CRITICAL AREAS AND CONCEPTUAL MITIGATION REPORT

HIGHLAND GLEN SHORT PLAT
KIRKLAND, WASHINGTON

Prepared For:

DCK PROPERTY, LLC
Kirkland, Washington

Prepared By:

TALASAEA CONSULTANTS, INC.
Woodinville, Washington

22 February 2008
(Revised 20 March 2008)

Critical Areas and Conceptual Mitigation Report

Highland Glen Short Plat
Kirkland, Washington

Prepared for:

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15020 Bear Creek Road NE
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22 February 2008
(Revised 20 March 2008)

EXECUTIVE SUMMARY

SITE NAME: Highland Glen Short Plat

SITE LOCATION: The project site is located northwest of the intersection of 111th Avenue NE and NE 104th Street in King County, Washington. The project site encompasses a triangular parcel approximately 3.27-acres and the adjacent right-of-way improvements for 111th Avenue NE. The tax parcel number for the project site is 322605-9026-08. The Public Land Survey System location of the project site is the SE¼ of Section 32, Township 26N, Range 5 East, W.M.

CLIENT: Ken Davidson, DCK Property, LLC

PROJECT STAFF: Bill Shiels; Principal, Jason Walker and Jason Long; Project Managers, David R. Teesdale, Wetland Ecologist

FIELD SURVEY: Conducted on 23 February 2005. Additional field work conducted through 2007.

DETERMINATION: One wetland (Wetland A) and one stream (Stream A) were identified on the project site. One wetland (Wetland B) was identified off site. Wetland A is a palustrine forested and palustrine emergent wetland that encompasses approximately 1.24-acres of the project site. This wetland slopes downward from east to west where it abuts the Burlington Northern Railway (BNRR) right-of-way and creates a Class B stream (Stream A). Wetland B is an extremely small isolated palustrine emergent wetland that likely formed as a result of a previous geotechnical soil investigation. This wetland encompasses approximately 150 sf off site south of Wetland A. Stream A is a small stream that flows both from the north corner and from the west parallel to the BNRR right-of-way, before converging and exiting the site through an existing culvert under the right-of-way and eventually into Forbes Creek. Wetland A is rated as a City of Kirkland Type 2 wetland. Under Kirkland Zoning Code (KZC), Type 2 wetlands and Class B streams located within Primary Basins (i.e., Forbes Creek Basin) require 75-foot and 60-foot standard buffers, respectively. Wetland B is under 1,000 sf within a Primary Basin and is understood to be exempt from regulation by the City.

HYDROLOGY: Hydrology within Wetland A was present during our site visits, as saturation was observed at the surface along the wetland edge. Sources of hydrology to Wetland A occur from precipitation, surface sheet-flow off neighboring streets, groundwater seeps, and possibly by a failed existing septic system. Stream A, which is apparently a perennial and non-fish bearing stream, is supported by Wetland A. Hydrology for Wetland B is supported, for the most part, by the retention of shallow groundwater on a hardpan layer at approximately 10-inches below the soil surface.

SOILS: The Natural Resources Conservation Service has mapped the site as Ragnar-Indianola Association, Moderately Steep (RdE). Ragnar-Indianola Association soils are comprised of both Ragnar and Indianola soils, which are considered well drained and somewhat excessively drained, respectively. RdE are not considered hydric soils according to the County, State, or Federal hydric soil lists. Field observations within the upland areas correspond well to the mapped soil type. However, soils within the wetland include a thin horizon of black (10YR2/1) sandy gravelly loam with a thin horizon of very dark greenish gray (1 GLEY 5GY/3) clay atop a thick horizon of course grayish brown (2.5Y5/2) sand.

VEGETATION: The project site includes both native and non-native plant species, with a monotypic, even-aged forest canopy comprised of red alder and black cottonwood. Vegetation within the understory vegetation of Wetland A includes red alder, black cottonwood, Himalayan blackberry, reed canarygrass, lady-fern, and giant horsetail. Vegetation within the riparian corridor of Stream A includes Pacific willow, Himalayan blackberry, and giant horsetail. Upland areas throughout the site have an understory of Himalayan blackberry, sword fern, and Indian plum.

PROJECT DESCRIPTION: The proposed project is a short plat subdivision for six single-family residential lots. The development of the project will include utilities, stormwater treatment and detention, site landscaping, and critical areas mitigation.

CRITICAL AREA IMPACTS: The proposed action involves impacting approximately 2,510 sf of Wetland A, all of which is "paper fill" impact. No land surface modification or direct impact will occur as a result of the paper fill impacts. Wetland and stream buffer will also be reduced through enhancement as allowed under Kirkland Zoning Code.

PROPOSED MITIGATION: Mitigation for impacts to Wetland A and its buffer will involve approximately 4,304 sf of wetland enhancement, 3,944 sf of wetland creation, and approximately 37,268 sf of buffer enhancement. Per KZC 90.55(4), no more than 1/3 of the wetland mitigation will be wetland enhancement, and the wetland enhancement is at a 4:1 ratio. Through wetland mitigation, no net loss of wetland function is expected to occur.

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1.0 INTRODUCTION

This Critical Areas and Conceptual Mitigation Report is the result of a sensitive areas study conducted on a parcel approximately 3.27-acres and the adjacent right-of-way improvements for 111th Avenue NE, located in the City of Kirkland, Washington. The purpose of this report is to describe existing site conditions, the proposed development, impacts to sensitive areas, and proposed mitigation.

The objective of this report is to: 1) describe the wetlands and streams identified and delineated on the site; 2) describe wildlife use and habitats; 3) identify impacts to sensitive areas that would occur from the proposed development; and 4) propose measures to mitigate for impacts to the sensitive areas.

2.0 GENERAL PROPERTY DESCRIPTION AND LAND USE

The subject property encompasses a triangular parcel approximately 3.27-acres and the adjacent right-of-way improvements for 111th Avenue NE, hereafter referred to as the "project site." The project site is generally located northwest of the intersection at 111th Avenue NE and NE 104th Street, within the City of Kirkland, Washington (**Figure 1**). The tax parcel number for the project site is 322605-9026-08. The Public Land Survey System location of the project site is the SE¼ of Section 32, Township 26N, Range 5 East, W.M.

The property is mostly undeveloped. A single family residence exists in the southeast corner of the property. Neighboring land-uses include 111th Avenue NE and other single-family homes to the east; NE 104th Street and other single-family houses to the south; the Burlington Northern Railroad (BNRR) right-of-way and City of Kirkland's Crestwoods Park to the west; and the BNRR right-of-way and King County green space located to the north. The project site slopes downward from east-southeast to west-northwest towards the BNRR right-of-way (**Figure 2**).

3.0 METHODOLOGY

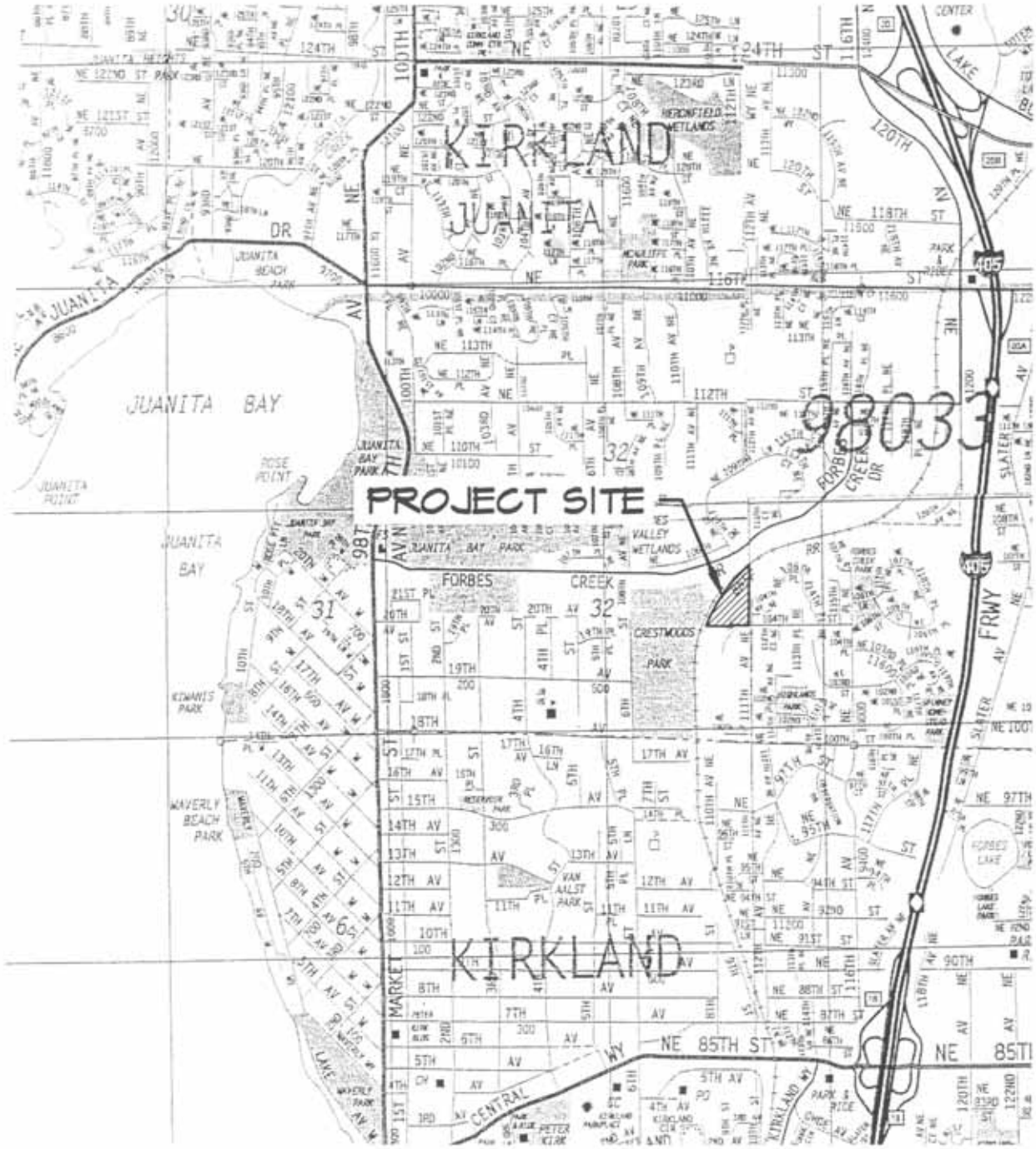
The wetland analysis of the project site involved a two-part effort. The first part consisted of a preliminary assessment and its immediate surroundings using published information about local environmental conditions. This information included: 1) wetland and soil maps from resource agencies, 2) sensitive areas maps from the City of Kirkland, and 3) any relevant studies completed or on-going in the vicinity of the project site. The second part involved a field survey, in which sensitive areas and features were identified, characterized, located and described (see Field Investigation section below).

3.1. Background Data Reviewed

Background information was reviewed prior to field investigations and included the following:

- National Wetlands Inventory Map (Kirkland, Quad), U.S. Fish and Wildlife Service, 1988,
- City of Kirkland Sensitive Areas Map, December 2003,
- Natural Resource Conservation Service, King County Area Soil Survey, 1973,
- King County Department of Natural Resources (KCDNR) Water Quality Index (WQI) Rating for WRIA 8, <http://dnr.metrokc.gov/wlr/waterres/streams/wqi.htm>;
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species Database, and

NW 1/4, SE 1/4, SEC 32, T26N, R5E, W.M.



NORTH

SOURCE: THE THOMAS GUIDE 2005; KING, PIERCE & SNOHOMISH COUNTIES.

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FIGURE: VICINITY MAP		DESIGN: JW	DRAWN: JL	TAL#: 909
APPLICANT: KEN DAVIDSON	ADDRESS: KIRKLAND, WA 98033	SCALE: NTS	
AT: NE 104TH ST.	DATUM: NAVD 88	DATE: 02-22-08	
IN: FORBES CREEK		REVISED:	
PURPOSE: CRITICAL AREAS REPORT	PROJECT: DAVIDSON PROPERTY		

1

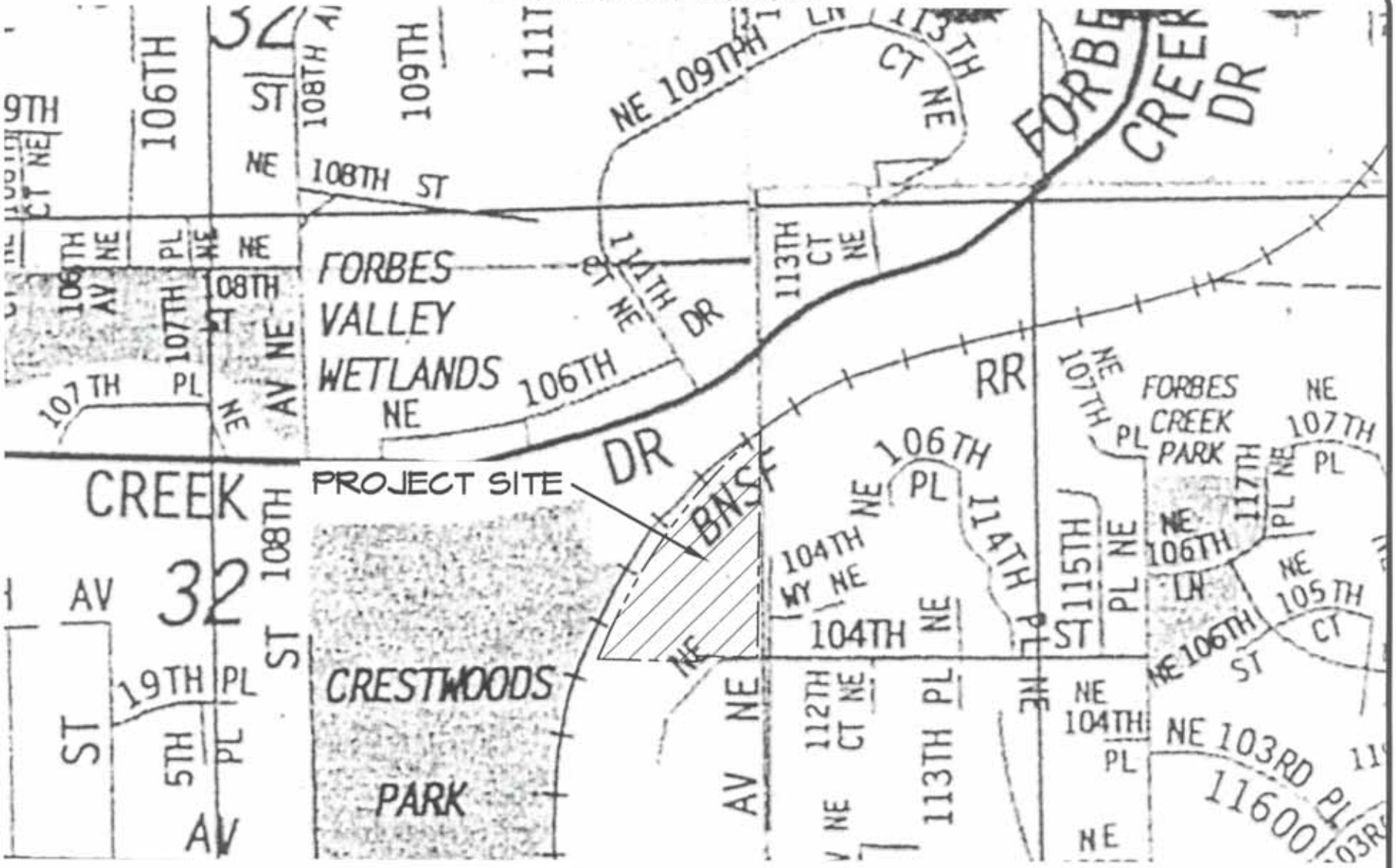

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FIGURE SITE MAP				DESIGN JW	DRAWN JL
APPLICANT KEN DAVIDSON	ADDRESS KIRKLAND, WA 98033			SCALE NTS	
AT NE 104TH ST.		DATUM NAVD 88		DATE 02-22-08	
IN FORBES CREEK				REVISED	
PURPOSE CRITICAL AREAS REPORT		PROJECT HIGHLAND GLEN SHORT PLAT			

TAL#
909

2

- Washington Department of Natural Resources (WDNR) Natural Heritage Database,

3.2. Field Investigation

A general site investigation was conducted on 23 February 2005 to gain an overall impression of the existing environment and current land uses, and to identify and delineated wetlands and streams. Additional site visits were conducted in 2006 and 2007 to further clarify wetland boundaries and ratings. Another site visit was conducted on 14 March 2008 to review Stream A. Observations were made of the general plant communities, wildlife habitats, and the locations of obvious and probable wetland and stream areas. Present and past land use practices were noted, as were significant geological and hydrological features.

Once likely or potential wetland areas were located, the routine on-site determination method was used to delineate wetlands according to the procedures outlined in: 1) the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and 2) the *Washington State Wetlands Identification and Delineation Manual* (1997). The wetland delineation was also conducted on 23 February 2005. Eight shallow groundwater wells were installed in Wetland A to monitor wetland hydrology and refine the limits of the wetland boundary. In addition, seven shallow groundwater monitoring wells were installed in Wetland B to determine if this wetland met the hydrology requirements for a wetland and to further refine the wetland boundary.

