Mitigation Monitoring Annual Report Year 5 (2016): Tualatin Valley Environmental Bank

1: *Tualatin Valley Environmental Bank* Identifiers:

DSL Permit # APP46796 Corps Permit # NWP-2009-552 Permittee Dave Heikes Farms Inc.
County Washington Report Date December 28, 2016 Monitoring Year 5
Date Removal-Fill Activity Completed October 2011
Date mitigation was completed: Grading October 2011 Planting wetlands-various dates 2011-2016 & buffers 2013-2016
Date(s) of data collection: June 21, 22, 25 & July 8, 2016
Report prepared by: C. Jonas Moiel & Jeff Handley

2: Monitoring Report Purpose:

This monitoring report is for a project that includes: (check all that apply):

- ❑ Compensatory **freshwater, non-tidal** wetland mitigation for permanent wetland impacts.
- ❑ Compensatory **estuarine** wetland mitigation for permanent wetland impacts.
- ❑ **Only non-wetland** compensatory mitigation.
- ❑ **Only** mitigation for **temporary** impacts that had a monitoring requirement.
- ❑ **Voluntary** wetland enhancement, creation or restoration (General authorization or individual permit) not funded with money from DSL's wetland mitigation fund.
- ❑ Voluntary wetland enhancement, creation or restoration (General authorization or individual permit) funded with money from DSL's **wetland mitigation fund**.
- **X** **Mitigation Bank** Report
- ❑ Other _____

3: Results:

	Performance standards (verbatim from permit)	Fully Met? (Y/N)	Comments/Reason for shortfall (mark NA if doesn't apply this year)
VEGETATION PERFORMANCE STANDARDS			
Herbaceous (PEM) Wetlands			
FACW or FAC Dominated Herbaceous Wetlands			
1.1	The combined cover of native species for Year 1 shall be 40%; Year 2 shall be 50%; and Year 3 and thereafter shall be 60%.	Y	Average cover of native species in 20 sample plots in this habitat class for Year 3 was 95%. At an 80% confidence level, the upper confidence interval (CI) was 100% and the lower CI was 91%. This meets the final standard (Year 3 & thereafter).
1.2	The cover of non-native invasive species during the 1st and 2nd years shall not exceed 30%. For year 3 and thereafter, the non-native invasive cover, excluding reed canarygrass (*Phalaris arundinacea*), shall not exceed 10%. The cover of reed canary grass shall not exceed 10% for year 3 and thereafter.	Y	Average cover of invasive species in this habitat class for Year 3 rounded to 1%. At an 80% confidence level, the upper confidence interval (CI) was 2% and the lower CI was 1%. No reed canarygrass was present in any sample plot. This meets the final standard (Year 3 & thereafter).

1.3	Bare substrate represents no more than 20% cover by the 3rd year after planting.	Y	There was a total rounded average of 6% bare substrate in this habitat, the cover of bare mineral soil or moss rounded to 3% and the cover of dead, sprayed non-native plants rounded to 3%. The upper CI was 9% and the lower CI was 3%. This meets the final standard (Year 3 & thereafter).
1.4	The standard for diversity in herbaceous wetlands is at least 6 native species, each with 5% or more average cover and occurring in at least 10% of the plots by the 3rd year after planting.	Y	This habitat is achieving the final standard (Year 3 & thereafter). Six native species (*Deschampsia cespitosa*, *Hordeum brachyantherum, Leersia oryzoides, Lotus unifoliolatus, Psilocarphus elatior & Plagiobothrys scouleri*) met the diversity criteria.
1.5	The hydrophytic vegetation standard is that the Prevalence Index is $\leq$ 3.0 and/or the vegetation passes the "50/20 rule" for dominance of hydrophytic vegetation.	Y	The average rounded Prevalence Index (PI) for the habitat class is 2 (FACW). No individual plots were "drier" than 3 (FAC).This meets the final standard (Year 3 & thereafter).
OBL Dominated Herbaceous Wetlands			
2.1	The standard for native cover for Year 1 shall be 10%; Year 2 shall be 20%; and Year 3 and thereafter shall be 40%.	Y	Average cover of native species in 13 herbaceous plots in this habitat class for Year 5 was 62%, which exceeds the Year 3 Standard. At an 80% confidence level, the upper confidence interval (CI) was 72% and the lower CI was 51%. This meets the final standard (Year 3 & thereafter).
2.2	The cover of non-native invasive species during the 1st and 2nd years shall not exceed 30%. For year 3 and thereafter, the non-native invasive cover, excluding reed canarygrass, shall not exceed 10%. The cover of reed canary grass shall not exceed 10% for year 3 and thereafter.	Y	The average invasive species cover in this habitat class rounded to 1%. At an 80% confidence level, the upper confidence interval (CI) was 3% and the lower CI was 0%. The only invasive species in the plots was reed canarygrass. This meets the final standard (Year 3 & thereafter).
Forested (PFO) Wetlands, Shrub dominated (PSS) Wetlands and Buffers			
3.1	The combined cover of native species for Year 1 shall be 40%; Year 2 shall be 50%; and Year 3 and thereafter shall be 60%.	PFO: Y PSS: Y Buffer: Y	**PFO:** Average cover of native species in the 34 herbaceous plots for this habitat class for Year 5 was 80% (upper CI = 87%, lower CI = 74%). There was an average of 32% cover of native woody species in the 18 woody sample plots (upper CI = 39%, lower CI =25%). Combining the herb & woody averages gives a total of 112% native cover, which meets the final standard (Year 3 & thereafter). **PSS:** Average cover of native species in the 41 herbaceous plots for this habitat class for Year 5 was 58% (upper CI= 66%, lower CI = 50%). There was an average of 59% cover of native woody species in the 20 woody sample plots (upper CI = 66%, lower CI =52%). Combining the herb & woody averages gives a total of 117% native cover, which meets the final standard (Year 3 & thereafter). **Buffer:** Average cover of native species in the 28 herbaceous plots for this habitat class was 70% (upper CI = 76%, lower CI = 64%). There was an average of 14% cover of native woody species in the 14 woody sample plots (upper CI = 16, lower CI =13). Combining the herb & woody averages gives a total of 84% native cover, which meets the Year 2 standard (this is Year 2 for the buffers).

3.2	The combined cover of non-native invasive species will not exceed 30% by Year 3 and thereafter.	PFO:Y PSS:Y Buffer: Y	**PFO:** The average cover of invasives in the herb plots for this class rounded to 2% (upper CI =3%, lower CI= 1%); invasive cover in the woody plots rounded to 0% (upper & lower CI= 0). This meets the final standard (Year 3 & thereafter). **PSS:** The average cover of invasives in the herb plots for this class was 3% (upper CI=4%, lower CI=2%); invasive cover in the woody plots rounded to 0% (upper & lower CI=0%). This meets the final standard (Year 3 & thereafter). **Buffer:** The average cover of invasives in the herb plots was 2% (upper CI= 4%. lower CI=1%) and average invasive cover in the woody plots rounds to 0% (upper CI & lower CI=0%).
3.3	Bare substrate represents no more than 40% cover by the 3rd year.	PFO:Y PSS:Y Buffer: Y	**PFO**: The average is 12% in the herbaceous plots (upper CI= 17%, lower CI =6%). **PSS:** the average is 3% in the herbaceous plots (upper CI=4%, lower CI =2%). **Buffer:** The bare substrate averages 6% (upper CI= 8%, lower CI= 4%). **Note:** As of 2015 and thereafter, any herbaceous plot having $\geq$ 60% shade from woody species is excluded from the bare substrate criteria.
3.4	By Year 3 and thereafter, there are at least 6 different native species. To qualify, a species must have at least 5% average cover in the habitat class, and occur in at least 10% of the plots sampled.	PFO:Y PSS: Y Buffer: N	**PFO:** 8 native species (*Deschampsia cespitosa, Hordeum brachyantherum, Leersia oryzoides, Plagiobothrys scouleri, Sparganium emersum* [herbs] plus *Fraxinus latifolia, Salix hookeriana & Salix lucida var. lasiandra (lasiandra)* [woody species]) met the criteria **PSS**: 8 species (*Epilobium ciliatum, Equisetum arvense, Impatiens capensis L. oryzoides* [herbs] plus *Salix hookeriana, S. sitchensis, S. lucida* var. *lasiandra* and *Populus balsamnifera* [woody species]) met the criteria. **Buffer:** Currently only 3 species (*Elymus glaucus, Plagiobothrys scouleri*, and *Festuca rubra* currently meet the criteria. Some species e.g. *Bromus caritinatus,* that were dominant last year did not respond well to this year's prolonged winter floods. Please see Section 2.1 for further discussion.
3.5	The density of woody vegetation is at least 1,000 native plants (shrubs) and/or stems (trees) per acre, including native volunteers. After the aerial canopy cover (*including* shrub cover) is 50% or greater, there will be no minimum number of plants/stems. Woody vegetation standards should be met for two successive years without irrigation.	PFO: Y PSS: Y Buffers: Y	**PFO:** There was an average of 1,294 plants or stems/acre in 18 woody plots, which meets the standard. Average percent woody cover was 32% (upper CI=39% & lower CI= 25%). **PSS:** There was an average of 1,244 plants or stems/acre in 20 woody plots, which meets the standard. Average percent woody cover was 59% (upper CI= 66%, lower CI= 52%). **Buffers:** There was an average of 1,210 plants or stems/acre in 14 woody plots. This meets the standard and represents a significant improvement over the average of 807 in 2015. Average percent woody cover was 14% (upper CI= 16%, lower CI = 13%).
3.6	The hydrophytic vegetation standard for PSS and PFO wetlands is that the Prevalence Index is $\leq$ 3.0 and/or the vegetation passes the "50/20 rule" for dominance of hydrophytic vegetation.	PFO: Y PSS: Y	**PFO:** The average rounded Prevalence Index (PI) from the herbaceous and woody plots were both 2 (FACW). **PSS:** The average rounded Prevalence Index (PI) from the herbaceous and woody plots were both 2 (FACW).

Notes: All the above cover percentages represent absolute aerial cover. In all cases, the "Year" refers to the number of years after *that portion of the site* was first planted. Thus **all habitat classes *except* the buffers are Year 5; the buffers are Year 3** (planting/seeding in the buffers is not yet complete). Bare substrate includes areas of bare soil and areas covered by moss, water, or dead herbaceous plants.

HYDROLOGY PERFORMANCE STANDARDS			
	The criteria for achieving wetland hydrology at the mitigation site will be met if hydrologic conditions meet or exceed the basic standard of the 1987 *US Army Corps of Engineers Wetland Delineation Manual*, and refined in the *Corp's May 2010 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region*.	Y*	Y* The post-construction wetland delineation "lite" was completed in 2014. This included a multi-year hydrology study that concluded that nearly all of the wetland areas have wetland hydrology and some areas designed to be uplands. DSL concurred with most of the delineated post-construction boundary but requested some additional to fine-tune the boundary. Additional delineation lite data were collected in 2016.

4: Further Actions:

Remedial work recommended	Yes ☐	No ☒
Deed Restriction or other protection instrument attached	Yes ☐	No ☒
Final Monitoring Report?	Yes ☐	No ☒
Requesting release or partial release of financial security?	Yes ☒*	No ☐

*A credit release will be requested for the submittal of this monitoring report, the Year 4 monitoring report as well as a release for completion of buffer planting. These releases will be requested via a memo in January of 2017.

December 28, 2016

TUALATIN VALLEY ENVIRONMENTAL BANK

MONITORING REPORT YEAR 5 (2016)

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1.0 MITIGATION PLAN PURPOSE AND OVERVIEW

1.1 LOCATION:

The Tualatin Valley Environmental Bank (TVEB) is located on 105.95 acres at the confluence of the Tualatin River, Christensen Creek and several unnamed surface and sub-surface drainages. The TVEB is located near 9400 southwest Heikes Drive in Hillsboro, Oregon, 97123; Township 1 South, Range 2 West, Section 32, utilizing portions of tax lots 1200 and 691; and Township 1 South, Range 2 West, Section 29, tax lot 601.

1.2 MITIGATION GOALS AND OBJECTIVES:

At the request of DSL, as of last year (2015), we have removed some portions of text that are unchanged from year to year. To review the "Mitigation Goals and Objectives" please refer to the the first three monitoring reports (Green Banks LLC 2012-2014) or the Mitigation Bank Instrument (Green Bank LLC 2010).

1.3 MAINTENANCE AND MANAGEMENT ACTIONS:

Green Banks uses an integrated approach to vegetation management at the TVEB. In 2016, there was a low need for maintenance compared to previous years due to reduced non-native species cover. Most of the common target weeds have been reduced to very low numbers and small populations. This reduction in weed cover has allowed us to adjust how we manage the site, with a transition away from repeated herbicide applications and an increase in mowing and hand-pulling efforts. This trend of decreased non-native cover has been noted for the past 4 years.

Green Banks' scientists observed all areas of the TVEB approximately monthly in 2016 to determine what maintenance/management actions were necessary. Vegetation maintenance included herbicide application, mowing, cutting, hand-pulling, and prescribed burning. Management strategies differ in various areas of the TVEB based on a variety of factors such as: row planting versus clustered/random planting, steep slopes, and saturated areas. Most of the wetland areas have a clustered planting of woody species and were managed on-foot by hand-pulling, cutting and on occasion by backpack herbicide sprayers. Most of the buffer areas (except those on steep slopes) were planted in rows and managed on-foot and with ATV.

The use of herbicide (volume and frequency) has been greatly reduced since 2015 (and previous years) as a result of having much lower weed cover. Some areas with higher levels of weed cover were backpack spot-sprayed twice in 2016. The sparse and sporadic weed cover made it possible to hand-pull target weeds, rather than relying on herbicides for control.

Most of the buffer areas, except those on steep slopes or with existing mature forest, were mowed three times in 2016 (spring, summer, fall). Mowing was completed in areas with row planting to reduce competition from grasses, reduce annual and biennial weed cover, and to maintain row visibility.

The wetland prairie area was heavily managed in 2013 and 2014, but had very little management in 2015. The entire area was burned, seeded and planted in 2014 (and in previous years) and as a result had

increased diversity and cover of broadleaf native species in 2015. In the fall of 2016, the prairie was burned and re-seeded in an attempt to further increase the diversity of the area. Per the request of Dana Field with DSL, we set up control plots to compare the various treatments over time. One control plot had no treatments in 2016; a second control plot was mowed but not burned. These control plots are 50-feet by 50-feet squared, and located in the central portion of the prairie.

Inter-seeding of native plant species is a common practice which has occurred multiple times per year since 2011. It will continue to occur until a diverse mix of native species, especially annuals, are common in abundance. Inter-seeding treatments were made to selected wetland and upland areas in 2016 including the wetland prairie and upland buffers.

1.4 MONITORING METHODS:

At the request of DSL, we have removed some portions of text that are unchanged from year to year. To completely review the "Monitoring Methods", including the criteria for designating plant species as "non-native" and/or "invasive", please refer to any of the first three monitoring reports (Green Banks LLC 2012-2014) or the original Mitigation Bank Instrument (Green Bank LLC 2010). Section 1.5 addresses relevant aspects of this year's data collection, as well as the general protocol regarding plot locations and sizes.

The 2016 vegetation monitoring was conducted on June 21st, 22nd and 25th by C. Jonas Moiel and Jeff Handley, and on July 8th by C. Jonas Moiel and Matthew Brittain. Monitoring was conducted about a month earlier in 2016 than in 2015. The primary reason for conducting monitoring earlier in the year was to capture more of the early season annuals as they were not being well represented in later season monitoring. On July 12th, Dana Field (DSL) and Michael Ladouceur (Corps) were provided with monitoring data and visited the site for an annual walk-through. The response was generally positive; they were impressed by the increased survivorship of trees and shrubs in certain portions of the buffers, relative to the mortality seen in 2014-2015. This was due in part to replanting areas that had higher mortality with more flood-tolerant species; we've observed a loss of several upland species due to flooding such as Douglas Fir which have been replaced with species such as red alder and Oregon ash.

1.5 MONITORING DATA LOCATIONS:

Please refer to Figures 1a-1c which display the planted habitat types (sample units), monitoring transect locations, monitoring data plots, photo monitoring locations, and hydrology monitoring pits and wells. The habitat types consist of PEM wetlands, PSS wetlands, PFO wetlands, and buffers. In the PEM wetlands, we divided the class into two sub-classes: OBL dominated and FAC/FACW dominated. This is the case because each of these sub-classes have different performance standards.

In the 2016 monitoring we had total of 13 herbaceous plots in the OBL PEM community; 20 herbaceous plots in the FAC/FACW PEM community; 34 herbaceous plots and 18 woody plots in the PFO community; 41 herbaceous plots and 20 woody plots in the PSS community; and 28 herbaceous and 14 woody plots in the upland buffer areas.

Over the first four years there have been some adjustments to the number and layouts of the plots; several were skewed, moved or removed to avoid a dirt road, property lines, deep inundation, or habitat transitions. These adjustments were documented in the first four monitoring reports and are also summarized in the notes following the vegetation monitoring data tables in Appendix A.

This year we removed two PFO herb plots, T11-FH8 and T11-FH9 that were inundated approximately 2 and 3 feet respectively and thus were not representative of the PFO habitat. This year we also removed nine OBL plots (T5-PEMOBL1, T8-PEMOBL1, T8-PEMOBL2, T9-PEMOBL2, T10-PEMOBL1, T10-PEMOBL2, T11-PEMOBL1, T11-PEMOBL2, and T11-PEMOBL3) that were too deeply inundated (≥ 1.5 foot to about 3 or more feet) to accurately estimate cover from a distance. In the past years, we had generally estimated cover in these plots from a close distance or in a few instances we used chest waders to get to the plots. The water was somewhat deeper this year (due to earlier season monitoring) and it was more difficult to view the vegetation, particularly the submerged vegetation. In previous years these plots had always been dominated by native species including emergent and/or floating leaf species such as *Sparganium emersum, Polygonum hydropiperoides, Polygonum amphibium*, *Potomogeton natens* and *Lemna minor* as well as submerged species including *Ceratophyllum demersum, Elodea canadensis, Potomogeton foliosus, and Stuckenia pectinata.* In most years non-native species have been totally absent from the permanently inundated plots but *Potomogeton crispus* has occasionally been present. During this year's agency tour of the site we mentioned the removal of the deeper plots and neither DSL nor the Corps had concerns.

Monitoring Transect and Plot Details-

Transects were established running west to east, beginning at the western edge of the project area. The first transect (T1) started near the northern end of the site, and subsequent parallel transects were located at intervals of approximately 500-feet south of each other. There were two transects (T1 and T3) that were slightly skewed to lengthen the transect distance across the wetland area and to incorporate a unique plant community (PSS, HGM Slope). Transect 12 was added in 2012 (Year 1) after reviewing the monitoring data to increase the number of PEM FAC/FACW dominated herbaceous wetland plots; it was located halfway between transects 10 and 11, approximately 250-feet south of transect 10.

In general, the first wetland plot on each transect was located 5-feet east of the beginning of the transect start point; if the wetland extended to the western site boundary. The first plots on two transects (T2-SH1 and T5-PEMOBL1) were offset more than 5-feet because the former was located in a narrow sliver at the tax lot edge and the latter was located in an area with inundation too deep to survey (>3 feet). Herbaceous plots were spaced every 50-feet after the first plot on a transect. On PSS and PFO transects, a corner of the first woody plot was located at the same location as the first herbaceous plot. Each subsequent woody plot was located 100-feet east of the previous woody plot. In situations where a transect crossed an inundated portion of the wetland that was too deep to survey (>3 feet), sampling plots were offset over the inundated area and restarted easterly along the transect at the nearest location with a water depth shallow enough to survey (although several of these inundated plots were removed this year). Sampling plots east of an offset plot were spaced at the standard interval described above.

Buffer plots were established at the ends of the existing transects, when space was available. Some wetland boundaries extend to, or near to, the project area boundary and some transects only have a small

amount of buffer near the edge of the project area; these areas were not used for buffer monitoring plots. The wetland-facing edge of the first buffer woody plot rectangle was located 15-feet from the approximate wetland boundary, and perpendicular to the transect.

The herbaceous plots were 1 square meter in size. Most of the herbaceous plots were established with the northwest corner of each meter-square at the transect plot location and were located on the south side of the transect. Some plots were located on the north side of the transect to avoid impermeable surface, upland areas, or tax lot edges. The amount of bare substrate and the areal cover of each herbaceous plant species growing in the plots was estimated and recorded. If stems or trunks of native woody species were taking up ground space in the herbaceous plots, the percent cover was noted on the data tables *but not added to the total native cover since native woody cover is recorded in the woody vegetated plots.* Percent shade from woody species rooted in and/or overhanging the herb plots was also recorded but *not added to the total native cover.*

The woody vegetation plots (used in the forested wetlands, shrub-dominated wetlands and buffers) were 1,350 square feet; rectangles measuring 45-feet by 30-feet. Most of the plots were established with the 45-foot edge laying east/west and the 30-foot edge facing north/south; located on the south side of the transect. Some of the plots were skewed either by having the 30-foot edge running east/west rather than north/south or were laid on the north side of the transect to avoid impermeable surface, upland areas, or tax lot edges. The number of individual stems (trees) or plants (shrubs) of each native species, including volunteers, were counted in each woody vegetation plot. We also estimated the percent cover of both native and non-native invasive woody species in each woody vegetation plot. As it becomes difficult to count clonal shrubs and/or when the shrub and tree cover is $\geq$ 50% we will visually estimate cover rather than completing total plant counts in some plots. This was done on a few dense PSS plots this year where individual plants were hard to discern. In these plots, cover for each species was estimated and the stem count was considered to be the same as last year (minus any obvious mortalities and/or plus any obvious first year saplings).

The locations of the start and end points of each monitoring transect, the northwestern corner of each herbaceous plot, and all four corners of the woody vegetation plots were GPS surveyed when the monitoring locations were established in 2012 and any subsequent modifications in 2012 through 2015 have been GPS surveyed. Although several plots were removed in 2016, no new plots were added or adjusted.

1.6 HYDROLOGY METHODS AND CONTEXT:

Post-construction hydrology monitoring has occurred each year since bank establishment, beginning in 2012. The MBI specifies that the post-construction delineation (delineation "lite") would occur during years 3 (2014) through 5 (2016). The delineation “lite” was conducted in 2014 and the resulting boundary is displayed on Figures 1a-1c and 2-2c. DSL generally concurred with much of the post-construction delineation boundary but indicated in an e-mail and attached map from Dana Field (dated March 13, 2015) that they wanted additional data collected in several areas, using paired plots, before a final concurrence would be issued (Appendix B). This response was given on March 13th which was over a

month into the growing season, which was abnormally dry in 2015. Due to these conditions, the additional data were not able to be collected in 2015.

This year, 31 wetland delineation plots were established in the areas identified by DSL in 2015. Field indicators of wetland plant communities, hydrology and soil were recorded for each data plot (Appendix B); although soil indicators are not considered conclusive in newly developing wetland areas. Delineation field work was completed by C. Jonas Moiel and Jeff Handley on February 16 and 17, 2016 and by C. Jonas Moiel on February 19, 2016. These supplemental delineation lite data are included in Appendix B.

Table 1 compiles the National Weather Service (NWS) monthly precipitation data for Hillsboro, Oregon from the start of the "Water Year" (October 1, 2015) through March 2016. The recorded monthly precipitation totals are included in the table along with the monthly averages from the NRCS WETS tables for Hillsboro. Additionally, the percentage of the average "Water Year to Date" at the end of each month is shown, as well as indicating whether or not the monthly totals fall within the 30-70 percentile "normal" range from the WETS table. Table 2 shows the daily precipitation recorded in Hillsboro by the NWS from February 1 through March 15, 2016.

Table 1: Monthly Precipitation Data Table

Month	Total Precipitation (Inches)	Average Precipitation (Inches)*	Percent of Monthly Average Precipitation	Within "Normal" 30-70 percentile Range from WETS Table?	Current Water Year to Date (Inches)	Percent of Average Water Year to Date at end of Month*
Oct. 2015	3.42	2.68	128%	above normal range (1.45"-3.27")	3.42	128%
Nov. 2015	4.00	6.03	66%	below normal range (4.07"-7.21")	7.42	85%
Dec. 2015	14.60	6.44	227%	above normal range (4.44"-7.67")	22.02	145%
Jan. 2016	7.53	5.76	131%	above normal range (3.70"-6.93")	29.55	141%
Feb. 2016	3.96	4.72	84%	within normal range (3.17"-5.65")	33.51	131%
March 2016	5.31	3.93	135%	above normal range (2.96"-4.59")	38.82	131%

* The average monthly precipitation and calculated average water year to date are from the Hillsboro WETS table, which varies slightly from the NWS average data for Hillsboro in some months.

Table 2: Daily Precipitation Data from February 1 through March 15, 2016

February	Precipitation (inches)	February (continued)	Precipitation (inches)	March	Precipitation (inches)
1	0.01	16	0.13	1	0.37
2	T	17	0.22	2	0.26
3	0.27	18	0.38	3	0.05
4	0.53	19	0.37	4	0.04
5	0.13	20	0.00	5	0.34
6	0.00	21	0.11	6	0.15
7	0.00	22	0.02	7	0.01
8	0.00	23	0.00	8	0.15
9	0.00	24	T	9	0.83
10	T	25	0.00	10	0.46
11	0.32	26	0.24	11	0.11
12	0.19	27	0.04	12	0.33
13	0.29	28	0.12	13	0.63
14	0.14	29	0.45	14	0.71
15	0.00			15	0.25

NWS 2015. "T"= trace.

The winter season of 2015-2016 had higher than average rainfall (see Table 1); in fact, the December total of 14.60 inches of precipitation set a monthly record for December in Hillsboro (NWS 2016). January 2016 rainfall was also high, above the "normal" 30-70 percentile range. As a result, early winter (pre-growing season) Tualatin River floods were deep and prolonged. We wanted to find a relatively dry period in the early growing season to establish several paired plots to "fine-tune" the post-construction delineation boundary in the areas identified by DSL. The first two weeks of February were relatively dry. As of Feb 15, 2016 (the day before we commenced our investigation), the month-to-date rain total in Hillsboro was 1.88 inches, which, according to the NWS, is 0.79 inches below the average month-to-date total of 2.67 inches for that date. By the end of February, the monthly totals were still below average but within the "normal" range. We had hoped to collect additional hydrology data at the locations of the newly established plots in early March but that period had above normal rainfall; 4.69 inches of monthly total of 5.31 inches fell in the first 15 days.

The typical period used for hydrology monitoring has been from the time of bud-break (usually in early February, between February 7 and 10) until early March. A multi-year hydrology study was submitted with the 2014 monitoring report as a part of the wetland delineation lite. Extensive hydrology monitoring ended in 2014, and in 2015 and 2016 we have been collecting the additional delineation lite data requested by DSL. The 2014 hydrology study included annual hydrology data collected in several ways: shallow monitoring wells, hydrology monitoring pits (open holes), spot-checks of hydrology, and aerial photography captured by a chartered plane in the early growing season. Please refer to Figures 1a-1c, Figure 2, Figures 2a-2c, and Appendix B, for hydrology monitoring locations and data.

In 2016, the growing season began on February 4th based on the bud break of native plant species on-site. It was determined to begin on February 10th in 2010, for the baseline wetland delineation.

