 and 12).

Figure 10. Photograph of the dirt roadway that has been cut into the hillside below the upper bench, looking south from middle brnch.

Figure 11. Photograph along the roadway, looking north with upper bench on right and middle bench visible in background.

Figure 12. Photograph of the middle bench, looking west toward slope to the lower terrace, pipe on right, disturbance visible on left and in foreground.

The landform descends a moderate to steep wooded slope from this middle bench to the first terrace above the river (Figures 13 and 14). This terrace is partially wooded, opening to a flat grassy field along the river's eastern shore. Cows graze throughout this area, including the upper and middle benches and the shoreline (Figures 14 and 15).

Figure 13. Photograph of the wooded slope between the middle bench (atop hill) and the lower terrace (in foreground), looking east/uphill.

Figure 14. Photograph of cows grazing on the partially-wooded lower terrace, East Fork Lewis River in background on right.

Figure 15. Photograph of the eastern bank of the East Fork Lewis River, looking south with the grassy terrace on left.

Topography varies greatly across the project area (Figure 16), from a high point along the northern border of 134 feet above mean sea level (amsl), to approximately 16 feet amsl on the river's edge.

Figure 16. Photograph of upper and middle benches, looking east with roadway descending hillside from the right.

Environmental Context

The project area is located on the northern margin of the Portland Basin, a structural depression centered on the confluence of the Willamette and Columbia Rivers. The basin is part of the larger Puget-Willamette Lowland, which represents the southern end of a coastal trough running from southeastern Alaska to the south end of the Willamette Valley (Ames 1994:5). As the Columbia River exits the Columbia Gorge from the east and enters the Portland Basin, the river becomes marked by extensive alluvial bottomlands, sloughs, lakes, and islands composed of low-lying alluvium. Similarly, the lower reach of the East Fork Lewis River is marked by extensive meanders and a broad flood plain. The point at which the Lewis River converges with the Columbia River marks the northern margin of the Portland Basin. Away from the river, Clark County has a climate similar to that of the Willamette Valley in Oregon—relatively mild temperatures with cool, wet winters and warm, dry summers (Franklin and Dyrness 1988: 45).

Hydrologically, the project area is located adjacent to the eastern shore of the East Fork Lewis River. The East Fork Lewis River flows out of the southwest corner of the Gifford Pinchot National Forest and travels west for 43 miles from its source near Cougar Rock and Lookout Mountain, through the entirety of Clark County, roughly splitting the county in half. Ethnographically and historically, the river supported very large runs of anadromous fish. The river continues to support sustainable runs of salmon and steelhead. The lower reach of the East

Fork Lewis River also contains sturgeon. Unlike most other rivers of its size in the region, the East Fork Lewis River is free flowing with no dams, making it important for salmon restoration. The river is known to contain archaeological sites along its banks, particularly upstream in the vicinity of Lucia Falls (Wilson 1997).

The project area is located in Franklin and Dyrness's (1988) regional Western Hemlock *(Tsuga heterophylla)* vegetation zone. This zone encompasses woodlands between the Pacific Ocean and the Cascade Mountains up to roughly 700 m (2296 ft.) amsl. Dominant elements of this forest community include Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and western red cedar (*Thuja plicata*) with few hardwood species. In specialized habitats, such as riparian zones or recently disturbed areas, red alder (*Alnus rubra*), bigleaf maple (*Acer macrophyllum*), and golden chinquapin (*Castanopsis chrysophlla*) are widespread. Along major watercourses, black cottonwood (*Populus trichocarpa*) and Oregon ash (*Fraxinus latifolia*) are dominant woodland species. Oregon white oak (*Quercus garryana*) is commonly found in drier soils, often thriving in areas too fire-damaged for evergreen species. Common forest understory plants throughout the zone include vine maple (*Acer circinatum*), hawthorn (*Crataegus douglasii*), wild rose (*Rosa gymnocarpa*), blackberry (*Rubus ursinus*), thimbleberry (*Rubus parviflorus*), and snowberry (*Symphoricarpos albus*) (Franklin and Dyrness 1988).

Vegetation within the project area includes, but is not limited to, white oak, Douglas fir, holly, apple, and various grasses and forbs.

The following soil descriptions are given in *Soil Survey of Clark County* (McGee 1972). Soils within the project area are mapped as three variants of the Hillsboro series. This series consists of deep, well-drained soils on terraces. These are medium-textured soils that developed in deposits of old Columbia River alluvium. Most areas are nearly level to gently sloping, but strongly sloping to very steep areas along drainageways and streams. Most areas are in the southwestern, central, and south-central parts of the county (McGee 1972).

Soils within the northern portion of the project area are mapped as HoC, or Hillsboro silt loam on 8 to 15% slopes. This soil typically consists of a surface layer of dark brown silt loam about 5 inches (12.7 cm) thick, with friable, dark brown silt loam below.

To the south of this, in the vicinity of the residences, soils are mapped as HoB, Hillsboro silt loam on 3 to 8% slopes. This is the dominant soil in the southwestern part of the county. The relief is gently undulating and in most places the slopes are short. In a typical profile the surface layer is dark brown silt loam about 7 inches (17.78 cm) thick. The next layer is about 48 inches (121.92 cm) thick with the top 17 inches (43.18 cm) consisting of a dark-brown silt loam followed by a dark grayish-brown silt loam.

The southernmost portion of the project area is mapped as HoE, or Hillsboro silt loam on 20 to 30% slopes. This soil is along Salmon Creek, Whipple Creek, and other major drainageways in the western part of Clark County. It typically consists of a surface layer of dark brown silt loam about 3 to 4 inches thick, with friable, dark brown silt loam below (McGee 1972).

Background Research and Literature Review

ASCC carried out ethnographic, historic, and archaeological background research using materials from the Washington State Department of Archaeology and Historic Preservation (DAHP) as well as resources located at the ASCC library and online. These materials included Washington State Archaeological Site Inventory files, cultural resource survey reports, General Land Offices (GLO) survey maps, various county road maps, tax assessor maps, and the Washington Information System for Architectural and Archaeological Records Data (WISAARD). ASCC used this background research to assess the archaeological probability of the project area and to establish an interpretive context for any materials encountered in the field.

Ethnographic Overview

The project is located within territory historically occupied by native Cowlitz and Chinook peoples of the Lower Columbia River. The term "Chinook" refers to both a linguistic classification as well as a cultural one (Ruby and Brown 1976). Early on, Euro-American traders used the term to refer to the indigenous people living on the Pacific shore from Willapa Bay to Tillamook Head, along the Columbia River from its mouth to The Dalles, and a short distance up the Willamette to its falls (Silverstein 1990). Traits common to Chinookan-speaking groups include a reliance on aquatic resources (primarily anadromous fish), woodworking (exemplified by planked houses and dugout canoes), twined basketry, untailored clothing, a distinctive art style, and a social emphasis on rank, including the practice of slavery (ibid.). A division of the Chinook considered culturally, geographically and linguistically as the Multnomah tribe traditionally inhabited the area around present-day Woodland, to the west of the project area. Ethnographies also place the Lewis River Cowlitz in this area at the time of European contact.

Chinookan speakers can be divided into the Lower Chinook, who lived near the Pacific coast, and the Upper Chinook, who lived farther inland along the Columbia River and its tributaries. The Multnomah sub-group of the Upper Chinook occupied the Columbia River from near Deer Island to just east of the Washougal River (Silverstein 1990).

Multnomah villages were recorded on both sides of the Columbia River. The first recorded Multnomah villages include the settlements on Wappato Island, now Sauvie Island (recorded in William Broughton's trip log, 1792) (Jones 1972), and two settlements recorded by Lewis and Clark: *Shoto*, located along Vancouver Lake, and *Cathlapottle*, located near the mouths of Lake River and the Lewis River (Silverstein 1990). The names of the villages also refer to smaller ethnic and political subgroups within the Multnomah linguistic group.

By the late 18th century, the Chinookan peoples of the Lower Columbia had come into contact with Euro-American traders who plied the Northwest Coast trading with the natives, primarily in furs. Diseases carried by the newcomers devastated the Chinook, essentially destroying their traditional lifeways within a single generation. Smallpox, dysentery, and malaria reduced the population by as much as 75% to 90% by some estimates (Hajda as cited in Ames 1994).