The shallow groundwater wells were installed following the procedures described in *Installing Monitoring Wells/Piezometers in Wetlands* (WRP Technical Note HY-IA #1). Observations of the hydrologic regime are normally made within 18 inches of the soil surface; however, the wells on the project site were installed deeper (an average of 33") than normally required to provide a better understanding of site hydrology. Well locations are illustrated on **Figure 6** and **Sheet W1.0**. Wells were monitored twice per week during dry periods and at least three times per week following heavy rainfall events.

Plant species were identified according to the taxonomy of Hitchcock and Cronquist (1973), and the wetland status of plant species was assigned according to the list of plant species that occur in wetlands for Region 9, published by the U.S. Fish and Wildlife Service (Reed 1988, 1993). Wetland classes were determined on the U.S. Fish and Wildlife Service's system of wetland classification (Cowardin, *et al.*, 1979). Vegetation was considered hydrophytic if greater than 50% of the dominant plant species had a wetland indicator status of facultative or wetter (i.e., facultative, facultative wetland, or obligate wetland).

Soil on the site was considered hydric if one or more of the following characteristics were present:

- organic soils or soils with a histic epipedon (i.e., organic surface layer),
- matrix chroma just below the A-horizon (or 10 inches, whichever is less) of 1 or less in unmottled soils, or 2 or less if mottles were present, or
- gleying immediately below the A-horizon.

Indicators of wetland hydrology may include, but are not necessarily limited to: drainage patterns, drift lines, sediment deposition, watermarks, stream gauge data and flood predictions, historic records, visual observation of saturated soils, and visual observation of inundation.

An evaluation of the vegetation, soils, and hydrology was made at various locations along the interface of wetland and upland. Wetland boundary points were then determined from this information, and marked with flagging and surveyed.

Appendix A contains wetland data forms prepared for selected test plots by Talasaea for representative locations in both the uplands and wetlands along the wetland boundary. These data forms document the vegetation, soils, and hydrology information that aided in the wetland boundary determination.

Following delineation of the wetland boundary as described above, fecal coliform samples were collected at eight identified seeps or areas of ponding within the wetland and delivered to an accredited laboratory for analysis. The results were reviewed to determine the effectiveness of the existing septic system and potential sources of hydrology to the identified wetland. The results of these samples are provided in **Appendix B**.

4.0 RESULTS

4.1. Analysis of Existing Information

4.1.1. National Wetlands Inventory

The National Wetlands Inventory (NWI) maps developed by the U.S. Fish and Wildlife Service (USFWS, 1988) identified no wetlands on the project site (**Figure 3**).

4.1.2. City of Kirkland's Sensitive Areas Map

The City of Kirkland's Sensitive Areas Map (Kirkland, 2003) depicts one wetland and one open stream on site (**Figure 4**). The wetland is illustrated as extending beyond the project site to the southwest as it parallels the BNRR right-of-way. Although the stream location depicted on Kirkland's Sensitive Areas map corresponds well to on-site field investigations, the depicted wetland boundary does not correspond well.

4.1.3. Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) has mapped the site as Ragnar-Indianola Association, Moderately Steep (RdE) (**Figure 5**). Ragnar-Indianola Association soils are comprised of equal parts Ragnar and Indianola soils, which are considered well drained and somewhat excessively drained, respectively. RdE are not considered hydric soils according to the County, State, or Federal hydric soil lists.

4.1.4. KCDNR WQI Rating for WRIA 8

Results from the KCDNR's WQI rating for streams within WRIA 8 (Cedar-Lake Washington Basin), were reviewed to determine the quality of the basin. The KCDNR's WQI rating was completed following the WQI rating system developed by Washington State Department of Ecology (Hallock, 2002) to reflect local stream conditions. The WQI rating system was used to rate 36 streams within the WRIA 8 and takes into account multiple water quality parameters from data collected from October 2003 through September 2004. This is a rating system that calculates a number ranging from 10 to 100 with lower values reflecting poorer water quality conditions. Three levels of "concern" were defined, including; low concern (> 80), moderate concern (40-80), and high concern (< 40). Of these levels, 18 streams were classified as moderate concern and 18 more streams were classified as high concern. Forbes Creek, which the on-site stream and wetlands are tributary to, is rated as the fifth highest concern stream, however the WQI rating value obtained for Forbes Creek is not provided. According to the summary provided, "pets and failing septic systems are the most likely sources of bacteria in the urban areas."

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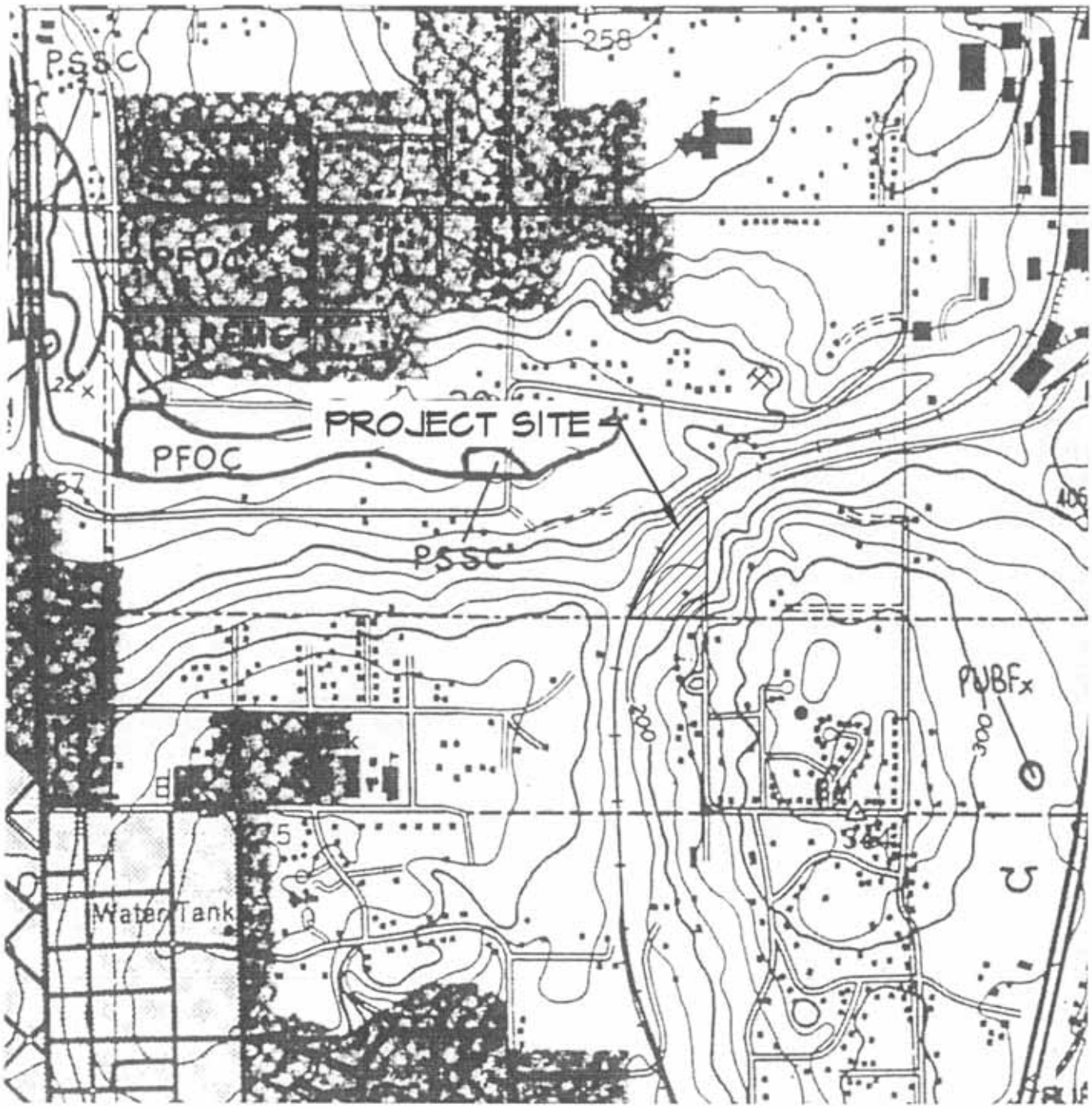

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U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE, NATIONAL WETLANDS INVENTORY MAP, KIRKLAND QUADRANGLE, 1988

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FIGURE: NATIONAL WETLANDS INVENTORY MAP		DESIGN: JW	DRAWN: JL / TAL#: 909
APPLICANT: KEN DAVIDSON	ADDRESS: KIRKLAND, WA 98033	SCALE: NTS	
AT: NE 104TH ST.	DATUM: NAVD 88	DATE: 02-22-08	3
IN: FORBES CREEK		REVISED	
PURPOSE: CRITICAL AREAS REPORT	PROJECT: DAVIDSON PROPERTY		

NW 1/4, SE 1/4, SEC 32, T26N, R5E, W.M.

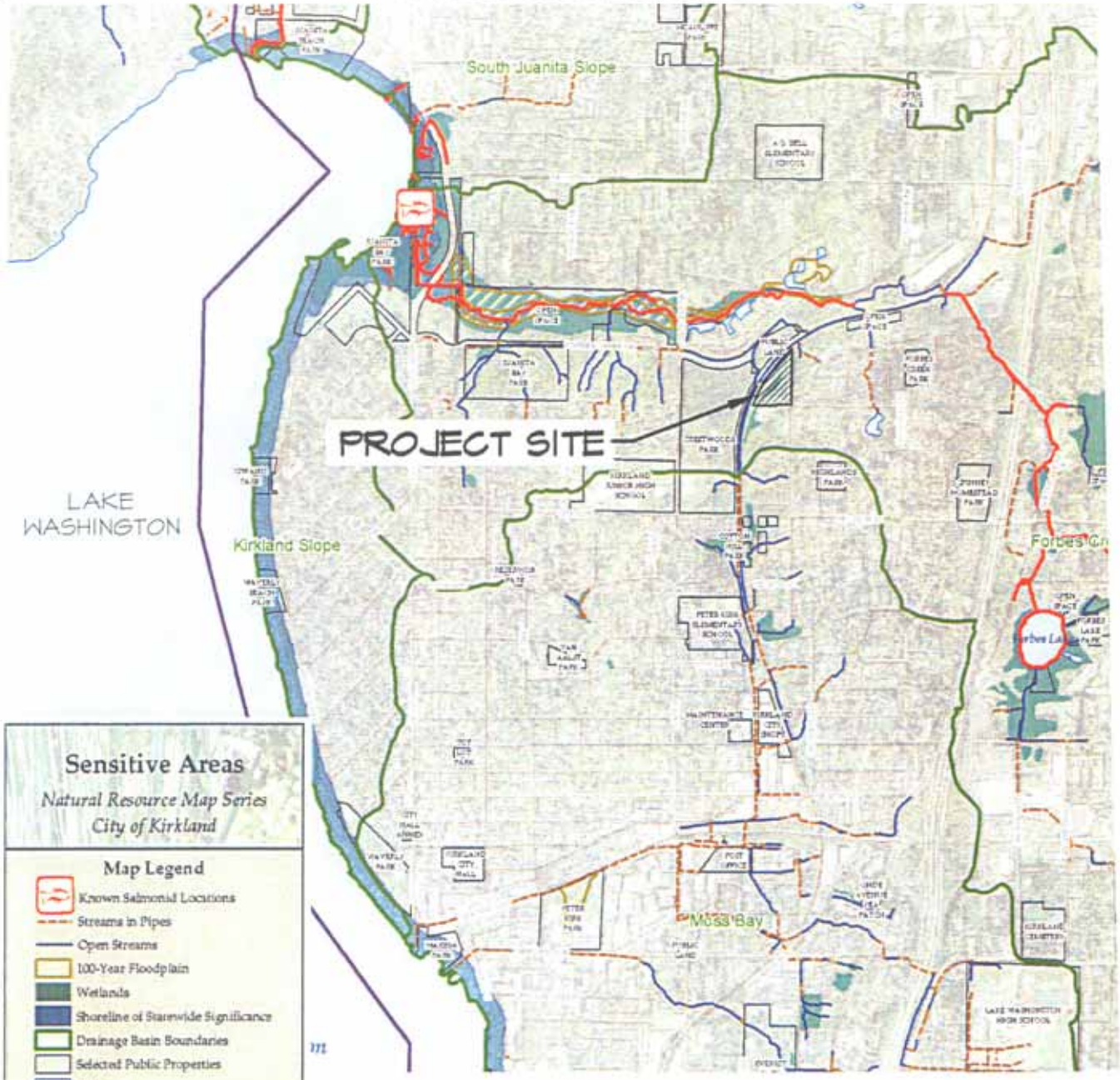

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FIGURE: CITY OF KIRKLAND SENSITIVE AREAS MAP		DESIGN: JW	DRAWN: JL	TAL#: 909
APPLICANT: KEN DAVIDSON	ADDRESS: KIRKLAND, WA 98033	SCALE: NTS		
AT: NE 104TH ST.	DATUM: NAVD 88	DATE: 02-22-08		
IN: FORBES CREEK		REVISED:		
PURPOSE: CRITICAL AREAS REPORT	PROJECT: DAVIDSON PROPERTY			

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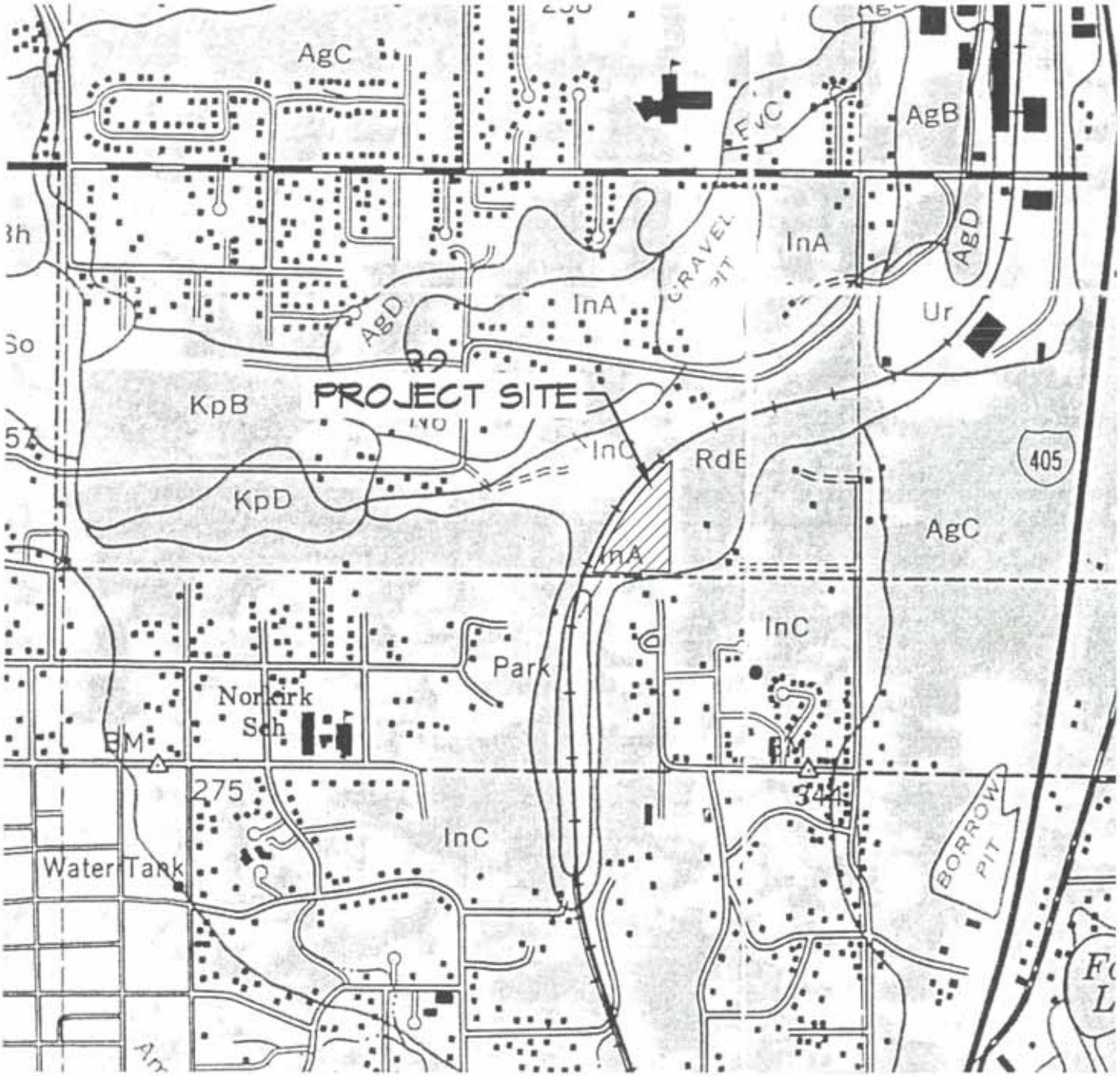
NW 1/4, SE 1/4, SEC 32, T26N, R5E, W.M.



