
KELLER FARM MITIGATION BANK MITIGATION BANKING INSTRUMENT

REDMOND, WASHINGTON



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1 **MITIGATION BANKING INSTRUMENT**
2 **Keller Farm Mitigation Bank**
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4

5 This Mitigation Banking Instrument (hereinafter, the “Instrument”) regarding the establishment,
6 use, operation, and maintenance of the Keller Farm Mitigation Bank (hereinafter, the “Bank”) is
7 made and entered into by and among Habitat Bank, LLC (hereinafter, the “Sponsor”), the U.S.
8 Army Corps of Engineers (hereinafter, the “Corps”), and the Washington State Department of
9 Ecology (hereinafter, “Ecology”), (hereinafter, collectively, the “Parties”), with reference to the
10 following:
11

12 **I. PREAMBLE**
13

14 **A. Purpose:** The purpose of this Instrument is to specify responsibilities for the
15 establishment, use, operation, and maintenance of the Bank. It consists of this “Basic Agreement”
16 establishing the central obligations assumed and consideration provided by each Party, as well as
17 Appendices (hereinafter, the “Appendices”) that establish the detailed Bank implementation plan,
18 including site-specific conditions, standards and procedural requirements applicable to the Bank.
19 The terms and provisions of the Appendices are incorporated into the Instrument. The Bank will
20 provide compensatory mitigation for unavoidable impacts to waters of the United States and waters
21 of the State, including wetlands, aquatic habitat and to other natural resources that result from
22 activities authorized by Federal, State, and local authorities, when use of the Bank has been
23 specifically approved by the appropriate regulatory agencies.
24

25 **B. Location and Ownership of Parcel:** Whereas, the Sponsor has been granted use by
26 the City of Redmond for the use of approximately 75.2 acres of land located along Bear Creek in
27 the City of Redmond, within King County, Washington and within portions of Section 6, Township
28 25N, Range 6E, and, Section 1, Township 25N, Range 5E of the Willamette Meridian. See
29 Appendix A for detailed description and map. All real property to be included within the Bank
30 site area is more completely described in the legal description attached as Exhibit A to this
31 Instrument.
32
33

1 **Table 1. Property Information Summary**

Survey Map Identifier	Property Owner	Parcel Number	Zoning	Acreage
Parcel A	City of Redmond	0125059051	BCDD2 (Mitigation Bank)	44.5
Parcel B	City of Redmond	0625069013	BCDD2 (Mitigation Bank)	38.9
			Total Parcel Acreage	83.4*
			Bear Creek Habitat Restoration Area Exclusion	4.8
			Avondale Road Easement**	3.4
			Total Bank site area	75.2
Easements and Buffers in the Bank Area				
Parcel B	City of Redmond Waterline Easement	0625069013	---	0.5
Parcel A, B	City of Redmond Pedestrian Trail Easement***	0125059051, 0625069013	---	0.4
			Total Bank Easements	0.9
Pedestrian Trail Buffer				0.4
Bank Boundary Buffer				9.4
			Total Bank Buffers	9.8
			Total Creditable Area	64.5

2 * Easement acreages are incorporated into each parcels' total acreage; therefore, are included in the Total Bank Parcel Acreage
3 calculation.

4 **City of Redmond Avondale Road Easement is not a part of the bank site area.

5 ***The City of Redmond Pedestrian Trail Easement refers to the reserved right of the City of Redmond to construct a pedestrian
6 trail. This right may be conveyed as an easement to a third-party at some time in the future.
7

8 **C. Project Description:** Whereas, the Sponsor has expressed intent to re-establish,
9 rehabilitate and enhance approximately 75.2 acres of wetlands, streams and associated upland
10 habitat in accordance with the provisions of this Instrument, and to then maintain the Bank in
11 accordance with the provisions of this Instrument. The Bank is projected to, among other purposes,
12 provide 51.1 acres of re-established wetland area, 7.9 acres of rehabilitated wetland area, 4.3 acres
13 of rehabilitated stream channel and associated wetlands, and 11.9 acres of enhanced riparian
14 upland forested area, as detailed in Appendices A and B of this Instrument.
15

1 The Bank site encompasses areas that shall not generate Bank credits. Non-creditable areas
 2 on the Bank consist of a 20-foot City waterline easement, a 30-foot City pedestrian trail easement¹
 3 (with a 15-foot buffer on each side), 100-foot and 50-foot perimeter buffers along the northern
 4 Bank Boundary, and a 100-foot perimeter buffer on the western Bank boundary. Buffer areas are
 5 to protect the Bank project from adjacent land uses. The buffer widths around the perimeter of the
 6 site are based upon current and anticipated land-use intensities on adjacent properties and the risk
 7 of impacts to the Bank from those activities. The available area for credit generation in the Bank
 8 is 64.5 acres.

9
 10 The Bank’s restoration actions specifically address the loss of wetland and aquatic area
 11 hydrology and those related functions including water quantity, water quality, and temperature
 12 limitations on the property. The Bank’s restoration actions also seek to improve anadromous fish
 13 habitat on the property which is an important goal in the watershed. The project will create new
 14 aquatic areas including stream channels, forested and shrub wetlands, and will improve
 15 connectivity between Bear Creek, Perrigo Creek, and floodplain wetlands which will create
 16 off-channel rearing and refuge habitat, as well as potential spawning habitat for anadromous fish
 17 within the Bank site. Large woody material will be placed in and along the new stream channels
 18 and wetland habitat areas according to the project plans, in order to create and improve fish and
 19 wildlife habitat.

20
 21 Restoration actions, as detailed in Table 2, will re-establish and rehabilitate wetlands and
 22 other aquatic areas in an urbanized watershed and sub-basin that is critically important to
 23 Endangered Species Act listed or threatened anadromous fish species. The Bank project will
 24 contribute to a large length of protected habitat and a riparian corridor that will benefit fish and
 25 wildlife species that depend on a variety of connected aquatic habitats. The Bank’s restoration
 26 actions will also improve water quality through capture and filtration of sediments, heavy metals,
 27 and nutrients, and will reduce flood impacts to the immediate area.

28 **Table 2. Proposed Bank Activity**

Mitigation Activity by Area	Habitat Type	Total Acres*
Farmland (Existing)	Bare Ground	75.2
Proposed Actions		
Forested Wetland Re-establishment:	PFO	19.1
Shrub/Emergent Wetland Re-establishment:	PSS/PEM Mosaic	32.0
Wetland and Stream Rehabilitation:	Riparian Stream/PEM Mosaic	4.3
Existing Wetland Rehabilitation:	Existing Wetland PFO/PSS Mix	7.9
Forested Riparian Upland Creation:	UPL	11.9
Total Bank Site Acres		75.2

29 *Total Acres includes areas within bank buffer and easements

30
 31 **D. Bank Overview:** Whereas, the general goals of Bank establishment are to restore site
 32 hydrology and floodplain connectivity to the existing and created aquatic areas, increase habitat
 33 function and complexity for anadromous fish and other aquatic dependent wildlife, and re-establish
 34 wetland and riparian vegetation communities typically found in the Bear Creek Basin and

¹ The City of Redmond Pedestrian Trail Easement refers to the reserved right of the City of Redmond to construct a pedestrian trail. This right may be conveyed as an easement to a third-party at some time in the future.

1 floodplain environment. The bank development plan will restore site conditions to a
2 pre-agricultural, pre-logging state while operating within the confines of existing site constraints.

3
4 The Bank site is located in Water Resource Inventory Area (WRIA) 8 in the lower portion of the
5 Bear Creek Basin, approximately 2.1 miles above Bear Creek’s confluence with the Sammamish
6 River. The entire 75.2 acres of the project is within the Bear Creek floodplain and has been actively
7 used for agriculture, predominately dairy farming, for the last 120 years. Prior to land clearing
8 activities, general land office notations describe the area as a “cedar swamp”. Approximately 7.9
9 acres of heavily disturbed wetland area currently exist on the site. The property was cleared by the
10 original homesteading family (Keller Family) which operated a dairy farm until the 1990’s, and
11 then rented portions of the property to other farmers for row crop production. The drainage system
12 on site includes a series of deep, channelized farm ditches that effectively convey surface water
13 and shallow groundwater off the property to dry out fertile soils in the floodplain.

14
15 The City of Redmond’s Bear Creek restoration project and other City-owned property is located
16 along the majority of the southern and eastern boundary of the Bank site. The Bank site is at the
17 confluence of three different creeks: Bear, Evans, and Perrigo Creeks, and the site itself includes
18 an additional 7,114 linear feet of ditches (classified as stream channels) within the Bank property.
19 Restoration actions will add an additional 5,162 linear feet of stream channel habitat, bringing the
20 total on the site to 12,276 linear feet of restored stream channel habitat which will have a direct
21 and year-round connection to Bear Creek. The stream channel and associated aquatic habitat areas
22 will be accessible for resident and anadromous fish species.

23
24 The Bank project’s design includes the following goals to restore critical habitat and aquatic
25 functions to the site:

- 26
- 27 • Permanently protect ecosystem functions at the Bank by implementing the Instrument
28 and executing a conservation easement with permanent funding for site stewardship.
 - 29 • Re-establish wetland hydrology and varying wetland hydroperiods across the site by
30 disabling farm ditches and performing targeted grading actions across the Bank site.
 - 31 • Create additional habitat area that supports wetland-dependent organisms. Increase
32 habitat structure and diversity on the Bank site over existing conditions.
 - 33 • Re-establish wetland vegetation and wetland habitat communities across the site.
34 Remove and control noxious and invasive plant species and reintroduce native
35 vegetation to increase habitat complexity in the floodplain wetlands and adjacent
36 upland areas. Plant native trees, shrubs, and herbaceous species to re-establish a
37 mosaic of habitat communities within the Bank property.
 - 38 • Improve access for aquatic organisms to floodplain wetland and aquatic areas.
39 Enhance and create off-channel rearing and refuge habitat for salmonids within the
40 floodplain streams and deeper backwater areas connected to Bear Creek.

- 1 • Reconnect Bear Creek to the floodplain and improve floodplain functions on the
2 Bank site including attenuation of flood flows, reductions in peak flood flows, food
3 web and organic material support and transport, and refuge habitat for fish and
4 wildlife during flood events.
- 5 • Establish a connection point for the future relocation of Perrigo Creek through the
6 adjacent parcel north of the Bank.
- 7 • Re-establish and rehabilitate stream channel habitat in the floodplain through grading
8 and addition of large woody debris (LWD). Create pool habitat and increase channel
9 habitat complexity.
- 10 • Increase shading and cover of streams through planting on the Bank site over existing
11 conditions.

12
13 **E. Interagency Review Team:** Whereas, in consideration of the establishment and
14 maintenance of the Bank, the Interagency Review Team (IRT) is willing to award compensatory
15 mitigation credits in the form of aquatic resource credits, in accordance with the procedures
16 outlined in this Instrument. These Bank credits will be made available to serve as compensatory
17 mitigation pursuant to applicable Federal and Washington State laws and regulations. The Corps
18 and Ecology serve as Co-Chairs of the IRT. The IRT is the group of Federal, State, tribal, and local
19 agencies that has reviewed, and will advise the Co-Chairs regarding, the establishment and
20 management of the Bank pursuant to the provisions of the Instrument.

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24 NOW, THEREFORE, the Parties agree to the following:

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27 **II. LEGAL AUTHORITIES**

28

29 **A. Authorities:** The establishment, use, operation, and maintenance of the Bank shall be
30 carried out in accordance with the following principal authorities.

31

32 1. Federal:

33

34 a. Clean Water Act (33 USC §§ 1251 et seq.)

35

36 b. Rivers and Harbors Act of 1899 (33 USC § 403)

37

38 c. Regulatory Programs of the Corps of Engineers, Final Rule (33 CFR Parts
39 320-332)

40

41 d. U.S. Army Corps of Engineers Regulatory Guidance Letter 05-1,
42 *Guidance on Use of Financial Assurances, and Suggested Language for*
43 *Special Conditions for Department of the Army Permits Requiring*
44 *Performance Bonds*, U.S. Army Corps of Engineers, February 14, 2005

45

- e. Guidelines for the Specification of Disposal Sites for Dredged and Fill Material (“404(b)(1) Guidelines,” 40 CFR Part 230)
- f. National Environmental Policy Act (42 USC §§ 4321 et seq.)
- g. Council on Environmental Quality Procedures for Implementing the National Environmental Policy Act (40 CFR Parts 1500-1508)
- h. Executive Order 11990 (Protection of Wetlands)
- i. Executive Order 11988 (Protection of Floodplains)
- j. Executive Order 13112 (Invasive Species)
- k. Fish and Wildlife Coordination Act (16 USC §§ 661 et seq.)
- l. Fish and Wildlife Service Mitigation Policy (46 FR 7644-7663, 1981)
- m. Endangered Species Act (16 USC §§ 1531 et seq.)
- n. Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§ 1801 et seq.)
- o. National Historic Preservation Act, as amended (16 USC § 470)
- p. Coastal Zone Management Act (16 USC § 1451 et seq.)

2. State of Washington:

- a. Washington Water Pollution Control Act, RCW 90.48 et seq.
- b. State of Washington Wetlands Mitigation Banking Statute (RCW 90.84)
- c. Washington State Rule on Wetland Mitigation Banking (WAC 173-700, Wetland Mitigation Banks)
- d. Washington State Environmental Policy Act (“SEPA” RCW 43.21C and WAC 197-11)
- e. Growth Management Act (RCW 36.70A)
- f. Washington State Hydraulic Code (RCW 77.55, WAC 220-110, and Hydraulic Permit Approval)

- g. Washington State Shoreline Management Act (RCW 90.58, WAC 173-27 as amended)
- h. Washington State Salmon Recovery Act (RCW 77.85)
- i. Washington State Aquatic Resources Act (RCW 90.74)
- j. Executive orders 89-10 and 90-04, Protection of Wetlands,

III. ESTABLISHMENT OF THE BANK

A. Permits: The Sponsor shall obtain all appropriate environmental documentation, permits and other authorizations needed to establish and maintain the Bank, prior to the award of any Bank credits. Compliance with this Instrument does not fulfill the requirement, or substitute, for such authorizations. Local authorizations and permits include, but are not limited to, City of Redmond approvals, permits, and authorizations issued under the statutory and regulatory provisions listed in the Appendices of this Instrument.

B. Bank Establishment: The Sponsor agrees to establish the Bank as described in Appendix B and to satisfactorily accomplish all performance standards reflected in Appendix C. In recognition thereof, compensatory mitigation credits will be awarded to the Sponsor in accordance with the procedures and schedules prescribed in the Appendices, particularly in Appendices C and D. In establishing the Bank, deviations from the prescribed Bank development plan and design, including deviations from any performance standards, may only be made with the prior approval of the Corps and Ecology, in consultation with the IRT. To propose modifications to the Bank development plan, the Sponsor shall submit a written request to the Corps and Ecology. Documentation of implemented modifications shall be made consistent with Article VI.B.2. of this Instrument. The Establishment Period of the Bank is defined in Article IV.K.

C. Financial Assurance Requirements: The Sponsor agrees to provide the following financial assurances for the work described in this Instrument:

1. Financial Assurance Mechanisms for Mitigation Bank Establishment: The Sponsor shall furnish either a Letter of Credit or a Surety Bond to provide financial assurance underlying the establishment and initial functionality of the Bank. This Letter of Credit or Surety Bond must be initiated by the Sponsor, in a form and content approved by the Corps and Ecology, and shall conform to the requirements of Appendix H, before any construction or implementation activities may be conducted on-site as part of the establishment period of the Bank, as defined in Article IV.K., and prior to the award of any Bank credits. Any construction or implementation activities conducted on-site prior to the inception of the establishment period must cease as of the effective date of this Instrument pursuant to Article VI.B.1, until an approved Letter of Credit or Surety Bond is initiated. The Corps and Ecology will notify the Sponsor that construction and implementation activities are authorized to commence, by granting the initial award of Bank credits in recognition of meeting all the performance standards under Objective 1, pursuant to Appendix D.

1
2
3 a. The Corps and Ecology must specifically approve all terms and
4 conditions of the Letter of Credit or Surety Bond, as well as the identity of the financial institution
5 issuing and underwriting the Letter of Credit or Surety Bond.
6

7 i. For Letters of Credit, only federally-insured institutions rated
8 investment grade or higher may issue the Letter of Credit. The Sponsor shall provide the Corps
9 and Ecology with a credit rating that indicates the financial institution has the required rating as of
10 the date of first issuance of the Letter of Credit. This credit rating shall be from a recognized
11 commercial rating service as specified in the Office of Federal Procurement Policy Pamphlet No.
12 7, available through the website of the Office of Management and Budget, Executive Office of the
13 President. Provided the required credit rating is held, approval of the financial institution selected
14 by the Sponsor shall not be unreasonably withheld. If the Corps or Ecology determines that the
15 credit rating of the financial institution issuing the Letter of Credit has subsequently failed to adhere
16 to these requirements, the Corps or Ecology may direct the Sponsor to provide an acceptable
17 substitute Letter of Credit within 30 days. If an acceptable substitute is not provided within the
18 prescribed period, the Corps or Ecology may immediately draw on the Letter of Credit up to its
19 full value without any further notice to the Sponsor. If notice of non-renewal as delineated in
20 section H.1.B. of Appendix H has been provided, and the Sponsor does not furnish an acceptable
21 replacement Letter of Credit or other approved financial assurance at least 30 days before the Letter
22 of Credit's expiration, the Corps or Ecology may immediately draw on the existing Letter of Credit
23 up to its full value without any notice to the Sponsor.
24

25 ii. For Surety Bonds, the surety must be currently certified on the
26 Department of the Treasury, Financial Management Service's Circular 570, Listing of Approved
27 Corporate Sureties. The penalty amount of the Surety Bond must fall within the per-bond
28 underwriting limitation prescribed in Circular 570, unless the amount which exceeds the specified
29 underwriting limit is coinsured or reinsured by a corporate surety currently certified in the
30 applicable list in Circular 570, and unless the amount of excess risk covered by coinsurance or
31 reinsurance does not exceed the underwriting limit of each coinsurer or reinsurer. The terms and
32 conditions of any coinsurance or reinsurance agreement must conform to the requirements of 31
33 Code of Federal Regulations sections 223.10 and 223.11, and the coinsurance or reinsurance
34 agreement must itself be specifically approved by the Corps and Ecology. Provided the required
35 certification is held and the applicable underwriting limitations are not exceeded, approval of the
36 surety selected by the Sponsor shall not be unreasonably withheld. If the Corps or Ecology
37 determines that the surety's certification under Circular 570 has been terminated, or that the per-
38 bond underwriting limitation prescribed in Circular 570 has been exceeded, the Corps or Ecology
39 may direct the Sponsor to provide an acceptable substitute Surety Bond within 30 days. If an
40 acceptable substitute financial assurance is not provided within the prescribed period, the Corps or
41 Ecology may immediately demand payment upon the Surety Bond up to its full value without any
42 further notice to the Sponsor. If notice of non-renewal as delineated in section H.1.2.B of Appendix
43 H has been provided, and the Sponsor does not furnish an acceptable replacement Surety Bond or
44 other approved financial assurance at least 30 days before the Surety Bond's expiration, the Corps
45 or Ecology may immediately demand payment upon the penal sum of the existing Surety Bond up
46 to its full value without any notice to the Sponsor.

1
2 iii. If a replacement financial assurance is required, no further credits
3 will be awarded to the Bank without an effective Letter of Credit, Surety Bond, or other approved
4 financial assurance.

5
6 iv. If the financial assurance applicable to the Bank shall expire by
7 its own terms prior to rescission or cancelation pursuant to the terms of Article III.C.1.f., the
8 Sponsor must reinitiate an acceptable financial assurance so that there is no interval in which there
9 is no approved financial assurance in effect. No further credits will be awarded to the Bank while
10 the Bank lacks an effective financial assurance instrument.

11
12 b. The Corps or Ecology, acting independently or in concert, may direct
13 disbursement from the credit funds account on a Letter of Credit, or payment of the penal sum on
14 a Surety Bond, as applicable, under the following circumstances: upon abandonment of Bank
15 establishment efforts; upon a failure stemming from any cause to achieve any of the Bank
16 Objectives or Performance Standards as reflected in Appendix C, including, but not limited to,
17 deficient design, ineffective establishment, deterioration of functionality or performance, or
18 financial limitations of the Sponsor; or upon the Sponsor's failure to maintain in force, or to
19 promptly reinstate, renew, or extend, the Letter of Credit or Surety Bond, as applicable, as required
20 by this Article III.C.1 and Appendix H. The Corps and/or Ecology shall provide specific and
21 express written direction for corrective action to the Sponsor in accordance with Article IV.H. of
22 this Instrument and Appendix F, Section F.4. ninety (90) calendar days prior to accessing funds
23 pursuant to a Letter of Credit, or ninety (90) calendar days prior to requiring payment of the penal
24 sum on a Surety Bond. If, within ninety (90) days of delivery of notice of the demand for corrective
25 action, the Sponsor has initiated compliance efforts and the Corps and Ecology have determined,
26 in their sole discretion, that substantial progress has been made toward completion of corrective
27 action, the Corps and Ecology will defer accessing the Letter of Credit or requiring payment on the
28 Surety Bond, as applicable. The Corps and/or Ecology need not provide the prior notice to the
29 Sponsor prescribed in this Article III.C.1: (a) when requiring payment on a Letter of Credit due to
30 failure to maintain the necessary credit rating or certification under Office of Federal Procurement
31 Policy Pamphlet No. 7; (b) when requiring payment on a Surety Bond due to failure to maintain
32 the necessary credit rating or certification under Financial Management Service Circular 570; or
33 (c) in the event that notice of non-renewal has been provided under Article III.C.1.a.i. or Article
34 III.C.1.a.ii.

35
36 c. Following consultation with the IRT, the Corps and/or Ecology may
37 access the funds guaranteed by the Letter of Credit, or require payment on the Surety Bond, as
38 applicable, to ensure accomplishment of any of the following objectives or features of the Bank:
39 construction, establishment, monitoring, maintenance, or remedial action activities reflected in, or
40 directly supporting accomplishment of, the Objectives and Performance Standards reflected in
41 Appendix C. The Sponsor expressly waives any and all opportunity to challenge, delay, or require
42 substantiation for any direction by the Corps or Ecology accessing and disbursing the funds
43 guaranteed by the Letter of Credit, or requiring payment on the Surety Bond, as applicable. The
44 Corps and/or Ecology may elect, in consultation with the IRT, to accomplish all of the Objectives
45 and Performance Standards prescribed in Appendix C, Section C.2. and for which the Sponsor has
46 assumed responsibility under Article III.B. of this Instrument. In lieu of accomplishing all

1 Objectives and Performance Standards in Appendix C, the Corps and/or Ecology, in their sole
2 discretion and in consultation with the IRT, may accomplish only that component or those
3 components of the Objectives and Performance Standards that are deemed reasonably necessary to
4 achieve a project that is stable, self-sustaining, and provides a level of general benefit to the aquatic
5 resources of the watershed that the Corps and/or Ecology deem appropriate under the
6 circumstances. Accomplishment of corrective or remedial actions determined to be necessary in
7 order to achieve the Sponsor's obligations under the objectives and performance standards will be
8 achieved by a Third-Party Designee designated by the Corps and/or Ecology. Eligible Third-Party
9 Designees may include, but are not limited to, non-profit entities, state or local agencies, tribal
10 components, or private mitigation providers. Such corrective or remedial action to accomplish
11 specified Sponsor responsibilities under the objectives and performance standards shall be
12 achieved in accordance with a plan developed by the Third-Party Designee and approved by the
13 Corps and Ecology as conforming to the provisions of this Instrument.
14

15 d. Any Letter of Credit shall take the general form of an agreement on the
16 part of the issuing financial institution to honor the engagement reflected therein as directed by one
17 or both of the beneficiaries in the event that the Corps and/or Ecology determine, in their sole and
18 exclusive discretion, that the principal has failed to fulfill any of the obligations established in this
19 Instrument. Any Surety Bond shall take the general form of an indemnity contract in a sum certain
20 obliging the surety to pay the full face value of the bond as directed by one or both of the
21 beneficiaries in the event that the Corps and/or Ecology determine, in their sole and exclusive
22 discretion, that the principal has failed to fulfill any of the obligations established in this Instrument.
23 A Letter of Credit or Surety Bond, as applicable, shall be furnished to guarantee the establishment
24 activities of the Bank, in the following amount:
25

26 (i): \$537,732.
27
28

29 e. Upon certification by the Corps and Ecology that the following
30 performance standards, as prescribed in Appendix C and Table D-3 of Appendix D, have been
31 achieved, the Corps and Ecology will authorize in writing that the required amount of the Letter
32 of Credit, or the required penal sum of the Surety Bond, be reduced as follows:
33

34 i. Following achievement and approval by the IRT of Performance
35 Standard 2A and Performance Standard 4A, a revised required amount of \$525,732.
36

37 ii. Following achievement and approval by the IRT of Performance
38 Standard 3A and completion of all Year 1 performance standards, a revised required amount of
39 \$255,732;
40

41 iii. Following completion of all Year 3 performance standards, a
42 revised required amount of \$109,146;
43

44 iv. Following completion of all Year 7 performance standards, a
45 revised required amount of \$39,300.
46

1 f. Upon satisfaction of all objectives and performance standards required
2 in Appendix C, and upon a determination by the Corps and Ecology that the Sponsor has satisfied
3 the additional requirements reflected in Article IV.K. of this Instrument for termination of the
4 establishment period of the Bank, the Corps and Ecology will waive their right to payment under,
5 and authorize rescission or cancellation of, the financial assurance instrument.
6

7 g. Notwithstanding the fact that the financial assurance may have been
8 accessed, or that payment upon that financial assurance may have been required, and full or partial
9 remedial or corrective action may have been taken by the Third Party Designee, unless this
10 Instrument is terminated pursuant to Article IV.J. or VI.B. the Sponsor shall remain responsible for
11 the timely and effective achievement of all the Objectives and Performance Standards mandated in
12 Appendix C.
13

14 h. Alternatively, the Sponsor may request, and the Corps and Ecology may
15 approve, a substitute financial assurance instrument for the financial assurance required under this
16 Instrument. The form and content of any financial assurance instrument must be specifically
17 approved before a substitution is utilized in satisfaction of the financial assurance obligations
18 during the establishment period of the Bank. The Corps and Ecology must specifically approve
19 the identity of the financial institution issuing and underwriting the financial assurance
20 instrument. The provisions of the substitute financial assurance instrument must conform to each
21 of the material requirements of this Article III.C.1., as well as Appendix H, within this
22 Instrument. Additionally, the substitute financial assurance must extend for the full period of time
23 that the financial assurance it replaces must extend and may be terminated pursuant to this Article
24 III.C.1. and Appendix H. The replacement financial assurance instrument must be instituted so
25 that there is no portion of the establishment period, following initiation of construction or other
26 implementation activities on-site, during which there is no financial assurance in effect. No further
27 Bank credits will be awarded while the Bank lacks an effective financial assurance instrument. The
28 replacement financial assurance instrument must be described in an amendment to the Instrument.
29

30 **2. Long-Term Management and Maintenance Endowment Fund:**

31 a. The Sponsor shall institute an endowment fund, established and
32 maintained through an escrow account, to fund management and maintenance actions as defined
33 in Article IV.M.1. of this Instrument and Appendix G, Section G.2., following the termination of
34 the establishment period of the Bank. This Long-Term Management and Maintenance (LTMM)
35 Endowment Fund shall be incrementally funded throughout the establishment period of the Bank,
36 with the funds disbursed to a Long-Term Steward upon the Sponsor's relinquishment of
37 responsibility for long-term management and maintenance of the Bank. The Sponsor agrees to
38 continue to deposit funds in the LTMM Endowment Fund escrow account, pursuant to Article
39 III.C.2.a. of this Instrument, until the LTMM Endowment Fund is fully funded in accordance with
40 Article III.C.2.b. of this Instrument.
41

42 b. The LTMM Endowment Fund escrow account shall be funded
43 throughout the establishment period of the Bank by depositing a designated sum corresponding to
44 each sale or transfer of Bank credits or use of Bank credits by the Sponsor as compensatory
45 mitigation for its own activities causing adverse impacts to the aquatic environment. This
46 designated sum shall be \$3,775 per credit sold, used, or transferred. Deposits to the LTMM

1 Endowment Fund must be completed within 30 days of the sale, use, or transfer transaction. The
2 Corps and Ecology must specifically approve the identity of the institution in which the escrow
3 account is established, as well as the form of that account. Approval of the identity of the financial
4 institution at which the escrow account is established, and the form of the investment account,
5 shall not be unreasonably withheld.
6

7 c. The LTMM Endowment Fund shall be considered to be fully funded
8 when the total value of the escrow account, including the principal amounts deposited and
9 earnings, has accumulated to a total of \$200,000.
10

11 d. The Sponsor shall enter into an escrow agreement with both the Corps
12 and Ecology conforming to the requirements of Appendix H, Section H.2. The escrow agreement
13 for the LTMM Endowment Fund shall be signed prior to the release of any Bank credits, and
14 before any construction or implementation activities may be conducted on-site during the
15 establishment period of the Bank, as defined in Article IV.K.
16

17 e. Upon receipt of written instructions signed by the Sponsor, Corps, and
18 Ecology, the LTMM Endowment Fund escrow account shall be terminated and all funds disbursed
19 pursuant to the instructions of the Corps and Ecology.
20

21 **D. Real Estate Provisions:** All real property to be included within the Bank is presently
22 owned in fee simple by the City of Redmond, as detailed in Appendix A. The Sponsor is
23 responsible for ensuring the landowner burdens the title to their real property upon which the Bank
24 is located through a grant of a conservation easement, pursuant to the provisions of Appendix G,
25 Section G.1. Each conservation easement must be approved, initiated, and recorded pursuant to
26 Appendix G, Section G.1., prior to the award of any Bank credits and before any construction or
27 implementation activities may be conducted on-site during the establishment period of the Bank,
28 as defined in Article IV.K. Any construction or implementation activities conducted on-site prior
29 to the inception of the establishment period must cease as of the effective date of this Instrument
30 pursuant to Article VI.B.1., until the approved conservation easements is recorded. The Corps and
31 Ecology will notify the Sponsor that construction and implementation activities are authorized to
32 commence, by granting the initial award of bank credits in recognition of meeting all performance
33 standards under Objective 1, pursuant to Appendix D.
34
35

36 **IV. OPERATION OF THE BANK**

37

38 **A. Service Area:** The Bank is approved to provide compensatory mitigation for impacts
39 to the waters of the United States and waters of the State, including wetlands and other aquatic
40 habitat resources, within the approved Lake Sammamish and Lake Washington Service Areas. A
41 detailed description and map of the Service Areas are included in Appendix E.
42

43 1. The Bank may be used to compensate for an impact that occurs within the
44 appropriate Service Area if specifically approved by the regulatory agency(ies) that have
45 jurisdiction over that impact, pursuant to the procedures and criteria prescribed in Appendix E.
46

- 1 a. **Lake Sammamish Service Area:** The Lake Sammamish Service Area for
2 the Bank encompasses the Lake Sammamish Watershed boundary including
3 those portions located in both King and Snohomish Counties. Within the
4 Lake Sammamish Watershed, impacts to aquatic resources may be
5 compensated through the use of Bank credits, provided that the Bank cannot
6 be used to compensate for direct impacts to known or potential salmonid-
7 bearing streams unless specifically approved by the permitting agencies and
8 the Corps and Ecology, following consultation with the IRT. “Known
9 salmonid-bearing streams” are those mapped and documented in officially
10 promulgated issuances of public and/or tribal entities include the WDFW,
11 WDNR, Counties, Cities, and the Muckleshoot Indian Tribe Fisheries
12 Division. In the absence of mapped or documented salmonid presence,
13 potential salmonid use may be demonstrated for a stream that meets the
14 physical parameters for fish use delineated in Washington Administrative
15 Code (WAC) 222-16-031(3)(b)(i)(A-D) and (ii)(A-B), or as revised.
16
- 17 b. **Lake Washington Service Area:** The Lake Washington Service Area for
18 the Bank encompasses the portions of the Lake Washington Sub-basin
19 located north of Interstate 90 (I-90) including those portions located in both
20 King and Snohomish Counties. The Lake Washington Service Area
21 excludes sub-basins in the City of Seattle, the small sub-basins that drain
22 directly into Puget Sound, and those Lake Washington Sub-basins/Creeks
23 specified in Appendix E. Within the Lake Washington Service Area, the
24 following impacts to aquatic resources may be compensated through the use
25 of Bank credits: wetland buffer-only impacts; impacts to Category II, III,
26 and IV Wetlands that are not directly adjoining known or potential
27 salmonid-bearing streams (as defined for the Lake Sammamish Service
28 Area) such as non-riverine wetlands; wetlands that do not qualify as Waters
29 of the United States; and violation losses to those kinds of wetlands. Other
30 types of impacts in the Lake Washington Service Area may be allowed to
31 be compensated at the Bank on a case by case basis, with approval by the
32 permitting agencies and the Corps and Ecology, following consultation with
33 the IRT.
34

35 2. In exceptional situations, the Bank may be used to compensate for an impact that occurs
36 geographically outside of, and/or beyond the allowable impact types specified for, the service
37 area(s) if specifically approved by the regulatory agency(ies) having jurisdiction over that impact
38 and by the Corps and Ecology, in consultation with the IRT, pursuant to the procedures and criteria
39 prescribed in Appendix E, Section E.3. If the Corps and/or Ecology determine that the Sponsor
40 has sold, used, or transferred Bank credits at any time to provide compensatory mitigation outside
41 of the Service Area without prior approval, the Corps and/or Ecology, in consultation with the
42 IRT, may direct that the sale, use or other transfer of Bank credits immediately cease, and will
43 determine, in consultation with the IRT, the Sponsor and the appropriate regulatory authority, what
44 remedial actions are necessary to correct the situation and will direct their performance prior to the
45 award of any additional Bank credits. Notwithstanding the fact that ceasing sale, use or other
46 transfer of Bank credits may have been required, unless this Instrument is terminated pursuant to

1 Article IV.J. or VI.B., the Sponsor shall remain responsible for the timely and effective
2 achievement of all the Objectives and Performance Standards mandated in Appendix C.
3

4 **B. Access to the Bank Site:** The Sponsor will allow, or otherwise provide for, access to
5 the Bank site by members of the IRT or their agents or designees, as reasonably necessary for the
6 purpose of inspection, compliance monitoring, and remediation consistent with the terms and
7 conditions of this Instrument and the Appendices, throughout the periods of Bank establishment,
8 operational life, and long-term management and maintenance. Inspecting parties shall provide the
9 Sponsor reasonable prior notice of a scheduled inspection and shall not unreasonably disrupt or
10 disturb activities on the property.
11

12 **C. Availability of Bank Credits:**
13

14 1. **Availability and Sale, Transfer, or Use of Bank Credits:** Subject to the
15 documentation and scheduling provisions of Appendix D, the Sponsor may submit to the IRT
16 written evidence that particular performance standards have been achieved. If the Corps and
17 Ecology, after consulting with the IRT and the Sponsor, concur that certain performance standards
18 have been achieved in full, the Corps and Ecology will respond in writing to the Sponsor that the
19 Bank credits associated with those performance standards are available for sale, transfer, or use by
20 the Sponsor as compensatory mitigation for its own activities causing adverse impacts to the
21 aquatic environment. Each instance of sale or any other transfer of Bank credits to a third party
22 shall be reflected in a credit transaction agreement, retained by the Sponsor and made available for
23 Corps and/or Ecology. Each such credit transaction agreement must include the name, address,
24 and telephone number of the purchaser or transferee. Each transaction agreement that is associated
25 with a permit must also indicate the permit number of the impacting project, the number of Bank
26 credits involved in the transaction, and must expressly specify that the Sponsor, and its successors
27 and assigns, assume legal responsibility for accomplishment and maintenance of the transferee's
28 compensatory mitigation requirements associated with the impacting project, upon completion of
29 the credit transaction. Each credit transaction agreement that is associated with a permit shall be
30 recorded with the county auditor. A copy of the recorded transaction agreement shall be provided
31 to the Corps and Ecology.
32

33 2. **Availability of Bank Credits in the Event Financial Assurances are**
34 **Accessed:** In the event the Corps and/or Ecology, acting pursuant to Articles III.C.1.a. or III.C.1.b.
35 of this Instrument, accesses the financial assurances established pursuant to Article III.C.1. of this
36 Instrument and accomplishes any objectives, performance standards, or features of the Bank, the
37 Corps and Ecology, in consultation with the IRT, may award Bank credits for sale, use, or transfer
38 by the Sponsor, in a quantity reflecting the objectives and performance standards achieved as a
39 result of such remedial action.
40

41 **D. Credit Deficit or Fraudulent Transactions:** If the Corps and/or Ecology determine
42 at any point that the Bank is operating at a deficit, or has engaged in fraudulent transactions in the
43 sale, use, or other transfer of Bank credits, the Corps and/or Ecology will cease the award of, and
44 will direct the Sponsor to immediately cease sale, use or other transfer of, Bank credits. The Corps
45 and/or Ecology will determine, in consultation with the IRT and the Sponsor, what remedial

1 actions are necessary to correct the situation and will direct their performance prior to the award
2 of any additional Bank credits.