While the Chinookan peoples were the most obvious indigenous inhabitants of Clark County, other Native American groups were present during late prehistoric times. Occupying the upper

portions of the Lewis River and Cowlitz River drainages were speakers of Ichishkíin Sínwit (also known as Sahaptin), a language primarily spoken to the east of the Cascades by plateau cultures such as the Yakama, Palouse, and Umatilla. Euro-American observers used the generic term "Klikitat" to describe Sahaptin-speaking peoples living west of the Cascades (Ray 1936). Along the upper Lewis and Cowlitz Rivers, these peoples were generally referred to as the Taitnapam, or Western Klikitat. It is generally thought that the Klikitat began arriving in western Washington when the Chinook, devastated by Euro-American diseases, abandoned many of their traditional territories (Hajda 1994).

The Klikitat subsistence pattern was oriented largely around open grasslands and prairies, which contained animal and plant resources and served as inland lines of communication and commerce (Norton et al. 1999). Klikitat peoples are thought to have maintained the open grasslands and prairies through periodic burning. The Klikitat wintered in the valleys of the Klikitat, White Salmon, Little White Salmon, Wind, and Lewis Rivers (Curtis 1911). With the ripening of the first roots and greens in spring, small groups would move to seasonal camps associated with a particular resource and stay, dependent on the availability of the resource. Like their Chinookan-speaking neighbors to the south and west, the Klikitat would converge in great numbers at fisheries during the heights of the spring and summer salmon runs. As the summer progressed into fall, the people would move higher into the uplands to take advantage of ripening berries and available game. With the end of the berry season, the people would reunite in social gathering locations before dispersing to their respective winter village sites. Movement between resource concentrations was quite fluid depending on need and resource availability (Boyd and Hajda 1987).

Moving into former Chinookan territories such as the Lewis River Basin, Sahaptin-speaking newcomers such as the Taitnapam may have adopted many of the practices of neighboring riverine groups such as the Cowlitz, an interior, Salish-speaking people who lived to the north of the project area along the Cowlitz River and its tributaries (Hajda 1990). The Cowlitz centered their tribal territories on major salmon streams, but they also harvested resources from the productive inland prairies (Hajda 1990, Boyd, ed. 1999). In the winter, the Cowlitz lived in cedar longhouses. In the spring, families moved to the prairies to dig wapato and camas, and they also traveled to the mountains to seek game and berries. Men would hunt both large and small game, and women would gather various berries. During resource-gathering excursions, the Cowlitz would occupy temporary camps (Hajda 1994).

The Cowlitz traveled by both trail and river to participate in trade with neighboring tribes, including trading surplus camas for sturgeon and other maritime staples with the Lower Chehalis, the Quinault, and groups along the Columbia River (Hajda 1990). Dentalium shells served as the primary medium of exchange when direct goods-for-goods trading was not an option. Intermarriage between the groups encouraged such productive relationships, though conflict sometimes disrupted these relationships (Hajda 1990). Several authors have pointed out the difficulty in assigning "tribal" boundaries within the Portland Basin (Boyd and Hajda 1987). The difficulty arises from the political independence of villages, seasonal population movements, trading patterns and village exogamy whereby travel and marriage between villages was the rule rather than the exception.

Historic Overview

The first undisputed European contact with the Pacific Northwest's indigenous people is recorded in 1792, when British naval officer George Vancouver explored Puget Sound. Ensuing decades saw more Euro-American incursions to the region, often under the banner of the Hudson's Bay Company (HBC), the vast British fur trading concern. In 1825, the HBC established Fort Vancouver, the first permanent non-native settlement in the Pacific Northwest. As the nexus of the Pacific Northwest fur trade, the fort served as an important foothold for further Euro-American settlement. Under the 1846 Oregon Treaty, the land on which Fort Vancouver stood changed from British to American control.

The growing Euro-American population in the Pacific Northwest led in 1848 to the creation by U.S. Congress of Oregon Territory, which included the present states of Washington, Oregon, and Idaho. Euro-American settlement of the region was spurred on by the Donation Land Claim Act of 1850, which granted acreage to eligible adult U.S. citizens who were able to homestead the land.

The earliest map of the project area is the 1854 General Land Office (GLO) cadastral map of Township 4 North, Range 1 East (Figure 17). This map depicts the project area amid unclaimed land on the northern shore of the East Fork Lewis River, labeled here as "South Fork Cattlepootle River", at the northern margin of an area labeled "Low rich bottomlands subject to inundation". To the south of the river, survey notes describe the environment at that time: "Land level and gently rolling. Soil 2nd rate clay loam, gravelly in places. Timber fir, cedar, maple, hemlock &c (sic), mostly burnt and dead & partly fallen with thick undergrowth" (GLO 1854).

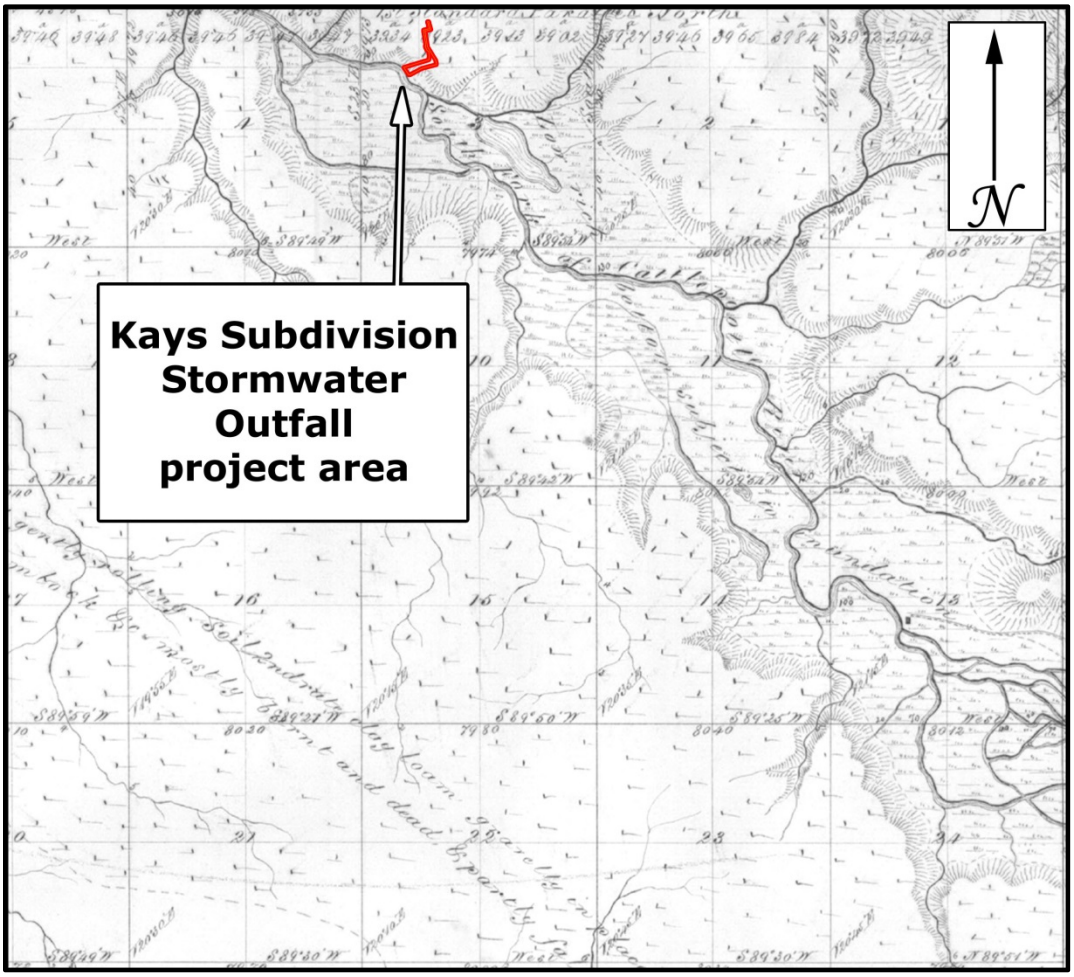

Figure 10. 1854 GLO cadastral map overlaid with the approximate location of the project area.

GLO maps from 1863 depict no ownership for the lands in the vicinity of the project area. According to a history of La Center, the first individual to stake a claim along the East Fork Lewis River was John Pollack in 1849 (Reilly 1979). Another account states that "the earliest settlements in the vicinity of the town of La Center were made in 1852. In that year John H. Timmen and Aurelius Wilkens took up claims about five miles above the present town site…while about the same time John Pollack, and his brother, located on the south side of the Lewis River" (Alley and Monroe-Fraser 1885:178).