LEGEND

RdE RAGNAR-INDIANOLA ASSOCIATION, MODERATELY STEEP

SOURCE: U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE, KING COUNTY AREA SOIL SURVEY, 1973

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FIGURE: NRCS SOILS MAP			DESIGN: JW	DRAWN: JL	TAL#: 909
APPLICANT: KEN DAVIDSON	ADDRESS: KIRKLAND, WA 98033		SCALE: NTS		
AT: NE 104TH ST.		DATUM: NAVD 88	DATE: 02-22-08		5
IN: FORBES CREEK			REVISED		
PURPOSE: CRITICAL AREAS REPORT		PROJECT: DAVIDSON PROPERTY			

4.1.5. WDFW Priority Habitats and Species and WDNR Natural Heritage Databases

No priority species or habitats are indicated on the subject property by either PHS or Natural Heritage programs. However, PHS does show that Forbes creek contains populations of priority resident and anadromous fish. Also, a bald eagle (*Haliaeetus leucocephalis*) nest is indicated along the shores of Lake Washington approximately one mile west of the project site. This nest is sufficiently distant that nesting eagles will not be disturbed by any development activities.

4.2. Analysis of Field Conditions

One wetland (Wetland A) and one stream were identified on the project site and one wetland was observed off site (Wetland B) (**Figure 6** and **Sheet W1.0**). These features are described in the following sections.

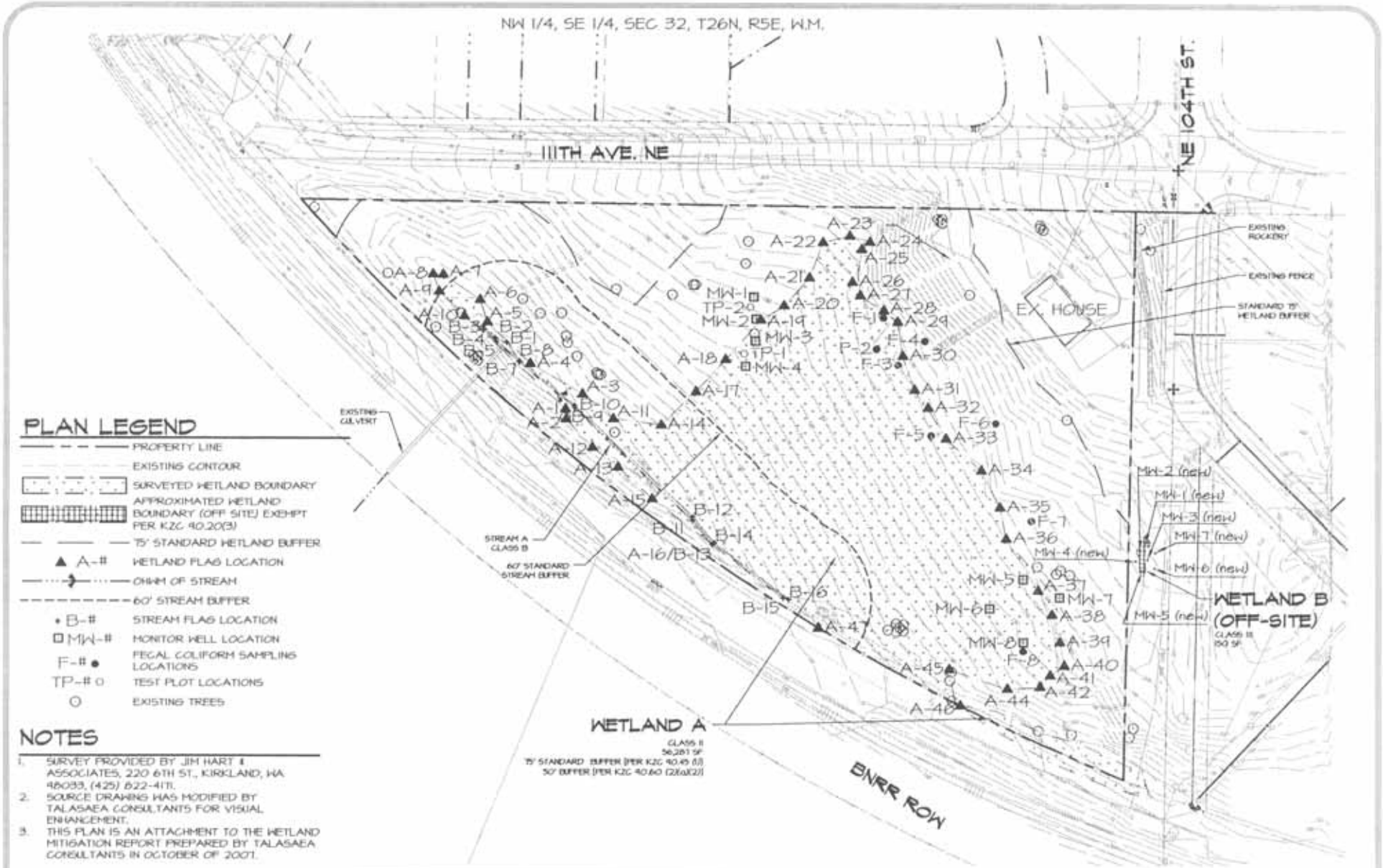
4.2.1. Wetland A

Wetland A, approximately 1.29-acres, is a large slope wetland located west and northwest of the existing area of fill at the southeast corner of the parcel. Wetland A is comprised of two wetland types as defined by Cowardin et al. (Cowardin, 1979), 1) palustrine forested wetland to the north and 2) palustrine emergent wetland to the south. Vegetation within Wetland A is comprised of both native and non-native species. Within the patch of palustrine forested wetland to the north, vegetation is dominated by a red-alder (*Alnus rubra*) and black cottonwood (*Populus trichocarpa*) forest canopy with a Himalayan blackberry (*Rubus discolor*) and giant horsetail (*Equisetum telmateia)* understory. Dominant vegetation composition within the southern patch of palustrine emergent wetland includes reed canarygrass (*Phalaris arundinacea*) and lady-fern (*Athyrium filix-femina*) with areas of common cattail (*Typha latifolia*) and stands of red-alder snags. Soils observed in Wetland A consist of a stratified soil profile with a thin horizon of black (10YR2/1) sandy gravelly loam, with another thin horizon of very dark greenish gray (1 GLEY 5GY/3) clay, with a thick horizon of course grayish brown (2.5Y5/2) sand.

During our site visit, hydrology was present throughout Wetland A and originated from three separate sources, namely 1) groundwater seeps, 2) surface flow, and 3) a failed septic system. Numerous seeps are located throughout the eastern boundary of the wetland and have attributed to a high groundwater table within the wetland that abruptly falls along its perimeter. Surface flow occurs, as there is evidence that stormwater from the adjacent streets sheet flows onto the site and has caused some areas along the steep eastern extent of the project site to slump and/or erode. The southern portion of the wetland, east of the single-family home, is also believed to be hydrologically supported by a failed septic system.

Some of the seeps identified along the southeastern corner of the wetland, and east of the patch of palustrine emergent wetland, contain significantly high levels of fecal coliform (**Appendix B**). These elevated levels of fecal coliform strongly suggest a failed septic system associated with the single-family residence, which is known to be located in that area. This failed septic system is believed to be the source of additional wetland hydrology that has resulted in the patch of palustrine emergent wetland. The excessive water and sewage released from the failed septic system has created areas upon the steep slope producing conditions sufficient for the cattail. Furthermore, the existing red-alder snags located in this area are of similar age, further suggesting that water levels within that area were previously drier.

This wetland has been rated using the City of Kirkland's wetland rating plates (Plate 26) several times since 2005. Initially, Adolfson and Associates had rated the wetland as a Type 3 wetland back in 2002. Since then, the forested vegetation component has changed and matured



PLAN LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- SURVEYED WETLAND BOUNDARY
- APPROXIMATED WETLAND BOUNDARY (OFF SITE) EXEMPT PER KZC 90.20(3)
- 75' STANDARD WETLAND BUFFER
- ▲ A-# WETLAND FLAG LOCATION
- CHAIN OF STREAM
- 60' STREAM BUFFER
- • B-# STREAM FLAG LOCATION
- □ MW-# MONITOR WELL LOCATION
- F-# ● FECAL COLIFORM SAMPLING LOCATIONS
- TP-# ○ TEST PLOT LOCATIONS
- ○ EXISTING TREES

NOTES

1. SURVEY PROVIDED BY JIM HART & ASSOCIATES, 220 6TH ST., KIRKLAND, WA 98033, (425) 822-4111.
2. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
3. THIS PLAN IS AN ATTACHMENT TO THE WETLAND MITIGATION REPORT PREPARED BY TALASAEA CONSULTANTS IN OCTOBER OF 2007.

GRAPHIC SCALE (IN FEET)
0 25 50 100
SCALE: 1"=100'

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FIGURE: EXISTING CONDITIONS MAP		DESIGN: JW / DRAWN: JL	TAL#: 909
APPLICANT: KEN DAVIDSON	ADDRESS: KIRKLAND, WA 98033	SCALE: 1"=100'	
AT: NE 104TH ST.	DATUM: NAVD 88	DATE: 02-22-08	6
IN: FORBES CREEK		REVISED: 03-20-08	
PURPOSE: CRITICAL AREAS REPORT	PROJECT: HIGHLAND GLEN SHORT PLAT		

enough that the wetland now satisfies the criteria for classification as a Type 2 wetland. Type 2 wetlands in a Primary Basin require a 75-foot buffer KZC §90.45(1).

4.2.2. Wetland B

Wetland B is an extremely small wetland (approximately 150 sf) located off property to the south. It is composed of one Cowardin wetland vegetation type (Palustrine emergent). Vegetation within the wetland includes red alder, reed canarygrass, and Pacific willow (*Salix lasiandra*). Vegetation outside of the wetland is dominated by Himalayan blackberry.

Soils within the delineated wetland boundary appear to be highly disturbed and unlike the soils immediately outside of the wetland. Within the wetland, the soils are a highly mottled silt loam with a hardpan layer at 10-inches. The soils outside of the wetland are a fine sandy loam, characteristic of the Ragnar-Indianola complex. No hardpan was intercepted during our investigations.

4.2.3. Stream A

Stream A is a small stream that flows south to north that has developed at the toe of the slope of the project site. This feature primarily occurs within a ditch associated with the BNRR railroad right-of-way and was likely further modified during construction of a sanitary sewer trunk line. Flow within the channel begins within Wetland A and enters the channel parallel to the railroad right-of-way. The stream is conveyed under the railroad to the northwest through a 24-inch culvert.

To the south of the railroad culvert inlet, Stream A appears to occur within a constructed ditch at the intersection of the railroad fill slope and the sloped terrain of the site. Approximately 50' to 75' south of the culvert, the ditch appears to have been filled in through sediment deposition. Approximately 20' to 30' farther south of this area, the channel braids out almost into a sheet flow before collecting again in a ditch. Farther south of this area a small channel was observed originating slightly to the east within Wetland A, unconfined by a ditch or railroad grade. During a 14 March 2008 site visit, we observed a very small but recognizable stream flowing off from Wetland A in this direction. This stream within the wetland is no more than one foot wide near the confluence with the ditch and no more than an inch deep at its deepest. At this upper-gradient location, flow within this channel is likely seasonal, given its small size and flow rate.

To the north of the railroad culvert inlet, a similar ditch appears to have been constructed at the intersection created by the railroad grade to direct water to the south. This ditch is completely covered by Himalayan blackberry and reed canarygrass. No water was observed in the ditch during our 14 March 2008 site visit, and no evidence of recent or historic flows were observed such as mobilized plant debris, sediments, or gravels. Flow into the culvert was observed from Stream A located south of the culvert, but not from the north.

Downstream of the site, Stream A flows through an existing channel that fans out before entering a large catch basin. From the catch basin the stream passes through a series of underground pipes and eventually discharges into Forbes Creek. Vegetation comprising the banks and riparian corridor of Stream A includes both native and non-native species, such as Pacific Willow (*Salix lasiandra*), red-alder, lady-fern, Himalayan blackberry, and giant horsetail.

Due to the low topographical location of the culvert inlet and sustained hydrology from Wetland A, it is plausible that Stream A at this location is perennial, and may satisfy the requirements for a Class B stream. Class B (perennial) streams within a Primary Basin require a 60-foot standard buffer KZC §90.90(1). However, we have not conducted observations of this feature throughout the late summer months, and it is also plausible that this feature may not have

sustained perennial flow at higher elevations in the channel. Further study would need to occur to confirm if the stream is perennial or ephemeral, and to what extent. To not postpone the application while additional analysis is conducted, the applicant is willing to accept a Class B rating of Stream A at this time.

4.2.4. Uplands

The upland areas are undeveloped, with the exception of the southeast corner, and are dominated by native and non-native vegetation. Vegetation throughout these areas includes a forest canopy of red-alder and black cottonwood with an understory of Himalayan blackberry, Indian plum (*Oemleria cerasiformis*), and sword-fern (*Polystichum munitum*). Soils throughout the upland area are comprised of deep horizons of well-drained dark grayish (10YR4/2) brown sandy gravel loam with no redoximorphic features (i.e., mottles).

4.2.5. Wildlife

Wildlife observations on the site were limited to species of birds, primarily songbirds; however, due to the time of year of our visit and the secretive nature of most wildlife, the probability of additional unobserved species is high. Numerous songbird species, including black-capped chickadee, dark-eyed junco, American robin, and American crow were observed on site.

5.0 PROPOSED PROJECT

5.1. Project Description

The proposed development is a six lot short plat for single-family residential use. Each lot will have its own driveway access to local roads. Access to Lots 1 through 5 will be from 111th Avenue NE. Access to Lot 6 will be from NE 104th Street (**Figure 7** and **Sheet W1.1**).

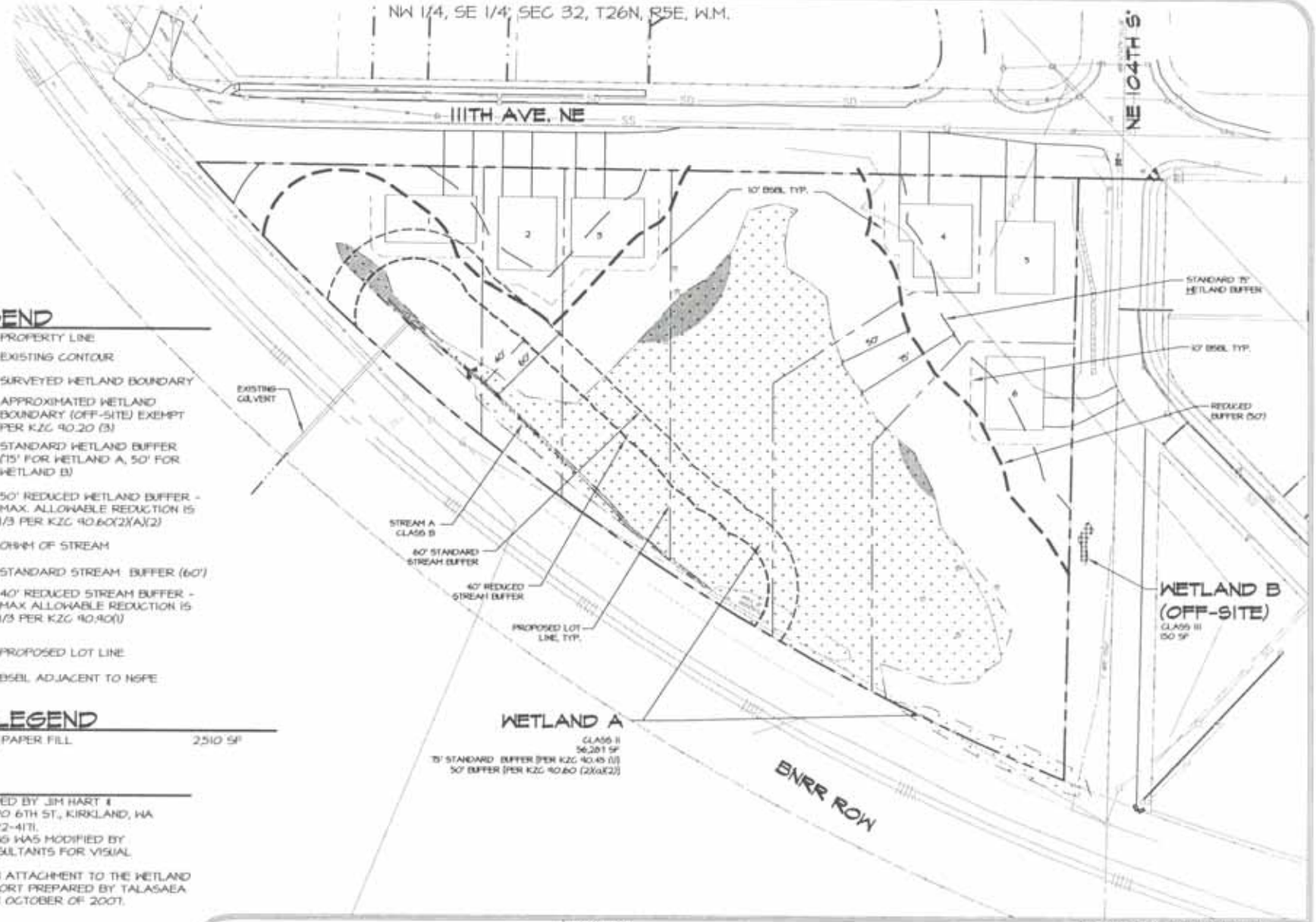
The development will provide necessary infrastructure, including utilities and sanitary sewer hook-up. Also included will be frontage road improvements required by the City. Storm water from surface streets will be collected, detained and directed to local storm water treatment facilities. Clean roof and footing drainage will be captured and released to the wetland by level spreaders located in the wetland buffer. The level spreaders will be constructed in shallow trenches near the boundaries of the wetland creation areas.