2.0 RESULTS

2.1 VEGETATION STANDARDS RESULTS

The raw vegetation monitoring data for all the herbaceous and woody plots are presented in eight tables included in Appendix A. In the first three years, the verbatim text of each vegetation standard and the results were presented in this section, essentially repeating all the information that is presented in the Cover Sheet. Starting last year, in the interest of brevity, please refer to the Cover Sheet, which provides the *exact wording* of all the Performance Standards, the current confidence interval (CI) ranges, and minor comments, as well as the Vegetation Performance Standards Summary Tables for each habitat unit (Tables 3a through 3e) and brief discussions below. Please note that for all wetland habitat types listed below, 2016 is considered to be Year 5. However, the upland buffers are considered to be Year 3 as this is the third year of monitoring since the initial planting was completed. The listed acreages for each habitat type are approximate; the final areas will be determined when DSL concurs with the final post-construction wetland boundary.

Table 3a: FAC/FACW PEM Habitat (~ 8.3 acres, 20 Herb Plots, Year 5)										
Criteria	**1.1:** Percent Native Cover		**1.2:** Percent Invasive Cover		**1.3:** Bare Substrate		**1.4:** Diversity		**1.5:** Hydrophytic Community	
Performance Standard	**1.1:** ≥ 60% by Year 3 and thereafter		**1.2:** ≤ 10% reed canarygrass and ≤ 10% other invasive species by Year 3 and thereafter		**1.3:** ≤ 20% by Year 3 and thereafter		**1.4:** Six native species with ≥ 5% cover, occurring in ≥ 10% of the plots.		**1.5:** Prevalence Index is ≤ 3.0	
	Average	Pass? Y/N	Average	Pass? Y/N	Average	Pass? Y/N	Number of species	Pass? Y/N	Average	Pass? Y/N
Results	**95%**	**Y**	**1%**	**Y**	**6%**	**Y**	**6**	**Y**	**2**	**Y**

Herbaceous Palustrine Emergent (PEM) Wetlands- FAC/FACW Dominated Community
The FAC/FACW PEM community is meeting all the performance standards (Standards 1.1-1.5). It is densely populated with a diverse suite of native grasses, forbs, sedges and rushes with an average of 95% native cover, which is 35% above the standard of 60% by Year 3 (Standard 1.1). This is less than the 110% native cover in 2015, likely due to monitoring earlier in the season before some plants reach their maximum size. Invasive cover (Standard 1.2) rounds to 1%. Cover by other non-natives is also minimal; only two of the thirteen non-natives recorded have an average cover as high as 1%. Six native species (*Deschampsia cespitosa, Hordeum brachyantherum, Leersia oryzoides, Lotus unifoliolatus, Plagiobothrys scouleri,* and *Psilocarphus eliator*) met the diversity standard (Standard 1.4) of ≥ 5% average cover and occurring in 10% of the plots. The average prevalence index (Standard 1.5) is 2 (FACW); no plots had a PI greater than 3 (FAC).

Table 3b: OBL PEM Habitat (~18.9 acres, 13 Herb Plots, Year 5)				
Criteria	**2.1:** Percent Native Cover		**2.2:** Percent Invasive Cover	
Performance Standard	**2.1:** ≥ 60% by Year 3 and thereafter		**2.2:** ≤ 10% reed canarygrass and ≤ 10% other invasive ecies by Year 3 and thereafter	
	Average	Pass? Y/N	Average	Pass? Y/N
Results	**62%**	**Y**	**1%**	**Y**

Herbaceous Palustrine Emergent (PEM) Wetlands- OBL Dominated Communities

The OBL PEM community is meeting all the performance standards (Standards 2.1 and 2.2). The average percent native cover (Standard 2.1) is 62%. Common dominant native species included *Leersia oryzoides, Spaganium emersum, Polygonum hydropiperoides, Polygonum amphibium,* and *Ludwigia palustris.* The native cover in the PEM OBL habitat had been greater in 2015 (83%). This was due to two factors. Firstly, monitoring this year was about a month earlier than before and thus the plants had not yet reached their maximum size (especially in the shallowly inundated plots on Transect 4). Secondly, we are no longer monitoring the deeper permanently inundated plots, which often had dense populations of submerged native aquatics such as *Ceratophyllum demursum, Elodea canadensis* and various *Potomogeton* species, as well as emergent and/or floating leaf species including the native *Polygonums, Potomogeton natens and Lemna minor*. Cover by invasive species (Standard 2.2) rounded to 1%. A small amount of *Phalaris arundinacea* was present in the habitat, observed only in one plot; no other invasives or other non-natives were recorded.

Table 3c: PFO Habitat (~23.8 acres, 18 Woody Plots & 34 Herb Plots, Year 5)

Criteria	**3.1**: Percent Combined Native Cover		**3.2:** Percent Invasive Cover		**3.3:** Bare Substrate		**3.4:** Diversity		**3.5:** Native Stem Count/ Cover		**3.6:** Hydrophytic Community	
Performance Standard	**3.1:** ≥ 60% by Year 3 and thereafter		**3.2:** ≤ 30% invasive species by Year 3 and thereafter		**3.3:** ≤ 40% by Year 3 and thereafter		**3.4:** Six native species with ≥ 5% cover, occurring in ≥ 10% of the plots.		**3.5:** Either ≥ 1,000 plants per acre or 50% aerial cover of woody species		**3.6:** Prevalence Index is ≤ 3.0	
	Average	Pass? Y/N	Average	Pass? Y/N	Average	Pass? Y/N	Number of species	Pass? Y/N	Average # Woody plants/acre	Pass? Y/N	Average	Pass? Y/N
Results	**112%** (80% herbs 32% woody)	**Y**	**2%**	**Y**	**12%**	**Y**	**8**	**Y**	**1,294**	**Y**	**2** (in both herb & woody plots)	**Y**

Note: As of 2015, any herbaceous plot having ≥ 60% shade from woody species was excluded from the bare substrate criteria.

Palustrine Forested (PFO) Wetlands

The PFO community is meeting all the performance standards. It is densely populated with native trees, shrubs and herbs. The combined percent cover of native species (Standard 3.1) is 112% (80% herbs and 32% woody species). This is a significant increase in cover by woody species from 2015 when it was 22%. Invasive cover (Standard 3.2) in the herb layer was 2% and the woody layer invasive cover rounds to 0%. Cover by other non-natives is also minimal; of the 18 non-natives recorded in the herb layer, only five species had average cover as high as 1%. Average bare substrate (Standard 3.3) was only 12%. This year, eight native species (five herbs and 3 woody species) met the diversity standard (Standard 3.4); six species is the standard. The species were *Deschampsia cespitosa, Hordeum brachyantherum, Leersia oryzoides, Plagiobothrys scouleri , Sparganium emersum, Fraxinus latifolia, Salix hookeriana,* and *Salix lucida* var. *lasiandra*. This is an improvement from 2015 when only five species met the standard. This is largely due to increased cover of the *Salix* species. The average density of native woody species (Standard 3.5) is 1,294 plants per acre which is an increase from last year's number of 1,171 plants per acre. The average prevalence index (Standard 3.6) in both the herb and woody plots is 2 (FACW).

Table 3d: PSS Habitat (~11.6 Acres, 20 Woody Plots & 41 Herb Plots, Year 5)												
Criteria	**3.1**: Percent Combined Native Cover		**3.2:** Percent Invasive Cover		**3.3:** Bare Substrate		**3.4:** Diversity		**3.5:** Native Stem Count/ Cover		**3.6:** Hydrophytic Community	
Performance Standard	**3.1:** ≥ 60% by Year 3 and thereafter		**3.2:** ≤ 30% invasive species by Year 3 and thereafter		**3.3:** ≤ 40% by Year 3 and thereafter		**3.4:** Six native species with ≥ 5% cover, occurring in ≥ 10% of the plots		**3.5:** Either ≥ 1,000 plants per acre or 50% aerial cover of woody species		**3.6:** Prevalence Index is ≤ 3.0	
	Average	Pass? Y/N	Average	Pass? Y/N	Average	Pass? Y/N	Number of species	Pass? Y/N	Average # woody plants /acre	Pass? Y/N	Average	Pass? Y/N
Results	**117%** (58% herbs 59% woody)	**Y**	**3%**	**Y**	**3%**	**Y**	**8**	**Y**	**1,244**	**Y**	**2** (in both herb & woody plots)	**Y**

Note: As of 2015, any herbaceous plot having ≥ 60% shade from woody species was excluded from the bare substrate criteria.

The PSS community is meeting all the performance standards (Standards 3.1- 3.6). It is densely populated with native trees, shrubs and herbs. The combined percent cover of native species (Standard 3.1) is 117% (58% herbs and 59% woody species), which is an increase in cover from 2015 when the total was 105%. Invasive cover (Standard 3.2) in the herb layer was 3% and the woody layer invasive cover rounds to 0%. Cover by other non-natives is also minimal; of the herbaceous non-natives recorded, only one species (*Poa trivialis*) had average cover as high as 3%. Very little bare substrate (Standard 3.3) remains in this habitat; only 3% was recorded compared with 15% in 2015. This is in part due to the fact that there was an increase in the number of herbaceous plots with ≥ 60% shade from woody species, which are thus excluded from the bare substrate criteria. This year, eight (four herbaceous and four woody) native species (*Epilobium ciliatum, Equisetum arvense, Impatiens capensis, Leersia oryzoides , Salix hookeriana, S. sitchensis, S. lucida* var. *lasiandra* and *Populus balsamnifera*) met the diversity standard (Standard 3.4). The habitat's density of 1,244 plants per acre meets density standard (Standard 3.5) and had an increase in density since 2015 when there was an average of 1,131 plants per acre. The average cover in the woody plots is 59% and a total of 12 of the 20 woody plots have ≥ 50% native woody cover. The average prevalence index (Standard 3.6) in both the herb and woody plots is 2 (FACW).

Table 3e: Buffer Habitat (~27.5 acres planted, 36.7 acres total; 14 Woody Plots & 28 Herb Plots, Year 3)										
Criteria	**3.1:** Percent Combined Native Cover		**3.2:** Percent Invasive Cover		**3.3:** Bare Substrate		**3.4:** Diversity		**3.5:** Native Stem Count/ Cover	
Performance Standard	**3.1:** ≥ 60% by Year 3 and thereafter		**3.2:** ≤ 30% invasive species by Year 3 and thereafter		**3.3:** ≤ 40% by Year 3 and thereafter		**3.4:** Six native species with ≥ 5% cover, occurring in ≥ 10% of the plots		**3.5:** Either ≥ 1,000 plants per acre or 50% aerial cover of woody species	
	Average	Pass? Y/N	Average	Pass? Y/N	Average	Pass? Y/N	Number of species	Pass? Y/N	Average # woody plants /acre	Pass? Y/N
Results	**84%** (70% herbs & 14% woody)	**Y**	**2%**	**Y**	**6%**	**Y**	**3**	**N**	**1,210**	**Y**

Note: As of 2015, any herbaceous plot having ≥ 60% shade from woody species was excluded from the bare substrate criteria.

This is Year 3 for the upland buffers and the community is meeting four of the five Year 3 standards. The combined percent cover of native species (Standard 3.1) is 84% (70% herbs and 14% woody cover).

This is similar to 85% in 2015 but there was a slight reduction in herbaceous cover (down from74%) and slight increase in woody cover (up from 11%). The winter floods were more prolonged than typical this year causing the reduced cover of some herbs. For example, the grass *Bromus carinatus* had 10% average cover in 2015 but only 2% cover this year. Invasive cover (Standard 3.2) in the herb layer was 1% and the woody layer invasive cover rounds to 0%. Cover by other non-natives is generally minimal, although *Leontodon taraxacoides* ssp.*taraxacoides* had an average cover of 4%, *Vulpia brominoides* had an average cover of 3% (down from 9% in 2015) and three species had an average cover of 2% (*Bromus hordeaceus, Lactuca serriola*, and *Sonchus asper*). Very little bare substrate (Standard 3.3) remains in this habitat; only 6% was recorded and there was 15% in 2015. Although last year, had it been applicable at Year 2, the buffer would have met the diversity standard (Standard 3.4) with six native grasses, this year only three species (*Elymus glaucus, Festuca rubra* ssp. *rubra* and *Plagiobothrys scouleri*) met the diversity standard.

NOTES: All the above cover percentages in the preceding tables and discussions represent absolute areal cover. Bare substrate includes areas of bare soil and areas covered by moss, water, and/or dead herbaceous plants.

2.2 HYDROLOGY STANDARDS RESULTS:

Standard: "The criteria for achieving wetland hydrology at the mitigation site will be met if hydrologic conditions meet or exceed the basic standard of the 1987 *US Army Corps of Engineers Wetland Delineation Manual*, and refined in the *Corp's May 2010 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region*."

Result: A wetland delineation lite was completed for the project area in 2014, with supplemental data collected in 2016. In 2014, primary indicators of wetland hydrology were observed in all of the enhancement and restoration areas, and nearly all of the designed creation areas, and in an area that was designed as upland buffer but was determined to be wetland creation. In the early growing season of 2014, during "normal" precipitation conditions, 57 out of the 61 hydrology pit locations displayed 17 or more days of consecutive wetland hydrology; and all 3 shallow monitoring wells displayed more than 17 days of consecutive wetland hydrology. Please refer to Appendix B and the 2014 (Year 3) Monitoring Report (Green Banks 2014) for detailed information on the hydrology study and delineation lite.

Standard met? Yes. In 2014 and 2016, all areas of wetland enhancement and restoration, and most wetland creation areas displayed primary and secondary hydrology indicators.

2.3 DELINEATION OF WETLAND ACREAGE ACHEIVED

The post-construction wetland delineation lite was completed in 2014, with supplemental data collected in 2016; please see Appendix B. The following statement is from the 2014 report:

"*The post-construction wetland delineation identified a total of 58.533 acres of wetland within the project area, which includes 4.11 acres of wetland restoration (100% of the designed restoration area) and 18.427 acres of wetland creation (101% of the designed creation area). A small area (1.203 acres) adjacent to the constructed swale within the creation area did not display wetland hydrology indicators and was determined to be upland; however, another small area (1.350 acres) that was designed to be upland buffer had wetland hydrology and hydrophytic vegetation, so was determined to be wetland. The result is a gain of 0.147 acres of wetland creation above what was proposed in the MBI; 18.28 wetland creation acres was designed, 18.427 wetland creation acres was achieved.*"

In March of 2015, DSL agreed with most of the areas delineated as wetland in 2014. However, they requested that additional data be collected in several areas prior to final concurrence.

Data were collected in these areas in the spring of 2016 and slight adjustments were made to the 2014 post-construction boundary line. Once we receive concurrence on the delineation lite we will incorporate these adjustments into a final post-construction wetland boundary. These small adjustments will have a minimal effect on the delineated wetland acreage from 2014.

2.4 WILDLIFE OBSERVATIONS

Since construction of the TVEB, the increased extent and duration of inundated areas have improved the habitat functions for amphibians, fish, insects, waterfowl and other avian species. Numerous species of ducks and Canada geese utilize the site. Great blue herons, egrets and belted kingfishers are often present, feeding in the water. A bald eagle's nest is present in the mature forest located in the southern portion of the site. A mating pair of eagles has been observed on-site since construction of the project in 2011. They have had two offspring per year in 2012 and 2013, and 1 offspring in 2014 and 2015. Besides the eagles, other raptors that utilize the site include osprey, northern harriers (marsh hawks), and other hawk species. During a brief site visit on September 19th 2013, Dave Helzer, a biologist with the City of Portland's Bureau of Environmental Services observed 20 bird species. Black tailed deer are often present in portions of the site and utilize the area for grazing and bedding. A coyote has been observed multiple times within the project area since 2011. Evidence of beaver activity has been observed with beaver cuttings and downed trees throughout the site.

On February 26th 2016 an amphibian survey was conducted by herpetologist Katie Holzier, PhD. assisted by Green Banks staff. The vegetation along the edges of the inundated portion of the site was searched for egg masses of various frogs, salamanders, and newts. Egg masses of the following five native species were observed: Pacific chorus frog (*Hyla regilla* aka *Pseudacris regilla*), red-legged frog (*Rana aurora*), northwestern salamander (*Ambystoma gracile*), long-toed salamander (*Ambystoma macrodactylum*) and roughskin newt (*Taricha granulosa*). We are pleased that the TVEB is providing habitat for this diverse assemblage of amphibians, especially the red-legged frog, which is somewhat rare in Oregon. No egg masses of non-native American bullfrog (*Rana catesbeiana* aka *Lithobates catesbeianus*) were found because they lay their eggs later in the season, but they are known to be present.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 PROJECT STATUS

The mitigation wetlands are essentially in compliance with all the performance standards for Year 5. The upland buffers are in compliance with all of the Year 3 standards except for diversity (Standard 3.4). The delineation lite was completed in 2014, and additional data has been collected in several areas. We consider the project to essentially be in compliance with the wetland hydrology standard as most of the wetland areas have demonstrated positive hydrology indicators and the areas in question are small, totaling approximately 2 acres. See the excerpt from the 2014 monitoring report below:

"The hydrology study and post-construction wetland delineation conducted in 2014, which included data from previous years, prove that the wetland mitigation bank has achieved the acreage targets for the enhancement, restoration, and creation areas as described in the MBI. The creation area was designed to be 18.28 acres, but ended up being 18.427 acres; slightly larger."

In Year 5 the wetland areas are continuing to be diverse native-dominated plant communities. The standards for percent native cover in the two PEM sub-classes (Standards 1.1 and 2.1), the PFO, PSS, and upland buffer habitat classes (Standard 3.1) are all being met. In the early years of a re-vegetation project, the primary concerns are invasion from non-native plant species and mortality of planted and seeded individuals. The TVEB wetland areas had very low weed cover for Year 5 with an average range of 0-3% non-native invasive cover within the various wetland plant community types. This meets the PEM non-native invasive cover standards (1.2 and 2.2) for Year 5, and also meets the PFO and PSS non-native invasive standard (Standard 3.2). The non-native invasive cover was much lower in 2016 (as well as in 2013-2015) than it was in 2012 (Year 1), when the combined herbaceous and woody invasive cover in the PSS habitat, for example, was 9%; whereas this year it was only 3%. Very little reed canarygrass was present in any of the habitats. Frequent vegetation management efforts have kept all non-native species at low cover amounts.

As noted in Section 2.1, there was mortality of some native herbs and grasses in the upland buffers this year, presumably due in part to prolonged winter flooding. While the buffers are still meeting Standard 3.2 with only 2% non-native invasive cover, certain weeds e.g., *Lactuca serriola*, and *Sonchus asper* (in the southeastern buffer) and *Leontodon taraxacoides* ssp.*taraxacoides* (in the western buffer) have expanded their cover. These non-native species in the buffers have been a target for control in 2016. In the fall of 2016, areas of bareground were re-seeded with a native grass seed mix that contained a higher proportion of wet-tolerant species than previously seeded.

The wetland areas have diverse plant communities with a large number of native species in all plant community types and all the applicable wetland habitats are meeting the diversity standards. It is anticipated that by next year (2017) even more tree and shrub species will have high enough aerial cover to further contribute to the diversity standards in the PFO and PSS habitat classes. Currently the FAC/FACW dominated PEM wetland is passing the diversity Standard 1.4 with six species; and the PSS and PFO are passing Standard 3.4 with eight species each.

The upland buffers are not currently meeting the diversity standard. Last year (Year 2) the buffer would have met the Year 3 diversity standard (Standard 3.4) with six native grasses; however three species met the diversity standard this year, likely due in part to the suppression of certain species from prolonged flooding. We anticipate that the buffer areas will meet the diversity standard in 2017 as a result of re-seeding efforts and the expansion of established native species.

The planting of native trees and shrubs in the form of bare root, nursery plug and live cutting have been successful. Some mortality has been observed, but a majority of the woody plantings in the PFO and PSS habitats have high vigor. As a result, there has been a dramatic increase in woody cover in these habitats, especially in the dense rapidly expanding thickets of planted willows and other shrubs in the PSS, where average woody cover is now 59%. Wooded wetland habitat classes now far exceed 1,000 plants and/or stems per acre (Standard 3.5) at an average of 1,294 per acre in the PFO and 1,244 in the PSS habitat. Additionally the buffers are now also in compliance with Standard 3.5; there was an average of 1,210 plants per acre, whereas in 2015 there were only 807 plants per acre. The buffer density increase is due in part to re-planting the buffer areas with flood-tolerant species.

The bare substrate in the PEM FAC/FACW dominated community is only 6% and is meeting the final (Year 3 and thereafter) standard of 20% for that habitat class (standard 1.3). The cover by bare substrate is decreasing in the woody wetland habitat classes and the PFO and PSS communities are meeting the 40% limit for Year 3 and thereafter (standard 3.3). Bare substrate averaged 12% in the PFO herbaceous plots in 2015, which is a reduction from the 20% bare ground in 2015. The PSS class averaged having

3% bare substrate in the herbaceous plots compared with 16% in 2015. This is due in part to more herbaceous plots with ≥ 60% shade, which are thus excluded from the bare substrate standard.

The hydrological enhancements made through construction of the project in 2011 are performing as designed. Please review the MBI or As-Built report for more information about the hydrological enhancements. The primary log-jam was observed approximately twice per month in 2016. Water flow through the log-jam was nearly perennially with very limited flows in the late summer. The primary log-jam is performing as it was designed as it delays the outflow of surface water from the site while providing safe fish passage.

The TVEB credit ledger for 2016 is included in Appendix E. The most recent credit release was on March 23rd 2015, for 6.55 credits. A total of 2.9735 credits were withdrawn from the bank in 2016. There are a total of 2.4102 credits currently released and available for withdrawal.

3.2 RECOMMENDATIONS

The TVEB is currently meeting nearly all of the performance standards for Year 5 and is on track to meeting the performance standards for future years. It is recommended that the current plan and strategy for vegetative community establishment continue. Non-native plant control efforts should continue multiple times per year for the next couple years. There has been a decrease in weed cover within the wetlands since 2012, and it is likely that this trend will continue. Areas of bareground have been re-seeded with a native grass mix in October of 2016; these areas should be observed frequently in 2017 as they have a high chance for weed infestation due to having low native cover. The entire project area should be observed multiple times per year in 2017 to direct maintenance efforts and ensure that the project goals are being met.

3.3 FINANCIAL SECURITY STATUS

A performance bond (Assignment of Deposit) in the amount of $89,782 was established for the release of enhancement area credits on October 24th 2011; $44,891 was returned to the bank sponsor after completion of hydrological enhancements and initial planting of the enhancement area, and $44,891 is currently in the account.

An irrevocable letter of credit was established for the release of restoration, creation and buffer credits in the amount of $196,075. Mr. Heikes, the bank sponsor, requested a partial reduction of this account in March of 2013. This partial reduction was granted on March 11th 2013, and was made prior to the scheduled reduction listed in Exhibit J of the MBI. The total amount remaining in the account is $114,125. An additional increment may be considered when the 3rd year performance standards have been met (DSL 2013).

The release of financial securities will generally follow the financial assurance release schedule as described in Exhibit J of the MBI.

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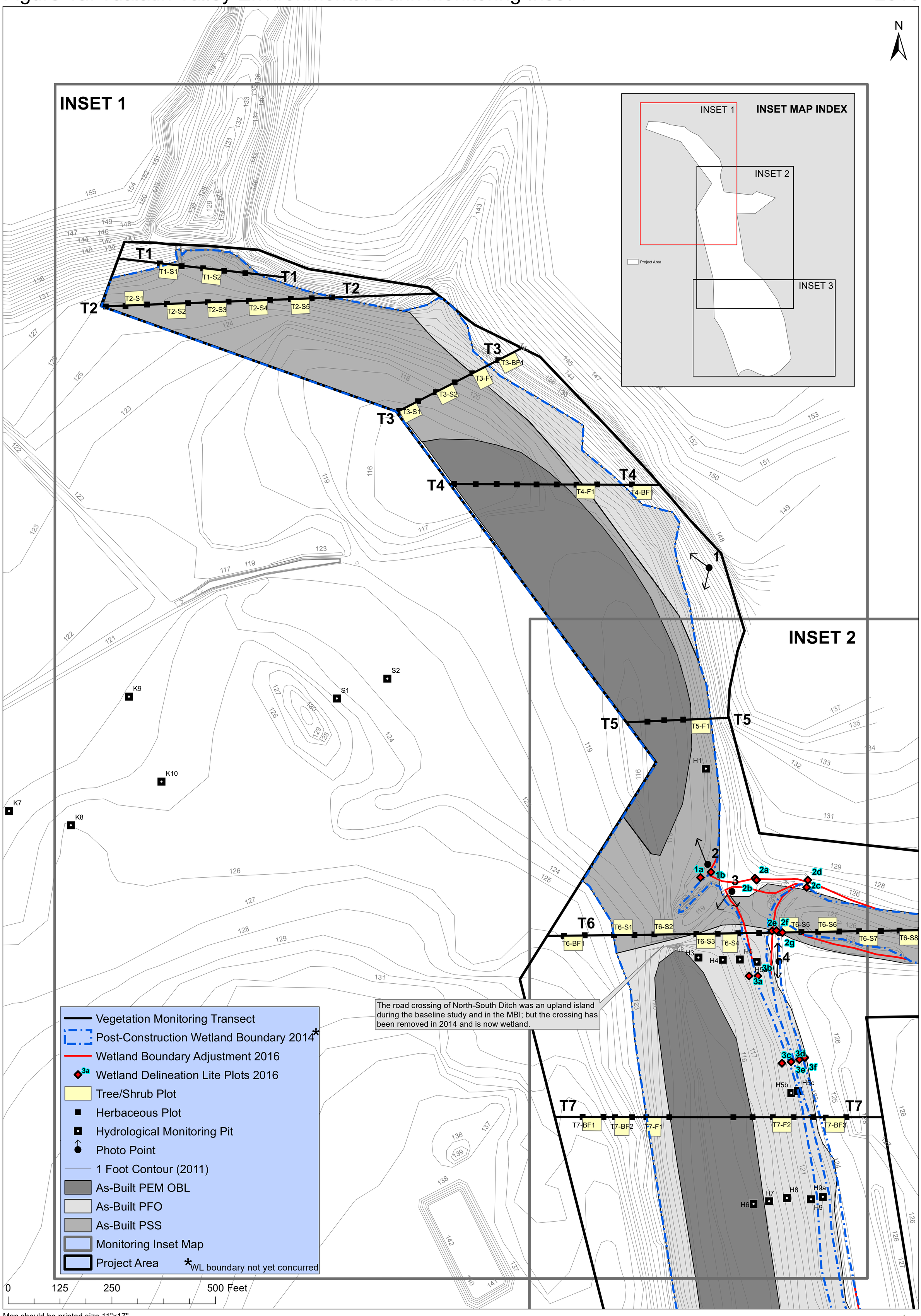
MAPS AND FIGURES:

Figure 1a-1c: Monitoring Location Maps
Figure 2: Post-Construction Wetland Delineation (pending concurrence)
Figure 2a-2c: Delineation Lite 2016 Additional Data
Figure 3: Credit Determination Map (pending delineation concurrence)