These early homesteaders cleared farms and grazed cattle. By 1870, sternwheelers (or lighter boats, when the water was low) plied the East Fork Lewis River trading dry goods and groceries for cash, butter, eggs and honey. In 1872, at the site of present-day La Center, sternwheeler captain William G. Weir built a house and opened a store and a post office (Caldbick 2010). In 1874 or 1875, the town's first plat was filed by John H. Zimmen, who changed the community's name from "Podunk" to "Timmen's Landing" (Ibid.).

The region's first commercial logging operations were underway by 1876. As sawmills were built on the East Fork and its tributaries, the settlement of Timmen's Landing grew. By the mid-1880s the town included two hotels, a Methodist church, a grist mill, a brickyard, a post of the Grand American Army of the Republic, and a grange hall. Built in 1874 by H. M. Knapp, a Deputy Grand Master of the Masonic "Patrons of Husbandry," the town grange was reputedly the first in the Washington Territory (Caldbick 2010).

The town's name change to "La Center" evidently occurred by 1888, as the town is labeled as such on that year's Map of Clarke [sic] County. This map, depicting ownership but not structures, reflects the rapid growth of the region. This map also depicts a road heading north from La Center, splitting east and west about a quarter-mile north of the town. The western spur travels along the midline of Section 33, corresponding to today's Bolen Street (Habersham 1888).

In 1907, La Center's dairying, mixed farming, logging, and milling supported a population of about 300. Eight sawmills operated within five miles of town, turning out tens of thousands of railroad ties for the Northern Pacific Railroad, which stopped at Ridgefield roughly ten miles away (Caldbick 2010). Within town were four general stores, one drugstore, two hotels, one restaurant, one livery stable, two blacksmith shops, one saloon, one hospital, one furniture store and one pool room.

La Center became formally incorporated in 1909, by which time the depletion of the surrounding timber was becoming apparent. A writer for the April, 1909 issue of *The Coast* magazine reported that, within the span of a few years, "about one-half of this forest has been marketed, and the logged-off lands are used for grazing and general farming" (Fanning 1909, cited in Caldbick 2010). As the forests around La Center were logged out, the town's population leveled off, remaining at or below 300 for the next sixty years (Caldbick 2010).

The 1910 Map of Clark County (National Map and Publishing Company 1910), which does not show ownership or structures, depicts the road that is today's Bolen Street. In 1918, the Pacific Highway was routed through La Center (Caldbick 2010). Although properties changed hands throughout the 20th century, La Center as a whole changed little. It remained small and rural, sustained largely by dairy farming. Its population dipped below 200 in the 1920s and again in the 1940s (Caldbick 2010).

The 1937 Metsker's Atlas of Clark County depicts Pacific Highway in its current configuration, running roughly north-south to the east of the project area, which is within land attributed to Rose L. Barnhart (Metsker 1937). The 1943 Mestker's Map shows the project area within land attributed to C.R. Barnhart. The town of La Center is platted to the immediate east of this land, with a road running roughly north-south, labeled "to Woodland" in the approximate configuration of Pacific Highway (Metsker 1943). Little has changed on the 1961 map, which shows the project area within land that is still attributed to C.R. Barnhart, although the holdings now extend to the opposite bank of the river. This map is the first to show W 5th Street (Metsker 1961). The 1974 Metsker's Map is the first to depict Interstate-5 to the west of the project area, which is now within land attributed to B. Barnhart (Metsker 1974).

In 1985, facing possible bankruptcy, La Center became the first community in Clark County to legalize card-room gambling. With a ten percent gambling tax bolstering the economy, the town went through a dramatic turnaround, its population growing roughly 500% between 1990 and 2010 (Caldbick 2010). Housing developments and other projects boomed, and gambling remains the town's largest source of revenue. The 1993 Metsker's Map shows W 5th Street extended to its current location, with the project area at the western terminus, within land attributed to Leigh, J. The town is divided into various additions, including La Center, Breezee's, McCann's and Rasmussen's (Metsker 1993). This map labels NW Timmon and Spencer Roads, as well as Pacific Highway, which passes to the east of the project area.

Aerial photomaps of the project area dating back to 1955 show that the residence and farm complex has been in its current location since this time, with a second residence constructed in 1992 (Clark County 2015).

Previous Archaeology

ASCC reviewed records from the DAHP and the ASCC library in order to establish an archaeological context for the region, focusing on studies within a one-mile radius of the project area. This review indicated that at least 14 previous cultural resource surveys have taken place within this radius (Cooper 2001; Mills 2002a; Wilson 2005; Bryant 2006a; Gall 2006a, 2006b; Holschuh 2006a; Easton 2007a; Hudson 2008; Lloyd-Jones 2008; Solimano 2008; Gall 2009; Freed 2011; Gall 2011). The majority of these are predetermination surveys designed to satisfy Clark County's archaeological ordinance, the nearest of which was performed on the pasture directly north of the Kays Subdivision Stormwater Outfall project area (Easton 2007a).

There have been seven archaeological sites or isolates recorded within one mile of the project area. The nearest of these is 45CL743, a single flaked quartzite cobble recorded as an isolate on the eastern margin of the pasture immediately north, approximately 450 feet (123 m) north/northeast of the northern terminus of the current project area (Easton 2007b).

Site number 45CL532 is located approximately 0.31 miles (0.5 km) east of the project area, along the south side of W 4th Street. This site is a historic debris scatter consisting of ceramics, glass, brick, cement, butchered bone, and metal fragments, is the result of building debris pushed over the edge of the terrace after two fires in the town of La Center in the early 1930s. Artifacts are datable to the 1920s and 1930s (Mills 2002b).

Three lithic isolates are recorded to the north and northwest of the project area, in the fields to the north of NW Pacific Highway. Isolate 45CL692 is located approximately 0.39 miles (0.62 km) north of the project area. The isolate consists of four cryptocrystalline silicate (CCS) flakes found in three positive shovel test probes (STPs) excavated during a predetermination survey (Bryant 2006a, 2006b). This isolate would be considered a site if recorded today, as currently DAHP defines a site as anything more than one artifact. A second isolate was recorded in the northern portion of the same study area, approximately 0.44 miles (0.71 km) north/northwest of the current project area (Bryant 2006a). This isolate, 45CL693, is a single CCS flake (Bryant

2006c). The third isolate, also a single CCS flake, is located approximately 0.73 miles (1.18 km) northwest of the northern terminus of the current project area (Holschuh 2006b). Approximately 0.8 miles (1.23 km) northwest of the project area is site number 45CL674, which consists of a small-scale lithic scatter recorded following a predetermination and survey on a terrace above Jenny Creek (Gall 2006a, 2006b, 2006c). The predetermination resulted in four CCS and one quartzite flakes, as well as a possible core (Gall 2006a). The subsequent survey recovered an additional 22 lithic flakes and two tools- a core and a biface fragment (Gall 2006b, 2006c).

Site 45CL54 is located approximately 0.63 miles (1.02 km) southwest of the shoreline of the current project area. There is little information recorded on this site, other than a rough location (Anonymous n.d.). A 1958-1959 article in *Tebiwa* describes the artifacts recovered from the site, including choppers, hammerstones, pecked and ground stone, edge-ground cobbles, manos, and projectile points or point fragments (Tuohy and Bryan 1958-1959:30). The authors also report inspecting an artifact collection belonging to a nearby property owner. This collection, probably from 45CL54, included 26 girdled cobbles, four stone bowls, a cobble with a pecked design, a perforated sinker, pestles, a stone pipe fragment, and over 60 projectile points (Tuohy and Bryan 1958-1959:29-30).

Although none of the sites and isolates recorded within one mile of the project area has been evaluated for inclusion on the NRHP, Solimano (2008) expresses the opinion that site number 45CL54 is a significant site. He states that the recorders identify at least 12 different tool classes, including groundstone, and features, and postulates that the site's age may span close to 8,000 years, as indicated by the assemblage (Solimano 2008).

Historic Properties

According to WISAARD, the nearest historic property included on the National Register of Historic Places is the Judge Lancaster House, located approximately 3.41 miles (5.39 km) west of the project area. The house was nominated in 1974 for its architecture- it is a good example of the Greek Revival style, and possibly one of the earliest frame houses in the Washington Territory (Richards 1974). It is also eligible as the residence of Columbia Lancaster, an early politician in Washington Territory. Lancaster arrived in the northwest in 1847 and was appointed as Chief Justice of the Provisional Supreme Court of Oregon. He later went on to serve as Joint Councilman in the Territorial Legislature and as the first delegate to congress from the Washington Territory (Richards 1974).

