

**WETLAND REPORT  
FOR THE  
BETROZOFF JONES SUBDIVISION**

**Site Location:**

11818 and 11845 Red-Wood Road  
Redmond, WA 98052

**Tax Parcel Numbers:**

948250-0070 (11818) and 942850-0065 (11845)

**Prepared For / Applicant:**

Todd Sherman, Vice President  
Sherman Building Company, LLC  
2100 124<sup>th</sup> Avenue NE, Suite 100  
Bellevue, WA 98004  
(206) 909-8187  
Toddsherman@gmail.com

**Property Owners:**

Betrozoff Family Trust (11818 Red-Wood Road)  
Adam Jones (11845 Red-Wood Road)

**Report Dated:**

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**Report Prepared By:**



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Mark Rigos, P.E.  
Certified Wetland Biologist  
440 SE Darst Street  
Issaquah, WA 98027  
(425) 652-6013  
markrigos@hotmail.com

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## 1. PROJECT OVERVIEW AND SITE DESCRIPTION

This Wetland Report was prepared to address possible wetlands on tax parcel numbers 948250-0070 (address 11418) and 942850-0065 (address 11845), which comprise the subject site (site) (See Vicinity Map – Figure 1). The south parcel (11418) is currently owned by the Betrozoff Family Trust. The north parcel (11845) is currently owned by Adam Jones. The site is located on the very north side of the City of Redmond (City) in the SW ¼ of Section 26, Township 26 North, Range 5 East, W.M. The proposed site development is a subdivision, ultimately to include homes, roads, landscaping, etc. To accommodate the development, the site's existing structures (two homes, sheds, garages, etc.) will be demolished and removed. Also, most of the existing vegetation will be cleared. The site will be graded to allow for gently sloping roads and yards. This Wetland Report has been prepared per the Critical Area Report Requirements in the City's Municipal Code 20D.140.10-060(2)(b), as required for a development of this magnitude.

The Betrozoff (south) Parcel area is 5.52 acres. In the existing conditions, it contains a long, brick rambler home and two detached garages. The home enjoys western view across the Sammamish River valley. The three structures are accessed by a long, skinny, circuitous paved driveway from a gated entrance at the intersection with Red-Wood Road. The structures are located on the south-central portion of the site. The site contains a septic drainfield. The parcel's east and central portions are landscaped amongst towering evergreen trees, intermixed with some deciduous trees such as birch, red alder and big leaf maple. Evergreen trees include Douglas fir, blue spruce, western hemlock, holly, western white pine, blue atlas, western red cedar and Pacific madrona. Existing landscaping includes lawn, juniper shrubs, rhododendrons, laurel hedges and several fruit trees. There is less landscaping on the very west side, likely because the topography is quite steep.

The Jones (north) Parcel area is 3.54 acres. Attached to a fence at the site entrance is a sign labeled "Quail Tree Farm". The site's total area is 9.04 acres. In the existing conditions, the north parcel's land use conditions are quite different on the south half versus the north half. The south half contains a large home with an attached 3-car garage and a shed. The home also enjoys western view across the Sammamish River valley. The home is also accessed by a long, circuitous paved driveway from a gated entrance at the intersection with Red-Wood Road. A concrete pad abuts the attached large garage. A septic drainfield is located away from the home. The south portion is landscaped amongst towering mature evergreen trees, some which appear to be 100 feet tall. These include Douglas fir, blue atlas and western red cedar. Existing landscaping includes expansive lawns, dwarf weeping Norway spruce, dwarf Alberta spruce, juniper shrubs, salal, holly, sword fern and a split rail fence. Several large deciduous trees such as big leaf maple are also present. Approximately 25% of the south half is impervious. No critical areas were observed immediately west of the parcel.

The north half of the Jones Parcel is essentially a farm pasture. A painted red barn and shed are located on the south side of the pasture. A well house is on the east side of the pasture. The north half is approximately 5% impervious. Horses and livestock were apparently present many years before 1986 and into the late 1990s. The north half is only partly fenced, as horses would roam on the approximate two acres and drink water from a farm pond / drainage ditch on the northeast corner of the parcel.

Access to both parcels is from individual asphalt driveways via Red-Wood Road, directly east of the site. North of the site is a farm and a single-family home. West of the south (Betrozoff) parcel is a rural (lacking sidewalks or shoulders) paved road named 154<sup>th</sup> Place NE. West of the north parcel (Jones) is a single-family home. South of the site is a vacant parcel and a single-family home.

On 10/27/2012 and 11/9/2012, I visited both parcels (the site) to evaluate for wetlands. Weather conditions on the first visit were overcast and sprinkling rain. During the previous several weeks, it had rained extensively. Weather conditions on my second visit were sunny and approximately 50 degrees. The previous week had been relatively dry. In areas of possible wetlands, I hung six blue and white striped flags labeled SL (Sample Location)-1 through SL-6 to document my findings, described later in this report.

## 2. METHODOLOGY, AUTHORITY AND LIMITATIONS

### A. Methodology

This wetland delineation was performed using the Routine Level 2 Methodology as described in the Washington State Wetlands Identification and Delineation Manual (Washington State Department of Ecology, March 1997). This Delineation Manual is an appropriate technical basis for determining the presence of wetlands. The Routine Level 2 Methodology is used when there is insufficient information already available to characterize the vegetation, soils and hydrology of the project area. The wetland determination was based on the presence of the three criteria for jurisdictional wetlands; hydrophytic vegetation, hydric soils and wetland hydrology. All three criteria must be present in order to classify an area as a wetland.

### B. Authority

This wetland determination is in accordance with Section 404 of the Clean Water Act, the objective of which is to "maintain and restore the chemical, physical and biological integrity of the waters of the United States" (COE, 1987).

### C. Limitations

Wetlands are subject to seasonal and annual variation. Wetland determinations and delineations are not final until approved by regulatory agencies and/or jurisdictions.

## 3. WETLAND DEFINITION / METHODS

A wetland is defined as an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. As stated from the Corps of Engineers Wetlands Delineation Manual (COE, 1987), wetlands are required to have the following three criteria:

### A. The site supports predominately hydrophytic (wetland) vegetation.

Dominant vegetation is determined using the 50/20 rule as described in the 1997 Washington State Wetlands Identification and Delineation Manual. Hydrophytic vegetation have adaptations that allow these species to survive in saturated and/or inundated environments. Hydrophytic vegetation exists at a site if greater than 50% of dominant species are classified as FAC, FAC+, FACW, FACW+ or OBL. The indicator status of wetland plants is classified according to the USFWS National Wetlands Inventory and National Plant List Panel (Reed, 1988). Less common indicators of hydrologic vegetation include visual observation of plant species growing in areas of prolonged inundation and/or soil saturation, morphological adaptations, technical literature, physiological adaptations and reproductive adaptations. As shown in the table below, an indicator status is applied to each species according to its probability of occurring in wetlands.

Indicator Category	Symbol	Occurrence in Wetlands
Obligate Wetland Plants	OBL	>99%
Facultative Wetland Plants	FACW	67-99%
Facultative Plants	FAC	34-67%
Facultative Upland Plants	FACU	1-33%
Obligate Upland Plants	UPL	<1%

Note: FACW, FAC, and FACU have + and - values to represent species near the wetter end of the spectrum (+) and the drier end of the spectrum (-).