Figure 1a: Tualatin Valley Environmental Bank Monitoring Inset 1

2016

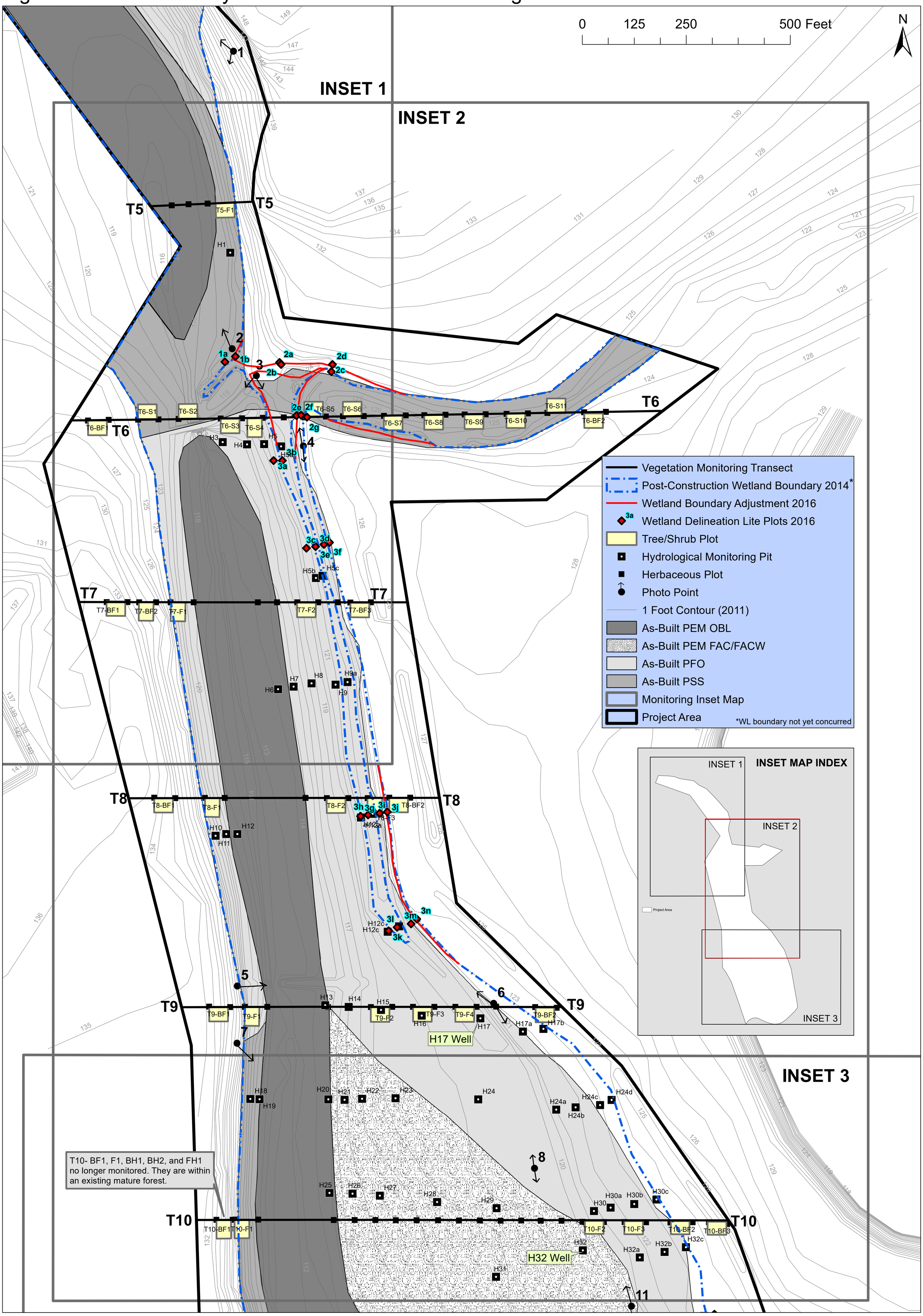


Map should be printed size 11"x17"

greenbanks

Figure 1b: Tualatin Valley Environmental Bank Monitoring Inset 2

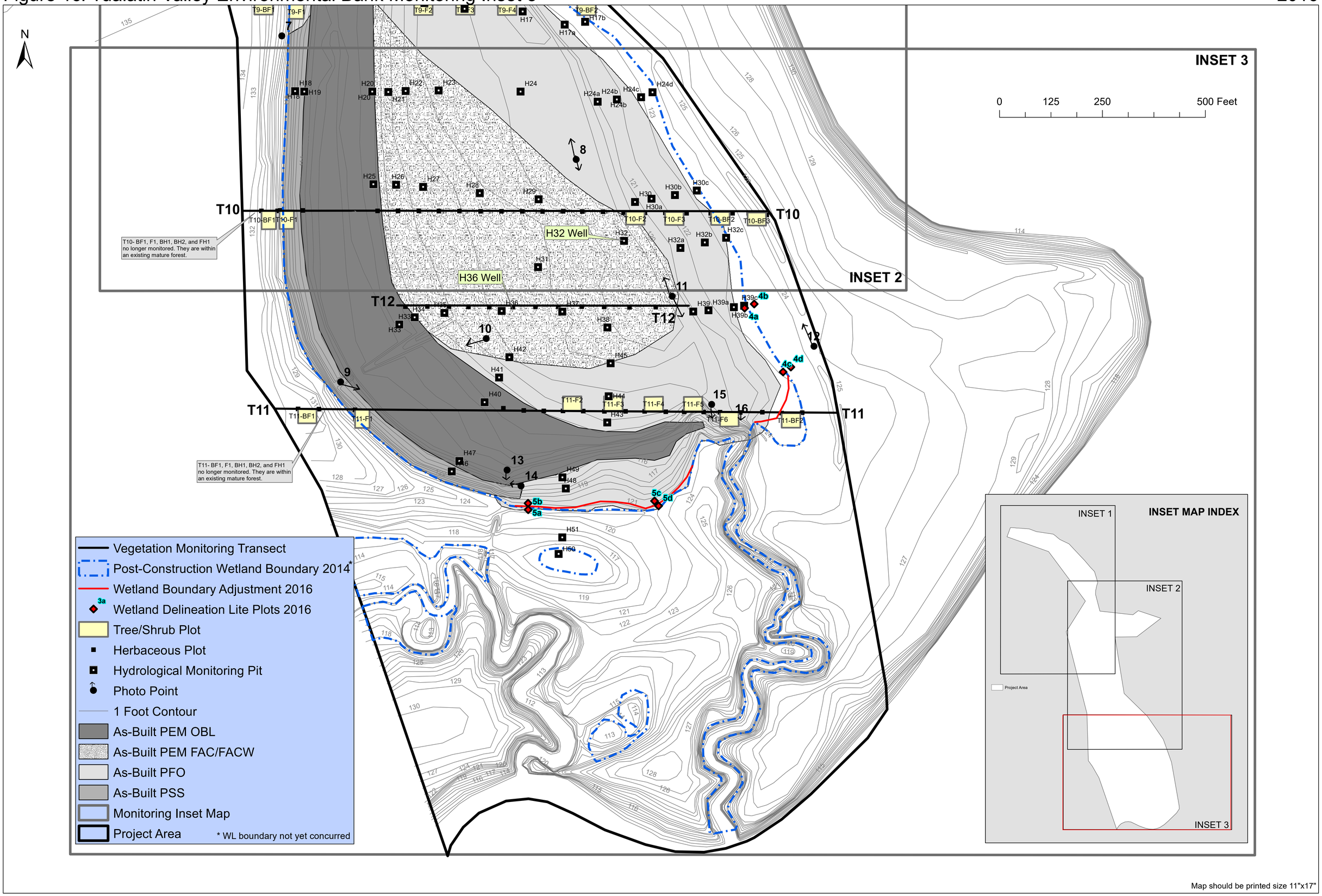
2016



Map should be printed size 11"x17"

greenbanks

Figure 1c: Tualatin Valley Environmental Bank Monitoring Inset 3 2016



Map should be printed size 11"x17"

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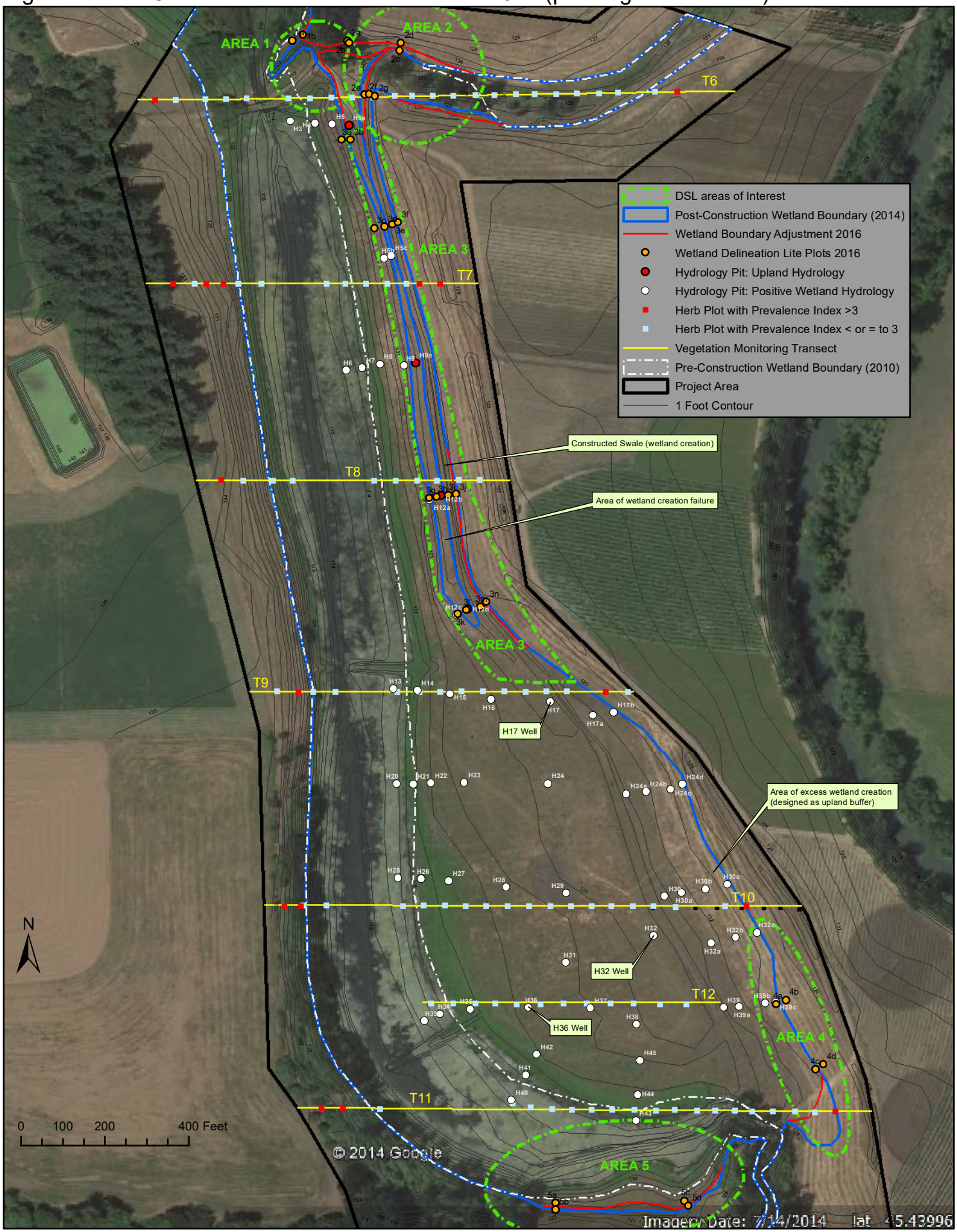
Figure 2: Post-Construction Wetland Delineation 2014 (pending concurrence)



Satellite imagery compliments of Google Earth; captured on 7/14/14.

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Figure 2a: Wetland Delineation Lite Supplemental Data 2016

Areas 1 and 2

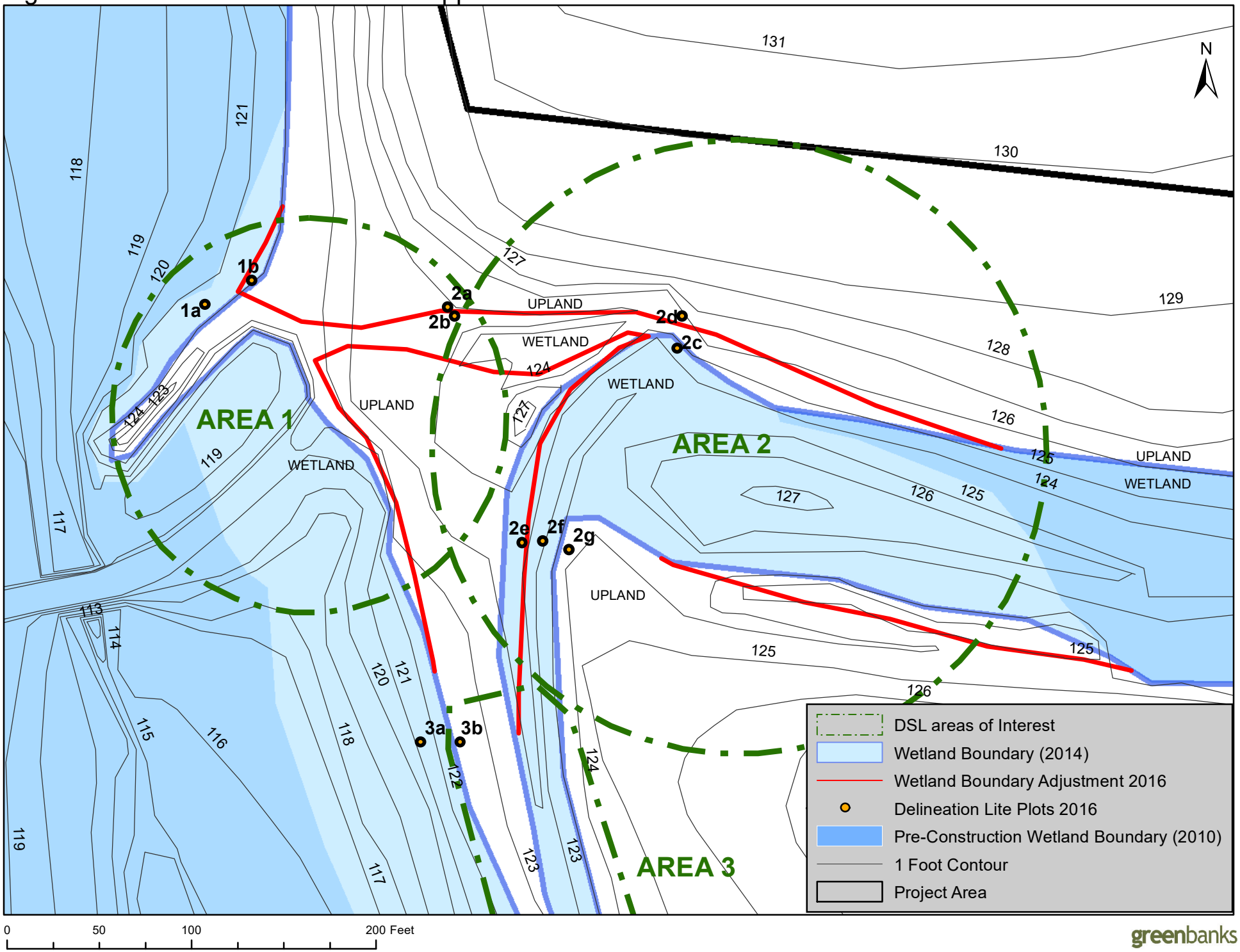

Figure 2b: Wetland Delineation Lite Supplemental Data 2016

Area 3

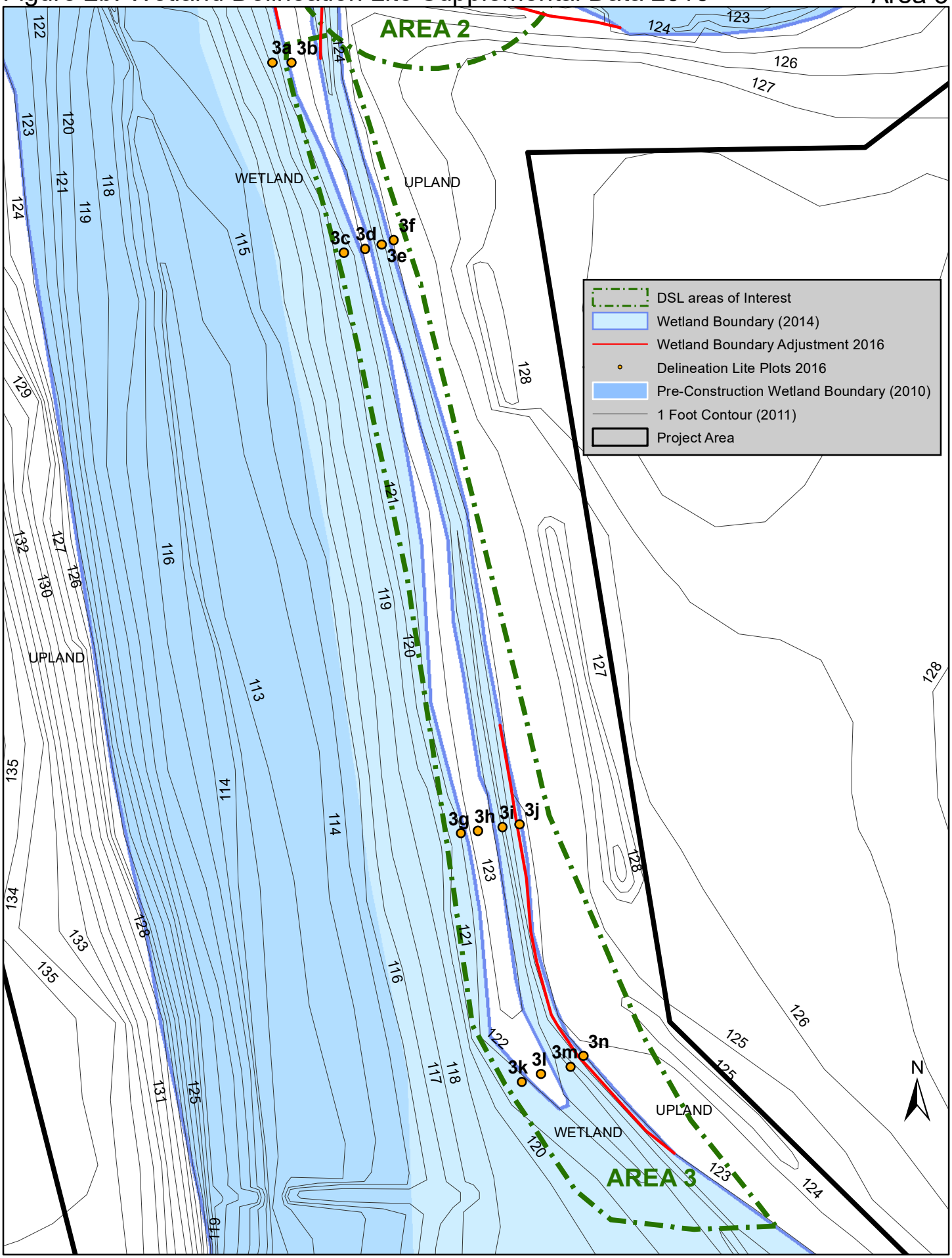

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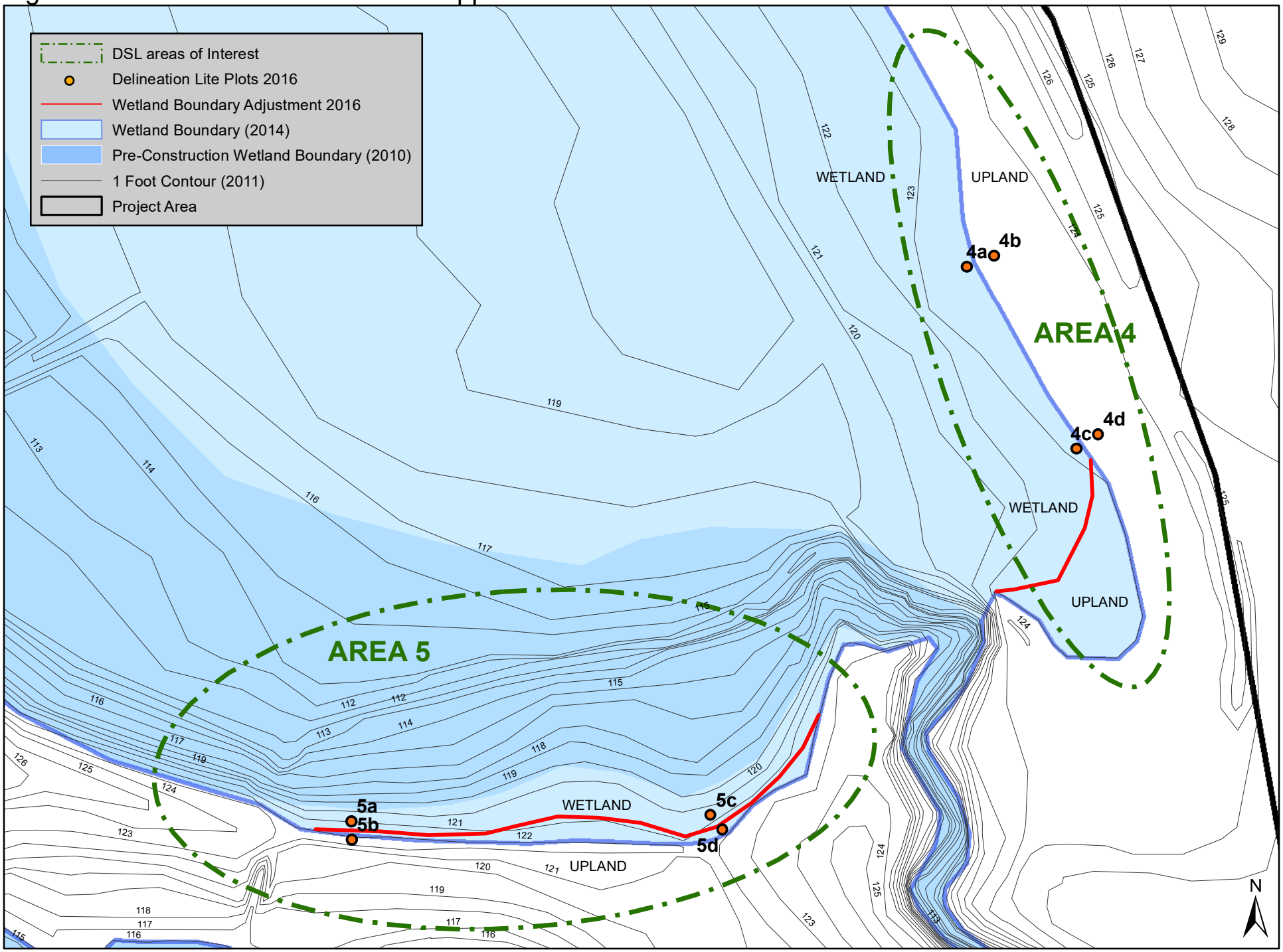
Figure 2c: Wetland Delineation Lite Supplemental Data 2016

Areas 4 and 5



0 100 200 400 Feet

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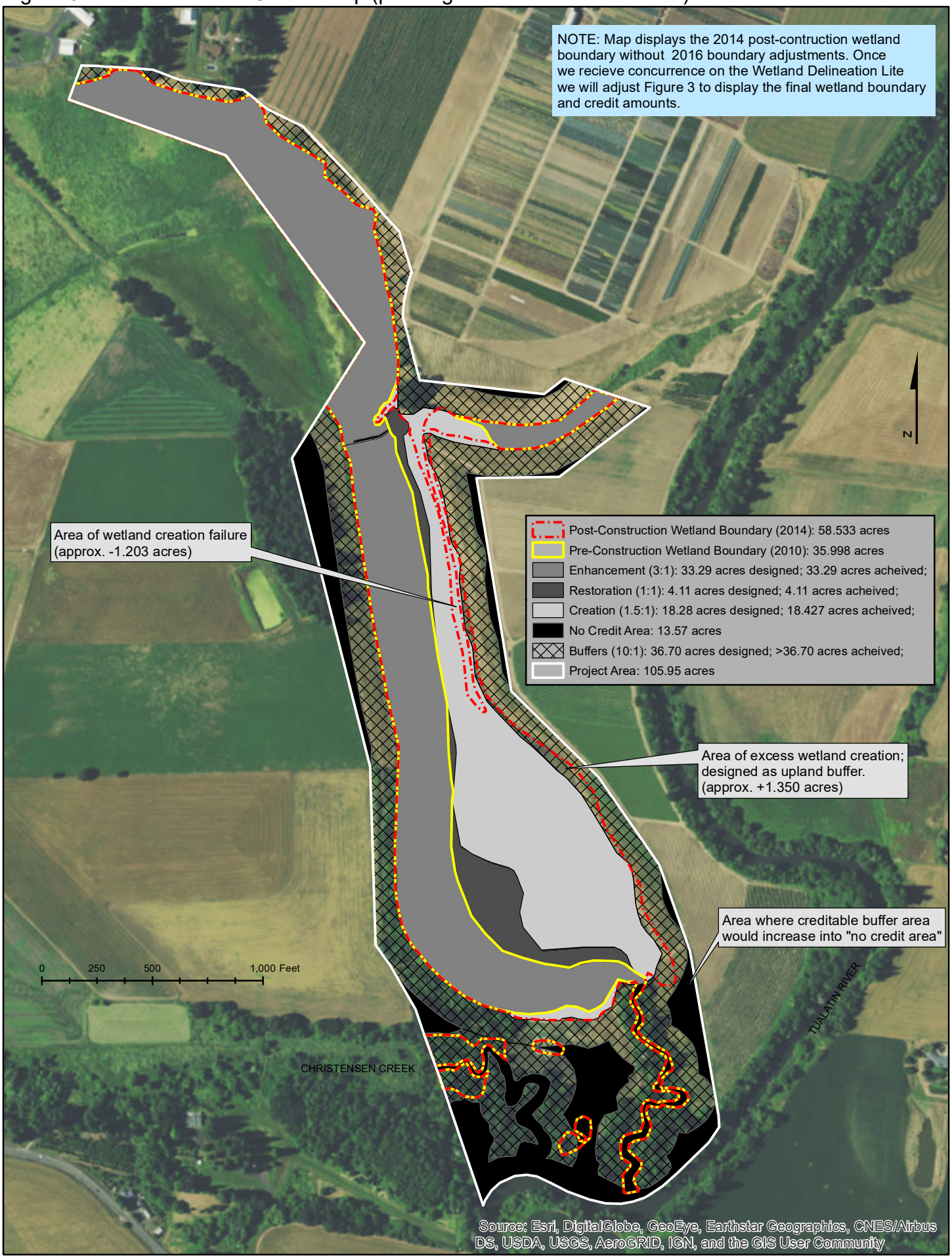
Figure 3: Determination of Credits Map (pending delineation concurrence)



Aerial photo compliments of Google Earth.

APPENDICES:

APPENDIX A: Vegetation Data
APPENDIX B: Wetland Delineation Lite 2016 Additional Data
APPENDIX C: Photographic Documentation
APPENDIX D: Vegetation Monitoring Transect Location Table
APPENDIX E: Credit Ledger (2016)

APPENDIX A: VEGETATION DATA

Vegetation Data Tables should be printed at the size of 11"x17".

Vegetation monitoring notes are included after the tables in this appendix.

