Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E.
Suite 106
Everett, Washington 98208
(425) 337-3174
Fax (425) 337-3045

CRITICAL AREA STUDY
FOR

JAYMARC HOMES, LLC – BRIDLE TRAILS

KIRKLAND, WA

Wetland Resources, Inc. Project #12257

Prepared By:
Wetland Resources, Inc.
9505 19th Avenue SE, Suite 106
Everett, WA 98208
(425) 337-3174

Prepared For:
JayMarc Homes, LLC
Attn: Jay Mezistrano
PO Box 2566
Renton, WA 98056

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SITE DESCRIPTION

On January 4, 2013, Wetland Resources, Inc. (WRI) conducted an investigation for the 17.6-acre site located east of 116th Avenue NE and south of NE 48th Place in Kirkland, Washington. The site is comprised of King County Tax Parcel Numbers: 1625059017, 1625059021, 1625059022, 1625059031, and 16259034. The purpose of the investigation was to identify jurisdictional wetlands and streams in the vicinity of the subject parcels.

The investigation area is comprised of several residential properties with assorted equestrian facilities. Two large arenas are located in the center of the site. 116th Avenue NE borders the west side of the site and two small roads off of 116th Avenue NE provide access to the site. Bridle Trails State Park borders the site on the east, with residential areas to the north and south. The site has a moderate west aspect, sloping toward 116th Avenue NE. Approximately two-thirds of the site is maintained as horse paddocks and training facilities. Dense shrubs and trees remain in the portion along the west side and there are trees in patches across the rest of the site.

Three wetlands and two streams were observed on or within the vicinity of the site, and are herein referred to as Wetland A, Wetland B, Wetland C, Stream A, and Stream B. Wetland A is a small area adjacent to Stream A near the northeast edge of the property. Wetland A extends off the property to the north. Wetland B is located along the west side of the site and continues off site to the south and across 116th Ave to the west. Wetland C is off-site to the south. Wetlands A, B, and C are classified as Type 2 wetlands.

Stream A runs from east to west, close to the north property line. It enters a culvert approximately 200 feet east of where it enters the property. It appears to flow off-site in a northwest direction. Stream A is classified as a Class C stream. Stream B is located at the southwest end of the property, near the road. It flows through a culvert under the south access road, runs through an open area, and then continues off-site to the south. Stream B is classified as a Class A stream.

WETLAND AND STREAM CLASSIFICATIONS – COWARDIN SYSTEM

According to the Cowardin System, as described in Classification of Wetlands and Deepwater Habitats of the United States, the classifications for the on-site wetlands and stream are as follows:

Wetland A: Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded.

Wetland B: Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded.

Wetland C (off-site): Palustrine, Emergent, Persistent, Semi-permanently Flooded.

Stream A: Riverine, Intermittent, Unconsolidated Bottom.

Stream B: Riverine, Lower Perennial, Unconsolidated Bottom.

WETLAND AND STREAM CLASSIFICATIONS-CITY OF KIRKLAND

Under the City of Kirkland's Environmentally Sensitive Area Regulations in Kirkland's Municipal Code (KMC), Chapter 90, the wetlands and streams within the vicinity of the subject site are classified as follows:

Wetland A – Type 2
Wetland A is a depressional wetland adjacent to Stream A that receives a score of 26 on the City of Kirkland's Wetland Field Data Form.

Wetland B – Type 2
Wetland B is a depressional wetland adjacent to Stream B that receives a score of 32 on the City of Kirkland's Wetland Field Data Form.

Wetland C (off-site) – Type 2
The off-site wetland was scored using the City of Kirkland's Wetland Field Data Form using previous wetland documentation and visual information gathered from the subject site and public roads. This off-site wetland is a depressional wetland that receives a score of 31 on the Wetland Field Data Form.

Stream A – Class C
Stream A enters the site near the northeast corner and enters a culvert approximately 265 feet to the west. After entering the culvert it appears to flow off-site to the northeast with no apparent outflow. There are some seeps in the northwest portion of Wetland A that may be associated with Stream A, but no outfall was observed. This stream is a Class C (seasonal) stream within the Yarrow Creek basin, which is defined as a Primary Basin. According to KMC 90.91 the buffer requirement for these streams is 35 feet.

Stream B – Class A
Stream B enters the site on the north edge near the west border and flows south through Wetland B. It moves through a culvert under both of the access roads. It continues flowing off-site to the south. This stream is a Class A (fish-bearing stream) within the Yarrow Creek basin, which is defined as a Primary Basin. According to KMC 90.91 the buffer requirement for these streams is 75 feet.