### B. The substrate is predominantly undrained hydric soil.

Hydric soils (soils formed under wetland conditions) are a positive indicator of wetland conditions. Hydric soil is defined as a soil "that in its undrained condition, is saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions in the upper part." (Soil Conservation Service, 1985). A preliminary determination of hydric soils for a site is made with reference to NRCS soil surveys (per county) and criteria established by The National Technical Committee for Hydric Soils (NTCHS). Hydric soil criteria are based on taxonomy, drainage and permeability. However, NRCS mapping units cover broad geographical areas and

commonly don't include smaller inclusions of non-hydric or hydric soils. Therefore, field confirmation is necessary. Field indicators of hydric soils are examined from 18" soil pits. For non-sandy soils, indicators include presence of organic soils (Histosols), histic epipedons, sulfidic material (hydrogen sulfide), aquic or peraquic moisture regime, reducing soil conditions, hydric soil colors, verified soils appearing on the NTCHS hydric soils list and presence of iron and manganese concretions. Hydric soil colors are analyzed immediately below the A-horizon or to a depth of 10" (whichever is shallower). Hydric soils include gleyed (gray) soils, low chroma soils in an unmottled matrix or soils with high chroma mottles within a low chroma matrix. Mottles (redoxymorphic features) are spots of contrasting color. Gleyed color and chroma are determined by using the Munsell Color Charts (Munsell Color, 1992). Hydric soil indicators for non-sandy soils include high organic matter content in the surface horizon, streaking of subsurface horizons by organic matter and/or spodic horizons.

**C. Substrate is saturated by water or covered by shallow water at least periodically during growing season.**

Typically, wetland hydrology occurs where the presence of water has an overriding influence on vegetation and soils, resulting in the development of wetland soils and wetland plant communities. Sites with wetland hydrology are periodically inundated and/or saturated during at least part of the growing season. Wetland hydrology normally exists where topography directs water into low relief areas dominated by soils with poor drainage characteristics. Areas demonstrate wetland hydrology if soils are periodically inundated or saturated to the surface for a sufficient duration during the growing season. "Sufficient duration" is considered to be greater than 12.5% of growing season days that are consecutively seasonally inundated and / or saturated to the surface. If the areas are inundated or saturated between 5-12.5% of the growing season, then they may or may not be wetlands. The growing season can either be defined by the number of frost-free days, or the period during which the soil temperature at 19.7 inches is above biological zero (41 degrees F). As a rule of thumb, the mesic growing season for Western Washington lowlands extends 245 days from March 1 to October 31 (Washington Department of Ecology, 1997). At each sample location, primary wetland hydrology indicators such as inundation, saturation in the upper 12", water marks, drift lines, sediment deposits and drainage patterns are noted. Secondary indicators such as oxidized root channels, water-stained leaves, local survey data, FAC-neutral test, etc. are also considered in the determination of a positive indicator for wetland hydrology.

#### **4. HYDROPHYTIC VEGETATION RESULTS**

Prevalent vegetation is characterized by dominant species comprising a plant community. Dominant species are those that contribute more to the character of a plant community than other species present, as estimated or measured in terms of some ecological parameter.

Both parcels have a variety of native mature vegetation mixed in with ornamental landscaping (primarily Northwest natives). Many existing tree and shrub species are noted above in Section 1. Six sample locations (SL) were documented onsite. Most of the site was clearly non-hydrophytic so SLs were only documented in areas that contained a species or prevalence of hydrophytic vegetation. SL-1 is located on the very west side of the north parcel in a horse pasture that had been used for grazing for many, many years. There were several mature trees such as Douglas fir (*Pseudotsuga menziesii* - UPL) at SL-1, but understory vegetation was composed of Himalayan blackberry (*Rubus procerus* - FACU), reed canarygrass (*Phalaris arundinacea* - FACW) and creeping buttercup (*Ranunculus repens* - FACW). Reed canarygrass, Himalayan blackberry and creeping buttercup are often found in disturbed areas. Because 50% of the vegetation is hydrophytic at SL-1, the hydrophytic vegetation criteria was met.

SL-2 is located approximately 100 feet north of SL-1 at a similar elevation. At SL-2, the dominant vegetation was Douglas fir (*Pseudotsuga menziesii* - UPL), big leaf maple (*Acer macrophyllum* - FACU), reed canarygrass (*Phalaris arundinacea* - FACW), creeping buttercup (*Ranunculus repens* - FACW) and common horsetail (*Equisetum arvense* - FAC). Again, the hydrophytic vegetation criteria was met at SL-2.

SL-3 is located on the northeast portion of the north parcel on a side slope adjacent to a former farm pond and drainage ditch. Wetland vegetation was slightly more prevalent in this area of the parcel compared to SL-1 and SL-2. Observed dominant vegetation included soft rush (*Juncus effuses* - FACW), Himalayan blackberry (*Rubus procerus* - FACU), reed canarygrass (*Phalaris arundinacea* - FACW), Canadian thistle (*Cirsium arvense* - FACU+)

and unidentified pasture grasses (likely FAC). The hydrophytic vegetation criteria was met at SL-3, because more than 50% of the vegetation was FAC, FACW or OBL.

SL-4 was located near the base of the drainage ditch. The vegetation diversity was practically non-existent at this spot as there were only two dominant plants, which were reed canarygrass (*Phalaris arundinacea* - FACW) and Canadian thistle (*Cirsium arvense* - FACU+). Because 50% of the vegetation was FAC or wetter, the hydrophytic vegetation criteria was met at SL-4.

SL-5 is located upslope (south) of SL-4 in a different drainage ditch on the south parcel, but in the same drainage corridor as SL-4. SL-5 is in the northeast corner of the south parcel, approximately 15 feet south from the drainage ditch's culvert inlet. Dominant vegetation at SL-5 included red alder (*Alnus rubra* - FAC), common horsetail (*Equisetum arvense* - FAC), reed canarygrass (*Phalaris arundinacea* - FACW) and bleeding heart (*Dicentra formosa* - FAC). The hydrophytic vegetation criteria was met at SL-5, because 50% of more of the vegetation was hydrophytic.

At SL-6, there was a bit more plant diversity compared to the other sample locations. Dominant vegetation included salmonberry (*Rubus spectabilis* - FAC+), Himalayan blackberry (*Rubus procerus* - FACU), common cattail (*Typha latifolia* - OBL), common horsetail (*Equisetum arvense* - FAC), reed canarygrass (*Phalaris arundinacea* - FACW), creeping buttercup (*Ranunculus repens* - FACW) and lady fern (*Athyrium filix-femina* - FAC). At SL-6, the hydrophytic vegetation criteria was met. For additional vegetation information, please see the Wetland Data Forms (Figure 6).

## 5. HYDRIC SOILS RESULTS

The site's soils are quite varied. Some pockets of the site, predominantly the central portion of the site, appear to contain a soil type commonly known as outwash, whereas the site's east and west sides appear to mimic till soils. Outwash soils drain moderately well to well and very rarely display wetland characteristics. Most of the site's soils appear to be till, quite possibly AgC (Alderwood gravelly sandy loam). Till soils are less permeable than outwash, and occasionally to rarely display wetland characteristics. Hydric soils are poorly drained and often show wetland characteristics.

During a wetland assessment, soils are classified by their hue, value and chroma (i.e., 7.5YR 3/3). The first number and letters correspond to the hue, the second number corresponds to the value and the third number corresponds to the chroma. At all six of the site's sample locations (SLs), the soils appear to have been modified to some degree. For example, SL-1 and SL-2 are in a farm pasture where grazing and livestock compaction occurred for long periods. The same is true at SL-3 and S-4 where grazing occurred, except that SL-3 and SL-4 also had stormwater flowing through this area or a farm pond area, due to a significant amount of impervious surface area, some of which has been recently (past 10 years) bypassed by the construction of a storm drainage collection and conveyance system on the east side of Red-Wood Road. SL-5 and SL-6 are located in a different ditch that have been heavily influenced by Red-Wood Road stormwater. The underlying soil at SL-5 was a poorly graded coarse sand, which may be an indicator that sand was placed by artificial means when the drainage ditch was constructed. SL-6's soils are trapping sediment laden runoff from Red-Wood Road, because of the fibrous root matter of the cattails. Because sediment has been trapped, it has dammed up the water. At SL-1, SL-2, SL-4 and SL-5, the hydric soil criteria was absent. At those SLs, the matrix chroma was either not low (1) or moderately low (2) without mottling. At SL-3 and SL-6, the hydric soils criteria was present, because there was low chroma (1) and/or mottling present with the matrix chroma being 1 or 2. For additional soils information, please see the Wetland Data Forms (Figure 6).