Methods

ASCC carried out fieldwork at the project area on March 10th, 2015. This field research consisted of a surface and subsurface investigation, conducted by Don Tatum, B.A. and Dana Holschuh, M.A. Weather was fair, with foggy skies that cleared to sun and temperatures in the 50s.

Visual Impact Assessment

A visual impact assessment was conducted for the project area in order to determine the likelihood that historic properties listed on, or eligible for listing on the National Register of Historic Places would be impacted by the proposed construction. As part of the visual impact assessment, digital photographs were taken in and around the project area. No clear line of sight between the project area and the Judge Lancaster House, site 45CL54, or any other properties listed on the NRHP was observed during the visual impact assessment (see *Previous Archaeology*).

Surface Investigation

During the surface investigation, ASCC walked the entire project area in parallel, adjacent transects spaced no more than 10 meters apart (Figure 18). The pedestrian survey was carried out in order to inspect exposed soils for the presence of archaeological materials, to assess the extent of historic/modern ground disturbance, to assess landforms in terms of archaeological probability, to identify historic features or properties, and to generally determine the likelihood that cultural resources are present within the project area.

Approximately 25-30% of the soils within the project area were exposed to ASCC's inspection. Areas of increased soil visibility were observed within areas that had been trampled by cattle (Figures 19 and 20), on the middle bench as a result of equipment movement (Figure 21) and within the road leading from the upper to the middle bench (Figure 22). No cultural materials were observed during the surface investigation.

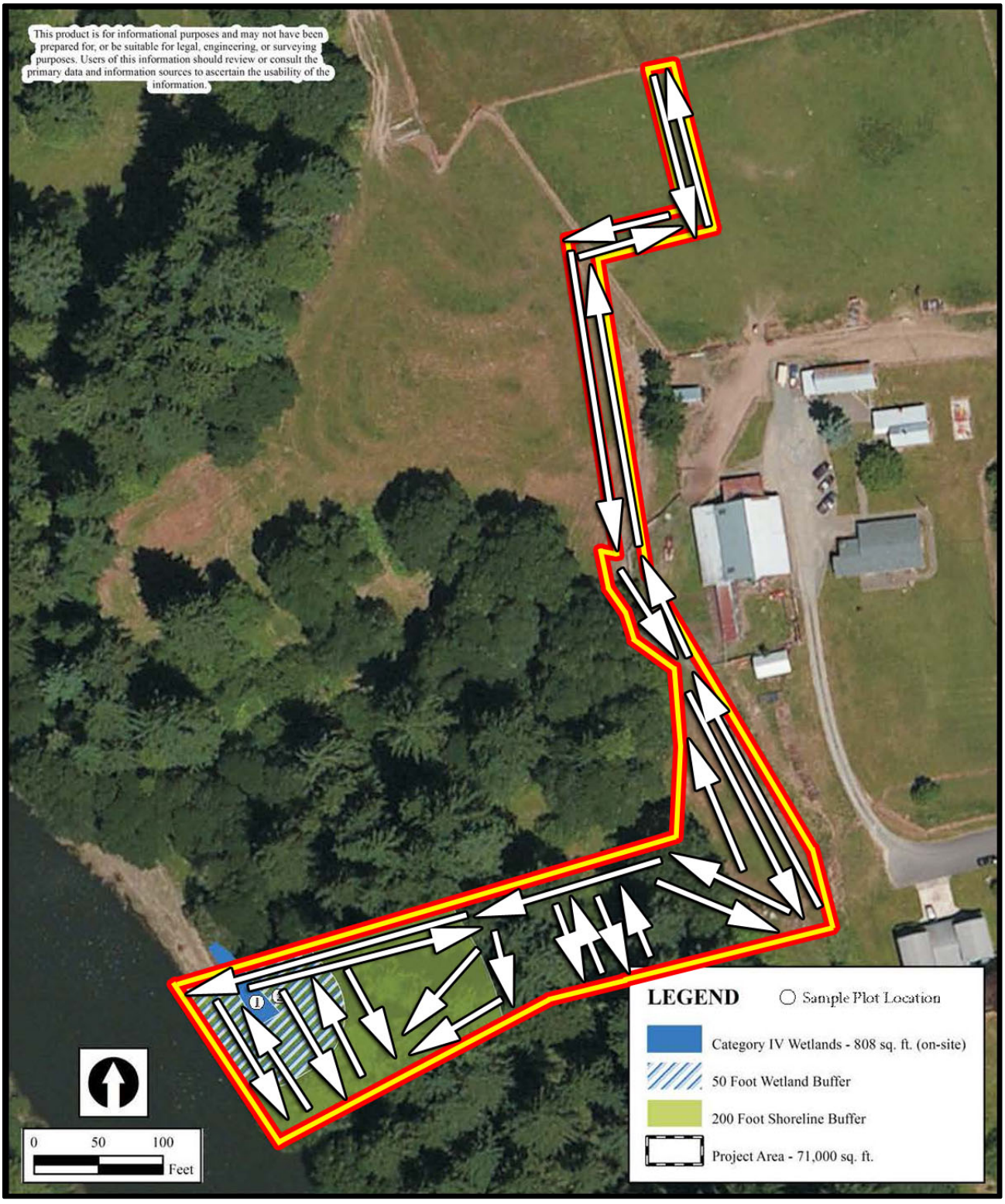

Figure 11. Aerial photomap of the project area showing the extent and orientation of the transects walked by ASCC during the surface investigation.

Figure 19. Photograph showing the increased soil visibility within the cow pasture area, looking north.

Figure 20. Photograph showing increased soil visibility within informal cow paths in the central portion of the project area, looking south.

Figure 21. Photograph showing the increased soil visibility on the lower terrace, looking south toward STP-1 (in background).

Figure 22. Photograph showing the increased soil visibility within the road leading down the hill between the upper and lower terraces.