3
4 **E. Provisions For Use of the Mitigation Bank Area:** The Corps and/or Ecology may
5 consider the Sponsor as being in material default of a provision of this Instrument and proceed
6 accordingly under Article IV.J. should the Corps and/or Ecology, in consultation with the IRT,
7 determine that either of the following has occurred:

8
9 1. The grant of additional easements, rights of way, or any other property interest
10 in the Bank site without written notification to the Corps and Ecology in accordance with Article
11 IV.N.

12
13 2. The use, or authorization of the use, or suffering the use of any areas within the
14 Bank for any purpose that is contrary to the provisions of this Instrument or the conservation
15 easement, or which interferes with the conservation purposes of the Bank.

16
17 **F. Maintenance Provisions:** Following achievement of the performance standards, the
18 Sponsor agrees to perform all necessary work to maintain those standards as prescribed in
19 Appendix F, Section F.5.

20
21 **G. Monitoring Provisions:** The Sponsor agrees to perform all necessary work, pursuant
22 to Appendix F, to monitor the Bank during the establishment period to demonstrate compliance
23 with the performance standards established in Appendix C.

24
25 **H. Contingency Plans/Remedial Actions:** In the event the Bank fails to achieve one or
26 more of the performance standards within the specific time schedule delineated in Appendix D,
27 the Sponsor shall develop necessary contingency plans and implement appropriate remedial and
28 monitoring actions for the Bank as specified in Appendix F, Section F.4, to attain those project
29 objectives and performance standards. Prior to implementing any remediation, supplemental
30 monitoring, or other corrective measures, the Sponsor shall obtain approval of the contingency
31 plans from the Corps and Ecology. The Corps and Ecology will consult with the IRT prior to
32 approval of the plans. All appropriate environmental documentation, permits, and other
33 authorizations needed to implement the contingency plan or take remedial action shall be obtained
34 by the Sponsor. In the event the Sponsor fails to implement necessary contingency actions within
35 the period prescribed by the Corps and Ecology in the notification of approval of the contingency
36 plan, the Corps and/or Ecology, in consultation with the Sponsor and the IRT, will direct remedial,
37 corrective, and/or sanctioning action in accordance with the procedures specified in Appendix F,
38 Section F.4. Alternatively, the Corps and/or Ecology may accomplish such remedial action
39 directly, acting through a Third Party Designee, by accessing the financial assurance instrument
40 pursuant to Articles III.C.1.a. and III.C.1.b. of this Instrument.

41
42 **I. Force Majeure:** The Sponsor may request pursuant to Article III.B., and the Corps and
43 Ecology may approve, changes to the construction, operation, objectives, performance standards,
44 timelines, or credit generation and award schedule of the Bank, pursuant to the standards and
45 procedures specified in Appendix F, if all of the following occur: an act or event causes substantial
46 damage such that it is determined to be a result of force majeure; such act or event has a significant

1 adverse impact on the quality of the aquatic functions, native vegetation, or soils of the Bank site;
2 and such act or event was beyond the reasonable control of the Sponsor, its agents, contractors, or
3 consultants to prevent or mitigate.

4 1. The evaluation of the damage caused by force majeure and the resulting changes
5 to mitigation requirements involve a communicative process. If the Sponsor asserts a mitigation
6 site has sustained significant adverse impacts due to an event or act which may be determined to
7 be force majeure, the Sponsor shall give written notice to the Corps, Ecology and the IRT as soon
8 as is reasonably practicable. After receiving written notice, the Corps and Ecology, in consultation
9 with the Sponsor and the IRT, shall evaluate whether the event qualifies as force majeure. The
10 Corps and Ecology, in consultation with the Sponsor and the IRT, will then evaluate whether
11 significant adverse impacts have occurred to the site. If a force majeure event is determined to
12 have occurred and significant adverse impacts are found to have occurred to the site, the Corps
13 and Ecology, in consultation with the IRT and the Sponsor, will evaluate whether and to what
14 extent changes to the Bank site will be in the best interest of the site and the aquatic environment,
15 and may approve such changes as detailed above. The Corps and Ecology retain sole discretion
16 over the final determination of whether an act or event constitutes force majeure, whether
17 significant adverse impacts to the Bank site have occurred, and to what extent changes to the Bank
18 site or its management will be permitted.

19 2. Force majeure events include natural or human-caused catastrophic events or
20 deliberate and unlawful acts by third parties.

21 a. Examples of a natural catastrophic event include, but are not limited to:
22 a flood equal to or greater in magnitude than the 100-year flood event; an earthquake of a force
23 projected from an earthquake with a return period of 475 years; drought that is significantly longer
24 than the periodic multi-year drought cycles that are typical of weather patterns in the Pacific
25 Northwest; as well as events of the following type when they reach a substantially damaging
26 nature: disease, wildfire, depredation, regional pest infestation, or significant fluviogeomorphic
27 change.

28 b. Examples of a human-caused catastrophic event include, but are not
29 limited to, substantial damage resulting from the following: war, insurrection, riot or other civil
30 disorders, spill of a hazardous or toxic substance, or fire.

31 c. Examples of a deliberate and unlawful act include, but are not limited
32 to, substantial damage resulting from the following: the dumping of a hazardous or toxic
33 substance, as well as significant acts of vandalism or arson.

34 3. The consequences of any events of force majeure recognized as such by the
35 Corps and Ecology shall not affect the status of previously released Bank credits, whether or not
36 they have yet been sold, used, or transferred.

37
38 **J. Default:** Should the Corps and/or Ecology, in consultation with the IRT, determine that
39 the Sponsor is in material default of any provision of this Instrument, the Corps and/or Ecology
40 may cease award of Bank credits, and may notify the Sponsor that the award, sale, and/or transfer

1 of Bank credits, or use by the Sponsor of Bank credits as compensatory mitigation for its own
2 activities causing adverse impacts to the aquatic environment, are suspended until the delineated
3 deficiencies are rectified. Upon written notification of suspension, the Sponsor agrees to
4 immediately cease any sale or transfer transactions not yet finally completed, and/or to cease any
5 use by the Sponsor of Bank credits as compensatory mitigation for its own activities causing
6 adverse impacts to the aquatic environment where a Corps or Ecology permit or authorization, as
7 required, has not yet been issued, until informed by the notifying agency that award, sale, use, or
8 transfer of Bank credits may be resumed. Should the Sponsor remain in default for a period of 90
9 days, the Corps and Ecology, in consultation with the IRT, may terminate this Instrument and any
10 subsequent banking operations. In the event such termination action is commenced, the Sponsor
11 agrees to fulfill its pre-existing obligations to perform all establishment, monitoring, maintenance,
12 management, and remediation responsibilities that arise directly from Bank credits that have
13 already been awarded, sold, used, or transferred at the time of termination. In the event of
14 termination, no further sale or transfer of Bank credits may occur, nor any use by the Sponsor of
15 Bank credits as compensatory mitigation for its own activities causing adverse impacts to the
16 aquatic environment within the Service Area where a Corps or Ecology permit or authorization,
17 as required, has not yet been issued.

18
19 **K. Establishment Period of the Bank:** The establishment period of the Bank will
20 commence on the date the Instrument takes effect pursuant to Article VI.B.1. Prior to termination
21 of the establishment period of the Bank, the Corps, and Ecology, in consultation with the IRT, will
22 perform a final compliance inspection to evaluate whether all performance standards have been
23 achieved. The establishment period for the Bank will terminate, and the period of long-term
24 management and maintenance will commence, when the Corps and Ecology determine, in
25 consultation with the IRT and the Sponsor, that the following conditions have been met:

26
27 (1) all applicable performance standards prescribed in Appendix C have been
28 achieved;

29
30 (2) all available Bank credits have been awarded, or the Corps and Ecology, in
31 consultation with the IRT, have approved the Sponsor's written request to permanently cease
32 banking activities;

33
34 (3) the Sponsor has prepared a Long-Term Management and Maintenance Plan
35 that has been approved by the Corps and Ecology through execution of a Long-Term Management
36 and Maintenance Agreement, pursuant to Article IV.M.1 and Appendix G, Section G.2.;

37
38 (4) the Sponsor has either: (i) assumed responsibilities for accomplishing the Long-
39 Term Management and Maintenance Plan, in which case the Sponsor will fulfill the role of Long-
40 Term Steward, or (ii) assigned those responsibilities to another Long-Term Steward pursuant to
41 Article IV.M.2. of this Instrument;

42
43 (5) the LTMM Endowment Fund has been fully funded;

44
45 (6) the contents of the LTMM Endowment Fund have been transferred to the Long-
46 Term Steward; and

1
2 (7) the Bank has complied with the terms of this Instrument.
3

4 **L. Operational Life of the Bank:** The operational life of the Bank will commence on the
5 date the Instrument takes effect pursuant to Article VI.B.1. Following the termination of the
6 establishment period of the Bank, and (1) upon sale, transfer, or use by the Sponsor as
7 compensatory mitigation for its own activities causing adverse impacts to the aquatic environment,
8 of all Bank credits, or (2) upon approval by the Corps and Ecology, in consultation with the IRT,
9 of the Sponsor's written request to permanently cease banking activities, the operational life of the
10 Bank will terminate.
11

12
13 **M. Long-Term Management and Maintenance:**
14

15 1. The Sponsor shall develop a Long-Term Management and Maintenance Plan
16 consistent with the guidelines and objectives specified in Appendix G, Section G.2, and submit
17 the Long-Term Management and Maintenance Plan for approval by the Corps and Ecology, in
18 consultation with the IRT. The Sponsor is responsible, as Long-Term Steward, for execution of
19 the approved Long-Term Management and Maintenance Plan. The Long-Term Steward will enter
20 in a Long-Term Management and Maintenance Agreement with the Corps and Ecology, which
21 will document the commitment on the part of the Long-Term Steward to adhere to the Long-Term
22 Management and Maintenance Plan as well as memorialize the approval of the Long-Term
23 Management and Maintenance Plan by the Corps and Ecology. The Long-Term Steward may only
24 deviate from the approved Long-Term Management and Maintenance Agreement upon written
25 approval by the Corps and Ecology, following consultation with the Long-Term Steward and the
26 other members of the IRT.
27

28 2. The Sponsor may assign its long-term management and maintenance
29 responsibilities to a third-party assignee, which will then serve as Long-Term Steward in place of
30 the Sponsor. The identity of the assignee and the terms of the long-term management and
31 maintenance assignment agreement between the Sponsor and the assignee must be approved by
32 the Corps and Ecology, in consultation with the IRT, in advance of long-term management and
33 maintenance assignment.
34

35 3. Upon execution of a long-term management and maintenance assignment
36 agreement and the transfer of the contents of the LTMM Endowment Fund, and upon satisfaction
37 of the remaining requirements for termination of the establishment period of the Bank under
38 Article IV.K. of this Instrument, the Sponsor shall be relieved of all further long-term management
39 and maintenance responsibilities under this Instrument.
40

41 **N. Accomplishment of Sponsor Responsibilities; Transfer of Ownership of the Bank**
42 **Site:** The Sponsor shall remain responsible for complying with the provisions of this Instrument
43 throughout the operational life of the Bank, regardless of the ownership status of the underlying
44 real property, unless those responsibilities have been assigned pursuant to the provisions of Article
45 VI.C. of this Instrument. The Sponsor shall provide written notice at least 60 days in advance of
46 any transfer of ownership of all or a portion of the Bank real property or rights to another party, by
47 any owners of real property comprising the Bank site, or their successors or assigns.

1
2
3 **V. RESPONSIBILITIES OF THE CORPS AND ECOLOGY**
4

5 **A.** The Corps and Ecology agree to provide appropriate oversight in carrying out
6 provisions of this Instrument.
7

8 **B.** The Corps and Ecology agree to review and provide comments on project plans,
9 monitoring reports, contingency and remediation proposals, and similar submittals from the
10 Sponsor in a timely manner. The Corps and Ecology will coordinate their review with the IRT.
11

12 **C.** The Corps and Ecology agree to review requests to modify the terms of this Instrument,
13 determine achievement of performance standards in order to evaluate the award of Bank credits, or
14 approve the Long-Term Management and Maintenance Plan. The Corps and Ecology will
15 coordinate the review with the IRT so that a decision is rendered, or comments detailing deficiencies
16 are provided, in a timely manner. The Corps and Ecology agree to not unreasonably withhold or
17 delay decisions on such requests.
18

19 **D.** The Corps and Ecology agree to act in good faith when rendering decisions about
20 acceptability of financial assurances, requiring corrective or remedial actions, requiring long-term
21 management and maintenance actions, and awarding Bank credits. The Corps and Ecology will
22 exercise good judgment in accessing financial assurances and will utilize those monies only to the
23 extent they reasonably and in good faith conclude that such remedial or corrective actions are an
24 effective and efficient expenditure of resources. In implementing the process delineated in Article
25 III.C.1 of this Instrument, the Corps and Ecology will act in good faith in determining the scope
26 and nature of corrective actions to be undertaken; shall act in good faith in conducting monitoring,
27 developing reports, and assessing compliance with performance standards; and will not
28 unreasonably limit corrective action activities or otherwise apply their discretion so as to unduly
29 prejudice the Sponsor as to the timing or number of Bank credits awarded. Corps and Ecology
30 approval of the identity of any assignee responsible for executing the LTMM Plan, and approval
31 of the terms of any long-term management and maintenance assignment agreement, will not be
32 unreasonably withheld.
33

34 **E.** The Corps and Ecology will periodically inspect the Bank site as necessary, in
35 consultation with the IRT, to evaluate the achievement of performance standards, to assess the
36 results of any corrective measures taken, to monitor implementation of the LTMM Plan, and, in
37 general, to verify the Sponsor's compliance with the provisions of this Instrument.
38

39 **F.** Upon satisfaction of the requirements of Article IV.K. under this Instrument, the
40 Corps and Ecology will jointly issue a letter certifying that the establishment period of that phase
41 of the Bank has terminated, and that the period of long-term management and maintenance has
42 begun, in consultation with the IRT. Upon satisfaction of the requirements of Article IV.L. of
43 this Instrument, the Corps and Ecology will jointly issue a letter certifying that the operational
44 life of that phase of the Bank has terminated.
45
46

1 **VI. GENERAL PROVISIONS**

2
3 **A. Decision Making by Consensus:** The Corps and Ecology will strive to achieve
4 consensus among the IRT regarding issues that arise pertaining to the establishment, operation,
5 maintenance, and management of the Bank. The Corps and Ecology will coordinate the review
6 and oversight activities of the IRT to best facilitate opportunity to reach the desired consensus.
7 Review and oversight decisions will take into account the views of the Sponsor to the maximum
8 extent practicable. Where consensus cannot otherwise be reached within a reasonable timeframe,
9 as described herein and following full consideration of the comments of the IRT and following
10 consultation with the Sponsor, the Corps holds the responsibility and authority under Section 404
11 of the Clean Water Act, and Ecology holds independent responsibility and authority under Section
12 401 of the Clean Water Act and ch. 90.48 RCW, to make final decisions regarding the application
13 of the terms of this Instrument.
14

15 **B. Entry into Effect, Modification or Amendment, and Termination of the**
16 **Instrument:**

17
18 1. This Instrument, consisting of both this Basic Agreement and the Appendices,
19 will enter into effect upon the signature by authorized representatives of each of the Sponsor,
20 Corps, Ecology, and the City of Redmond, fulfilling its role as the “local jurisdiction” acting
21 pursuant to RCW 90.84.040, as of the date of the last of these signatures.
22

23 2. This Basic Agreement portion of the Instrument may be amended or modified
24 only with the written approval of the Sponsor, the Program Manager for Shorelands and
25 Environmental Assistance on behalf of Ecology and the Seattle District Engineer on behalf of the
26 Corps, or their designees. Any such modifications or amendments will take effect following
27 consultation with the IRT. Amendment or modification of the provisions of the Appendices may
28 be effectuated through an exchange of letters signed by the Sponsor, the Mitigation Program
29 Coordinator serving as Co-Chair on behalf of the Corps, and the Wetland Section Manager serving
30 as Co-Chair on behalf of Ecology, following consultation with the IRT, provided the exchange of
31 letters expresses mutual agreement as to the exact language to be deleted or modified, and the
32 exact language to be inserted.
33

34 3. This Instrument may be terminated by the mutual agreement of the Sponsor,
35 Corps, Ecology, following consultation with the IRT, or may be terminated under the terms of
36 Article IV.J. of this Instrument in the case of default by the Sponsor. In the event any termination
37 action is commenced, the Sponsor agrees to fulfill its pre-existing obligations to perform all
38 establishment, monitoring, maintenance, management, and remediation responsibilities that arise
39 directly from Bank credits that have already been sold, used, or transferred at the time of
40 termination.
41

42 4. Upon termination of the operational life of the Bank pursuant to Article IV.L.,
43 and certification to that effect pursuant to Article V.F., this Instrument shall terminate without
44 further action by any Party. Thereafter, the Long-Term Management and Maintenance Agreement
45 developed, approved, and instituted in accordance with Article IV.M. shall govern the continuing
46 obligations of the Sponsor, or its assignee as applicable.

1
2 **C. Assignment of Obligations under this Instrument:** The Sponsor may be permitted
3 to assign its obligations, responsibilities, and entitlements under this Instrument to a third party.
4 The Corps and Ecology, following consultation with the IRT, must approve the identity of the
5 assignee in order for any assignment to effectively relieve the Sponsor of those obligations. In
6 evaluating a prospective assignee, the Corps and Ecology may consider characteristics such as
7 environmental mitigation expertise, wetlands mitigation project or analogous experience, expertise
8 in salmon and salmonid habitat ecology, and financial strength and stability. Approval of the
9 identity of the assignee will not be unreasonably withheld. The assignee must execute a mitigation
10 banking instrument with the Corps and Ecology under terms identical, to the extent practicable, to
11 the present Instrument. The applicable financial assurances established pursuant to Articles
12 III.C.1. and III.C.2. of this Instrument must be initiated. The obligations, responsibilities, and
13 entitlements under this Instrument may reside in only a single entity at any one time, and may not
14 be severed or transferred piecemeal. However, the physical ownership of the Bank site real
15 property and the obligations, responsibilities, and entitlements under this Instrument are separate
16 and distinct; thus, ownership may be transferred pursuant to the provisions of Article IV.N.,
17 independently of assignment of this Instrument. Once assignment of this Instrument has been
18 properly accomplished, the Sponsor will be relieved of all its obligations and responsibilities under
19 this Instrument. Specific additional provisions pertaining to the assignment of long-term
20 management and maintenance obligations are described at Article IV.M.

21
22 **D. Specific Language of this Basic Agreement Shall Be Controlling:** To the extent that
23 specific provisions of this Basic Agreement portion of the Instrument are inconsistent with any
24 terms and conditions contained in the Appendices, or inconsistent with other documents that are
25 incorporated into this Instrument by reference and that are not legally binding, the specific
26 language within this Basic Agreement shall be controlling.

27
28 **E. Notice:** Any notice required or permitted hereunder shall be deemed to have been
29 given either (i) when delivered by hand, or (ii) three (3) days following the date deposited in the
30 United States mail, postage prepaid, by registered or certified mail, return receipt requested, or
31 (iii) when sent by Federal Express or similar next-day nationwide delivery system, addressed as
32 follows (or addressed in such other manner as the party being notified shall have requested by
33 written notice to the other party):

34
35 Habitat Bank, LLC
36 801 E 1st St. Suite B-107
37 Cle Elum, WA 98922
38 425-785-8428

39
40 U.S. Army Corps of Engineers, Seattle District
41 Mitigation Banking Coordinator/Co-Chair of the IRT
42 Regulatory Branch
43 Seattle District, Corps of Engineers
44 4735 E. Marginal Way South
45 P.O. Box 3755
46 Seattle, WA 98124-3755

1 206-764-3495
2
3

4 Washington State Department of Ecology
5 Mitigation Banking Specialist/Co-Chair of the IRT
6 Shorelands and Environmental Assistance Program
7 P.O. Box 47600
8 300 Desmond Drive
9 Olympia, WA 98504-7600
10 360-407-6000
11
12

13 **F. Entire Agreement:** This Instrument, consisting of both this Basic Agreement and the
14 Appendices, constitutes the entire agreement between the Parties concerning the subject matter
15 hereof.
16

17 **G. Invalid Provisions:** In the event any one or more of the provisions contained in this
18 Instrument are held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality
19 or unenforceability will not affect any other provisions hereof, and this Instrument shall be
20 construed as if such invalid, illegal or unenforceable provision had not been contained herein.
21

22 **H. Effect of Agreement:**
23

24 1. This Instrument does not in any manner affect statutory authorities and
25 responsibilities of the signatory Parties. This Instrument is not intended, nor may it be relied upon,
26 to create any rights in third parties enforceable in litigation with the United States or the State of
27 Washington. This Instrument does not authorize, nor shall it be construed to permit, the
28 establishment of any lien, encumbrance, or other claim with respect to the Bank site, with the sole
29 exception of the right on the part of the Corps and Ecology to require the Sponsor to implement
30 the provisions of this Instrument, including recording the conservation easement, required as a
31 condition of approval of the crediting plan reflected in this Instrument and the issuance of any
32 permits for discharges of dredged and fill material into waters of the United States associated with
33 construction, operation and maintenance of the Bank.
34

35 2. Corps approval of this Instrument constitutes regulatory approval required for
36 Keller Farm Mitigation Bank to be used to provide compensatory mitigation for Department of the
37 Army permits pursuant to 33 C.F.R. 332.8(a)(1). This Instrument is not a contract between the
38 Sponsor or property owner and the Corps or any other agency of the Federal government. Any
39 dispute arising under this Instrument will not give rise to any claim by the Sponsor or property
40 owner for monetary damages. This provision is controlling notwithstanding any other provision
41 or statement in the Instrument to the contrary.
42

43 **I. Attorneys' Fees:** If any action at law or equity, including any action for declaratory
44 relief, is brought to enforce or interpret the provisions of this Instrument, each party to the litigation
45 shall bear its own attorneys' fees and costs of litigation.
46

1 **J. Availability of Funds:** Implementation of this Instrument is subject to the requirements
2 of the Anti-Deficiency Act, 32 U.S.C. § 1341, and the availability of appropriated funds. Nothing
3 in this Instrument may be construed to require the obligation, appropriation, or expenditure of any
4 money from the United States Treasury, in advance of an appropriation for that purpose.
5

6 **K. Headings and Captions:** Any paragraph heading, or caption contained in this
7 Instrument shall be for convenience of reference only and shall not affect the construction or
8 interpretation of any provision of this Instrument.
9

10 **L. Counterparts:** This Instrument may be executed by the Parties in any combination, in
11 one or more counterparts, all of which together shall constitute one and the same instrument.
12

13 **M. Binding:** This Instrument, consisting of both this Basic Agreement and the
14 Appendices, shall be immediately, automatically, and irrevocably binding upon the Sponsor and
15 its heirs, successors, assigns and legal representatives upon execution by the Sponsor, the Corps,
16 Ecology, and the City of Redmond, fulfilling its role as the “local jurisdiction” acting pursuant to
17 RCW 90.84.040.
18

1 IN WITNESS WHEREOF, the Parties hereto have executed this Instrument on the date herein
2 below last written.

3
4 **PARTIES:**

5
6 By the Sponsor:

7
8
9
10 _____
11 Victor Woodward
12 Manager, Habitat Bank, LLC

Date

13
14 By the Corps:

15
16
17
18 _____
19 Mark A. Gerald
20 Colonel, Corps of Engineers
21 Seattle District Engineer

Date

22
23 By Ecology:

24
25
26
27 _____
28 Gordon White
29 Program Manager, Shorelands and Environmental Assistance Program
30 Washington State Department of Ecology

Date

31
32
33
34

1 **OTHER IRT MEMBERS:**

2
3 Signature by other IRT members indicates assent on the part of the represented organization to the
4 provisions of this Instrument, but does not give rise to any affirmative obligations, express or
5 implied. This Instrument is not binding on the other IRT members.
6

7
8
9
10 _____
11 John Marchione
12 Mayor
13 City of Redmond
14

_____ Date

15
16
17
18 _____
19 Dan Opalski
20 Director, Water Division
21 Environmental Protection Agency
22 Region 10
23

_____ Date

24
25
26
27 _____
28 Jeff Davis
29 Habitat Program Assistant Director
30 Washington Department of Fish and Wildlife
31

_____ Date

KELLER FARM MITIGATION BANK

Appendices to the Mitigation Banking Instrument

Habitat Bank, LLC
801 E 1st St. Suite B #107
Cle Elum, WA 98922

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APPENDIX A GENERAL BANK INFORMATION

A.1 Business Purpose and Ecological Goals of the Bank

The purpose of the Bank is to generate mitigation credits for projects that will have an adverse impact on the aquatic environment and that need to compensate for those impacts as a condition of their permits or other regulatory requirements resulting from project impacts.

The Bank site is located within the Redmond city limits at the confluence of two regionally significant salmon bearing streams, Bear Creek and Evans Creek. The City of Redmond (City) purchased the property from the Keller Family in 2015, with the intent of facilitating the establishment of a mitigation bank on the site, in support of City plans and policies (City of Redmond 2011, City of Redmond 2015).

The Keller Farm Mitigation Bank Project Prospectus (Habitat Bank LLC, 2015) describes the Bank project and its relationship to local and regional management goals and regulations. The Bank site area, known locally as “the Keller Farm”, has been identified as a high priority restoration site since the 1990s and was specifically identified as a potential mitigation bank site in the Final Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Chinook Salmon Conservation Plan (2005). Mitigation banking is a permitted use of the property under the City of Redmond zoning code 20C-70.70-050–Bear Creek Permitted Uses. The Bank site is identified as a “Near Term Action” important to regional salmonid habitat restoration efforts as part of the Lake Washington/Cedar/Sammamish Salmon Conservation Plan for Water Resource Inventory Area (WRIA) 8, adopted by the National Oceanic and Atmospheric Administration (NOAA) and implemented by local stakeholders to achieve Chinook salmon recovery consistent with the Endangered Species Act (Chinook Salmon Conservation Plan, 2005; ESA 16 U.S.C. S 1531). The general goals of the WRIA-8 Conservation Plan are:

- Habitat Protection- “Particular emphasis should be placed on protecting...sources of groundwater and riparian areas to maintain natural hydrologic processes and temperatures that support Chinook”
- Restore Wetlands- “Wetlands act as a biological filter, moderate flows, provide nutrient and invertebrate subsidies to nearby streams, and provide foraging and resting habitats for fish.”
- Floodplain Connectivity- “Protect and restore floodplain connectivity and increase off-channel habitat by minimizing road crossing, reducing channel confinement, and removing floodplain structures. Floodplains provide off-channel habitats, as well as lower velocity areas during periods of high flow.”
- Channel Complexity- “Add large woody debris to create pools. Channel complexity provides juvenile Chinook with refuge and foraging opportunities while adult Chinook benefit from areas to rest on their upstream migration.”

- Riparian Vegetation- “Restore riparian vegetation to improve channel stability, provide sources of large woody debris that can contribute to the creation of pool habitat and reduce peak water temperatures that favor non-native species.”

The Bear Creek Watershed is designated as a “Highest Restoration Watershed” within the City’s adopted Watershed Management Plan (City of Redmond and Herrera Environmental Consultants, 2013), which presents the City’s integrated approach to stormwater and watershed management within its jurisdiction. The Watershed Management Plan is based on landscape and ecological principles and represents the City’s commitment to maintaining water quality and restoring its watersheds by rehabilitating the City’s surface waters, and the ecological processes on which they depend, over the next fifty to one hundred years. Surface waters within the Highest Restoration watersheds, such as Bear Creek, are to be rehabilitated by 2060 in compliance with the strategies proposed in the plan. The Watershed Plan is consistent with the City’s Water Resources Strategic Plan which establishes the City’s vision and goals and identifies near term project funding (City of Redmond, 2015).

The primary ecological goals and objectives of the Keller Farm Mitigation Bank are as follows:

- Permanently protect ecosystem functions at the Bank by implementing the Instrument and executing a conservation easement with permanent funding for site stewardship.
- Re-establish wetland hydrology and varying wetland hydroperiods across the site by disabling farm ditches and performing targeted grading actions across the Bank site.
- Create additional habitat area that supports wetland-dependent organisms. Increase habitat structure and diversity on the Bank site over existing conditions.
- Re-establish wetland vegetation and wetland habitat communities across the site. Remove and control noxious and invasive plant species and reintroduce native vegetation to increase habitat complexity in the floodplain wetlands and adjacent upland areas. Plant native trees, shrubs, and herbaceous species to re-establish a mosaic of habitat communities and increase habitat structure, complexity, and function.
- Improve access for aquatic organisms to floodplain wetland and aquatic areas. Enhance and create off-channel rearing and refuge habitat for salmonids within the floodplain streams and deeper backwater areas connected to Bear Creek.
- Reconnect Bear Creek to the floodplain and improve floodplain functions on the Bank site including attenuation of flood flows, reductions in peak flood flows, food web and organic material support and transport, and refuge habitat for fish and wildlife during flood events.
- Establish a connection point for the future relocation of Perrigo Creek through the adjacent parcel north of the Bank.
- Re-establish and rehabilitate stream channel habitat in the floodplain through grading and addition of large woody debris (LWD). Create pool habitat and increase channel habitat complexity.
- Increase shading and cover of streams through planting on the Bank site over existing conditions.

Relevant documentation supporting the technical information in these appendices is included in a separate Resource Folder. The Resource Folder is not considered part of the MBI but is prepared by the Sponsor and provided to all IRT members to serve as a reference source. The Resource Folder includes the wetland delineation report, wetland functional assessment, wetland ratings, vegetation survey, hydrologic monitoring and modeling, basis of design report, and other technical information that was used to establish baseline conditions at the Bank and support the design for the site.

A.2 Bank Location and Legal Description

The Bank site encompasses 75.2 acres within portions of Section 1 of Township 25 N, Range 5 East, and Section 6 of Township 25 N., Range 6 E., Willamette Meridian within the city limits of Redmond, Washington (**Figure A-1, Vicinity and Site Selection Map**). The Bank will encompass the majority of two different tax parcels which are owned by the City of Redmond (**Table A-1, Property Information Summary**) (**Figure A-2, Property Map**). A corridor approximately 15-20 feet wide adjacent to Bear Creek that is within the two project tax parcels will not be included within the Bank boundary and is part of the City’s “Bear Creek Restoration Project”. The City has contracted with Habitat Bank LLC to implement and manage the Keller Farm Mitigation Bank. A legal description of the Bank project boundary is provided in Exhibit A to Appendix A.

Table A-1. Property Information Summary

Survey Map Identifier	Property Owner	Parcel Number	Zoning	Acreage
Phase 1				
Parcel A	City of Redmond	0125059051	BCDD2 (Mitigation Bank)	44.5
Parcel B	City of Redmond	0625069013	BCDD2 (Mitigation Bank)	38.9
			Total Parcel Acreage	83.4*
			Total Bank site area (Excluding Bear Creek Habitat Restoration Area and Avondale Road Easement**)	75.2
Easements in the Bank Area				
Parcel B	City of Redmond Waterline Easement	0625069013	---	0.5
Parcel A, B	City of Redmond Pedestrian Trail** Easement	0125059051, 0625069013	---	0.4
			Total Bank Easements	0.9
			Bank Site Buffers	9.8
			Total Creditable Area	64.5

* Easement acreages are incorporated into each parcels' total acreage and therefore are included in the Total Bank Parcel Acreage calculation. **City of Redmond Avondale Road Easement is not a part of the Bank site area.

**The City of Redmond Pedestrian Trail Easement refers to the reserved right of the City of Redmond to construct a pedestrian trail. This right may be conveyed as an easement to a third-party at some time in the future.