## 6. WETLAND HYDROLOGY RESULTS

A wetland can receive hydrology from many possible sources such as precipitation, upslope surface sheet flow runoff from precipitation, seeping shallow interflow, rising groundwater from below, tidal influences, overbank stream flooding, etc. Wetland hydrology indicators may include drainage patterns, drift lines, sediment deposition,

watermarks, stream gage data, flood predictions, historic records, and visual observation of saturated soils and inundation. The 1987 manual requires inundation, flooding or saturation to the surface for at least 5 - 12.5% of the growing season to satisfy the hydrology requirements for jurisdictional wetlands (COE, 1987). Hydrological indicators include primary indicators such as saturation in the upper 12 inches or inundation on the surface and secondary indicators such as water stained leaves and the FAC-neutral test. One primary indicator or two secondary indicators are required for an area to meet the wetland hydrology criteria.

For this site, the wetland hydrology indicator was present at SL-3, SL-4, SL-5 and SL-6. The wetland hydrology indicator was absent at SL-1 and SL-2. Even after several large storms, the soils in the upper 12 inches of SL-1 and SL-2 was only damp to moist. It was not saturated. At the other four sample locations, there was saturation in the upper 12 inches of soil. At SL-6, the ground surface was nearly inundated. For additional wetland hydrology information, please see the Wetland Data Forms (Figure 6).

## 7. WETLAND DETERMINATION SUMMARY

### A. Redmond Wetland Definition:

Per Redmond Zoning Code (RMC Title 21 – effective 4/16/2011), Article VII Definitions, RZC 21.78 A Definitions, a wetland is defined as follows:

*“Areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands include those artificial wetlands intentionally created from non-wetland areas created to mitigate conversion of wetlands.”*

### B: North (Jones) Parcel:

The south half of the North (Jones) Parcel does not show wetland characteristics. In the northwest corner, near SL-1 and SL-2, is a pasture whose soils have been trampled / compacted by horse and livestock activity for many, many years. The compaction can create a condition where soil permeability decreases, so that is why pastures are often quite moist in the upper several inches of soil. However, even in this case, the wetland hydrology indicator was not clearly met. Although hydrophytic vegetation is present in several areas in the vicinity of SL-1 and SL-2, the soils in the pasture were non-hydric, so a wetland is not present on the west side of the north parcel.

In the very northeast corner of the Jones Parcel is a depression and man-made drainage ditch. SL-3 is on the a side slope of the drainage ditch, likely close to the shoreline of the former farm pond. SL-4 is placed at the bottom of the depression. The depression and drainage ditch both contain all three wetland criteria and thus would normally be considered wetland. However, these areas do not meet Redmond’s wetland definition for the following two reasons:

1. The depression is at the north terminus of an existing man-made drainage ditch and former farm pond. The depression terminates at a 12-inch diameter (inner) concrete culvert inlet. In November 2012, property owner Adam Jones told me that he purchased this property in 1986. Before 1986, at that time and for 13 years later, horses and livestock would drink water from the farm pond in this depression. Apparently, during the rainy season, there was so much stormwater runoff flowing into the depression that it was used as a farm pond. On occasions, the depression would fill with up to three feet deep of water. Apparently, the concrete culvert would periodically plug, which helped allow the farm pond to fill with water. As of 2012, the farm pond no longer exists because there is decreased stormwater runoff being directed to the drainage ditch than there used to be, there are no longer horses or livestock onsite, and the system has not been plugged. In approximately 2005, a storm drainage collection and conveyance system was constructed on the east side of Red-Wood Road in conjunction with pavement improvements. This fairly recent system conveys natural stream water from tributary areas to the southeast. So what effectively has happened was that stream water has been diverted into the new conveyance system under the east side of Red-Wood Road. I

observed stream flow in this new stream culvert system on my first site investigation. There is no longer enough tributary water to create the farm pond effect on the subject site. However, because this area was a farm pond, it is not considered a wetland, because a farm pond is exempt from Redmond's wetland definition (see above).

2. The second reason that this area is not considered a wetland, is because a drainage ditch is exempt from Redmond's wetland definition. The man-made drainage ditch was constructed many years ago. Its slope is approximately 5% and its base width is approx. 10 feet. Side slopes range from 2H:1V to 3H:1V. The drainage ditch is not a natural wetland feature, because it was constructed to collect and convey stormwater runoff generated from Red-Wood Road. This is evidenced by the heavy invasive vegetation (Himalayan blackberry and reed canarygrass) that now entirely dominates the bottom and side slopes of the drainage ditch. The ditch is located partly on public right-of-way and partly on private property. Although the recent pavement improvements on Red-Wood Road included an 18-inch wide thickened edge to decrease the amount of road generated stormwater from sheet flowing down the side slope and entering the drainage ditch / depression, there is still approximately one acre of Red-Wood pavement (impervious surface area) further to the south that currently flows through the drainage ditch / depression. The approximate dimensions of the pavement tributary area are 1,600 feet long by 30 feet wide, being directed toward the farm pond. Runoff from the road sheet flowed west into the man-made drainage ditch that had been created decades earlier during the original construction of Red-Wood Road. This drainage ditch begins just south of the Red-Wood Road / 116<sup>th</sup> Street NE intersection.

**C. South (Betrozoff Parcel):**

The South Parcel does not show any wetland characteristics except for near its east property line, adjacent to Red-Wood Road. As noted earlier, SL-5 and SL-6 are located in the roadside drainage ditch that is along its east property line. At SL-5, the hydric soil criteria was absent, because of so much free draining sand. As a result, SL-5 is clearly not wetland. To the south, at SL-6, all three wetland criteria were clearly exhibited. However, SL-6 is in a man-made drainage ditch which is exempt from the City of Redmond's wetland definition. Currently, approximately 48,000 square feet (1,600 feet long x 30 feet wide) of pavement (impervious surface area) sheet flows across Red-Wood Road and down into the drainage ditch. In fact, most of the road is actually cross-sloped down to the west, as the road centerline appears to lack a "crown" as evidenced by quite expansive longitudinal pavement cracking. Because most of the road is not crowned, more road runoff flows into the drainage ditch. Upslope of SL-6 is a 40-foot long, 12-inch diameter concrete culvert and 100-foot long, 12-inch diameter corrugated metal pipe (cmp) that conveys road runoff to SL-5 and SL-6. SL-6 shows some substantial wetland characteristics, as easily observed just upstream of a ~75-foot long by 16-foot (avg.) wide swath of cattails. The drainage ditch is located partly on City right-of-way and partly on private property. Neither the City nor the property owner has maintained the drainage ditch in the past 10-20 years. As a result, cattails have formed a thick rhizomatic mat, which has trapped sediments, that have prevented stormwater from freely flowing north in the ditch. Just before the cattails, the ditch is partially dammed up because of the trapped sediment. In summary, as noted above, a drainage ditch is exempt from the City's wetland definition.

Just west of the drainage ditch fronting the Betrozoff parcel is a narrow trough containing saturated soils just beneath ground surface. The trough is approximately 6 - 8 feet wide by 100 - 150 feet long. Following a large storm event, it's possible that surface water runoff flows north through the trough. Although wetland hydrology and hydric soils (2 of the 3 wetland criteria) appear to exist in the trough, the trough does not qualify as wetland, because the hydrophytic vegetation criteria was generally not met. First, there was more non-hydrophytic vegetation than hydrophytic vegetation (see Vegetation Table below). Second, the most dominant vegetation in the corridor was Douglas fir, laurel hedge and rhododendrons, which are indicators of a non-wetland area.