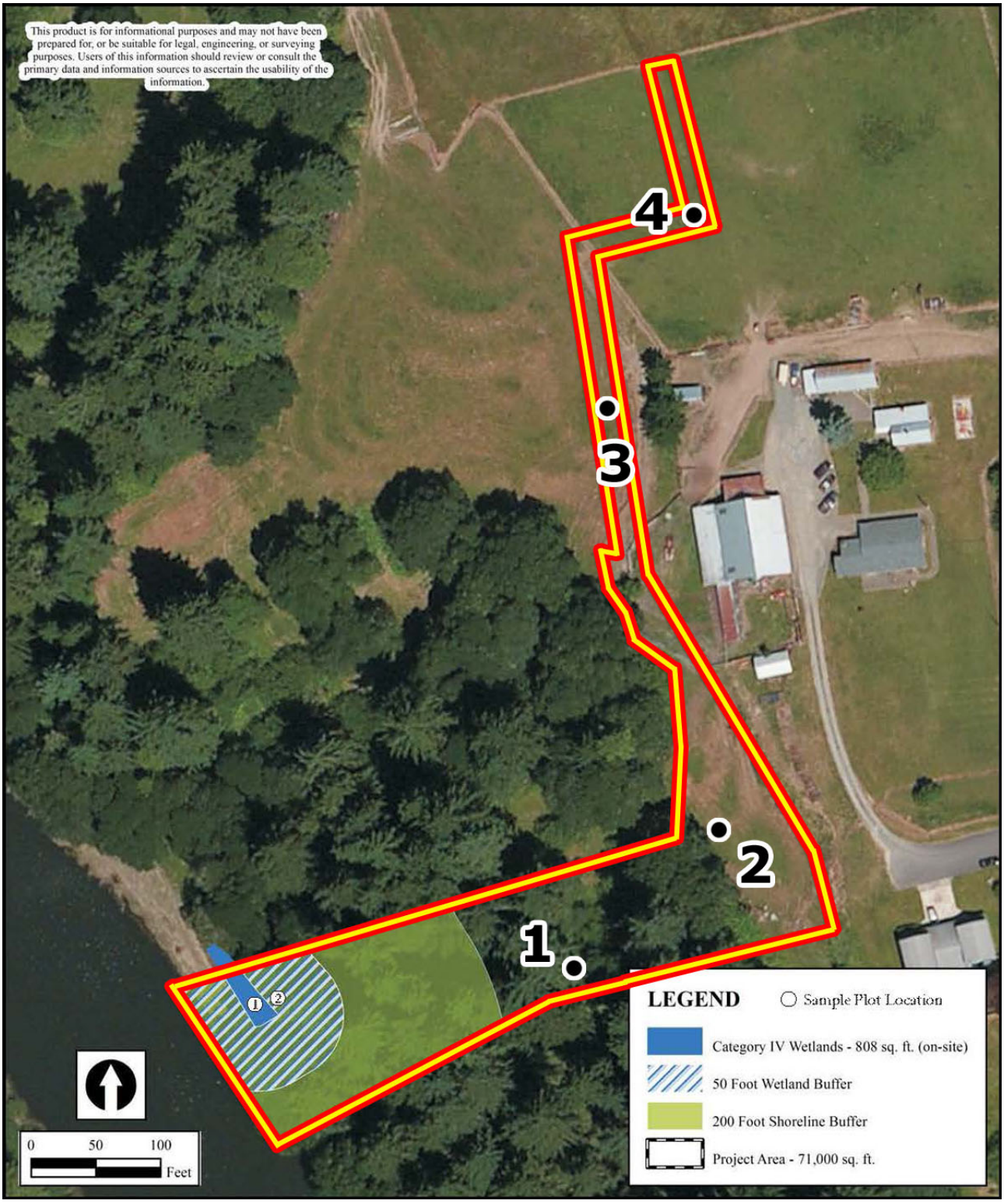

Figure 23. Aerial photomap showing locations of the four negative STPs excavated during the subsurface investigation.

During the subsurface investigation, ASCC excavated four shovel test probes within the project area (Figure 23). All of the STPs were excavated by shovel as cylindrical holes measuring roughly 50 cm in diameter at the surface. They were placed on stable soils in order to sample the various landforms across the project area. All excavated soils were processed through nested 1/4-inch (6mm) and 1/8-inch (3mm) stainless steel mesh. Detailed notes on the subsurface investigation, including location information, descriptions of soil types, texture, color, and the presence or absence of cultural materials, were kept in field notes which are on file at ASCC's office, in Vancouver.

Figure 24. Photograph of the soil profile observed in STP-3.

Figure 25. Photograph of the soil profile observed in STP-4.

Figure 26. Photograph of the soil profile observed in STP-2.

Figure 27. Photograph of the soil profile observed in STP-1, auger hole visible at base.

Soils observed during the subsurface investigation were consistent with the descriptions of three variants of Hillsboro silt loam given by McGee (1972). ASCC observed dark brown silt loam to a depth between 25 (STP-1) and 45 (STP-4) cm below ground surface (bgs). Below this was a dark yellowish brown silty loam or silty clay loam, interpreted to represent subsoil (Figures 24-27). ASCC augered STP-4 to a depth of approximately 120 cm bgs in order to sample deeper sediments on this lower terrace above the East Fork Lewis River. No cultural resources were observed in any of the STP excavated during the subsurface investigation.

Results and Recommendations

ASCC found no cultural resources within the project area, and has established that no previously recorded archaeological sites or other historic properties are visible from the project area. **It is therefore ASCC's opinion that the proposed Kays Subdivision Stormwater Outfall project will have no effect on historic properties, including archaeological deposits, listed on, or eligible for listing on, the NRHP. No further archaeological work is necessary.**

Project coordinators should bear in mind that a survey is, by definition, a sampling process that cannot completely rule out the presence of archaeological materials. To prepare for the possibility that archaeological resources are discovered during project activities, ASCC recommends that project coordinators develop inadvertent discovery language, such as that included below.

Sample Inadvertent Discovery Language

In the unlikely event of an inadvertent discovery of potentially significant archaeological materials (bones, shell, stone tools, hearths, etc.) and/or human remains during project activities, all work in the immediate vicinity should stop, the area must be secured, and the discovery must be reported to the Department of Archaeology and Historic Preservation (DAHP) (360-586-3065) and all relevant Native American tribes. In the event human remains are identified, local law enforcement, the county medical examiner, State Physical Anthropologist at DAHP (360-586-3534), the Clark County planning office, and the affected Tribes should be contacted immediately. Compliance with all applicable laws pertaining to archaeological resources (RCW27.53, 27.44 and WAC 25-48) and human remains (RCW 68.50) is required.

ascc/dh15194

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100%

Technical Information Report

Kay's Subdivision

June 6, 2014

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A PROJECT OVERVIEW

The project is located between the East Fork Lewis River and the NW Pacific Highway within the 98629 zip code. The project is a proposed residential subdivision consisting of 37 lots that will be serviced by new sanitary, storm, and water lines. New impervious surfaces will be installed and shall include asphalt roadway, concrete sidewalks, roof areas, and retaining walls. Native vegetation and open fields shall be converted to lawn and landscaped areas.

Site Location and Topography

The project is located in La Center, WA and is bordered by the NW Pacific Highway, W 8th Street, and the East Fork Lewis River. The project is outside of the 200-ft Shoreline Buffer.

The existing site consists of open fields that slope moderately to the southwest from the NW Pacific Highway and the developed residential lots. Adjacent to the southwest border of the project is an established wetland and landslide scarp. The natural drainage pattern for the undeveloped land is southwest toward the East Fork Lewis River with grades of 6-20%.

Existing Storm Systems

The existing curb on W E Ave collects stormwater runoff from the street via catchbasins and directs the flow east under W 8th Street to the existing 12-in storm conveyance system in the NW Pacific Highway.

The runoff collected by the storm system in the NW Pacific Highway ultimately outfalls at the East Fork Lewis River via a tributary channel.

A ditch in NW Pacific Highway carries some new runoff to the west.

Assumptions and Design Parameters

There will be no onsite detention. A new outfall will be constructed on the tidally influenced East Fork Lewis River.

Runoff from new pollution generating surfaces shall be treated onsite. Runoff from rooftops and from the majority of landscaped areas shall be conveyed directly to the new storm sewer main line.

Runoff shall be conveyed to the East Fork Lewis River via a new offsite storm drain.

Runoff shall not outfall directly to the adjacent wetlands due to landslide potential (Appendix C).

Drainage to and from Adjacent Properties

The site will receive some offsite drainage from the eastern adjacent properties.

Drain Tiles (if applicable)

N/A

Adjacent Areas Description

NW Pacific Highway is a 24-ft paved scenic highway with unpaved shoulders along the northern border of the project.

W E Avenue is an asphalt road that is 18-ft wide with unpaved shoulders. W E Avenue widens between W 9th Street and W 8th Street to a 32-ft asphalt road with concrete curb and sidewalk.

W 8th Street is a 17-ft asphalt road with unpaved shoulders.

The eastern adjacent properties are mostly developed. The Zoning Designations are Residential Professional (RP) and Low Density Residential (LDR-7.5). The Comprehensive Plan Designations are Mixed Use (MU) and Urban Low Density Residential (UL) respectively.

The southern adjacent parcel is privately owned and currently used as pasture. The Zoning Designation is Urban Low (R1-7.5) and the Comprehensive Plan Designation is Urban Low Density Residential (UL).

An established wetland is adjacent to the southwest border of the project. The Zoning Designation is Urban Low (R1-7.5) and the Comprehensive Plan Designation is Parks/Open Space (P/OS).

The western adjacent parcel is privately owned and currently used as pasture. The Zoning Designation is Urban Low (R1-7.5) and the Comprehensive Plan Designation is Urban Low Density Residential (UL).

Site General Description

The project will have approximately 13-ac of onsite or offsite land disturbing activity. Roughly 60% will be new impervious surfaces while the remaining area will consist of landscaped surfaces. Runoff generated by the site will be conveyed via an underground gravity system to a filtering water quality facility. The WQ facility will have a high-flow bypass. A new downstream storm line will be constructed across adjacent farmland (outside city limits) and then westward in the W 5th Avenue right-of-way (inside city limits) to a new outfall to the East Fork Lewis River.

Description of Land-Disturbing Activity

Land disturbing activities are limited to the construction of concrete driveways, asphalt roadway, sidewalks, retaining walls, landscaping, lot grading, housing, and the installation of proposed utilities.

Future offsite construction activities are not included in the proposed water quality treatment system design. However, future development is included in the conveyance design.