Methodology

Wetland conditions were evaluated using the on-site, routine methodology described in the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), (referred as 2010 Regional Supplement) as required by Snohomish County. In general, wetland delineation consisted of two tasks: (1) assessing vegetation, soil, and hydrologic characteristics to identify areas meeting the wetland identification criteria, and (2) mapping wetland boundaries using aerial photography and existing survey information.

The following criteria descriptions were used in the boundary determination:

Vegetation Criteria

The 2010 Regional Supplement defines hydrophytic vegetation as "the community of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to exert a controlling influence of the plant species present." Field indicators were used to determine whether the vegetation meets the definition for hydrophytic vegetation.

Soils Criteria and Mapped Description

The National Technical Committee for Hydric Soils, as described in the 2010 Regional Supplement, defines hydric soils as "a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." Field indicators were used to determine whether a given soil meets the definition for hydric soils.

The soils underlying this site are mapped in the *Soil Survey of King County Area Washington* as Alderwood gravelly sandy loam, 6 to 15 percent slopes (AgC), Alderwood gravelly sandy loam, 15 to 30 percent slopes (AgD), and Norma loam.

The AgC soil unit is described as rolling with irregularly shaped areas ranging from 10 to about 600 acres in size. The A horizon ranges form very dark brown to dark brown. The B horizon is dark brown, grayish brown, and dark yellowish brown. Permeability is moderately rapid in the surface layer and subsoil and very slow in the substratum. Available water capacity is described as low. Included within this soil unit are the poorly drained Norma, Bellingham, Seattle, Tukwila, Shalcar soils, and Alderwood soils that have slopes more gentle or steeper than 6 to 15 percent. Included soil units make up no more than 30 percent of the total acreage.

The AgD soil unit is made up of moderately well drained soils that have a weakly consolidated substratum at a depth of 24 to 40 inches. In a representative profile, the surface layer and subsoil are very dark brown, dark brown, and grayish brown gravelly sandy loam about 27 inches thick. The substratum is grayish-brown, weakly consolidated

to strongly consolidated glacial till that extends to a depth of 60 inches and more. Soils included with this soil mapping make up no more than 30 percent of the total acreage. Some areas are up to 25 percent Everett soils that have slopes of 15 to 30 percent, and some areas are up to 2 percent Bellingham, Norma, and Seattle soils, which are in depressions. Runoff is medium, and the erosion hazard is severe.

The Norma series is made up of poorly drained soils that formed in alluvium, under sedges, grass, conifers, and hardwoods. These soils are in basins on the glaciated uplands and in areas along the stream bottoms. In a representative profile, the surface layer is black sandy loam about 10 inches thick. The subsoil is dark grayish brown and dark gray sandy loam and extends to a depth of 60 inches or more. Permeability is moderately rapid. The seasonal water table is at or near the surface. In drained areas, the effective rooting depth is 60 inches or more. The available water capacity is moderately high, to high. Norma soil is listed on the Hydric Soils List for Washington.

Hydrology Criteria

The Washington State Wetlands Identification and Delineation Manual, 1997 edition, states that criteria for designation as a wetland based on hydrology is met when "areas which are seasonally inundated and/or saturated to the surface for a consecutive number of days ≥12.5 percent of the growing season, provided that soil and vegetation parameters are met. Areas inundated or saturated between 5 and 12.5 percent of the growing season in most years may or may not be wetland. Areas saturated to the surface for less than 5 percent of the growing season are non-wetlands." Field indicators are employed in the determination that wetland hydrology parameters are met.

BOUNDARY DETERMINATION FINDINGS

Wetland A

Wetland A is a small depressional wetland adjacent to Stream A located in the northeast corner of the site. Vegetation within the wetland consists of a canopy of red alder (*Alnus rubra*) with an understory of salmonberry (*Rubus spectabilis*) and creeping buttercup (*Ranunculus repens*). Soils in this wetland are typically a black (10YR 2/1) sandy loam from the surface to six inches below. The sublayer is a yellowish brown (10YR 5/4) loamy sand with redoximorphic features present. Soils were saturated to the surface.

The dominance of species rated "Facultative" or wetter satisfies the criteria for hydrophytic vegetation in the areas mapped as wetland. Based on field indicators of hydric soils, it appears that the areas mapped as wetland are saturated to the surface for more than 12.5 percent of the growing season, thereby fulfilling wetland hydrology criteria in the absence of observed primary indicators of hydrology. Wetland A meets all criteria for designation as a wetland.