**Vegetation Table**

<u>Common Name</u>	<u>Plant Type</u>	<u>Wetland Indicator Status</u>	<u>Hydrophytic</u>
Douglas fir	Tree	UPL	no
Western white pine	Tree	FACU-	no
Red alder	Tree	FAC	either
Bitter cherry	Tree	FACU	no
Pacific willow	Tree	FACW	yes
Beaked hazelnut	Shrub	FACU	no



Laurel hedge	Shrub	UPL	no
Holly	Shrub	FACU	no
Rhododendron	Shrub	FACU	no
Smooth Labrador-tea	Shrub	FACW+	yes
Himalayan blackberry	Shrub	FACU	no
Blueberry	Shrub	FACU	no
Lady fern	Shrub	FAC	either
Horsetail	Groundcover	FACW	yes
Creeping buttercup	Groundcover	FACW	yes
Reed canarygrass	Groundcover	FACW	yes

In summary, the site does not contain a wetland per the City of Redmond's wetland definition. In addition, the City's Wetland Summary Sheet was not completed, because the site does not contain a wetland.

## 8. RECOMMENDATIONS

The drainage ditch on the very east side of the site, partially in Red-Wood Road will need to remain in some fashion following development of the site. Currently, the ditch has a few problems, which are noted as follows:

- A. Buried Culvert: The 12-inch diameter corrugated metal pipe (cmp) outlet somewhere near the Jones's paved driveway entrance was not found. The outlet is likely buried north of the driveway. The culvert should be video cameraed to determine if the culvert is clogged. The outlet should be found and removed of debris. If the culvert is crushed under the driveway, then a properly sized culvert should be installed.
- B. Ditch Maintenance: Along the Jones frontage, the drainage ditch has not been maintained very well by either the property owner or the City. On the north segment, Himalayan blackberry has completely overgrown the side slopes. At the base of the ditch, reed canarygrass has completely invaded. Rip-rap pads should be placed every 100 feet in the ditch to reduce erosion potential.
- C. Ditch Maintenance: Between SL-6 and SL-5, along the Betrozoff frontage, the drainage ditch has not been maintained. Cattails have been allowed to grow and have silted up and dammed the ditch. As a result, the drainage ditch dams up stormwater which has created wetland characteristics. The cattails should be removed, the sediment needs to be properly disposed of and the ditch needs to be properly sloped at 1% minimum. The excavated material should be properly disposed of offsite.
- D. Water Quality Treatment?: If Red-Wood Road stormwater runoff is going to continue to enter the drainage ditch along the site's east property line, then the City should consider if this stormwater needs to be treated in a water quality system. The tributary area is nearly one acre of public ROW pavement that extends all the way south up to the Red-Wood Road / 116<sup>th</sup> Street intersection. The implementation of a water quality treatment system (such as a bio-filtration swale or compost filter vault) should be the financial responsibility of the City because it is offsite ROW stormwater, should they believe a water quality treatment system is warranted. Red-Wood Road is not crowned very well in the middle, so almost the entire road section actually sheet flows west toward the subject site's drainage ditch.

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Washington State Hydric Soils List, Washington State Department of Ecology, Revised December 15, 1995.