Applicable Minimum Requirements

Based on the Flow Chart for Determining Requirements for New Development of the SWMMWW (Figure 2.4.1, Vol. I), the following minimum requirements will apply to the project site:

1. Preparation of Stormwater Site Plans
   A copy of the Stormwater Site Plans will be attached in the Appendices.
2. Construction Stormwater Pollution Prevention
   The SWPPP will be provided on request.
3. Source Control of Pollution
4. Preservation of Natural Drainage Systems and Outfalls
5. On-site Stormwater Management
6. Runoff Treatment
7. Flow Control
8. Wetlands Protection
9. Operation and Maintenance

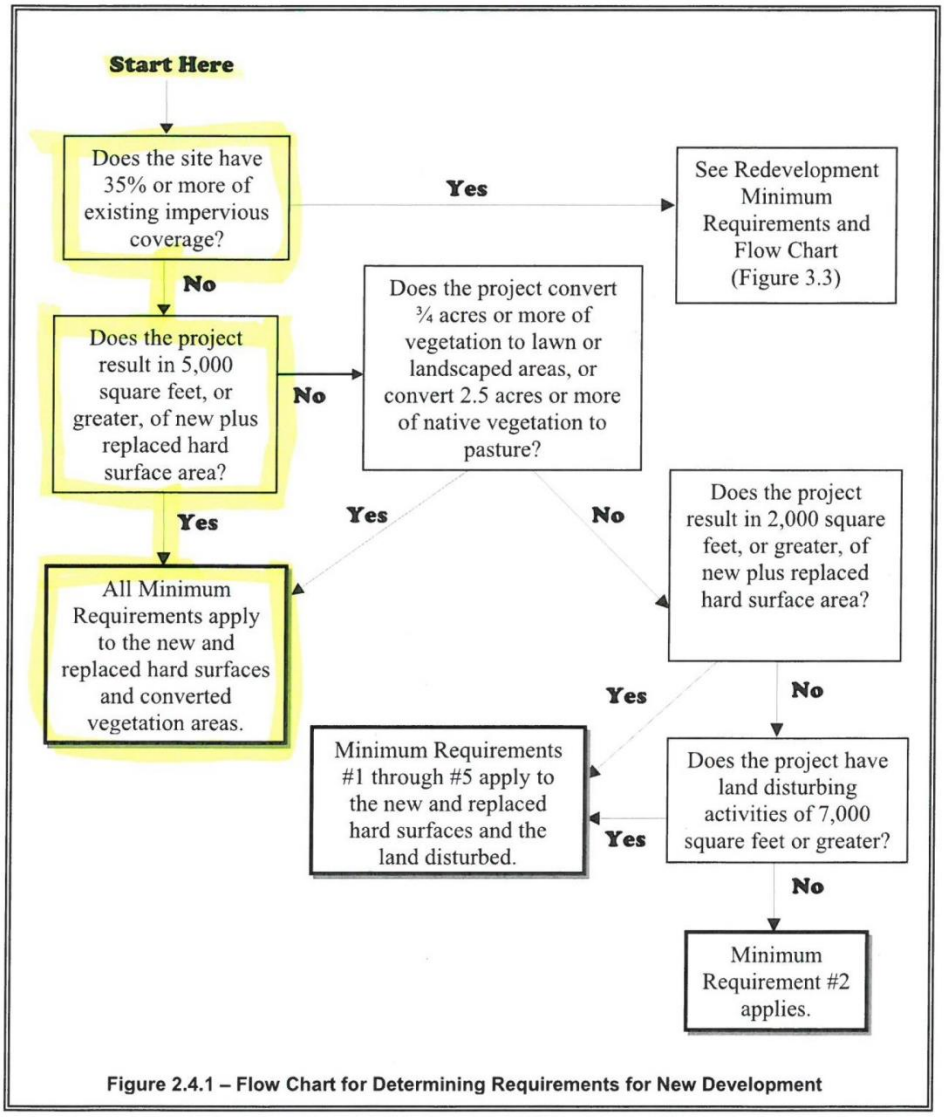

Figure 1 – 2012 Flow Chart for Determining Requirement for New Development (SWMMWW)

Minimum Requirement Statement

The stormwater management design for this project is based on and complies with the stormwater requirements for the 2012 Stormwater Management Manual for Western Washington and the La Center Municipal Code (LCMC).

B APPROVAL CONDITIONS SUMMARY

Source Control of Pollution

The development activity is anticipated to include the following activities listed in Section 2.2 of Volume IV of the SWMMWW that will require use of BMPs as indicated:

Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots

BMP: Sprinkle or wet down soil or dust with water as long as it does not result in a surface water discharge.
Contractual Mechanism: Per the WSDOT Standard Specifications Section 2-07, the Contractor shall apply water for dust control. The pay item "Water" will not be included in the Contract, making this work incidental to construction and the cost included in other Contract pay items.

BMP: Limit exposure of soil (dust source) as much as feasible.
Contractual Mechanism: Per the WSDOT Standard Specifications Section 8-01.3(1), the Contractor shall limit the total size of disturbed area as indicated.

BMP: Stabilize dust-generating soil by growing and maintaining vegetation, mulching, topsoiling, and/or applying stone, sand, or gravel.
Contractual Mechanism: Per the WSDOT Standard Specifications Section 8-01.3(1), the Contractor shall stabilize unworked disturbed areas within the time duration indicated. Pay items will be included in the Contract to perform this stabilization work.

Maintenance and Repair of Vehicles and Equipment

BMP: To be determined by the Contractor.
Contractual Mechanism: Per the WSDOT Standard Specifications Section 1-07.15(1), the Contractor shall prepare a Spill Prevention, Control, and Countermeasures Plan which per item 7 will include measures to address the maintenance and repair of vehicles and equipment. The pay item "SPCC Plan" will be included in the Contract.

Preservation of Natural Drainage Systems and Outfalls

The peak discharge of the 100-yr is greater than 0.5-cfs and therefore will require a conveyance system to the discharge point. The outfall to the East Fork Lewis River will be protected from erosion by reducing flows to non-erosive velocities of less than 3-fps using corrugated plastic pipe.

On-site Stormwater Management

The Flow Control Design BMPs in Volume III of the SWMMWW do not apply because (a) detention facilities will not be used and (b) infiltration facilities will not be used because of landslide potential.

Runoff Treatment

The project proposes more than 5,000 square feet of pollution-generating impervious surface and therefore will require water quality treatment facilities. As described in Section F, a proprietary filtering system will be used to meet this requirement. The off-line facility target flow rate (adjusted for 15 min) shall be treated by the treatment facility per the SWMMWW (Section 4.1.2, Vol. V).

Flow Control

A high-flow bypass will be used to manage water flow rates to the treatment facility. See Section D.

Wetlands Protection

The downstream storm pipe passes through an offsite wetland. Mitigation will be managed in a separate permit process.

Other Water-Related Issues

N/A

C DOWNSTREAM ANALYSIS

Downstream analysis is not required for this project per LCMC 18.320.220(5)(a), "Discharge to Large Water Bodies."

D QUANTITY CONTROL ANALYSIS AND DESIGN

Hydrologic Analysis

Sizing calculations are provided in Appendix B. The hydrologic parameters used in completing the high-flow bypass manhole analysis are provided in Table 1.

For complete hydrologic analysis, see Appendix B.

Table 1 – Summary of hydrologic parameters used in completing analysis

Basins/Subbasin	Area (ac)	% Impervious (%)	Curve Numbers	Time of Concentration (min)
Basins Served by Street Catch Basins				
1	0.217	44	80/98	5.0
1B	0.186	73	80/98	5.0
2	0.233	44	80/98	8.0
2B	0.313	39	80/98	5.5
3	0.336	40	80/98	5.0
3B	0.106	83	80/98	5.0
3C	0.229	49	80/98	5.0
3D	0.125	82	80/98	5.0
4	0.261	47	80/98	5.0
4B	0.267	48	80/98	5.0
4C	0.182	62	80/98	5.0
4D	0.234	53	80/98	5.0
5	0.205	54	80/98	5.0
6	0.197	59	80/98	5.0
7	0.257	59	80/98	5.0
7B	0.264	57	80/98	5.0
7C	0.257	62	80/98	5.0
8	0.095	86	80/98	5.0
9	0.118	79	80/98	5.0
10	0.118	64	80/98	5.0
10B	0.183	88	80/98	5.0
11	0.237	68	80/98	5.0
11B	0.385	41	80/98	5.0
11C	0.098	56	80/98	5.0
12	0.085	89	80/98	5.0
12B	0.258	43	80/98	5.0
14	0.213	56	80/98	5.0
14B	0.194	68	80/98	5.0
Roof Areas and Landscaping				
A	0.332	62	80/98	5.0
B	0.103	67	80/98	5.0
C	0.322	64	80/98	5.0
D	0.122	57	80/98	5.0
E	0.576	48	80/98	5.0
F	0.074	93	80/98	5.0
G	0.607	57	80/98	5.0
H	0.157	100	0/98	5.0
I	0.217	64	80/98	5.0
J	0.434	48	80/98	5.0
K	0.207	67	80/98	5.0
L	0.157	100	0/98	5.0

Basins/Subbasin	Area (ac)	% Impervious (%)	Curve Numbers	Time of Concentration (min)
M	0.139	50	80/98	5.0
N	0.295	47	80/98	5.0
O	0.069	100	0/98	5.0
P	0.197	70	80/98	5.0
Q	0.169	0	80/0	5.0
R	0.190	73	80/98	5.0
		Offsite Drainage		
Offsite A	0.979	0	78/0	14.8
Offsite B	0.462	0	80/0	14.8
Offsite C	0.455	0	80/0	12.5
Offsite D	0.497	7	80/98	12.5
Offsite South	7.000	67	80/98	10.0
Offsite Future	10.416	67	80/98	5.0

Basin R: A portion of the Pacific Highway improvements discharges a minor flow that disperses in the natural grassy strip adjacent to the roadway west of the project.