5.2. Impacts to Sensitive Areas

The site plan for the Highland Glen Short Plat has been designed to avoid or minimize impacts to sensitive areas to the greatest extent possible (**Figure 7** and **Sheet W1.1**). Several design alternatives were previously considered which included three additional residential lots with greater wetland impact. The current site plan indicates six residential lots with limited direct and indirect land surface modification impacts to the wetlands or the stream. In consideration of the Kirkland Zoning Code (KZC), the location of the development on this site in this configuration is understood to be the lowest impact alternative in respect to wetlands, streams, and other critical habitats. The project proposes 2,510 sf of indirect impact (paper fill) to Wetland A. The buffer for Wetland A is proposed to be reduced with enhancement in order to provide a minimum number of building lots based on current site zoning requirements. To meet minimum buffer widths, areas of inadequate buffer width are treated as a wetland paper fill where the buffer is proposed to be moved into the wetland. The total area of proposed paper fill is approximately 2,510 sf at three locations in Wetland A (**Figure 7, Sheet W1.1**).

5.3. Regulatory Considerations for Wetland and Buffer Modification

It is understood that the City of Kirkland is familiar with the concept of paper fill, and considers the use of paper fill the same as actual wetland fill as it is applied to the KZC.



PLAN LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- SURVEYED WETLAND BOUNDARY
- APPROXIMATED WETLAND BOUNDARY (OFF-SITE) EXEMPT PER KZC 90.20 (3)
- STANDARD WETLAND BUFFER (75' FOR WETLAND A, 50' FOR WETLAND B)
- 50' REDUCED WETLAND BUFFER - MAX. ALLOWABLE REDUCTION IS 1/3 PER KZC 90.60(2)(A)(2)
- CHANN OF STREAM
- STANDARD STREAM BUFFER (60')
- 40' REDUCED STREAM BUFFER - MAX. ALLOWABLE REDUCTION IS 1/3 PER KZC 90.90(1)
- PROPOSED LOT LINE
- BSBL ADJACENT TO NSFE

IMPACTS LEGEND

- PAPER FILL — 2510 SF

NOTES

1. SURVEY PROVIDED BY JIM HART & ASSOCIATES, 220 6TH ST., KIRKLAND, WA 98033, (425) 822-4171.
2. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
3. THIS PLAN IS AN ATTACHMENT TO THE WETLAND MITIGATION REPORT PREPARED BY TALASAEA CONSULTANTS IN OCTOBER OF 2007.

GRAPHIC SCALE (IN FEET)
0 25 50 100
SCALE: 1"=100'

NORTH

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast
Woodinville, Washington 98077
Bus (425)861-7550 - Fax (425)861-7549

FIGURE: PROP. SITE PLAN & CONCEPTUAL IMPACTS PLAN		DESIGN: JW / DRAWN: JL	TAL#: 909
APPLICANT: KEN DAVIDSON	ADDRESS: KIRKLAND, WA 98033	SCALE: 1"=100'	
AT: NE 104TH ST.	DATUM: NAVD 88	DATE: 02-22-08	7
IN: FORBES CREEK		REVISED: 03-20-08	
PURPOSE: CRITICAL AREAS REPORT	PROJECT: HIGHLAND GLEN SHORT PLAT		

Pursuant to KZC §90.55(2), where in primary basins, modification shall not affect more than 10 percent of the wetland on the subject property. The proposed project impacts are well within this limit.

5.3.1. Wetland Modification

Pursuant to Process IIA for the consideration of project impacts, information pursuant to items a-j of KZC §90.55(1) is provided herein to consider the proposed modification of the wetland:

a. It will not adversely affect water quality;

The project will not adversely affect water quality because mitigation is expected to provide an increase in water quality functions within the wetland.

b. It will not adversely affect fish, wildlife, or their habitat;

The project will not adversely affect fish, wildlife, or attendant habitat. With mitigation, functions and values for wildlife are expected to improve with the removal of an existing septic system and, planting native vegetation with forage and cover opportunities, and management of invasive noxious weeds within the wetland mitigation areas.

c. It will not have an adverse effect on drainage and/or storm water detention capabilities;

The project will be designed to not adversely effect drainage or stormwater functions. With mitigation, there will also be no net loss of area within Wetland A. Created wetland is proposed at a 2:1 ratio by using available hydrologic sources. The mitigation design is intended to mimic the existing hydrologic characteristics of the existing sloped wetland.

d. It will not lead to unstable earth conditions or create erosion hazard or contribute to scouring actions;

To implement the mitigation design, there will be some minor modifications to upland slopes within Wetland A for the purpose of wetland creation. Wetland creation will provide down logs and vegetation with soil binding properties to enhance the existing slopes. No unstable earth conditions, erosion hazards, or scouring actions are anticipated.

e. It will not be materially detrimental to any other property or the City as a whole;

Since there will be very little potential for erosion or unstable earth conditions, it is improbable that there will be materially detrimental affects to any other property or to the City as a whole.

f. [For Type 2 wetlands] in primary basins, the modification shall not affect more than 10 percent of the wetland on the subject property;

The proposed paper fill will affect approximately 2,510 sf out of approximately 56,287 sf, or approximately 4.5 percent of the total area of Wetland A. This is below the 10 percent threshold.

g. Compensatory mitigation is provided in accordance with the table in subsection (4) of this section;

Compensatory mitigation in the form of wetland creation and wetland and buffer enhancement will meet the ratios prescribed by subsection (4) of §90.55 KZC.

h. Fill material does not contain organic or inorganic material that would be detrimental to water quality or fish and wildlife habitat;

No detrimental organic or inorganic fill will be used. The minor amount of structural fill material needed will be obtained from the site or imported from a commercial supplier. With mitigation, the project is expected to improve water quality for fish and wildlife habitat.

i. All exposed areas are stabilized with vegetation normally associated with native wetlands and/or buffers, as appropriate; and

The wetland areas in the vicinity of the impacted areas will be enhanced through removal of noxious weed species and selective planting of native trees and shrubs with soil binding properties.

j. There is no practicable or feasible alternative development proposal that results in less impact to the [Type 2] wetland and its buffer.

Several alternative designs of the desired land use on this site have been studied and discussed with the City through pre-application review and formal submittal. In consideration of this site, we believe the basic purpose of this project cannot be reasonably accomplished to successfully avoid all impacts on the associated buffer and wetland. As proposed, and in consideration of the KZC, the revised site plan would avoid or result in less impact on the wetland and buffer than any option previously proposed.

This revised proposal reflects a reduction in size, scope, configuration, and density of the project. Any further reduction in the function of the site is believed to not be feasible by the applicant. The proposed site plan and its impacts represent the least invasive site plan that still meets the design and density requirements based on current site zoning. The current proposed development plan has been the result of an iterative process that has reduced the amount of impact while allowing for a reasonable level of development. The unique shape of the property and the orientation of Wetland A provided considerable constraints to site design and layout

5.3.2. Wetland Buffer Modification

Pursuant to KZC §90.60(1)(b): "*Wetland buffer impact is assumed to occur when wetland fill or modification is proposed. Any proposal for wetland fill/modification shall include provisions for establishing a new wetland buffer zone to be located around the compensatory mitigation sites and to be equal in width to its standard buffer specified in KZC 90.45(1) or a buffer reduced in accordance with this section by no more than one-third of the standard buffer width in all cases (regardless of wetland type or basin type).*" The project proposes a buffer from the wetland mitigation areas reduced in accordance with the provisions of the KZC.

Pursuant to KZC §90.60(2)(b): "*The applicant shall demonstrate that through enhancing the buffer (by removing invasive plants, planting native vegetation, installing habitat features such as downed logs or snags, or other means), the reduced buffer will function at a higher level than the existing standard buffer. At a minimum, a buffer enhancement plan shall provide the following: (a) a map locating the specific area of enhancement; (b) a planting plan that uses*

native species, including groundcover, shrubs, and trees; and (c) a monitoring and maintenance program prepared by a qualified professional consistent with the standards specified in KZC 90.55(4). Buffers may not be reduced at any point by more than one-third of the standards in KZC 90.45(1)." The project proposes appropriate mitigation consistent with this section and this study includes maps, a planting plan, and a monitoring and maintenance program consistent with this section.

Also pursuant to KZC §90.60(2)(b), an improvement or land surface modification shall be approved in a wetland buffer only if it meets items 1-9 of that section. Information pursuant to these items is provided herein to consider the proposed modification of the buffer:

1. It is consistent with *Kirkland's Streams, Wetlands, and Wildlife Study* (The Watershed Company, 1998) and the *Kirkland Sensitive Areas Regulatory Recommendations Report* (Adolfson Associates, Inc., 1998);

   The re-occurring theme with the Kirkland's Streams, Wetlands, and Wildlife Study and the Kirkland Sensitive Areas Regulatory Recommendations Report is the need to protect and preserve sensitive areas within Primary Basins to the greatest extent possible. The Watershed Company report identifies important streams and wetlands within the Forbes Creek basin and identifies environmental concerns within the basin. The Adolfson report makes recommendations regarding protection of sensitive areas and regulation of development. The proposed project and mitigation plan is consistent with the recommendations of these reports. With mitigation, no net loss of wetland will result from the development. New wetland areas will be created and the existing wetland will be enhanced to provide additional habitat value for wildlife while preserving and enhancing stormwater detention and water quality functions. The buffer areas adjacent to proposed development will be protected with fencing, and enhanced by removal of noxious weed species and replanted with desirable native trees and shrubs. The resulting buffer will be of higher habitat value compared to existing conditions.

2. It will not adversely affect water quality;

   The project will not adversely affect water quality because vegetation enhancement is expected to provide an increase in water quality functions within the buffer.

3. It will not adversely affect fish, wildlife, or their habitat;

   The project will not adversely affect fish, wildlife, or attendant habitat. With mitigation, functions and values for wildlife are expected to improve with the removal of an existing septic system and, planting native vegetation with forage and cover opportunities, and management of invasive noxious weeds within the enhanced buffer areas.

4. It will not have an adverse effect on drainage and/or storm water detention capabilities;

   With mitigation, there is expected to be an improvement in buffer functions and values. With enhancement, modification of the buffer will not have an adverse effect on drainage or stormwater functions.

5. It will not lead to unstable earth conditions or create an erosion hazard;

   To implement the mitigation design, there may be some minor disturbance to the upland slopes within the buffer of Wetland A for the purpose of implementing the wetland

creation areas. The buffer will be replanted where it is disturbed for mitigation construction access. Access areas will occur in areas dominated by Himalayan blackberry. No unstable earth conditions, erosion hazards, or scouring actions are anticipated with mitigation.

6. It will not be materially detrimental to any other property or the City as a whole;

   Since there will be very little potential for erosion or unstable earth conditions, it is improbable that there will be materially detrimental affects to any other property or to the City as a whole.

7. Fill material does not contain organic or inorganic material that would be detrimental to water quality or to fish, wildlife, or their habitat;

   No detrimental organic or inorganic fill will be used. The minor amount of structural fill material needed will be obtained from the site or imported from a commercial supplier. With mitigation, the project is expected to improve water quality for fish and wildlife habitat.

8. All exposed areas are stabilized with vegetation normally associated with native wetland buffers, as appropriate; and

   The buffer areas in the vicinity of the impacted areas will be restored and enhanced through removal of noxious weed species and selective planting of native trees and shrubs with soil binding properties.

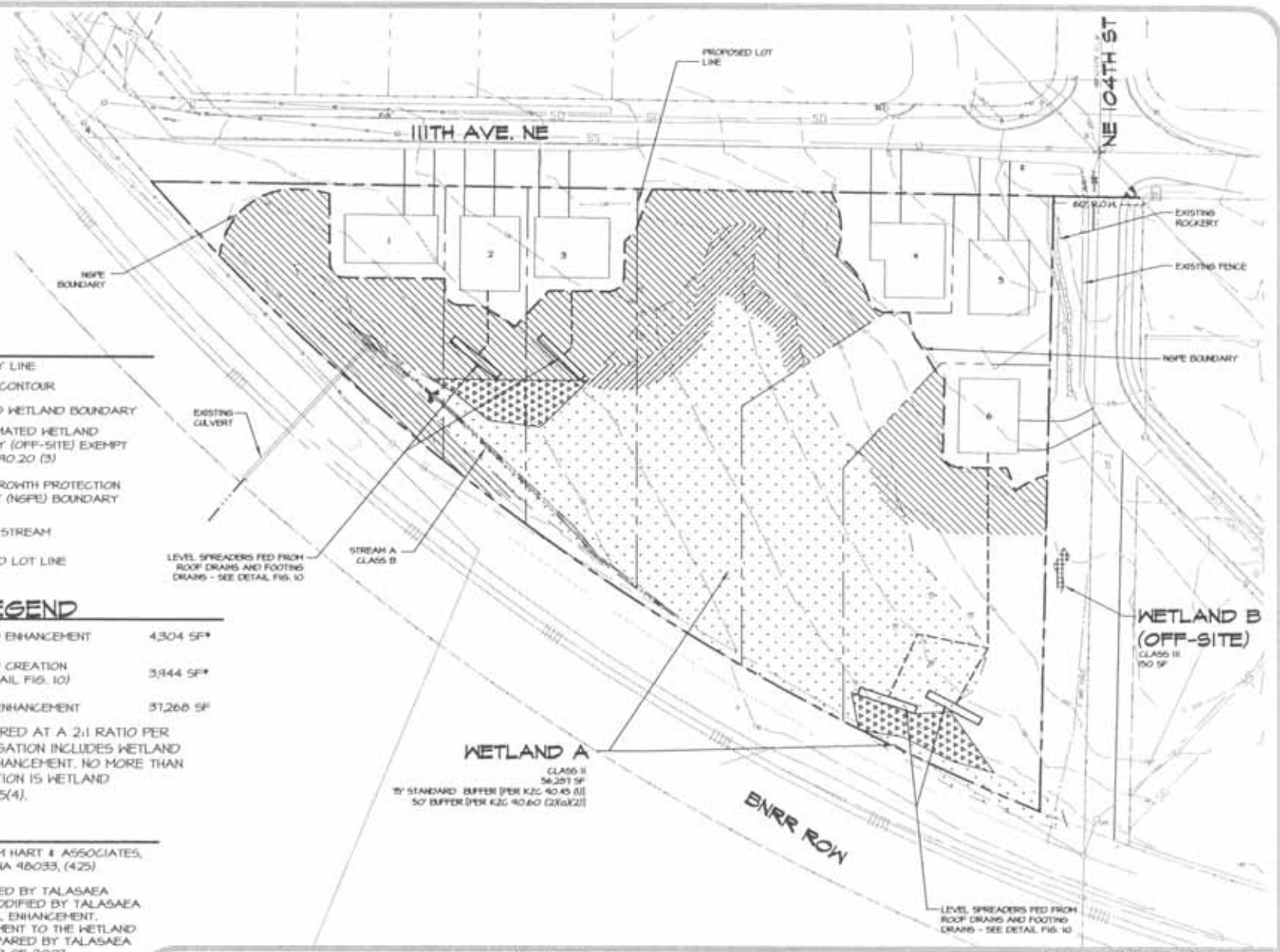
9. There is no practicable or feasible alternative development proposal that results in less impact to the buffer.

   Several alternative designs of the desired land use on this site have been studied and discussed with the City through pre-application review and formal submittal. In consideration of this site, we believe the basic purpose of this project cannot be reasonably accomplished to successfully avoid all impacts on the associated buffer and wetland. As proposed, and in consideration of the KZC, the revised site plan would avoid or result in less impact on the wetland and buffer than any option previously proposed.

   This revised proposal reflects a reduction in size, scope, configuration, and density of the project. Any further reduction in the function of the site is believed to not be feasible by the applicant. The proposed site plan and its impacts represent the least invasive site plan that still meets the design and density requirements based on current site zoning. The current proposed development plan has been the result of an iterative process that has reduced the amount of impact while allowing for a reasonable level of development. The unique shape of the property and the orientation of Wetland A provided considerable constraints to site design and layout

5.4. Wetland Impacts

The project proposes to impact Wetland A (Type 2) by paper filling 2,510 sf. A compensatory mitigation plan that, at a minimum, provides functional equivalency has been developed. Wetland mitigation will be accomplished through wetland creation and wetland enhancement (**Figure 8** and **Sheet W1.2**).