# **APPENDIX**

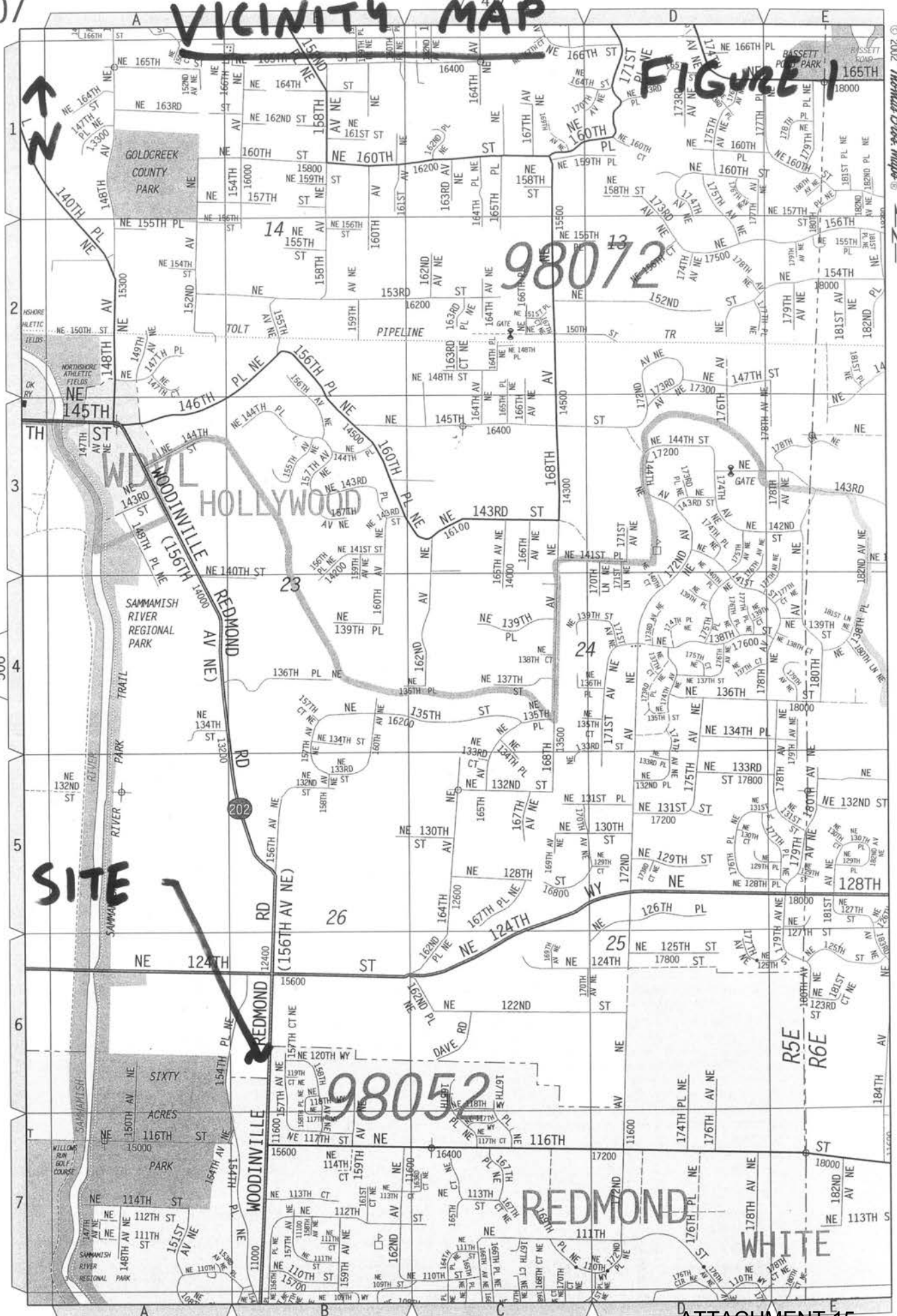
# VICINITY MAP

# FIGURE 1

# 98072

# 98052

# SITE

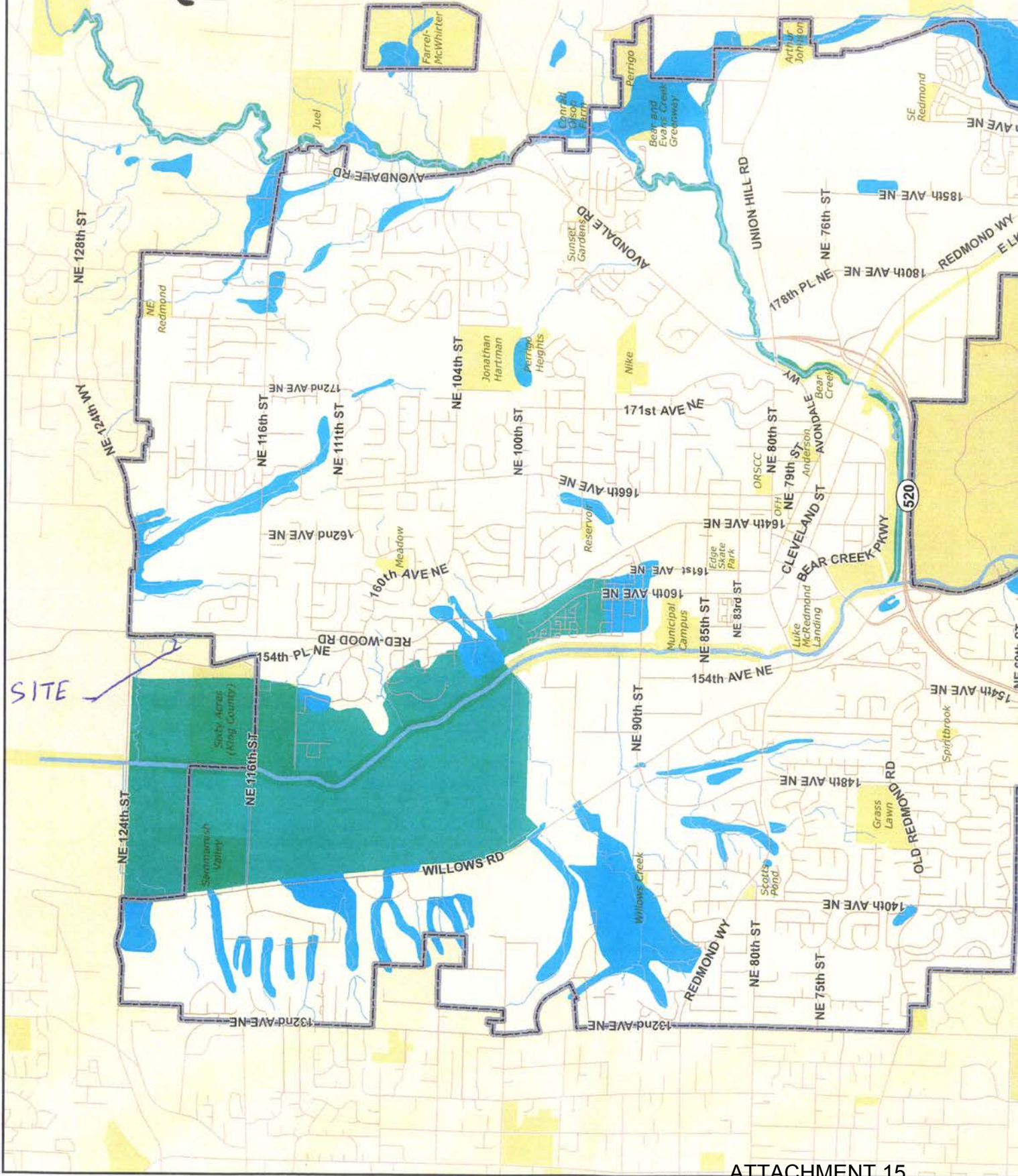


© 2002 Thomas Bros. Maps

# REDMUND WETLAND MAP

## FIGURE 2

← NORTH  
(NTS)



# REDMOND STREAM MAP

## FIGURE 3

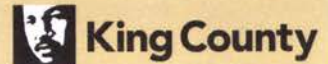
← NORTH  
(NTS)



# AERIAL PHOTO IMAP FIGURE 4



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# FIGURE 5

## PHOTOS



Photo A: Looking southwest toward home on North (Jones) Parcel



Photo B: Looking south at paved driveway entrance into the North (Jones) Parcel. Pavement is stained and showing watermarks from water overtopping pavement. 12-inch corrugated metal pipe outlet not found.





Photo C: Looking northeast at former farm pond / current drainage ditch on the North (Jones) Parcel. Sample Location 3 is on the left side of the photo and SL-4 is at the low point in the center of the photo.



Photo D: Looking north at unmaintained roadside drainage ditch choked full of Himalayan blackberry and reed canarygrass. Drainage ditch located partly in public right-of-way and partly on the North (Jones) Parcel.



Photo E: Looking south-southeast up the drainage ditch on the North (Jones) Parcel. Vehicle in foreground is driving on Red-Wood Road.



Photo F: Looking ~~south~~ at the side of the home on the South (Betrozoff) Parcel.  
North



Photo G: Looking north at the roadside drainage ditch sloping down to the north along the South (Betrozoff) Parcel.



Photo H: Approximately 100 feet north of Photo G, looking south at 12-inch diameter corrugated metal pipe outlet and drainage ditch along the South (Betrozoff) Parcel.



Photo I: Looking south at unmaintained drainage ditch that slopes down to the north.

**SAMPLE LOCATION (SL) -1 DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
*(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)*

Project Site: 11818 and 11845 Red-Wood Road, Redmond, WA	Date: 11/9/2012
Applicant/Owner: Todd Sherman / Betrozoff Family Trust and Adam Jones	County: King
Investigator(s): Mark Rigos, P.E., Certified Wetland Biologist	State: WA
	S/T/R: 26 / 26 North / 5 East
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: Redmond
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: N/A
Is Area a Potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: East side of Jones Site
Explanation of atypical or problem area:	

**VEGETATION** (For strata, indicate T = tree; S = shrub; H = herb; G = grass)

Dominant Plant Species	Stratum	% Cover	Indicator	Dominant Plant Species	Stratum	% Cover	Indicator
1 Douglas fir	T		UPL	8			
2 Himalayan blackberry	S		FACU	9			
3 Reed canarygrass	G		FACW	10			
4 Creeping buttercup	H		FACW	11			
5				12			
6				13			
7				14			

**Hydrophytic Vegetation Indicators:** % of Dominants that are OBL, FACW or FAC: 50%

Check all indicators that apply & explain below:

Visual observation of plant species growing in areas of prolonged inundation/saturation	Physiological/reproductive adaptations	Yes
Morphological adaptations	Wetland plant database	
Technical Literature	Personal knowledge of regional plant communities	
	Other (explain)	

**Hydrophytic Vegetation Present?**  Yes  No

Rationale for decision/Remarks: Hydrophytic vegetation was present.

**HYDROLOGY**

Is it the growing season? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water Marks <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Oxidized Root (live root) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Based on <input type="checkbox"/> soil temp (record temp)	On	Channels <12 in.
other (explain) <input checked="" type="checkbox"/> First Fall Frost occurred yesterday	Drift Lines <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Drainage Patterns <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth of inundation: 0 inches	FAC-Neutral Test <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Local Soil Survey Data <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth to free water in pit: >18 inches	Sediment Deposits <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water-Stained Leaves <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth to saturated soil: >18 inches	Other (explain):	
Check all that apply and explain below:		
Stream, Lake, or Gage Data <input type="checkbox"/>		
Aerial Photographs <input type="checkbox"/>	Other <input type="checkbox"/>	
<b>Wetland Hydrology Present?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Rationale for decision/Remarks: Surface 2 inches of soil was damp to moist from significant recent rainfall, but not saturated. Historic horse / livestock slightly compacted surface soils.		

**SOILS**

Map Unit Name (Series and Phase): Till (SCS maps being updated)	Drainage Class: Moderately poorly draining					
Taxonomy (Subgroup):	Field Observations Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
<b>Profile Description:</b>						
Depth (inches)	Horizon	Matrix color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle abundance size contrast	Texture, concretions, structure, etc.	Drawing of Soil Profile (match description)
0-12	A	7.5 YR 3/3	5 YR 5/6	Distinct / few		
<input type="checkbox"/> Histosol	<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> High Organic Content in Surface Layer of Sandy Soils				
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> Gleyed or Low-Chroma (=1) Matrix	<input type="checkbox"/> Organic Streaking in Sandy Soils				
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Matrix Chroma with ≤ 2 with mottles	<input type="checkbox"/> Listed on National/Local Hydric Soils List				
<input type="checkbox"/> Aquatic Moisture Regime	<input type="checkbox"/> Mg or Fe Concretions	<input type="checkbox"/> Other (explain in remarks)				

**WETLAND DETERMINATION (Circle)**

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Rationale/Remarks:</b> The three wetland criteria were not present.	