The Bank site is located at the confluence of two regionally significant salmon bearing streams, Bear Creek and Evans Creek. The site is bounded to the north by residential development, to the east by Bear Creek and open space, to the south by Lower Bear Creek and adjacent commercial and mixed-use development, and to the west by Avondale Road Northeast. The Bank site is within the Bear Creek Design District, a Comprehensive Plan land use designation and zoning overlay that encompasses the two Bank site parcels, a large parcel to the east and several smaller parcels northwest of and adjacent to the Bank. The City of Redmond Zoning Code, RZC 21.14.070 describes the purpose of the Bear Creek Design District as follows: “The purpose of the Bear Creek Design District (comprising Performance Area 1 and Performance Area 2) is to provide development potential on the upland portion of the Bear Creek Design District in the northwest portion of the site in a comprehensive master plan that would allow for the permanent protection of Bear Creek, its riparian corridor, and associated wetlands and floodplains. The Design District provides for the location of retirement residence facilities, associated limited support services, and affordable housing for employees. The Design District will provide critical

links in the Bear and Evans Creek Greenway System, an important planned regional trail along Bear and Evans Creeks. The balance of the undevelopable portion of this district will be established as a wetland mitigation banking site.” The two parcels within the Bank site are specifically designated for establishment as a wetland mitigation bank (RZC 21.14.070).

Two easements are present on the Bank site (**Figures A-3, Existing Conditions, and Figures A-4 and A-5, Adjacent Land Uses**):

- 1) a 20-foot-wide waterline pipeline easement runs north-south along the western edge and northwest portion of Parcel 0625069013;
- 2) a 30-foot-wide future trail easement runs northwest to southeast through Parcel 0125059051 in the southwest portion of the Bank site.¹

All properties within the Bank project boundaries have been pledged for use in the Bank in a manner consistent with this Instrument. None of any of the following areas are creditable under this Instrument: The City of Redmond Waterline Easement, the City of Redmond Pedestrian Trail Easement, and all buffer areas. The total Bank site area is 75.2 acres and the available area for credit generation is 64.5 acres, which excludes easement areas and buffer areas.

The inclusion of the aforementioned property in the Bank and the granting of a conservation easement restricting future land uses for the benefit of the Bank shall not convey or establish any property interest on the part of any Party to this Instrument, nor convey or establish any interest in Bank credits. The Instrument does not authorize, nor shall it be construed to permit, the establishment of any lien, encumbrance, or other claim with respect to the property, with the sole exception of the right on the part of the Corps and Ecology to require the Sponsor to implement elements of this Instrument, including recording the conservation easement in exchange for Corps and Ecology approval of this Instrument and the program of development and use of mitigation credits delineated herein.

A.3 Land Use History and Project Overview

A.3.1 Site Description

The Bank site is in Water Resource Inventory Area (WRIA) 8 in the lower portion of the Bear Creek watershed at the confluence of Bear and Evans Creeks (**Figure A-10, Watershed Map**), both regionally significant salmonid streams. Bear Creek is a lowland stream system, whose headwaters, located in the Paradise Lake Conservation Area in Snohomish County, retain relatively intact forest cover, and a somewhat rural character, with fewer stream crossings and lower total impervious area than other urbanizing systems in WRIA 8. Bear Creek supports multiple species and runs of salmonids and has long been identified as an important salmonid bearing stream and “Core Chinook Area”, as described in the 2005 Chinook Salmon Conservation Plan. Federally threatened Puget Sound steelhead are also present in the Bear Creek system.

¹ The City of Redmond Pedestrian Trail Easement refers to the reserved right of the City of Redmond to construct a pedestrian trail. This right may be conveyed as an easement to a third-party at some time in the future

The Bank site is part of larger uninterrupted wetland and riparian corridor associated with Bear and Evans Creeks that extends from Avondale Road NE east to 196th Ave NE and north to NE 95th Street. Numerous habitat restoration and mitigation projects have been completed over the last two decades in this corridor and more are planned. From the Bank site, Bear Creek flows approximately 1.3 miles to where it joins the Sammamish River, which then flows north approximately 11 miles to its confluence with Lake Washington. Lake Sammamish is approximately 1.5 miles south of the Bank. In 2013, the City completed the “Lower Bear Creek Rehabilitation Project” which was a Washington State Department of Transportation (WSDOT) funded mitigation project for impacts related to work on State Route 520. The project restored a natural channel configuration, reconnected Bear Creek with its floodplain, and re-established a riparian corridor in the lower 3,000 feet of Bear Creek that was historically channelized. Other channel and riparian enhancements were also completed by the City, King County, and WSDOT in the lower Bear Creek corridor between State Route 202 and the Sammamish River. A number of other habitat projects in the vicinity of the Bank site have been identified in the 2014 “WRIA 8 Three-Year Work Plan – Capital Project and Program Priorities”, including the proposed “Bear Creek Habitat Restoration Project”. The City of Redmond plans to implement this “sister” project, in a corridor approximately 15-20 feet wide between the eastern and southern Bank boundaries and Bear Creek (**Figure A-4**). The Bear Creek Habitat Restoration Project will be located within the two project tax parcels that include the Bank site, but the restoration project will be located outside of the Bank boundary (**Table A-1**).

The Bear Creek Habitat Restoration Project will install large woody debris (LWD) in Bear Creek and revegetate the riparian corridor with native plantings. The City has access through the Bank site to install LWD and other construction work. Based on project timelines, it is expected that the City’s Bear Creek Habitat Restoration Project will be constructed either before the Bank or concurrently with the Bank project.

The Bank site has been under some form of agricultural use since originally homesteaded in the late 19th century, including use as a dairy farm, cropland, and pasture. The site is currently managed as agricultural land. The site is flat to gently sloping (**Figure A-6, Site Topography Map**) and all of the proposed Bank area is located within the 100-year floodplain of Bear Creek (**Figure A-9, Hydrology**). Approximately half of the Bank area is within the floodway of Bear Creek (Essency Environmental LLC and Shannon and Wilson, Inc, 2016). Approximately 7.9 acres of depressional wetlands have been delineated on the Bank site, all of which are currently managed as agricultural land (**Figure A-8, Wetland and Stream Delineation**). A series of constructed ditches (classified as streams) drain the site and discharge into Bear Creek at the southwestern corner of the site (**Figures A-8 and A-9**). Approximately 5,400 linear feet of Bear Creek abut the south and east Bank boundaries. Most of the Bear Creek riparian areas adjacent to the east and south Bank boundaries are dominated by blackberry and reed canarygrass with little to no native tree or shrub cover. Some individual alder, spruce, Oregon ash and cottonwood trees are present in the riparian areas along Bear Creek. Perrigo Creek and the onsite ditches have little to no riparian cover as they have been actively managed for farming. There are several adjacent parcels along the south Bank boundary that are heavily forested, making up 1.2 acres of mature riparian forest, with numerous large Oregon ash trees and old, mature native shrubs.

Table A-2 provides a summary of adjacent land uses for the parcels surrounding the Bank site and **Figure A-2** shows the locations of these parcels. Adjacent land uses are a mixture of low

intensity land use (floodplain and river corridors) and higher intensity land use (surrounding upland areas), consistent with the Bank’s urban setting. Several of the adjacent parcels surrounding the Bank already have conservation easements or protective easements limiting or reducing any future development.

Table A-2. Summary of Adjacent Land Uses

Parcel and Location	Parcel Current Use/Description	Zoning
North Bank Boundary		
Avondale Road/City of Redmond Stormwater Easement	Major arterial road connecting City of Redmond with Cottage Lake. Sidewalks and 60’ vegetated Stormwater Easement adjacent to Bank boundary.	Road Easement
Parcel number: 0125059141	Single family residential parcel (one home).	Single-Family Urban Residential (R-6); Comprehensive Plan Land Use is Single-Family Urban and Bear Creek Design District
Parcel number: 0125059035	Single family residential parcel (one home).	Single-Family Urban Residential (R-6)
Parcel number: 0625069151 0125069131	Currently vacant. Future zoning is retirement residence facilities, associated limited support services, and affordable housing for employees. Perrigo Creek daylighting to occur through parcel per City of Redmond Design District Standards with future development project. Floodplain restrictions prohibit development along Bank//parcel boundary. North Ditch to remain through parcel along Bank boundary.	Bear Creek Design District 1 (BCDD1)
Parcel number: 033960TRCT	Residential tract with non-developable conservation area between tracked homes and Bank boundary. Open vegetation with some trees and shrubs.	Single family residential Tract (R)
Parcel number: 0625069011	Currently a 55 years and older mobile home park. Low intensity land uses and open space along Bear Creek corridor which flows through property.	Single-Family Urban Residential (R-6)
East Bank Boundary*		
Parcel number: 0625069159	WSDOT 520 Evans Creek Mitigation Project. Approximately 30 acres of protected wetland and riparian area.	Bear Creek Design District 2.1 (BCDD2.1); Comprehensive Plan Land

Parcel and Location	Parcel Current Use/Description	Zoning
	Heavily vegetated with trees and shrubs adjacent to Bank site.	Use is Manufacturing Park and Bear Creek Design District
South Bank Boundary*		
Parcel number: 5530400010 5530400020	Commercial office building with protected riparian buffer along Bear Creek. Buffer planted with trees and shrubs.	Business Park (BP)
Parcel number: 0625069015	Hospital with protected riparian buffer along Bear Creek. Buffer planted with trees and shrubs.	Business Park (BP)
Parcel number: 0125059189	City-owned parcel for future pedestrian trail. Parcel is open space with trees and shrubs.	Semirural Residential (RA-5); Comprehensive Plan Land Use is Park and Open Space.
Parcel number: 0125059038	City-owned parcel for future pedestrian trail. Open space with trees and shrubs.	Semirural Residential (RA-5); Comprehensive Plan Land Use is Park and Open Space.
Parcel number: 0125059081	Vacant, forested north of Bear Creek. Business Park on south side of Bear Creek.	Semirural Residential (RA-5) and Business Park (BP); Comprehensive Plan Land Use is Park and Open Space and Business Park.
Parcel number: 0125059040	Protected Buffer along Bear Creek. Vacant, heavily forested with trees and shrubs north of Bear Creek. Mixed use (apartments/commercial) building south of Bear Creek.	Semirural Residential (RA-5) and Business Park (BP); Comprehensive Plan Land Use is Park and Open Space and Business Park.
Parcel number: 0125059122	Existing office building and forested riparian area on south side of Bear Creek.	Business Park (BP)

*The City of Redmond is planning to implement the “Bear Creek Habitat Restoration Project” in the riparian corridor of Bear Creek along the eastern and southern Bank boundaries, which will further buffer the Bank project from adjacent land uses to the south and east.

Water quality in the upper Bear Creek watershed is generally good as evidenced by a population of native freshwater mussels within upper Bear Creek. Freshwater mussels are relatively rare within urban and urbanizing environments and are good indicators of high water quality (Habitat Bank 2015). The lower 3.5 miles of Bear Creek are listed as impaired for multiple water quality parameters. The section of Bear Creek adjacent to the Bank site is listed as a Category 4A

waterbody for high fecal coliform bacteria concentrations, high temperature, and low dissolved oxygen concentrations and a Category 5 waterbody for bioassessment (WSDOE 2017)

Restoration actions to be implemented at the Bank site have the potential to significantly improve wetland, riparian, stream, and floodplain habitats and ecological functions, and have the potential to create significant value for anadromous and other native fish species in the Sammamish watershed.

A.3.2 Land Use History

The lands in the vicinity of Lake Sammamish are known to have been heavily used by native peoples prior to European settlement and are within the traditional territory of the Sammamish people (NWAA 2009). A map from 1895 shows Bear, Evans, and Perrigo Creeks converging in roughly the center of the site (WSU Libraries Digital Collections). An 1873 land survey for the area characterizes the site and immediate surrounding area as a mosaic of forested and shrub uplands and “swamp” (US Department of the Interior, Bureau of Land Management Land Management). Presence of cedar, spruce, Douglas fir, alder, bigleaf maple, vine maple, salmonberry, crabapple, roses, willows, dogwoods, and native grasses were described in the 1873 survey notes.

The site is a portion of land that was claimed by Morris Keller in 1889 as part of the Homestead Relocation Act (NWAA, 2009). The Keller family owned the Bank site property through early 2015, at which time they sold the property to the City of Redmond. During much of the Keller family ownership, the site was managed as a dairy farm. As part of site management, Bear Creek, which used to flow across the site to the north of its current location, was ditched and moved south, to its current channel. The site was extensively ditched, drained, grazed and tilled for crop production over the years. The dairy ceased operations in the 1980’s and agricultural use of the property shifted to pasture, hay production, and row crops. The site is currently being managed as agricultural land by the City of Redmond and Habitat Bank LLC with an emphasis on control of invasive and non-native plant species.

During the period when the dairy was in operation, cattle crossed Bear and Evans Creeks by wading from bank to bank. Bank erosion was severe due to these continual crossings and from unrestricted stock access to the streams for watering. Drainage ditches on the property were constructed in the early part of the twentieth century and were periodically maintained for decades. During the early part of the 20th century, the hillside west of Avondale Road was logged, and logs were floated from the Keller Farm downstream to the Sammamish River by way of a constructed canal and splash dam logging where water was diverted from Bear Creek, routed westward toward Avondale Road, and then southwesterly through the ditch that presently exists parallel to Avondale Road. The canal was filled in near Bear Creek, presumably upon completion of the logging operations. The remnant canal remains as the South Ditch on the Bank site (Habitat Bank LLC, 2015). Other current and proposed land uses on the Bank site are a City of Redmond watermain installed in 2012, and a future proposed trail as are described in section A.2, above.

A.4 Bank Site Baseline Conditions

Implementation of the Keller Farm Mitigation Bank is anticipated to result in substantial gains in aquatic ecosystem functions as compared to baseline conditions present as of the date of execution of the MBI. Those baseline conditions are described below.

A.4.1 Bank Site Access

Main access to the Bank property is from Avondale Road Northeast just northwest of the Bank property. A second access point to the southwest quadrant of the site from Avondale Road is also available for use and will become the primary access after construction.

A.4.2 Summary of Existing Habitat Types

The 75.2-acre Bank site includes 1.7 acres of existing stream/riparian habitat (existing ditches), 7.9 acres of existing agricultural wetlands, and 65.6 acres of agricultural upland (**Figures A-3, A-4 and A-5**).

A.4.3 Cultural Resources

The lands in the vicinity of Lake Sammamish are known to have been heavily used by native peoples prior to European settlement. In 1854 and 1855, many Indian Tribes in the Pacific Northwest entered into treaties with the United States wherein they reserved the right to fish, hunt, and gather in areas off their reservations. These reserved treaty rights are the “supreme law of the land” and where in conflict with state law are preemptive. Judicial decisions have affirmed that treaty rights have a right to harvest fish free of state interference, subject to conservation principles; to co-manage the fishery resource with the State; and to harvest up to 50% of the harvestable fish. See, *United States v. Washington*, 384 F. Supp. 312 (Wd Wn. 1974) aff’d 520 F. 2d 676 (9th Cir, 1975); *Washington v. Washington State Commercial Passenger Fishing Vessel Assn*, 443 U.S. 658 (1979).

The project falls within the recognized and court affirmed treaty fishing areas of the federally recognized Muckleshoot Tribe and Yakama Nation, Subject to the limitations on the exercise of those rights as set out in the court decisions. In addition, the federally recognized Snoqualmie Tribe has ancestral ties to the study area but has no affirmed off-reservation treaty fishing rights. No other federally recognized tribe has any affirmed fishing rights in the Bank or Service Areas.

A.4.4 Site Geology

The Bear Creek watershed occurs within the Puget Lowlands, an area that was formed by glaciation of the Vashon Stade, which covered the Seattle area with an ice sheet up to a mile thick until approximately 18,000 to 13,500 years ago (as cited in Booth and others, 2003). The Puget Lowland formation follows a defined topographic pattern that has been classified as moving from the rocky alpine headwaters, following a steep descent into confined mountain valleys, and emerging into broad low-gradient lowland valleys where the channels are walled by unconsolidated fluvial sediments.

Surface geology mapping from the Washington Geological Survey indicates the Bank site is underlain by alluvium (Shannon and Wilson, Inc., 2017a). The northern boundary of the site is adjacent to alluvial fan and glacial outwash deposits.

Based on explorations completed for geotechnical engineering services for the water transmission main by GeoEngineers, Inc. (2008), depths of alluvium range from the surface to 50 feet, the maximum depths explored. Alluvium encountered in the explorations along the water supply pipeline on the south side of the site near Bear Creek consisted of soft to stiff clay and silt and loose to medium dense sand to a depth of about 10 feet. Farther north, the alluvium consisted of sand and gravel, and the glacial outwash areas had cobbles and boulders at the northernmost boundary of the site.

Shannon and Wilson, Inc (2017b) completed a Geologic Hazard review per City of Redmond critical areas code (21.64.060 Geologically Hazardous Areas) for the project. The assessment indicates no impacts to geologically hazardous critical areas, including erosion, landslides, and seismic hazards, resulting from the project.

A.4.5 Soils

The U.S. Department of Agriculture (USDA) surficial soils map (2016) indicates that a majority (68 percent) of the site surficial soils consist of Puget silty clay loam, while areas along the margins of Bear Creek have Sultan silt loam (26 percent of the site) and Renton silt loam (2 percent of the site) (**Figure A-7 Surficial Soils and Groundwater Monitoring**). Surficial soils on adjacent properties to the north and south of the Bank site and along the Bear Creek stream alignment and about 2 percent of the site itself are Everett very gravelly, sandy loam (EvB).

USDA reports Puget silty clay loam (Pu) as poorly drained hydric soil with a moderately low capacity to transmit water (0.06 to 0.2 inch per hour) and with a shallow groundwater table (approximately 0 inch below ground surface [bgs]). The Sultan (Su) and Renton (Re) silt loams are somewhat poorly drained with a moderately high capacity to transmit water (0.57 to 1.98 inches per hour) with a groundwater table at 1 to 3 feet bgs. EvB is excessively drained with a high capacity to transmit water (1.98 to 5.5 inches per hour) and a deep, water table (greater than 80 inches bgs).

Essency Environmental (2016) documented surface soil profiles and collected hydrologic information at 64 shallow test pits across the site during the early growing season. The data collected show that large areas of hydric soil on the site are currently effectively drained, and, except for Wetland A which has deep peat/muck deposits, the wetlands currently on the site are perched systems. Perching layers are dense silty clay loam or clayier, with redox features within the B horizon. Pit data showed that the vertical thickness of perching layers varied and in non-wetland areas was often underlain by a layer of almost pure sand or had alternating layers of dense mineral soil and sand. Some pits in drained hydric soil were completely dry throughout the monitoring period, or part or all of the horizons above the perching layer were saturated, while clayey layers were dry to moist. “Channels” were observed in the A horizon where surface water was moving through the soil downslope, but surrounding areas of the horizon were not saturated.

A.4.6 Frequently Flooded Areas

Shannon and Wilson (2017c) completed a Floodplain No-Rise report per Federal Emergency Management Agency (FEMA) guidelines for the Bank site. The City is the floodplain administrator for the adjacent reach of Bear Creek. Shannon and Wilson’s modeling suggests there would be no changes in the flood elevations due to the Bank project. See the technical reports in the Resource Folder for more details on existing flood conditions. All of the Bank site is within the 100-year floodplain of Bear Creek. Historically the main channel of Bear Creek would have moved within the Bank site, although the main channel was confined to improve agricultural activities on the site over the last 100 years. During large storm events and locally heavy precipitation, Bear Creek can overtop its banks in multiple locations across the Bank site and inundate portions of the site for consecutive days. These storm events were modeled by Shannon Wilson during the project design.

A.4.7 Critical Aquifer Recharge Areas

Shannon and Wilson (2017d) completed a Level II Hydrologic Assessment relating to Critical Aquifer Recharge Areas (CARA) for the Bank project. The Project lies within Redmond’s designated CARA within Wellhead Protection Zones 1 (six-month Time of Travel (TOT)), and 2 (one-year TOT), for City Wells 1, 2, and 5. As stated in the CARA Critical Areas Report, the alluvial soils documented within the project area have a relatively moderate to high permeability and potential effects to groundwater can be relatively rapid. Overlying topsoil/agricultural soils, where encountered, have a relatively low permeability and will impede infiltration and any effects to groundwater. The use of Best Management Practices (BMPs) during Bank construction are expected to further reduce any potential effects to groundwater. Passive dewatering activities that occur during construction will capture surface water from precipitation and within existing onsite ditches. Some of the water within ditches may be the result of groundwater seepage. Groundwater conditions prior to and during construction are expected to be similar, although the groundwater conditions are expected to vary seasonally. Groundwater levels following construction will likely be similar or higher than pre-construction conditions, and no negative effects to City wells are anticipated. Assuming that subsurface soil and groundwater conditions are similar to those outlined previously, and assuming appropriate BMPs are employed during construction, no long-term negative effects to groundwater or the CARA are expected.

A.4.8 Wetlands

Essency Environmental (2016) delineated nine wetlands totaling 7.9 acres within the Bank site boundaries. A portion of one wetland (Wetland G) extends onto adjacent parcels (**Table A-3** and **Figure A-8**, Wetland and Stream Delineation). All wetlands have been heavily disturbed by past resource activities including logging and agricultural use dating back to the 19th century. All of the wetlands are depressional, seasonally wet, and currently farmed.

All nine wetlands are located within the 100-year floodplain of Bear Creek. During high water events, flood waters enter the floodplain by Bear Creek overtopping its banks at the northeast corner of the site, and via the lowest points in the onsite ditches overtopping from backwater flooding from Bear Creek. Prior to 2016, vegetation in the existing wetlands consisted primarily of non-native pasture grasses, row crops and invasive species. The fields and ditch banks were

tilled and treated with herbicide in the summer of 2016 to control poison-hemlock (*Conium maculatum*), blackberry (*Rubus armeniacus*) and reed canarygrass (*Phalaris arundinacea*). In the fall of 2016, the fields including the agricultural wetlands on the Bank site were planted with the following grass mix to provide erosion control, forage food for animals and control the spread of invasive species:

30% *Deschampsia cespitosa* (tufted hairgrass)

15% *Dactylis glomerata* (orchardgrass)

15% *Festuca arundinacea* (tall fescue)

15% *Lolium multiflorum* (annual ryegrass)

15% *Alopecurus geniculatus* (water foxtail)

5% *Agrostis exarata* (spike bentgrass)

5% *Trifolium repens* (white clover)

With the reduction of reed canarygrass across the site, the existing wetland areas are currently dominated by tufted hairgrass and water foxtail.

Wetlands were rated using the Washington State Wetland Rating System for Western Washington: 2014 Update (Hruby, 2014). A summary of the size, rating, and function assessment score of the wetlands is provided in **Table A-3**.

Table A-3. Summary of Wetland Characteristics

Wetland	Area onsite (acres)	HGM Classification	Cowardin Class	Ecology Rating/ Total Score	Water Quality/ Hydrologic/ Habitat Function Scores
A	1.60	Depressional	PEM / D, E	Category II / 20	7 / 7 / 6
B	0.55	Depressional	PEM / E	Category III/ 19	6 / 7 / 6
C	0.22	Depressional	PEM / E	Category III/ 19	6 / 7 / 6
D	2.34	Depressional	PEM / E	Category III/ 19	6 / 7 / 6
E	0.50	Depressional	PEM / E	Category III/ 19	6 / 7 / 6
F	0.94	Depressional	PEM / E	Category III/ 19	6 / 7 / 6
G	0.42*	Depressional	PEM / E	Category III/ 19	6 / 7 / 6
H	1.15	Depressional	PEM / E	Category III/ 19	6 / 7 / 6
I	0.18	Depressional	PEM / E	Category III/ 19	6 / 7 / 6
TOTAL	7.9 ac				

* An additional 1.07 acres of Wetland G extends onto two parcels adjacent to the Bank site.

PEM = palustrine, emergent. D = Continuously saturated. E = Seasonally flooded/saturated

A network of deep ditches has altered the hydrologic regime on the site for decades and much of the site has been “effectively drained”. Puget Silty Clay Loam, a hydric soil, is shown on soil maps across most of the site. Sultan Silt Loam, a non-hydric soil, is also present primarily along the current and historic riparian corridor of Bear Creek. Bear, Evans, and Perrigo Creeks historically converged near the center of the site and side or backwater channels were also likely present.

The hydrologic and soils data collected for the site show that large areas of hydric soil on the site are currently effectively drained, and, except for Wetland A which has deep peat/muck deposits, the wetlands currently on the site are perched systems.

All wetlands onsite are currently farmed. Restoring hydrologic connectivity with the groundwater table and floodplain connectivity with Bear and Perrigo Creeks and the other onsite streams and re-establishing native vegetation will improve wetland functions for habitat, water quality, and hydrology over existing conditions.

A.4.9 Streams

There are several perennial streams present on and adjacent to the Bank site: Bear Creek, Perrigo Creek, and a network of deep, artificial ditches on the Bank site that are classified as streams. The 1.7 acres of ditches on the Bank site drain the site and ultimately discharge to Bear Creek at the southwest corner of the site (Figure A-9, Hydrology). Bear Creek is a Class I stream (Type S-Shoreline of the State using the Washington State Department of Natural Resources Water Typing System) (**Table A-4**). Perrigo Creek and the Bank site ditches (North, Central, South,

East Lateral and West Lateral) are Class II streams (Type F salmonid streams using the Washington Water Typing System), as defined in Redmond Zoning Code 21.64.020.

The Washington Department of Fish and Wildlife shows the portion of Bear Creek in the site vicinity as known spawning habitat for fall Chinook and sockeye salmon, rearing habitat for coho salmon, and lists documented presence of winter steelhead, kokanee, and resident cutthroat trout (WDFW 2016a-Salmonscape, WDFW 2016b-PHS). Perrigo Creek is mapped as having documented presence of coho salmon, kokanee, and resident cutthroat trout (WDFW 2016b), and modeled presence (not documented) of fall Chinook salmon, sockeye salmon, and winter steelhead (WDFW 2016a).

Bear and Evans Creeks adjacent to the project site are listed as impaired under the Washington State Department of Ecology 303d list (Washington Department of Ecology, 2016) for the bioassessment parameter (Category 5) and for temperature and dissolved oxygen just upstream of the project site (Category 4a).

The Bank site ditches provide poor salmonid habitat, although they are used for juvenile rearing. Juvenile Chinook and Coho salmon were observed in onsite ditches in 2016 (Essency Environmental 2016). The ditch channels have vertical banks, are relatively uniform and are at depths between 4-8 feet below the surrounding ground surface, with marginal quality pool habitat present only near culverts. Substrate is generally fine material and not suitable for spawning or incubation of salmonids. Wood and other cover is absent from most of the ditch channel habitat aside from some trees and shrubs that are located along the downstream end of the North Ditch, resulting in no recruitment of new wood into the system, and little habitat complexity. Upwelling from groundwater and shade from herbaceous riparian vegetation may moderate water temperatures during spring. However, during summer, upwelling flow is reduced and water temperatures may become too warm for salmonids at times. Fish habitat in Perrigo Creek is likely currently limited to the immediate area at its confluence with Bear Creek. The remainder of Perrigo Creek is piped, ditched, filled or otherwise altered resulting in extremely degraded habitat.

Table A-4. Summary of Stream Characteristics

Stream	Redmond Stream Class (Stream Type)	Existing Stream Length (feet)	
Bear Creek	Class I (Type S)	5,523	Adjacent to Bank Site
Perrigo Creek	Class II (Type F)	*1,128	On Bank Site
North Ditch	Class II (Type F)	2425	On Bank Site
West Lateral Ditch	Class II (Type F)	593	On Bank Site
Central Ditch	Class II (Type F)	1,536	On Bank Site
South Ditch	Class II (Type F)	1,667	On Bank Site
East Lateral Ditch	Class II (Type F)	893	On Bank Site

*Perrigo Creek includes 1,128 feet of open channel and 225 feet of culvert onsite

A.4.10 Existing Vegetation Communities on the Bank Site

The 75.2-acre Bank site consists of approximately 65.6 acres of active upland agricultural fields, 7.9 acres of actively farmed wetlands, and 1.7 acres of existing ditches. Prior to 2016, the agricultural fields including both the upland and wetland areas were comprised of non-native pasture grasses, row crops and invasive species with the two most dominant invasive species being reed canarygrass and poison-hemlock. The Bank site has been managed for invasive species through tilling and herbicide applications since 2015. In the fall of 2016, the Bank site was re-seeded to prevent further establishment of invasive species and prevent erosion. Vegetation within the existing agricultural fields is now comprised of the species listed in section A.4.8. as well as patches of reed canarygrass along the ditches and in some wetland areas in the north section of the Bank site (e.g., Wetland H).

The immediate Bear Creek riparian area adjacent to the eastern, southeastern, and southern boundaries of the Bank is dominated by blackberry and reed canarygrass with little to no native tree or shrub cover. Some individual alder, spruce, Oregon ash, and cottonwood trees are present as are a few stands of willows. Perrigo Creek and the onsite ditches have little to no riparian cover aside from some trees and shrubs at the downstream end of the North Ditch. Several parcels adjacent to the southwest portion of the Bank site which include both sides of Bear Creek include approximately 1.2 acres of mature riparian forest, with numerous large Oregon ash trees and old, mature native shrubs.

A.4.11 Invasive Species on the Bank Site

Invasive species of concern on the site include poison-hemlock, non-native blackberry species, giant hogweed (*Heracleum mantegazzianum*), reed canarygrass, tansy ragwort (*Senecio jacobaea*), thistle species (*Cirsium sp.*), ivy (*Hedera sp.*) bindweed species (*Convolvulus sp.*), holly species (*Ilex sp.*), and other invasive grasses and weeds. Habitat Bank has been actively managing invasive species on the Bank site since 2015.

A.4.12 Fish and Wildlife Habitat

A.4.12.1 Fish Habitat

The Bank site is located in WRIA 8 in the lower portion of the Bear Creek Watershed at the confluence of Bear and Evans Creeks (**Figure A-10, Watershed Map**), both regionally significant salmonid streams. Portions of the Lake Sammamish and Lake Washington Watersheds provide a common migratory pathway for salmon in WRIA-8. The 2005 Puget Sound Salmon Recovery Plan notes: “Hydrology is recognized as the most important factor in the ecological processes that create and sustain aquatic habitat” (PSSRP, 2005). Salmon recovery efforts are a primary objective in the restoration actions that occur in this urban watershed, with major emphasis placed on habitat restoration, water quality improvements, and water temperature reductions. The Bank site is specifically identified as a restoration project in the 2005 Lake Washington/Cedar/Sammamish Watershed Chinook Salmon Conservation Plan (WRIA 8 Committee 2005) and the 10-year Update to this Plan (Lake Washington/Cedar/Sammamish Watershed Salmon Recovery Council 2017). Actions

undertaken as compensatory mitigation at the Bank site will address all three of these watershed objectives.

Fish species known to inhabit the Bear Creek watershed include: fall Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), sockeye salmon (*O. nerka*), kokanee (non-anadromous *O. nerka*), winter steelhead (*O. mykiss*), resident rainbow trout (non-anadromous *O. mykiss*), resident cutthroat trout (*O. clarkii*), and three-spined stickleback (*Gasterosteus aculeatus*). Bull trout (*Salvelinus confluentus*) have been documented in Lake Sammamish and are mapped as present in the Sammamish River (WDFW, 2016a and 2016b), but have not been observed in Bear Creek. Other native fish species such as dace (*Rhinichthys sp.*), sculpin (*Cottus sp.*), mountain whitefish (*Prosopium williamsoni*), and brook lamprey (*Lampetra richardsoni*) are also present (Habitat Bank LLC, 2015). Juvenile Chinook and coho salmon and three-spined stickleback have been observed in ditches on the Bank site (Essency Environmental 2016). Fish habitat in Perrigo Creek is currently limited to the immediate area at its confluence with Bear Creek. The remainder of Perrigo Creek is ditched or piped. Federal and state listed fish species that may be present on the Bank site are shown in **Table A-5**.

Table A-5. Federal and State Listed Species That May be Present on the Bank Site

Species, ESU, or DPS	State Status in King County*	Federal Status*	Presence onsite
<i>Fish</i>			
Chinook Salmon (<i>Oncorhynchus tshawytscha</i>) Puget Sound Chinook ESU	Candidate	Threatened	Documented
Coho Salmon (<i>Oncorhynchus kisutch</i>) Puget Sound Coho ESU	PHS Listed	Species of Concern	Documented
Steelhead (<i>Oncorhynchus mykiss</i>) Puget Sound Steelhead DPS	PHS Listed	Threatened	Documented
Bull Trout (<i>Salvelinus confluentus</i>) Pacific Region Coastal Recovery Unit	Candidate	Threatened	Documented in the Sammamish River and Lake Sammamish
Sockeye Salmon (<i>Oncorhynchus nerka</i>)	Candidate	Not Listed	Documented
Kokanee (<i>Oncorhynchus nerka</i>)	PHS Listed	Not Listed	Documented
Cutthroat (<i>Oncorhynchus clarkii</i>)	PHS Listed	Species of Concern	Documented
River Lamprey (<i>Lampetra ayresii</i>)	Candidate	Species of Concern	Suitable Habitat Present

*Sources: WDFW Priority Habitat and Species (PHS) Statewide List and Distribution by County for King County: <http://wdfw.wa.gov/conservation/phs/list/> and <http://apps.wdfw.wa.gov/phsontheweb/>.

USFWS Washington Fish and Wildlife Office Federal species list for Washington State Webpage:

<https://www.fws.gov/wafwo/promo.cfm?id=177175754>.

NOAA Fisheries ESA Threatened or Endangered Species List:

<https://www.fisheries.noaa.gov/national/endangered-species-conservation/esa-threatened-endangered-species>.

All databases accessed October 2019.

A.4.12.2 Birds, Amphibians, and Mammals

Bird, amphibian, and mammal usage of the Bank site is limited because it is currently managed for agriculture. Large flocks of geese and ducks use the site in the fall through the spring. Song birds, raptors, small and large mammals that thrive in agricultural landscapes, such as black-tailed deer and coyote, have also been observed (**Table A-6**). Beaver are present in Bear Creek and the adjacent wetland and riparian corridor to the east of the Bank site. Red-legged frogs (*Rana aurora*) have been observed on the Bank site. Suitable habitat for other amphibian species, such as Pacific chorus frogs, northwestern and long-toed salamanders, rough-skinned newt, and western toad is present in hedgerow areas, the Bear Creek riparian corridor, and portions of the existing ditches. **Table A-6** lists amphibian, bird and mammal species observed at the Bank site in 2016.

Table A-6. Wildlife Observed at the Bank Site in 2016.