PLAN LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- SURVEYED WETLAND BOUNDARY
- APPROXIMATED WETLAND BOUNDARY (OFF-SITE) EXEMPT PER KZC 90.20 (3)
- NATIVE GROWTH PROTECTION EASEMENT (NGPE) BOUNDARY
- ORHM OF STREAM
- PROPOSED LOT LINE

MITIGATION LEGEND

	WETLAND ENHANCEMENT	4,304 SF*
	WETLAND CREATION (SEE DETAIL FIG. 10)	3,944 SF*
	BUFFER ENHANCEMENT	37,268 SF

*WETLAND MITIGATION REQUIRED AT A 2:1 RATIO PER KZC 90.55(4). WETLAND MITIGATION INCLUDES WETLAND CREATION AND WETLAND ENHANCEMENT. NO MORE THAN 1/3 OF THE WETLAND MITIGATION IS WETLAND ENHANCEMENT PER KZC 90.55(4).

NOTES

1. SURVEY PROVIDED BY JIM HART & ASSOCIATES, 220 6TH ST., KIRKLAND, WA 98033, (425) 822-4171.
2. WETLAND B FIELD LOCATED BY TALASAEA
3. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
4. THIS PLAN IS AN ATTACHMENT TO THE WETLAND MITIGATION REPORT PREPARED BY TALASAEA CONSULTANTS IN OCTOBER OF 2007.

GRAPHIC SCALE (IN FEET)
0 25 50 100
SCALE: 1"=100'

NORTH

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast
Woodinville, Washington 98077
Bus (425)861-7550 - Fax (425)861-7549

FIGURE: PROP. SITE PLAN & CONCEPTUAL MITIGATION PLAN			DESIGN: JW	DRAWN: JL	TAL#: 909
APPLICANT: KEN DAVIDSON	ADDRESS: KIRKLAND, WA 98033		SCALE: 1"=100'		
AT: NE 104TH ST.		DATUM: NAVD 88	DATE: 02-22-08		8
IN: FORBES CREEK			REVISED: 03-20-08		
PURPOSE: CRITICAL AREAS REPORT		PROJECT: HIGHLAND GLEN SHORT PLAT			

Compensatory mitigation for the 2,510 sf of wetland impacts within the project site is proposed as 3.944 sf of wetland creation and 4,304 sf of wetland enhancement. Per KZC 90.55(4), no more than 1/3 of the wetland mitigation will be wetland enhancement and the wetland enhancement is at a 4:1 ratio. With mitigation, there is expected to be a gain in wetland/stream functions and values. Enhancement measures will include a) reducing fecal coliform levels present within wetland/stream hydrology by removing the failed septic system, b) removal of invasive species, c) planting a variety of evergreen and deciduous trees and shrubs, and d) placement of large woody material.

5.5. Stream Buffer Impacts

The project proposes to reduce the stream buffer from 60 feet to 40 feet at the north end of the site. Compensatory mitigation areas (enhanced buffer) will provide mitigation with pursuant to KZC §90.100(1)(b). Due to the degraded quality of the existing stream buffer, the proposed stream buffer enhancement is expected to significantly increase the functions and values of the combined wetland and stream buffer.

As described in KZC §90.90(1), the stream buffer may be reduced by no more than one-third of the standard buffer width. This project proposes wetland modification with compensatory mitigation, which will include wetland creation and wetland enhancement. With the available opportunities for buffer enhancement, the buffer is proposed to be reduced by 1/3 of the standard width (from 60 to 40 feet) at the northern location of the stream. The proposed reduced buffer width is 40 feet and development within this project is designed such that it will not encroach into this reduced standard buffer.

The stream buffer will be enhanced with native vegetation and large woody material to provide additional wetland/stream protection and habitat value. With mitigation, ecological functions and protection of wetland and stream areas are expected to improve.

Pursuant to KZC §90.100(1)(b): "Buffers may be decreased through buffer enhancement. The applicant shall demonstrate that through enhancing the buffer (by removing invasive plants, planting native vegetation, installing habitat features such as downed logs or snags, or other means) the reduced buffer will function at a higher level than the standard existing buffer. A buffer enhancement plan shall at a minimum provide the following: (1) a map locating the specific area of enhancement; (2) a planting plan that uses native species, including groundcover, shrubs, and trees; and (3) a monitoring and maintenance program prepared by a qualified professional consistent with the standards specified in KZC 90.55(4). Buffers may not be reduced at any point by more than one-third of the standards in KZC 90.90(1)."

Pursuant to KZC §90.100(2): *"Modification requests for averaging or reduction/enhancement of Class A stream buffers shall be considered by the Hearing Examiner pursuant to Process IIA, described in Chapter 150 KZC. Modification requests for averaging or reduction/enhancement of Class B stream buffers shall be considered by the Planning Official pursuant to Process I, described in Chapter 145 KZC. Modification requests for averaging or reduction/enhancement of Class C stream buffers shall be considered by the Planning Official."* The project proposes appropriate mitigation consistent with this section for modification of the Class B stream buffer and this study includes maps, a planting plan, and a monitoring and maintenance program consistent with this section.

Also pursuant to KZC §90.100(2) an improvement or land surface modification shall be approved in a stream buffer only if it meets items a-j of that section. Information pursuant to these items is provided herein to consider the proposed modification of the stream buffer:

a. It is consistent with *Kirkland's Streams, Wetlands and Wildlife Study* (The Watershed Company, 1998) and the *Kirkland Sensitive Areas Regulatory Recommendations Report* (Adolfson Associates, Inc., 1998);

The re-occurring theme with the Kirkland's Streams, Wetlands, and Wildlife Study and the Kirkland Sensitive Areas Regulatory Recommendations Report is the need to protect and preserve sensitive areas within Primary Basins to the greatest extent possible. The Watershed Company report identifies important streams and wetlands within the Forbes Creek basin and identifies environmental concerns within the basin. The Adolfson report makes recommendations regarding protection of sensitive areas and regulation of development. The proposed project and mitigation plan is consistent with the recommendations of these reports. With mitigation, no net loss of stream buffer function will result from the development. The stream buffer will be enhanced to provide additional habitat value for wildlife while preserving and enhancing water quality functions. The buffer areas adjacent to proposed development will be protected with fencing, and enhanced by removal of noxious weed species and replanted with desirable native trees and shrubs. The resulting buffer will be of higher habitat value compared to existing conditions.

b. It will not adversely affect water quality;

The project will not adversely affect water quality because vegetation enhancement is expected to provide an increase in water quality functions within the buffer.

c. It will not adversely affect fish, wildlife, or their habitat;

The project will not adversely affect fish, wildlife, or attendant habitat. With mitigation, functions and values for wildlife are expected to improve with the removal of an existing septic system and, planting native vegetation with forage and cover opportunities, and management of invasive noxious weeds within the enhanced buffer areas.

d. It will not have an adverse effect on drainage and/or storm water detention capabilities;

With mitigation, there is expected to be an improvement in buffer functions and values. With enhancement, modification of the buffer will not have an adverse effect on drainage or stormwater functions.

e. It will not lead to unstable earth conditions or create an erosion hazard or contribute to scouring actions;

To implement the mitigation design, there may be some minor disturbance to the upland slopes within the stream buffer for the purpose of implementing the wetland creation areas. The buffer will be replanted where it is disturbed for mitigation construction access. Access areas will occur in areas dominated by Himalayan blackberry. No unstable earth conditions, erosion hazards, or scouring actions are anticipated with mitigation.

f. It will not be materially detrimental to any other property or the City as a whole;

Since there will be very little potential for erosion or unstable earth conditions, it is improbable that there will be materially detrimental affects to any other property or to the City as a whole.

g. Fill material does not contain organic or inorganic material that would be detrimental to water quality or to fish, wildlife, or their habitat;

No detrimental organic or inorganic fill will be used. The minor amount of structural fill material needed will be obtained from the site or imported from a commercial supplier. With mitigation, the project is expected to improve water quality for fish and wildlife habitat.

h. All exposed areas are stabilized with vegetation normally associated with native stream buffers, as appropriate; and

The buffer areas in the vicinity of the impacted areas will be restored and enhanced through removal of noxious weed species and selective planting of native trees and shrubs with soil binding properties

i. There is no practicable or feasible alternative development proposal that results in less impact to the buffer.

Several alternative designs of the desired land use on this site have been studied and discussed with the City through pre-application review and formal submittal. In consideration of this site, we believe the basic purpose of this project cannot be reasonably accomplished to successfully avoid all impacts on the associated buffer. As proposed, and in consideration of the KZC, the revised site plan would avoid or result in less impact on the wetland and buffer than any option previously proposed.

This revised proposal reflects a reduction in size, scope, configuration, and density of the project. Any further reduction in the function of the site is believed to not be feasible by the applicant. The proposed site plan and its impacts represent the least invasive site plan that still meets the design and density requirements based on current site zoning. The current proposed development plan has been the result of an iterative process that has reduced the amount of impact while allowing for a reasonable level of development. The unique shape of the property and the orientation of Stream A and Wetland A provided considerable constraints to site design and layout

5.5.1. General Description of the Paper Fill Concept

What is Paper Fill?

Paper wetland fill is the hypothetical filling of a wetland and is not actual wetland fill. Impacts for paper wetland fill are treated as actual fill and are mitigated according to prescriptive code requirements. This type of wetland impact requires an assessment of the impacted wetland functions that may result from the proposed project, and minimally would provide mitigation of the hypothetical fill to replace any lost wetland and buffer functions and values. Mitigation measures provided for paper fill are usually consistent with measures for actual wetland fill impacts. The application of paper fill for most projects may have considerations to the possible impairment of habitat functions, but preserves hydrologic and water quality wetland functions within the paper fill area in most applications. To effectively mitigate for paper fill, the associated impacts to habitat functions and values need to be replaced and/or enhanced.

Where does the Buffer Go?

With paper fill, the standard wetland buffer width is preserved and moved into the wetland. Paper fill is applied by relocating a standard wetland buffer to be partially or completely within the associated wetland to the dimension of the standard buffer width. In essence, the

prescriptive wetland buffer becomes part of the wetland, and would provide functions attributable to a buffer while maintaining most wetland functions. Mitigation for paper fill usually includes substantial enhancement of the adjacent ecosystem, and provides compensatory mitigation as if actual wetland fill had occurred. This method is often applied because of site area constraints where it would not be feasible to provide additional buffer area (e.g., wetland buffer averaging). Paper fill can also be applied where buffers cannot be reduced beyond the minimum widths prescribed by code. Because of the need to preserve wetland and buffer functions and values, paper fill is most appropriate when applied to degraded ecosystems where such ecological gains can most easily be realized. Development projects utilizing paper fill, with appropriate mitigation, have the ability to demonstrate a net gain in ecological functions and values when compared to pre-development conditions.

When is Paper Fill a Viable Option?
Application of the paper fill concept can offer the opportunity to develop a site that would otherwise not be possible under the prescriptive measures of most local codes. Through paper fill, many opportunities exist to develop and restore sites that are significantly encumbered by degraded (but regulated) wetland and stream ecosystems. With mitigation, such sites can be developed using paper fill with a net gain in ecological value instead of remaining in a degraded state. Similar to actual wetland fill, paper wetland fill must demonstrate avoidance and minimization of impacts to be consistent with the land use ordinances. However, the application of paper fill can be considered a means of avoidance and minimization of wetland impacts if actual impacts can be avoided though its use. Avoidance of actual wetland fill and the enhancement of remaining wetland functions through mitigation can result in a net gain in overall ecological function.

Which Jurisdictions have Allowed the use of Paper Fill?
Paper fill is an impact-and-mitigation concept that has been previously recognized and allowed by the cities of Bothell, Auburn, Kent, Redmond, Issaquah, Mill Creek, as well as Snohomish County, and many other local jurisdictions.

5.6. Wetland Buffer Impacts

The project proposes to reduce the wetland buffer from 75 feet to 50 feet at the compensatory mitigation areas (enhanced and created wetland areas) and will provide buffer mitigation with enhancement pursuant to KZC §90.60(2)(a)(2). Due to the degraded quality of the existing wetland buffer, the proposed wetland buffer enhancement is expected to significantly increase the functions and values of the wetland and wetland buffer.

As described in KZC §90.60(1), wetland buffer impact will occur when wetland fill or modification will occur, and the buffer location around the compensatory mitigation site may be reduced by no more than one-third of the standard buffer width. This project proposes wetland modification with compensatory mitigation, which will include wetland creation and wetland enhancement. With the available opportunities for buffer enhancement, the buffer is proposed to be reduced by 1/3 of the standard width (from 75 to 50 feet) adjacent to the wetland mitigation areas.

The wetland buffer will be enhanced with native vegetation and large woody material to provide additional wetland/stream protection and habitat value. Approximately 37,268 sf of currently degraded buffer will be enhanced under the current concept. A City-approved fence will also be installed at the buffer boundary bordering the development and Native Growth Protection Easement (NGPE) signs will be installed along the fence. With mitigation, ecological functions and protection of wetland and stream areas are expected to improve.

5.7. Duration of Impacts

Direct and indirect impacts are expected to be relatively small and short-lived, as compensatory mitigation will result in functional equivalency. Disruption of wildlife will likely continue throughout the construction process. With mitigation, the function and value of wildlife habitat will exceed the existing functions and values.

6.0 MITIGATION MEASURES

6.1. Goal, Objectives, and Performance Standards

The primary goal of the mitigation project is to replace the functions and values lost due to the indirect (paper fill) impacts of approximately 2,510 sf of a Type 2 wetland. To accomplish this goal, the proposed project will create a minimum of 3,944 sf of new wetland; enhance 4,304 sf of existing wetland, and enhance 37,268 sf of existing wetland and stream buffer. The following mitigation measures will be evaluated through the following objectives and performance standards. Performance monitoring of the mitigation areas will be conducted for a period of five years for the City of Kirkland.

Objective A: Increase the woody vegetation coverage and structural diversity in the created and enhanced wetlands, wetland buffers, and stream buffer areas by planting a wide variety of native evergreen and deciduous trees and shrubs to increase biological support functional values.
Performance Standard A: In the created wetlands, and in the enhanced wetland and buffers, at least 15 species of desirable native plant species will be present in the overall mitigation area at the end of Year 5. In any wetland or buffer areas where bare ground is generated, woody plant coverage must be at least 20% by Year 1, 50% by Year 3, and 80% by Year 5. Woody plant coverage in enhanced wetland and buffer areas must be at least 10% by Year 1, 30% by Year 3, and 50% by Year 5. Woody coverage may be comprised of both planted and recolonized native species.

Objective B: Ensure the success of the woody species in the mitigation areas.
Performance Standard B: Percent survival of planted woody species must be 100% at the end of Year 1, and at least 85% for each subsequent year of the monitoring period.

Objective C: Increase the overall habitat functions of the mitigation area to wildlife by incorporating habitat features (i.e., bird nest boxes, bat roosting boxes, snags, down logs, brush piles, boulder piles, and constructed cavities in stumps and down logs) into the wetlands and buffer system.
Performance Standard C: In the created wetland and wetland and buffer enhancement areas, there will be at least 17 habitat features per acre (1 piece/2,500 square feet) including down woody material (logs, rootwads, etc.) and snags. Large woody debris will only be placed where large equipment is able to access the mitigation areas without causing any further environmental damage to the wetlands and buffers. There will also be a minimum of three bird nest boxes installed on new snags or existing large trees and a minimum of 3 bat roosting boxes installed on existing large trees.

Objective D: Increase the habitat functions and erosion control functions in the created and enhanced wetland and buffer areas by planting a wide variety of herbaceous vegetation to provide erosion control, slope stability, and increased wildlife habitat.
Performance Standard D: Herbaceous coverage of vegetation in mitigation areas shall be at least 30% by the end of Year 1, 50% by the end of Year 2, and 85% by the end of Years 3 and

5, excluding those areas of the site that may have sparse herbaceous vegetation due to dense shade from woody species coverage.

Objective E: Following construction, the created and enhanced wetland areas will exhibit wetland hydrology. In these wetland areas, wetland conditions will be verified by the presence of field indicators.
Performance Standard E: Throughout the five-year monitoring period, a combination of native or naturalized woody and herbaceous vegetation that is predominantly FAC or wetter will cover the wetland areas. Wetland areas will also exhibit evidence of saturated soil conditions (i.e., signs of ponding, water marks, water-stained leaves, or redoximorphic features in the soil) and will remain inundated or saturated to the surface for at least 10% of the growing season, defined as April through mid-November. Additionally, two shallow groundwater monitoring wells will be provided within each of the wetland creation areas so that groundwater elevations are documented weekly during the early growing season (from 1 March to 15 February of each monitoring year, or as seasonally adjusted due to precipitation conditions).

Objective F: Remove and control invasive plants to less than 20% cover at mitigation enhancement areas and to less than 10% over in any wetland or buffer areas where bare ground is generated.
Performance Standard F: After construction and following every monitoring event for a period of five years, exotic and invasive plant species will be maintained at levels below total cover percentages in the mitigation areas. These species include: Scot's broom, Himalayan and evergreen blackberry, reed canarygrass, purple loosestrife, hedge bindweed, Japanese knotweed, English ivy, Canada thistle, and creeping nightshade.