TUALATIN VALLEY ENVIRONMENTAL BANK

2016 Vegetation Monitoring	**Sample Date(s):**	6/21/16-7/8/16		*Percent (%) Cover*																											
Buffer Herbaceous Community	Origin (N, NN, I)	Wetland Status (1 - 5)	**T3-BH1**	**T3-BH2**	**T4-BH1**	**T4-BH2**	**T6-BH1**	**T6-BH2**	**T6-BH3**	**T6-BH4**	**T7-BH1**	**T7-BH2**	**T7-BH3**	**T7-BH4**	**T7-BH5**	**T7-BH6**	**T8-BH1**	**T8-BH2**	**T8-BH3**	**T8-BH4**	**T9-BH1**	**T9-BH2**	**T9-BH3**	**T9-BH4**	**T10-BH3**	**T10-BH4**	**T10-BH5**	**T10-BH6**	**T11-BH3**	**T11-BH4**		
Species																															**Average**	
Native Herbaceous Species																																
Achillea millefolium	N	4	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	5	0	0	0	3	10	0	0	**1**	
Bidens cernua	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	**0**	
Bidens frondosa	N	2	0	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	3	15	0	0	0	1	0	0	0	0	0	0	**1**	
Bromus carinatus	N	5	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	5	0	0	0	0	0	0	30	0	7	**2**	
Deschampsia cespitosa	N	2	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	25	0	0	30	30	1	0	0	0	0	10	**4**	
Deschampsia elongata	N	2	0	0	0	0	0	5	0	15	0	0	0	0	12	0	0	0	1	0	0	0	0	0	0	0	20	0	15	10	**3**	
Elymus glaucus	N	4	0	60	95	45	0	0	0	0	94	20	25	10	0	5	10	25	0	0	20	30	0	0	0	0	0	0	0	0	**16**	
Epilobium ciliatum	N	2	0	0	2	0	0	0	0	5	2	0	0	0	15	0	0	0	2	5	0	0	0	1	1	0	1	3	1	0	**1**	
Epilobium densiflorum	N	2	0	0	1	0	0	0	0	0	0	0	0	1	0	3	0	0	0	4	0	0	0	0	15	0	0	0	0	0	**1**	
Equisetum arvense	N	3	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Festuca idahoensis	N	4	0	0	0	0	0	0	15	25	0	25	10	5	3	20	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**4**	
Festuca rubra ssp. *rubra*	N	3	0	0	0	5	35	10	85	20	0	55	62	60	0	0	73	70	0	0	60	70	0	0	0	0	0	0	25	30	**24**	
Gnaphalium palustre	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	**0**	
Hordeum brachyantherum	N	2	0	0	0	0	0	0	2	0	0	0	0	0	10	20	0	0	0	0	0	0	15	3	2	50	0	0	0	0	**4**	
Lotus unifoliolatus	N	4	0	0	0	0	0	0	0	0	0	0	0	3	3	5	0	0	0	0	0	0	0	2	0	0	4	0	0	0	**1**	
Madia sativa	N	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	1	0	10	0	0	0	0	**1**	
Panicum capillare	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	**0**	
Plagiobothrys scouleri	N	2	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	55	0	0	0	0	15	70	0	0	0	0	0	**5**	
Polygonum (Persicaria) lapathifolium	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	1	0	0	0	0	0	0	**0**	
Potentilla norvegica	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	**0**	
Prunella vulgaris	N	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	**0**	
Psilocarphus elatior	N	2	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	5	0	0	0	0	5	0	0	8	0	0	0	**1**	
Rorippa curvisiliqua	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	20	0	0	0	2	1	7	15	0	3	5	**2**	
Veronica peregrina	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	1	0	0	1	3	0	3	**0**	
Invasive Herbaceous Species																																
Cirsium arvense	I	3	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Rubus sp. (cultivar) seedlings	I		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	**0**	
Holcus lanatus	I	3	30	2	2	2	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	
Non-Native Herbaceous Species																																
Agrostis capillaris	NN	3	0	0	0	0	25	5	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	**1**	
Agrostis species	NN		0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Alopecurus pratensis	NN	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Anthemis cotula	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	10	5	0	0	0	0	0	0	0	8	0	0	0	0	5	0	**1**	
Avena species	NN		0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Bromus hordeaceus	NN	4	25	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	
Capsella bursa-pastoris	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**0**	
Centaurium erythraea (umbellatum)	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	**0**	
Cerastium glomeratum	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	1	0	0	1	0	0	0	**0**	
Crepis setosa	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	**0**	
Daucus carota	NN	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Geranium dissectum	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	**0**	
Geranium molle	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	5	0	**0**	
Gnaphalium uliginosum	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Hypochaeris radicata	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	**0**	
Kickxia elatine	NN	3	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0	2	5	0	0	0	0	0	0	2	0	0	0	**0**	
Lactuca serriola	NN	4	1	0	0	0	0	0	0	0	3	0	0	12	0	0	0	0	4	0	2	0	3	2	3	5	7	0	20	5	**2**	
Leontodon taraxacoides ssp.taraxacoides	NN	5	0	0	0	0	35	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**	
Lolium perenne	NN	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	6	10	0	0	0	10	5	0	3	0	3	0	**1**	
Misopates orontium	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**0**	
Myosotis discolor	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	**1**	
Poa annua	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	**0**	
Plantago major	NN	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	5	0	0	5	2	2	10	0	3	0	8	**1**	
Raphanus sativus	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	**0**	
Sonchus asper	NN	4	0	0	0	0	1	0	0	1	0	0	0	0	12	0	0	0	2	8	0	0	0	3	0	10	3	15	3	5	**2**	
Vicia hirsuta	NN	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Vicia sativa	NN	5	25	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	
Vulpia brominoides	NN	4	0	10	0	45	0	0	0	0	0	0	0	0	0	20	5	0	0	0	3	0	0	0	0	0	0	0	0	0	**3**	
Bare Substrate																																
Bare ground and/or moss			0	0	0	3	0	0	0	5	0	0	0	0	1	2	10	0	0	15	10	0	22	11	0	0	6	31	10	12	**5**	
Dead sprayed weeds			15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	**1**	
Shade & Woody Stem Cover on Ground																																
Shade from woody plants			0	0	0	0	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	**1**	
Stem cover on ground			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Aerial cover of native trees/shrubs rooted in plot (species 4 letter code noted)			0	0	0	0	1 (ALRU)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2 MAAQ) 3(PHCA)	0	2 (ALRU)	0	0	0		
Summary Information			**T3-BH1**	**T3-BH2**	**T4-BH1**	**T4-BH2**	**T6-BH1**	**T6-BH2**	**T6-BH3**	**T6-BH4**	**T7-BH1**	**T7-BH2**	**T7-BH3**	**T7-BH4**	**T7-BH5**	**T7-BH6**	**T8-BH1**	**T8-BH2**	**T8-BH3**	**T8-BH4**	**T9-BH1**	**T9-BH2**	**T9-BH3**	**T9-BH4**	**T10-BH3**	**T10-BH4**	**T10-BH5**	**T10-BH6**	**T11-BH3**	**T11-BH4**	**Habitat Average**	**Standard Error**
Cover of Native Herbaceous Species			7	60	98	50	36	15	102	75	96	100	97	86	70	73	83	100	74	69	85	100	52	61	90	72	55	43	44	67	**70**	4.8
Lower CI (80%)																															64	
Upper CI (80%)																															76	
Cover of Invasive Herbaceous Species			30	2	2	2	0	0	10	10	0	0	3	2	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	**2**	1.1
Lower CI (80%)																															1	
Upper CI (80%)																															4	
Bare Substrate			15	0	0	3	0	0	0	5	0	0	0	0	1	2	10	0	0	15	10	0	37	11	0	0	6	31	10	12	**6**	1.8
Lower CI (80%)																															4	
Upper CI (80%)																															8	
Native Diversity																															Currently 3 native herb spp. (ELGL,PLSC & FERU) meet the diversity criteria	
Prevalence Index			4	4	4	4	4	5	3	3	4	3	3	3	3	4	3	3	2	2	3	3	2	3	2	3	2	4	3	3		
Weighted Prevalence Index			352	411	417	381	370	461	349	263	395	345	335	336	272	366	285	330	251	244	305	330	154	225	212	274	225	293	286	247		
Sum of herbaceous plant cover			91	103	106	97	100	102	112	95	100	100	100	100	99	98	90	100	102	110	90	100	63	89	100	100	92	69	90	88		

TUALATIN VALLEY ENVIRONMENTAL BANK

2016 Vegetation Monitoring

PFO Herbaceous Community

Sample Date(s): 6/21/16-7/8/16

Percent (%) Cover

Species	Origin (N, NN, I)	Wetland Status (1 - 5)	T3-FH1	T4-FH1	T4-FH2	T5-FH1	T5-FH2	T7-FH1	T7-FH2	T7-FH3	T7-FH4	T8-FH1	T8-FH2	T8-FH3	T8-FH4	T9-FH1	T9-FH2	T9-FH3	T9-FH4	T9-FH5	T9-FH6	T9-FH7	T9-FH8	T10-FH2	T10-FH3	T10-FH4	T10-FH5	T11-FH2	T11-FH3	T11-FH4	T11-FH5	T11-FH6	T11-FH7	T11-FH10	T11-FH11	T11-FH12	Row Average
Native Herbaceous Species																																					
Achillea millefolium	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	**0**
Agrostis exarata	N	2	0	0	0	0	0	10	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Alisma trivale	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	**0**
Beckmannia syzigachne	N	1	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	**0**
Bidens cernua	N	1	0	0	0	0	7	0	0	0	0	10	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Bidens frondosa	N	2	0	0	0	0	0	35	0	0	0	0	0	0	8	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
Carex densa	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	**1**
Carex obnupta	N	1	0	0	0	0	0	0	0	0	10	0	0	3	0	0	0	0	15	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	**1**
Carex scoparia and/or C. ovalis	N	2	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Deschampsia cespitosa	N	2	0	0	0	0	10	20	0	0	6	10	0	15	0	0	0	75	0	20	6	25	95	70	20	65	15	0	0	0	0	0	0	0	45	15	**15**
Deschampsia elongata	N	2	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Eleocharis acicularis	N	1	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Eleocharis obtusa	N	1	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	**1**
Eleocharis palustris	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	0	0	0	0	0	0	0	0	**2**
Epilobium densiflorum	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	**0**
Epilobium ciliatum	N	2	0	0	10	0	5	0	1	0	0	0	0	0	0	0	15	0	1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	2	0	1	**1**
Equisetum arvense	N	3	85	10	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
Festuca rubra ssp. *rubra*	N	3	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Hordeum brachyantherum	N	2	0	0	3	0	30	0	0	0	7	0	0	10	0	0	5	0	1	0	0	5	0	20	2	0	45	0	0	0	0	0	0	0	10	40	**5**
Impatiens capensis	N	2	25	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Juncus effusus	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Juncus oxymeris	N	2	0	0	0	0	0	0	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Juncus patens	N	2	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	**0**
Juncus tenuis	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Leersia oryzoides	N	1	0	95	95	100	0	0	15	0	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	5	45	25	10	35	0	0	0	**15**
Lemna minor	N	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	**0**
Lotus unifoliolatus	N	4	0	0	0	0	0	0	0	0	0	0	0	5	7	0	80	1	1	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	8	0	**3**
Ludwigia palustris	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Madia sativa	N	5	0	0	0	0	0	0	0	7	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
Microsteris gracillis	N	4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Panicum capillare	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	**0**
Plagiobothrys scouleri	N	2	0	0	0	0	0	0	0	45	3	0	0	50	10	0	15	0	40	55	90	30	0	3	10	25	2	0	0	0	0	0	0	0	0	0	**11**
Polygonum (Persicaria) hydropiperoides	N	1	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	25	25	15	0	0	0	**4**
Polygonum (Persicaria) lapathifolium	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Potomogeton natens and/or P. nodosus	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	10	15	0	0	0	**1**
Prunella vulgaris	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	**0**
Psilocarphus elatior	N	2	0	0	0	0	0	0	0	40	5	0	0	2	25	0	10	0	0	0	0	2	0	0	4	0	1	0	0	0	0	0	0	0	0	0	**3**
Ranunculus sceleratus	N	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Rorippa curvisiliqua	N	1	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	**1**
Rubus ursinus	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Schoenoplectus tabernaemontani	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	**0**
Sparganium emersum	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	5	35	50	30	0	0	0	**5**
Veronica peregrina	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	**0**
Invasive Herbaceous Species																																					
Cirsium vulgare	I	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Convolvulus arvensis	I	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	15	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	**1**
Phalaris arundinacea	I	2	0	0	0	3	5	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	3	0	0	0	0	0	0	**1**
Non-Native Herbaceous Species																																					
Agrostis stolonifera	NN	3	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Anthemis cotula	NN	4	0	0	0	0	0	0	0	3	0	0	0	2	10	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Centaurium erythraea (umbellatum)	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**0**
Crepis setosa	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	**0**
Daucus carota	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	**0**
Geranium dissectum	NN	4	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Hypochaeris radicata	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	**0**
Kickxia elatine	NN	3	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Lactuca serriola	NN	4	0	0	0	0	7	7	0	0	10	5	0	0	5	0	0	1	0	1	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	**1**
Leontodon taraxacoides ssp.taraxacoides	NN	5	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	**1**
Lolium perenne	NN	3	0	0	0	0	0	10	0	0	0	20	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Misopates orontium	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	2	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Poa annua	NN	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Poa species (asssumed NN, FAC)	*NN*	*3*	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Raphanus sativus	NN	5	0	0	0	0	0	0	0	0	0	7	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Rumex crispus	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Rumex obtusifolius	NN	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Sonchus asper	NN	4	0	0	0	0	0	2	0	0	0	10	0	2	7	0	10	0	0	1	0	1	1	0	0	1	5	0	0	0	0	0	0	0	2	0	**1**
Bare Substrate														0																							
Bare ground and/or moss			NA (0)	0	0	0	1	4	0	0	44	0	0	0	0	85	0	7	22	17	0	28	3	7	9	0	21	0	14	17	3	4	4	NA (97)	13	21	**10**	bare substrate is NA plots that have >. 60% woody shade
Dead sprayed weeds			0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	10	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	**2**	
Unvegetated water			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Shade, Woody Stem Cover & Water Depth																																					
Shade from woody plants			100	5	30	5	25	0	25	5	0	15	0	0	0	0	5	3	5	0	15	15	0	0	0	15	0	0	0	5	0	0	0	100	10	0	**11**	
Stem cover on ground			0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	
Aerial cover of native trees/shrubs rooted in plot (species 4-letter code noted)			5 (SPDO)	0	0	0	0	0	25 (COSE)	0	0	15 (FRLA)	0	0	0	0	5 (LOIN)	3 (SAHO)	0	0	15 (FRLA)	15 (FRLA)	1 (FRLA)	0	0	10 (LOIN)	0	0	0	5 (SALA)	0	0	0	0	0	0		
Approx. water depth (feet)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0.25	0	0	0	**0**	

Summary Information	T3-FH1	T4-FH1	T4-FH2	T5-FH1	T5-FH2	T7-FH1	T7-FH2	T7-FH3	T7-FH4	T8-FH1	T8-FH2	T8-FH3	T8-FH4	T9-FH1	T9-FH2	T9-FH3	T9-FH4	T9-FH5	T9-FH6	T9-FH7	T9-FH8	T10-FH2	T10-FH3	T10-FH4	T10-FH5	T11-FH2	T11-FH3	T11-FH4	T11-FH5	T11-FH6	T11-FH7	T11-FH10	T11-FH11	T11-FH12	Habitat Average	Standard Error
Cover of Native Herbaceous Species	110	106	113	102	77	65	99	97	44	20	110	110	50	0	126	76	60	78	97	63	96	93	86	92	69	111	80	90	97	96	96	2	63	56	**80**	5.2
Lower CI (80%)																																			74	
Upper CI (80%)																																			87	
Cover of Invasive Herbaceous Species	0	0	0	3	5	0	0	0	0	20	0	0	0	0	0	0	3	2	15	2	0	0	5	0	0	0	6	3	0	0	0	0	0	0	**2**	1
Lower CI (80%)																																			1	
Upper CI (80%)																																			3	
Bare Substrate	NA	0	0	0	1	4	0	0	44	0	0	0	12	85	0	17	37	17	0	28	3	7	9	0	21	0	14	7	3	4	4	NA	13	41	**12**	4
Lower CI (80%)																																			6	
Upper CI (80%)																																			17	
Native Diversity																																			8 plants meet diversity criteria- DECE, HOBR, LEOR, PLSC & SPEM (herbs) + FRLA, SAHO & SALA (woody)	
Prevalence Index	3	1	1	1	2	3	2	2	2	3	1	2	3	4	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	3	2	**2**	N/A
Weighted Prevalence Index	305	126	136	108	220	249	210	230	139	234	110	238	266	65	451	180	121	179	269	141	196	186	196	191	184	111	92	96	97	96	96	7	258	127		
Sum of herbaceous plant cover	110	106	113	105	99	96	109	101	56	85	110	114	88	15	136	83	63	83	112	67	97	93	91	93	79	111	86	93	97	96	96	3	87	59		

TUALATIN VALLEY ENVIRONMENTAL BANK

2016 Vegetation Monitoring — **Sample Date(s):** 6/21/16-7/8/16

Percent (%) Cover

PSS Herbaceous Community Species	Origin (N, NN, I)	Wetland Status (1 - 5)	T1-SH1	T1-SH2	T1-SH3	T1-SH4	T1-SH5	T2-SH1	T2-SH2	T2-SH3	T2-SH4	T2-SH5	T2-SH6	T2-SH7	T2-SH8	T2-SH9	T2-SH10	T2-SH11	T2-SH12	T3-SH1	T3-SH2	T3-SH3	T3-SH4	T6-SH1	T6-SH2	T6-SH3	T6-SH4	T6-SH5	T6-SH6	T6-SH7	T6-SH8	T6-SH9	T6-SH10	T6-SH11	T6-SH12	T6-SH13	T6-SH14	T6-SH15	T6-SH16	T6-SH17	T6-SH18	T6-SH19	T6-SH20	Average	
Native Herbaceous Species																																													
Agrostis exarata	N	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Alisma triviale	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Beckmannia syzigachne	N	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Bidens cernua	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	20	5	10	2	0	0	**1**	
Bidens frondosa	N	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Carex obnupta	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Carex species	N		0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Cyperus erythrorhizos	N	1	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Deschampsia cespitosa	N	2	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	5	0	0	0	15	0	5	0	0	0	0	0	0	0	0	0	0	**1**	
Eleocharis obtusa	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	2	7	3	8	0	0	**1**	
Epilobium ciliatum	N	2	0	7	0	5	7	0	0	0	1	3	15	35	0	0	0	0	2	0	0	35	10	5	80	15	0	0	5	0	0	2	10	4	5	25	0	0	15	2	15	3	15	**8**	
Epilobium densiflorum	N	2	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Equisetum arvense	N	3	65	5	0	10	0	10	5	5	0	0	0	0	80	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**5**	
Equisetum palustre	N	2	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	
Festuca rubra ssp. *rubra*	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Galium aparine	N	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Glyceria borealis	N	1	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Gnaphalium palustre	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	25	0	0	3	0	0	0	0	2	0	0	15	3	0	**1**	
Hordeum brachyantherum	N	2	0	0	0	0	0	0	0	0	75	0	10	35	0	0	0	0	0	0	0	0	0	0	0	3	10	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**3**	
Impatiens capensis	N	2	40	85	50	35	35	35	30	35	5	0	10	0	0	10	10	35	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**10**	
Juncus bufonius	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Juncus effusus	N	2	0	0	0	15	0	0	0	15	0	0	5	0	0	0	0	25	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**2**	
Leersia oryzoides	N	1	0	0	0	0	0	0	20	25	0	70	0	0	0	40	0	0	0	60	0	0	40	0	5	65	0	65	70	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**11**	
Lotus unifoliolatus	N	4	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	
Navarretia species	N		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Panicum capillare	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	25	**1**	
Plagiobothrys scouleri	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	5	0	0	0	0	0	0	0	0	10	0	0	0	0	0	**1**	
Polygonum lapathifolium	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	2	0	0	0	5	**0**	
Potentilla norvegica	N	3	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Ranunculus sceleratus	N	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Rorippa curvisiliqua	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	2	0	5	**0**	
Scirpus microcarpus	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	
Typha latifolia	N	1	15	0	0	0	0	70	40	0	0	0	0	0	2	5	0	5	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**	
Veronica americana	N	1	0	0	0	0	10	0	20	0	0	20	0	0	30	0	0	15	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	
Invasive Herbaceous Species														0																										0			
Cirsium arvense	I	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	**0**	
Convolvulus arvensis	I	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Cyperus esculentus	I	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	**0**	
Holcus lanatus	I	3	12	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	**1**	
Rubus aremeniacus (seedlings)	I	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	**0**	
Phalaris arundinacea	I	2	0	0	0	0	0	5	0	10	0	0	10	0	10	0	0	0	0	0	15	0	6	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	7	0	**2**	
Non-Native Herbaceous Species																																													
Agrostis capillaris	NN	3	0	0	1	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	
Agrostis stolonifera	NN	3	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	85	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	10	30	0	15	85	0	**6**	
Agrostis species (assmed NN, FAC or wetter)	*NN*	*3*	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	**1**	
Alopecurus pratensis	NN	3	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Anthemis cotula	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	10	0	5	0	0	0	0	0	0	0	0	0	0	**1**	
Bromus hordeaceus	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Daucus carota	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	**0**	
Echinochloa crusgalli	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	**0**	
Geranium dissectum	NN	4	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Gnaphalium uliginosum	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	3	15	0	10	0	10	**1**	
Hypochaeris radicata	NN	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Kickxia elatine	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	2	0	0	0	0	5	6	0	6	0	0	0	0	0	0	0	0	0	0	**1**	
Lactuca serriola	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	**0**	
Leontodon taraxacoides ssp.taraxacoides	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	5	0	0	6	0	0	0	0	0	0	0	0	0	0	**1**	
Lolium perenne	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	0	0	3	0	0	3	0	0	20	0	0	0	0	0	0	0	0	0	0	**2**	
Lotus corniculatus	NN	3	7	0	5	5	0	0	0	0	0	0	0	0	0	0	0	5	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	
Lythrum portula	NN	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	15	0	20	0	0	**2**	
Misopates orontium	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Parentucellia viscosa	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	**0**	
Plantago lanceolata	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Plantago major	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	**0**	
Poa annua	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	**0**	
Poa species	NN	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Poa trivialis	NN	3	0	2	5	0	15	0	0	0	20	5	15	7	5	2	40	10	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	
Raphanus sativus	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	7	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Ranunculus repens	NN	3	0	0	7	2	10	0	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	
Rumex crispus	NN	3	0	0	0	0	0	0	0	0	3	0	5	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	**1**	
Rumex obtusifolius	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**0**	
Sonchus asper	NN	4	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0	0	**0**	
Solanum dulcamara	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Trifiloium species	NN		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	15	**1**	
Vicia species, assumed NN, FACU or drier	*NN*	*4*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	**0**	
Vicia tetrasperma	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	**0**	
Bare Substrate																																													
Bare ground and/or moss			0	NA (10)	0	NA (24)	0	0	0	0	0	NA(5)	5	6	0	0	NA(20)	0	0	5	0	NA (20)	0	0	NA (0)	NA (0)	0	0	0	9	49	NA (90)	0	NA (94)	NA (93)	NA (71)	NA (99)		2	NA (75)	5	0	5	**3**	bare substrate is NA in plots with ≥ 60% shade.
Dead/sprayed weeds			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Shade & Woody Stem Cover on Ground																																													
Shade from woody plants			5	60	10	95	0	0	0	0	0	90	0	5	5	15	100	0	0	0	5	60	10	20	80	60	40	10	5	0	0	100	5	100	100	100	100	10	5	100	30	0	5	**32**	
Stem cover on ground			0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	**1**	
Aerial cover of native trees/shrubs <u>rooted</u> in plot (species 4 letter code noted)			5 (SALA)	0	0	0	3 (FRLA)	0	0	0	0	0	0	0	0	10 (SPDO)	100 (Salix)	0	0	0	0	0	10 (SALA)	0	0	0	0	5 (LOIN)	0	0	0	0	5 (ALRU)	0	0	0	100 (POBA)	5 (Salix sp)	0	0	0	0	0		
Summary Information			**T1-SH1**	**T1-SH2**	**T1-SH3**	**T1-SH4**	**T1-SH5**	**T2-SH1**	**T2-SH2**	**T2-SH3**	**T2-SH4**	**T2-SH5**	**T2-SH6**	**T2-SH7**	**T2-SH8**	**T2-SH9**	**T2-SH10**	**T2-SH11**	**T2-SH12**	**T3-SH1**	**T3-SH2**	**T3-SH3**	**T3-SH4**	**T6-SH1**	**T6-SH2**	**T6-SH3**	**T6-SH4**	**T6-SH5**	**T6-SH6**	**T6-SH7**	**T6-SH8**	**T6-SH9**	**T6-SH10**	**T6-SH11**	**T6-SH12**	**T6-SH13**	**T6-SH14**	**T6-SH15**	**T6-SH16**	**T6-SH17**	**T6-SH18**	**T6-SH19**	**T6-SH20**	**Habitat Average**	**Standard Error**
Cover of Native Herbaceous Species			123	97	85	66	67	115	115	80	83	93	52	82	112	105	10	80	17	112	0	41	107	5	91	92	65	85	111	31	30	2	18	4	5	26	1	35	38	15	42	6	50	**58**	6.3
Lower CI (80%)																																												50	
Upper CI (80%)																																												66	
Cover of Invasive Herbaceous Species			12	0	0	0	7	5	0	10	0	0	10	0	10	0	0	0	0	0	15	0	6	0	0	10	0	0	0	5	0	7	3	0	0	3	0	0	0	0	5	7	10	**3**	1
Lower CI (80%)																																												2	
Upper CI (80%)																																												4	
Bare Substrate			0	NA	0	NA	0	0	0	0	0	NA	5	6	0	0	NA	0	0	5	0	NA	0	0	NA	NA	0	0	0	9	49	NA	0	NA	NA	NA	NA	0	2	NA	5	0	5	**3**	0
Lower CI (80%)																																												2	
Upper CI (80%)																																												4	
Native Diversity																																												8 plants meet diversity criteria-EPCI, EQAR, IMCA, & LEOR (herbs) + POBA,SASI, SALA, & SAHO (woody).	
Prevalence Index			3	2	2	2	2	2	1	2	2	1	2	2	2	2	3	2	3	1	3	2	2	3	2	1	3	1	1	3	3	3	3	3	3	2	1	1	2	2	2	3	2	**2**	N/A
Weighted Prevalence Index			359	205	269	171	218	180	155	190	233	126	222	197	322	161	140	230	329	112	285	178	211	348	210	136	334	145	154	303	133	29	295	15	18	69	1	142	211	47	186	287	210		
Sum of herbaceous plant cover			142	99	113	76	101	120	115	100	106	103	95	94	132	107	50	110	112	112	100	74	118	104	101	102	108	105	113	91	51	10	101	6	7	32	1	103	98	25	95	100	95	**88**	