NOTES:

**SL-2 DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
*(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)*

Project Site: 11818 and 11845 Red-Wood Road, Redmond, WA	Date: 11/9/2012
Applicant/Owner: Todd Sherman / Betrozoff Family Trust and Adam Jones	County: King
Investigator(s): Mark Rigos, P.E., Certified Wetland Biologist	State: WA
	S/T/R: 26 / 26 North / 5 East
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: Redmond
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: N/A
Is Area a Potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: Northeast corner of Jones Site
Explanation of atypical or problem area:	

**VEGETATION** (For strata, indicate T = tree; S = shrub; H = herb; G = grass)

Dominant Plant Species	Stratum	% Cover	Indicator	Dominant Plant Species	Stratum	% Cover	Indicator
1 Big leaf maple	T		FACU	8			
2 Douglas fir	T		UPL	9			
3 Creeping buttercup	H		FACW	10			
4 Horsetail	H		FAC	11			
5 Reed canarygrass	G		FACW	12			
6				13			
7				14			

**Hydrophytic Vegetation Indicators:** % of Dominants that are OBL, FACW or FAC: 60%

Check all indicators that apply & explain below:

Visual observation of plant species growing in areas of prolonged inundation/saturation	Physiological/reproductive adaptations	Yes
Morphological adaptations	Wetland plant database	
Technical Literature	Personal knowledge of regional plant communities	
	Other (explain)	

**Hydrophytic Vegetation Present?**  Yes  No

Rationale for decision/Remarks: Hydrophytic vegetation was greater than or equal to 50%.

**HYDROLOGY**

Is it the growing season? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water Marks <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Oxidized Root (live root) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Based on <input type="checkbox"/> soil temp (record temp)	On	Channels <12 in.
other (explain) <input checked="" type="checkbox"/> First Fall Frost occurred yesterday	Drift Lines <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Drainage Patterns <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth of inundation: 0 inches	FAC-Neutral Test <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Local Soil Survey Data <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth to free water in pit: >18 inches	Sediment Deposits <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water-Stained Leaves <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth to saturated soil: >18 inches	Other (explain):	
Check all that apply and explain below:		
Stream, Lake, or Gage Data <input type="checkbox"/>		
Aerial Photographs <input type="checkbox"/>	Other <input type="checkbox"/>	
<b>Wetland Hydrology Present?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Rationale for decision/Remarks: Near the same topographic elevation of SL-1, SL-2's lack of wetland hydrology was similar.		

**SOILS**

Map Unit Name (Series and Phase): Till (SCS maps being updated)	Drainage Class: MPD					
Taxonomy (Subgroup):	Field Observations Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
<b>Profile Description:</b>						
Depth (inches)	Horizon	Matrix color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle abundance size contrast	Texture, concretions, structure, etc.	Drawing of Soil Profile (match description)
0-10	A	7.5 YR 2/2	None			
>10	B	2.5 YR 5/4	None			
<b>Hydric Soil Indicators:</b> (check all that apply)						
<input type="checkbox"/> Histosol	<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> High Organic Content in Surface Layer of Sandy Soils				
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> Gleyed or Low-Chroma (=1) Matrix	<input type="checkbox"/> Organic Streaking in Sandy Soils				
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Matrix Chroma with ≤ 2 with mottles	<input type="checkbox"/> Listed on National/Local Hydric Soils List				
<input type="checkbox"/> Aquatic Moisture Regime	<input type="checkbox"/> Mg or Fe Concretions	<input type="checkbox"/> Other (explain in remarks)				
<b>Hydric Soils Present?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Rationale for decision/Remarks: Chroma was 2 without mottling.						

**WETLAND DETERMINATION (Circle)**

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Rationale/Remarks:</b> SL-1 and SL-2's vegetation, hydrology and soils were similar.	

**NOTES:**

**SL-3 DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
*(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)*

Project Site: 11818 and 11845 Red-Wood Road, Redmond, WA	Date: 11/9/2012
Applicant/Owner: Todd Sherman / Betzoff Family Trust and Adam Jones	County: King
Investigator(s): Mark Rigos, P.E., Certified Wetland Biologist	State: WA
	S/T/R: 26 / 26 North / 5 East
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: Redmond
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: N/A
Is Area a Potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: Side slope along former farm pond
Explanation of atypical or problem area:	

**VEGETATION** (For strata, indicate T = tree; S = shrub; H = herb; G = grass)

Dominant Plant Species	Stratum	% Cover	Indicator	Dominant Plant Species	Stratum	% Cover	Indicator
1 Soft rush	G		FACW	8			
2 Himalayan blackberry	S		FACU	9			
3 Reed canarygrass	G		FACW	10			
4 Thistle	H		FACU+	11			
5 Unidentified pasture grasses	G		FAC	12			
6				13			
7				14			

**Hydrophytic Vegetation Indicators:** % of Dominants that are OBL, FACW or FAC: 60%

Check all indicators that apply & explain below:

Visual observation of plant species growing in areas of prolonged inundation/saturation	Physiological/reproductive adaptations	Yes
Morphological adaptations	Wetland plant database	
Technical Literature	Personal knowledge of regional plant communities	
	Other (explain)	

**Hydrophytic Vegetation Present?**  Yes  No

Rationale for decision/Remarks: Hydrophytic vegetation greater than or equal to 50%.

**HYDROLOGY**

Is it the growing season? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water Marks <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Oxidized Root (live root) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Based on <input type="checkbox"/> soil temp (record temp)	On	Channels <12 in.
other (explain) <input checked="" type="checkbox"/> First Fall Frost occurred yesterday	Drift Lines <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Drainage Patterns <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth of inundation: 0 inches	FAC-Neutral Test <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Local Soil Survey Data <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth to free water in pit: >18 inches	Sediment Deposits <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water-Stained Leaves <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth to saturated soil: 6 inches	Other (explain):	
Check all that apply and explain below:		
Stream, Lake, or Gage Data <input type="checkbox"/>		
Aerial Photographs <input type="checkbox"/>	Other <input type="checkbox"/>	
<b>Wetland Hydrology Present?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Rationale for decision/Remarks: Soil saturation in the upper 12 inches.		

**SOILS**

Map Unit Name (Series and Phase): Till (SCS maps being updated)	Drainage Class: MPD					
Taxonomy (Subgroup):	Field Observations Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
<b>Profile Description:</b>						
Depth (inches)	Horizon	Matrix color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle abundance size contrast	Texture, concretions, structure, etc.	Drawing of Soil Profile (match description)
0-12	A	10 YR 2/2	7.5 YR 5/6	Few / relatively distance		
<b>Hydric Soil Indicators:</b> (check all that apply)						
<input type="checkbox"/> Histosol	<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> High Organic Content in Surface Layer of Sandy Soils				
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> Gleyed or Low-Chroma (=1) Matrix	<input type="checkbox"/> Organic Streaking in Sandy Soils				
<input type="checkbox"/> Sulfidic Odor	<input checked="" type="checkbox"/> Matrix Chroma with ≤ 2 with mottles	<input type="checkbox"/> Listed on National/Local Hydric Soils List				
<input type="checkbox"/> Aquatic Moisture Regime	<input type="checkbox"/> Mg or Fe Concretions	<input type="checkbox"/> Other (explain in remarks)				
<b>Hydric Soils Present?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						
Rationale for decision/Remarks: Mottling with 2 chroma.						

**WETLAND DETERMINATION (Circle)**

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Rationale/Remarks:</b> SL-3 is not considered wetland, because it is located in an area that was formerly a farm pond. Farm ponds are exempt from Redmond's wetland definition.	