6.2. Wetland Mitigation

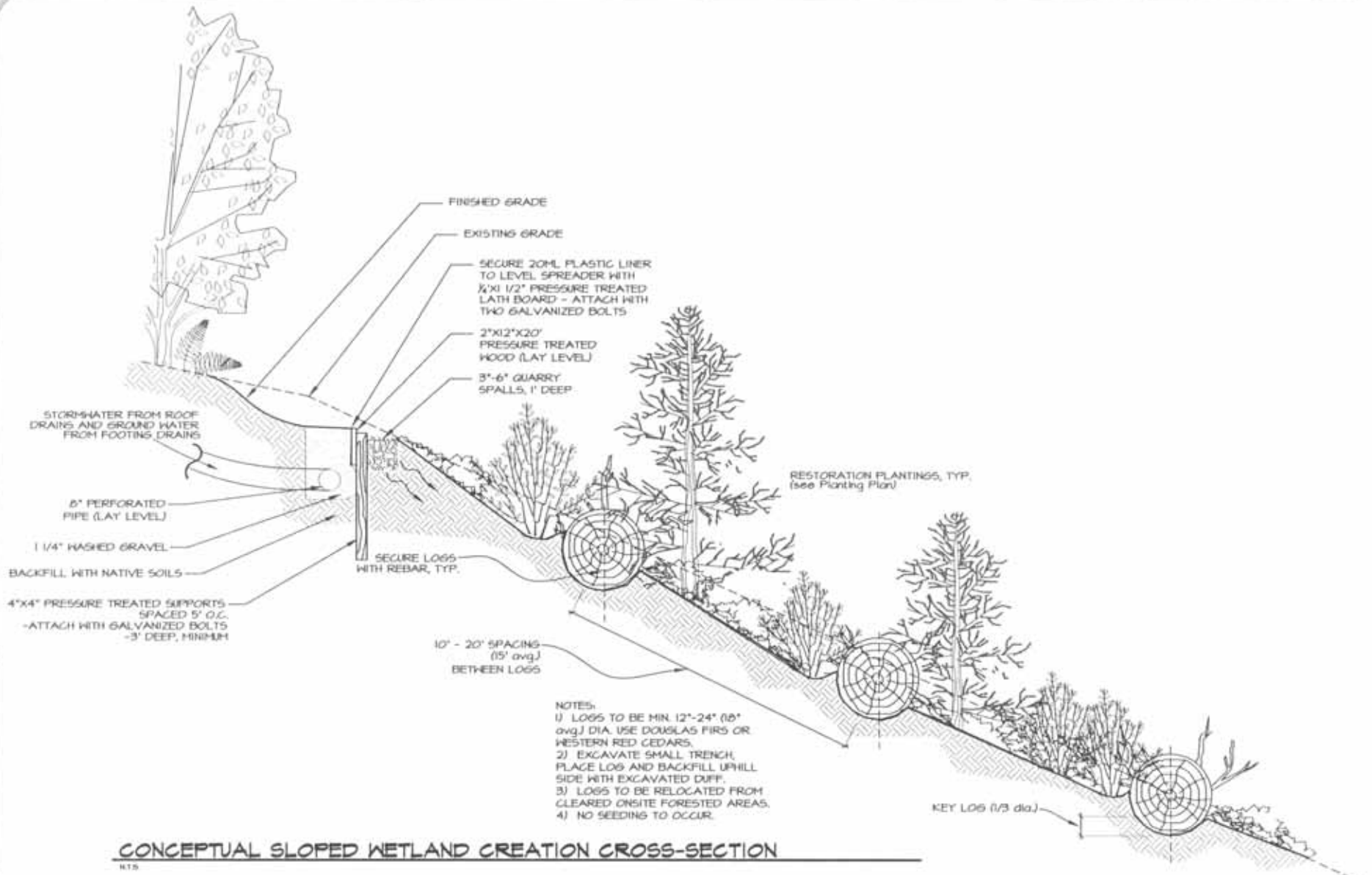
Mitigation for the proposed 2,510 sf of paper fill will occur through 3,944 sf of wetland creation and 4,304 sf of wetland enhancement (**Figure 8** and **Sheet W1.2**) as described in **Section 5.3.**

6.2.1. Hydrological Support

As part of the proposed project, the existing failed septic system will be removed and will no longer provide the additional hydrology that is expected to have created the patch of palustrine emergent wetland. However, Wetland A will continue to be hydrologically supported by local precipitation, groundwater seeps, and surface flows.

Improvements to 111th Avenue Northeast will require that some areas of organic fill be replaced with new structural fill. From consultation with the project civil engineer and geotechnical engineer, the over-excavation and replacement of this material is not expected to exceed 4 feet in depth, and no adverse impacts to the interflow of groundwater or support of Wetland A are anticipated.

Hydrologic support will be provided to the wetland creation area by means of collected and dispersed groundwater from footing drains. Soil logs from the geotechnical study prepared for this project indicate that groundwater is available at proposed building locations, and will likely be intercepted at future footing drains. Additionally, supplemental clean rooftop water will also be collected and conveyed to the wetland creation areas as a build-in contingency measure. Collected water will be dispersed at infiltration trenches up-gradient of the wetland creation areas (**Figure 10** and **Sheet W1.2**). This introduced hydrology will mimic the natural shallow interflow of the adjacent sloped wetland. Groundwater and clean rooftop water will be moderated by discharge into the trenches. Flows will be further moderated for increased residency by the provision of shallow surface depressions created by down logs and woody



CONCEPTUAL SLOPED WETLAND CREATION CROSS-SECTION

N.T.S.

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Resource & Environmental Planning
15020 Bear Creek Road Northeast
Woodinville, Washington 98077
Bus (425)861-7550 - Fax (425)861-7549

FIGURE: CONC. SLOPED WETLAND CREATION CROSS-SECTION		DESIGN: JW / DRAWN: JL	TAL#: 909
APPLICANT: KEN DAVIDSON	ADDRESS: KIRKLAND, WA 98033	SCALE: 1"=100'	
AT: NE 104TH ST.	DATUM: NAVD 88	DATE: 02-22-08	10
IN: FORBES CREEK		REVISED: 03-20-08	
PURPOSE: CRITICAL AREAS REPORT	PROJECT: HIGHLAND GLEN SHORT PLAT		

debris keyed into the grade at these locations. This form of hydrological support for wetland creation will mimic the adjacent wetland conditions.

6.2.2. Planting

Indigenous evergreen and deciduous trees and shrubs will be planted in the wetland enhancement area and the enhanced buffer to provide improved habitat value and soil binding properties within the mitigation areas (**Figure 9** and **Sheet W2.0**). The plant species proposed will be chosen for a variety of qualities, including: adaptation to specific water regimes, value to wildlife, value as a physical or visual barrier, pattern of growth (structural diversity), and aesthetic values.

Native tree, shrub, and herbaceous species will be chosen to increase both the structural and species diversity of the mitigation areas, thereby increasing the area's value to wildlife for forage and cover. Species of vegetation that are both beneficial to wildlife and unfriendly to humans will be used in areas where human exclusion is desired. Plant materials will consist of a combination of bare-root specimens, balled and burlapped plants, and container plants.

6.2.3. Habitat Features

Habitat features, including down logs, stumps, snags, rock piles (if available); brush piles; and nest/roost boxes will be placed in the mitigation areas to enhance the wildlife habitat and biological diversity and support functions. These habitat features are intended to minimize the temporal losses from the proposed development and will be obtained from areas on the project site that will be cleared for development.

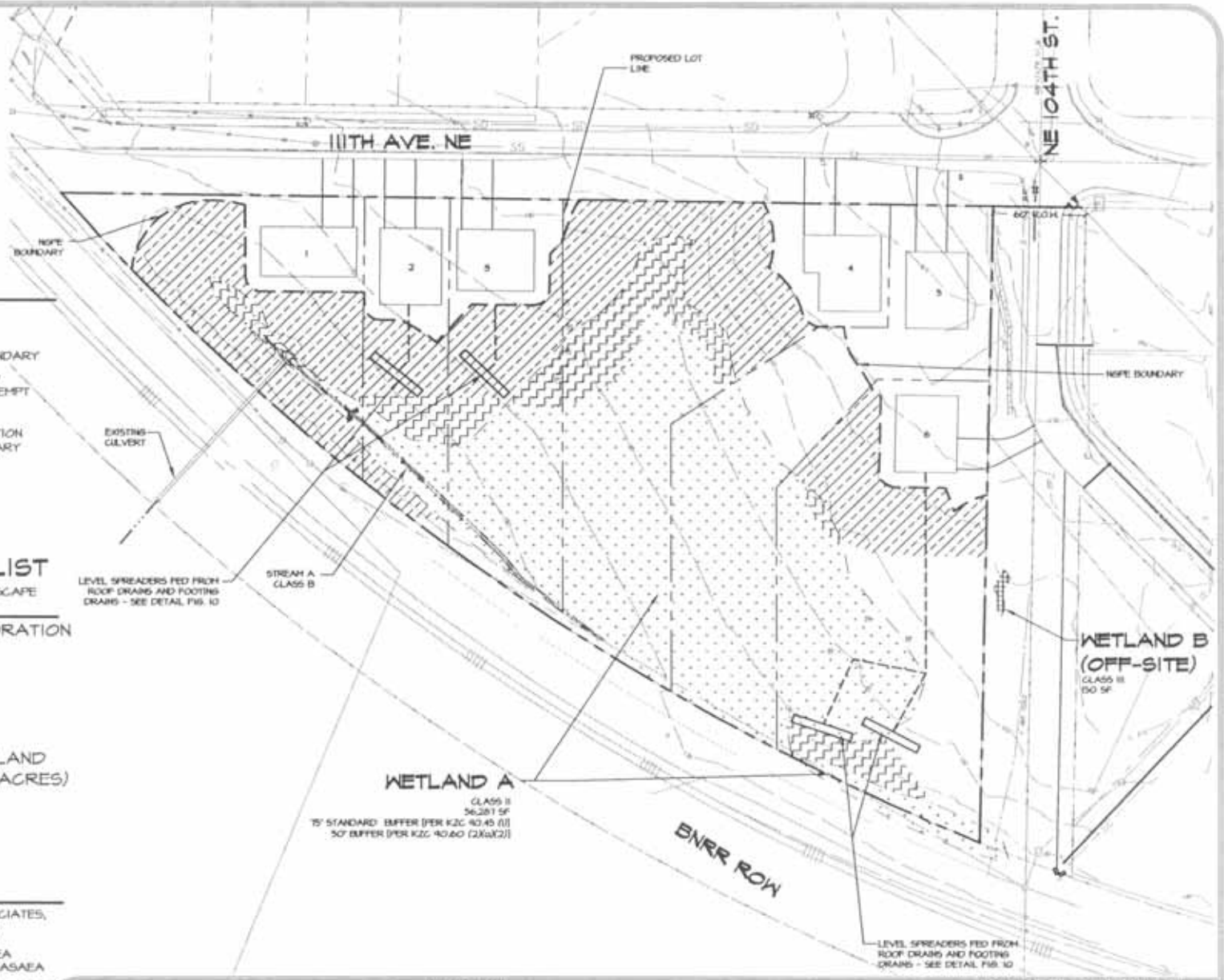
Snags provide perching, feeding, and nesting sites for a variety of native birds. Cavity nesting bird species, such as tree swallows, violet-green swallows, chickadees, and woodpeckers, would be expected to utilize such features. Bird-nesting boxes will be attached to each installed snag or to existing mature trees to augment the natural habitat. Down logs and stumps provide the slow release of nutrients as the wood decays, and also provide cover for amphibians, small mammals, and other wildlife. Cavities will be constructed in selected down logs and stumps to provide habitat for birds, small mammals, and native plantings. Brush piles will also be placed throughout the mitigation areas to provide important cover for various birds and small mammals. Boulders recovered from site excavation (if available) will be placed in small piles throughout the mitigation area. These piles can provide habitat for reptiles and small mammals.

6.3. Wetland and Stream Buffer Enhancement

In addition to the wetland enhancement described above, the existing wetland and stream buffers will also be enhanced to allow for required buffer reduction, increase wildlife habitat value, and increase water quality protection. Approximately 37,268 sf of currently degraded wetland and stream buffer will be enhanced. Enhancement measures will include: 1) planting the buffers with a wide variety of native deciduous and evergreen trees and shrubs, interspersed with existing vegetation, to increase both plant structural and species diversity, 2) removing non-native and invasive plant species from the buffers, and 3) placement of large woody material in the outer portions of the buffer in areas where heavy equipment can access the buffer without doing damage to the existing native buffer vegetation, and also placement of large woody material in areas where invasive plant species will be removed.

6.4. Invasive Species Removal in Wetland and Buffer

Initial and ongoing (as necessary) noxious weed management will be conducted through manual and appropriate chemical means. To control areas of extensive Himalayan blackberry (Rubus discolor) infestation, blackberries will be manually cut to near ground level with roots and tops removed. New growth will then be treated with wick applications of imazapyr



PLAN LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- SURVEYED WETLAND BOUNDARY
- APPROXIMATED WETLAND BOUNDARY (OFF-SITE) EXEMPT PER KZC 90.20 (3)
- NATIVE GROWTH PROTECTION EASEMENT (NGPE) BOUNDARY
- CHAIN OF STREAM
- PROPOSED LOT LINE

PLANT COMMUNITIES LIST

(ALL PLANTS TO BE FIELD LOCATED BY LANDSCAPE ARCHITECT/BIOLOGIST)

BUFFER ENHANCEMENT & RESTORATION (.80 ACRES)

REFER TO SHEET L2.0 FOR PLANT LIST

FORESTED / SCRUB-SHRUB WETLAND ENHANCEMENT & CREATION (.22ACRES)

REFER TO SHEET L2.0 FOR PLANT LIST

NOTES

1. SURVEY PROVIDED BY JIM HART & ASSOCIATES, 220 6TH ST., KIRKLAND, WA 98033, (425) 822-4171.
2. WETLAND B FIELD LOCATED BY TALASAEA
3. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
4. THIS PLAN IS AN ATTACHMENT TO THE WETLAND MITIGATION REPORT PREPARED BY TALASAEA CONSULTANTS IN OCTOBER OF 2007.

GRAPHIC SCALE (IN FEET)

0 25 50 100

SCALE: 1"=100'

NORTH

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast
Woodinville, Washington 98077
Bus (425)861-7550 - Fax (425)861-7549

FIGURE: CONCEPTUAL PLANTING PLAN & SCHEDULE		DESIGN: JW / DRAWN: JL / TAL#: 909	
APPLICANT: KEN DAVIDSON	ADDRESS: KIRKLAND, WA 98033	SCALE: 1"=100'	
AT: NE 104TH ST.	DATUM: NAVD 88	DATE: 02-22-08	9
IN: FORBES CREEK		REVISED: 03-20-08	
PURPOSE: CRITICAL AREAS REPORT	PROJECT: HIGHLAND GLEN SHORT PLAT		

("Habitat®", EPA Registration #241-426) and/or glyphosate ("Rodeo®", EPA Registration #62719-324). Imazapyr and glyphosate are herbicidal active ingredients approved by the Washington State Department of Ecology to control invasive and noxious weeds. Pesticide applications must be conducted by a technician licensed by the Washington State Department of Agriculture (WSDA).

6.5. Temporary Irrigation System

An above-ground temporary irrigation system will be provided capable of full head-to-head coverage of all planted areas. The temporary irrigation system shall either utilize controller and point of connection (POC) from the site irrigation system or shall include a separate POC and controller with a backflow prevention device per water jurisdiction inspection and approval. The system shall be zoned to provide optimal pressure and uniformity of coverage, as well as separation for areas of full sun or shade and slopes in excess of 5%.

The system shall be operational by June 15 (or at time of planting) and winterized by October 15, or as needed. Irrigation shall be provided for the first 2 years of the monitoring period. The irrigation system shall be programmed to provide ½-inch of water per week (one cycle with two start times per week or every three days). A chart describing the location of all installed or open zones and corresponding controller numbers shall be placed inside the controller and given to the Owner's representative.

In addition to the temporary irrigation system, a soil moisture retention agent (i.e., Soil Moist) will be incorporated into the backfill of planting pits to minimize the potential for plant desiccation in the mitigation areas.

7.0 CONSTRUCTION MANAGEMENT

A pre-construction meeting will be held on site to review and discuss all aspects of the mitigation project prior to any construction activity. The owner, as well as a City representative, will attend the meeting. Prior to commencement of any work by contractors adjacent to the sensitive areas, the clearing limits will be staked and fenced. Silt fences will be installed at the clearing limits and significant habitat features and vegetation to be retained will be clearly marked in the field.

A wetland biologist will regularly review plan implementation during construction to ensure that the objectives and specifications of the mitigation plan are met. Any significant modifications to the design that may occur as a result of unforeseen circumstances will be approved by the owner, the City, and Talasaea Consultants prior to their implementation.

Stormwater containment and City of Kirkland Best Management Practices (BMPs) will be implemented during construction to protect the water quality of wetlands and streams from possible impacts. BMPs will minimize erosion and sedimentation and protect water quality within the wetlands and stream during storm events. Silt fences, straw bales, and other structures will be installed to slow runoff and remove suspended sediments during construction. BMPs to be implemented may include, but will not be limited to:

- site runoff containment,
- street sweeping,
- filter fabric fences,
- interceptor swales,
- rock-lined swales,

- catch basin inserts,
- straw bales and rock and check dams,
- rocked road entries,
- construction practices,
- covered stockpiles.