Class	Genus species	Common Name
Amphibians	<i>Rana aurora</i>	Red Legged Frog
Birds	<i>Branta canadensis</i>	Canada Goose
	<i>Chen rossii</i>	Ross's Goose
	<i>Aix sponsa</i>	Wood Duck
	<i>Anas strepera</i>	Gadwall
	<i>Anas platyrhynchos</i>	Mallard
	Trochilidae	Unidentified Hummingbird
	<i>Charadrius vociferus</i>	Killdeer
	<i>Gallinago delicata</i>	Wilson's Snipe
	<i>Ardea herodias</i>	Great Blue Heron
	<i>Haliaeetus leucocephalus</i>	Bald Eagle
	<i>Accipiter cooperii</i>	Cooper's Hawk (carcass)
	<i>Buteo jamaicensis</i>	Red-tailed Hawk
	<i>Columba livia</i>	Rock Pigeon
	<i>Larus argentatus</i>	Herring Gull
	<i>Megaceryle alcyon</i>	Belted Kingfisher
	<i>Colaptes auratus</i>	Northern Flicker
	<i>Cyanocitta stelleri</i>	Steller's Jay
	<i>Corvus brachyrhynchos</i>	American Crow
	<i>Tachycineta thalassina</i>	Violet-green Swallow
	<i>Hirundo rustica</i>	Barn Swallow
	<i>Poecile atricapillus</i>	Black-capped Chickadee
	<i>Cistothorus palustris</i>	Marsh Wren
	<i>Thryomanes bewickii</i>	Bewick's Wren
	<i>Turdus migratorius</i>	American Robin
	<i>Sturnus vulgaris</i>	European Starling
	<i>Geothlypis trichas</i>	Common Yellowthroat
	<i>Junco hyemalis</i>	Dark-eyed Junco
<i>Pipilo maculatus</i>	Spotted Towhee	
<i>Melospiza melodia</i>	Song Sparrow	

Class	Genus species	Common Name
	<i>Passerculus sandwichensis</i>	Savannah Sparrow
	<i>Zonotrichia atricapilla</i>	Golden-Crowned Sparrow
	<i>Zonotrichia leucophrys</i>	White-Crowned Sparrow
	<i>Haemorhous mexicanus</i>	House Finch
	<i>Agelaius phoeniceus</i>	Red-Winged blackbird
	<i>Sturnella neglecta</i>	Western Meadowlark
	<i>Spinus tristis</i>	American Goldfinch
Mammals	<i>Castor canadensis</i>	Beaver (sign)
	<i>Odocoileus hemionus columbianus</i>	Columbian Black-Tailed Deer (tracks)
	<i>Sylvilagus floridanus</i>	Eastern Cottontail
	<i>Canis latrans</i>	Coyote (scat)

The Priority Habitat and Species (PHS) Report from WDFW for the project site (WDFW 2016b) does not show any PHS listed, or otherwise state listed or federally listed bird, amphibian, or mammal species on or in the immediate vicinity of the Bank site. However, the following species on the PHS list for King County have the potential to be found on or near the Bank site now and/or after construction and establishment of the Bank:

Table A-7. Federal and State Listed Species and Federal Species of Concern That May be Present on the Bank Site Now or after Implementation of the Bank.

Species	State Status in King County*	Federal Status	Presence onsite
Birds			
Allen's Hummingbird (<i>Selasphorus sasin</i>)	Not Listed	Bird of Conservation Concern	Suitable Habitat Present
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Not Listed	Species of Concern	Observed
Great Blue Heron (<i>Ardea herodias</i>)	PHS Listed	Not Listed	Suitable Habitat Present
Northern Goshawk (<i>Accipiter gentilis</i>)	Candidate	Not Listed	Potential Habitat
Band-tailed Pigeon (<i>Patagioenas fasciata</i>)	PHS Listed	Not Listed	Potential Habitat
Pileated Woodpecker (<i>Dryocopus pileatus</i>)	Candidate	Not Listed	Suitable Habitat Present Adjacent to Bank
Olive-sided Flycatcher(<i>Contopus cooperi</i>)	Not Listed	Bird of Conservation Concern	Suitable Habitat Present
Peregrine Falcon (<i>Falco peregrinus</i>)	Not Listed	Species of Concern	Suitable Habitat Present
Purple Finch (<i>Carpodacus purpureus</i>)	Not Listed	BCC ¹	Suitable Habitat Present

Species	State Status in King County*	Federal Status	Presence onsite
Purple Martin (<i>Progne subis</i>)	Candidate	Bird of Conservation Concern	Suitable Habitat Present
Rufous Hummingbird (<i>Selasphorus rufus</i>)	Not Listed	Bird of Conservation Concern	Suitable Habitat Present
Willow Flycatcher (<i>Empidonax traillii</i>)	Not Listed	Bird of Conservation Concern	Suitable Habitat Present
Amphibians			
Oregon spotted frog (<i>Rana pretiosa</i>)	Endangered	Threatened	Potential Habitat
Red-Legged Frog (<i>Rana aurora</i>)	Not Listed	Not Listed	Observed
Western Toad (<i>Anaxyrus boreas</i>)	Candidate	Species of Concern	Suitable Habitat Present
Reptiles			
Pacific (Western) Pond Turtle (<i>Actinemys marmorata</i>)	Endangered	Under Review	Potential Habitat
Mammals			
Bats	PHS Listed	Not Listed	Suitable Habitat Present

*Sources: WDFW Priority Habitat and Species (PHS) Statewide List and Distribution by County for King County: <http://wdfw.wa.gov/conservation/phs/list/> and <http://apps.wdfw.wa.gov/phsontheweb/>.
 USFWS Washington Fish and Wildlife Office Federal Species List for Washington State: <https://www.fws.gov/wafwo/promo.cfm?id=177175754>.
 USFWS Birds of Conservation Concern Report: <https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>.

A.4.13 Existing Wetland Functional Assessment

Using the Washington Department of Ecology's *Washington State Wetland Rating System for Western Washington, Revised* (Hruby 2014), the Bank site wetlands were scored based on the rating of three functions: water quality, hydrologic and habitat, as indicated by the potential of the site to provide the function (site potential), the potential of the landscape to maintain the function at the site scale (landscape potential), and the value each function may have for society (rating of value). A score based on the ratings of site potential, landscape potential, and value for each of the three functions was then calculated, with the scores potentially ranging from 3 (lowest rating) to 9 (highest rating). Wetland rating forms and figures were included in the *Keller Farm Mitigation Bank Critical Areas Report – Wetlands and Streams* (Essency Environmental 2016) and copies are provided in the Resource Folder.

Table A-3 in Section **A.4.8–Wetlands** summarizes existing wetland ratings and characteristics. There are 7.9 acres of wetlands within the Bank site consisting of 1.6 acres of Category II Depressional wetlands and 6.3 acres of Category III Depressional wetlands. All wetlands on the

Bank site provide a medium level of water quality functions (6-7 points), a medium level of hydrologic functions (7 points), and a medium level of habitat functions (6 points). Total wetland scores were 20 points (Category II) for Wetland A and 19 points (Category III) for Wetlands B through I.

Water Quality

All existing wetlands on the Bank site provide a medium level of water quality functions (total water quality score of 6-7 points). Wetlands on the Bank site currently provide low or medium site potential function for water quality improvement. All wetlands are located within the floodplain of Bear Creek and are inundated during overbank flood events. However, lack of surface channel connections with Bear Creek or existing onsite ditches and limited extent of seasonal ponding during non-flood events restrict the site potential of existing wetlands to provide water quality functions. In addition, because the site is in agricultural use, pollutant filtering capability of vegetation in site wetlands is limited.

The landscape potential function for existing wetlands to provide water quality functions is rated medium because more than 10 percent of the surrounding area is in land use (agriculture) that generates pollutants and because of heavy use of site wetlands by waterfowl. All existing wetlands are rated as high for providing water quality improvement that is valuable to society because both Bear Creek adjacent to the Bank and Perrigo Creek are listed on the State of Washington 303d list as impaired for water quality parameters (Essency Environmental 2016). Perrigo Creek is impaired for temperature and a Total Maximum Daily Load (TMDL) has been established. Bear Creek is listed for bioassessment, dissolved oxygen, temperature, and bacteria and TMDLs have been established for the latter three parameters.

Hydrologic Functions

All existing wetlands on the Bank site provide a medium level of hydrologic functions (total hydrologic score of 7 points). Existing wetlands have medium potential to reduce flooding and erosion, because these depressional wetlands provide up to 2 feet of storage during flooding and high precipitation events. The landscape potential function for existing wetlands to provide hydrologic functions is rated medium because more than 10 percent of the surrounding area is in land use (agriculture) that generates excess runoff. Existing wetlands provide a high level of hydrologic function that is valuable to society, as the wetlands capture surface water that would otherwise flow down gradient that could damage both human and natural resources downstream.

Habitat Functions

All existing wetlands on the Bank site provide a medium level of habitat functions (total habitat score of 6 points). Existing wetlands currently have low site potential to provide habitat function. Plant communities are entirely emergent, are farmed, and lack special habitat features such as large, downed woody debris and standing snags. Invasive species (reed canarygrass, blackberries, and poison hemlock) are present and being managed on the site. The landscape potential function for site wetlands to provide hydrologic functions is medium due to the developed nature of the area within 1 kilometer of the Bank site. Existing wetlands provide a

high level of habitat function that is valuable to society because the Bank site has been categorized as an important habitat site in both City of Redmond and regional planning documents.

A.5 Summary

Restoration actions which are detailed in the *Keller Farm Mitigation Bank Basis of Design Report* and in Appendix B of this Instrument have the potential to greatly improve the existing conditions of wetlands and other aquatic areas on the site, as well as improve the habitat conditions for fish and wildlife within the Bank site. Restoration actions will rehabilitate 7.9 acres of existing wetland habitats while re-establishing approximately 51.1 acres of wetlands. The existing 7,114 linear feet (1.7 acres) of ditched tributary streams will be rehabilitated and approximately 5,162 linear feet (2.6 acres) of stream channel will be added on the Bank site.

Enhanced floodplain connections with Bear Creek will be established that will increase the range of flow conditions where Bear Creek flows will contribute to hydrologic support of floodplain wetlands and streams. These connections will also allow fish access to the re-established wetlands and stream channels in the floodplain.

Post construction, the Bank site will consist of a mosaic of forested upland, forested, scrub-shrub, and emergent wetland, and stream channel habitat. The Bank will create new aquatic habitat for resident and anadromous fish species and improve existing habitat for the regionally important salmonid populations that are present on the Bank site. Post-project conditions will provide numerous functional benefits over existing conditions including: allowing Bear Creek flows to infiltrate in wetland areas during a wider range of flow conditions; recharging the local groundwater aquifer; increasing floodplain wetland groundwater storage; providing cooling of groundwater through soil heat adsorption of surface waters, and delaying release of cooler groundwater to the floodplain streams later in the spring and summer when stream temperatures are highest. Plantings adjacent to Bear Creek and floodplain streams will also help to moderate summer water temperatures and re-established vegetation communities within the wetlands and riparian upland areas will increase habitat diversity and accessibility for aquatic dependent plants and animals.

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Exhibit A to Appendix A

Bank Site Legal Description

Bank Site Legal Description

(Parcels 0125059051, 0625069013)

A PORTION OF REVISED PARCELS A AND B, KELLER FARM BOUNDARY LINE ADJUSTMENT NO. 201302135 OF THE CITY OF REDMOND, RECORDED UNDER RECORDING NUMBER 20140903900007, AS AMENDED AND SUPPLEMENTED BY AFFIDAVIT OF MINOR CORRECTION OF MAP RECORDED UNDER RECORDING NUMBER 20150112000362;

SAID PORTION BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS;

COMMENCING AT THE WEST QUARTER CORNER OF SECTION 6, TOWNSHIP 25 NORTH, RANGE 6 EAST, WILLAMETTE MERIDIAN;

THENCE SOUTH 89°57'40" EAST, A DISTANCE OF 831.91 FEET TO THE NORTHWESTERLY CORNER OF THE ABOVE DESCRIBED REVISED PARCEL B, ALSO BEING **THE POINT OF BEGINNING**;

THENCE SOUTH 89°57'40" EAST ALONG THE NORTHERLY LINE OF SAID PARCEL B, A DISTANCE OF 707.16 FEET;

THENCE SOUTH 02°24'18" EAST, A DISTANCE OF 73.71 FEET;

THENCE SOUTH 70°09'39" EAST, A DISTANCE OF 112.71 FEET;

THENCE NORTH 85°59'30" EAST, A DISTANCE OF 131.90 FEET;

THENCE SOUTH 02°52'57" EAST, A DISTANCE OF 139.10 FEET;

THENCE SOUTH 68°11'03" WEST, A DISTANCE OF 101.65 FEET;

THENCE SOUTH 03°24'05" WEST, A DISTANCE OF 47.85 FEET;

THENCE SOUTH 49°43'57" EAST, A DISTANCE OF 73.30 FEET;

THENCE SOUTH 00°15'44" WEST, A DISTANCE OF 16.41 FEET;

THENCE SOUTH 86°11'07" EAST, A DISTANCE OF 93.70 FEET;

THENCE SOUTH 12°00'52" WEST, A DISTANCE OF 95.28 FEET;

THENCE SOUTH 54°28'09" WEST, A DISTANCE OF 70.20 FEET;

THENCE SOUTH 85°59'49" WEST, A DISTANCE OF 177.05 FEET;

THENCE SOUTH 00°29'07" EAST, A DISTANCE OF 683.65 FEET;

THENCE SOUTH 39°08'49" WEST, A DISTANCE OF 130.11 FEET;

THENCE SOUTH 67°12'20" WEST, A DISTANCE OF 135.70 FEET;

THENCE SOUTH 81°05'58" WEST, A DISTANCE OF 189.62 FEET;

THENCE NORTH 76°56'22" WEST, A DISTANCE OF 107.55 FEET;

THENCE SOUTH 80°51'08" WEST, A DISTANCE OF 89.50 FEET;

THENCE SOUTH 16°51'39" WEST, A DISTANCE OF 23.19 FEET;

THENCE SOUTH 75°24'55" WEST, A DISTANCE OF 160.02 FEET;

THENCE NORTH 58°48'46" WEST, A DISTANCE OF 26.56 FEET;

THENCE SOUTH 75°10'39" WEST, A DISTANCE OF 163.18 FEET;

THENCE NORTH 66°31'59" WEST, A DISTANCE OF 122.67 FEET;

THENCE SOUTH 28°52'30" WEST, A DISTANCE OF 50.28 FEET;

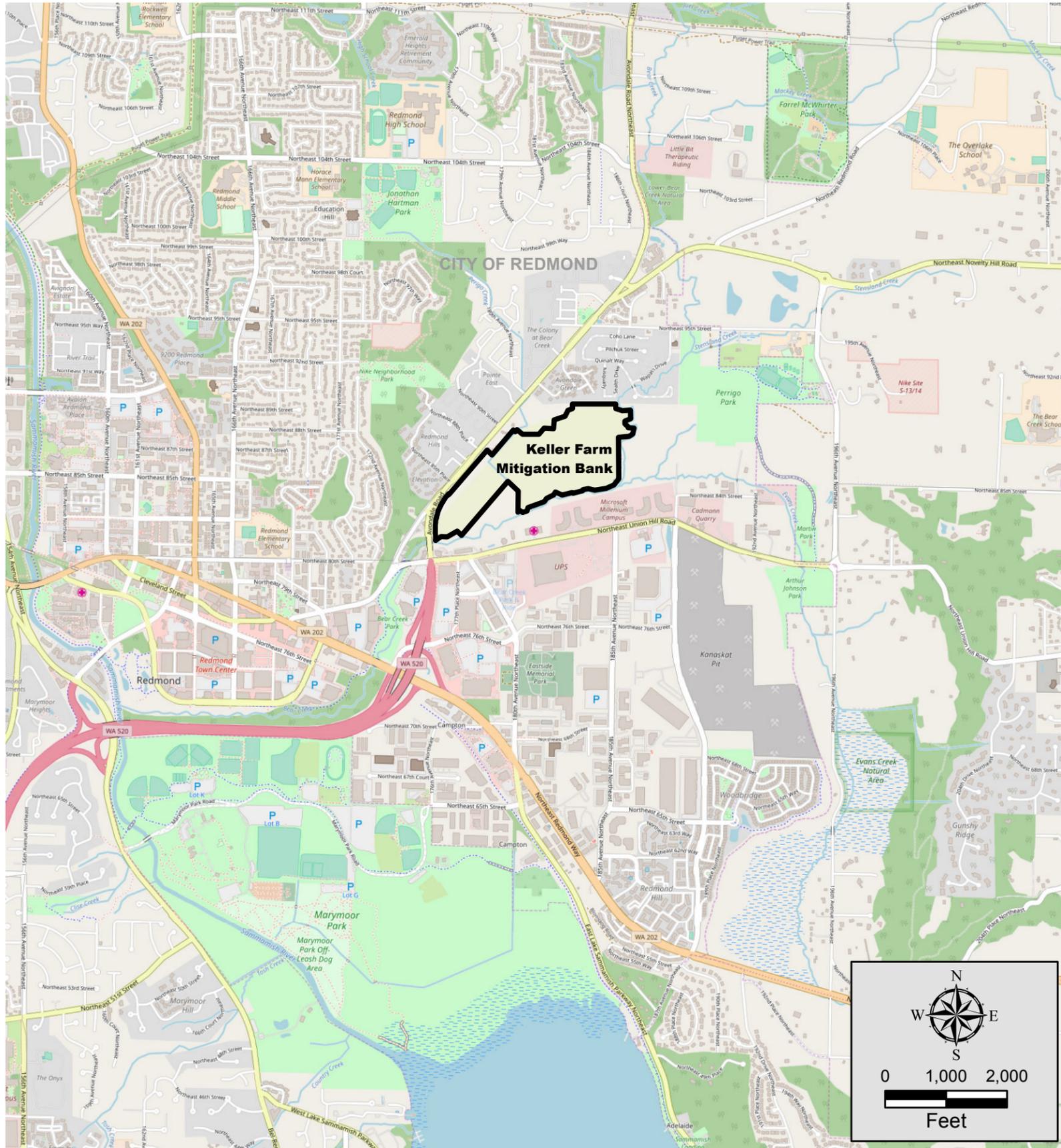
THENCE SOUTH 62°48'58" WEST, A DISTANCE OF 42.18 FEET TO THE WEST LINE OF SAID REVISED PARCEL B;

THENCE CONTINUING SOUTH 62°48'58" WEST, A DISTANCE OF 90.08 FEET;

THENCE SOUTH 37°02'48" WEST, A DISTANCE OF 70.15 FEET;

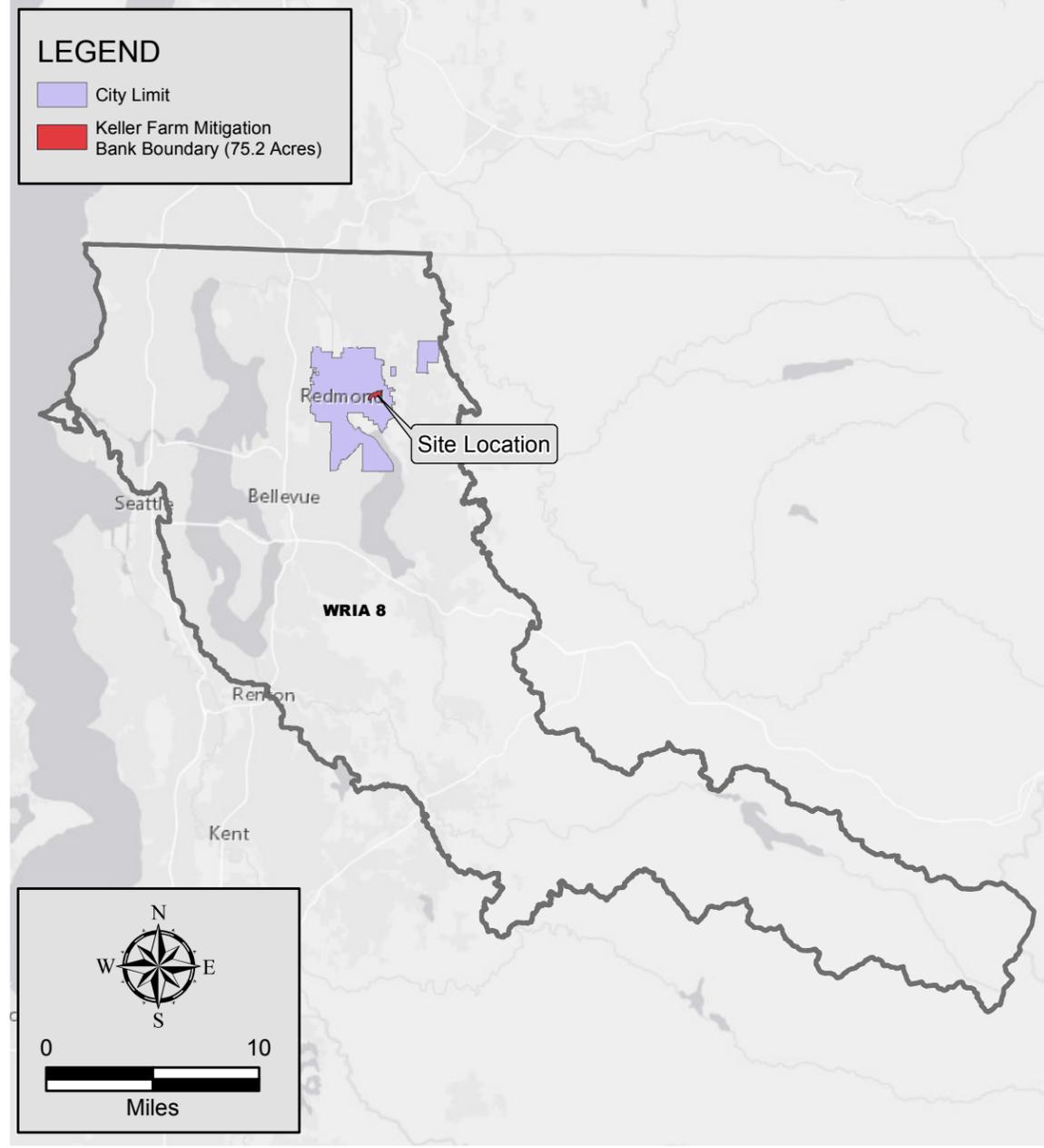
THENCE SOUTH 70°24'25" WEST, A DISTANCE OF 283.31 FEET;
THENCE SOUTH 15°08'41" WEST, A DISTANCE OF 53.58 FEET;
THENCE SOUTH 67°21'37" WEST, A DISTANCE OF 72.52 FEET;
THENCE NORTH 56°39'40" WEST, A DISTANCE OF 55.57 FEET;
THENCE SOUTH 57°50'29" WEST, A DISTANCE OF 43.46 FEET TO THE WEST LINE OF SAID REVISED
PARCEL A;
THENCE NORTH 01°10'42" EAST ALONG THE WEST LINE OF SAID PARCEL A, A DISTANCE OF 340.90 FEET;
THENCE NORTH 46°06'06" WEST ALONG THE WEST LINE OF SAID PARCEL A, A DISTANCE OF 236.32 FEET;
THENCE SOUTH 40°33'59" WEST ALONG THE WEST LINE OF SAID PARCEL A, A DISTANCE OF 1165.35
FEET;
THENCE NORTH 46°09'09" WEST, A DISTANCE OF 100.63 FEET;
THENCE SOUTH 59°28'05" WEST, A DISTANCE OF 192.39 FEET;
THENCE NORTH 84°54'24" WEST, A DISTANCE OF 101.39 FEET;
THENCE SOUTH 54°35'47" WEST, A DISTANCE OF 109.26 FEET;
THENCE NORTH 00°56'20" WEST, A DISTANCE OF 76.01 FEET;
THENCE NORTH 03°34'18" WEST, A DISTANCE OF 32.75 FEET TO THE BEGINNING OF A NON-TANGENT
CURVE TO THE RIGHT FROM WHICH THE CENTER BEARS NORTH 85°00'02" EAST HAVING A RADIUS OF
862.85 FEET;
THENCE NORTH EASTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 46°46'30",
FOR AN ARC LENGTH OF 704.41 FEET;
THENCE LEAVING SAID CURVE ON A NON-TANGENT BEARING SOUTH 49°06'52" EAST, A DISTANCE OF
10.00 FEET;
THENCE NORTH 40°53'08" EAST, A DISTANCE OF 956.64 FEET;
THENCE SOUTH 44°14'14" EAST, A DISTANCE OF 110.40 FEET ALONG THE NORTH LINE OF SAID REVISED
PARCEL A;
THENCE NORTH 40°53'08" EAST, A DISTANCE OF 539.43 FEET ALONG THE NORTH LINE OF SAID REVISED
PARCEL A;
THENCE SOUTH 49°06'52" EAST, DISTANCE OF 42.00 FEET ALONG THE NORTH LINE OF SAID REVISED
PARCEL A;
THENCE NORTH 40°53'08" EAST, A DISTANCE OF 45.00 FEET ALONG THE NORTH LINE OF SAID REVISED
PARCEL A;
THENCE SOUTH 49°06'52" EAST, A DISTANCE OF 115.45 FEET ALONG THE NORTH LINE OF SAID REVISED
PARCEL A;
THENCE SOUTH 89°57'41" EAST, A DISTANCE OF 269.08 FEET ALONG THE NORTH LINE OF SAID REVISED
PARCEL A;
THENCE NORTH 40°53'08" EAST, A DISTANCE OF 133.60 FEET ALONG THE NORTH LINE OF SAID REVISED
PARCEL A;
THENCE SOUTH 86°25'35" EAST, A DISTANCE OF 156.07 FEET ALONG THE NORTH LINE OF SAID REVISED
PARCEL A;
THENCE NORTH 03°36'15" EAST, A DISTANCE OF 147.45 FEET ALONG THE NORTH LINE OF SAID REVISED
PARCEL A;
THENCE NORTH 72°32'29" EAST ALONG THE NORTH LINE OF SAID REVISED PARCEL A, A DISTANCE OF
5.14 FEET TO THE NORTHWEST CORNER OF SAID REVISED PARCEL B AND NORTHEAST CORNER OF SAID

REVISED PARCEL A, AND CONTINUING ALONG THE NORTH LINE OF SAID REVISED PARCEL B, A DISTANCE OF 185.42 FEET;
THENCE NORTH 47°00'00" EAST, A DISTANCE OF 23.28 FEET ALONG THE NORTH LINE OF SAID REVISED PARCEL B;
THENCE NORTH 18°47'39" EAST, A DISTANCE OF 84.46 FEET ALONG THE NORTH LINE OF SAID REVISED PARCEL B;
THENCE NORTH 69°07'15" EAST, A DISTANCE OF 79.63 FEET ALONG THE NORTH LINE OF SAID REVISED PARCEL B;
THENCE NORTH 00°30'26" EAST ALONG THE WESTERLY LINE OF SAID REVISED PARCEL B, A DISTANCE OF 77.80 FEET **TO THE POINT OF BEGINNING.**



LEGEND

- City Limit
- Keller Farm Mitigation Bank Boundary (75.2 Acres)



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FIGURE: A-1
VICINITY AND SITE LOCATION
KELLER FARM
MITIGATION BANK
Redmond, Washington

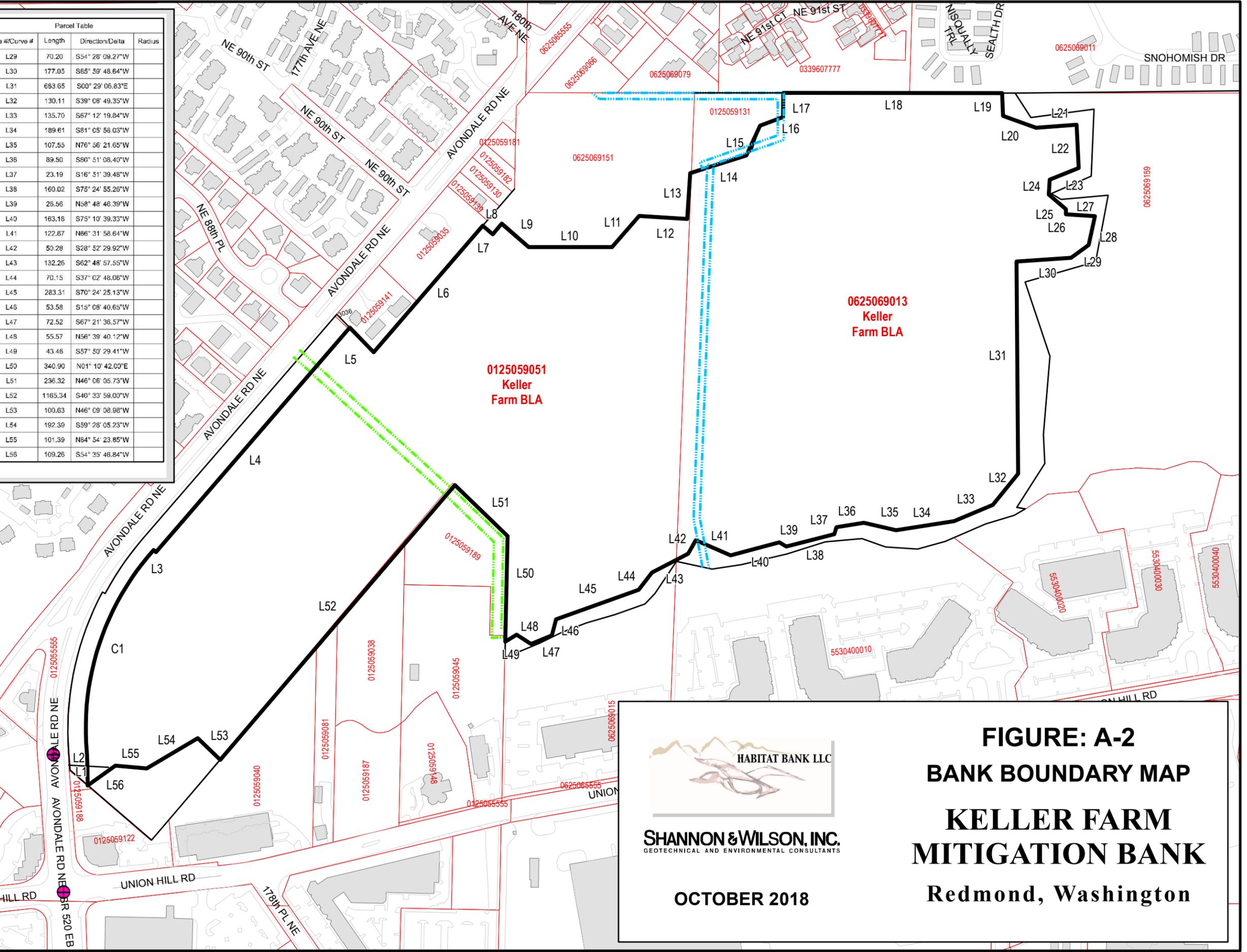
Line #/Curve #	Length	Direction/Delta	Radius
C1	704.41	046.7749	862.85
L1	76.01	N00° 56' 20.34"W	
L2	32.75	N03° 34' 18.35"W	
L3	10.90	S49° 06' 52.00"E	
L4	956.64	N40° 53' 08.00"E	
L5	110.40	S44° 14' 14.00"E	
L6	539.43	N40° 53' 08.00"E	
L7	42.00	S49° 06' 52.00"E	
L8	45.00	N40° 53' 08.00"E	
L9	115.45	S49° 06' 52.00"E	
L10	269.05	S88° 57' 41.00"E	
L11	133.80	N40° 53' 08.00"E	
L12	156.07	S86° 25' 35.00"E	
L13	147.45	N03° 36' 15.00"E	
L14	190.56	N72° 32' 29.00"E	
L15	105.55	N24° 46' 40.08"E	
L16	79.63	N88° 07' 15.00"E	
L17	77.80	N00° 30' 26.00"E	
L18	707.16	S89° 57' 40.00"E	
L19	73.71	S02° 24' 18.24"E	
L20	112.71	S70° 09' 39.19"E	
L21	131.90	N85° 59' 30.23"E	
L22	139.10	S02° 52' 56.75"E	
L23	101.65	S68° 11' 02.99"W	
L24	47.85	S03° 24' 04.93"W	
L25	73.30	S49° 43' 57.46"E	
L26	16.41	S00° 15' 43.68"W	
L27	93.70	S86° 11' 07.18"E	
L28	95.28	S12° 00' 52.05"W	

Line #/Curve #	Length	Direction/Delta	Radius
L29	70.20	S34° 28' 09.27"W	
L30	177.05	S85° 59' 48.64"W	
L31	683.65	S00° 29' 06.83"E	
L32	130.11	S39° 08' 49.35"W	
L33	135.70	S67° 12' 19.84"W	
L34	189.61	S81° 05' 58.03"W	
L35	107.55	N76° 56' 21.65"W	
L36	89.50	S80° 51' 08.40"W	
L37	23.19	S16° 51' 39.48"W	
L38	160.02	S75° 24' 55.26"W	
L39	26.56	N58° 48' 46.39"W	
L40	163.16	S75° 10' 39.33"W	
L41	122.67	N86° 31' 58.64"W	
L42	50.28	S28° 52' 29.92"W	
L43	132.26	S62° 48' 57.55"W	
L44	70.15	S37° 02' 48.08"W	
L45	283.31	S70° 24' 25.13"W	
L46	53.58	S15° 08' 40.65"W	
L47	72.52	S67° 21' 36.57"W	
L48	55.57	N56° 39' 40.12"W	
L49	43.46	S57° 50' 29.41"W	
L50	340.90	N01° 10' 42.00"E	
L51	236.32	N46° 06' 05.73"W	
L52	1165.34	S40° 33' 59.00"W	
L53	100.63	N46° 09' 08.98"W	
L54	192.39	S39° 28' 05.23"W	
L55	101.39	N84° 54' 23.85"W	
L56	109.26	S34° 35' 48.84"W	

LEGEND

- Property Boundary
- Water Line Easement (20 ft)
- Trail Easement (30 ft)
- Building
- Parcel
- Keller Farm Mitigation Bank Boundary (75.2 Acres)

Note: Parcel boundaries, buildings, utilities, and trails are from the City of Redmond's GIS shapefile datasets.