Wetland B

Wetland B is a depressional wetland on the west site of the site. Vegetation within the wetland primarily consists of a canopy of Pacific willow, black cottonwood, and red alder with an understory of red elderberry (*Sambucus racemosa*), salmonberry, hardhack (*Spiraea douglasii*), horsetail (*Equisetum arvense*), and creeping buttercup. Soils in this wetland are typically a black (10YR 2/1) or very dark brown (10YR 2/2) sandy loam with a grayish brown (2.5Y 4/2) sublayer.

Non-Wetland

The areas mapped as non-wetland include pasture/paddock areas, landscaping near residences, and a few stands of large trees. A variety of vegetation was observed in the upland areas including: red alder, Himalayan blackberry, mixture of pasture grasses, Douglas fir, western hemlock, and ornamental landscaping plants.

Soil texture and color varied across the site. Upland soils were a very dark grayish brown (10YR 3/2) sandy loam or an olive brown (2.5Y 4/3) loamy sand. These soils were moist during our January visit.

FUNCTIONS AND VALUES ASSESSMENT

Methodology

The methodology for this functions and values assessment is based on professional opinion developed through past field analyses and interpretation. This assessment pertains specifically to the wetlands and streams in the vicinity of the site, but is typical for assessments of similar systems common to Western Washington.

Functional Components

Wetlands and streams in Western Washington perform a variety of ecosystem functions. Included among the most important functions provided by wetlands are stormwater control, water quality improvement, fish and wildlife habitat, aesthetic value, recreational opportunities and education. The most commonly assessed functions and their descriptions are listed below. Assessments of these functions for the project site are provided in the "Analysis" section of this report.

Hydrologic Functions

Wetlands often function as natural water storage areas during periods of precipitation and flooding. By storing water that otherwise might be channeled into open flow systems, wetlands can attenuate or modify potentially damaging effects of storm events, reducing erosion and peak flows to downstream systems. Additionally, the soils underlying wetlands are often less permeable, providing long-term storage of stormwater or floodflow and controlling baseflows of downstream systems. Stormwater storage capacity and floodflow attenuation are generally a function of the size of the wetland and their topographic characteristics.

Water Quality
Surface water quality improvement is another evaluated function. Surface runoff during periods of precipitation increases the potential for sediments and pollutants to enter surface water. Wetlands improve water quality by acting as filters as water passes through them, trapping sediments and pollutants from surface water. Ponded areas within depressional wetlands also allow sediments to drop out of suspension, thereby increasing water quality. As development increases, the potential for polluted water to reach wetlands and streams also increases. Unnaturally high inputs of pollutants, which are often found in urbanized areas, along with the size of the wetlands and the vegetation structure within them are the main limiting factors of this function.

Wildlife Habitat
Wetlands have potential to provide diverse habitat for aquatic, terrestrial, and avian species for nesting, rearing, resting, cover, and foraging. Wildlife species are commonly dependent upon a variety of intermingled habitat types, including wetlands, adjacent uplands, large bodies of water, and movement corridors between them. Human intrusion, including development within and adjacent to wetlands, and impacts to movement corridors are the most limiting factors for wildlife habitat functions.
Assessments of these functions for the project site are provided below.

Existing Conditions

Wetland A
The on-site portion of Wetland A is a small depressional wetland adjacent to Stream A. Water in this wetland flows from east to west, moving down the topographical gradient. Wetland A collects precipitation and overbank flooding of Stream A and therefore provides storm water attenuation. However, this function is limited since the wetland is on a slope and water residence time is low. The majority of the on-site portion of this wetland is vegetated by shrubs and trees and a vegetated corridor connects it to the Bridle Trails State Park. The location of this wetland, adjacent to the forested Bridle Trails State Park, provides great potential for wildlife use.

Wetland A Values:
Hydrologic Function: Low to moderate
Water Quality Function: Low to moderate
Wildlife Habitat Function: Moderate

Wetland B
Wetland B is split into four areas by the two access roads and 116th Ave. NE. The northern and middle sections are densely vegetated and the soils primarily undisturbed. The southern on-site section of this wetland is mowed and maintained lawn with ornamental willow trees. Being located adjacent to a stream allows this wetland to provide floodwater storage during storm events. It also improves water quality by

reducing the sediment load transported in the water. The majority of Wetland B contains multiple vegetation classes, hydroperiods, a moderate diversity of vegetation species, and moderate habitat interspersion. These characteristics provide potential for this wetland to perform a high habitat function. The corridors and connections to other wetlands in the areas are fairly disturbed, but it is located near the open space of Watershed Park and the Bridle Trails State Park.