Street sweeping will clean construction sediments from roads to minimize sediment-laden runoff into storm drains. Filter fabric fencing at the clearing limits will reduce over-ground stormwater sediment transport. Interceptor swales will divert construction runoff from sensitive areas to treatment facilities. Rock-lined swales will reduce the sediment loads in stormwater runoff. Catch basin inserts will act as sediment control during construction by removing sediment, oil and grease, and other pollutants adsorbed to sediments from stormwater. Straw bales placed in ditches will slow water down and catch sediment as stormwater leaves the construction site. Rocked road entries will minimize mud and sediment collection on roadways. Construction practices will include capping, covering, and stabilizing exposed soil before building. Other BMPs will be implemented, as appropriate.

7.1. Post-Construction Assessment

A post-construction assessment will be conducted upon completion of construction within the mitigation areas, and a report including record drawings will be submitted to the City. The purpose of this assessment is to determine whether the site conditions are consistent with the approved plan and to establish baseline conditions for future monitoring.

8.0 MONITORING PROGRAM

Performance monitoring of the mitigation areas will be conducted for a period of five years, with reports submitted to the City of Kirkland according to the schedule presented in **Table 1**.

Table 1. Projected Calendar for Performance Monitoring and Maintenance Events

Year	Date	Maintenance Review (MR)	Performance Monitoring (M) and Well Monitoring (WM)	Report Due to City (R)
1	Spring	MR	M+WM**	R
	Fall	MR	M	R
2	Spring	MR	M+WM**	R
	Fall	MR	M	R
3	Spring	MR	WM**	
	Fall	MR	M	R
4	Spring	MR	WM**	
	Fall	MR	M	R
5	Spring	MR	WM**	
	Fall	MR	M	R*

*Obtain approval for release of bond from the City (presumes performance criteria are met).
**Conduct well monitoring weekly during the early growing season (from 1 March to 15 February of each monitoring year, or as seasonally adjusted due to precipitation conditions). Summarize data in following monitoring report.

8.1. Reports

Each monitoring report will include: a) photo-documentation, b) estimates of percent vegetative cover, plant survival, and invasive species, c) wildlife usage, d) water quality and hydrology, e) site stability, and f) an overall qualitative assessment of project success for the mitigation areas.

The first monitoring report will serve as the baseline assessment report. If the performance criteria are met, monitoring will cease after the fifth year, unless objectives are met at an earlier date and the City accepts the mitigation project as successfully completed.

8.2. Methods for Monitoring the Performance Standards

Each monitoring report will include an evaluation of the mitigation project to ensure that the goal, objectives, and performance standards of the project are being met. The objectives and performance standards as stated in Section 6.1 will be monitored utilizing the following methods.

Performance Standard A Methods: Permanent transects, 50 feet long and ten feet wide, will be established during the baseline assessment within each plant community in the mitigation areas. During monitoring events, trees, shrubs, and herbaceous vegetation will be evaluated within each of these sampling locations.

Percent area cover of shrubs and trees will be evaluated through the use of point-intercept sampling methodology. Using this methodology, a tape will be extended between two permanent markers established 25 feet apart. Shrubs and trees intercepted by the tape will be identified, and the intercept distance recorded. Percent cover by species will then be calculated by adding the intercept distances and then expressed as a total proportion of the tape length.

Performance Standard B Methods: During monitoring events, plant survival will be evaluated within each of the sampling transect locations. Percent survival of shrubs and trees will be evaluated in a 10-foot belt along the established transect. The species and location of shrubs and trees within this belt will be recorded, and will be evaluated during each monitoring event to determine percent survival. If, at any time, the overall plant survival falls below the minimum 85%, a contingency plan will be developed to raise the survival rate. The established vegetation sampling transects will aid in determining the success of plant establishment.

Performance Standard C Methods: During each monitoring event, both the bird nesting and bat roosting boxes will be inspected for use by wildlife. In addition, down logs and stumps will also be inspected for use by critters and insects. All wildlife recordings will be included in the annual monitoring reports.

Performance Standard D Methods: Herbaceous vegetation coverage will be visually estimated along the established vegetation transects.

Performance Standard E Methods: During each monitoring event, plant species present in the created and enhanced wetland areas will be recorded to determine whether they are FAC or wetter. In addition, observations of wetland hydrology will be recorded including well data, ponding, watermarks, water-stained leaves, and soil saturation. Two shallow groundwater monitoring wells will be provided within each of the wetland creation areas so that groundwater elevations are documented weekly during the early growing season (from 1 March to 15 February of each monitoring year, or as seasonally adjusted due to precipitation conditions). Data from well monitoring will be included in monitoring reports.

Performance Standard F Methods: During monitoring events, undesirable plant species will also be measured within each sampling location. Invasive shrub species will be measured with the woody species (methodology discussed under **Objective A**). Invasive herbaceous species will be measured with the herbaceous species (methodology discussed under **Objective D**). Invasive plants will be maintained at levels below 20% cover at mitigation enhancement areas and to less than 10% over in any wetland or buffer areas where bare ground is generated.

Removal of these species will occur regularly to prevent infestations. Removal will occur by hand whenever possible. Undesirable species include, but are not limited to: Scot's broom, Himalayan and evergreen blackberry, reed canarygrass, purple loosestrife, hedge bindweed (morning glory), Japanese knotweed, and creeping nightshade.

8.3. Wildlife Habitat

Birds, mammals, reptiles, amphibians, and invertebrates observed in the wetland, stream, and buffer areas (either by direct or indirect means) will be identified and recorded during scheduled monitoring events, and at any other times observations are made. Direct observations include actual sightings, while indirect observations include tracks, scat, nests, song, or other indicative signs. The kinds and locations of the habitat with greatest use by each species will be noted, as will any breeding or nesting activities.

8.4. Hydrology, Soils, Water Quality, and Site Stability

During each monitoring event, an assessment will be made of the water regime within the wetlands, stream, and buffer areas to ensure that proper hydrological conditions exist. General observations will be made of the extent and depth of soil saturation or inundation.

Water quality will be assessed qualitatively; unless it is evident there is a serious problem. In such an event, water quality samples will be taken and analyzed in a laboratory for suspected parameters. Qualitative assessments of water quality include:

- oil sheen or other surface films,
- abnormal color or odor of water,
- stressed or dead vegetation or aquatic animals,
- turbidity, and
- absence of aquatic animals.

Observations will be made on the stability of slopes in the mitigation areas. Any erosion or slumping of the slopes will be recorded and corrective measures will be taken.

8.5. Photo Documentation

Locations will be established within the mitigation area from which panoramic photographs will be taken throughout the monitoring period. These photographs will document general appearance and relative changes within the plant community. Review of the photos over time will provide a semi-quantitative representation of success of the planting plan. Vegetation sampling plot and photo-point locations will be shown on a map and submitted with the baseline assessment report and yearly performance monitoring reports.

9.0 MAINTENANCE (M) AND CONTINGENCY (C)

Maintenance will be performed regularly to address any conditions that could jeopardize the success of the mitigation areas. During maintenance reviews, any maintenance items requiring attention will be identified and reported to the landscape maintenance contractor.

Established performance standards for the project will be compared to the monitoring results to judge the success of the mitigation project. If there is a significant problem with achieving the performance standards, the bondholder shall work with the City to develop a contingency plan. Contingency plans may include, but are not limited to: re-grading, additional plant installation, erosion control, modifications to hydrology, and plant substitutions of type, size, quantity, and location. Contingency will include many of the items listed below and would be implemented if

these performance standards are not met. Maintenance and remedial action on the site will be implemented immediately upon completion of the monitoring event (unless otherwise specifically indicated below).

- During year one, replace all dead plant material. (M)
- Water all plantings at a rate of 1-inch of water at least every week between June 15 and September 15 during the first year after installation, and for the first year after any replacement plantings. (C & M)
- Replace dead plants with the same species or a substitute species that meets the goal and objectives of the mitigation plan, subject to the approval of the wetland biologist. (C)
- Re-plant area after reason for failure has been identified (e.g., moisture regime, poor plant stock, disease, shade/sun conditions, wildlife damage, etc.). (C)
- Remove/control weedy or exotic invasive plants (e.g., Scot's broom, reed canarygrass, Himalayan blackberry, purple loosestrife, etc.). Use of herbicides or pesticides within the mitigation area would only be implemented if other measures failed or were considered unlikely to be successful. Mulch rings should be maintained on trees and shrubs, until they become established. All non-native vegetation must be removed and dumped off site. (C & M)
- Clean-up trash and other debris. (M)
- Selectively prune woody plants to meet the mitigation plan's goals and objectives (e.g., thinning and removal of dead or diseased portions of trees/shrubs). (M)
- Make minor excavations by hand, as needed and after consulting with City staff, to correct surface drainage or soil moisture conditions. (C)

10.0 MAINTANENCE/MONITORING BOND

A maintenance/monitoring bond equal to 100% of the estimated maintenance and monitoring costs for the five-year monitoring period shall be posted with the City of Kirkland prior to finalization of the building permit. The bond may be released in partial amounts at the reasonable discretion of the City. Partial release of the bonding obligation would be in proportion to work successfully completed over the five-year City-monitoring period.

11.0 SUMMARY

The Highland Glen Short Plat property is a residential development project encompassing approximately 3.27-acres. It is located within the City of Kirkland at the intersection of 111th Avenue NE and NE 104th Street.

Site investigations identified two wetlands (one on site and one off site) and one stream on site. The on-site wetland is comprised of two Cowardin classes; palustrine forested wetland and palustrine emergent wetland. A small, Class B stream has developed at the toe of the slope of the project site and the fill associated with the BNRR railway right-of-way. Flow within the channel begins both near the north corner of the site and midway up the west side of the site as groundwater and seeps enter the channel and flow parallel to the BNRR right-of-way to a 24-inch culvert. The stream converges into the culvert and exits the site to the northwest under the BNRR railway.

The current development plans for the project site involve the construction of six individual single-family lots. The project will include necessary infrastructure, including utilities, surface runoff treatment and detention, and site landscaping. An existing failed septic system will be

abandoned as part of the project and each site will be connected to the local sanitary sewer system.

Construction plans have been developed to avoid impacts to sensitive areas to the maximum extent practicable. Approximately 2,510 sf of wetland will be indirectly filled in order to provide a reasonable alignment of buildable lots. Impacts to wetland and buffer areas will be mitigated through wetland creation, wetland enhancement, and buffer enhancement.

No net loss of wetland area or functions will occur with the proposed development, and functions and values of existing/preserved wetland and associated buffer will be improved through a combination of wetland enhancement and buffer enhancement.

12.0 REFERENCES

City of Kirkland Sensitive Areas Map, December 2003.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual.* Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Miss.

King County Department of Natural Resources (KCDNR). *Water Quality Index (WQI) Rating for WRIA 8,* <http://dnr.metrokc.gov/wlr/waterres/streams/wqi.htm>

Kirkland, City of. 2005. City of Kirkland Zoning Code. Revised 5 April 2005.

Kirkland Sensitive Areas Regulatory Recommendations Report. 1998. Adolfson and Associates, Inc.

Kirkland's Streams, Wetlands, and Wildlife Report. Forbes Creek Basin. 1998. The Watershed Company.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States.* U.S. Fish and Wildlife Service, Department of the Interior. FWSOBS-70/31.

Hallock, David. 2002. DRAFT Washington's Water Quality Index. Washington State Department of Ecology

Hitchcock, C.L., and A. Cronquist. 1973. *Flora of the Pacific Northwest.* University of Washington Press. 730 pp.

Reed, P.B. Jr. 1988. *National List of Plant Species that Occur in Wetlands: Northwest (Region 9).* USF&WS Biol. Report 88.

Reed, P.B. Jr. 1993. Supplement to: *National List of Plant Species that Occur in Wetlands: Northwest (Region 9).* USF&WS Biol. Report 88.

Reed, P.B. Jr. 1998. National List of Plant Species that Occur in Wetlands: Northwest (Region 9). USF&WS Update.

U.S. Army Corps of Engineers, Wetlands Research Program (WRP) Technical Note. *Installing Monitoring Wells/Piezometers in Wetlands,* <http://www.wes.army.mil/el/wrtc/wrp/tnotes/hyia3-1.pdf>

U.S. Department of Agriculture, Soil Conservation Service, King County Area Soil Survey. 1973.

U.S. Fish and Wildlife Service. 1988. National Wetlands Inventory Map, Auburn Quadrangle.

Washington State Department of Ecology. March 1997. *Washington State Wetlands Identification and Delineation Manual.*

Washington State Department of Fish and Wildlife. 1999. Species of concern: State candidate species. WDFW. Olympia, WA.

Washington State Department of Natural Resources. 1994. *Endangered, Threatened and Sensitive Vascular Plants of Washington.*

Williams, R.W., R.M. Laramie, and J.J. Ames. 1975. A Catalog of Washington Streams and Salmon Utilization Volume 1 Puget Sound Region. Washington Department of Fisheries. Olympia, WA.

APPENDIX A

Wetland Determination Data Forms, Talasaea Consultants, 2006

ROUTINE WETLAND DETERMINATION DATA FORM 1 *(Revised)*

Project/Site:	TAL-909 Davidson Short Plat		Date: 07-14-06
Applicant/Owner:	Davidson		County: King
Investigators:	DRT		State: Washington
Do normal circumstances exist on the site?		Yes	Community ID:
Is the site significantly disturbed (Atypical Situation?)		No	Transect ID:
Is the area a potential Problem Area (If needed, explain on reverse)?		No	Plot ID: TP-A1

VEGETATION

Plant species	Stratum	% Cover	Indicator Status	Plant species	Stratum	% Cover	Indicator Status
*Alnus rubra**	T	30	FAC	*Salix lasiandra*	S	<5	FACW+
Populus trichocarpa	T	<5	FAC	*Rubus discolor**	S	80	FACU
Rubus spectabilis	S	5	FAC+	*Athyrium filix-femina*	H	2	FAC+
Polystichum munitum	H	2	FACU	*Equisetum telmateia*	H	2	FACW

* Dominant Percent of dominant species that are OBL, FACW, or FAC 0

Criterion Met? No | Rationale/Remarks: Dominant species not greater than 50% FAC, FACW, or OBL

Check all Hydrophytic Vegetation Indicators that apply and explain:

- ☐ Plant growing in areas of prolonged inundation/saturation
- ☐ Morphological adaptations
- ☒ Technical literature
- ☐ Physiological/reproductive adaptations
- ☒ Wetland plant database
- ☐ Personal knowledge of regional plant communities
- ☐ Other (explain)

HYDROLOGY

Field Observations:

Depth of surface water	-
Depth to free water	>18"
Depth to saturated soil	>18"

Is it the growing season? ☒ Yes ☐ No

Based on: ☐ Soil temp (record temp)

☐ Other (explain):

Primary Wetland Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12in/30cm
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Wetland Hydrology Indicators (minimum 2 required):

- ☐ Oxidized root channels in upper 12in/30cm
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other

Criterion Met? No | Rationale/Remarks: No indications of wetland hydrology

SOILS

Map unit name (Series and phase) Ragnar fine sandy loam

Taxonomy (subgroup)

Drainage class

Field Observations confirm mapped type? Yes

Profile Description: Depth	Matrix colors (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance/contrast	Texture, concretions, structure, etc
0-5"	10YR 4/2			Gravelly sandy loam
5"-8"	10YR 4/2	10YR 5/6	F,M	Gravelly sandy loam
8"-18"	10YR 5/2	10YR 4/6	C, M	Sandy loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low chroma (=1) matrix
- ☒ Matrix chroma ≤2 with mottles
- ☐ Mg or FE concretions
- ☐ High organic content in surface layer in sandy soils
- ☐ Listed on National Hydric Soils List
- ☐ Other ( )

Criterion Met? Yes | Rationale/Remarks: Chroma 2 with mottles indicates hydric conditions.

WETLAND DETERMINATION

Wetland vegetation present?	**No**	Remarks: **Despite the soil color indicating hydric soils, the site did not have wetland hydrology or vegetation. TP is just upslope of TWC reflag for A-39.**	Is this sampling point within a wetland? **No**
Wetland hydrology present?	**No**		
Hydric soils present?	**Yes**		

ROUTINE WETLAND DETERMINATION DATA FORM 1 *(Revised)*

Project/Site:	TAL-909 Davidson Short Plat		Date: 07-14-06
Applicant/Owner:	Davidson		County: King
Investigators:	DRT		State: Washington
Do normal circumstances exist on the site?		Yes	Community ID:
Is the site significantly disturbed (Atypical Situation?)		No	Transect ID:
Is the area a potential Problem Area (If needed, explain on reverse)?		No	Plot ID: TP-A2

VEGETATION

Plant species	Stratum	% Cover	Indicator Status	Plant species	Stratum	% Cover	Indicator Status
*Alnus rubra**	T	50	FAC	*Rubus discolor**	S	60	FACU
Blechnum spicant	H	<5	FAC+	*Equisetum telmataea**	H	60	FACW
Polystichum munitum	H	<5	FACU				

* Dominant Percent of dominant species that are OBL, FACW, or FAC 66%

Criterion Met? Yes	Rationale/Remarks: Dominant species greater than 50% FAC, FACW, or OBL.