TUALATIN VALLEY ENVIRONMENTAL BANK

2016 Vegetation Monitoring	Sample Date(s):	6/21/16-7/8/16	Percent (%) Cover														
OBL Herbaceous Community																	
Species	**Origin (N, NN, I)**	**Wetland Status (1 - 5)**	**T4-PEMOBL1**	**T4-PEMOBL2**	**T4-PEMOBL3**	**T4-PEMOBL4**	**T4-PEMOBL5**	**T4-PEMOBL6**	**T5-PEMOBL2**	**T7-PEMOBL1**	**T7-PEMOBL3**	**T9-PEMOBL1**	**T9-PEMOBL3**	**T10-PEMOBL3**	**T11-PEMOBL4**	**Row Average**	
Native Herbaceous Species																	
Alisma triviale	N	1	10	0	0	0	0	0	0	0	0	0	7	0	0	**1**	
Ceratophyllum demersum	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Eleocharis acicularis	N	1	0	0	0	0	0	0	0	0	0	0	2	0	0	**0**	
Eleocharis obtusa	N	1	0	0	0	0	0	0	0	0	0	0	7	0	0	**1**	
Elodea canadensis	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Elodea species	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Juncus oxymeris	N	2	0	0	0	0	0	0	0	0	0	0	55	0	0	**4**	
Leersia oryzoides	N	1	15	30	15	7	20	10	0	0	10	0	10	3	0	**9**	
Lemna minor	N	1	1	1	3	3	10	5	5	5	0	0	0	1	3	**3**	
Ludwigia palustris	N	1	0	0	0	0	0	0	0	0	60	0	0	10	0	**5**	
Polygonum amphibium var. *emersum* (*Persicaria amphibia*)	N	1	0	0	0	0	0	0	15	25	0	30	0	0	0	**5**	
Polygonum (*Persicaria*) *hydropiperoides*	N	1	0	0	0	20	35	10	25	0	0	10	15	40	30	**14**	
Polygonum (Persicaria) lapathifolium	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Polygonum species (not *P. persicaria*, assumed native)	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Potomogeton species	N	1	0	0	0	0	0	0	0	0	0	10	0	0	0	**1**	
Potomogeton natens and/or P. nodosus	N	1	0	0	0	0	0	0	0	0	0	0	0	30	0	**2**	
Sparganium emersum	N	1	0	0	0	0	0	0	60	30	0	30	0	0	60	**14**	
Stuckenia pectinata	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Typha latifolia	N	1	0	0	5	0	0	15	0	0	0	0	0	0	0	**2**	
Invasive Herbaceous Species																	
Phalaris arundinacea	I	2	0	0	0	0	0	15	0	0	0	0	0	0	0	**1**	
Non-Native Herbaceous Species																	
None this year	NN		0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Bare Substrate																	
Bare ground			0	0	0	0	0	0	0	0	0	0	10	0	0	**1**	
Unvegetated water (aprox.)			74	69	77	70	35	45	0	40	30	20	0	16	7	**37**	
Shade, Woody Stem Cover & Water Depth																	
Shade from woody plants			0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Stem cover on ground			0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Approx. water depth (feet)			0.25	0.33	0.5	1	1	0.5	1.33	2.5	1.5	2	0	1	2	**1**	
Summary Information																**Habitat Average**	**Standard Error**
Cover of Native Herbaceous Species			26	31	23	30	65	40	105	60	70	80	96	84	93	**62**	8
Lower CI (80%)																51	
Upper CI (80%)																72	
Cover of Invasive Herbaceous Species			0	0	0	0	0	15	0	0	0	0	0	0	0	**1**	1
Lower CI (80%)																0	
Upper CI (80%)																3	
Bare Substrate			74	69	77	70	35	45	0	40	30	20	10	16	7	**38**	8
Lower CI (80%)																28	
Upper CI (80%)																48	
Native Diversity																NA- there is no standard for this community	
Prevalence Index			1	1	1	1	1	1	1	1	1	1	2	1	1	**1**	
Weighted Prevalence Index			26	31	23	30	65	70	105	60	70	80	151	84	93		
Sum of plant cover			26	31	23	30	65	55	105	60	70	80	96	84	93	**60**	

TUALATIN VALLEY ENVIRONMENTAL BANK

2016 Vegetation Monitoring	Sample Date(s):	6/21/16-7/8/16																						
FAC / FACW PEM Community			T10-PEM2	T10-PEM3	T10-PEM4	T10-PEM5	T10-PEM6	T10-PEM7	T10-PEM8	T10-PEM9	T10-PEM10	T12-PEM2	T12-PEM3	T12-PEM4	T12-PEM5	T12-PEM6	T12-PEM7	T12-PEM8	T12-PEM9	T12-PEM10	T12-PEM11	T12-PEM12		
Species	Origin (N, NN, I)	Wetland Status (1 - 5)																					**Average**	
Native Herbaceous Species																								
Agrostis exarata	N	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Beckmannia syzigachne	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	**0**	
Bidens cernua	N	1	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Carex scoparia	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	**1**	
Carex obnupta	N	1	0	0	0	0	0	5	0	0	3	0	30	0	35	0	0	0	0	0	0	0	**4**	
Cyperus erythrorhizos	N	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Deschampsia cespitosa	N	2	0	0	0	5	2	0	0	10	35	0	0	0	0	35	3	0	75	15	50	0	**12**	
Deschampsia elongata	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	**3**	
Downingia elegans	N	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Eleocharis acicularis	N	1	5	0	0	0	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0	**1**	
Eleocharis obtusa	N	1	15	7	0	0	0	0	0	0	0	0	0	55	0	0	0	0	0	0	0	0	**4**	
Eleocharis palustris	N	1	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	**2**	
Epilobium ciliatum	N	2	0	0	10	5	1	1	0	0	0	0	0	0	10	5	0	1	0	0	0	0	**2**	
Epilobium densiflorum	N	2	0	0	0	0	0	0	0	5	15	0	0	0	0	0	0	0	10	15	5	0	**3**	
Galium trifidum	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	**0**	
Gnaphalium palustre	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Hordeum brachyantherum	N	2	0	0	0	35	65	37	10	25	20	0	0	0	10	15	15	5	10	50	3	2	**15**	
Leersia oryzoides	N	1	60	30	55	3	0	0	0	0	0	25	40	30	5	0	0	0	0	0	0	0	**12**	
Lotus unifoliolatus	N	4	0	0	0	5	0	5	4	30	30	0	0	0	50	12	12	3	10	3	20	7	**10**	
Ludwigia palustris	N	1	0	30	0	0	0	0	0	0	0	0	7	5	0	0	0	0	0	0	0	0	**2**	
Madia sativa	N	5	0	0	0	0	12	0	5	0	0	0	0	0	0	3	20	0	0	3	0	0	**2**	
Microsteris gracillis	N	4	0	0	1	0	1	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	**0**	
Plagiobothrys figuratus	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0	0	0	0	**1**	
Plagiobothrys scouleri	N	2	0	0	0	5	0	25	55	15	0	0	0	0	0	0	40	85	0	0	0	5	**12**	
Polygonum (Persicaria) hydropiperoides	N	1	25	0	0	0	0	0	0	0	0	30	20	8	0	0	0	0	0	0	0	0	**4**	
Potetilla gracillis	N	3	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	**0**	
Prunella vulgaris	N	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	20	0	**1**	
Psilocarphus elatior	N	2	0	0	0	25	10	20	30	2	0	0	0	0	10	12	5	0	0	1	1	1	**6**	
Rorippa curvisiliqua	N	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Sparganium emersum	N	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	
Veronica peregrina	N	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Invasive Herbaceous Species																								
Convolvulus arvensis	I	5	0	0	0	3	0	3	2	0	3	0	0	0	0	2	5	0	0	5	0	0	**1**	
Non-Native Herbaceous Species																								
Agrostis stolonifera	NN	3	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	
Alopecurus pratensis	NN	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Echinochloa crusgalli	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Gnaphalium uliginosum	NN	3	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Leontodon taraxacoides ssp.taraxacoides	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	3	**0**	
Lolium perenne	NN	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Lythrum portula	NN	1	0	20	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**1**	
Plantago major	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**0**	
Rumex crispus	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	**0**	
Sonchus asper	NN	4	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0	1	0	0	0	0	**0**	
Taraxacum officinale	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	**0**	
Trifolium pratense	NN	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	**0**	
Vicia tetrasperma	NN	5	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Bare Substrate																								
Bare ground and/or moss			0	3	0	0	0	0	0	8	0	5	2	0	0	0	0	0	0	5	5	32	**3**	
Dead sprayed weeds			0	20	25	1	8	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	**3**	
Shade & Woody Stem Cover on Ground																								
Shade from woody plants			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Stem cover on ground			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Summary Information			T10-PEM2	T10-PEM3	T10-PEM4	T10-PEM5	T10-PEM6	T10-PEM7	T10-PEM8	T10-PEM9	T10-PEM10	T12-PEM2	T12-PEM3	T12-PEM4	T12-PEM5	T12-PEM6	T12-PEM7	T12-PEM8	T12-PEM9	T12-PEM10	T12-PEM11	T12-PEM12	**Habitat Average**	**Standard Error**
Cover of Native Herbaceous Species			115	67	71	92	91	96	104	87	103	95	98	111	120	97	103	102	105	87	99	65	**95**	3.3
Lower CI (80%)																							91	
Upper CI (80%)																							100	
Cover of Invasive Herbaceous Species			0	0	0	3	0	3	2	0	3	0	0	0	0	2	5	0	0	5	0	0	**1**	0.4
Lower CI (80%)																							1	
Upper CI (80%)																							2	
Bare Substrate			0	23	25	1	8	0	0	8	0	5	2	0	0	0	3	0	0	5	5	32	**6**	2.1
Lower CI (80%)																							3	
Upper CI (80%)																							9	
Native Diversity																							6 species meet criteria: DECE, LOUN, LEOR, HOBR, PLSC & PSEL.	
Prevalence Index			1	1	1	2	2	2	2	3	3	1	1	1	3	2	3	2	2	2	3	2	**2**	N/A
Weighted Prevalence Index			110	87	127	212	216	210	241	234	278	95	97	123	300	229	321	204	230	214	278	144		
Sum of plant cover			115	87	90	106	92	100	106	92	106	95	98	112	120	103	115	106	105	95	99	68		

TUALATIN VALLEY ENVIRONMENTAL BANK

2016 Vegetation Monitoring	Sample Date(s):	6/21/16-7/8/16																			
PFO Tree and Shrub Data	**Percent Cover**																				
Species	Origin (N, NN, I)	Wetland Status (1 - 5)	T3-F1	T4-F1	T5-F1	T7-F1	T7-F2	T8-F1	T8-F2	T8-F3	T9-F1	T9-F2	T9-F3	T9-F4	T10-F2	T10-F3	T11-F2	T11-F3	T11-F4	T11-F6	**Row Average**
Native Tree and Shrub Species:																					
Alnus rubra	N	3	0	0	0	1	8	2	3	4	0	4	0	4	1	0	0	6	0	0	**2**
Amelanchier alnifolia	N	4	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	**1**
Cornus sericea ssp. *sericea (alba)*	N	2	3	4	0	3	10	1	2	0	0	1	1	1	1	0	0	2	0	3	**2**
Corylus cornuta	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	**0**
Crataegus douglasii	N	3	0	0	3	1	3	1	3	5	40	1	1	1	1	1	0	0	0	1	**3**
Fraxinus latifolia	N	2	1	12	10	10	25	6	15	1	0	8	10	8	5	5	1	2	1	12	**7**
Lonicera involucrata	N	3	0	0	0	0	0	0	1	0	0	3	2	2	0	2	0	0	0	1	**1**
Malus fusca	N	2	0	0	0	0	4	0	0	0	0	0	0	1	2	0	0	0	0	0	**0**
Physocarpus capitatus	N	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	**0**
Populus balsamifera	N	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Rosa nutkana	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	**0**
Rosa pisocarpa	N	3	0	0	0	0	1	0	0	1	10	1	0	1	0	0	0	1	0	0	**1**
Rubus spectabilis	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**0**
Salix hookeriana	N	2	10	25	35	1	10	0	4	0	1	2	1	0	0	0	5	1	1	0	**5**
Salix lucida var. *lasiandra (lasiandra)*	N	2	35	15	15	0	0	0	12	0	0	2	1	6	1	0	7	8	2	0	**6**
Salix scouleriana	N	3	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Salix sitchensis	N	2	6	5	0	0	2	0	0	0	0	0	0	0	0	0	0	1	1	0	**1**
Spiraea douglasii	N	2	5	0	0	1	6	0	10	1	0	1	1	0	1	0	1	1	5	1	**2**
Symphoricarpos albus	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	**0**
Non-Native Shrub and Tree Species																					
Crataegus monogyna	NN	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**0**
Invasive Shrub and Tree Species																					
Rubus armeniacus	I	4	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	**0**
Rubus species (cultivar)	I		0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	**0**
Native Shrub and Tree Count	**Woody Stem Count (Trees and Shrubs)**																				
Alnus rubra	N	3	0	0	0	2	2	4	1	14	0	2	0	2	1	0	0	4	0	0	**2**
Amelanchier alnifolia	N	4	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	**0**
Cornus sericea ssp. *sericea (alba)*	N	2	3	2	0	3	8	1	2	0	0	3	2	2	1	0	0	4	0	5	**2**
Corylus cornuta	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	**0**
Crataegus douglasii	N	3	0	0	1	1	5	1	6	8	5	3	3	2	4	4	0	0	0	2	**3**
Fraxinus latifolia	N	2	1	6	3	20	12	12	21	2	0	23	32	19	22	21	1	7	1	5	**12**
Lonicera involucrata	N	3	0	0	0	0	0	0	2	0	0	13	7	6	0	10	0	0	0	3	**2**
Malus fusca	N	2	0	0	0	0	3	0	0	0	0	0	0	1	5	0	0	0	0	0	**1**
Physocarpus capitatus	N	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	**0**
Populus balsamifera	N	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Rosa nutkana	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	**0**
Rosa pisocarpa	N	3	0	0	0	0	1	0	0	1	22	2	0	1	0	0	0	2	0	0	**2**
Rubus spectabilis	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**0**
Salix hookeriana	N	2	5	20	23	1	6	0	2	0	3	2	2	0	0	0	3	4	1	0	**4**
Salix lucida var. *lasiandra (lasiandra)*	N	2	25	6	13	0	0	0	15	0	0	5	1	10	2	0	32	24	8	0	**8**
Salix scouleriana	N	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Salix sitchensis	N	2	3	5	0	0	1	0	0	0	0	0	0	0	0	0	0	2	1	0	**1**
Spiraea douglasii	N	2	6	0	0	1	7	0	19	1	0	2	1	0	3	0	3	4	15	1	**4**
Symphoricarpos albus	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	**1**
Summary Information																					**Habitat Average**	**Standard Error**
Cover of Invasive Shrubs and Trees			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
Lower CI (80%)																					0	
Upper CI (80%)																					0	
Native Diversity--See PFO Herb table for summary info																						
Density of Woody Vegetation		Average per acre	1387	1258	1420	903	1517	581	2194	839	1065	1775	1549	1387	1291	1162	1258	1646	839	1226	**1294**	
Plot Area (shrub/tree plot)	1350																					
Per acre multiplier: Input 4,047 if plot area entered in B62 is in sq.meters or 43,560 for sq.feet	43560																					
Percent Cover of Native Shrubs and Trees			60	61	68	17	70	10	50	12	66	23	17	24	13	9	14	22	10	33	**32**	5
Lower CI (80%)																					25	
Upper CI (80%)																					39	
Sum of native plants /plot			43	39	44	28	47	18	68	26	33	55	48	43	40	36	39	51	26	38	**40**	
Does Plot Pass Native Cover Standard based on ≥ 50% Native Cover Y or N?			Y	Y	Y	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N		
Does Plot Pass Native Cover Standard based on ≥ 1000 plants or stems per acre Y or N?			Y	Y	Y	N	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		
Prevalence Index--woody strata			2	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	3	**2**	
Weighted Prevalence Index			120	122	144	36	152	23	107	34	223	55	37	56	28	22	28	51	20	89		
Sum of plant cover			60	61	68	17	70	10	50	12	69	23	17	24	13	9	14	22	10	33		

TUALATIN VALLEY ENVIRONMENTAL BANK

2016 Vegetation Monitoring	Sample Date(s):	6/21/16-7/8/16	Percent Cover															
Buffer Tree and Shrub Data			T3-BF1	T4-BF1	T6-BF1	T6-BF2	T7-BF1	T7-BF2	T7-BF3	T8-BF1	T8-BF2	T9-BF1	T9-BF2	T10-BF2	T10-BF3	T11-BF2		
Native Tree and Shrub Species:	Origin (N, NN, I)	Wetland Status (1 - 5)															Row Average	
Abies grandis	N	4	0	1	0	1	2	3	0	2	0	0	0	0	0	0	**1**	
Acer circinatum	N	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**0**	
Acer macrophyllum	N	4	3	6	0	2	0	0	0	0	1	0	1	0	1	0	**1**	
Alnus rubra	N	3	0	1	2	1	0	0	1	0	2	0	1	2	2	2	**1**	
Crataegus douglasii	N	3	3	0	1	1	0	0	1	1	1	1	0	1	1	0	**1**	
Frangula purshiana	N	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	**0**	
Fraxinus latifolia	N	2	1	2	0	2	0	0	1	0	1	0	1	2	0	0	**1**	
Holodiscus discolor	N	4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**0**	
Lonicera involucrata	N	3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	**0**	
Mahonia aquifolium	N	4	0	1	1	4	4	1	2	2	2	1	2	2	2	3	**2**	
Philadelphus lewisii	N	5	0	0	0	1	0	0	0	0	1	0	0	0	0	0	**0**	
Physocarpus capitatus	N	2	0	0	0	0	1	1	0	1	0	0	1	1	0	0	**0**	
Pinus pondserosa	N	4	2	0	0	0	0	2	0	0	0	0	0	0	0	0	**0**	
Populus balsamifera	N	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	**0**	
Prunus emarginata	N	4	0	0	0	0	0	1	0	1	0	0	0	0	0	0	**0**	
Pseudostuga menziesii	N	4	4	4	1	1	6	6	1	10	2	5	1	0	1	2	**3**	
Ribes sanguinium	N	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Rosa nutkana	N	3	0	1	0	1	3	0	2	1	2	1	1	3	1	1	**1**	
Rosa pisocarpa	N	3	0	0	1	0	0	0	1	0	0	0	1	0	0	0	**0**	
Rubus parviflorus	N	4	0	0	0	0	0	0	1	0	1	0	1	0	0	0	**0**	
Sambucus racemosa	N	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Spiraea douglasii	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Symphoricarpos albus	N	4	0	0	0	0	2	2	1	1	1	1	1	0	1	0	**1**	
Thuja plicata	N	3	0	0	0	0	1	1	0	1	0	1	0	0		0	**0**	
Tsuga heterophylla	N	4	0	0	0	0	1	2	0	1	0	1	0	0	0	0	**0**	
Non-Native Shrub and Tree Species																		
None this year			0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Invasive Shrub and Tree Species																		
Rubus armeniacus	I	4	0	0	0	0	0	0	0	0	0	1	0	0	0	1	**0**	
Rubus cultivar	I		0	0	0	0	1	0	0	1	0	0	1	0	0	0	**0**	
Native Shrub and Tree Count	**Woody Stem Count (Trees and Shrubs)**																	
Abies grandis	N	4	0	2	0	1	5	6	0	2	0	0	0	0	0	0	**1**	
Acer circinatum	N	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0	**0**	
Acer macrophyllum	N	4	8	12	0	5	0	0	0	0	1	0	1	0	3	0	**2**	
Alnus rubra	N	3	0	1	13	4	0	0	5	0	6	0	2	11	8	8	**4**	
Amelanchier alnifolia	N	4	1	3	0	0	1	0	0	0	2	0	1	0	0	0	**1**	
Crataegus douglasii	N	3	4	0	6	1	0	0	1	2	1	1	0	2	1	0	**1**	
Frangula purshiana	N	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	**0**	
Fraxinus latifolia	N	2	5	3	0	4	0	0	3	0	3	0	4	7	0	0	**2**	
Holodiscus discolor	N	4	0	0	0	0	0	0	0	0	0	2	0	0	0	0	**0**	
Lonicera involucrata	N	3	0	0	0	0	0	0	0	0	0	0	0	3	1	0	**0**	
Mahonia aquifolium	N	4	0	2	17	16	13	6	13	8	15	7	13	10	17	21	**11**	
Philadelphus lewisii	N	5	0	0	0	2	0	0	0	0	1	0	0	0	0	0	**0**	
Physocarpus capitatus	N	2	0	0	0	0	2	2	0	1	0	0	1	4	0	0	**1**	
Pinus pondserosa	N	4	1	0	0	0	0	1	0	0	0	0	0	0	0	0	**0**	
Populus balsamifera	N	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	**0**	
Prunus emarginata	N	4	0	0	0	0	0	2	0	1	0	0	0	0	0	0	**0**	
Pseudostuga menziesii	N	4	11	7	3	5	13	11	3	14	5	9	2	0	1	4	**6**	
Ribes sanguinium	N	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Rosa pisocarpa	N	3	0	0	2	0	0	0	1	0	0	0	1	0	0	0	**0**	
Rosa nutkana	N	3	0	1	0	2	5	0	6	2	5	3	3	10	1	2	**3**	
Rubus parviflorus	N	4	0	0	0	0	0	0	4	0	1	0	5	0	0	0	**1**	
Sambucus racemosa	N	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Symphoricarpos albus	N	4	0	0	0	0	10	8	1	1	2	3	2	0	3	0	**2**	
Thuja plicata	N	3	0	0	0	0	1	2	0	1	0	1	0	0	0	0	**0**	
Tsuga heterophylla	N	4	0	0	0	0	2	5	0	1	0	2	0	0	0	0	**1**	
Summary Information																	**Habitat Average**	**Standard Error**
Cover of Invasive Shrubs and Trees			0	0	0	0	1	0	0	1	0	1	1	0	0	1	**0**	0
Lower CI (80%)																	0	
Upper CI (80%)																	1	
Native Diversity--See buffer Herb table for summary info																		
Density of Woody Vegetation		Average per acre	1162	1033	1323	1323	1646	1162	1194	1000	1355	807	1162	1517	1129	1129	**1210**	
Plot Area (shrub/tree plot)	1350																	
Per acre multiplier: Input 4,047 if plot area entered in B97 is in sq.meters or 43,560 for sq.feet	43560																	
Percent Cover of Native Shrubs and Trees			19	18	6	15	22	19	11	21	15	12	13	12	10	8	**14**	1
Lower CI (80%)																	13	
Upper CI (80%)																	16	
Sum of native plants /plot			36	32	41	41	54	43	37	33	42	28	36	47	35	35	**39**	
Does Plot Pass Native Cover Standard based on ≥ 50% Native Cover Y or N?			N	N	N	N	N	N	N	N	N	N	N	N	N	N		
Does Plot Pass Native Cover Standard based on ≥ 1000 plants or stems per acre Y or N?			Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y		
Sum of plant cover			19	18	6	15	23	19	11	22	15	13	14	12	10	9	**15**	

TUALATIN VALLEY ENVIRONMENTAL BANK

2016 Vegetation Monitoring	Sample Date(s):	6/21/16-7/8/16	Percent Cover																						
PSS Shrub and Tree Data																									
Native Shrub and Tree Species:	Origin (N, NN, I)	Wetland Status (1 - 5)	T1-S1	T1-S2	T2-S1	T2-S2	T2-S3	T2-S4	T2-S5	T3-S1	T3-S2	T6-S1	T6-S2	T6-S3	T6-S4	T6-S5	T6-S6	T6-S7	T6-S8	T6-S9	T6-S10	T6-S11	Row Average	
Acer macrophyllum	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**0**	
Alnus rubra	N	3	0	25	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	**1**	
Cornus sericea ssp. *sericea (alba)*	N	2	1	5	1	0	7	5	2	0	0	10	6	20	8	2	5	3	0	0	1	0	**4**	
Corylus cornuta	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Crataegus douglasii	N	3	0	0	4	0	3	5	0	0	0	0	0	0	4	1	0	0	2	0	1	0	**1**	
Frangula purshiana	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**0**	
Fraxinus latifolia	N	2	0	10	0	0	2	22	0	0	0	5	0	2	10	7	5	10	0	1	2	0	**4**	
Lonicera involucrata	N	3	0	0	0	0	0	0	0	0	0	3	3	5	1	1	0	0	0	0	0	0	**1**	
Malus fusca	N	2	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**0**	
Physocarpus capitatus	N	2	0	0	0	0	2	1	1	0	0	0	0	2	0	1	1	1	0	0	0	0	**0**	
Populus balsamifera	N	3	0	0	3	0	0	0	0	0	0	0	0	0	0	15	15	65	70	20	0	0	**9**	
Pseudostuga menziesii	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**0**	
Rosa nutkana	N	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	7	0	0	0	0	0	**1**	
Rosa pisocarpa	N	3	0	0	0	0	3	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	**0**	
Salix hookeriana	N	2	73	25	30	20	4	8	15	8	30	20	30	10	10	0	0	0	5	7	25	15	**17**	
Salix lucida var. *lasiandra (lasiandra)*	N	2	1	30	10	20	10	0	2	12	15	0	40	7	0	0	0	0	2	5	4	8	**8**	
Salix scouleriana	N	3	0	0	0	0	0	0	0	0	0	0	5	5	0	0	45	0	0	10	0	0	**3**	
Salix sitchensis	N	2	0	5	5	10	3	5	1	10	10	55	10	0	0	0	0	0	3	3	6	10	**7**	
Spiraea douglasii	N	2	5	3	5	3	0	3	5	1	8	0	0	3	0	0	1	0	1	0	0	0	**2**	
Non-Native Shrub and Tree Species																								
Crataegus monogyna	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**0**	
Malus pumila	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	**0**	
Invasive Shrub and Tree Species																								
Rubus armeniacus	I	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	**0**	
Bare Substrate- See the PSS herbaceous plot data on a separate table for bare substrate data.																								
Native Shrub and Tree Count	**Woody Stem Count (Trees and Shrubs)**																							
Acer macrophyllum	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**0**	
Alnus rubra	N	3	0	3	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	1	0	**0**	
Cornus sericea ssp. *sericea (alba)*	N	2	1	4	2	0	5	4	2	0	0	6	5	17	4	2	3	5	0	0	1	0	**3**	
Corylus cornuta	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
Crataegus douglasii	N	3	0	0	4	0	4	6	0	0	0	0	0	0	5	1	0	0	1	0	1	0	**1**	
Frangula purshiana	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**0**	
Fraxinus latifolia	N	2	0	5	0	0	4	3	0	0	0	4	0	2	8	14	2	6	0	1	2	0	**3**	
Lonicera involucrata	N	3	0	0	0	0	0	0	0	0	0	2	1	4	1	2	0	0	0	0	0	0	**1**	
Malus fusca	N	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	**0**	
Physocarpus capitatus	N	2	0	0	0	0	5	1	1	0	0	0	0	1	0	1	2	1	0	0	0	0	**1**	
Populus balsamifera	N	3	0	0	2	0	0	0	0	0	0	0	0	0	0	9	12	22	48	23	0	0	**6**	
Pseudostuga menziesii	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**0**	
Rosa nutkana	N	3	0	0	0	0	0	0	0	0	0	0	0	0	5	0	20	0	0	0	0	0	**1**	
Rosa pisocarpa	N	3	0	0	0	0	6	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**0**	
Salix hookeriana	N	2	26	8	30	11	2	4	6	11	15	10	18	6	3	0	0	0	6	10	29	19	**11**	
Salix lucida var. *lasiandra (lasiandra)*	N	2	0	10	8	7	5	0	2	8	8	0	28	3	0	0	0	0	2	5	5	6	**5**	
Salix scouleriana	N	3	0	0	0	0	0	0	0	0	0	0	3	1	0	0	2	0	0	6	0	0	**1**	
Salix sitchensis	N	2	1	2	6	8	1	2	1	7	4	16	4	0	0	0	0	0	1	1	4	5	**3**	
Spiraea douglasii	N	2	10	2	9	4	0	5	14	2	12	0	0	4	0	0	1	0	1	0	0	0	**3**	
Summary Information																							**Habitat Average**	**Standard Error**
Cover of Invasive Shrubs and Trees			0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	**0**	0
Lower CI (80%)																							0	
Upper CI (80%)																							0	
See PSS Herb table for summary info on diversity																								N/A
Density of Woody Vegetation		Average per acre	1226	1097	1968	968	1097	871	839	903	1258	1226	1904	1258	903	1033	1420	1162	1904	1484	1387	968	**1244**	
Plot Area (shrub/tree plot)	1350																							
Per acre multiplier: Input 4,047 if plot area entered in B61 is in sq.meters or 43,560 for sq.feet	43560																							
Percent Cover of Native Shrubs and Trees			80	103	58	53	37	50	26	31	63	93	94	56	37	30	80	80	83	46	40	33	**59**	5
Lower CI (80%)																							52	
Upper CI (80%)																							66	
Sum of native plants/plot			38	34	61	30	34	27	26	28	39	38	59	39	28	32	44	36	59	46	43	30	**39**	
Does Plot Pass Native Cover Standard based on ≥ 50% Native Cover Y or N?			Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	Y		N	Y	Y	Y	N	N	N		
Does Plot Pass Native Cover Standard based on ≥ 1000 plants or stems per acre Y or N?			Y	Y	Y	N	Y	N	N	N	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	N		
Prevalence Index--All strata			2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	2	2	**2**	
Weighted Prevalence Index			160	231	123	106	80	105	52	62	126	189	196	124	83	78	236	253	238	122	82	66		
Sum of plant cover			80	103	58	53	37	50	26	31	63	93	94	56	37	30	82	86	83	46	40	33	**59**	

MONITORING NOTES:

General

-Occasionally a native woody species was rooted in herbaceous plots in various habitat classes. The percent cover at ground level of "stems" was recorded in the tables followed by the 4-letter species code, but the woody cover recorded in herb plots was not added to the total native percent cover so as not to double up cover already captured in the woody plot data for the PFO, PSS & Buffer habitat classes.