**NOTES:**

**SL-4 DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
*(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)*

Project Site: 11818 and 11845 Red-Wood Road, Redmond, WA	Date: 11/9/2012
Applicant/Owner: Todd Sherman / Betzoff Family Trust and Adam Jones	County: King
Investigator(s): Mark Rigos, P.E., Certified Wetland Biologist	State: WA
	S/T/R: 26 / 26 North / 5 East
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: Redmond
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: N/A
Is Area a Potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: Bottom of drainage ditch
Explanation of atypical or problem area:	

**VEGETATION** (For strata, indicate T = tree; S = shrub; H = herb; G = grass)

Dominant Plant Species	Stratum	% Cover	Indicator	Dominant Plant Species	Stratum	% Cover	Indicator
1 Reed canarygrass	G		FACW	8			
2 Thistle	H		FACU+	9			
3				10			
4				11			
5				12			
6				13			
7				14			

**Hydrophytic Vegetation Indicators:** % of Dominants that are OBL, FACW or FAC: 50%

Check all indicators that apply & explain below:  
 Visual observation of plant species growing in areas of prolonged inundation/saturation      Physiological/reproductive adaptations  
 Morphological adaptations      Wetland plant database  
 Technical Literature      Personal knowledge of regional plant communities  
 Other (explain)

**Hydrophytic Vegetation Present?**  Yes  No

Rationale for decision/Remarks: Hydrophytic vegetation greater than or equal to 50%.

**HYDROLOGY**

Is it the growing season? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water Marks <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Oxidized Root (live root) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Based on <input type="checkbox"/> soil temp (record temp)	On _____	Channels <12 in.
other (explain) <input checked="" type="checkbox"/> First Fall Frost occurred yesterday	Drift Lines <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Drainage Patterns <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Depth of inundation: 0 inches	FAC-Neutral Test <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Local Soil Survey Data <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth to free water in pit: >18 inches	Sediment Deposits <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water-Stained Leaves <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth to saturated soil: 6 inches	Other (explain):	
Check all that apply and explain below: Stream, Lake, or Gage Data <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/>		
<b>Wetland Hydrology Present?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Rationale for decision/Remarks: Soil saturation in the upper 12 inches..		

**SOILS**

Map Unit Name (Series and Phase): Till (SCS maps being updated)	Drainage Class: MPD					
Taxonomy (Subgroup):	Field Observations Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
<b>Profile Description:</b>						
Depth (inches)	Horizon	Matrix color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle abundance size contrast	Texture, concretions, structure, etc.	Drawing of Soil Profile (match description)
0-12	A	10 YR 5/3			Some streaking	
<b>Hydric Soil Indicators:</b> (check all that apply)						
<input type="checkbox"/> Histosol	<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> High Organic Content in Surface Layer of Sandy Soils				
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> Gleyed or Low-Chroma (=1) Matrix	<input type="checkbox"/> Organic Streaking in Sandy Soils				
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Matrix Chroma with ≤ 2 with mottles	<input type="checkbox"/> Listed on National/Local Hydric Soils List				
<input type="checkbox"/> Aquatic Moisture Regime	<input type="checkbox"/> Mg or Fe Concretions	<input type="checkbox"/> Other (explain in remarks)				
<b>Hydric Soils Present?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Rationale for decision/Remarks: Hydric soils are not clearly met. Chroma between 2 and 3.						

**WETLAND DETERMINATION (Circle)**

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soils Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Rationale/Remarks:</b> Hydric soils not clearly met. Plus, location of SL-4 is in roadside drainage ditch and former farm pond, which are both exempt from Redmond's wetland definition.	

NOTES:



**SL-5 DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
*(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)*

Project Site: 11818 and 11845 Red-Wood Road, Redmond, WA	Date: 11/9/2012
Applicant/Owner: Todd Sherman / Betzoff Family Trust and Adam Jones	County: King
Investigator(s): Mark Rigos, P.E., Certified Wetland Biologist	State: WA
	S/T/R: 26 / 26 North / 5 East
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: Redmond
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: N/A
Is Area a Potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: Bottom of drainage ditch
Explanation of atypical or problem area:	

**VEGETATION** (For strata, indicate T = tree; S = shrub; H = herb; G = grass)

Dominant Plant Species	Stratum	% Cover	Indicator	Dominant Plant Species	Stratum	% Cover	Indicator
1 Red alder	T		FAC	8			
2 Common horsetail	H		FAC	9			
3 Reed canarygrass	G		FACW	10			
4 Bleeding heart	H		FAC	11			
5				12			
6				13			
7				14			

**Hydrophytic Vegetation Indicators:** % of Dominants that are OBL, FACW or FAC: 100%

Check all indicators that apply & explain below:

Visual observation of plant species growing in areas of prolonged inundation/saturation	Physiological/reproductive adaptations	Yes
Morphological adaptations	Wetland plant database	
Technical Literature	Personal knowledge of regional plant communities	
	Other (explain)	

**Hydrophytic Vegetation Present?**  Yes  No

Rationale for decision/Remarks: Hydrophytic vegetation was greater than or equal to 50%.

**HYDROLOGY**

Is it the growing season? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water Marks <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Oxidized Root (live root) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Based on <input type="checkbox"/> soil temp (record temp)	On _____	Channels <12 in. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
other (explain) <input checked="" type="checkbox"/> First Fall Frost occurred yesterday	Drift Lines <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Drainage Patterns <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Depth of inundation: 0 inches	FAC-Neutral Test <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Local Soil Survey Data <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth to free water in pit: >18 inches	Sediment Deposits <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water-Stained Leaves <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth to saturated soil: 8 inches	Other (explain):	
Check all that apply and explain below:		
Stream, Lake, or Gage Data <input type="checkbox"/>		
Aerial Photographs <input type="checkbox"/>	Other <input type="checkbox"/>	
<b>Wetland Hydrology Present?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Rationale for decision/Remarks: Saturated soils in the upper 12 inches.		

**SOILS**

Map Unit Name (Series and Phase): Till (SCS maps being updated)	Drainage Class: MWD					
Taxonomy (Subgroup):	Field Observations Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
<b>Profile Description:</b>						
Depth (inches)	Horizon	Matrix color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle abundance size contrast	Texture, concretions, structure, etc.	Drawing of Soil Profile (match description)
0-12	A	7/5 YR 4/3	None			
<b>Hydric Soil Indicators:</b> (check all that apply)						
<input type="checkbox"/> Histosol	<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> High Organic Content in Surface Layer of Sandy Soils				
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> Gleyed or Low-Chroma (=1) Matrix	<input type="checkbox"/> Organic Streaking in Sandy Soils				
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Matrix Chroma with ≤ 2 with mottles	<input type="checkbox"/> Listed on National/Local Hydric Soils List				
<input type="checkbox"/> Aquatic Moisture Regime	<input type="checkbox"/> Mg or Fe Concretions	<input type="checkbox"/> Other (explain in remarks)				
<b>Hydric Soils Present?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Rationale for decision/Remarks: Soil is actually moderately well drained at the low point in the drainage ditch. Soil is comprised of coarse and fine sands.						

**WETLAND DETERMINATION (Circle)**

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soils Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Rationale/Remarks:</b> SL-5 is not in a wetland, because hydric soils are absent and it is located in a drainage ditch alongside Red-Wood Road.	