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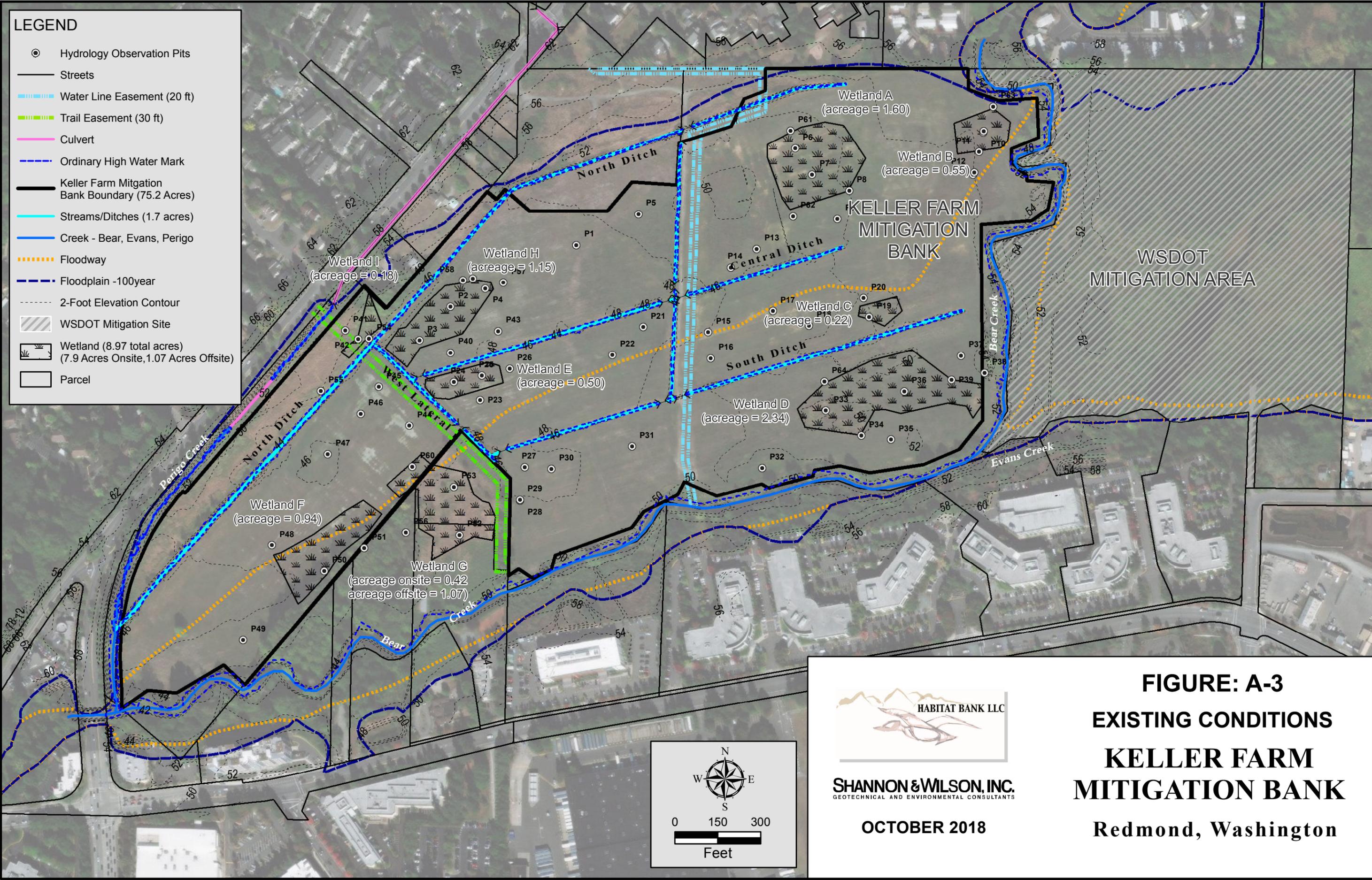
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OCTOBER 2018

FIGURE: A-2
BANK BOUNDARY MAP
KELLER FARM
MITIGATION BANK
Redmond, Washington

Filename: I:\EF\21-1 SEAI\25008\12566 Keller Farm\GIS\MXD\21-1-12566-280 FIG-A2 PROPERTY.mxd Date: 10/25/2018 br

Filename: \\EF2\1-1 SEA\12500s\12566 Keller Farm\GIS\MXD\21-1-12566-280 FIG-A3_ExistingConditions.mxd Date: 10/23/2018 .brl





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FIGURE: A-3

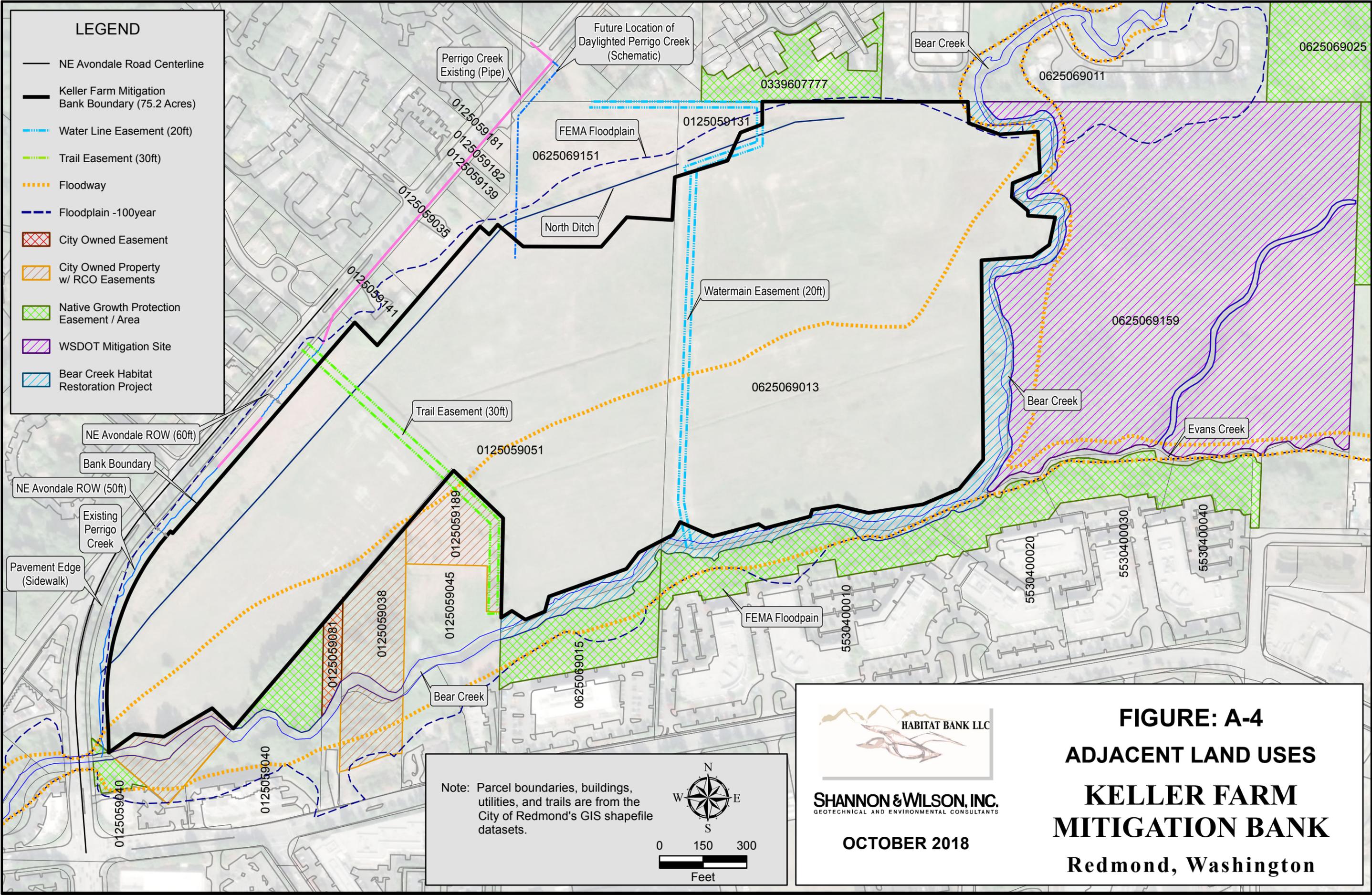
EXISTING CONDITIONS

KELLER FARM

MITIGATION BANK

Redmond, Washington

Filename: I:\EP21-1 SEA\12500s\12566 Keller Farm\GIS\MXD\21-1-12566-280 FIG-A4_Adjacent_Land_Uses.mxd Date: 10/10/2018 brl

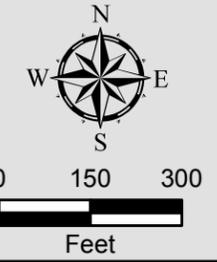


LEGEND

- NE Avondale Road Centerline
- Keller Farm Mitigation Bank Boundary (75.2 Acres)
- Water Line Easement (20ft)
- Trail Easement (30ft)
- Floodway
- Floodplain -100year
- City Owned Easement
- City Owned Property w/ RCO Easements
- Native Growth Protection Easement / Area
- WSDOT Mitigation Site
- Bear Creek Habitat Restoration Project

- NE Avondale ROW (60ft)
- Bank Boundary
- NE Avondale ROW (50ft)
- Existing Perrigo Creek
- Pavement Edge (Sidewalk)

Note: Parcel boundaries, buildings, utilities, and trails are from the City of Redmond's GIS shapefile datasets.



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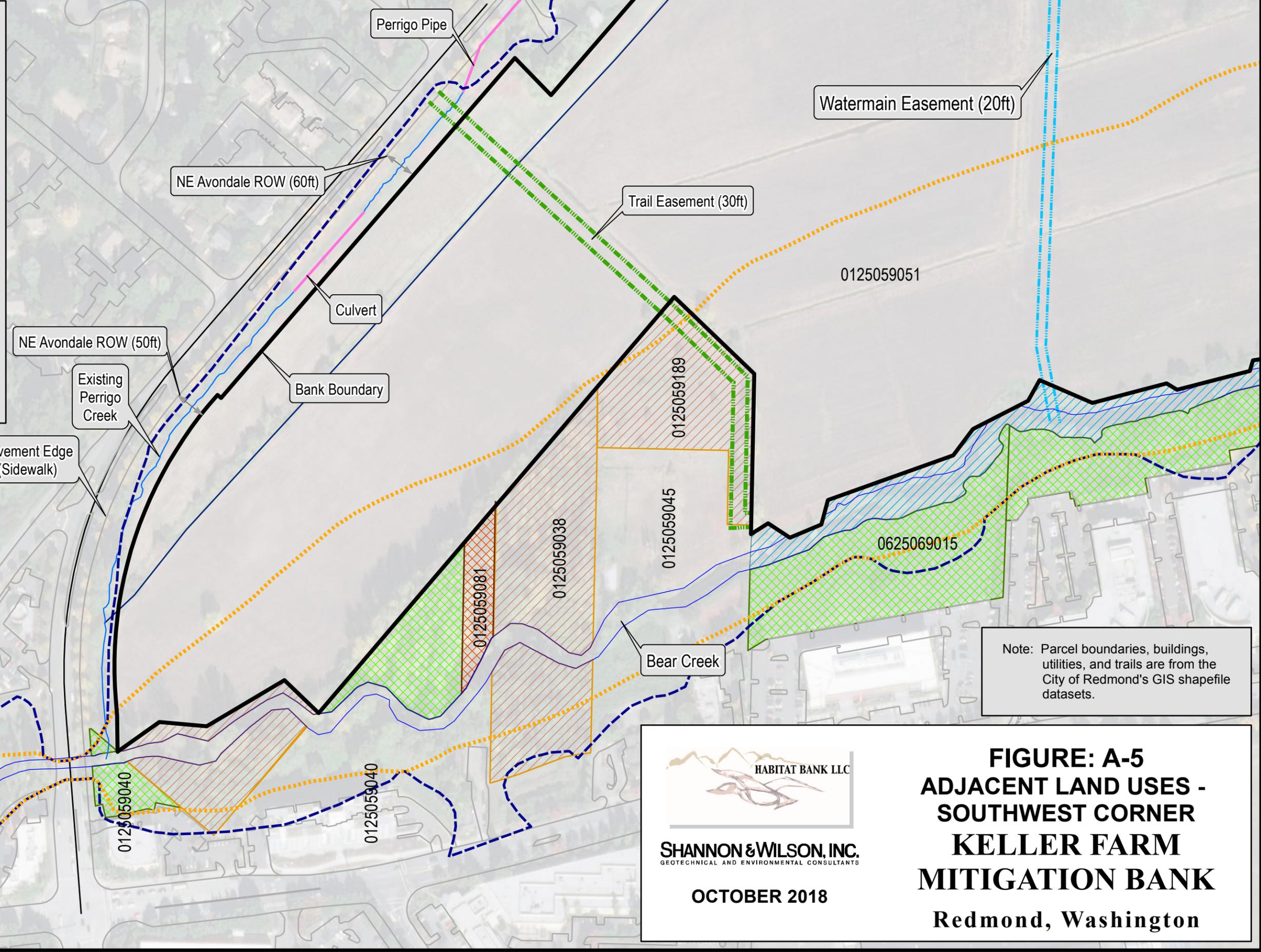
OCTOBER 2018

FIGURE: A-4
ADJACENT LAND USES
KELLER FARM
MITIGATION BANK
Redmond, Washington

Filename: I:\EP21-1 SEA\12500s\12566 Keller Farm\GIS\MXD\21-1-12566-280 FIG-A5_AdjacentLandUses_Zoom.mxd Date: 10/10/2018 brt

LEGEND

- NE Avondale Road Centerline
- Keller Farm Mitigation Bank Boundary (75.2 Acres)
- Trail Easement (30ft)
- Culvert
- Water Line Easement (20ft)
- Floodway
- Floodplain -100year
- ▨ City Owned Easement
- ▨ City Owned Property w/ RCO Easements
- ▨ Native Growth Protection Easement / Area
- ▨ WSDOT Mitigation Site
- ▨ Bear Creek Habitat Restoration Project



Pavement Edge (Sidewalk)

Existing Perrigo Creek

NE Avondale ROW (50ft)

NE Avondale ROW (60ft)

Bank Boundary

Culvert

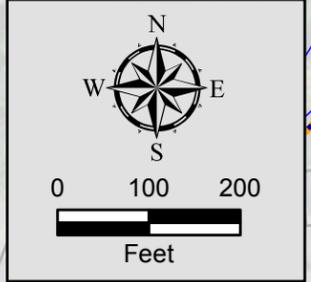
Perrigo Pipe

Trail Easement (30ft)

Watermain Easement (20ft)

Bear Creek

Note: Parcel boundaries, buildings, utilities, and trails are from the City of Redmond's GIS shapefile datasets.





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OCTOBER 2018

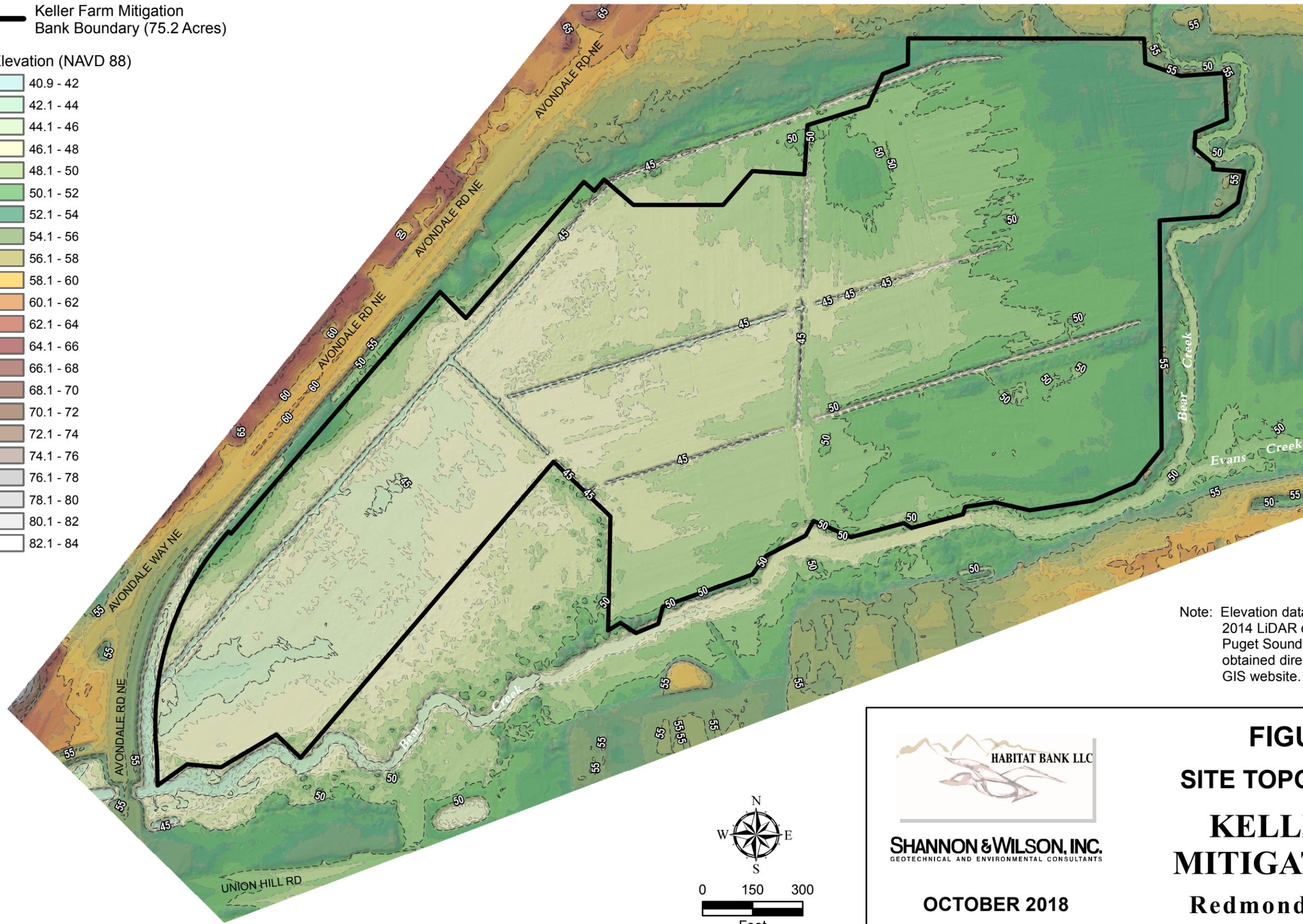
FIGURE: A-5
ADJACENT LAND USES -
SOUTHWEST CORNER
KELLER FARM
MITIGATION BANK
Redmond, Washington

LEGEND

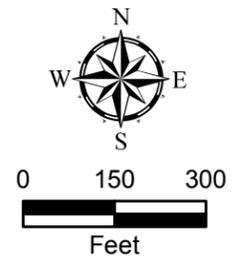
 Keller Farm Mitigation Bank Boundary (75.2 Acres)

Elevation (NAVD 88)

-  40.9 - 42
-  42.1 - 44
-  44.1 - 46
-  46.1 - 48
-  48.1 - 50
-  50.1 - 52
-  52.1 - 54
-  54.1 - 56
-  56.1 - 58
-  58.1 - 60
-  60.1 - 62
-  62.1 - 64
-  64.1 - 66
-  66.1 - 68
-  68.1 - 70
-  70.1 - 72
-  72.1 - 74
-  74.1 - 76
-  76.1 - 78
-  78.1 - 80
-  80.1 - 82
-  82.1 - 84



Note: Elevation data is from the City of Redmond 2014 LiDAR dataset and was acquired from Puget Sound LiDAR Consortium. Contours obtained directly from the City of Redmond's GIS website.



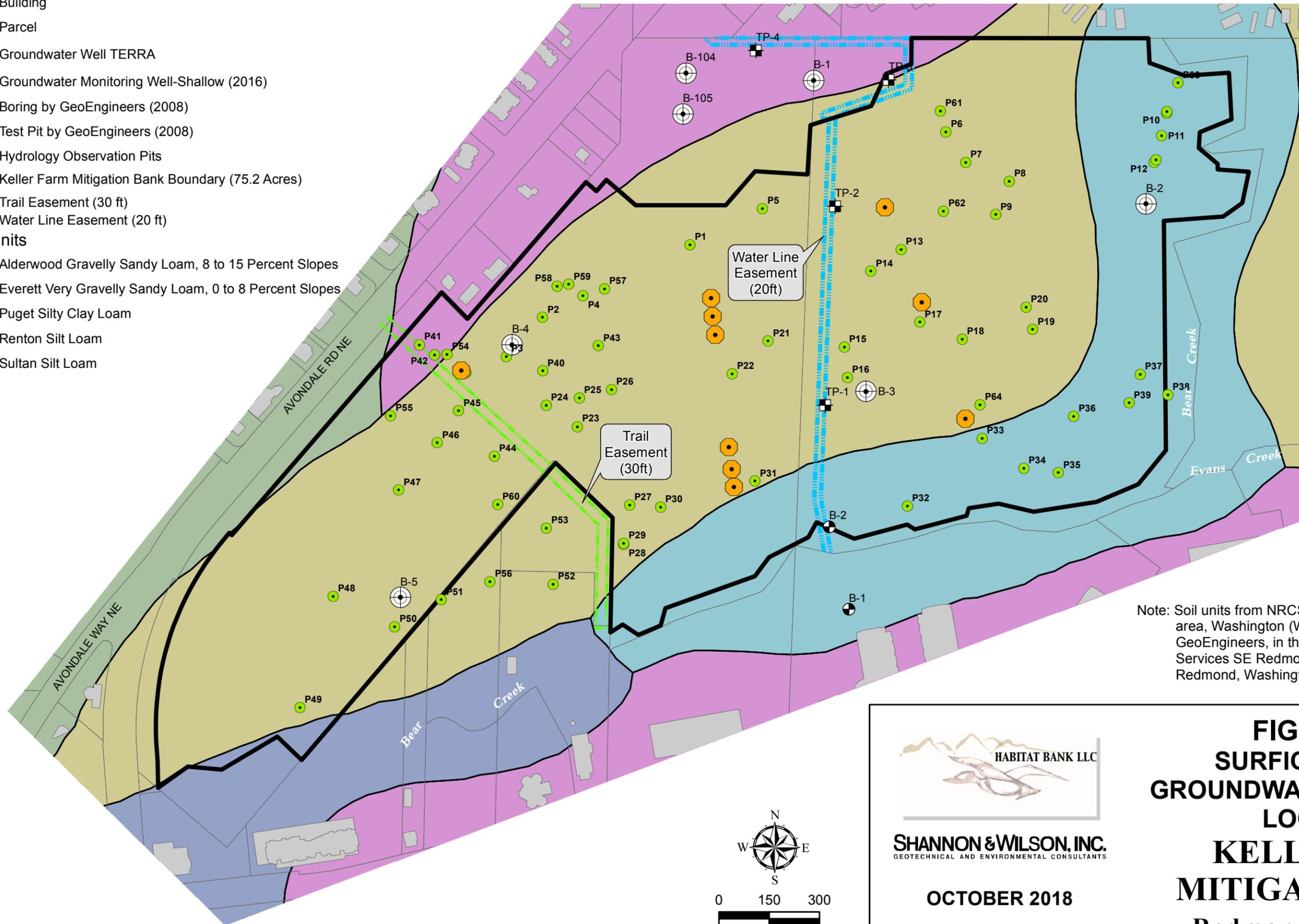

HABITAT BANK LLC

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GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
OCTOBER 2018

FIGURE: A-6
SITE TOPOGRAPHY MAP
KELLER FARM
MITIGATION BANK
 Redmond, Washington

LEGEND

-  Building
 -  Parcel
 -  Groundwater Well TERRA
 -  Groundwater Monitoring Well-Shallow (2016)
 -  Boring by GeoEngineers (2008)
 -  Test Pit by GeoEngineers (2008)
 -  Hydrology Observation Pits
 -  Keller Farm Mitigation Bank Boundary (75.2 Acres)
 -  Trail Easement (30 ft)
 -  Water Line Easement (20 ft)
- Soil Units**
-  Alderwood Gravelly Sandy Loam, 8 to 15 Percent Slopes
 -  Everett Very Gravelly Sandy Loam, 0 to 8 Percent Slopes
 -  Puget Silty Clay Loam
 -  Renton Silt Loam
 -  Sultan Silt Loam



Note: Soil units from NRCS Soil Survey of King County area, Washington (WA633). Soil explorations from GeoEngineers, in their report, Geotechnical Engineers Services SE Redmond Water Transmission Main, Redmond, Washington, November 20, 2008.



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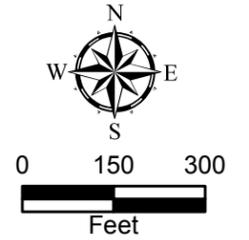
OCTOBER 2018

FIGURE: A-7
SURFICIAL SOILS &
GROUNDWATER MONITORING
LOCATIONS
KELLER FARM
MITIGATION BANK
Redmond, Washington

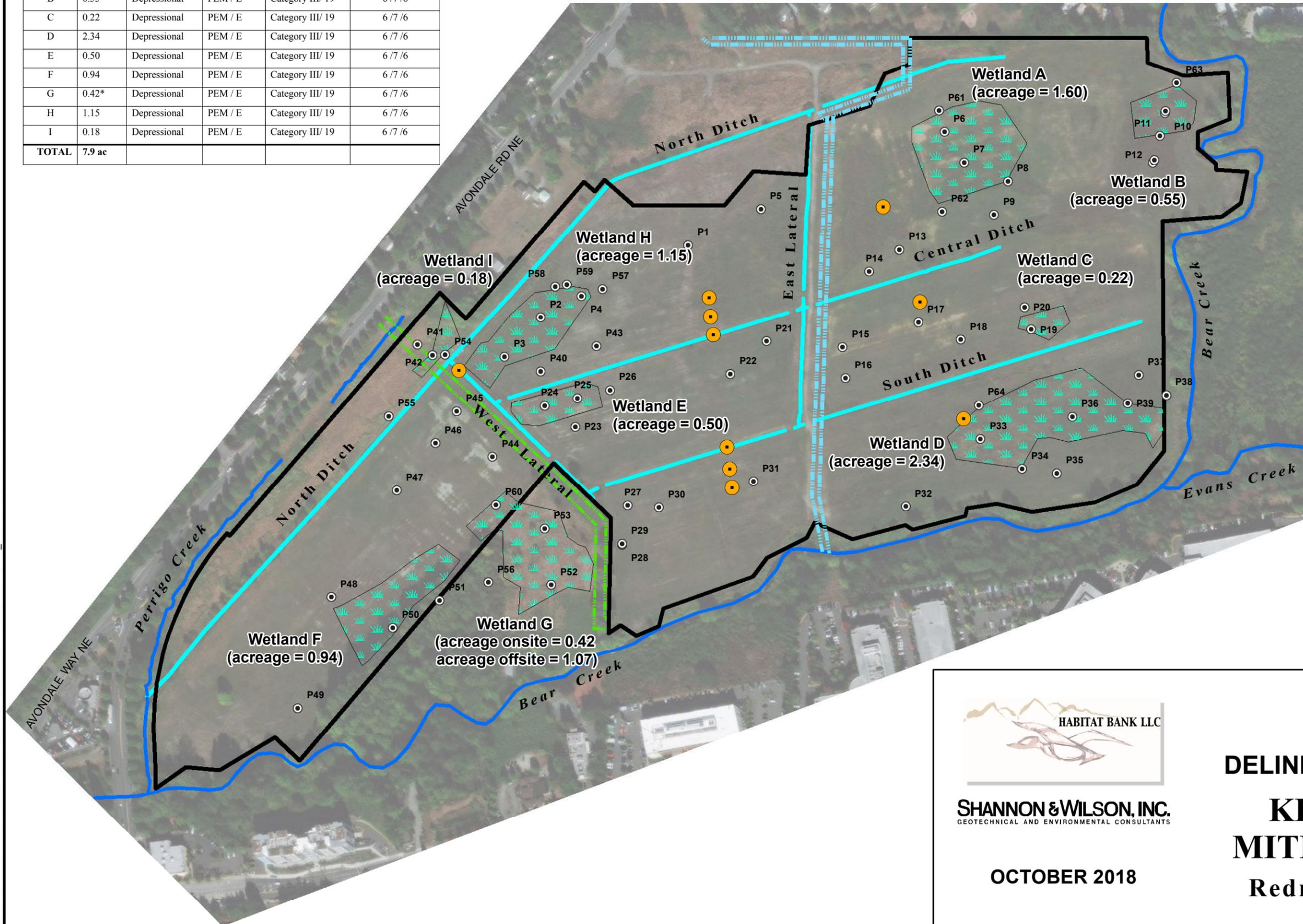
Wetland	Area onsite (acres)	HGM Classification	Cowardin Class	Ecology Rating/ Total Score	Water Quality/ Hydrologic/ Habitat Function Scores
A	1.60	Depressional	PEM / D, E	Category II / 20	7 / 7 / 6
B	0.55	Depressional	PEM / E	Category III / 19	6 / 7 / 6
C	0.22	Depressional	PEM / E	Category III / 19	6 / 7 / 6
D	2.34	Depressional	PEM / E	Category III / 19	6 / 7 / 6
E	0.50	Depressional	PEM / E	Category III / 19	6 / 7 / 6
F	0.94	Depressional	PEM / E	Category III / 19	6 / 7 / 6
G	0.42*	Depressional	PEM / E	Category III / 19	6 / 7 / 6
H	1.15	Depressional	PEM / E	Category III / 19	6 / 7 / 6
I	0.18	Depressional	PEM / E	Category III / 19	6 / 7 / 6
TOTAL	7.9 ac				

LEGEND

- Hydrology Observation Pit
- Groundwater Monitoring Well-Shallow
- Keller Farm Mitigation Bank Boundary (75.2 Acres)
- Trail Easement (30 ft)
- Water Line Easement (20 ft)
- Streams/Ditches
- Creek - Bear, Evans, Perigo
- Wetland (8.97 total acres)
(7.9 Acres Onsite, 1.07 Acres Offsite)



Note: Wetland and OHWM boundaries were delineated by Essency Environmental, LLC. Boundary locations were recorded using a hand-held Trimble GPS unit and post-processed.