Quantity Control System Design

Onsite detention is not required for this project; however, flow control is necessary for the high-flow bypass upstream of the water quality facility. Flow control is being provided by a high-flow bypass manhole that contains a flow control weir. The pipe flowing to the WQ facility also has a 4" orifice at the inlet to restrict flow.

The Water Quality Design Storm is successfully routed to the treatment facility without overtopping the top of the weir in the high-flow bypass manhole. See Appendix B.

Table 2 – Analysis Results of the Water Quality Design Storm (WWHM) for the Quantity Control System

Discharge Points	Peak Flow (cfs)	Peak Elevation (ft)	Weir Elevation (ft)	Comments
10" Primary Routing to WQ Facility	0.59	120.62	120.62	OK (Peak doesn't overtop weir)
24" Secondary Routing	0.00	118.48	120.62	OK (Peak doesn't overtop weir)

Table 3 – Analysis Results of the 100-yr, 24-hr Design Storm for Quantity Control System

Discharge Points	Peak Flow (cfs)	Peak Elevation (ft)	Weir Elevation (ft)	Comments
10" Primary Routing to WQ Facility	0.78	122.13	120.62	-
24" Secondary	19.36	122.13	120.62	-

Quantity Control System Plan

For the quantity control facility diagram see the development plans.

E CONVEYANCE SYSTEMS ANALYSIS AND DESIGN

Criteria and Their Sources

LCMC 18.320.220(4)(c): For stormwater conveyance design, the "design storm" shall be the 100-year storm.

LCMC 18.320.220(4)(d): Development sites shall be planned to be able to pass a 100-year storm through the site.

LCMC 18.320.220(4)(e): Closed conveyance system elements shall be designed to operate in an open flow, not pressure flow, regime.

LCMC 18.320.220(4)(j): Design of conveyance systems shall be in accordance with Chapter III-2 of the Puget Sound Manual.

Initial Conditions

The existing site is assumed to be mostly undeveloped pasture. Currently, water flows as overland flow through wetlands and down the existing slope to the river.

Assumptions

The site discharge point will be in the East Fork Lewis River.

Some offsite surfaces will be treated by the water quality facility.

All onsite surfaces must be treated by the water quality facility.

Hydraulic Analysis

The hydraulic analysis for the Storm Sewer Main uses the parameters defined in Table 1.

See Hydrocad output in Table 4.

For conveyance calculations see Appendix B.

Table 4 – Conveyance System Analysis for 100-yr Design Storm.

Upstream Structure	Downstream Structure	Pipe ID (in)	Max. Velocity (fps)	Design Flow, Q_{100} (cfs)	Slope (ft/ft)	Capacity at Bank-Full (cfs)	% Full (%)
			Storm Main Onsite				
MH #27	MH #27B	12	10.70	1.00	0.1712	14.74	7
MH #27B	MH #2	12	11.79	1.38	0.1725	14.79	9
MH #20	MH #19	12	2.16	0.31	0.0050	2.50	12
MH #19	MH #18B	12	5.90	0.80	0.0380	6.95	12
MH #18B	MH #18	12	6.23	1.02	0.0365	6.81	15
MH #18	MH #17B	12	9.56	1.94	0.0723	9.58	20
MH #17B	MH #17	12	9.48	2.03	0.0684	9.32	22
MH #17	MH #16B	12	10.39	2.29	0.0800	10.08	23
MH #16B	MH #16	12	10.77	2.61	0.0800	10.08	26
MH #16	MH #6	12	12.45	2.84	0.1122	11.93	24
MH #15	MH #14	12	6.54	0.31	0.1150	12.08	3
MH #14	MH #13	12	6.04	0.63	0.0500	7.97	8
MH #13	MH #12B	12	5.69	0.87	0.0324	6.41	14
MH #12B	MH #12	12	6.28	1.11	0.0350	6.66	17
MH #12	MH #11	12	10.25	1.66	0.0996	11.24	15
MH #11	MH #10	24	5.59	12.04	0.0050	16.00	75
MH #10	MH #9	24	5.58	12.22	0.0050	15.89	77
MH #9	MH #8B	24	5.65	12.72	0.0050	16.00	80
MH #8B	MH #8	24	5.69	12.89	0.0050	16.09	80
MH #8	MH #7	24	5.66	13.34	0.0050	15.86	84
MH #7	MH #6	24	5.72	13.72	0.0050	16.00	86
MH #6	MH #5	30	6.15	17.08	0.0050	29.00	59
MH #5	MH #4	30	6.15	17.07	0.0050	29.00	59
MH #4	MH #3B	30	6.24	17.46	0.0050	29.39	59
MH #3B	MH #3	30	6.20	17.66	0.0050	29.00	61
MH #3	MH #2	30	6.23	18.27	0.0050	28.91	63
MH #2	MH #1	30	6.37	20.04	0.0050	29.00	69
MH #1	Bypass MH #29	30	6.41	20.22	0.0050	29.18	69
Bypass MH #29	MH #26	24	21.35	18.78	0.1347	82.99	23
			Yards Onsite				
Yard Inlet #12	MH #27	6	5.89	0.31	0.0677	1.46	21
Yard Inlet #9	MH #19	6	5.23	0.51	0.0340	1.03	50
Yard Inlet #10	MH #18	6	5.28	0.26	0.0568	1.34	19
Yard Inlet #11	MH #17	6	3.92	0.27	0.0244	0.88	31
Yard Inlet #5	MH #9	6	6.45	0.50	0.0600	1.37	36
			Offsite				
MH #26	MH #25	30	7.28	20.40	0.0070	34.27	60
MH #25	MH #24	30	7.30	20.37	0.0070	34.37	59
MH #24	MH #23	30	7.73	26.76	0.0070	34.31	78

Upstream Structure	Downstream Structure	Pipe ID (in)	Max. Velocity (fps)	Design Flow, Q_{100} (cfs)	Slope (ft/ft)	Capacity at Bank-Full (cfs)	% Full (%)
MH #23	MH #22	30	7.73	26.69	0.0070	34.33	78
MH #22	MH #21	30	7.71	26.62	0.0070	34.29	78
MH #21	Type 3 MH	24	31.20	26.60	0.2947	122.80	22
Type 3 MH	Outfall	48	2.72	26.62	0.0010	30.29	88
			Treatment Facility				
Bypass MH #29	MH #28B	10	2.85	0.78	0.0050	1.55	50
MH #28B	MH #28	10	2.90	0.78	0.0050	1.59	49
MH #28	WQ Facility	10	2.96	0.98	0.0050	1.52	64
WQ Facility	MH #26	10	3.03	0.98	0.0050	1.56	63

Summary

Each conveyance element meets the capacity to convey the 100-yr design storm at open flow conditions and discharge at non-erosive velocities. See Hydrocad output in Table 4.

Each conveyance element will be able to pass a 100-year storm through the site.

Each closed conveyance system element operates in an open flow, not pressure flow, regime.

The oufall pipe will be a 48-in diameter corrugated plastic pipe. This should be sufficient to convey the 100-yr flow at less than 3.0-fps.

F WATER QUALITY DESIGN

"At a minimum, 91% of the total runoff volume, as estimated by an approved continuous runoff model, must pass through the treatment facility(ies) at or below the approved hydraulic loading rate for the facility(ies)" per the SWMMWW (Section 2.5.6, Vol. I).

Treatment Level

Per the Treatment Facility Selection Flowchart of the SWMMWW (Figure 2.1.1, Vol. V), a basic treatment facility can be applied to this project site.