NOTES:

**SL-6 DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
*(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)*

Project Site: 11818 and 11845 Red-Wood Road, Redmond, WA	Date: 11/9/2012
Applicant/Owner: Todd Sherman / Betzoff Family Trust and Adam Jones	County: King
Investigator(s): Mark Rigos, P.E., Certified Wetland Biologist	State: WA
	S/T/R: 26 / 26 North / 5 East
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: Redmond
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: N/A
Is Area a Potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: Bottom of drainage ditch
Explanation of atypical or problem area:	

**VEGETATION** (For strata, indicate T = tree; S = shrub; H = herb; G = grass)

Dominant Plant Species	Stratum	% Cover	Indicator	Dominant Plant Species	Stratum	% Cover	Indicator
1 Salmonberry	S		FAC+	8			
2 Himalayan blackberry	S		FACU	9			
3 Cattail	S		OBL	10			
4 Common horsetail	H		FAC	11			
5 Reed canarygrass	G		FACW	12			
6 Lady fern	S		FAC	13			
7 Creeping buttercup	H		FACW	14			
<b>Hydrophytic Vegetation Indicators:</b>		% of Dominants that are OBL, FACW or FAC:		86%			
Check all indicators that apply & explain below:		Physiological/reproductive adaptations					
Visual observation of plant species growing in areas of prolonged inundation/saturation		Wetland plant database					
Morphological adaptations		Personal knowledge of regional plant communities					
Technical Literature		Other (explain)					
<b>Hydrophytic Vegetation Present?</b>		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No				
Rationale for decision/Remarks: Hydrophytic vegetation is present.							

**HYDROLOGY**

Is it the growing season? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water Marks <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Oxidized Root (live root) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Based on <input type="checkbox"/> soil temp (record temp )	On _____	Channels <12 in.
other (explain) <input checked="" type="checkbox"/> First Fall Frost occurred yesterday	Drift Lines <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Drainage Patterns <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Depth of inundation: 0 inches	FAC-Neutral Test <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Local Soil Survey Data <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth to free water in pit: 6 inches	Sediment Deposits <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Water-Stained Leaves <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Depth to saturated soil: 0 inches	Other (explain):	
Check all that apply and explain below:		
Stream, Lake, or Gage Data <input type="checkbox"/>		
Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/>		
<b>Wetland Hydrology Present?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Rationale for decision/Remarks: Wetland hydrology is present; just downstream of SL-6 are cattails that impede the movement of water in the drainage ditch which has caused hydrophytic vegetation to thrive.		

**SOILS**

Map Unit Name (Series and Phase): Till (SCS maps being updated)	Drainage Class: PD					
Taxonomy (Subgroup):	Field Observations Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
<b>Profile Description:</b>						
Depth (inches)	Horizon	Matrix color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle abundance size contrast	Texture, concretions, structure, etc.	Drawing of Soil Profile (match description)
0-6	A	7.5 YR 3/1				
<b>Hydric Soil Indicators:</b> (check all that apply)						
<input type="checkbox"/> Histosol	<input type="checkbox"/> Reducing Conditions	<input checked="" type="checkbox"/> High Organic Content in Surface Layer of Sandy Soils				
<input type="checkbox"/> Histic Epipedon	<input checked="" type="checkbox"/> Gleyed or Low-Chroma (=1) Matrix	<input type="checkbox"/> Organic Streaking in Sandy Soils				
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Matrix Chroma with ≤ 2 with mottles	<input type="checkbox"/> Listed on National/Local Hydric Soils List				
<input type="checkbox"/> Aquatic Moisture Regime	<input type="checkbox"/> Mg or Fe Concretions	<input type="checkbox"/> Other (explain in remarks)				
<b>Hydric Soils Present?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						
Rationale for decision/Remarks: Low chroma.						

**WETLAND DETERMINATION (Circle)**

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Rationale/Remarks:</b> SL-6 is located in a roadside drainage ditch, which is exempt from Redmond's wetland definition.	

NOTES:

# Washington State University



To all to whom these presents shall have come: Greeting.

Be it known that we, the President and Faculty of the University under authority of the Board of Regents and the laws of the State of Washington, have admitted

**Mark Joseph Riggs**

to the degree of

**Bachelor of Science  
in Biology**

with all the Rights, Privileges, and Dignities to that degree appertaining.

Given at Pullman in the State of Washington, on the Tenth day of May in the Year One Thousand Nine Hundred and Ninety-seven of the Republic the Two Hundred and Twenty-first, and the State of Washington the One Hundred and Eighth.

*Amuel W. Smith*  
President of the University

*John W. Ellis*  
President of the Board of Regents

FIGURE 7

Richard Chinn Environmental Training, Inc.

certifies that

Mark J. Rigos

has successfully completed a

38 Hour Army Corps of Engineers Wetland Delineation & Management Training Program

Issued Certificate No. 982 and 2.8 CEUs on this fifteenth day of April, 1999 in Seattle, Washington



Richard Chinn, CET

Richard Chinn Environmental Training, Inc.

PO Box 10776, Pompano Beach, FL 33061-6776

800.427.0307 • FAX: 508.629.0783 • [info@richardchinn.com](mailto:info@richardchinn.com) • <http://www.richardchinn.com>

This training has been based in part on the U. S. Army Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1 (1987 manual), as provided for in the training materials developed in conjunction with section 307(e) of the Water Resources Development Act of 1990 for the Wetland Delineator Certification Program.



FIGURE 7

August 13, 2013

ESM Consulting Engineers, LLC  
Eric LaBrie, AICP  
VP, Director of Planning  
33400 8<sup>th</sup> Avenue South, Suite 205  
Federal Way, WA 98003

**RE: Stream Supplemental Letter to My 12/3/2012-Wetland Delineation Report for the Betrozoff Jones Subdivision; Located at 11818 and 11845 Red-Wood Road, Redmond, WA 98052; Tax Parcel Numbers 948250-0070 (11818) and 942850-0065 (11845)**

Dear Mr. LaBrie,

This letter acts as a Stream Supplement to my 3/2/2013-Wetland Delineation Report. It has been prepared to address the comment by the City of Redmond (City), "*Wetland Report: Clearly indicate that the off-site stream is located greater than 50' from the property boundary (include distance).*" The City's wetland map shows a stream starting on the very east side of the subject site and shows it flowing northerly.

In reality, the stream is not located on the subject site, instead it is located on the opposite (east) side of Red-Wood Road public right-of-way (ROW). The City's wetland map has not been updated for this stream's correct location. On the ROW's east side, the stream flows north through a series of storm drainage conveyance pipes connected by several catch basins under the pavement's east flow line. This conveyance system was constructed in approximately 2002 in association with SR-203 road improvements that were permitted and designed in the early 2000's.

On August 1, 2013 I visited the ROW and observed that the conveyance pipes were conveying very low flows (approx. 1 gallon per minute). It had rained slightly on July 31, 2013. Based on my field measurements, the stream is approx. 52' east of the site's east property line. I measured this separation immediately north of addressed 11845's existing driveway entrance. The 52' separation consists of:

- 7' wide paved shoulder from the drainage pipe to the east white fog line
- 12' wide paved northbound travel lane
- 12' wide paved southbound travel lane
- 12' wide paved shoulder
- 9' wide vegetated / rocked side slope

As noted in my Wetland Delineation Report, the northeast corner of the site contains a former farm (stock watering) pond, which is exempted from Redmond's wetland definition. The former farm pond's outflow is a culvert (which remains) that is sloped to the north underneath a driveway berm benefitting the neighboring property to the north. The culvert outfall is located approximately 57' north of the subject site's north property line. Since the re-construction of SR-203 occurred, the farm pond, culvert and culvert outfall are no longer functioning as a stream.

In conclusion, the stream is located more than 50' from the subject site's property line. If you have any questions or concerns, please do not hesitate to contact me at [markrigos@hotmail.com](mailto:markrigos@hotmail.com). Thank you for your kind attention.

Sincerely,



Mark Rigos, P.E., Certified Wetland Biologist  
River's Edge Consulting, LLC  
440 SE Darst Street  
Issaquah, WA 98027  
Phone: (425) 652-6013; Email: [markrigos@hotmail.com](mailto:markrigos@hotmail.com)

Cc: Todd Sherman; Sherman Building Company, LLC; 2100 124<sup>th</sup> Avenue NE, Suite 100, Bellevue, WA 98004