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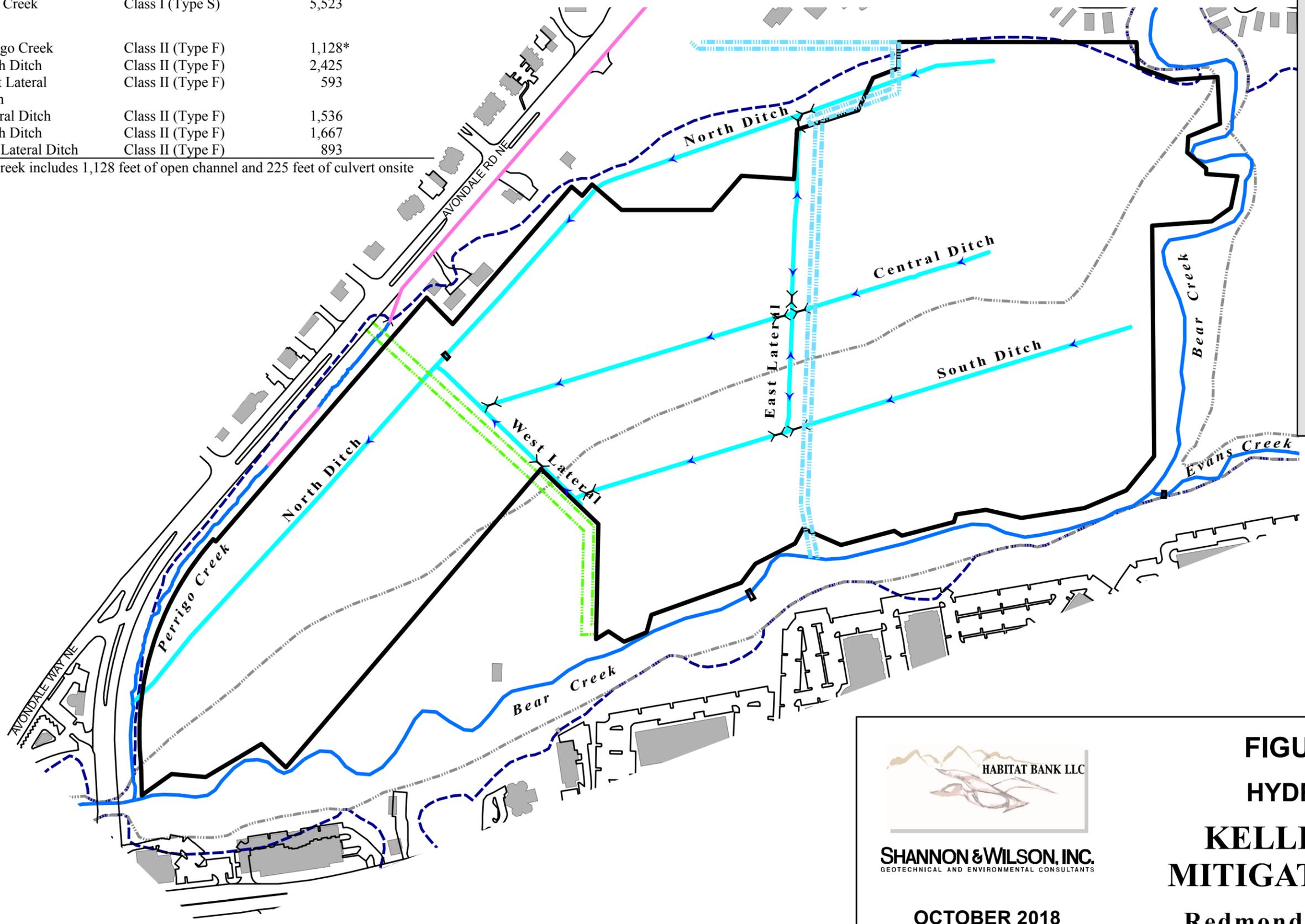
FIGURE: A-8
WETLAND -
DELINEATED BOUNDARIES
KELLER FARM
MITIGATION BANK
Redmond, Washington

Stream	Redmond Stream Class (Stream Type)	Approx. Stream Length (feet)
Bear Creek	Class I (Type S)	5,523
Perrigo Creek	Class II (Type F)	1,128*
North Ditch	Class II (Type F)	2,425
West Lateral	Class II (Type F)	593
Ditch		
Central Ditch	Class II (Type F)	1,536
South Ditch	Class II (Type F)	1,667
East Lateral Ditch	Class II (Type F)	893

*Perrigo Creek includes 1,128 feet of open channel and 225 feet of culvert onsite

LEGEND

- Streets
- Culvert
- Water Line Easement (20ft)
- Trail Easement (30ft)
- Building
- Keller Farm Mitigation Bank Boundary (75.2 Acres)
- Creek
- Streams/Ditches (1.79 Acres)
- Floodway
- Floodplain -100year



Filename: I:\EF2\1-1 SEA\12500s\12566 Keller Farm\GIS\IMXD\21-1-1-12566-280 FIG-A9_HYDROLOGY.mxd Date: 10/23/2018 .brl

HABITAT BANK LLC

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OCTOBER 2018

FIGURE: A-9

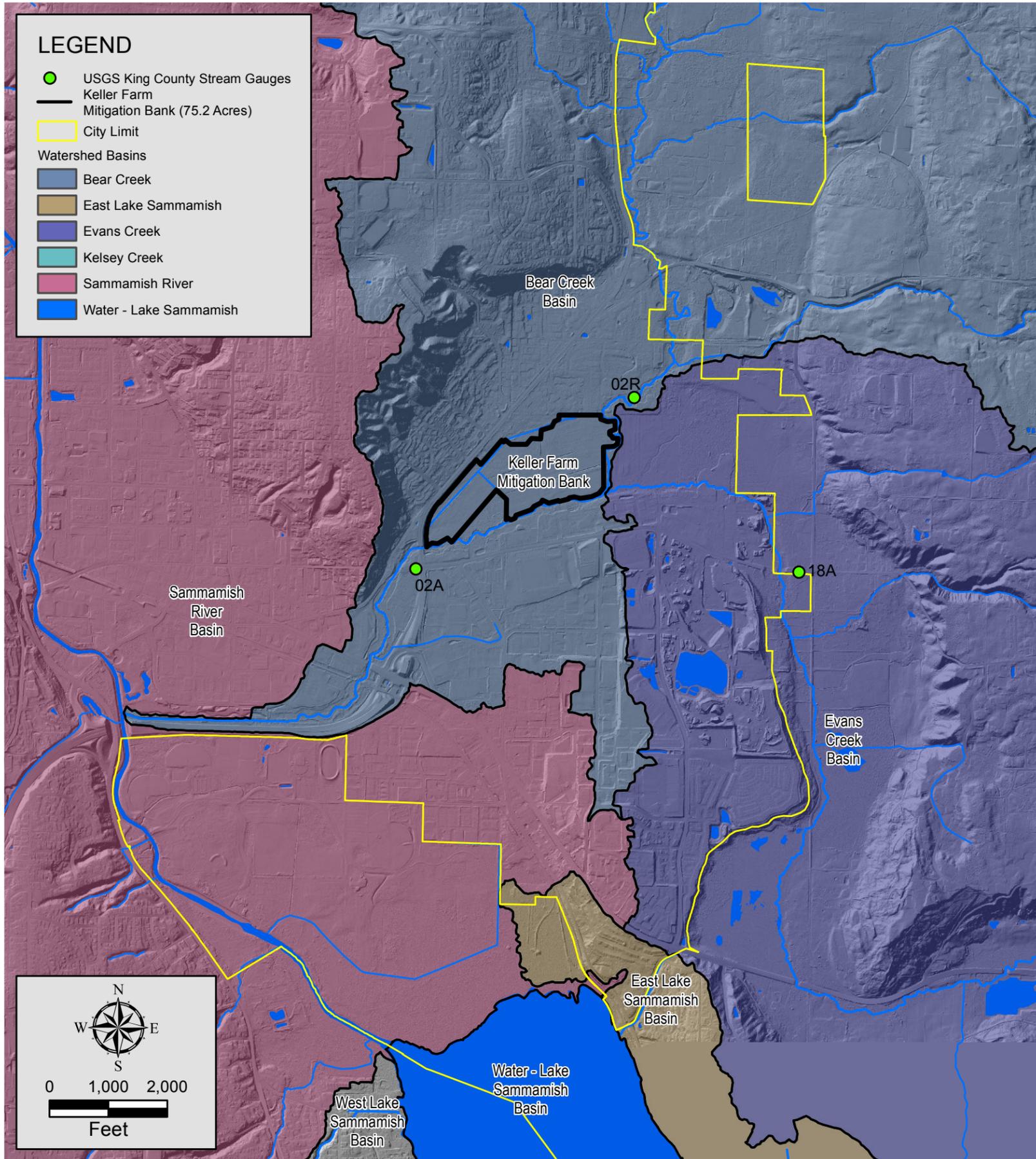
HYDROLOGY

KELLER FARM

MITIGATION BANK

Redmond, Washington

Filename: I:\EF21-1 SEA\12500s12566 Keller Farm\GIS\IMXD21-1-12566-280 FIG-A10_WATERSHEDS.mxd Date: 10/10/2018 .brl



HABITAT BANK LLC

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OCTOBER 2018

FIGURE: A-10
WATERSHED MAP
KELLER FARM
MITIGATION BANK
Redmond, Washington

APPENDIX B BANK DEVELOPMENT PLAN AND DESIGN

B.1 Development Plan – Overview

The Bank project is located within the City of Redmond at the confluence of two regionally significant, salmon-bearing streams, Bear Creek and Evans Creek (**Figure B-1** and **Appendix A-General Bank Information**). Another smaller stream, Perrigo Creek, flows adjacent to a portion of the western Bank boundary and discharges to Bear Creek at the southwest corner of the Bank. The Bank design goals were developed as part of the Project Prospectus (Habitat Bank, 2015) and Basis of Design Report (Shannon and Wilson, Inc., 2018). The design goals are consistent with Ecology, Corps, and U.S. Environmental Protection agency guidelines for establishing mitigation bank goals and criteria, as well as with Bear Creek Basin restoration planning efforts and WRIA-8 restoration goals as established by the WRIA-8 Salmon Recovery Council. Wetland and habitat restoration goals on the Bank site were developed to address the limiting factors in the watershed related to the loss of wetland hydrology, the loss of habitat and vegetation communities, and the manipulation of topography affecting wetlands, floodplain, and stream habitat conditions, as well as anadromous fish species including threatened Chinook salmon. Implementation of the Keller Farm Mitigation Bank is anticipated to result in substantial gains in aquatic ecosystem functions as compared to baseline conditions present as of the date of execution of the MBI. The site-specific goals and objectives include:

Permanently protect ecosystem functions at the Bank by implementing the Instrument and executing a conservation easement with permanent funding for site stewardship.

- Re-establish wetland hydrology and varying wetland hydroperiods across the site by disabling farm ditches and performing targeted grading actions across the Bank site.
- Create additional habitat area that supports wetland-dependent organisms. Increase habitat structure and diversity on the Bank site over existing conditions.
- Re-establish wetland vegetation and wetland habitat communities across the site. Remove and control noxious and invasive plant species and reintroduce native vegetation to increase habitat complexity in the floodplain wetlands and adjacent upland areas. Plant native trees, shrubs, and herbaceous species to re-establish a mosaic of habitat communities within the Bank property.
- Improve access for aquatic organisms to floodplain wetland and aquatic areas. Enhance and create off-channel rearing and refuge habitat for salmonids within the floodplain streams and deeper backwater areas connected to Bear Creek.
- Reconnect Bear Creek to the floodplain and improve floodplain functions on the Bank site including attenuation of flood flows, reductions in peak flood flows, food web and organic material support and transport, and refuge habitat for fish and wildlife during flood events.

- Establish a connection point for the future relocation of Perrigo Creek through the adjacent parcel north of the Bank.
Re-establish and rehabilitate stream channel habitat in the floodplain through grading and addition of large woody debris (LWD). Create pool habitat and increase channel habitat complexity.
- Increase shading and cover of streams through planting on the Bank site over existing conditions.

The Bank design goals and objectives are based on information and data collected on the site and documented in the following reports:

- Keller Farm Mitigation Baseline Conditions Report, November 2016, Essency Environmental;
- Keller Farm Mitigation Bank, Basis of Design Report (Revised), March 2018, Shannon and Wilson Inc.;
- Keller Farm Mitigation Bank, Cultural Resources Report for the Keller Farm Mitigation Bank, April 2016, Historical Research Associates Inc.;
- Bear Creek Wetland Mitigation, Survey Exhibit Map, November 2016, LDC The Civil Engineering Company.

In addition to references listed at the end of this Appendix, findings from other relevant reports, plans and studies have also informed the Bank design including:

- Bear Creek Restoration and Wood Installation Project, Keller Farm Site, May 2017, Shannon and Wilson Inc.;
- Bear Creek Basin Plan, August 1992, King County;
- Avondale Road NE Townhome Development at 180th Ave NE, October 2017, Preliminary Design Plans, Joe Stroeble;
- Geotechnical Engineering Services, SE Redmond Water Transmission Main, Redmond, Washington, November 2008, GeoEngineers;
- Critical Aquifer Recharge Area Report, Lodge at Bear Creek, Redmond, Washington, July 2008, Terra Associates, Inc.;
- Redmond – Bear Creek Valley, Ground Water Management Plan: Management Strategies, February 1999, King County Department of Natural Resources;
- A Regional and Geomorphic Reference for Quantities and Volumes of Instream Wood in Unmanaged Forested Basins of Washington State, 2007, M. Fox and S. Bolton;

- Water Resources Inventory Assessment (WRIA) 8 – Approved 2014 Three-Year Work Plan, Capital Project and Program Priorities, WRIA 8;
- Salmon and Steelhead, Habitat Limiting Factors Report for the Cedar –Sammamish Basin (WRIA 8), September 2001, Kerwin J., Washington Conservation Commission; and
- Medina to SR 202: Eastside Transit and HOV Project, Final Wetland Mitigation Report, April 2010, Washington State Department of Transportation.

B.1.1 Summary of Design Elements

The Basis of Design Report (Shannon and Wilson, Inc., Revised March 2018) describes design alternatives considered to achieve project goals. The selected alternative includes the following design elements (also refer to **Figure B-5, Site Design Plan**):

- **Floodplain grading and shaping** – The Bank site will be reshaped and contoured to re-establish wetland hydrology and varying wetland hydroperiods across the site (**Figure B-6, Wetland Hydroperiod**). No grading will occur in existing wetlands except at connections to new floodplain streams or at wetland edges to match new grading contours. Approximately 64,000 cubic yards of material will be excavated, and the same 64,000 cubic yards will be used for onsite fill. No fill will be placed in existing wetlands. Some excavated material will be placed in existing onsite ditches (streams) to create stream riffles as detailed below.
- **Floodplain stream meandering and grading** – Approximately 12,276 linear feet (4.3 acres) of meandering floodplain streams will replace the existing 7,114 linear feet (1.7 acres) of straight farm ditches.
- **Floodplain stream riffles (ditch plugs)** – Floodplain stream riffles (called “ditch plugs” in the Basis of Design Report) will be constructed in the floodplain streams on the Bank site. The stream riffles are designed to raise and maintain water elevations in the floodplain streams and surrounding zones of influence, including adjacent wetlands. Stream riffles will be constructed to meet WSDOT Standard Specification 9-03.11(1) for Streambed Sediment (WSDOT Standard Specifications for Road, Bridge, and Municipal Construction, M41-10) (**Figure B-21, Floodplain Stream Riffle Detail**). Large woody debris pieces will also be installed in stream riffles.
- **Floodplain connections to Bear Creek**– Six floodplain connections with Bear Creek will be constructed: three overflow connections, two backwater channel connections, and where the floodplain streams outlet to Bear Creek (**Figures B-5, Site Design Plan**). These floodplain connections increase the number of locations and range of flow conditions where Bear Creek flows will contribute to hydrologic support of floodplain wetlands and streams. These connections also allow fish access to the re-established wetlands and stream channels in the floodplain. The floodplain connections will be protected from erosive flows by LWD complexes that will also provide physical cover and habitat for fish. The two overflow connections at the northeast corner of the Bank site and the overflow connection on the southern boundary of the Bank site are designed to engage at approximately 200-300 cfs and

- will enable floodwaters to flow through the central portion of the site and then exit through the downstream connection to Bear Creek. The two backwater channel connections along the southern boundary are intended to be engaged and inundated for extended periods from winter through spring.
- **Large woody debris (LWD) complexes** – The Bank project will install 10 LWD complexes along Bear Creek, two complexes at each connection to Bear Creek (**Figures B-5 and B-18**). These features are designed to enhance flood overflows and provide structure, cover, and complexity in Bear Creek at the connection points. The LWD complexes will each have one key member that is minimum 2 feet in diameter at breast height (DBH) and minimum 20 feet long, and a minimum of eight additional individual pieces of wood that are minimum 1-foot DBH and minimum 10 feet long.
 - **Large woody debris (LWD) individual pieces** – A minimum of 52 individual LWD pieces will be installed in the Bank floodplain streams as habitat and floodplain roughness elements. Each LWD individual piece of wood will be 1-2 feet in diameter and 10-20 feet in length (**Figures B-8 and B-19**).
 - **Plantings and vegetation** – Wetland and riparian upland communities comprised of native species will be established on the Bank site (**Figures B-16 and B-17**). Riparian uplands and forested wetlands will include both trees and shrubs. Scrub-shrub wetlands and riparian banks along the floodplain streams will be planted with a mixture of shrub and emergent herbaceous species.
 - **Groundwater monitoring well decommission** – There are four groundwater monitoring wells from previous site investigations on the Bank site that will be formally decommissioned as part of the Bank project.
 - **Perrigo Creek future daylight connection** – The daylighting and realignment of Perrigo Creek on Parcel 0625069151 is a City of Redmond requirement for any redevelopment on the parcel. Parcel 0625069151 is adjacent to the northwest/central boundary of the Bank (**Figure B-3**). The Bank site design includes construction of a receiving point for the future daylighting and realignment of Perrigo Creek (**Figures B-5 and B-8**). The Bank design team has coordinated with the current property purchase option holders on a mutually acceptable design and included a receiving channel design for daylighting Perrigo Creek into the north central wetland complex on the Bank site that meets the City’s Design District code requirements for both projects. The Bank’s design does not rely on hydrology from Perrigo Creek to drive or support wetland hydrology on the Bank site. However, the future relocation of Perrigo Creek would re-establish fish access to upstream areas of Perrigo Creek, and contribute additional hydrologic support to downstream receiving streams and adjacent wetlands on the Bank site. The preferred order of construction is to implement the Bank project first so the connection point on the Bank site is ready to receive Perrigo Creek flows when it is rerouted and daylighted.

The Bank site includes wetland habitat areas that are classified as “depressional and riverine” under the HGM classification system and “palustrine and riverine” wetlands under the Cowardin classification system. Improvements to water quality, water quantity, and habitat functions within the re-established and rehabilitated wetland areas on the Bank site will be documented

and evaluated through the Bank’s performance standards, which allow credits to be generated and released to the Sponsor. The improvement of wetlands on the Bank site can be placed into two categories of restoration actions, per the joint agency guidance on compensatory mitigation found in *Wetland Mitigation in Washington State Part.1 Version 1* (Washington Department of Ecology, et al., 2006):

Wetland Re-establishment: *The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former wetland. Re-establishment results in rebuilding a former wetland and results in a gain in wetland acres and functions. Activities could include removing fill, plugging ditches, or breaking drain tiles.*

Wetland re-establishment actions at the Bank include restoring wetland hydrology to historical wetland areas within the Bear Creek Floodplain that have been drained over the last 100 years by ditches. Restoration activities include plugging, disabling and re-meandering the existing farm ditches, and grading portions of the site to create a diversity of wetland habitat communities.

Wetland Rehabilitation: *The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural or historic functions [and processes] of a degraded wetland. Rehabilitation results in a gain in wetland function but does not result in a gain in wetland acres. Activities could involve breaching a dike to reconnect wetlands to a floodplain or returning tidal influence to a wetland.*

Wetland rehabilitation actions include restoring the natural wetland hydroperiod of existing wetlands through floodplain reconnection with Bear Creek and disabling of existing ditches, grading to create connectivity between existing wetlands and reestablished wetlands, and reestablishing native vegetation communities within the existing wetland areas.

Additionally, riparian uplands surrounding the re-established and rehabilitated wetland areas will be enhanced through the planting of native trees and shrubs which will create interspersed terrestrial habitat, important for aquatic dependent wildlife as well as providing other improvements such as shading aquatic areas on the site and providing a source of organic material and large wood.

B.1.2 Creditable Areas, Buffers, Easements, and Rights-of-Way

Table B-1 summarizes the Bank site boundary acreage, buffer acreages, easement acreages and creditable area acreage. The City-owned parcel boundaries and the Bank boundary were provided in a survey by LDC The Civil Engineering Company (**Figure B-3, Survey Exhibit Map**). The Bank site includes portions of two City-owned parcels and is 75.2 acres in total.

The Bank includes non-creditable buffer areas along the northern and western boundaries and on both sides of the pedestrian trail easement¹ on the western portion of the site (**Figure B-5**). The

¹ The City of Redmond Pedestrian Trail Easement refers to the reserved right of the City of Redmond to construct a pedestrian trail. This right may be conveyed as an easement to a third-party at some time in the future.

Bank has a non-creditable 100-foot buffer along all portions of the northern Bank boundary, except for a short segment of this buffer that is 50 feet wide because it is adjacent to a Native Growth Protection Area (NGPA). The Bank boundary along Bear Creek was established in such a way as to separate permitting for the Bank project from the Bear Creek Habitat Restoration project which will be completed by the City of Redmond. The Bank boundary is to the edge of Bear Creek at the locations where there are reconnections of the floodplain to Bear Creek (**Figure B-5**). The area between the Bank boundary and Bear Creek will be retained by the City of Redmond for the Bear Creek Habitat Restoration project. There is no buffer on the Bank along Bear Creek where the City of Redmond will be completing the adjacent restoration project, or where the Bank boundary extends to the ordinary high-water mark of the Creek. In the southwest portion of the Bank, there is no buffer along the parcels that extend across Bear Creek and border the Bank boundary from the south (**Figure B-5**). These parcels have permanent development restrictions which prohibit future development from occurring adjacent to the Bank project.

The Bank site has two non-credit generating easements. The first is a 30-foot wide City of Redmond pedestrian trail easement which will have additional 15-foot wide non-creditable buffers on each side (**Figure B-5**). The City of Redmond’s Master Plan for pedestrian trails seeks to connect existing and proposed trail systems in the eastern half of the City with trail systems in the western half of the City. The City may look for other routes away from the Bank site to connect the two trail systems but if that is not possible and a pedestrian trail is planned through the Bank site easement area, the Sponsor and City will consult with the Bank IRT and Co-chairs prior to any development of the trail design. All areas of the easement disturbed by trail construction work within the easement will be restored to a natural condition. The trail easement and trail buffer will be planted at the time of Bank construction with vegetation that is consistent with the proposed habitat types in the easement and will be subject to the applicable Performance Standards.

The second easement on the Bank is a 20-foot wide easement for an existing City of Redmond buried water supply pipeline. The water supply pipeline is 8 to 10 feet below the ground surface and will be planted with low growing and shallow rooted vegetation in accordance with the applicable Performance Standard(s).

All easement areas and all buffer areas on the Bank site are non-creditable. The creditable area of 64.5 acres was calculated as the total acreage within the Bank boundary less buffer and easement acreages.

Table B-1. Bank Boundary, Easement and Buffer Acreages

TYPE	ACRES
Bank Boundary	75.2
Buffers	9.8
Easements	0.9
Credit Areas	64.5

B.2 Bank Design

B.2.1 Floodplain Site Grading and Shaping

Areas of the Bank site within the floodplain will be reshaped and recontoured to lower ground surface elevations, in conjunction with a higher groundwater table created by disabling and plugging the existing ditch system on the site (**Figures B-8 through B-13**). Grading actions and the higher groundwater table will re-establish wetland areas and connect existing wetland areas. Cut material will be placed outside existing wetland areas and create upland habitat areas along the newly meandered floodplain stream channels and wetland areas. The grading plan is based on light detection and ranging (LiDAR) topography (2014), ditch topographic surveys provided by LDC (2016), and wetland delineations provided by Essency (2016). Cut and fill quantities and existing grades may vary from the site design plan due to slight uncertainties associated with the LiDAR topography. The site grading plan has a cut/fill balance of 64,000 cubic yards. There will be no fill in existing wetlands.

Approximately 7,114 linear feet of straight farm ditches (Type F streams used by salmonids) are present on the Bank site (**Figures B-4**). Of these 7,114 feet, approximately 4,850 linear feet will be re-contoured to create meandering floodplain streams (**Figure B-5**). An additional 5,162 linear feet of stream will be created. The total post project stream length will be 12,276 linear feet or 4.3 acres. The stream channels will have connection points with existing and re-established wetland areas. Targeted grading will occur around the perimeters of existing wetland areas to create connectivity to the streams and prevent fish stranding. Elevations in areas graded to re-establish wetlands will be lowered 1 to 2 feet to an elevation within 1 foot of the raised groundwater table resulting from the stream riffle features (ditch plugs). These low-lying graded areas will be frequently inundated by Bear Creek to become emergent, shrub-scrub, and forested wetlands.

The Central and South ditches will be re-contoured to create new meandering floodplain streams (**Figures B-5 through B-13**). Nearly the entire West Lateral Ditch will be filled, and approximately 50 percent (onsite portions) of the Central and South Ditches will be filled. The portions that are not filled will be re-graded as part of the new floodplain stream channels or adjacent wetlands. The North Ditch will remain in its current location, however the steep banks will be pulled back in the southwest portion of the Bank site to create a more natural appearance and tie into the new grading contours.

The floodplain streams will be excavated with riffle-pool sequences. Stream riffles will be constructed to raise and maintain water elevations in the floodplain streams and surrounding zones of influence across the site (**Figure B-21, Floodplain Stream Riffle Detail**). The stream channels will be excavated in some areas to a similar depth as the current ditches to provide deeper pools with a year-round connection to groundwater. The design geometry of the meanders and riffle-pool spacing is roughly based on bankfull width design criteria noted in the literature (USDA, 1998). This is to emulate an abandoned floodplain stream channel that would have been the former mainstem Bear Creek and is now a narrower, depositional, floodplain relic channel. The maximum pool depths of the new floodplain streams will be 4 to 5 feet deep below the top of stream bank, similar in bottom elevation to the existing farm ditches that currently intercept

groundwater. Distance between meanders is designed at 300 feet and will feature a glide approximately 150 feet in length leading into the pool that is approximately 140 feet long, exiting to a riffle 10-20 feet long. The pools will be constructed to intercept existing groundwater seeps and springs to provide cool water refugia for fish and aquatic organisms.

Grading work will lower the existing ground surface elevation 1 to 2 feet along the margins of the floodplain streams to create a hydrologic regime that supports a mix of shrub-scrub and emergent wetland habitat types (**Figure B-9, Cross Sections**). Grading will also occur at the three floodplain overflow locations to lower existing ground elevations at each floodplain connection point to collect and route flood flows through the floodplain streams and wetland complexes during flood events (**Figure B-8, Grading Plan**). Grading to lower existing ground elevations will create a mix of wetland habitats including emergent, scrub-shrub, and forested wetland areas. Lower elevation areas supporting wetlands will be interspersed with upland hummocks which will support riparian forested uplands.

Six floodplain connections with Bear Creek will be constructed: three overflow connections, two backwater channel connections, and where the floodplain streams outlet to Bear Creek. The positions of the Bear Creek overflow connections were determined based on field observations after flooding events. The two connections at the northeast corner of the Bank site and the overflow connection on the southern boundary of the Bank site are designed to engage at approximately 200-300 cfs and will enable floodwaters to flow through the central portion of the site during high flows. The two backwater channel connections along the southern boundary are intended to be engaged with Bear Creek and inundated for extended periods winter through spring. The upper ends of the backwater channels are also designed to overtop at 200-300 cfs. The floodplain connections will be protected from erosive flows by LWD complexes that will also provide physical cover and habitat for fish.

Cut (excavated) material will be placed in elongated, 2 to 3-foot high hummocks across the Bank site to create Riparian Upland Forest areas planted with native trees and shrubs (**Figures B-8 through B-13 and Figure B-16, Planting Plan**). Cut material taken out of the floodplain and placed into hummocks along the northern portion of the Bank site will create flood storage and provide protection to adjacent property owners along the Bank project.

Floodplain grading and shaping actions meet FEMA no-rise requirements and provide up to 25,000 cubic yards of compensatory flood storage (**Table B-2**). The precise amount of Compensatory Flood Storage will be determined in the As Built Grading Report.

Table B-2. Grading Volume and Quantity Summary

	Quantity
Cut Volume	64,000 CY
Fill Volume	64,000 CY
Compensatory Flood Storage	25,000 CY
Grading Below OHWM	1.26 Acres

B.2.2 Habitat Types Across Bank Site

The Bank is expected to support a variety of different habitat types (**Table B-3 and Figures B-5 and B-16**). The following habitat types and acreage amounts will be created on the Bank site:

Table B-3. Proposed Habitat Types and Acreages

HABITAT TYPE (Action)	CREDITABLE ACRES	NON- CREDITABLE BUFFERS	NON- CREDITABLE EASEMENTS	Totals
Riparian Upland Forest (Enhancement)	6.7	5.1	0.1	11.9
Riparian Forest Wetland (Re-establishment)	17.5	1.5	0.1	19.1
Shrub-Scrub/Emergent Wetland Mix (Re- establishment)	28.7	2.8	0.5	32.0
Riparian Wetland Stream Complex (Rehabilitation)	3.9	0.3	0.1	4.3
Existing Wetland PFO/PSS Mix (Rehabilitation)	7.7	0.1	0.1	7.9
Subtotal	64.5	9.8	0.9	
Total	75.2			

Table B-4 shows the existing habitat types and acreages on the Bank site and the proposed changes to habitat types and acreages after construction of the project occurs:

Table B-4. Summary of Existing and Proposed Habitat Types and Acreages

	EXISTING ACREAGE	PROPOSED ACREAGE	ACTIVITY PROPOSED
Total Upland Area (Grass)	65.6	11.9	Plant to Riparian Upland Forest
Total Ditch Area (new stream channel)	1.7	4.3	Farm ditches restored to stream channel
Wetland Area	7.9	59.0	Restore wetland hydrology, floodplain connectivity, improve habitat, plant native wetland vegetation
Total Bank Site Area:	75.2	75.2	
Wetland Area by Cowardin Classification			
PFO/PSS Mosaic (existing wetlands)	7.9	7.9	Rehabilitation
PFO	--	19.1	Re-establishment
PSS/PEM Mosaic	--	32.0	Re-establishment
Total Wetland Area	--	59.0	

Wetland habitat types are based on the post-construction ground surface elevations, in conjunction with expected changes to groundwater and surface water hydrology resulting from reconfiguring existing ditched streams to meandered channels and raising groundwater elevations by installing stream riffles (**Figure B-5, Site Design Plan**). Historically, the Bear Creek floodplain was dominated by mixed conifer forest, including forested wetlands and uplands. Forested wetlands were interspersed with shrub-scrub wetlands and emergent wetlands in the lower inundated elevations of the floodplain and within disturbed areas, such as flooded beaver ponds, remnant stream channels and the margins of aquatic areas. Final graded elevations will vary across the site and will support different habitat types based on the location of each habitat on the Bank and its hydroperiod (**Figures B-5 and B-6**). Wetland and upland habitat communities will be established within elevations ranges as shown in **Table B-5**. Existing wetlands are currently at approximately 46-52 feet across the site.

Table B-5. Proposed Habitat Types and Elevations

HABITAT TYPE	ELEVATION RANGE ON BANK SITE
Riparian Upland Forest (Enhancement)	46-54 feet
Riparian Forest Wetland (Re-establishment)	45-53 feet
Shrub-Scrub/Emergent Wetland Mix (Re-establishment)	44-53 feet
Riparian Wetland Stream Complex (Rehabilitation)	44-50 feet
Existing Wetland (Rehabilitation)	46-52 feet

It is expected these habitat communities will change and transition over time. Influences on vegetation communities are expected to include beavers, flooding, native vegetation recruitment, shading, competition, and species transition. Beaver are native to the Bear Creek watershed and are expected to use portions of the Bank site. Beaver activity, including building lodges and dams, is considered a naturally occurring process in the development of natural, self-sustaining habitat. Neighbors of the Bank are concerned about potential flooding from beaver activity, so it is critical that the Bank site is designed to prevent impact to adjacent property owners, and that appropriate maintenance activities are approved in advance if they are required to prevent flooding of neighboring properties.

B.2.3 Habitat Features - Floodplain Streams and Connections

As part of past farming and drainage activities at the Bank site, channelized, linear ditches were built with multiple culvert crossings. The onsite ditches are classified as fish-bearing streams and are used by a variety of salmonid and non-salmonid fish species (Essency, 2016). The Bank design plan includes removal of all culverts, excavation of meandering, floodplain streams with riffle-pool and riffle-glide habitats, and floodplain stream connections to Bear Creek that have LWD complexes (**Figure B-4 Existing Conditions and B-5 Site Design Plan**).

Regrading in the floodplain will create approximately 12,276 linear feet of meandering floodplain streams (**Figures B-5 and B-8**). The floodplain stream pools will intercept groundwater and the constructed riffles will raise and maintain water levels in the streams. Approximately 22 riffles will be installed throughout the floodplain streams. The top elevations of the stream riffles will be constructed to within 1 foot of the top of the new stream banks to restore water levels closer to pre-agricultural conditions.

The Basis of Design Report for the Bank (Shannon and Wilson, Inc, March 2018) compared the existing Central Ditch flows to the new meandering floodplain stream planned for the same location. During a spring average water year (2009) flood, flows in Bear Creek were 250 cubic feet per second (cfs). The model indicates flooding in the Central Ditch had a depth of 3.5 feet, a velocity of 0.8 feet per second (fps), a top width of 10 feet, and an estimated discharge of

19.6 cfs. The model indicates that for a similar Bear Creek spring flood event of 250 cfs, the new floodplain stream channel will have a depth of 3.3 feet, velocity of 0.3 fps, a top width of 20 feet, and an estimated discharge of 19.8 cfs. Modeled flows in the Central Ditch and new stream channel are roughly equivalent, with the new stream channel having lower velocities, an attribute considered more suitable for migrating juvenile fish.

A network of meandering streams will be constructed on the central and eastern portions of the Bank site. Perrigo Creek will be relocated and discharged into the Bank site as part of the development approval for the adjacent parcel northwest of the Bank. All floodplain streams will combine into a single stream on the southwest portion of the Bank site and this stream will discharge to Bear Creek about 125 feet upstream from Avondale Road NE bridge over Bear Creek. The portion of the existing North Ditch upstream of the existing West Lateral Ditch will remain unchanged. The North Ditch downstream of the West Lateral Ditch will be slightly meandered and will discharge to Bear Creek at its current location. The existing Perrigo Creek channel that parallels Avondale Road will not be changed as part of the Bank project.

The existing linear ditches currently intercept and route groundwater and seasonal floodwaters directly to Bear Creek. Post-project, the new floodplain streams and wetlands will retain groundwater across the site. Floodplain streams will also connect with Bear Creek at a variety of flow levels. The new outlet of the floodplain streams into Bear Creek at the southwest corner of the Bank will be perennially connected with Bear Creek during all flow conditions. The two floodplain overflow connections with Bear Creek in the northeast portion of the site and the floodplain overflow connection on the southern portion of the site will be constructed to overtop into the floodplain when Bear Creek is flowing between 200 and 300 cfs. These flows generally occur in the spring and early summer months and correlate with a post-construction elevation of approximately ± 52 feet at the northeast floodplain connection points. Backwater flooding via the new backwater channels along the south boundary of the Bank adjacent to Bear Creek will also occur to varying degrees into the floodplain and wetlands depending upon Bear Creek flows. The design elevation at the mouths of the backwater channels and the floodplain overflow connection on the southern part of the Bank site is ± 49 feet. Grading elevations were chosen to avoid ponding in floodplain wetlands during summer and fall periods when warm temperatures would occur that could be detrimental to aquatic life. Post-project conditions will provide numerous functional benefits over existing conditions including: allowing Bear Creek flows to infiltrate in wetland areas during a wider range of flow conditions; recharging the local groundwater aquifer; increasing floodplain wetland groundwater storage; providing cooling of groundwater through soil heat adsorption of surface waters, and delaying release of cooler groundwater to the floodplain streams later in the spring and summer when stream temperatures are highest.

Perrigo Creek will be relocated and discharged into the Bank site as part of the development approval for the adjacent Parcel 0625069151 northwest of the Bank (**Figures B-3 and B-5**). The City of Redmond requires any development on this parcel to daylight and relocate the currently piped section of Perrigo Creek on the parcel. The Bank sponsor has coordinated with potential purchasers of this parcel and the Bank construction plans include a connection point on the Bank site for the future relocation of the Perrigo Creek (**Figures B-5, B-8, and B-9**). The connection point for Perrigo Creek on the Bank site will be graded up to the edge of the Bank parcel and to an elevation similar to that required to relocate Perrigo Creek through adjacent parcel

(**Figure B-11**). Shannon and Wilson confirmed the design grades of the receiving channel on the development property, North Ditch, and Perrigo Creek, and these channels slope downward into the Bank site. The Bank project design has included a 50-foot wide receiving area positioned directly along the edge of the property line that can accept Perrigo Creek in the future when the adjacent development project is constructed. The actual flow from Perrigo Creek is very small and is limited by the culvert under Avondale Road (See **Basis of Design Report** for details). The Bank design was developed to provide adequate hydrology to site wetlands and streams without surface flows supplied by Perrigo Creek. In addition, the stream channels on the Bank project are designed to support the additional flows of Perrigo Creek. Connecting Perrigo Creek in the future will have no adverse impacts on the ecological functions of the Bank project.

Floodplain stream riffles will be constructed to raise and maintain water elevations in the floodplain streams and surrounding zones of groundwater influence across the site (**Figures B-8 through B-13 and Figure B-21**). The stream channels will be excavated in some areas to a similar depth as the current ditches to provide deeper pools with a year-round connection to groundwater. The design geometry of the meanders and riffle-pool spacing is roughly based on bankfull width design criteria noted in the literature (USDA, 1998). This is to emulate an abandoned floodplain stream channel that would have been the former mainstem Bear Creek and is now a narrower, depositional, floodplain relic channel. The maximum pool depths of the new floodplain streams will be 4 to 5 feet deep below the top of stream bank, similar in bottom elevation to the existing farm ditches that currently intercept groundwater. Distance between meanders is designed at 300 feet and will feature a glide approximately 150 feet in length leading into the pool that is approximately 140 feet long, exiting to a riffle 10-20 feet long. The stream channels will be excavated in some areas to a similar depth as the current ditches to provide deeper pools with a year-round connection to groundwater. The pools will be constructed to intercept existing groundwater seeps and springs to provide cool water refugia for fish and aquatic organisms.