A proprietary filtering system will be used to provide water quality treatment that has been approved by the Washington State Department of Ecology.

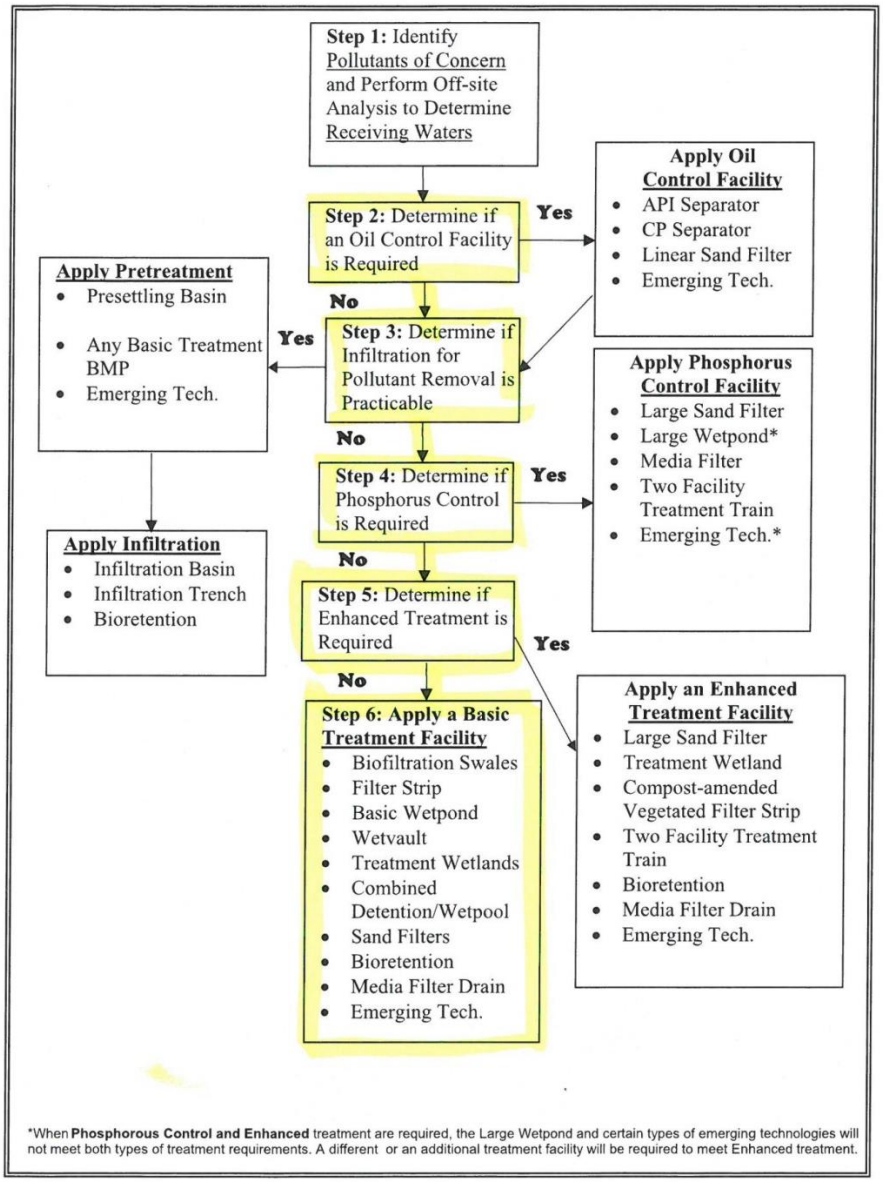

Figure 2.1.1 – Treatment Facility Selection Flow Chart

Figure 2 – Treatment Facility Selection Flow Chart

Geotechnical Information

Infiltration system is not advised.

BMPs

A proprietary filtering system will be used to provide water quality treatment that has been approved by the Washington State Department of Ecology.

The planned filtering system is two Modular Wetland Systems treatment vaults with a combined treatment capacity of 0.69-cfs.

The water quality treatment facility will be downstream of the system and will treat the following onsite surfaces:

Table 5 – Summary of Pervious and Impervious Surfaces used in the WWHM model.

Area in Basin (ac)		HSG for Clark County	Description	Slope
		Pre-developed Condition		
12.432	Pervious	SG3	Forest	Moderate
		Developed Condition		
0.979	Pervious	SG3	Field	Moderate
5.672	Pervious	SG3	Lawn	Moderate
3.296	Impervious	SG3	Roads	Moderate
2.485	Impervious	SG3	Roof Tops	Flat

LID Measures

LID measures are not being used because instability precludes infiltration practices on this site and because the primary pollution generating surfaces are steep roadway sections that do not lend themselves readily to green infrastructure in a limited width right-of-way.

Initial Conditions

For the runoff treatment analysis models "the pre-developed condition shall be assumed to be forested land cover unless reasonable, historic information is provided that indicates the site was prairie prior to Settlement" (SWMMWW).

Assumptions

The assumed pad size is 50-ft x 60-ft (3000-sf) per parcel when calculating the impervious areas.

Runoff from Basin R on Pacific Highway will not enter the onsite storm system due to constraints. The runoff will continue westward in a grass-lined roadside swale which dissipates into pasture areas. The onsite treatment system has a slight amount of extra capacity for additional onsite pollutants.

Analysis

An approved continuous runoff model (WWHM3) was used to perform the hydrologic analysis of the water quality storm event as defined in the SWMMWW (Section 2.5.6, Vol. I). The WWHM3 output is included in Appendix B. The calculated water quality flow rate at the treatment location is 0.59-cfs.

Summary

A system will be installed per manufacturer recommendations.

The minimum required standard offline facility treatment flow rate (adjusted for 15 min) is 0.59-cfs for 12.432-ac of development (See WWHM results in Appendix B). The recommended filtering treatment system must treat at least this amount.

G SOILS EVALUATION

Site Suitability for Infiltration for Flow Control, Runoff Treatment, and LID Measures

The site is not suitable for stormwater infiltration due to the concerns with landslide slope stability (see Appendix C). The runoff will be routed through a new storm system.

Groundwater Data

Per the geotechnical report, the groundwater has been observed at depths ranging from 15-ft to 186-ft and may be subject to seasonal and location variance (see Appendix C).

Soil Parameters and Design Methods for Uses in Hydrologic and Hydraulic Design

Per LCMC 18.320.220(2)(b), the following curve numbers will be used per the 1992 Stormwater Management Manual for the Puget Sound Basin (Table 1.3, Vol. III):

The curve number (CN) for impervious areas and HSG B is 98.

The CN for lawn and landscaping in "good condition" with a HSG B is 80.

The CN for meadow or pasture with a HSG B is 78.

According to the NRCS Resource Report for Clark County:

> The site is comprised primarily of Hillsboro Silt Loam and classified as Hydrologic Soil Group B (HSG B).

Infiltration Rates where BMPs will be used

N/A

Report Findings

See attached geotechnical report in Appendix C.

H SPECIAL REPORTS AND STUDIES

N/A

I OTHER PERMITS

Developer/local agency agreement: City of La Center, WA.

Short-term water quality modification approval: Washington State Department of Ecology (Ecology)

Section 10, 404, and 103 permits: U.S. Army Corps of Engineers

Clark County wetland permit: CCC Chapter 40.450

City of La Center, WA shoreline management permit

J GROUNDWATER MONITORING PROGRAM

N/A

K MAINTENANCE AND OPERATIONS MANUAL

To be maintained by the Home Owners Association.

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Stormwater Management Manual for the Western Washington (*SWMMWW*). Publication #12-10-030 Washington Department of Ecology, Olympia, WA. 2012.

Appendix A Maps

A1 Vicinity Map

A2 Soils Map

A3 Wellhead Protection Map

A4 Floodplains

A5 Shoreline Management

A6 Basin Map

A7 Wetland Maps

Appendix B Hydrologic Exhibits

B1 **Minimum Requirement: Flow Chart for Determining Requirements for New Development**

B2 **Treatment Facility Selection Flowchart.**

B3 **Hydrologic Calculations from Hydrocad for Site**

B4 **Hydrologic Calculations from Hydrocad for High-Flow Bypass Manhole**

B5 **Hydrologic Calculations from WWHM3 for Water Quality**

B6 **Outfall Buoyancy Check**

B7 **Inlet Analysis**

B8 **Overland Pipe Calculations**

Appendix C Geotechnical Report