- In the herbaceous plot data for the PFO, PSS & Buffer habitat classes, as of 2015, we started recording "shade from woody plants" i.e., aerial cover. Again this was not added to the native cover totals. *Starting in 2015, any herb plot with 60% or more aerial cover from woody plants is excluded from the bare substrate criteria.*

-Several herbaceous plots in the wetlands are listed as having *Carex scoparia* and/or *C. ovalis.* These two species are very similar looking native FACW sedges; we did not key every sample but it is likely both species are present.

-The identification of *Microsteris gracillis,* present in low percentages in a few herb plots in the PEM and PFO communities, is somewhat tentative.

PEM-OBL Herbaceous Community

- Plot T7-PEMOBL3: Cover was estimated from approximately 6 feet away.

-There are some disagreements re: the nativity of *Sparganium emersum.* As per the Mitigation Bank Instrument, this species will be considered a native for this project.

-Both *Potomogeton nodosus* and *P. natens* are present in this community and have similar floating leaves (the submerged leaves differ). Populations within plots identified as one or the other may include both. Both species are native OBL aquatic plants.

-Identification of *Stuckenia pectinata* (formerly *Potomogeton pectinatus*) and *Potomogeton foliosus* is somewhat tentative; no flowers were present in samples, but they matched the vegetative characteristics of these species. These species were not seen in 2016 but may be seen again in future years.

PSS-Herb Plots

-In plot T1-SH1, the plant identified as *Equisetum arvense* is likely a known hybrid w/ *E. fluviatile.*

PFO-Herb Plots

-PFO herb plot T9-FH1: The bare ground (85%) was entirely covered in flood debris.

-PFO herb plot T9-FH10: The bare ground (97%) was covered in moss & organic debris.

PFO, PSS and Upland Buffers-Tree & Shrub Plots

-PSS woody plot T1-S2, although there was 105% native woody cover due to overlap of some species, there was nonetheless ~ 10% open area.

- Buffer woody plot T4-BF1: There may be about 5% encroachment into the wetland on this plot.

-In the woody habitats a few plots had pre-existing *dense* thickets of native roses or willows; the stem counts were conservatively estimated.

-As of 2015, as per guidance from DSL, in assigning percent cover to planted trees and shrubs, the smallest percent cover assigned is 1%, which is any cover > 0%.

-Willows identified as *Salix hookeriana* (aka *S. piperi*) may occasionally include *S. scouleriana* plants; the two may look very similar when young.

Removals and Addition of Plots in 2016:

- Two PFO herb plots were removed: T11-FH8 and T11-FH9 were inundated approximately 2 and 3 feet respectively and thus were not representative of the PFO habitat.
- Nine PEMOBL plots were removed: (T5-PEMOBL1, T8-PEMOBL1, T8-PEMOBL2, T9-PEMOBL2, T10-PEMOBL1, T10-PEMOBL2, T11-PEMOBL1, T11-PEMOBL2, and T11-PEMOBL3). They were too deeply inundated ($\geq$ 1.5 foot to about 3 or more feet) to accurately estimate cover from a distance.

Removals and Addition of Plots in 2015:

- The five PSS herbaceous plots on Transect 6 (T6-SH2, T6-SH6, T6-SH11, T6-SH12, and T6-SH14) that had been removed in 2014 due to being in total shade provided by a few scattered mature trees were added back. However these herb plots (and any others with $\geq$ 60% aerial cover from woody plants) are now excluded from the bare substrate criteria.
- Several plots were added on the eastern side of transect 10 in 2015 to ensure full coverage of the transect. These plots were T10-F3, T10-FH5, T10-BF3, T10-BH5, and T10-BH6.
- One of the inundated OBL plots, T7-PEMOBL2 was too deep to estimate cover from a distance so it was removed.

Removals and Addition of Plots in 2014:

- PFO herb plot T5-FH2 was added; it had originally thought to have been in the buffer but it is in wetland.
- Five PSS herbaceous plots on Transect 6 (T6-SH2, T6-SH6, T6-SH11, T6-SH12, and T6-SH14) were removed due to being in total shade provided by a few scattered mature trees.
- Two PFO woody plots (T10-F1 and T11-F1) and the two associated herbaceous plots (T10-FH1 and T11-FH1) were removed because they were located in the pre-existing mature wetland forest, where no woody and herbaceous planting had occurred.
- One PFO woody plot (T11-F5) was removed from the PFO community because it was approximately 70% inundated.
- In the buffer we initially sampled but then removed two woody plots (T10-BF1 and T11-BF1) and associated herb plots (T10-BH1 and T11-BH1) because they were in the existing mature forested unplanted buffer.

Alterations of Plot Location or Orientation in 2014:

- PFO woody plot T4-F1 and associated herb plot T4-FH1 were moved approximately 20 feet to the east to the plant community break because the woody plot had previously been partially within the PEM OBL habitat.
- PSS woody plot T6-S4 was moved and skewed (as in 2013) and the associated herb plot T6-SH6 was moved to the west to avoid placement in the road, however the resulting placement varied from slightly from the 2013 location.
- Buffer woody plot T7-BF2 and associated herb plot T7-BH3 were placed only about 30 feet east of the previous herb plot (rather than the usual 50 feet) so that the woody plot would fit within the mitigation buffer; the rectangular woody plot was also skewed so that the short edge was parallel to the transect for the same reason. Buffer woody plot T9-BF2 was similarly skewed.

Removal or Re-Labeling of Plots in 2013:

- Herb plot T10-PEM1 (initially placed in the FAC/FACW community) was re-labeled as T10-OBL3 since it was actually in the OBL community.

- Herb plot T12-PEM1 (also initially placed in the FAC/FACW community) was inundated on August 1, 2013 and was discarded.

Alterations of Plot Location or Orientation in 2012 or 2013:

- PSS herb plot T2-SH1 started 15 ft from property line because of bisecting property line (the 1st shrub plot was not associated with this herb plot for the same reason (it was with T2-SH2 instead))
- PFO woody plot T5-F1 was moved approximately 10 feet to the east of its original location because a portion of it was in the OBL-dominated herbaceous habitat.
- PSS plots T6-S2 and T6-SH3 were skewed slightly because portions of them were in open water.
- PSS woody plot T6-S4 was moved approximately 25 feet west so it would be completely out of an unimproved access road, and the associated herb plot T6-SH6 was moved so it would be in the corner of the shrub plot.
- PSS woody plot T6-S11 was skewed north so that it would be entirely within one wetland habitat type.
- PFO woody plots T8-F1, T9-F1 and T10-F1 were skewed so that the short edge was parallel to the transect in order to fit within the community.

Plant Nomenclature:

-Plant nomenclature is up-to-date. The USDA PLANTS database (http://plants.usda.gov/java/) was our source for nomenclature. In cases where the latest nomenclature is different than that listed in the Corps WIS list, the name used name in the Corps' list, or closest synomy is in parentheses. Except for a few species as noted in the Mitigation Bank Instrument, this is also our source for nativity designations.

-The Wetland Indicator Statuses (WIS) are from the 2014 list for the Western Mountains, Valleys and Coast Region as presented in the Corps' *State of OREGON 2014 Wetland Plant List*

Principal Plant Identification Resources Used For This Project

Technical Flora and Keys:

-Hitchcock, C. Leo and Cronquist. 1974. Flora of the Pacific Northwest. University of Washington Press.

-Hitchcock, C. Leo et. al. 1955, 1959, 1961, 1964 and 1969. Vascular Plants of the Pacific Northwest (5 Volumes). University of Washington Press.

-Kozloff, Eugene N. 2005. Plants of Western Oregon, Washington and British Columbia. Timber Press.

-Meyers, Stephen C. *et. al.* 2015. Flora of Oregon- Volume 1: Pteridophytes, Gymnosperms, and Monocots. Botanical Research Institute of Texas Press.

-Various authors. 2014. The on-line Oregon Flora Project keys and plant descriptions. URL http://www.oregonflora.org/

Field Guides:

-Cooke, Sarah Spear (Editor). 1997. A Field Guide to the Common Wetland Plants of Western Washington and Northwestern Oregon. Seattle Audubon Society

-Guard, B. Jennifer. 1995. Wetland Plants of Oregon and Washington. Lone Pine Publishing.

-Whitson, Tom D. (editor) et. al. 1996. Weeds of the West. 5th Edition. University of Wyoming Press.

-Other Resources:
-John Christy, Wetland ecologist for the Institute for Natural Resources was consulted in previous years concerning the identification of several native species.
-Richard Brainerd and others from the Carex Working Group in Corvallis, Oregon were consulted in previous years concerning the identification of several native *Bromus* species.
-Stephen C. Meyers, Taxonomic Director, Oregon Flora Project, Oregon State University was contacted in 2016 to confirm our identification of atypical samples of the native *Polygonum hydropiperoides* (aka *Persicaria hydropiperoides*) that had spotted leaves, a feature that is not described for this species in any regional flora. He confirmed our ID of *P. hydropiperoides* and speculated that there may have been hybridization with *Polygonum persicaria* (aka *Persicaria maculosa)* in past generations that had subsequently back-crossed with pure strains of *P. hydropiperoides.* Because this was an unusual plant he requested that we send a pressed specimen that will now be included in their herbarium.
-USDA PLANTS database URL http://plants.usda.gov/java/. This site provides drawings, photos and distribution maps plus useful links to other web sites including the CalPhotos website URL http://calphotos.berkeley.edu etc.

APPENDIX B: WETLAND DELINEATION LITE ADDITIONAL DATA 2016

This appendix includes the following:

-Wetland Delineation Lite summary report

-Wetland Delineation Lite Data Sheets

-DSL sketch map received from Dana Field on March 13th 2015 (via email) displaying areas where additional data is needed for the post-construction wetland delineation.

APPENDIX B: Wetland Delineation Lite Supplemental Data and Results 2016

BACKGROUND:
A wetland delineation lite study was included with the Year 3(2014) Tualatin Valley Environmental Bank Monitoring Report (Green Banks 2014); please review this report sections: 1.6, 2.2, 2.3, 3.1, and Appendix B (2014), for detailed information about the study. In March of 2015, DSL (Field) commented on the 2014 delineation lite study and in general agreed with most of the delineated wetland areas but requested that additional data be collected in paired data plots in five areas (Figure 2). We attempted to collect the requested data on March 19th 2015 but the site conditions were drier than normal and the timing was approximately 40 days into the growing season. In 2016, we established 31 paired data plots in the areas of interest. These data plots are displayed on Figures 1a-1c, 2, and 2a-2c; the DSL defined areas of interest were approximately drawn on Figures 2a-2c. Standard data sheets for these plots are included in this Appendix.

METHODS:
Delineation field work was completed by C. Jonas Moiel and Jeff Handley on February 16 and 17, and by C. Jonas Moiel on February 19, 2016. Field indicators of wetland vegetation, soils, and hydrology were recorded at each data plot location.

A delineation lite is a two-parameter wetland delineation that utilizes vegetation and hydrology data to define a wetland boundary. It does not utilize soils as an indicator because they can take many years to develop hydric characteristics and therefore may not be representative of current site conditions. Soils were recorded at each data plot but were not used to determine if a plot was located in a wetland or upland.

Hydrology was recorded at each data plot in 2016 as a "snapshot-in-time" but the data were not representative of the site's hydrology. This was partly due to low precipitation amounts in the weeks prior to the study (see Section 1.6 of monitoring report). The project area has complex hydrology consisting of groundwater seeps and Tualatin River flood (and/or backflooding) events. The Tualatin River is known to flood the site multiple times per year, typically between December and March, and when these events occur the inundation remains onsite for weeks. This prolonged flooding duration is a result of the hydrological improvements made during project construction (i.e. plugging outfall culvert, constructing log-jam). Based on the frequency and duration of typical flood events, the riverine wetland areas achieve the primary wetland hydrology standards: Surface Water (A1), High Water Table (A2), and Saturation (A3), for 14 consecutive days or more during the early growing season, for more than 5 out of every 10 years. These flood events occur more than every other year (>50% probability) as determined from the baseline waters delineation in 2010 utilizing river gauge data for an approximate 20-year period (Green Banks 2010). The long-term hydrology study which was completed in 2014 provides data in the vicinity of all of the newly installed data plots and was utilized in combination with this 2016 supplemental study. A "snapshot-in-time" of hydrology may not be as accurate in determining a wetland boundary for complex sites and therefore a long term study is preferred.

Vegetation was considered to be under "normal conditions" and utilized for the wetland delineation lite. The wetlands within the project area were seeded and planted in 2010-2011 and have never been

irrigated. The vegetative communities have had time to stabilize as it has been 5 years after installation; additionally, several of the years since planting (2012, 2013, 2014) have had below average rainfall which can stress wetland rated plant species.

Soils were sampled at each plot location by augering holes approximately 24 inches below ground surface and recording soil textures, colors, and redoximorphic features. All of the plot locations were located within wetland creation areas (the enhancement and restoration areas are very wet with obligate dominated plant communities).

RESULTS:
The results of the 2016 supplemental delineation lite data provide additional support that the 2014 delineation lite study findings are accurate in most areas (see figures 2a-2c). There was a total of 31 data plots recorded in 2016, 15 of which were determined to exist in wetlands, and 16 in uplands. Some small adjustments were made to the 2014 post-construction wetland boundary and are displayed as "Wetland Boundary Adjustment 2016" on the maps.

As mentioned previously, the hydrology data from the 2014 study were utilized in combination with "snapshot-in-time" measurements taken at the time of plot sampling. Many plots displayed primary and secondary wetland hydrology characteristics at the time of sampling. However, all of the wetland plots were in close proximity and similar elevations to longer term hydrology monitoring locations that displayed positive wetland hydrology in 2014; during a year with normal conditions and less than average rainfall. Therefore, the 2014 hydrology data were relied on for plots that did not have free-water or saturation within 12 inches of the ground surface in 2016.

Of the 31 plots sampled, 28 of them had hydrophytic plant communities; this includes all wetland plots (15), and nearly all of the upland plots (13 of 16 upland plots had hydrophytic communities). Wetland plant communities expand well into the delineated uplands in areas likely as a result of very wet conditions in the early growing season and prolonged flooding duration. In 2016, the Tualatin River flooded the site 3 times and the duration of inundation in the delineated uplands was nearly a month. As a result, certain upland species have died back and been replaced with more wet-tolerant species. For example, blue wildrye (*Elymus glaucus*) dominated the upland buffer areas in the first couple years of bank establishment but now has a low cover and has been replaced by hydrophytic species such as tufted hairgrass (*Deschampsia cespitosa*) and red fescue (*Festuca rubra var. rubra*). The vegetation data collected in 2016 support the conclusion that the delineated wetland boundary is accurately located; they actually show that it is conservatively placed (erring on the side of upland).

The soils data further support the wetland delineation lite results. As mentioned previously, soils are not expected to transition to display hydric characteristics within a short term and therefore are not used for delineation lite studies. In this case, we were surprised to find that 10 of the 31 plots sampled in 2016 had hydric soils (7 wetland plots, 3 upland plots). <u>None</u> of these plots were located in areas that previously had hydric soils during the baseline study in 2010. The baseline hydric soil survey was very comprehensive with 167 soil plots that were used to determine the hydric soil boundary; this boundary was concurred by DSL and the Corps in 2010. The fact that hydric soils were observed at 32% of the delineation lite wetland plots, supports the conclusion that these areas have active wetland hydrology

that persists long enough to cause a transition in soil characteristics. Three upland plots also had hydric soils. This confirms that the post-construction wetland boundary is conservatively located (erring on the side of upland) as some areas determined to be upland based on long term hydrology data are displaying wetland soil characteristics (and likely located within the wetlands rather than the uplands).

WETLAND BOUNDARY ADJUSTMENT 2016:
There were a few areas where the 2014 post-construction wetland boundary line was adjusted slightly as a result of this year's study; see figures 2a-2c. The wetland boundaries were GPS'ed during the collection of additional delineation lite plot data in 2016. GPS data were collected with a Trimble GEOXT GPS unit that can achieve sub-meter accuracy after post-processing.

Areas 1 and 2 are located in an area of wetland creation at the inlet of the constructed swale (Figure 2a). This area has complex topography, and some of the topography has changed slightly after project construction due to soil settling, compaction, and erosion (minimal); the As-Built topography survey was completed in 2011. The 2014 post-construction wetland boundary in this area relied on the topography survey and ground-truthing to define the boundary. In 2016, the wetland boundary was adjusted in this area, increasing the size of wetland. Wetland characteristics determined through the collection of paired plots were used to delineate the boundary.

Area 3 is located on a gentle slope and includes the constructed swale (Figure 2b). This riverine wetland area has complex hydrology that is influenced by the Tualatin River levels, surface water in the constructed swale, and precipitation. A slight adjustment was made to the 2014 delineated boundary in Area 3. This adjustment was made after paired plot data were collected, and was a result of utilizing wetland characteristics determined through those plots, and slight variations in topography.

Area 4 is located in the southeast portion of the project area (Figure 2c). This area has more than one soil type/texture; the soil texture is clayey in some areas and silty in others. The 2014 delineation lite study determined that the clayey soils had positive wetland hydrology at higher elevations in this area, than the silty soils. For this reason, the wetland boundary does not strictly follow the same topological elevation. A wetland boundary adjustment was made in 2016 in this area, in proximity to the log-jam. The soil type in the vicinity of the log jam had a silty texture and did not have the same wetland characteristics as other wetland plots at the same elevation. For this reason, we reduced the size of the wetland in this area.

Area 5 is located on a gentle hillslope in the southern portion of the project area (Figure 2c). The wetland boundary in this area has expanded since project construction due to the increased flood elevations and duration of flooding, resulting from the constructed log-jam. The 2014 post-construction wetland boundary was adjusted slightly in this area in 2016. This boundary adjustment was made based on the paired plot data and slight variations in topography.

NOTE: *We will update the 2014 post-construction wetland boundary to reflect the 2016 boundary adjustments once we have concurrence on the delineation lite study.*

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **1A**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain, bench Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR): A (MLRA 2) Lat: 45.444 Long: -122.962 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Cove silty clay loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___	**Is the Sampled Area within a Wetland?** **Yes X** **No** ___
Hydric Soil Present?	Yes ___	No **X (NA)**	
Wetland Hydrology Present?	Yes **X**	No ___	

Remarks:
*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot center was located approximatey 10 feet north of standing water. Plot was located about 25 feet southwest of 1B, approximately 2 feet lower in elevation.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus latifolia*	8%	Yes	FACW
2. *Salix lucida (lasiandra)*	2%	No	FACW
3.			
4.			
Total Cover:	10%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Cornus sericea (alba)*	7%	Yes	FACW
2. *Lonicera involucrata*	2%	No	FAC
3. *Crataegus douglasii*	1%	No	FAC
4. *Physocarpus capitatus*	1%	No	FACW
5.			
Total Cover:	11%		
Herb Stratum (Plot size: 5 ft.)			
1. *Hordeum brachyantherum*	15%	Yes	FACW
2. *Epilobium ciliatum*	3%	No	FACW
3. *Agrostis capillaris*	2%	No	FAC
4. *Plantago lanceolata*	2%	No	FACU
5. *Phalaris arundinacea*	1%	No	FACW
6.			
7.			
8.			
Total Cover:	23%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	77%		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:
More Pacific willow was rooted in the standing water at lower elevation than plot center and thus not included in data. Lots of leaf litter and small unknown seedlings in herb plot. Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover e.g., Pacific willow in the tree layer.

SOIL

Sampling Point: **1A**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-18	7.5YR 3/2	100	no redox				sandy loam	
18-24	7.5YR 3/2	100	no redox				silt loam	some sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:
Soil indicators are not applicable for "delineation-lite" in restoration or creation areas.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
X FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___
Water Table Present?	Yes X	No ___	Depth (inches):	19" bgs (rising)
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	9" bgs

Wetland Hydrology Present? **Yes** **X** **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:
The free water in pit was still rising after we completed data collection. Flood debris noted on veg ≥ 9 feet above plot elevation. The 2014 Delineation lite hydrology study concluded that this plot met wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **1B**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR): A (MLRA 2) Lat: 45.444 Long: -122.962 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Cove silty clay loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes ___	No **X**
Hydric Soil Present?	Yes ___	No **X (NA)**
Wetland Hydrology Present?	Yes ___	No **X**

Is the Sampled Area within a Wetland? **Yes** ___ **No** **X**

Remarks:

*Although rainfall for the water year was above normal, rainfall in the first half of February was below average. Plot was located about 25 feet northeast of 1A, approximately 2 feet higher in elevation.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus garryana*	30%	Yes	FACU
2. *Frangula purshiana*	2%	No	FAC
3.			
4.			
Total Cover:	32%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Pseudotsuga menziesii*	1%	No	FACU
2. *Salix scouleriana*	2%	No	FAC
3. *Lonicera involucrata*	1%	No	FAC
4. *Fraxinus latifolia*	1%	No	FACW
5. *Symphoricarpos albus*	1%	No	FACU
Total Cover:	6%		
Herb Stratum (Plot size: 5 ft.)			
1. *Hordeum brachyantherum*	50%	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	50%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 50%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species ___	x 2 =	___
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover.

SOIL

Sampling Point: **1B**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-26	7.5YR 3/2	100	no redox				sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:
Soil indicators are not applicable for "delineation-lite" in restoration or creation areas.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes	_____	No	X	Depth (inches): _____
Water Table Present?	Yes	_____	No	X	Depth (inches): >26" bgs
Saturation Present? (includes capillary fringe)	Yes	_____	No	X	Depth (inches): >26" bgs

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:
No free water or saturation; soil becomes more moist with depth. The 2014 Delineation lite hydrology study concluded that this plot did not meet wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **2A**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR): A (MLRA 2) Lat: 45.444 Long: -122.962 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes ___	No **X**
Hydric Soil Present?	Yes ___	No **X (NA)**
Wetland Hydrology Present?	Yes ___	No **X**

Is the Sampled Area within a Wetland? **Yes** ___ **No** **X**

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot was located near the northern edge of the "east-west swale", about 15 feet NW of Plot 2B and approximately 1.5 feet higher in elevation.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Pseudotsuga menziesii*	2%	No	FACU
2. *Populus balsamifera*	2%	No	FAC
3. *Cornus sericea (alba)*	1%	No	FACW
4. *Rosa pisocarpa*	1%	No	FAC
5. *Rubus armeniacus*	1%	No	FAC
Total Cover:	7%		
Herb Stratum (Plot size: 5 ft.)			
1. *Elymus glaucus*	20%	Yes	FACU
2. *Agrostis capillaris*	5%	No	FAC
3. *Plantago lanceolata*	1%	No	FACU
4. *Epilobium ciliatum*	1%	No	FACW
5.			
6.			
7.			
8.			
Total Cover:	27%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 73%

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species ___	x 2 =	___
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover .

SOIL

Sampling Point: **2A**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-9	7.5YR 3/2	100	no redox				silt loam	some sand
9-16	7.5YR 3/2	100	no redox				silt loam	
16-24	7.5YR 3/2	90	7.5YR 3/3	10	C	matrix	silt loam	more clay, less sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

Soil indicators are not applicable for "delineation-lite" in restoration or creation areas.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):	_____
Water Table Present?	Yes _____	No X	Depth (inches):	> 24" bgs
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):	> 24" bgs

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation; soil slightly moist at bottom. The 2014 Delineation lite hydrology study concluded that this plot did not meet wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **2B**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): <1%

Subregion (LRR): A (MLRA 2) Lat: 45.444 Long: -122.962 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___
Hydric Soil Present?	Yes **X (NA)**	No ___
Wetland Hydrology Present?	Yes **X**	No ___

Is the Sampled Area within a Wetland? **Yes X** **No** ___

Remarks:

*Although rainfall for the water year was above normal, rainfall in the first half of February was below average. Plot located in "east-west swale", about 15 feet SE of Plot 2A and approximately 1.5 feet lower in elevation.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus balsamifera*	40%	Yes	FAC
2.			
3.			
4.			
Total Cover:	40%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Populus balsamifera*	10%	Yes	FAC
2. *Lonicera involucrata*	1%	No	FAC
3. *Salix species*	1%	No	OBL to FAC
4.			
5.			
Total Cover:	12%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	25%	Yes	FACW
2. *Hordeum brachyantherum*	10%	Yes	FACW
3. *Phalaris arundinacea*	7%	No	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	42%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	58%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:

SOIL

Sampling Point: **2B**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-5	7.5YR 3/2	100	no redox				silt loam	
5-11	7.5YR 3/2	85	5YR 4/4	15	C	RC	silt loam	
11-24	7.5YR 3/2	97	7.5YR 4/4	3	C	matrix	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes **X (NA)** No _____

Remarks:

This plot location did not have hydric soils during the baseline delineation (2010) and has developed hydric characteristics.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**NW coast**)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Frost-Heave Hummocks (D4)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes	X	No		Depth (inches): 2" bgs (rising)
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): to surface

Wetland Hydrology Present? Yes **X** No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

15% ORC. Standing water is present near plot center. The 2014 Delineation lite hydrology study concluded that this plot met wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **2C**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): A (MLRA 2) Lat: 45.440 Long: -122.961 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___
Hydric Soil Present?	Yes **X (NA)**	No ___
Wetland Hydrology Present?	Yes **X**	No ___

Is the Sampled Area within a Wetland? **Yes X** **No** ___

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot located about 20 feet south of Plot 2D, about 1.5 feet lower in elevation.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus balsamifera*	25%	Yes	FAC
2.			
3.			
4.			
Total Cover:	25%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Salix species*	20%	Yes	OBL to FAC
2. *Cornus sericea (alba)*	15%	Yes	FACW
3. *Populus balsamifera*	5%	No	FAC
4.			
5.			
Total Cover:	40%		
Herb Stratum (Plot size: 5 ft.)			
1. *Hordeum brachyantherum*	40%	Yes	FACW
2. *Juncus effusus*	5%	No	FACW
3. *Epilobium ciliatum*	1%	No	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	46%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	54%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:

SOIL

Sampling Point: **2C**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-11	7.5YR 3/2	90	5YR 4/6	5	C	RC	silt loam	
			5YR 4/6	5	C	matrix	silt loam	
11-14	7.5YR 4/2	75	5YR 4/6	25	C	matrix	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** **X (NA)** **No** _____

Remarks:

This plot location did not have hydric soils during the baseline delineation (2010) and has developed hydric characteristics.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**NW coast**)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Frost-Heave Hummocks (D4)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___
Water Table Present?	Yes X	No ___	Depth (inches):	6" bgs (rising)
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	surface

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

5% ORC. Standing water is present near plot center. The 2014 Delineation lite hydrology study concluded that this plot met wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **2D**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): < 1%

Subregion (LRR): A (MLRA 2) Lat: 45.444 Long: -122.961 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes ___	No **X**
Hydric Soil Present?	Yes ___	No **X (NA)**
Wetland Hydrology Present?	Yes **X**	No ___

Is the Sampled Area within a Wetland? **Yes** ___ **No** **X**

Remarks:

*Although rainfall for the water year was above normal, rainfall in the first half of February was below average. Plot is located approximately 20 feet north of Plot 2C, about 1.5 feet higher in elevation, just beyond the wetland boundary.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Pseudotsuga menziesii*	2%	No	FACU
2. *Populus balsamifera*	1%	No	FAC
3. *Thuja plicata*	1%	No	FAC
4. *Mahonia aquifolium*	1%	No	FACU
5. *Rosa nutkana*	1%	No	FAC
Total Cover:	8%*	see remarks	
Herb Stratum (Plot size: 5 ft.)			
1. *Elymus glaucus*	40%	Yes	FACU
2. *Hordeum brachyantherum*	20%	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	60%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 40%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species ___	x 2 =	___
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks:

* *Fraxinus latifolia* and *Acer macrophyllum* saplings were also present in the sapling/shrub stratum, at 1% cover each. Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover

SOIL

Sampling Point: **2D**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-10	7.5YR 3/2	100	no redox				silt loam	
10-13	7.5YR 3/2	90	7.5YR 3/4	10	C	matrix	silt loam	
13-24	7.5YR 4/2	80	5YR 4/4	20	C	matrix	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes	X	No		Depth (inches): 15" bgs
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): 12" bgs

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season**.

Remarks:

Although the plot has wetland hydrology (saturation @ 12" bgs), it is not supporting a hydrophytic plant community. The plot was located just upslope of the wetland boundary.

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **2E**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): A (MLRA 2) Lat: 45.443 Long: -122.962 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **? see veg notes**	No ___
Hydric Soil Present?	Yes ___	No **X (NA)**
Wetland Hydrology Present?	Yes ___	No **X**

Is the Sampled Area within a Wetland? **Yes** ___ **No** **X**

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot was located in excavated swale, approximately 8 feet west of Plot 2F, and about 2 feet higher in elevation..

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Cornus sericea (alba)*	1%	No	FACW
2. *Crataegus douglasii*	1%	No	FAC
3. *Fraxinus latifolia*	1%	No	FACW
4.			
5.			
Total Cover:	3%		
Herb Stratum (Plot size: 5 ft.)			
1. *Hordeum brachyantherum*	2%	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	2%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 98%

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species ___	x 2 =	___
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **? see notes** **No** ___

Remarks:

Sparsely vegetatated due mostly to weed control; additionally there was about 10% cover of dead (likely sprayed) *Vulpia brominoides* (FAC). Had this still been alive the plot would have had a marginally hydrophytic community. Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover. Douglas fir saplings that were clearly planted *this season* were not included in the sapling/shrub data.

SOIL

Sampling Point: **2E**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-24	7.5YR 3/2	100	no redox					

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____		
Water Table Present?	Yes _____	No X	Depth (inches):	> 24 " bgs	
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):	> 24 " bgs	

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

Soil was moist but no free water or saturation in the pit. The 2014 Delineation lite hydrology study concluded that this plot did not meet wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **2F**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): excavated swale Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): A (MLRA 2) Lat: 45.443 Long: -122.962 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___
Hydric Soil Present?	Yes ___	No **X (NA)**
Wetland Hydrology Present?	Yes **X**	No ___

Is the Sampled Area within a Wetland? **Yes X** **No** ___

Remarks:

*Although rainfall for the water year was above normal, rainfall in the first half of February was below average. Plot was located in excavated swale, approximately 8 feet east of Plot 2 E, and about 2 feet lower in elevation.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Salix species*	15%	Yes	OBL to FAC
2. *Cornus sericea (alba)*	2%	No	FACW
3. *Populus balsamifera*	1%	No	FAC
4. *Lonicera involucrata*	1%	No	FAC
5.			
Total Cover:	19%		
Herb Stratum (Plot size: 5 ft.)			
1. *Hordeum brachyantherum*	30%	Yes	FACW
2. *Deschampsia cespitosa*	30%	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	60%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 40%

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species ___	x 2 =	___
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:

SOIL

Sampling Point: **2F**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-16	7.5YR 3/2	97	7.5YR 4/4	3	C	matrix	silt loam	
16-24	7.5YR 3/2	95	7.5YR 4/4	5	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

Although the soil does not yet meet the criteria of any of the hydric soil indicators, it is very close to meeting the requirement of 5% redox (for chroma 2 matrix) in the upper layer for the Redox Dark Surface (F6) indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
X FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

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

Water Table Present? Yes X No _____ Depth (inches): 3" bgs

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): surface

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season**.

Remarks:

Surface water was present nearby in the swale. The 2014 Delineation lite hydrology study concluded that this plot met wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **2G**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): A (MLRA 2) Lat: 45.443 Long: -122.962 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **? See veg notes**	No ___
Hydric Soil Present?	Yes ___	No **X (NA)**
Wetland Hydrology Present?	Yes ___	No **X**

Is the Sampled Area within a Wetland? **Yes** ___ **No** **X**

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot was located approximately 20 feet east of Plot 2 F, and about 2 feet higher in elevation.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Acer macrophyllum*	1%	No	FACU
2.			
3.			
4.			
5.			
Total Cover:	1%		
Herb Stratum (Plot size: 5 ft.)			
1. *Agrostis capillaris*	1%	No	FAC
2. *Poa annua*	1%	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	2%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 98%

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 0 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **? See notes** **No** ___

Remarks:

Sparsely vegetatated due mostly to weed control; additionally there was about 40% cover of dead (likely sprayed) *Vulpia brominoides* (FAC). Had this still been alive the plot would have had a marginally hydrophytic community. Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover. Douglas fir & red-osier dogwood saplings that were clearly planted *this season* were not included in the sapling/shrub data.

SOIL

Sampling Point: **2G**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-14	7.5YR 3/2	100	no redox				silt loam	
14-24	7.5YR 3/2		missing data				silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):	_____	
Water Table Present?	Yes _____	No X	Depth (inches):	> 24" bgs	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):	> 24" bgs	**Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation in pit. The 2014 Delineation lite hydrology study concluded that this plot did not meet wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3A**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR): A (MLRA 2) Lat: 45.443 Long: -122.962 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___
Hydric Soil Present?	Yes **X (NA)**	No ___
Wetland Hydrology Present?	Yes **X**	No ___

Is the Sampled Area within a Wetland? **Yes X** **No** ___

Remarks:

*Although rainfall for the water year was above normal, rainfall in the first half of February was below average. Plot was located about 30 feet east of the water's edge at the time. The plot was approximately 20 feet east of Plot 3B and about 2 feet lower.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	15%	Yes	FAC
2.			
3.			
4.			
Total Cover:	15%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Fraxinus latifolia*	5%	Yes	FACW
2. *Crataegus douglasii*	5%	Yes	FAC
3. *Cornus sericea (alba)*	3%	Yes	FACW
4. *Thuja plicata*	1%	No	FAC
5. *Frangula purshiana*	1%	No	FAC
Total Cover:	15%		
Herb Stratum (Plot size: 5 ft.)			
1. *Hordeum brachyantherum*	15%	Yes	FACW
2. *Juncus patens*	4%	No	FACW
3. *Plagiobothrys scouleri*	5%	No	FACW
4. *Deschampsia cespitosa*	3%	No	FACW
5.			
6.			
7.			
8.			
Total Cover:	27%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 73%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:

The popcorn flower (*Plagiobothrys scouleri*) was in seedling stage.

SOIL

Sampling Point: **3A**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-7	7.5YR 3/2	100	no redox				silt loam	
7-15	7.5YR 3/2	95	7.5YR 4/6	5	C	matrix	silt loam	
15-28	7.5YR 3/2	92	5YR 4/6	8	C	matrix	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X (NA) **No** ___

Remarks:

Although soils are NA for restoration or creation wetlands in "delineation-lite", this plot has already developed a hydric soil indicator (F6).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**NW coast**)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Frost-Heave Hummocks (D4)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes X	No ___	Depth (inches):	23" bgs (rising)	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	20" bgs	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

Flood debris noted in vegetation approximately 6 feet above ground. No free water or saturation in upper 12" but other primary and secondary indicators indicate this plot has wetland hydrology. The 2014 Delineation lite hydrology study concluded that this plot does meet wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3B**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): A (MLRA 2) Lat: 45.443 Long: -122.962 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **? See veg notes**	No ___	**Is the Sampled Area within a Wetland?** **Yes X** **No** ___
Hydric Soil Present?	Yes ___	No **X (NA)**	
Wetland Hydrology Present?	Yes ___	No **X**	

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot was located approximately 20 feet east of Plot 3A and about 2 feet higher in elevation.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Fraxinus latifolia*	2%	No	FACW
2. *Lonicera involucrata*	1%	No	FAC
3. *Crataegus douglasii*	1%	No	FAC
4. *Malus fusca*	1%	No	FACW
5. *Alnus rubra*	1%	No	FAC
Total Cover:	6%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	3%	No	FACW
2. *Epilobium densiflorum*	2%	No	FACW
3. *Rorippa curvisiliqua*	2%	No	OBL
4. *Plagiobothrys scouleri*	1%	No	FACW
5. *Trifolium species*	1%	No	FACW to UPL
6.			
7.			
8.			
Total Cover:	9%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	91%		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species ___	x 2 =	___
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **notes** **No** ___

Remarks:

Sparsely vegetatated likely due, in part, to weed control. Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover and thus we cannot apply the 50/20 rule; also PI test is NA without hydric soil.. However this does appear to be a hydrophytic community based on the plants. The popcorn flower (Plagiobothrys scouleri) was in seedling stage.

SOIL

Sampling Point: **3B**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-10	7.5YR 3/2	100					silt loam	
10-14	7.5YR 3/2	95	5YR 4/6	5	C	matrix	silt loam	
14-24	7.5YR 3/2	85	7.5YR 4/4	15	C	matrix	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):	_____
Water Table Present?	Yes _____	No X	Depth (inches):	> 24" bgs
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):	> 24" bgs

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

The 2014 Delineation lite hydrology study concluded that this plot does not meet wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3C**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR): A (MLRA 2) Lat: 45.443 Long: -122.962 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No	
Hydric Soil Present?	Yes	No **X (NA)**	
Wetland Hydrology Present?	Yes **X**	No	

Is the Sampled Area within a Wetland? **Yes X** **No** ___

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot was located approximately 40 feet east of the water line at the time. Plot is located aproximately 25 feet west of Plot 3D, and about 2.5 feet lower in elevation.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	1%	No	FAC
2.			
3.			
4.			
Total Cover:	1%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Salix species*	15%	Yes	OBL to FAC
2. *Crataegus douglasii*	5%	No	FAC
3. *Fraxinus latifolia*	5%	No	FACW
4. *Cornus sericea (alba)*	5%	No	FACW
5. *Spiraea douglasii*	1%	No	FACW
Total Cover:	31%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	10%	Yes	FACW
2. *Hordeum brachyantherum*	3%	No	FACW
3. *Plagiobothrys scouleri*	2%	No	FACW
4. *Rorippa curvisiliqua*	1%	No	OBL
5. *Carex obnupta*	1%	No	OBL
6.			
7.			
8.			
Total Cover:	17%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 83%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:

The willow leaves were not fully open yet but this did not appear to be Scouler's willow (FAC) but rather one of the three other common willows on-site, which are all FACW.

SOIL

Sampling Point: **3C**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-10	7.5YR 3/2	97	7.5YR 4/6	3	C	matrix	silt loam	
10-16	7.5YR 3/2	95	7.5YR 4/6	5	C	matrix	silt loam	
16-30	7.5YR 3/2	90	7.5YR 4/4	10	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

Although the soil does not yet meet the criteria of any of the hydric soil indicators, it is very close to meeting the requirement of 5% redox (for chroma 2 matrix) in the upper layer for the Redox Dark Surface (F6) indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
X FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes	X	No		Depth (inches): 25" bgs (rising)
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): 20" bgs

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

Flood debris noted in vegetation approximately 5 feet above ground. At the time of the investigation, saturation and free water were below 12" in the pit, likely due to below average rainfall in early February and no recent floods. Nonetheless, the other primary & secondary hydro indicators and the strongly hydrophytic plant community all indicate this is a wetland. The 2014 Delineation lite hydrology study concluded that this plot does meet wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/16/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3D**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): < 1%

Subregion (LRR): A (MLRA 2) Lat: 45.443 Long: -122.962 Datum: NAD 83 UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___	**Is the Sampled Area within a Wetland?** Yes ___ No **X**
Hydric Soil Present?	Yes ___	No **X (NA)**	
Wetland Hydrology Present?	Yes ___	No **X**	

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot was located approximately 25 feet east of Plot 3C, and about 2.5 feet higher in elevation and approximtely 25 west of Plot 3E and about 2 feet higher in elevation.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Fraxinus latifolia*	1%	No	FACW
2. *Crataegus douglasii*	1%	No	FAC
3. *Frangula purshiana*	1%	No	FAC
4. *Rosa pisocarpa*	1%	No	FAC
5.			
Total Cover:	4%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	30%	Yes	FACW
2. *Hordeum brachyantherum*	5%	No	FACW
3. *Elymus glaucus*	2%	No	FACU
4.			
5.			
6.			
7.			
8.			
Total Cover:	37%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	63%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes **X** No ___

Remarks:

Lots of dead *Vulpia brominoides.* Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover.

SOIL

Sampling Point: **3D**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc2	Texture	Remarks
0-15	7.5YR 3/2	100	no redox				silt loam	
15-26	7.5TY 3/2	97	7.5YR 4/4	3	C	matrix	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):	_____
Water Table Present?	Yes _____	No X	Depth (inches):	> 26" bgs
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):	> 26" bgs

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

The 2014 Delineation lite hydrology study concluded that this plot does not meet wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3E**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): excavated swale Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): A (MLRA 2) Lat: 45.443 Long: -122.962 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___	**Is the Sampled Area within a Wetland?** **Yes X** **No** ___
Hydric Soil Present?	Yes ___	No **X (NA)**	
Wetland Hydrology Present?	Yes **X**	No ___	

Remarks:
*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot is located in excavated swale, approximately 25 feet east of Plot 3D, about 2 feet lower; and approximately 12 feet west of Plot 3F and about 2 feet lower.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Fraxinus latifolia*	1%	No	FACW
2. *Frangula purshiana*	1%	No	FAC
3. *Crataegus douglasii*	1%	No	FAC
4. *Lonicera involucrata*	1%	No	FAC
5.			
Total Cover:	4%		
Herb Stratum (Plot size: 5 ft.)			
1. *Agrostis exarata*	20%	Yes	FACW
2. *Juncus patens*	10%	Yes	FACW
3. *Carex obnupta*	10%	Yes	OBL
4. *Deschampsia cespitosa*	7%	No	FACW
5. *Lolium perenne*	2%	No	FAC
6.			
7.			
8.			
Total Cover:	49%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	51%		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species ___	x 2 =	___
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:
Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover. Shrubs were located at slightly higher elevation than plot center.

SOIL

Sampling Point: **3E**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-16	7.5YR 3/2	97	7.5YR 4/4	3	C	matrix	silt loam	
16-25	7.5YR 3/2	80	7.5YR 4/4	20	C	matrix	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
X FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches): > 25" bgs
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): 20" bgs

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:
At the time of the investigation, saturation was below 12" in the pit, likely due to below average rainfall in early February and no recent floods. Nonetheless, the other primary & secondary hydro indicators and the strongly hydrophytic plant community indicate this is a wetland. The 2014 Delineation lite hydrology study concluded that this plot meets wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3F**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR): A (MLRA 2) Lat: 45.443 Long: -122.961 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

	Yes	No
Hydrophytic Vegetation Present?	X	
Hydric Soil Present?	X (NA)	
Wetland Hydrology Present?		X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:

*Although rainfall for the water year was above normal, rainfall in the first half of February was below average.. Plot is located at the top of the cut of the excavated swale; approximately 12 feet east of Plot 3E and about 2 feet higher.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Pseudotsuga menziesii*	1%	No	FACU
2. *Fraxinus latifolia*	1%	No	FACW
3. *Mahonia aquifolium*	1%	No	FACU
4. *Alnus rubra*	1%	No	FAC
5.			
Total Cover:	4%		
Herb Stratum (Plot size: 5 ft.)			
1. *Epilobium densiflorum*	1%	No	FACW
2. *Deschampsia cespitosa*	1%	No	FACW
3. *Plagiobothrys scouleri*	1%	No	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	3%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 97%

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	
FACW species	4	x 2 =	8
FAC species	1	x 3 =	3
FACU species	2	x 4 =	8
UPL species	0	x 5 =	
Column Totals:	7 (A)		19 (B)

Prevalence Index = B/A = **2.3**

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

About 50% dead, dried out grasses. Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover, thus we can not do the 50/20 test, Since there is hydric soil, then the PI (2.3) is theroetically applicable. This is tentatively a nominally hydrophytic community, based *on what is living.*

SOIL

Sampling Point: **3F**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-8	7.5YR 3/2	98	7.5YR 4/4	2	C	matrix	silt loam	
8-24	7.5YR 3/2	90	7.5YR 4/4	10	C	matrix	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X (NA) **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___
Water Table Present?	Yes ___	No X	Depth (inches):	> 24" bgs
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	> 24" bgs

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation. Even though this plot had hydric soil and a hydrophytic plant community, it was outside of the 2014 wetland hydrology line so we conclude it is not a wetland.

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3G**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR): A (MLRA 2) Lat: 45.441 Long: -122.961 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___
Hydric Soil Present?	Yes **X (NA)**	No ___
Wetland Hydrology Present?	Yes **X**	No ___

Is the Sampled Area within a Wetland? **Yes X** **No** ___

Remarks:

*Although rainfall for the water year was above normal, rainfall in the first half of February was below average. About 30 feet west of excavated swale.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Fraxinus latifolia*	1%	No	FACW
2. *Thuja plicata*	1%	No	FAC
3. *Frangula purshiana*	1%	No	FAC
4. *Crataegus douglasii*	1%	No	FAC
5. *Alnus rubra*	1%	No	FAC
Total Cover:	5%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	25%	Yes	FACW
2. *Epilobium ciliatum*	1%	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	26%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	74%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover.

SOIL

Sampling Point: **3G**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-6	7.5YR 3/2	98	7.5YR 4/4	2	C	matrix	silt loam	
6-14	7.5YR 3/2	95	7.5YR 4/4	5	C	matrix	silt loam	
14-24	7.5YR 3/2	70	7.5YR 4/4	30	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** **X(NA)** **No** _____

Remarks:

This plot location did not have hydric soils during the baseline delineation (2010) and has developed hydric characteristics.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
X FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):	_____
Water Table Present?	Yes _____	No X	Depth (inches):	>24" bgs
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):	>24" bgs.

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation in upper 12" but other primary and secondary indicators, including hydric soil, indicate this plot has wetland hydrology. The 2014 Delineation lite hydrology study concluded that this plot meets wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3H**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): ≤ 1%

Subregion (LRR): A (MLRA 2) Lat: 45.441 Long: -122.961 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___
Hydric Soil Present?	Yes ___	No **X(NA)**
Wetland Hydrology Present?	Yes ___	No **X**

Is the Sampled Area within a Wetland? **Yes** ___ **No** **X**

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot is located approximately 20 feet east of plot 3G, about 1 foot higher.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Crataegus douglasii*	1%	No	FAC
2. *Fraxinus latifolia*	1%	No	FACW
3. *Symphoricarpos albus*	1%	No	FACU
4. *Rosa nutkana*	1%	No	FAC
5. *Frangula purshiana*	1%	No	FAC
Total Cover:	5%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	40%	Yes	FACW
2. *Hordeum brachyantherum*	5%	No	FACW
3. *Phalaris arundinacea*	3%	No	FACW
4. *Epilobium ciliatum*	1%	No	FACW
5.			
6.			
7.			
8.			
Total Cover:	49%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 51%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

x Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover.

SOIL

Sampling Point: **3H**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-9	7.5YR 3/2	97	7.5YR 4/4	3	C	matrix	silt loam	
9-14	7.5YR 3/2	95	7.5YR 4/6	5	C	matrix	silt loam	
14-24	7.5YR 3/2	80	7.5YR 4/4	20	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):	_____	
Water Table Present?	Yes _____	No X	Depth (inches):	> 24" bgs	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):	> 24" bgs	**Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation. The 2014 Delineation lite hydrology study concluded that this plot does not meets wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3I**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): excavated swale Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): A (MLRA 2) Lat: 45.441 Long: -122.961 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___
Hydric Soil Present?	Yes **X(NA)**	No ___
Wetland Hydrology Present?	Yes **X**	No ___

Is the Sampled Area within a Wetland? **Yes X** **No** ___

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average.. Plot is located in excavated swale, approximately 25 feet east of Plot 3H, about 2.5 feet lower.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Crataegus douglasii*	1%	No	FAC
2.			
3.			
4.			
5.			
Total Cover:	1%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	80%	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	80%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	20%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover.

SOIL

Sampling Point: **3I**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-18	7.5YR 3/2	95	7.5YR 4/4	5	C	matrix	silt loam	
18-24	7.5YR 3/2	85	7.5YR 4/4	15	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** **X (NA)** **No** _____

Remarks:

This plot location did not have hydric soils during the baseline delineation (2010) and has developed hydric characteristics.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
X FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):	_____
Water Table Present?	Yes _____	No X	Depth (inches):	> 24" bgs
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):	> 24" bgs

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation. Other indicators, including hydric soil indicate that this plot has wetland hydrology. The 2014 Delineation lite hydrology study concluded that this plot meets wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3J**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): near top of swale Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR): A (MLRA 2) Lat: 45.441 Long: -122.961 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___	**Is the Sampled Area within a Wetland?** **Yes** ___ **X** **X**
Hydric Soil Present?	Yes ___	No **X (NA)**	
Wetland Hydrology Present?	Yes ___	No **X**	

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Located approximately 20 feet east of Plot 3I, about 2.5 feet higher.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Fraxinus latifolia*	1%	No	FACW
2. *Pseudotsuga menziesii*	1%	No	FACU
3. *Mahonia aquifolium*	1%	No	FACU
4. *Alnus rubra*	1%	No	FAC
5.			
Total Cover:	4%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	80%	Yes	FACW
2. *Hordeum brachyantherum*	15%	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	95%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 5%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species ___	x 2 =	___
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

x Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover.

SOIL

Sampling Point: **3J**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-10	7.5YR 3/2	98	7.5YR 4/4	2	C	matrix	silt loam	
10-26	7.5YR 3/2	85	7.5YR 4/4	15	C	matrix	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):	_____	
Water Table Present?	Yes _____	No X	Depth (inches):	>26" bgs	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):	>26" bgs	**Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation. The 2014 Delineation lite hydrology study concluded that this plot does not meet wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3K**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): none Slope (%): ≤ 1

Subregion (LRR): A (MLRA 2) Lat: 45.440 Long: -122.961 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___
Hydric Soil Present?	Yes ___	No **X (NA)**
Wetland Hydrology Present?	Yes **X**	No ___

Is the Sampled Area within a Wetland? **Yes X** **No** ___

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot was located approximately 20 feet west of Plot 3L, about 1.5 feet lower.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	2%	No	FAC
2.			
3.			
4.			
Total Cover:	2%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Crataegus douglasii*	1%	No	FAC
2. *Lonicera involucrata*	1%	No	FAC
3. *Fraxinus latifolia*	1%	No	FACW
4. *Salix species*	1%	No	OBL to FAC
5.			
Total Cover:	4%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	5%	Yes	FACW
2. *Rorippa curvisiliqua*	2%	No	OBL
3. *Plagiobothrys scouleri*	1%	No	FACW
4. *Hordeum brachyantherum*	1%	No	FACW
5.			
6.			
7.			
8.			
Total Cover:	9%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 91%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species ___	x 2 =	___
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover.

SOIL

Sampling Point: **3K**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-9	7.5YR 3/2	98	7.5YR 4/4	2	C	matrix	silt loam	
9-16	7.5YR 3/2	90	7.5YR 4/4	10	C	matrix	silty clay loam	
16-24	7.5YR 3/2	80	7.5YR 4/4	20	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:
Nearly meets Indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
X FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches): ___
Water Table Present?	Yes	___	No	X	Depth (inches): > 26" bgs
Saturation Present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): > 26" bgs

Wetland Hydrology Present? **Yes** **X** **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:
No free water or saturation but other primary and secondary indicators indicate this plot has wetland hydrology. The 2014 Delineation lite hydrology study concluded that this plot meets wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014)

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3L**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): < 1%

Subregion (LRR): A (MLRA 2) Lat: 45.440 Long: -122.961 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___
Hydric Soil Present?	Yes ___	No **X (NA)**
Wetland Hydrology Present?	Yes ___	No **X**

Is the Sampled Area within a Wetland? **Yes** ___ **No** **X**

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Located approximately 20 feet east of Pot 3K, about 1.5 feet higher.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Fraxinus latifolia*	1%	No	FACW
2. *Crataegus douglasii*	1%	No	FAC
3. *Frangula purshiana*	1%	No	FAC
4. *Alnus rubra*	1%	No	FAC
5. *Lonicera involucrata*	1%	No	FAC
Total Cover:	5%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	5%	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	5%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	95%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks:

About 35% cover by dead and/or sprayed plants, lots of moss Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover.