Twenty-two (22) stream riffle structures will be constructed of streambed sediment, sand, gravel, rocks and large woody debris. Stream riffles will be constructed to create backwater pools upstream of the riffles. These pools will collect cooler groundwater and provide fish habitat rearing and resting areas. A minimum of 52 individual LWD pieces will be installed in the floodplain streams as habitat and floodplain roughness elements. Each LWD individual piece of wood will be 1-2 feet in diameter and 10-20 feet in length (**Figures B-8 and B-19**).

The stream riffles will be approximately 7 feet long (along the stream profile) and approximately 50 feet wide, keyed 20 feet into each bank (**Figure B-21**). The keyed-in width of the stream riffles is oversized to accommodate future floodplain stream bank erosion and migration. Site observations of post-flood conditions indicate that overbank flows have a fairly broad and meandering flow path that could migrate, erode, and bypass a narrow stream-riffle structure. The stream-riffle design width mimics natural sand/gravel bar deposits that would occur from historical Bear Creek channel migration. The stream riffles have a 10 Horizontal to 1 Vertical (10H:1V) riffle downslope, and 0.5 foot of height between each successive riffle crest, which will provide fish passage for a range of adult and juvenile fish species.

Riffle bed material sizing was based on the following methods (see **Basis of Design Report** for additional details):

- Observation based on Bear Creek streambed material – well-graded streambed, with silt, sand, fine to large gravels observed along Bear Creek and in the floodplain.
- Calculation of critical shear stress for the Low, Moderate and High flow events during the growing season and the 100-year flood events.
- Shields Critical Shear Stress (U.S. Department of Transportation, Federal Highway Administration, 2005) – Sizing bed material incipient motion based on critical shear stress for particle size diameter. A D_{50} of 1 inch and D_{100} of 6 inches was calculated.
- Unit Discharge Bed Design Method (Barnard, 2013) – Sizing bed material using depth and velocity calculations. A D_{50} of 1.4 inches was calculated.

Both the Shields Method and Discharge Bed Design Method calculated that bed material sizes fall within the observed bed material in Bear Creek. Based on these results, Shannon & Wilson recommended a well-graded mix. Based on feedback from the IRT, it is recommended a 100 percent streambed sediment (WSDOT, 2016) be placed with key member large woody debris pieces in the riffles (WSDOT Standard Specifications 2016). The smaller bed material (streambed sediment size) may erode in some areas, but such erosion will not substantially change the overall hydrologic influence of the structures on the site because the incorporation of LWD pieces in the riffle structures will increase their stability and longevity. Additionally, beavers have the potential to create hydrologic modifications (dams) which would act similarly to the riffle features.

Bear Creek along the Bank site was modified over the last 120 years, leaving a straightened reach with a degraded riparian corridor, eliminating connected off-channel rearing habitat and refugia for resident and anadromous fish species. To help reverse this habitat loss, the Bank design includes excavation of backwater floodplain features that would be engaged at higher flows and flood conditions. These features will replicate meander oxbows and chute channels that are common geomorphologic features for a meandering stream and alluvial floodplain system. A total of six floodplain connections with Bear Creek will be constructed: three overflow connections, two backwater channel connections, and where the floodplain streams outlet to Bear Creek (**Figure B-5, Site Design Plan**). These floodplain connections increase the number of locations and range of flow conditions where Bear Creek flows will contribute to hydrologic support of floodplain wetlands and streams. These connections also allow fish access to the re-established wetlands and stream channels in the floodplain. The floodplain connections will be protected from erosive flows by LWD complexes that will also provide physical cover and habitat for fish. The LWD complex features are described in detail below.

As described in **Basis of Design Report** (Section 4.2.3 Combined Groundwater and Surface Water Conditions – Selected Alternative, and Section 5.6 Habitat Features – Floodplain Streams and Connections), the HEC-RAS2D model was used to analyze performance of the floodplain

streams and backwater channels. The following modeling nodes were selected to analyze post-project habitat conditions using conditions measured during the 2015 growing season (a drier than normal year):

- Floodplain wetland area
- Floodplain stream
- Backwater channel
- Bear Creek

The modeling nodes within Bear Creek near proposed LWD complexes show that water depths decrease or are similar to those in existing flood conditions, and that water depths increase during low-flow conditions. Thus, the project will provide locally beneficial improvements in stream habitat conditions. Velocities in Bear Creek would decrease for all flow conditions because of the new floodplain connections and effects of roughness provided by new LWD complexes.

The modeling nodes in the floodplain streams and wetlands show the following modeled surface water depths:

- Stream Riffle: between 1 and 3 feet
- Stream Pool: depths between 3 and 6 feet
- Wetland Surface: depths between 0 and 1.2 foot

The modeling nodes for the designed floodplain streams and wetlands showed that velocity conditions for the riffle, pools, and wetland areas would be less than 1 foot per second throughout the growing season. The model further showed that both the pool and riffle had flow at all times during the growing season, and the wetland was inundated for at least 63 total days during the 2015 growing season.

The hydraulic modeling results indicate that for a relatively dry 2015 growing season, there would be adequate stream, precipitation, and groundwater hydrology to reestablish and rehabilitate wetland hydrology at the Bank site. The modeling results also indicate that Bear Creek and floodplain stream flows would be conducive to fish habitat by providing connectivity to cool, groundwater-fed streams that have increased depths compared to existing conditions, and minimal velocities during the modeled growing season.

In the **Basis of Design Report**, Shannon and Wilson noted that there are modeled flow areas within the floodplain and wetland grading and restoration areas with velocities that could be high enough to result in surface soil erosion and damage to new plantings. These higher-prone erosion areas were addressed in the Bank design by targeted placement of riffle structures and LWD roughness features to reduce flow velocities. To minimize erosion and damage to plantings, grass cover should be established across the Bank site prior to the next flood season and plantings

should be installed per specifications (**Figures B-16 and B-17**). To prevent erosion from occurring in the first year after construction, an erosion control mix (sterile wheat) will be broadcast onto all disturbed areas on the site including the floodplain connection points, backwater connection points, and upland areas along Bear Creek. At the same time, the entire site will be seeded with a native wetland or upland seed mix (depending on habitat type) that may take longer to establish but will provide long-term native species diversity and cover.

B.2.4 Habitat Features – Large Woody Debris (LWD)

The Bank project design includes LWD habitat features throughout the site. LWD complexes will be installed at the floodplain Bear Creek connection points, and individual logs will be placed in and along the banks of floodplain streams (**Figures B-5, B-8 and B-10 through B-13**). The Bear Creek Habitat Restoration Plan proposes additional LWD to the mainstem of Bear Creek, adjacent to the Bank site. As described in the **Basis of Design Report**, several constraints affected the design and placement of LWD for both projects:

- Floodplain regulations require no-rise for construction in the floodway. FEMA allows variance on the no-rise of up to 0.1 foot for habitat restoration projects using LWD in the floodplain. Shannon and Wilson’s analysis indicated the proposed LWD complexes at the floodplain stream connections showed no-rise and therefore does not require application of the FEMA habitat restoration variance. The analysis completed for the City of Redmond Bear Creek Habitat Restoration Plan LWD complexes also shows no-rise, using a modeling procedure described in the **Bear Creek Large Woody Debris Habitat Restoration Report** (Shannon and Wilson, 2018).
- LWD design guidelines suggest conducting a risk analysis to understand the potential risks of LWD installation to human health and safety. Such risk analyses evaluate the potential risks for human interaction with LWD during boating, swimming, and use of land adjacent to where LWD is placed. The project reach of Bear Creek is not routinely used and not easily accessible for boating and swimming, so the probability of human interaction from these activities is low. LWD installations can present risks to infrastructure such as roads and bridges. In particular, use of biodegradable anchors and fastening materials could pose a risk through anchor failure and transport of LWD material to the Avondale Road NE bridge and further downstream.

B.2.4.1 Large Woody Debris (LWD) Density

LWD loading calculations for both the Bank and City of Redmond Bear Creek Habitat Restoration Projects were completed by Shannon and Wilson using parameters and criteria identified in Fox and Bolton (2007) for the abundance and volume of LWD found in “unmanaged” or “natural” streams in Washington State. Fox and Bolton developed recommendations using a variety of metrics, including stream bankfull width. Bear Creek has an average bankfull width of about 14 meters (46 feet) adjacent to the Bank site. Using the 75th percentile target for wood debris loading design criteria from Fox and Bolton, in a stream the size of Bear Creek, a minimum of four key pieces every 100 meters, a total wood count of 63 pieces every 100 meters, and 99 cubic meters of wood every 100 meters are desirable.

Shannon and Wilson surveyed LWD in Bear Creek from the Avondale Road NE bridge to the upstream most point at northeast corner proposed Bank site boundary, a total distance of 1,645 meters (**Figure B-4 and Appendix A–General Bank Information**). The survey identified 130 total pieces of wood with 7 key pieces, and an estimated LWD volume of 111m³ (**Table B-6**). A key piece is assumed to have a DBH greater than 2 feet and trunk (bole) length greater than 20 feet from the intact root ball.

The breakdown of LWD found by size classes was:

- 4 to 12 inches DBH – 53 pieces
- 12 inches – 24 inches DBH – 17 pieces
- Greater than 24 inches DBH (key pieces) – 2 pieces

These data translate into 66 key pieces, 1,036 total wood pieces, and 1,629 cubic meters of wood for a 1,645-meter-long reach (**Table B-6**).

The Bank site design provides for 10 LWD complexes at the floodplain reconnection locations in Bear Creek, each with 1 key piece of LWD and 8 smaller pieces, for a total of 90 pieces of LWD, and an additional 52 LWD individual pieces installed in the floodplain streams (**Table B-6 and Figure B-5**). The City of Redmond’s Bear Creek Restoration Plan specifies 49 LWD complexes in Bear Creek, each with one LWD key piece and 8 smaller pieces, for a total of 441 pieces of wood. The combined LWD values for both the Bank and Bear Creek Restoration projects meet the 75th percentile LWD loading criteria from Fox and Bolton for Number of Key Pieces (66). Increases in LWD densities will occur over time through accumulation of woody debris from upstream sources and contributions from adjacent planted areas.

Table B-6. Large Woody Debris (LWD) Design Criteria (Fox and Bolton, 2007)

	Number of Non-Key Pieces	Number Key Pieces ¹	Total Number of Pieces	LWD Volume (m ³)
	6m-30m	>10m-100m		0m-30m
²Fox & Bolton, 2007 75th Percentile				
Per 100m	63	4	67	99
Per 1,645m	1036	66	1102	1629
Bear Creek Existing LWD Survey				
Per 100m	8	0.4	8.3	7
Per 1,645m	130	7	137	111
³Bear Creek Habitat Restoration Plan - LWD Complexes				
Per 100m	24	3	27	25
Per 1,645m	392	49	441	411
⁴Keller Farm Mitigation Bank – Bear Creek Connections LWD Complexes				
Per 100m	5	1	5	5
Per 1,645m	80	10	90	84
⁴Keller Farm Mitigation Bank - Floodplain Streams LWD				
Per 100m	4	0	4	3
Per 1,645m	68	0	68	48
Bear Creek Existing LWD + Bear Creek Restoration LWD + KFMB Bear Creek Connections LWD + Keller Farms Floodplain Streams LWD				
Per 100m	37	4	41	37
Per 1,645m	670	66	736	653

Notes: All information in Table B-6 provided by Shannon and Wilson.

- 1 A key piece is assumed to have a DBH greater than 2 feet and trunk (bole) length greater than 20 feet from the intact root ball.
- 2 The average bankfull width for Bear Creek adjacent to the Bank site = 14m (46ft). Bear Creek stream reach length = 1,645m (5,400ft).
- 3 Bear Creek Habitat Restoration Plan - 49 LWD Complexes each with 1 key piece (min 2ft diameter x 20ft long) and 8 additional pieces (~1ft diameter x 20ft long)
- 4 Keller Farm Mitigation Bank - 10 LWD Complexes each with 1 key piece (min 2ft diameter x 20ft long) and 8 additional pieces (~1ft diameter x 20ft long)

B.2.4.2 Large Woody Debris (LWD) Design

The Bank project LWD design includes two types of installations: (a) 10 LWD complexes at five floodplain connections, and (b) 52 LWD individual pieces in the floodplain streams and adjacent riparian corridors. LWD pieces in the floodplain streams will provide cover and habitat for fish. LWD pieces in the floodplain will provide roughness and reduce floodplain velocities and may provide nurse logs for future tree establishment. Additional roughness features will be placed in the floodplain overflow areas to reduce the potential for avulsion of Bear Creek (**Figure B-5**).

Figures B-18 and B-19 show details of the LWD complexes. A key piece is defined as a piece of wood greater than 2 feet DBH and greater than 20 feet in length. A LWD individual piece is defined as between 1 and 2 feet in diameter and between 10 feet and 20 feet in length. Small woody debris is less than 1 foot in diameter.

Figures B-19 and B-20 show details of the LWD anchors. Three LWD anchoring options may be used: (a) soil ballast anchor, (b) boulder anchor, or (c) helical piles. Each anchor design was chosen based on evaluations of the uplift forces, neglecting drag for LWD complexes (13 kips) and LWD individual logs (7 kips). Habitat Bank and the City of Redmond will determine the preferred anchoring method for each LWD location based upon a geotechnical analysis of onsite soil borings and projected cost estimates.

The anchor options are summarized below:

LWD Individual Piece Anchor Options

- Soil Ballast – Three feet of compacted soil cover.
- Boulders – Five 3-foot-diameter boulders, or two 4-foot-diameter boulders.
- Helical Pile – Two helical piles and resistive plates to resist 7 kips of force. The Contractor will provide helical pile design and manufacturer submittal for approval.

LWD Complex Anchor Options

- Soil Ballast – Four feet of compacted soil cover.
- Boulders – Nine 3-foot-diameter boulders, or four 4-foot-diameter boulders.
- Helical Pile – Two helical piles and resistive plates to resist 13 kips of force. The Contractor will provide helical pile design and manufacturer submittal for approval.

LWD anchors and individual and small logs will be attached to LWD key pieces using metal chain connections to reduce the likelihood of anchor failure and downstream movement of LWD towards the Avondale Road bridge.

B.2.5 Habitat Features – Perch Poles, Brush Piles, and Nest Boxes

To provide a variety of bird and wildlife habitat, the Bank design includes a minimum of 8 perch poles (snags), 10 brush piles, and 8 wood duck nest boxes (**Figure B-2, B-5, B-8, B-10 through B-13, and B-19**). The Bank Sponsor and Contractor will use a combination of salvaged brush and downed timber at the site and imported materials for habitat features. Perch poles will be native conifer species, greater than 20 feet tall and greater than 15 inches DBH. Brush piles will be a minimum of 10 feet in diameter and \pm 8 feet in height. Brush piles, downed logs, and other LWD will be comprised of native species, preferably conifer, either salvaged from local City timber clearing projects or sourced from other local timber clearing. Wood duck nest boxes will be WDFW-approved design or similar and will be mounted on 8-foot tall posts or in existing trees along Bear Creek (within Bank site boundary) and near backwater channels.

B.2.6 Seeding, Planting, and Vegetation Communities

Grading and construction will occur during the summer months. Wetland and upland areas will be seeded with appropriate native seed mixes immediately after construction and grading is completed (**Figures B-16 and B-17, Table B-6**). In addition to the native seed mixes, sterile Winter Wheat (*Triticum aestivum*) will be seeded in all disturbed areas including areas around the floodplain connection points, created stream channels and Bear Creek at a seeding rate of 50-100 lbs/acre to ensure erosion control during the first year after construction. Seed will be watered as needed. Live stakes, bareroot native trees and shrubs, and herbaceous wetland plugs will be planted the following winter and spring (**Tables B-7 and B-8**). The proposed woody plant species palette is similar to that of the WSDOT SR-520 – Keller Farm Compensatory Mitigation Site along Bear and Evans Creek, adjacent to the Bank site on the east side of Bear Creek².

Plantings will be installed at the following minimum densities:

Riparian Upland Forest: Trees = 450 trees per acre
Riparian Upland Forest: Shrubs = 450 shrub plants per acre
Forested Wetland and Existing Wetland: Trees = 400 trees per acre
Forested Wetland and Existing Wetland: Shrubs = 300 shrub plants per acre
Shrub-Scrub Wetland: Shrubs = 1000 shrub plants per acre
Riparian Wetland/Stream Channel Complex = Herbaceous wetland seed mix (minimum 5 million seeds/acre). Plugs = 18 to 24 inches on center.

² For WSDOT plan see: <https://www.wsdot.wa.gov/sites/default/files/2014/10/24/SR520-Report-FinalWetlandMitigationMedinaToSR202-042010.pdf>

Table B-7. Native Herbaceous Species to be Planted

Community Type	Species in Wetland and Upland Seed Mix and Planted as Plugs			
	Common Name	Scientific Name	Seeded Mix	Plugs
All Wetlands	Tufted hairgrass	<i>Deschampsia cespitosa</i>	x	
	Western mangrass	<i>Glyceria occidentalis</i>	x	
	Bur-reed	<i>Sparganium emersum</i>	x	
	Softstem bulrush	<i>Scirpus tabernaemontanii</i>	x	x
	Creeping spike-rush	<i>Eleocharis palustris</i>	x	x
	Slough Sedge	<i>Carex obnupta</i>	x	x
	Wapato	<i>Sagittaria latifolia</i>	x	x
	Woolly sedge	<i>Scirpus atrocinctus</i>	x	x
	Shortawn foxtail	<i>Alopecurus aequalis</i>	x	
	Rice cut-grass	<i>Leersia oryzoides</i>	x	
	American water plantain	<i>Alisma triviale</i>	x	
	American sloughgrass	<i>Beckmannia syzigachne</i>	x	
	Small fruited bulrush	<i>Scirpus microcarpus</i>	x	x
Riparian Uplands	California Brome	<i>Bromus carinatus</i>	x	
	Roemers Fescue	<i>Festuca roemeri</i>	x	
	Spike Bentgrass	<i>Agrostis exarata</i>	x	
	Blue Wildrye	<i>Elymus glaucus</i>	x	
	Meadow Barley	<i>Hordeum brachyantherum</i>	x	
	Slender Hairgrass	<i>Deschampsia elongata</i>	x	

Table B-8. Native Tree and Shrub Species to be Planted

Habitat Type	Common Name	Scientific Name
Riparian Upland Forest: Trees = 450 trees per acre	Black cottonwood	<i>Populus trichocarpa</i>
	Bitter cherry	<i>Prunus emarginata</i>
	Scouler's willow	<i>Salix scouleriana</i>
	Douglas-fir	<i>Pseudotsuga menziesii</i>
	Big leaf maple	<i>Acer macrophyllum</i>
	Red alder	<i>Alnus rubra</i>
	Oregon ash	<i>Fraxinus latifolia</i>
	Western red cedar	<i>Thuja plicata</i>
	Pacific willow	<i>Salix lucida</i>
	Western hemlock	<i>Tsuga heterophylla</i>
	Sitka spruce	<i>Picea sitchensis</i>

Riparian Upland Forest: Shrubs = 450 shrub plants per acre	Nootka rose	<i>Rosa nutkana</i>
	Sitka willow	<i>Salix sitchensis</i>
	Ninebark	<i>Physocarpus capitatus</i>
	Red-osier dogwood	<i>Cornus sericea</i>
	Vine maple	<i>Acer circinatum</i>
	Oregon grape	<i>Mahonia nervosa</i>
	Salmonberry	<i>Rubus spectabilis</i>
	Black twinberry	<i>Lonicera involucrata</i>
	Snowberry	<i>Symphoricarpos albus</i>
	Red elderberry	<i>Sambucus racemosa</i>
	Beaked hazelnut	<i>Corylus cornuta</i>
Forested Wetlands and Existing Wetland: Trees = 400 trees per acre	Black cottonwood	<i>Populus trichocarpa</i>
	Oregon ash	<i>Fraxinus latifolia</i>
	Western red cedar	<i>Thuja plicata</i>
	Sitka spruce	<i>Picea sitchensis</i>
	Scouler's willow	<i>Salix scouleriana</i>
	Pacific willow	<i>Salix lucida</i>
	Red alder	<i>Alnus rubra</i>
	Cascara	<i>Frangula purshiana</i>
Forested Wetland and Existing Wetland: Shrubs = 300 shrub plants per acre	Nootka rose	<i>Rosa nutkana</i>
	Sitka willow	<i>Salix sitchensis</i>
	Scouler's willow	<i>Salix scouleriana</i>
	Black twinberry	<i>Lonicera involucrata</i>
	Ninebark	<i>Physocarpus capitatus</i>
	Pacific crabapple	<i>Malus fusca</i>
	Red-osier dogwood	<i>Cornus sericea</i>
	Salmonberry	<i>Rubus spectabilis</i>
	Spiraea	<i>Spiraea douglasii</i>
	Vine maple	<i>Acer circinatum</i>
Scrub-Shrub Wetland: 1,000 shrub plants per acre	Nootka rose	<i>Rosa nutkana</i>
	Sitka willow	<i>Salix sitchensis</i>
	Scouler's willow	<i>Salix scouleriana</i>
	Black twinberry	<i>Lonicera involucrata</i>
	Ninebark	<i>Physocarpus capitatus</i>
	Pacific crabapple	<i>Malus fusca</i>
	Red-osier dogwood	<i>Cornus sericea</i>
	Salmonberry	<i>Rubus spectabilis</i>
	Spiraea	<i>Spiraea douglasii</i>

Intensive farming on the site has resulted in highly disturbed and compacted soils, proliferation of invasive species, lack of woody vegetation, and low vegetation diversity across the site. Invasive species currently present on the site include reed canarygrass (*Phalaris arundinacea*), poison hemlock (*Conium maculatum*), and Himalayan blackberry (*Rubus armeniacus*). Invasive

species control is imperative in an urban bank project such as this. Therefore, in anticipation of Bank certification and construction, the Sponsor has sprayed existing invasive species and reseeded the site with a native herbaceous seed mix to reduce cover and spread of invasive plants over the last three years (2017-2019). Additional details on site preparation and planned planting are described below.

B.2.6.1 Site Preparation

For all areas of the Bank Site (prior to grading/construction):

- Remove derelict materials, irrigation pipe, and garbage left over by farmers and dairy operations.
- Spray-disc-spray site for poison hemlock and reed canarygrass until there is a significant reduction in percentage cover and re-sprouting.
- Mow and spray for Himalayan blackberry along riparian areas of site.
- Reseed site with native grass seed mix to stabilize site and prevent growth of invasive species.
- Respray for Himalayan blackberry and poison hemlock. Repeat annually until eliminated or project goes to construction.
- Spot spray ditch lines for reed canarygrass, prior to construction.

B.2.6.2 Plant and Seed Specifications

Upland and Wetland Seeding:

All disturbed upland and wetland areas will be seeded after site grading is complete with a native wetland or upland seed mix (**Table B-7**). Wetland and upland seed mixes will either be broadcast, hydroseeded, or drilled in. Rates of broadcast vary depending on seed size, seeding method, and habitat type but the overall seeding rate is estimated to be minimum 5 million seeds per acre. Additional native species may be added to the list or substituted for other species per consultation with native seed suppliers and the IRT. Variations from this plan will be noted in the as-built report.

To address erosion potential, sterile Winter Wheat (*Triticum aestivum*) will be seeded in all disturbed areas including areas around the floodplain connection points, created stream channels and Bear Creek at a seeding rate of 50 to 100 lbs/acre to quickly establish cover and root growth, prior to any significant rain events in November. Seed will be hydroseeded or watered as needed.

Bareroot Stock:

- Bareroot species will be grown by a native plant nursery with appropriate seed sourcing to Puget Sound growing zones.
- Bareroot stock will be 2-0 stock or similar, depending on availability from grower.
- The bareroot stock will have well-developed roots and sturdy stems, with an appropriate root-to-shoot ratio.
- Bareroot stock will be kept cool and moist prior to being planted.
- No damaged or desiccated roots or diseased plants will be accepted.
- Unplanted bareroot stock will be properly stored at the end of each planting day to prevent drying out.

Willow Cuttings:

- Cuttings will be purchased from a local native plant nursery or contract cut from local sources.
- Cuttings will be a minimum of 4 feet long and ¼-inch diameter.
- Cuttings will be kept cool and moist prior to being planted.
- Cutting stock should be installed within approximately 1 week of cutting.
- Unplanted cutting stock will be properly stored at the end of each planting day to prevent desiccation.

Wetland Plugs:

Native wetland sedges and rushes will be planted as plugs in the emergent wetland and riparian habitat areas by hand 18 to 24 inches on center in order to augment the seeding of the emergent and riparian habitat areas. Plugs will be planted in the fall after construction, using handheld planting tools specialized for installing plugs in wetland areas.

B.3 Post-Construction Conditions and Anticipated Functional Lift of Wetlands and Aquatic Areas**B.3.1 Wetlands**

Two functional assessment methods were utilized to evaluate pre- and post-project conditions of existing wetlands on the site (Wetlands A-I) (**Figures B-4 and B-5**): the Washington Department of Ecology’s Wetland Rating System (Hruby 2014), and the “Credit-Debit Method” (Hruby, 2012). Full results for each of these assessments can be found in the project Resource Folder (see Pre-and Post-Project Wetland Rating Summary Forms and Calculating Credits and Debits for Compensatory Mitigation in Wetlands of Western Washington Credit Worksheet).

Table B-9. Summary of Wetland Characteristics- Existing and Post-Bank Implementation

Wetland	Area onsite (acres)	HGM Classification	Cowardin Class [#]	Ecology Rating Category - Total Score	Existing Water Quality/ Hydrologic/ Habitat Function Scores	Post-Project Rating - Total Score: Water Quality/ Hydrologic/ Habitat Function Scores
A	1.60	Depressional	PEM / D, E	Cat II - 20	7 / 7 / 6	Cat II - 21: 8/6/7
B	0.55	Depressional	PEM / E	Cat III - 19	6 / 7 / 6	Cat II - 21: 8/6/7
C	0.22	Depressional	PEM / E	Cat III - 19	6 / 7 / 6	Cat II - 21: 8/6/7
D	2.34	Depressional	PEM / E	Cat III - 19	6 / 7 / 6	Cat II - 21: 8/6/7
E	0.50	Depressional	PEM / E	Cat III - 19	6 / 7 / 6	Cat II - 21: 8/6/7
F	0.94	Depressional	PEM / E	Cat III - 19	6 / 7 / 6	Cat II - 21: 8/6/7
G	0.42*	Depressional	PEM / E	Cat III - 19	6 / 7 / 6	Cat II - 21: 8/6/7

H	1.15	Depressional	PEM / E	Cat III - 19	6 /7 /6	Cat II - 21: 8/6/7
I	0.18	Depressional	PEM / E	Cat III - 19	6 /7 /6	Cat II - 21: 8/6/7
TOTAL	7.9 ac					

* An additional 1.07 acres of Wetland G extends onto two parcels adjacent to the Bank site.

PEM = palustrine, emergent. D = Continuously saturated. E = Seasonally flooded/saturated

Existing Wetlands A-I on the Bank site would gain significant functional lift in water quality and habitat functions from rehabilitation and enhancement actions associated with implementation of the Bank. Hydrologic functions in existing wetlands would remain similar to pre-project conditions, although total hydrologic scores would decrease by 1 point for some wetlands because they would have outlets post-construction which rates a lower Hydrologic Site Potential score (see Pre-and Post-Project Wetland Rating Summary Forms in the Resource Folder for details). Wetland A would remain a Category II wetland but gain 1 total rating point and 9 points in water quality site potential, and 9 points in habitat site potential. Wetland G would increase from a Category III to Category II wetland and gain 2 total rating points, while increasing 1 point in total water quality and habitat scores and gaining 6 points in water quality site potential. The remaining 7 wetlands would increase in function from Category III to Category II and increase by 1-2 total rating points. They would also gain 1-2 points for total water quality score, gain 1 point for total habitat score, gain 5-7 points for water quality site potential and gain 7-9 points for habitat site potential. For existing wetlands onsite, the Credit-Debit Method estimates that 14.2 acre-points would be generated for water quality functions and 7.9 acre-points would be generated for habitat functions with Bank implementation. Additionally, 500 water quality acre-points, 438 hydrology acre-points, and 438 habitat acre-points would be generated by re-establishing and rehabilitating approximately 63.3 acres of former wetlands on the site. Re-established wetlands are anticipated to be rated Category II at maturity and have similar rating scores. A net increase of 51.1 acres of wetland and 2.6 acres of stream channel/wetland complex will result from the project.

B.3.2 Perrigo Creek and other Onsite Streams

Existing linear ditches on the Bank site will be reconfigured and additional stream length will be added to establish a sustainable and more natural stream configuration consisting of riffle/pool habitat sequences. Riffle bed control structures will be installed to raise the grade of the stream beds, and subsequently the local, unconfined groundwater levels. This should improve rearing conditions for salmonids and extend the time these onsite streams are available for rearing. Adjacent terraced floodplain/wetland areas will directly improve instream hydrologic, water quality and habitat conditions.

As part of the future development on Parcel 062069151, Perrigo Creek will be fully daylighted and rerouted through the Bank site closer to its historic location. This daylighting will restore fish access to upstream areas of Perrigo Creek.

The total tributary stream length on the Bank site after construction will be approximately 12,276 linear feet, a net increase of 5,162 linear feet over existing conditions. This equates to a net increase of 2.6 acres of stream channel.

B.3.3 Bear Creek

Six floodplain connections with Bear Creek will be constructed: three overflow connections, two backwater channel connections, and where the floodplain streams outlet to Bear Creek (Figure B-5). These floodplain connections increase the number of locations and range of flow conditions where Bear Creek flows will contribute to hydrologic support of floodplain wetlands and streams. These connections also allow fish access to the re-established wetlands and stream channels in the floodplain. The floodplain connections will be protected from erosive flows by LWD complexes that will also provide physical cover and habitat for fish. The two connections at the northeast corner of the Bank site and the connection at the southern boundary of the Bank site are designed to engage at approximately 200-300 cfs and will enable floodwaters to flow through the central portion of the site during high flows. The backwater channel connections along the southern boundary are intended to be engaged and inundated for extended periods winter through spring.

No other specific in-channel enhancements are proposed in Bear Creek as part of the Bank project. However, the City of Redmond hopes to implement the Bear Creek Habitat Restoration Plan, in the channel and riparian buffer corridor of Bear Creek adjacent to the Bank.

Post-project conditions will provide numerous functional benefits over existing conditions including: allowing Bear Creek flows to infiltrate in wetland areas during a wider range of flow conditions; recharging the local groundwater aquifer; increasing floodplain wetland groundwater storage; providing cooling of groundwater through soil heat adsorption of surface waters, and delaying release of cooler groundwater to the floodplain streams later in the spring and summer when stream temperatures are highest. Plantings adjacent to Bear Creek and floodplain streams will also help to moderate summer stream water temperatures.

B.3.4 Riparian Shading

The existing riparian areas on the Bank site provide little to no shade for Bear Creek and the ditched floodplain streams. During warm summer months, solar radiation can increase stream water temperatures, and some reaches of Bear Creek downstream of the Bank site have documented impairments of water temperatures. The Water Quality Improvement Report for the Bear-Evans Watershed for Water Temperature and Dissolved Oxygen (Mohamedali and Lee, 2008) notes the reach of Bear Creek adjacent to the Bank has an Effective Shade Deficit of 61-80%. An important recommendation in this report is to fully revegetate the Bank site and the Bear Creek Habitat Restoration Project (undertaken by the City of Redmond). The Bank site will re-establish a vegetated mix of riparian upland forest and forested wetlands along the riparian corridor at a width of between 100 and 150 feet along Bear Creek, in addition to the tree and shrub plantings that will be established by the City's Restoration Project along Bear Creek. The Bank site planting list includes tall coniferous and deciduous trees (black cottonwood, Douglas-fir, big leaf maple, Oregon ash, western red cedar, western hemlock and Sitka spruce), and a shrub understory with a variety of plant heights and growth patterns including shrub species that can form dense canopies (**Table B-8**). The riparian upland forest hummocks have been strategically located to provide shade along the southern edge of the new floodplain streams, and

along the western bank of Bear Creek on the east side of the Bank site, thereby improving riparian shade and cover functions to the floodplain streams and fish habitat areas, and future large woody debris contributions to the floodplain and streams.

Shannon and Wilson reviewed a solar calendar and shade calculator for potential shade lengths provided by a new tree planted on the Bank site along Bear Creek during the summer months (see **Basis of Design Report** located in Bank Project Resource Folder). **Table B-10** shows the results of the shade analysis for three different summer dates for a tree in this location. On June 21st, high air temperatures average 71°F in Redmond and a 50-foot tree could provide as much as 88 feet of shade, and a 150-foot tree as much as 270 feet of shade length. The planted trees within the Bank site will provide shade benefits for the floodplain streams and Bear Creek within a 10 to 50-year timeframe after plants are installed. Shrub species will likely provide shade benefits starting 3 to 10 years after plants are installed.

The Bank’s riparian restoration and stream plantings are an integral part of a regional effort to restore riparian conditions and functions and reduce temperatures in Bear Creek and the Sammamish River. Vegetating the banks of Bear Creek and the tributary floodplain streams within the Bank site with trees and shrubs will provide additional shading during the critical months in the summer and fall when adult salmon are migrating and spawning in the Bear Creek and Sammamish River systems. Bank grading was designed so that during summer and fall periods when water levels across the Bank site will be at their lowest levels, water will be confined to the riparian stream channel areas, rather than spreading out or ponding across the site which could warm surface waters. Additionally, the floodplain streams will maintain their groundwater connection, which provides a cold-water source in the streams and to Bear Creek. Figure B-6 shows the expected wetland hydroperiod and stream channel inundation areas. More detailed hydroperiod figures are found in the **Basis of Design Report**. Riparian wetlands are not expected to have extended periods of standing water June through October. Post-project monitoring will include collection of stream water temperatures.

Table B-10. Shade Length Analysis

Date	Tree Height	Time of Day (PDT)	High Air Temp. (Avg.)	Shade Length (ft)
June 21	50ft	12:00	71°F	25
		18:00		88
	100ft	12:00		51
		18:00		176
	150ft	12:00		80
		18:00		270
August 1	50ft	12:00	77°F	32
		18:00		100
	100ft	12:00		64

		18:00		201
	150ft	12:00		99
		18:00		308
Sept. 30	50ft	12:00	71°F	43
		18:00		146
	100ft	12:00		86
		18:00		292
	150ft	12:00		132
		18:00		448

B.4 Bank Construction

The Bank Sponsor will work with the landowner (City of Redmond), Essency Environmental, Shannon and Wilson, and permitting agencies to acquire all necessary construction permits to implement the Bank project.