Check all Hydrophytic Vegetation Indicators that apply and explain:

- ☐ Plant growing in areas of prolonged inundation/saturation
- ☐ Morphological adaptations
- ☐ Technical literature
- ☐ Physiological/reproductive adaptations
- ☒ Wetland plant database
- ☐ Personal knowledge of regional plant communities
- ☐ Other (explain)

HYDROLOGY

Field Observations:

Depth of surface water	-
Depth to free water	>20"
Depth to saturated soil	15"

Is it the growing season? ☒ Yes ☐ No

Based on: ☐ Soil temp (record temp)

☐ Other (explain):

Primary Wetland Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12in/30cm
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Wetland Hydrology Indicators (minimum 2 required):

- ☐ Oxidized root channels in upper 12in/30cm
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other

Criterion Met? No	Rationale/Remarks: No indications of wetland hydrology

SOILS

Map unit name (Series and phase) Ragnar fine sandy loam	Drainage class
Taxonomy (subgroup)	Field Observations confirm mapped type? Yes

Profile Description: Depth	Matrix colors (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance/contrast	Texture, concretions, structure, etc
0-4"	10YR3/3			Sandy loam
4"-8"	2.5Y 5/2	10YR 3/4	C, F	Silt loam
8"-20"	G1 5/10G	10YR 3/4	C, M	L

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☒ Gleyed or low chroma (=1) matrix
- ☒ Matrix chroma ≤2 with mottles
- ☐ Mg or FE concretions
- ☐ High organic content in surface layer in sandy soils
- ☐ Listed on National Hydric Soils List
- ☐ Other ( )

Criterion Met? Yes	Rationale/Remarks: Low chroma or gley soils indicate wetland condition

WETLAND DETERMINATION

Wetland vegetation present?	Yes	Remarks: **This is likely wetland here, but too late in season to determine hydrology. TP is ~1/2 between TWC A-39 and TC A-39.**	Is this sampling point within a wetland? **Yes**
Wetland hydrology present?	No		
Hydric soils present?	Yes		

ROUTINE WETLAND DETERMINATION DATA FORM 1 *(Revised)*

Project/Site:	TAL-909 Davidson Short Plat		Date: 07-14-06
Applicant/Owner:	Davidson		County: King
Investigators:	DRT		State: Washington
Do normal circumstances exist on the site?		Yes	Community ID:
Is the site significantly disturbed (Atypical Situation?)		No	Transect ID:
Is the area a potential Problem Area (If needed, explain on reverse)?		No	Plot ID: TP-3

VEGETATION

Plant species	Stratum	% Cover	Indicator Status	Plant species	Stratum	% Cover	Indicator Status
*Populus trichocarpa**	T	40	FAC	*Alnus rubra**	T	40	FAC
*Oemleria cerasiformis**	S	20	FACU	*Prunus caroliniana*	S	10	NI
*Rubus discolor**	S	30	FACU	*Crataegus monogyna*	S	<5	FAC-
Ilex aquifolium	S	<5	FACU	*Equisetum telmataea**	H	40	FACW
Torreychloe pauciflora	H	5	FACW	*Amelanchier alnifolia*	S	5	FACU

* Dominant Percent of dominant species that are OBL, FACW, or FAC 60%

Criterion Met? Yes | Rationale/Remarks: Dominant species greater than 50% FAC, FACW, or OBL.

Check all Hydrophytic Vegetation Indicators that apply and explain:

- ☐ Plant growing in areas of prolonged inundation/saturation
- ☐ Morphological adaptations
- ☐ Technical literature
- ☐ Physiological/reproductive adaptations
- ☒ Wetland plant database
- ☐ Personal knowledge of regional plant communities
- ☐ Other (explain)

HYDROLOGY

Field Observations:

Depth of surface water	-
Depth to free water	>20"
Depth to saturated soil	>20"

Is it the growing season? ☒ Yes ☐ No

Based on: ☐ Soil temp (record temp)

☐ Other (explain):

Primary Wetland Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12in/30cm
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Wetland Hydrology Indicators (minimum 2 required):

- ☒ Oxidized root channels in upper 12in/30cm
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other

Criterion Met? No | Rationale/Remarks: No indications of wetland hydrology

SOILS

Map unit name (Series and phase) Ragnar fine sandy loam	Drainage class
Taxonomy (subgroup)	Field Observations confirm mapped type? Yes

Profile Description: Depth	Matrix colors (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance/contrast	Texture, concretions, structure, etc
0-12"	10YR 5/2	10YR 4/6	F, F	Sandy loam
12"-18"	10YR 5/2	10YR 4/6	C, M	Sandy loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low chroma (=1) matrix
- ☒ Matrix chroma ≤2 with mottles
- ☐ Mg or FE concretions
- ☐ High organic content in surface layer in sandy soils
- ☐ Listed on National Hydric Soils List
- ☐ Other ( )

Criterion Met? Yes | Rationale/Remarks: Chroma of 2 or less with mottles indicates hydric conditions

WETLAND DETERMINATION

Wetland vegetation present?	**Yes**	Remarks: **TP is likely in wetland. Hydrology not apparent due to the season. This TP is near TC A-39.**	Is this sampling point within a wetland? **Yes**
Wetland hydrology present?	**No**		
Hydric soils present?	**Yes**		

ROUTINE WETLAND DETERMINATION DATA FORM 1 *(Revised)*

Project/Site:	TAL-909 Davidson Short Plat		Date: 07-14-06
Applicant/Owner:	Davidson		County: King
Investigators:	DRT		State: Washington
Do normal circumstances exist on the site?		Yes	Community ID:
Is the site significantly disturbed (Atypical Situation?)		No	Transect ID:
Is the area a potential Problem Area (If needed, explain on reverse)?		No	Plot ID: TP-A4

VEGETATION

Plant species	Stratum	% Cover	Indicator Status	Plant species	Stratum	% Cover	Indicator Status
*Alnus rubra**	T	30	FAC	*Acer macrophyllum**	T	10	FACU
*Rubus spectabilis**	S	30	FAC+	*Rubus discolor**	S	30	FACU
Sambucus racemosa	S	5	FACU	*Polystichum munitum**	H	10	FACU
*Equisetum telmateia**	H	10	FACW	*Tellimia grandiflora**	H	10	NI

* Dominant Percent of dominant species that are OBL, FACW, or FAC 43

Criterion Met? No | Rationale/Remarks: Dominant species not greater than 50% FAC, FACW, or OBL

Check all Hydrophytic Vegetation Indicators that apply and explain:

- ☐ Plant growing in areas of prolonged inundation/saturation
- ☐ Morphological adaptations
- ☐ Technical literature
- ☐ Physiological/reproductive adaptations
- ☒ Wetland plant database
- ☐ Personal knowledge of regional plant communities
- ☐ Other (explain)

HYDROLOGY

Field Observations:

Depth of surface water	-
Depth to free water	>20"
Depth to saturated soil	14"

Is it the growing season? ☒ Yes ☐ No

Based on: ☐ Soil temp (record temp)

☐ Other (explain):

Primary Wetland Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12in/30cm
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Wetland Hydrology Indicators (minimum 2 required):

- ☐ Oxidized root channels in upper 12in/30cm
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other

Criterion Met? No | Rationale/Remarks: No indications of wetland hydrology

SOILS

Map unit name (Series and phase) Ragnar fine sandy loam	Drainage class
Taxonomy (subgroup)	Field Observations confirm mapped type? No

Profile Description: Depth	Matrix colors (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance/contrast	Texture, concretions, structure, etc
0-4"	10YR 4/2.5	10YR 4/4	F, F	Sandy loam
4"-14"	10YR 4/3	10YR 4/6		Sandy loam
	2.5Y 6/3	10YR 4/6		Clay loam
14"+	2.5Y 5/1	10YR 4/6	F, C	Clay loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low chroma (=1) matrix
- ☐ Matrix chroma ≤2 with mottles
- ☐ Mg or FE concretions
- ☐ High organic content in surface layer in sandy soils
- ☐ Listed on National Hydric Soils List
- ☐ Other ( )

Criterion Met? No | Rationale/Remarks: High chroma values indicate upland conditions

WETLAND DETERMINATION

Wetland vegetation present?	No	Remarks: **This point is likely transitional between upland and wetland. Between 4" and 14", soil was a mixture of sandy loam and clay loam chunks.**	Is this sampling point within a wetland? No
Wetland hydrology present?	No		
Hydric soils present?	Yes		

ROUTINE WETLAND DETERMINATION DATA FORM 1 *(Revised)*

Project/Site:	TAL-909 Davidson Short Plat		Date: 07-14-06
Applicant/Owner:	Davidson		County: King
Investigators:	DRT		State: Washington
Do normal circumstances exist on the site?		Yes	Community ID:
Is the site significantly disturbed (Atypical Situation?)		No	Transect ID:
Is the area a potential Problem Area (If needed, explain on reverse)?		No	Plot ID: TP-A5

VEGETATION

Plant species	Stratum	% Cover	Indicator Status	Plant species	Stratum	% Cover	Indicator Status
*Alnus rubra**	T	40	FAC	*Populus trichocarpa**	T	40	FAC
*Rubus discolor**	S	25	FACU	*Equisetum arvense*	H	10	FAC
*Polystichum munitum**	H	30	FACU	*Rubus ursinus**	S	20	FACU

* Dominant Percent of dominant species that are OBL, FACW, or FAC 20%

Criterion Met? No | Rationale/Remarks: Dominant species not greater than 50% FAC, FACW, or OBL

Check all Hydrophytic Vegetation Indicators that apply and explain:

- ☐ Plant growing in areas of prolonged inundation/saturation
- ☐ Morphological adaptations
- ☐ Technical literature
- ☐ Physiological/reproductive adaptations
- ☒ Wetland plant database
- ☐ Personal knowledge of regional plant communities
- ☐ Other (explain)

HYDROLOGY

Field Observations:

Depth of surface water	-
Depth to free water	>20"
Depth to saturated soil	>20"

Is it the growing season? ☒ Yes ☐ No

Based on: ☒ Soil temp (record temp)

☐ Other (explain):

Primary Wetland Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12in/30cm
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Wetland Hydrology Indicators (minimum 2 required):

- ☐ Oxidized root channels in upper 12in/30cm
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other

Criterion Met? Yes | Rationale/Remarks:

SOILS

Map unit name (Series and phase) Ragnar fine sandy loam	Drainage class
Taxonomy (subgroup)	Field Observations confirm mapped type? Yes

Profile Description: Depth	Matrix colors (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance/contrast	Texture, concretions, structure, etc
0-12"	10YR 4/2			Sandy clay loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low chroma (=1) matrix
- ☐ Matrix chroma ≤2 with mottles
- ☐ Mg or FE concretions
- ☐ High organic content in surface layer in sandy soils
- ☐ Listed on National Hydric Soils List
- ☐ Other ( )

Criterion Met? No | Rationale/Remarks: High chroma value indicates upland conditions

WETLAND DETERMINATION

Wetland vegetation present?	No	Remarks: **This point is next to Watershed Company's suggested flag, which is upslope from an area of recent disturbance. We saw evidence of water ponding in the disturbed area, but no other wetland evidence**	Is this sampling point within a wetland? No
Wetland hydrology present?	No		
Hydric soils present?	No		

ROUTINE WETLAND DETERMINATION DATA FORM 1 *(Revised)*

Project/Site:	TAL-909 Davidson Short Plat		Date: 01-31-06
Applicant/Owner:	Ken Davidson		County: King
Investigators:	DRT		State: Washington
Do normal circumstances exist on the site?		Yes	Community ID:
Is the site significantly disturbed (Atypical Situation?)		No	Transect ID:
Is the area a potential Problem Area (If needed, explain on reverse)?		No	Plot ID: TP-1B

VEGETATION

Plant species	Stratum	% Cover	Indicator Status	Plant species	Stratum	% Cover	Indicator Status
*Alnus rubra**	T	10	FAC	*Rubus discolor**	S	20	FACU
Polystichum munitum	H	<2	FACU	*Phalaris arundinacea**	H	80	FACW
*Salix lasiandra**	T	10	FACW	*Equisetum arvense*	H	20	FAC

* Dominant Percent of dominant species that are OBL, FACW, or FAC 100

Criterion Met? Yes | Rationale/Remarks: Dominant species greater than 50% FAC, FACW, or OBL

Check all Hydrophytic Vegetation Indicators that apply and explain:

- ☐ Plant growing in areas of prolonged inundation/saturation
- ☐ Morphological adaptations
- ☒ Technical literature
- ☐ Physiological/reproductive adaptations
- ☐ Wetland plant database
- ☐ Personal knowledge of regional plant communities
- ☐ Other (explain)

HYDROLOGY

Field Observations:

Depth of surface water -
Depth to free water 5"
Depth to saturated soil 0"

Is it the growing season? ☐ Yes ☒ No
Based on: ☐ Soil temp (record temp)
☒ Other (explain): Time of year

Primary Wetland Hydrology Indicators:

- ☐ Inundated
- ☒ Saturated in upper 12in/30cm
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Wetland Hydrology Indicators (minimum 2 required):

- ☐ Oxidized root channels in upper 12in/30cm
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other

Criterion Met? Yes | Rationale/Remarks:

SOILS

Map unit name Ragnar - Indianola Complex (Series and phase)
Taxonomy (subgroup)
Drainage class
Field Observations confirm mapped type? No

Profile Description: Depth	Matrix colors (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance/contrast	Texture, concretions, structure, etc
0-10	2.5Y 4/2	-	-	Silt loam
10"+	2.5Y 5/2	10YR 4/6	Common coarse	Silt loam
	10YR 7/4	10YR 4/6	Common coarse	Silt loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low chroma (=1) matrix
- ☒ Matrix chroma ≤2 with mottles
- ☐ Mg or FE concretions
- ☐ High organic content in surface layer in sandy soils
- ☐ Listed on National Hydric Soils List
- ☐ Other ( )

Criterion Met? Yes | Rationale/Remarks: Low chroma with mottles indicate hydric conditions

WETLAND DETERMINATION

Wetland vegetation present?	**Yes**	Remarks: **Positive indications of wetland vegetation, hydrology, and soils. Soils appear to be significantly disturbed and atypical of Ragnar - Indianola complex.**	Is this sampling point within a wetland? **Yes**
Wetland hydrology present?	**Yes**		
Hydric soils present?	**Yes**		

ROUTINE WETLAND DETERMINATION DATA FORM 1 *(Revised)*

Project/Site:	TAL-909 Davidson Short Plat		Date: 1-31-06
Applicant/Owner:	Ken Davidson		County: King
Investigators:	DRT		State: Washington
Do normal circumstances exist on the site?		Yes	Community ID:
Is the site significantly disturbed (Atypical Situation?)		No	Transect ID:
Is the area a potential Problem Area (If needed, explain on reverse)?		No	Plot ID: TP-2B

VEGETATION

Plant species	Stratum	% Cover	Indicator Status	Plant species	Stratum	% Cover	Indicator Status
*Acer macrophyllum**	T	30	FACU	*Alnus rubra**	T	40	FAC
*Rubus discolor**	S	70	FACU	*Ranunculus repens**	H	20	FACW
*Rubus ursinus**	S	10	FACU	*Polystichum munitum**	H	10	FACU

* Dominant Percent of dominant species that are OBL, FACW, or FAC 33%

Criterion Met? No | Rationale/Remarks: Dominant species not greater than 50% FAC, FACW, or OBL.

Check all Hydrophytic Vegetation Indicators that apply and explain:

- ☐ Plant growing in areas of prolonged inundation/saturation
- ☐ Morphological adaptations
- ☒ Technical literature
- ☐ Physiological/reproductive adaptations
- ☐ Wetland plant database
- ☐ Personal knowledge of regional plant communities
- ☐ Other (explain)

HYDROLOGY

Field Observations:

Depth of surface water	-
Depth to free water	>18"
Depth to saturated soil	>18"

Is it the growing season? ☐ Yes ☒ No

Based on: ☐ Soil temp (record temp)

☒ Other (explain): Time of year

Primary Wetland Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12in/30cm
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Wetland Hydrology Indicators (minimum 2 required):

- ☐ Oxidized root channels in upper 12in/30cm
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other

Criterion Met? No | Rationale/Remarks: No indications of wetland hydrology

SOILS

Map unit name (Series and phase) Ragnar - Indianola Complex	Drainage class
Taxonomy (subgroup)	Field Observations confirm mapped type? Yes

Profile Description: Depth	Matrix colors (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance/contrast	Texture, concretions, structure, etc
0-18"	2.5Y 4/3			Fine sandy loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low chroma (=1) matrix
- ☐ Matrix chroma ≤2 with mottles
- ☐ Mg or FE concretions
- ☐ High organic content in surface layer in sandy soils
- ☐ Listed on National Hydric Soils List
- ☐ Other ( )

Criterion Met? No | Rationale/Remarks: High chroma indicates upland conditions.

WETLAND DETERMINATION

Wetland vegetation present?	No	Remarks: **No indications of wetland vegetation, hydrology, or soil. Soil in this location was not disturbed.**	Is this sampling point within a wetland? **No**
Wetland hydrology present?	No		
Hydric soils present?	No		