SOIL

Sampling Point: **3L**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-11	7.5YR 3/2	100	no redox					
11-19	7.5YR 3/2	80	7.5YR 4/4	20	C	matrix	silt loam	
19-24	7.5YR 3/2	75	7.5YR 4/4	20	C	matrix	silty clay loam	
"			7.5YR 4/6	5	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes _____	No	X	Depth (inches):	_____
Water Table Present?	Yes _____	No	X	Depth (inches):	> 24" bgs
Saturation Present? (includes capillary fringe)	Yes _____	No	X	Depth (inches):	> 24" bgs

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation. The 2014 Delineation lite hydrology study concluded that this plot does not meet wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3M**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): excavted swale Local relief (concave, convex, none): concave Slope (%): ____

Subregion (LRR): A (MLRA 2) Lat: 45.440 Long: -122.961 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes ____	No X (NA)	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Located at the bottom of the excavated swale, approximately 25 feet east of Plot 3L, and about 1.5 feet lower.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Salix species*	1%	No	OBL to FAC
2.			
3.			
4.			
5.			
Total Cover:	1%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	90%	Yes	FACW
2. *Carex obnupta*	1%	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	91%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	9%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No ____**

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover.

SOIL

Sampling Point: **3M**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-16	7.5YR 3/2	97	7.5YR 4/4	3	C	matrix	silt loam	
16-27	7.5YR 3/2	95	7.5YR 4/4	5	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
X FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes	X	No		Depth (inches): 24" bgs (rising)
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): 18" bgs

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation in upper 12" but other primary and secondary indicators indicate this plot has wetland hydrology. The 2014 Delineation lite hydrology study concluded that this plot meets wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **3N**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): near top of swale cut Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): A (MLRA 2) Lat: 45.440 Long: -122.961 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___	**Is the Sampled Area within a Wetland?** Yes ___ No **X**
Hydric Soil Present?	Yes **X (NA)**	No ___	
Wetland Hydrology Present?	Yes ___	No **X**	

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Located near top of swale cut, approximately 15 feet east of 3M, about 2.5 feet higher.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Pseudotsuga menziesii*	1%	No	FACU
2. *Abies grandis*	1%	No	FACU
3. *Fraxinus latifolia*	1%	No	FACW
4. *Rosa nutkana*	1%	No	FAC
5. *Lonicera involucrata*	1%	No	FAC
Total Cover:	5%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	85%	Yes	FACW
2. *Hordeum brachyantherum*	3%	No	FACW
3. *Phalaris arundinacea*	2%	No	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	90%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	10%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species ___	x 2 =	___
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes **X** No ___

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover.

SOIL

Sampling Point: **3N**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-5	7.5YR 3/2	100	no redox				silt loam	
5-11	7.5YR 3/2	90	7.5YR 4/4	10	C	matrix	silty clay loam	
11-24	7.5YR 3/2	80	7.5YR 4/4	20	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X (NA) **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___
Water Table Present?	Yes ___	No X	Depth (inches):	> 24"
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	> 24"

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

Even though this plot had hydric soil and a hydrophytic plant community, it was outside of the 2014 wetland hydrology line so we conclude it is not a wetland.

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **4A**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): A (MLRA 2) Lat: 45.437 Long: -122.958 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silty clay loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** **Yes X** **No ___**
Hydric Soil Present?	Yes ___	No X (NA)	
Wetland Hydrology Present?	Yes X	No ___	

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot located near wetland boundary & approximately 25 feet west of Plot 4B, a few inches lower.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Fraxinus latifolia*	1%	No	FACW
2.			
3.			
4.			
5.			
Total Cover:	1%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	30%	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	30%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 70%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No ___**

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover. About 60% dead unidentifiable grasses.

SOIL

Sampling Point: **4A**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-8	7.5YR 3/2	97	7.5YR 4/4	3	C	matrix	silt loam	
8-16	7.5YR 3/2	97	7.5YR 4/4	3	C	matrix	silty clay loam	
16-24	7.5YR 3/2	93	7.5YR 4/4	7	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
X FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches): > 24" bgs
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): 22" bgs

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation in upper 12" but other primary and secondary indicators indicate this plot has wetland hydrology. The 2014 Delineation lite hydrology study concluded that this plot meets wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **4B**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): A (MLRA 2) Lat: 45.437 Long: -122.958 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silty clay loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___	**Is the Sampled Area within a Wetland?** Yes ___ No **X**
Hydric Soil Present?	Yes **X (NA)**	No ___	
Wetland Hydrology Present?	Yes ___	No **X**	

Remarks:

*Although rainfall for the water year was above normal, rainfall in the first half of February was below average. Plot located approximately 25 feet east of Plot 4A, a few inches higher.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Abies grandis*	1%	No	FACU
2. *Pseudotsuga menziesii*	1%	No	FACU
3.			
4.			
5.			
Total Cover:	2%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	10%	Yes	FACW
2. *Hordeum brachyantherum*	1%	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	11%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	89%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes **X** No ___

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover. There was also some dead/sprayed plants on the ground. Douglas fir, red alder, Oregon grape, and Nootka rose plants that were *clearly planted this year* were not included in data.

SOIL

Sampling Point: **4B**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-8	7.5YR 3/2	98	7.5YR 4/4	2	C	matrix	silt loam	
8-18	7.5YR 3/2	95	7.5YR 4/4	5	C	matrix	silty clay loam	
18-24	7.5YR 3/2	90	7.5YR 4/4	10	C	matrix	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X (NA) **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___
Water Table Present?	Yes ___	No X	Depth (inches):	> 24" bgs
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	> 24" bgs

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

Even though this plot had hydric soil and a hydrophytic plant community, it was outside of the 2014 wetland hydrology line so we conclude it is not a wetland.

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **4C**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): A (MLRA 2) Lat: 45.437 Long: -122.958 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silty clay loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___
Hydric Soil Present?	Yes **X (NA)**	No ___
Wetland Hydrology Present?	Yes **X**	No ___

Is the Sampled Area within a Wetland? **Yes X** **No** ___

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot located approximately 20 feet west of Plot 4D, a few inches lower.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Fraxinus latifolia*	1%	No	FACW
2.			
3.			
4.			
5.			
Total Cover:	1%		
Herb Stratum (Plot size: 5 ft.)			
1. *Plagiobothrys scouleri*	2%	No	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	2%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 98%

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 0 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species 3	x 2 =	6
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: 3 (A)		6 (B)

Prevalence Index = B/A = **2.00**

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:

There was also ≥ 50% dead, unidentifiable grasses.Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover. Based on the living plants, the plot passes the PI test.

SOIL

Sampling Point: **4C**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-7	7.5YR 3/2	98	7.5YR 4/4	2	matrix	C	silty clay loam	
7-12	7.5YR 3/2	95	7.5YR 4/4	5	matrix	C	silty clay loam	
12-24	7.5YR 3/2	92	7.5YR 4/4	8	matrix	C	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X (NA) **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	> 24" bgs	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	23" bgs	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation in upper 12" but other primary and secondary indicators,including hydric soil, indicate this plot has wetland hydrology. The 2014 Delineation lite hydrology study concluded that this plot meets wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/17/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **4D**

Investigator(s): C. Jonas Moiel & Jeff Handley Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): A (MLRA 2) Lat: 45.437 Long: -122.958 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silty clay loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___	**Is the Sampled Area within a Wetland?** Yes ___ No **X**
Hydric Soil Present?	Yes ___	No **X (NA)**	
Wetland Hydrology Present?	Yes ___	No **X**	

Remarks:

*Although rainfall for the water year was above normal, rainfall in the first half of February was below average. Plot located approximately 20 feet east of Plot 4C, a few inches higher.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Fraxinus latifolia*	1%	No	FACW
2. *Pseudotsuga menziesii*	1%	No	FACU
3.			
4.			
5.			
Total Cover:	2%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	10%	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	10%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 90%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species ___	x 2 =	___
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes **X** No ___

Remarks:

Also some dead or dried out unidentifiable grasses. Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover. Douglas fir, red alder, Oregon grape, and Nootka rose plants that were clearly planted *this year* were not included in data.

SOIL

Sampling Point: **4D**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-8	7.5YR 3/2	99	7.5YR 4/4	1	C	matrix	silt loam	
8-13	7.5YR 3/2	97	7.5YR 4/4	3	C	matrix	silty clay loam	
13-24	7.5YR 3/2	93	7.5YR 4/4	7	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):	_____	
Water Table Present?	Yes _____	No X	Depth (inches):	> 24" bgs	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):	> 24" bgs	**Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

The 2014 Delineation lite hydrology study concluded that this plot does not meet wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JH Data checked by: JM

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/19/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **5A**

Investigator(s): C. Jonas Moiel Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): gentle hillslope Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): A (MLRA 2) Lat: 45.436 Long: -122.960 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___	**Is the Sampled Area within a Wetland?** **Yes X** **No** ___
Hydric Soil Present?	Yes **X (NA)**	No ___	
Wetland Hydrology Present?	Yes **X**	No ___	

Remarks:
*Although rainfall for the water year was above normal, rainfall in the first half of February was below average. Plot is located on natural hillslope approximately 10 ft south of the OBL wetland plant community, approximately 20 feet north of Plot 5b, about 2 feet lower in elevation.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Fraxinus latifolia*	1%	No	FACW
2. *Alnus rubra*	1%	No	FAC
3.			
4.			
5.			
Total Cover:	2%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	35%	Yes	FACW
2. *Agrostis stolonifera*	30%	Yes	FAC
3. *Hordeum brachyantherum*	20%	Yes	FACW
4. *Lotus unifoliatus*	10%	No	FACU
5. *Daucus carota*	3%	No	FACU
6.			
7.			
8.			
Total Cover:	98%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	2%		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:
Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover. Fraxinus and Alnus were saplings.

SOIL

Sampling Point: **5A**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-6	7.5YR 3/2	100					silt loam	
6-10	7.5YR 3/2	95	7.5YR 4/4	5	C	matrix	silt loam	
10-20	7.5YR 4/2	85	7.5YR 4/4	15	C	matrix	silty clay loam	fine redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** **X (NA)** **No** ___

Remarks:
This plot location did not have hydric soils during the baseline delineation (2010) and has developed hydric characteristics.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
X FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___	
Water Table Present?	Yes X	No ___	Depth (inches): 16"	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 13"	**Yes** **X** **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:
At the time of the investigation, saturation was at 13" in the pit, likely due to below average rainfall in early February and no recent floods. Nonetheless, the secondary hydro indicators, presence of hydric soils and the hydrophytic plant community indicate this is a wetland. The 2014 Delineation lite hydrology study concluded that this plot meets wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JM Data checked by: JH

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/19/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **5B**

Investigator(s): C. Jonas Moiel Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): A (MLRA 2) Lat: 45.436 Long: -122.960 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Chehalis silt loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___	**Is the Sampled Area within a Wetland?** Yes ___ No **X**
Hydric Soil Present?	Yes ___	No **X (NA)**	
Wetland Hydrology Present?	Yes ___	No **X**	

Remarks:

*Although rainfall for the water year was above normal, rainfail in the first half of February was below average. Plot is located approximately 20 feet south and 2 feet higher than Plot 5a.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Fraxinus latifolia*	1%	No	FACW
2. *Alnus rubra*	1%	No	FAC
3. *Mahonia aquifolium*	1%	No	FACU
4.			
5.			
Total Cover:	3%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	60%	Yes	FACW
2. *Hordeum brachyantherum*	25%	Yes	FACW
3. *Epilobium densiflorum*	5%	No	FACW
4. *Lolium perenne*	5%	No	FAC
5. *Lotus unifoliatus*	3%	No	FACU
6. *Daucus carota*	2%	No	FACU
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes **X** No ___

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover.

SOIL

Sampling Point: **5B**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-16	7.5YR 3/3	100					silt loam	
16-24	7.5YR 3/3	98	7.5YR 4/6	2	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches): >24"
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): 22"

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation in upper 12" observed during the time of sampling. The 2014 Delineation lite hydrology study concluded that this plot does not meet wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JM Data checked by: JH

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/19/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **5C**

Investigator(s): C. Jonas Moiel Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): gentle hillslope Local relief (concave, convex, none): concave Slope (%): 4

Subregion (LRR): A (MLRA 2) Lat: 45.436 Long: -122.959 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Cove silty clay loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___	**Is the Sampled Area within a Wetland?** **Yes X** **No** ___
Hydric Soil Present?	Yes **X (NA)**	No ___	
Wetland Hydrology Present?	Yes **X**	No ___	

Remarks:

*Although rainfall for the water year was above normal, rainfall in the first half of February was below average. Plot is located on gentle hillslope adjacent to OBL wetland plant community; approximately 20 feet northwest and 2.5 feet lower than Plot 5d.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Alnus rubra*	1%	No	FAC
2. *Fraxinus latifolia*	1%	No	FACW
3.			
4.			
5.			
Total Cover:	2%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	70%	Yes	FACW
2. *Lotus unifoliatus*	15%	No	FACU
3. *Hordeum brachyantherum*	10%	No	FACW
4. *Bidens cernua*	3%	No	FACW
5. *Hypochaeris radicata*	2%	No	FACU
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ___

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover. Alnus and Fraxinus in shrub layer were saplings.

SOIL

Sampling Point: **5C**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-6	7.5YR 3/2	97	7.5YR 4/4	3	C	matrix	silty clay loam	
6-11	7.5YR 3/2	94	7.5YR 4/4	6	C	matrix	clay loam	
11-24	7.5YR 4/2	85	7.5YR 4/4	15	C	matrix	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** **X(NA)** **No** _____

Remarks:

This plot location did not have hydric soils during the baseline delineation (2010) and has developed hydric characteristics.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**NW coast**)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Frost-Heave Hummocks (D4)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes	X	No		Depth (inches): 14"
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): 11"

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

Saturation was observed in upper 12" during the time of sampling. The 2014 Delineation lite hydrology study concluded that this plot meets wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JM Data checked by: JH

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

Project/Site: Tualatin Valley Environmental Bank City/County: Near Farmington/Washington Sampling Date: 2/19/2016

Applicant/Owner: Tualatin Valley Environmental Bank State: OR Sampling Point: **5D**

Investigator(s): C. Jonas Moiel Section, Township, Range: Sec 32, T1S, R2W

Landform (hillslope, terrace, etc.): near top of hillslope Local relief (concave, convex, none): convex Slope (%): 2

Subregion (LRR): A (MLRA 2) Lat: 45.436 Long: -122.959 Datum: NAD 83, UTM 10N

Soil Map Unit Name: Cove silty clay loam, occasional overflow NWI classification: upland

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ___	**Is the Sampled Area within a Wetland?** Yes ___ No **X**
Hydric Soil Present?	Yes ___	No **X(NA)**	
Wetland Hydrology Present?	Yes ___	No **X**	

Remarks:

*Although rainfall for the water year was above normal, rainfall in the first half of February was below average. Plot is located near the top of gentle hillslope, approximately 20 feet southeast and 2.5 feet higher than Plot 5c.

VEGETATION

Tree Stratum (Plot size: 50 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0%		
Sapling/Shrub Stratum (Plot size: 25 ft.)			
1. *Alnus rubra*	1%	No	FAC
2. *Crataegus douglasii*	1%	No	FAC
3.			
4.			
5.			
Total Cover:	2%		
Herb Stratum (Plot size: 5 ft.)			
1. *Deschampsia cespitosa*	50%	Yes	FACW
2. *Agrostis capillaris*	15%	No	FAC
3. *Lolium perenne*	10%	No	FAC
4. *Lotus unifoliatus*	10%	No	FACU
5. *Daucus carota*	7%	No	FACU
6. *Hordeum brachyantherum*	5%	No	FACW
7. *Leontodon taraxacoides ssp taraxacoides*	3%	No	UPL
8.			
Total Cover:	100%		
Woody Vine Stratum (Plot Size: 5 ft.)			
1.			
2.			
Total Cover:	0%		
% Bare Ground in Herb Stratum	0%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes **X** No ___

Remarks:

Note- any plant with < 5% absolute cover is not considered dominant regardless of its relative cover. Alnus saplings in shrub stratum.

SOIL

Sampling Point: **5D**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-12	7.5YR 3/3	100					silty clay loam	
12-24	7.5YR 4/3	97	7.5YR 4/6	3	C	matrix	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X (NA)**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**NW coast**)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Frost-Heave Hummocks (D4)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present?	Yes	_____	No	X	Depth (inches): _____
Water Table Present?	Yes	_____	No	X	Depth (inches): > 24" bgs
Saturation Present? (includes capillary fringe)	Yes	_____	No	X	Depth (inches): > 24" bgs

Wetland Hydrology Present? **Yes** _____ **No** **X**

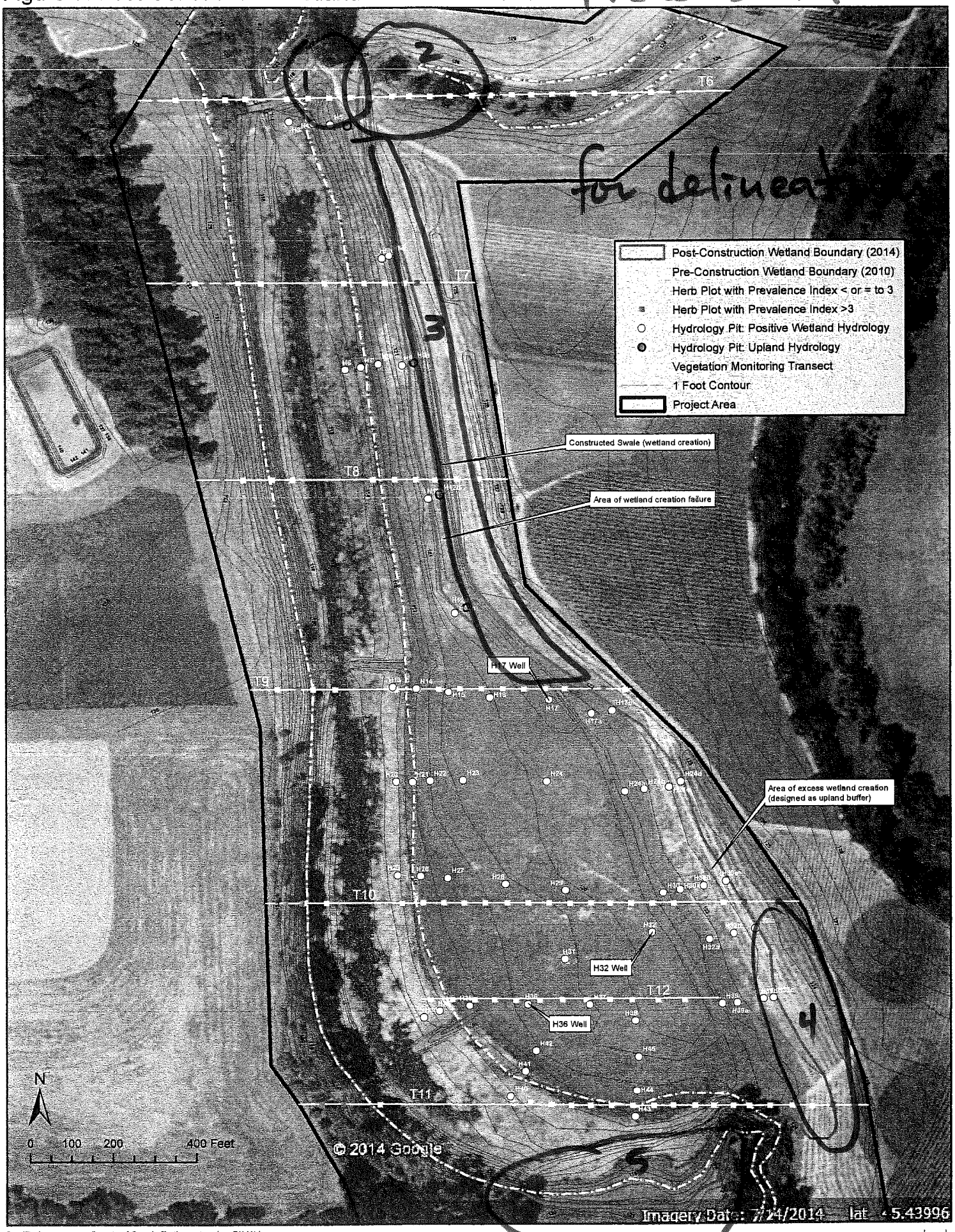
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **In 2014 and previous years, depth to free-water and saturation was recorded approximately 3 times per week at 61 open pits, and 3 shallow monitoring wells during the early growing season.**

Remarks:

No free water or saturation at the time of sampling. The 2014 Delineation lite hydrology study concluded that this plot does not meets wetland hydrology criteria based on nearby long term sampling locations at the same approximate elevation- see report (Green Banks 2014).

Data entered by: JM Data checked by: JH

Figure 2: Post-Construction Wetland Delineation 2014 Need Data



Satellite imagery compliments of Google Earth; captured on 7/14/14.

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APPENDIX C: PHOTOGRAPHIC DOCUMENTATION

Photographic Documentation: Photos taken on 9/13/2016

Photo Point 1 NW: Photo displays native dominated plant communities within the wetland area and native grass dominated upland buffer.

Photo Point 1 SW: Photo displays native dominated plant communities within the wetland area and native grass dominated upland buffer

Photo Point 2 NW: Photo displays native dominated plant communities within the wetland area and vigorously-growing woody plantings.

Photo Point 3 SW: Photo displays the un-improved access road near the "north-south" ditch.

Photo Point 3 SE: Photo displays the un-improved access road which crosses the constructed swale.

Photo Point 4 N: Photo displays the head of the constructed swale, at the un-improved access road crossing.

Photo Point 4 S: Photo displays head of constructed swale, at the un-improved access road crossing.

Photo Point 5 E: Photo displays northern woody-debris jam / ditch plug.

Photo Point 6 NW: Photo displays constructed swale and wetland creation area within the PFO vegetation community and upland buffer.

Photo Point 6 SE: Photo displays constructed swale and wetland creation area.

Photo Point 7 SE: Photo displays wetland enhancement, restoration and creation areas.

Photo Point 8 NW: Photo displays wetland creation area within the PEM FAC/FACW and PFO vegetation communities.

Photo Point 8 SE: Photo displays wetland creation and restoration areas within the PEM FAC/FACW and PFO vegetation communities.

Photo Point 9 SE: Photo displays southern woody-debris jam / ditch plug.

Photo Point 10 SW: Photo displays woody-debris jam / ditch plug, and an obligate dominated PEM community.

Photo Point 11 NW: Photo displays the mouth of the constructed swale and the wetland creation area.

Photo Point 11 SE: Photo displays the mouth of the constructed swale looking toward the log jams.

Photo Point 12 NW: Photo displays upland buffer area at Year 3.

Photo Point 13 SW: Photo displays the re-contoured location of the 18” culvert, ditch outfall, and adjacent hill-slope trench.

Photo Point 14 NW: Photo displays the re-contoured location of the 18” culvert and ditch outfall.

Photo Point 15 SW: Photo displays the secondary log jam.

Photo Point 16 SE: Photo displays primary log jam.

APPENDIX D: VEGETATION MONITORING TRANSECT LOCATION TABLE

TUALATIN VALLEY ENVIRONMENTAL BANK
Vegetation Monitoring Transect Locations:

Transect	Start Latitude	Start Longitude	End Latitude	End Longitude
T1	45.448	-122.968	45.448	-122.967
T2	45.448	-122.968	45.448	-122.966
T3	45.447	-122.965	45.447	-122.964
T4	45.446	-122.965	45.446	-122.963
T5	45.445	-122.963	45.445	-122.962
T6	45.443	-122.963	45.443	-122.959
T7	45.442	-122.963	45.442	-122.961
T8	45.441	-122.963	45.441	-122.961
T9	45.439	-122.962	45.439	-122.960
T10	45.438	-122.962	45.438	-122.958
T11	45.437	-122.962	45.437	-122.958
T12	45.437	-122.961	45.437	-122.959

Please refer to Section E: Monitoring Data Locations for an in depth description of plot locations. Transects ran west to east. In general, the first plot on a transect was 5 feet east of the transect start point; herbaceous plots were spaced every 50 feet and tree/shrub plots were spaced every 100 feet. Some areas were not sampled due to deep inundation, upland, or impermiable surface. The locations of the start and end points of each monitoring transect, the northwestern corner of each herbaceous plot, and all four corners of the woody vegetation plots were GPS'ed; this data is available upon request.

APPENDIX E: CREDIT LEDGER (2016)

TUALATIN VALLEY ENVIRONMENTAL BANK CREDIT LEDGER: 12/31/15 - 12/28/16

Date	Transaction Type	Jurisdiction	Permitee	Permit Number (DSL/Corps)	Wetland Impact Type	Number of Credits (ac.)	Balance of Credits after Transaction (ac.)
2/25/2016	withdrawl	State/Federal	City of Forest Grove	NWP-2015-00525, DSL-58632	PSS; Slope/Flats	0.195	5.1887
4/12/2016	withdrawl	State/Federal	Portland Metro	NWP-2016-00046, DSL-58724 RF	Riverine Impounding; PFO/PEM, PSS/PEM	0.009	5.1697
4/12/2016	withdrawl	State/Federal	West Linn- Wilsonville School District	NWP-2009-00318, DSL-44165-RF	PFO; Slope	0.01	5.1787
5/3/2016	withdrawl	State/Federal	Robert Evans Co.	NWP-2015-00518, DSL-APP0058613	1.46 PEM/Slope; 0.02 PSS/Slope	1.48	3.6897
6/6/2016	withdrawl	State/Federal	Pahlisch Homes	NWP-2016-00208, DSL-58697-RF	PEM/Riverine Flow-Through	0.04	3.6497
6/6/2016	withdrawl	State/Federal	Pahlisch Homes	NWP-2016-00082, DSL-58880-RF	PEM/Flats	0.05	3.5997
7/11/2016	withdrawl	State	TriCounty Investments LLC	DSL-7713-ENF	PEM/Slope	0.14	3.4597
7/12/2016	withdrawl	State/Federal	Kemmer Ridge LLC	NWP-2016-00122, DSL-58916-RF	PEM, Slope/Flats	0.44	3.0197
7/20/2016	withdrawl	State/Federal	CenterCal Properties	2005-00604, DSL-35402-RF	PEM, Slope	0.12	2.8997
7/22/2016	withdrawl	State/Federal	West Hills Development Co.	NWP-2016-00189, DSL-59079-RF	PEM, Slope/Flats	0.17	2.7297
9/28/2016	withdrawl	State/Federal	City of Tualatin	NWP-2007-01030, DSL-39676-RF	PEM, PSS; Riverine	0.3	2.4297
10/17/2016	withdrawl	State/Federal	West Hills Development	NWP-2016-00170, DSL-59020-RF	PEM, PFO; Slope/Flats	0.006	2.4237
11/18/2016	withdrawl	State/Federal	Ben Miles	NWP-2016-00430, DSL-59374-RF	PEM; Slope/Flats	0.0135	2.4102
Credits Released 2016 (ac.): 0.0			**Credits Withdrawn 2016 (ac.): 2.9735**				
Total Credits Released (ac.): 16.32			**Total Credits Withdrawn (ac.): 13.9098**			**Balance (ac.):**	**2.4102**