Wetland B Values:
Hydrologic Function: Moderate
Water Quality Function: Moderate
Wildlife Habitat Function: Moderate to high

Off-site Wetland
The off-site wetland was scored using the City of Kirkland's Wetland Field Data Form using previous wetland documentation and visual information gathered from the subject site and public roads. Using the available information and considering the proximity to the two wetlands on-site as well as the Watershed Park and Bridle Trails State Park we estimate this wetland to have the following values:

Hydrologic Function: Low to moderate
Water Quality Function: Low to moderate
Wildlife Habitat Function: Moderate

Stream A
The open section of Stream A provides a small area of riparian habitat. It may provide habitat for aquatic and amphibious species. This stream does provide floodwater storage and sediment and organic material transport. However, the culvert in this stream limits its ability to provide high quality functions.

Stream B
Stream B is known (Washington Department of Fish and Wildlife) to be used by cutthroat trout and is presumably providing habitat for other aquatic species. This stream does provide floodwater storage and sediment and organic material transport. Proximity to 116th Street NE and developments as well as culverted areas prevent this stream from providing high quality functions.

<u>Buffer Functions and Values Assessment</u>
Vegetated wetland buffers obstruct water flow, thereby decreasing water velocity, allowing infiltration into the soil, and reducing soil erosion potential. Wetland buffers help to moderate water level fluctuations. Buffer vegetation impedes the flow of runoff, increases the humus content of soil (greater adsorption capacity), and preserves soil composition as intense rainfall hits the ground. Many birds, mammals, and amphibians use wetland buffers for some part of their life needs. The varying types of vegetation in wetland buffers provide cover for safety, breeding, and escape, and native species as food

sources. Their use of these sites is dependent on the valuable edge habitat found at the wetland/upland border.

The Stream A and Wetland A buffer is primarily vegetated with a variety of low emergent plants, with some shrubs and trees close to the wetland. Two existing structures are partially located in the Wetland A buffer. The soils in the Wetland A buffer have been disturbed and the area that is cleared is most likely compacted from horses. This buffer does provide some of a water quality and hydrologic function through the vegetation decreasing water velocity and reducing erosion potential. Since this wetland and its buffer are so close to a large undisturbed forested area, this buffer contributes to providing habitat for wildlife.

The Stream B and Wetland B buffer is vegetated with emergent vegetation, Himalayan blackberry, nettles, and bittersweet nightshade. The buffer area slopes toward the wetland. In the north end of the buffer the soil appears to have a thick layer of old horse manure on the surface. The south end of the buffer is cleared and actively used as horse paddocks. This buffer does slow water velocity and reduce erosion potential. It does perform a limited hydrologic and water quality function. The lack of vegetation in the southern end of the buffer and the dominance of blackberry and grasses in the northern end limit the shelter and food this buffer provides for wildlife.

WILDLIFE

During the January 2013 visit very few wildlife species were observed. Stream B is known to have resident cutthroat trout (*Oncorhynchus clarkia*) and the Bridle Trails State Park is known to have a barred owl (*Strix varia*) population. Coho salmon presence is documented in Yarrow Bay and several streams within the Yarrow Bay basin.

The following avian species expected to use the subject site include: common raven (*Corvus corax*), American crow (*Corvus brachyrhynchos*), American robin (*Turdus migratorius*), house finch (*Carpodacus mexicanus*), black-capped chickadee (*Poecile atricapillus*), bushtit (*Psaltriparus minimus*), northern flicker (*Colaptes auratus*), hairy woodpecker (*Picoides villosus*), downy woodpecker (*Dendrocopus villosus*), red-breasted nuthatch (*Sitka canadensis*), brown creeper (*Certhia americana*), swainson's thrush (*Hyocichla ustulata*), varied thrush (*Ixoreus naevius*), and sharp-shinned hawk (*Accipiter striatus*).

Mammals expected to use this site include: Virginia opossum (*Didelphis virginiana*), shrews (*Sorex spp.*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), gray squirrel (*Sciurus carolinensis*), black tailed deer (*Odocoileus hemionus columbianus*), and eastern cottontail rabbits (*Sylvilagus floridanus*).

Other wildlife expected to use this site include: pacific tree frog (*Hyla regilla*), northwestern salamander (*Ambystoma gracile*), and rough-skinned newt (*Taricha granulosa*). These lists are not meant to be all-inclusive and may omit species that currently utilize or could utilize the site.

USE OF THIS REPORT

This Critical Area Study is supplied to JayMarc Homes, LLC as a means of determining on-site environmentally sensitive area conditions, as required by the City of Kirkland. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions.

The laws applicable to critical areas are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect. The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.

Meryl Kamowski
Associate Ecologist

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