B.4.1 Construction Timing

All grading, earthwork, and installation of LWD stream and habitat features will occur in the summer of the Bank development year. The site will be seeded with sterile fast growing Winter Wheat (*Triticum aestivum*) in all disturbed areas including areas around the floodplain connection points, created stream channels and Bear Creek. At the same time all areas of the site will be seeded with a native herbaceous wetland or upland seed mix (depending on habitat type) immediately following the completion of construction. Some tree and shrub plantings may occur during the fall after construction including emergent plug plantings or live stakes, but most woody plantings will occur the following winter/spring.

B.4.2 Temporary Erosion and Sediment Control

Temporary erosion and sediment control (TESC) best management practices (BMPs) will be implemented prior to construction in accordance with the National Pollutant Discharge Elimination System (NPDES) permit to be obtained for the project and the site-specific Stormwater Pollution Prevention Plan developed for the project. A Certified Erosion and Sediment Control Lead (CESCL) will be present during construction and a Stormwater Pollution Prevention Plan (SWPPP) will be prepared and implemented during construction.

Best Management Practices (BMPs) from the Stormwater Management Manual for Western Washington (Ecology, 2012 and amended 2014) are required for a project of this nature. The following BMPs will be implemented during construction of the Bank project (other BMPs may be added based on site-specific conditions during construction) (see also **Figures B-7, B-14, and B-15**):

- Establish and maintain 2 construction entrances
- Establish and maintain 2 staging areas
- Maintain vegetated buffers between grading areas and Bear Creek

- Install high visibility orange fencing for exclusion from wetlands and other areas where clearing/grading will not occur.
- Install check dams in floodplain stream network
- Install isolation berms and silt fences at connections with Bear Creek
- Provide dust control during summertime grading
- Meet seeding deadline and irrigate to establishment vegetated cover in disturbed areas before onset of wet season

Construction entrances will be at the two current access locations to the site (**Figure B-7**). High-visibility orange fencing will be installed around perimeters of existing wetlands and other areas where grading will not occur (clearing/grading limits) to prevent disturbance. Stream realignment work will be planned and sequenced to prevent downstream release of sediment. The Contractor will install silt fences and other stream protection measures before installing LWD complexes adjacent to Bear Creek, and Contractor will maintain soil berms between construction zones and Bear Creek during construction.

The Contractor will create surface roughening by using tracked equipment or other accepted practices to reduce sediment run-off before seeding the site. The Contractor will minimize work in wet weather, cover stockpiles, and spread hydroseed with mulch and tackifier to establish sterile wheat and reduce erosion of the graded floodplain in erosion prone areas including areas around the floodplain connection points, created stream channels and Bear Creek. All seeding including native seed mixes and erosion control shall be completed by September 15 and hydroseeded areas shall be watered until October 15.

The Contractor will control dust and limit dust leaving the site by using water trucks. The Contractor shall be responsible for providing a Temporary Erosion and Sediment Control Plan and having a CESCL on site.

B.4.2.1 Stormwater Pollution Control Plan (SWPPP)

A Stormwater Pollution Prevention Plan (SWPPP) including applicable BMPs will be prepared and implemented during construction. The Storm Water Pollution Prevention Plan (SWPPP) shall be retained onsite or within reasonable access to the site.

All BMPs shall be inspected, maintained, and repaired as needed to assure continued performance of their intended function. A Certified Erosion and Sediment Control Lead shall always be onsite or on-call. Whenever inspection and/or monitoring reveals that the BMPs identified in the SWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of any pollutant, appropriate BMPs or design changes shall be implemented as soon as possible. The SWPPP shall be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP shall be completed within seven (7) days following the inspection. All applicable reporting procedures shall be followed if an exceedance occurs.

B.4.3 Construction Considerations and Permits

The Bank Sponsor, City of Redmond, and the project consultants have managed multiple similar types of construction as the Bank requires. The following is a list of key construction considerations for the project:

- The ditches have flowing water at all times of the year. The Contractor will be notified that management of ditch flows is necessary during construction. Re-grading of the existing ditches will require de-fishing before dewatering. A detailed plan shall be developed for de-fishing and dewatering the existing ditches before construction and maintaining dewatering during construction.
- Construction access from both existing entrance points to the site will be available (**Figure B-7**). The access across from NE 90th Place has more room to slow down and turn into the site than the access across from NE 88th Place.
- Site grading will need to be completed by August 15 to allow seeding and establishment of the erosion control cover crop and prevent damage to floodplain streams and other project features during upcoming flood events.
- Construction of the LWD complexes along Bear Creek will require isolation and dewatering of the excavation areas and appropriate BMPs to prevent exceedance of water quality standards. The selection and use of applicable BMPs is the responsibility of the Sponsor as part of the NPDES, Construction Stormwater General permit, Corps permit, and Hydraulic Project Approval.
- Decommissioning of the existing groundwater monitoring wells shall be performed by a licensed well installation contractor. Records of the well decommissioning must be provided to the City of Redmond, Bank Sponsor, Shannon and Wilson, Ecology, and the IRT.
- For this project, LWD key members are considered trees greater than or equal to 2 feet DBH.
- Stream riffle construction materials, stream bed materials, large woody debris, and all plant materials shall be inspected and approved by the Bank sponsor's representative prior to installation.
- During construction, the Contractor shall protect the water pipeline. The pipeline is known to be 2 feet below the bottom of the ditches. There are reports of buried metal sheets positioned between the pipe and ditch bottom, which has not been confirmed (see **Basis of Design Report** for more details).
- Erosion control hydroseeding in erosion prone areas including areas around the floodplain connection points, created stream channels and Bear Creek and herbaceous native plant seeding on the entire site will be done immediately after grading and other heavy equipment work is completed. Tree and shrub plantings will be completed fall through spring after completion of construction. Seasonal flooding could damage installed plantings. Waterfowl, beaver, and other predation on plants is also a concern. These issues will be monitored and addressed as needed.

B.5 Site Maintenance and Monitoring

The Bank Sponsor will perform post-construction site maintenance and monitoring for the duration of the Bank establishment period in accordance with the provisions of Appendix F. After this period, the Long-Term Steward will assume responsibility for maintenance in accordance with the provisions of Appendix G. Yearly site monitoring (see **Appendix F** for information on monitoring) will help guide and inform required maintenance actions.

General site maintenance will be performed throughout the Bank site to address conditions that may limit the success of the Bank and attainment of the performance standards and objectives described in Appendix C. Anticipated maintenance activities fall into two main categories and include, but are not limited to, vegetative maintenance and general maintenance.

Vegetative maintenance includes such activities as watering, replanting failed plants to meet performance standards, controlling invasive plants, mowing, and deterring herbivores such as voles, beaver, and deer. Spraying, mowing, or hand trimming weeds at the base of trees and shrubs to discourage voles and root competition also may occur. General maintenance activities may include: repairing any areas subject to erosion, removal of trash and debris from vagrancy or post-flood conditions, maintenance of nest boxes and other habitat structures, and maintenance of signage or fencing around the site. All maintenance activities will be documented in project monitoring reports.

Site maintenance may also include beaver management actions (See **Appendix F** for more information). The North Ditch (**Figures B-4 and B-5**) will maintain its original conveyance capacity and will function similar to pre-project conditions after the Bank project is constructed. The upper end of the North Ditch will be kept clear of beaver dams and debris so that backwater flooding does not occur on adjacent upstream properties. The City of Redmond and Bank Sponsor will be responsible for maintenance of the North Ditch during the Bank establishment and monitoring period, including the ditch section on Parcel 0625059151, located adjacent to the north central boundary of Bank.

B.6 Bank Fencing and Signage

There is existing wildlife fencing along the north and west boundaries of the Bank site bordering residential areas. The Sponsor, with the City of Redmond Natural Resources Department, will extend this fencing along the development parcel and adjacent to Avondale Road so that there is continuous fencing with appropriate gates, from Bear Creek in the north all along the west side of the project to the south where Bear Creek runs under Avondale Road. Fencing will be built with treated wood posts with elevated welded wire 24 inches high extending between posts at 2 to 4 feet in elevation. City of Redmond approved Wetland Buffer signage (**Figure B-6**) will be installed at entrance and access points, and every 500 feet along the fence.

B.7 Summary

The proposed Bank project restoration actions have the potential to greatly improve the existing conditions of wetlands, streams, and fish and wildlife habitat within the Bank site. Restoration actions will rehabilitate 7.9 acres of existing wetland habitats while re-establishing approximately 51.1 acres of wetlands. The existing 7,114 linear feet (1.7 acres) of existing ditched tributary streams will be rehabilitated and approximately 5,162 linear feet (2.6 acres) of stream channel will be added.

Enhanced connections with the Bear Creek floodplain will be established which will increase the range of flow conditions where Bear Creek flows will contribute to hydrologic support of floodplain wetlands and streams. These connections will also allow fish access to the re-established wetlands and stream channels in the floodplain. The City of Redmond hopes to implement the Bear Creek Habitat Restoration Plan in the channel and riparian buffer corridor of Bear Creek adjacent to the Bank which will provide further habitat for anadromous and resident fish in Bear Creek.

Post-construction, the Bank site will consist of a mosaic of uplands, stream channels, and forested, scrub-shrub, and emergent wetlands, and will provide improved habitat for regionally important salmonid populations. Post-project conditions will provide numerous functional benefits over existing conditions including: recharging the local groundwater aquifer; increasing floodplain wetland groundwater storage; providing cooling of groundwater through soil heat adsorption of surface waters, and delaying release of cooler groundwater to the floodplain streams later in the spring and summer when stream temperatures are highest. Native vegetation established in the wetlands and riparian uplands along Bear Creek and along the floodplain streams will also help to moderate summer stream water temperatures and improve habitat functions for wetland dependent fish and wildlife.

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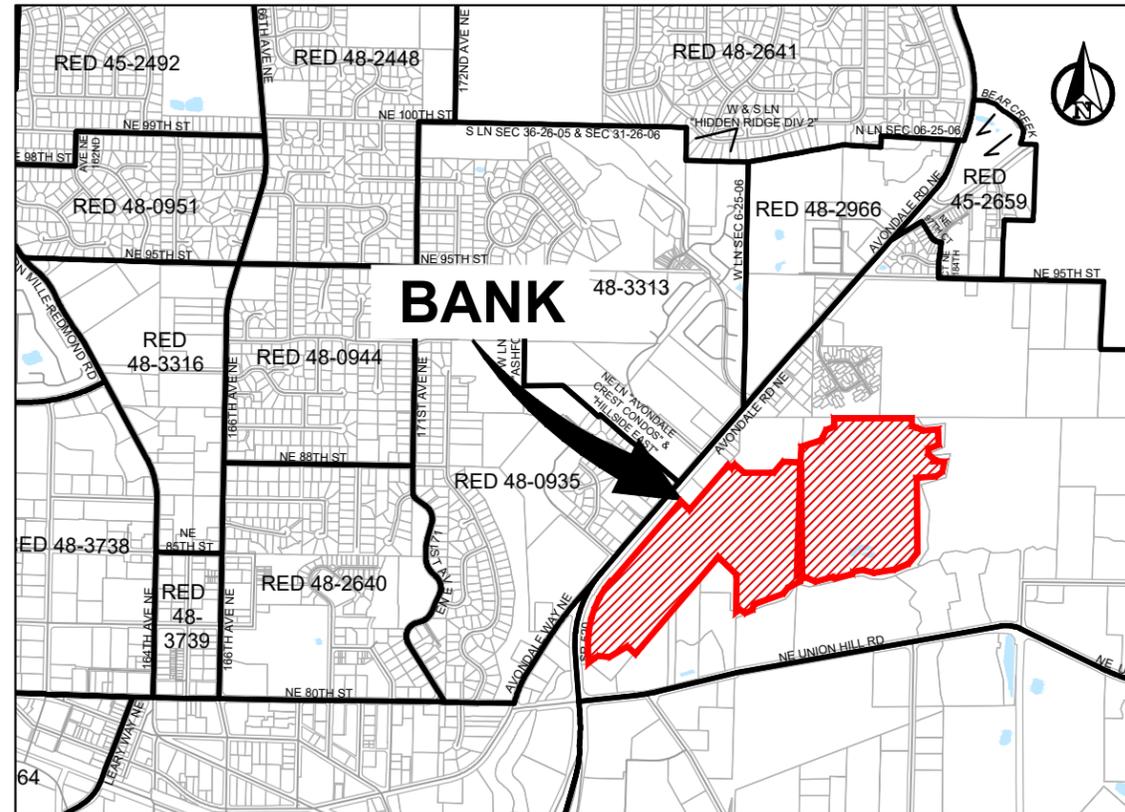
KELLER FARM WETLAND MITIGATION BANK

HABITAT BANK, LLC

CITY OF REDMOND

SE 1/4 SECTION 1, TWP 25N, R5E & SW 1/4 SECTION 6, T25N, R6E

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B-7	TEMPORARY SEDIMENT & EROSION CONTROL PLAN
B-8	PROPOSED GRADING PLAN
B-9A	CROSS SECTIONS
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B-21	FLOODPLAIN STREAM RIFFLE DETAIL



Vicinity Map

NTS

NOTE:
THIS DEVELOPMENT SHALL BE CONSTRUCTED
IN ACCORDANCE WITH THE 2016 CITY OF
REDMOND STANDARD SPECIFICATIONS AND
DETAILS.

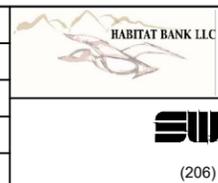
APPROVED FOR CONSTRUCTION

FOR: _____
Director of Public Works
City of Redmond
Date: _____
Plan Chk Engr: _____
Storm: _____
Utility: _____
Fire: _____
Trans/Engr: _____
Planning: _____

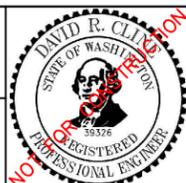
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REV	DATE	DESCRIPTION	BY	SUB	APP
1	11/3/17				
2	3/27/18	DRAFT-FINAL			
3	6/23/18	REV. 1			
4	10/05/18	REV. 2			
5	10/25/18	REV. 3			
6	04/25/19	REV. 4			
		REV. 5			

DESIGNED BY *SJH*
DRAWN BY *SJH*
CHECKED BY *DRC*
APPROVED BY _____
DATE April 2019



HABITAT BANK, LLC
P.O. BOX 354, KIRKLAND WA, 98083
(425) 205-0279



KELLER FARM MITIGATION BANK
VICINITY MAP
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-1

GENERAL NOTES

- ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS.
- ALL WORK SHALL BE IN ACCORDANCE WITH AND THE CONTRACTOR SHALL ADHERE TO ALL TERMS AND CONDITIONS OF PROJECT PERMITS. THE CONTRACTOR IS RESPONSIBLE TO SECURE APPLICABLE PERMITS THAT HAVE NOT BEEN PROVIDED BY THE OWNER. THE CONTRACTOR SHALL RECEIVE TRANSFER FROM THE OWNER OF THE GENERAL CONSTRUCTION STORMWATER PERMIT FROM THE WASHINGTON STATE DEPARTMENT OF ECOLOGY, AND SUBMIT A TRAFFIC CONTROL PLAN TO THE CITY OF REDMOND PUBLIC WORKS TRAFFIC OPERATIONS DIVISION, AND RECEIVE THESE TWO PERMITS PRIOR TO STARTING THE CONSTRUCTION.
- THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS RELATED TO SAFETY OF PERSONNEL, OWNER'S REPRESENTATIVES AND THE PUBLIC. THE CONTRACTOR SHALL ADHERE TO ALL ENVIRONMENTAL LAWS, REGULATIONS AND PERMIT CONDITIONS RELEVANT TO THE PROJECT.
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THEIR OWN ELECTRICITY, COMMUNICATIONS, WATER AND SANITARY FACILITIES AS DESCRIBED IN TEMPORARY FACILITIES SPECIFICATIONS.
- ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS, OR AS SHOWN ON PLANS.
- ALL LOCATIONS OF EXISTING UTILITIES SHOWN SHOULD BE CONSIDERED APPROXIMATE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN OR NOT SHOWN ON THE PLANS. EXISTING UTILITIES SHALL BE AVOIDED, PROTECTED, SUPPORTED AND MAINTAINED DURING CONSTRUCTION AND ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- CONTACT THE UNDERGROUND UTILITIES LOCATION SERVICE (1-800-424-5555 OR 811) AT LEAST 72 HOURS PRIOR TO CONSTRUCTION.
- SEE TESC PLANS AND NOTES FOR EROSION AND SEDIMENTATION CONTROL REQUIREMENTS.
- CONTAMINATED OR TURBID DEWATERING EFFLUENT FROM CONSTRUCTION EQUIPMENT OPERATION, TRUCK WASH WATER, OPEN TRENCHES OR WORK INSIDE A COFFERDAM SHALL BE HANDLED SEPARATELY FROM STORMWATER.
- SURVEY DATUM INFORMATION IS PROVIDED ON THE SITE SURVEY SHEET. ELEVATIONS ARE SHOWN IN FEET. DISTANCES AND LENGTHS ARE SHOWN IN FEET, DECIMAL FEET AND INCHES.
- ALL STATIONING REFERS TO THE CENTERLINE OF CONSTRUCTION AND IS THE MEASURED HORIZONTAL DISTANCE.
- ALL TRASH, RUBBLE, ASPHALT, CONCRETE, DEBRIS AND BURIED DEBRIS, WITHIN THE PROJECT WORK LIMITS, SHALL BE REMOVED AND DISPOSED OF OFFSITE BY THE CONTRACTOR.
- THE CONTRACTOR SHALL PERFORM EXCAVATION IN A SAFE CONDITION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SHORING, SHEETING, BRACING, BENCHING, DEWATERING AND ALL NECESSARY PROTECTIVE MEASURES TO PREVENT DAMAGE TO ADJACENT PROPERTIES, STRUCTURES OR UTILITIES.
- IF UNANTICIPATED CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL IMMEDIATELY BRING THE CONDITION TO THE ATTENTION OF THE ENGINEER.
- DETAILS ARE INTENDED TO SHOW FINAL CONDITIONS OF THE DESIGN. MODIFICATIONS MAY BE REQUIRED TO SUIT THE JOB SITE DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED IN THE WORK.
- THE CONTRACTOR SHALL MAKE ALL NECESSARY PROVISIONS TO PROTECT AND REPAIR IMPACTS TO EXISTING STRUCTURES INCLUDING ROADWAYS, DRAINAGES, FARM STRUCTURES, AND VEGETATION UNLESS SUCH ITEMS ARE TO BE DISTURBED OR REMOVED AS INDICATED IN THE CONSTRUCTION PLANS AND DOCUMENTS.
- ALL EXISTING GROUND WATER MONITORING WELLS WILL BE DECOMMISSIONED.
- 10 LWD COMPLEXES WILL BE INSTALLED AT LOCATIONS SHOWN. A MINIMUM OF 10 BRUSH PILES, 8 PERCH POLES, AND 52 INDIVIDUAL LWD PIECES WILL BE CONSTRUCTED AND INSTALLED AT THE APPROXIMATE LOCATIONS SHOWN. FINAL LOCATIONS MAY BE ADJUSTED BASED ON FIELD CONDITIONS. BRUSH PILES AND PERCH POLES WILL BE CONSTRUCTED AND INSTALLED TO WITHSTAND FLOODPLAIN CONDITIONS..
- UP TO 8 WOOD DUCK NEST BOXES (WDFW-APPROVED DESIGN OR SIMILAR) WILL BE MOUNTED ON 8'-TALL POSTS OR IN EXISTING TREES ALONG BEAR CREEK AND NEAR BACKWATER CHANNELS

ABBREVIATIONS

- BM - BENCH MARK
- BTM - BOTTOM
- BW - BOTTOM WIDTH
- CB - CATCH BASIN
- CL - CENTERLINE
- CLL - CONSTRUCTION LINE LIMIT
- CLR. - CLEARANCE
- CMP - CORRUGATED METAL PIPE
- CONC - CONCRETE
- CSBC - CRUSHED SURFACING BASE COURSE
- CSTC - CRUSHED SURFACING TOP COURSE
- DIAM - DIAMETER
- DBM - DIAMETER BREST HEIGHT
- E - EAST
- ELEV - ELEVATION
- EX - EXISTING
- EG - EXISTING GRADE
- FG - FINISH GRADE
- GA. - GAUGE
- HDPE - HIGH DENSITY POLYETHYLENE
- ID - INSIDE DIAMETER
- IE - INVERT ELEVATION
- INV - INVERT
- LG - LONG
- LF - LINEAR FEET
- MFG. - MANUFACTURER'S
- MISC. - MISCELLANEOUS
- MW - MONITORING WELL
- NNS - NO NAME SLOUGH
- N - NORTH
- NE - NORTHEAST
- NW - NORTHWEST
- OC - ON CENTER
- OHW - ORDINARY HIGH WATER
- SPEC'S. - PROJECT SPECIFICATIONS
- R - RADIUS
- REQ'D - REQUIRED
- R/W - RIGHT OF WAY
- SD - STORM DRAIN
- SE - SOUTHEAST
- SEC. - SECTION
- SHT. - SHEET
- S - SOUTH
- S.F. - SQUARE FEET
- STA - STATION
- TESC - TEMPORARY EROSION AND SEDIMENT CONTROL
- TBD - TO BE DETERMINED
- TOB - TOP OF BANK
- TYP - TYPICAL
- WDFW - WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
- W.S. - WATER SURFACE
- W - WEST
- WL - WETLAND

LEGEND

- | EXISTING | PROPOSED |
|---------------------------------------|----------------------------|
| | |
| PROPERTY LINE | MAJOR CONTOUR (5') |
| | |
| PROJECT PROPERTY BOUNDARY | MINOR CONTOUR (1') |
| | |
| MAJOR CONTOUR (5') | OVERHEAD ELECTRIC |
| | |
| MINOR CONTOUR (1') | CULVERT |
| | |
| PROJECT BOUNDARY / 50' BANK BUFFER | NEW LARGE WOODY DEBRIS |
| | |
| RIGHT OF WAY BOUNDARY | LARGE WOODY DEBRIS COMPLEX |
| | |
| EASEMENT BOUNDARY | SILT FENCE |
| | |
| ORDINARY HIGH WATER MARK | BANK BOUNDARY |
| | |
| WETLAND BOUNDARY | PERCH POLE |
| | |
| EDGE OF WATER | BRUSH PILE |
| | |
| OVERHEAD ELECTRIC | |
| | |
| EDGE OF AC PAVEMENT | |
| | |
| CULVERT | |
| | |
| FEMA FLOODWAY | |
| | |
| FEMA FLOODPLAIN (100-YEAR FLOODPLAIN) | |
| | |
| CLEARING LINE LIMIT | |
| | |
| LANDSLIDE BOUNDARY | |
| | |
| CLASS 1 STREAM BOUNDARY | |
| | |
| CITY 100-YEAR NO-RISE FLOODPLAIN | |
| | |
| SILT FENCE | |
| | |
| MONITORING WELLS (MW) | |
| | |
| LARGE WOODY DEBRIS | |
| | |
| CATCH BASIN | |

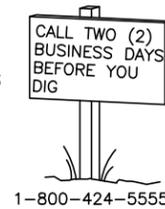
SURVEY NOTES

- SURVEY AND BASEMAPPING WAS PERFORMED BY LDC, INC. REFER TO SURVEY EXHIBIT PLAN FOR MORE DETAILS.
- UNLESS NOTED OTHERWISE ON THE PLANS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SURVEY MONUMENTS AND OTHER SURVEY MARKERS DURING CONSTRUCTION. ANY DAMAGE TO SURVEY MARKERS AND MONUMENTS IS THE RESPONSIBILITY OF CONTRACTOR TO REPAIR.



UTILITY NOTES

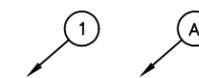
- THE LOCATIONS AND EXTENTS OF EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE AND ARE NOT NECESSARILY COMPLETE. A REASONABLE EFFORT HAS BEEN MADE TO LOCATE AND DELINEATE EXISTING UTILITIES BASED UPON AVAILABLE RECORDS & SURVEYS. THE CONTRACTOR SHALL DETERMINE THE TYPE, LOCATION, SIZE, AND/OR DEPTH OF THE EXISTING UTILITIES WITHIN THE WORK AREA BEFORE COMMENCING WORK. THE CONTRACTOR SHALL CONTACT THE UTILITIES UNDERGROUND LOCATION CENTER AT (800) 424-5555 OR 811 AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL ASSUME COMPLETE RESPONSIBILITY FOR DAMAGED UTILITIES.
- AT NO TIME SHALL THE CONTRACTOR INTERRUPT THE OPERATION OF ANY UTILITIES WITHOUT PRIOR APPROVAL FROM THE UTILITY OWNERS. APPROVAL SHALL BE REQUESTED AT LEAST 48 HOURS IN ADVANCE OF THE TIME THAT THE INTERRUPTION OF THE SYSTEM IS REQUIRED.



ABBREVIATIONS

- DETAIL DESIGNATION
- SHEET CALLED FROM
- SHEET LOCATED ON
- SECTION DESIGNATION
- SHEET CALLED FROM
- SHEET LOCATED ON

SECTION



NOTE REFERENCE
REFERENCE DESIGNATION TO NOTE APPEARING ON SAME SHEET

NOTE:
THIS DEVELOPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2016 CITY OF REDMOND STANDARD SPECIFICATIONS AND DETAILS.

APPROVED FOR CONSTRUCTION

FOR: _____
Director of Public Works
City of Redmond
Date: _____
Plan Chk Engr: _____
Storm: _____
Utility: _____
Fire: _____
Trans/Engr: _____
Planning: _____

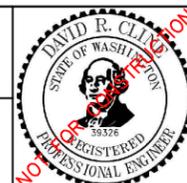
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DESIGNED BY _____
DRAWN BY _____
CHECKED BY _____
APPROVED BY _____
DATE April 2019

HABITAT BANK LLC
HABITAT BANK, LLC
P.O. BOX 354, KIRKLAND WA, 98083
(425) 205-0279

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
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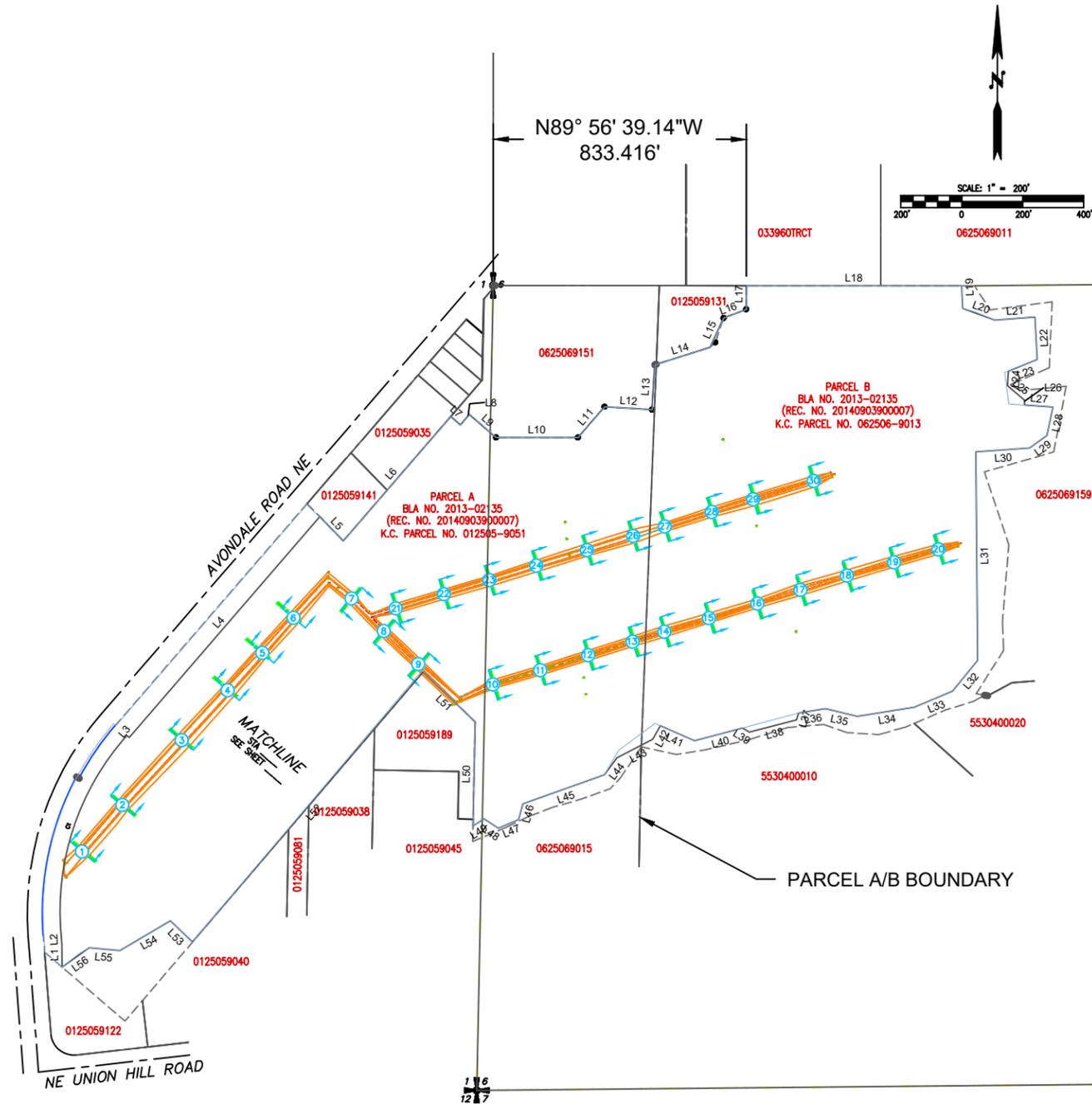
KELLER FARM MITIGATION BANK
GENERAL NOTES
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-2

PORTIONS OF THE SOUTHEAST 1/4 OF SECTION 1, TOWNSHIP 25 NORTH, RANGE 5 EAST, W.M.
AND GOVERNMENT LOTS 6 AND 7, SECTION 6, TOWNSHIP 25 NORTH, RANGE 6 EAST, W.M., KING COUNTY, WASHINGTON

BEAR CREEK WETLAND MITIGATION SURVEY EXHIBIT MAP

Line #/Curve #	Length	Direction/Delta	Radius
C1	704.407	046.7749	862.847
L1	76.012	N00° 56' 20.34"W	
L2	32.747	N03° 34' 18.35"W	
L3	10.000	S49° 06' 52.00"E	
L4	956.640	N40° 53' 08.00"E	
L5	110.402	S44° 14' 14.00"E	
L6	539.430	N40° 53' 08.00"E	
L7	42.000	S49° 06' 52.00"E	
L8	45.000	N40° 53' 08.00"E	
L9	115.450	S49° 06' 52.00"E	
L10	269.080	S89° 57' 41.00"E	
L11	133.600	N40° 53' 08.00"E	
L12	156.070	S86° 25' 35.00"E	
L13	147.452	N03° 36' 15.00"E	
L14	190.561	N72° 32' 29.00"E	
L15	105.551	N24° 46' 40.09"E	
L16	79.630	N69° 07' 15.00"E	
L17	77.800	N00° 30' 26.00"E	
L18	707.161	S89° 57' 40.00"E	
L19	73.709	S02° 24' 18.24"E	
L20	112.712	S70° 09' 39.19"E	
L21	131.902	N85° 59' 30.23"E	
L22	139.096	S02° 52' 56.75"E	
L23	101.654	S68° 11' 02.99"W	
L24	47.851	S03° 24' 04.93"W	
L25	73.297	S49° 43' 57.46"E	
L26	16.406	S00° 15' 43.66"W	
L27	93.701	S86° 11' 07.18"E	
L28	95.277	S12° 00' 52.05"W	
L29	70.195	S54° 28' 09.27"W	
L30	177.046	S85° 59' 48.64"W	
L31	683.649	S00° 29' 06.83"E	
L32	130.113	S39° 08' 49.35"W	
L33	135.697	S67° 12' 19.84"W	
L34	189.615	S81° 05' 58.03"W	
L35	107.549	N76° 56' 21.65"W	
L36	89.497	S80° 51' 08.40"W	
L37	23.191	S16° 51' 39.48"W	
L38	160.020	S75° 24' 55.26"W	
L39	26.555	N58° 48' 46.39"W	
L40	163.182	S75° 10' 39.33"W	
L41	122.674	N66° 31' 58.64"W	
L42	50.282	S28° 52' 29.92"W	
L43	132.257	S62° 48' 57.55"W	
L44	70.151	S37° 02' 48.08"W	
L45	283.305	S70° 24' 25.13"W	
L46	53.575	S15° 08' 40.65"W	
L47	72.519	S67° 21' 36.57"W	
L48	55.572	N56° 39' 40.12"W	
L49	43.461	S57° 50' 29.41"W	
L50	340.902	N01° 10' 42.00"E	
L51	236.320	N46° 06' 05.73"W	
L52	1165.345	S40° 33' 59.00"W	
L53	100.632	N46° 09' 08.98"W	
L54	192.391	S59° 28' 05.23"W	
L55	101.393	N84° 54' 23.85"W	
L56	109.257	S54° 35' 46.84"W	



SURVEY INFORMATION

LEGAL DESCRIPTION

PARCELS A AND B OF REDMOND BOUNDARY LINE ADJUSTMENT NUMBER 2013-02135, AS RECORDED UNDER RECORDING NUMBER 20140903900007. SAID BOUNDARY LINE ADJUSTMENT BEING A PORTION OF THE SE 1/4 OF SECTION 1, TOWNSHIP 25 NORTH, RANGE 5 EAST AND A PORTION OF THE SW 1/4 SECTION 6, TOWNSHIP 25 NORTH, RANGE 6 EAST.

VERTICAL DATUM

NORTH AMERICAN VERTICAL DATUM-1988

HORIZONTAL DATUM:

NAD 83/91
WASHINGTON STATE COORDINATES-NORTH ZONE

BASIS OF BEARING

NAD83/91 FROM GPS OBSERVATION
WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 6, TOWNSHIP 25 NORTH, RANGE 6 EAST (BEARING = N01°10'42"E)

REFERENCES

REDMOND BOUNDARY LINE ADJUSTMENT NUMBER 2013-02135, AS RECORDED UNDER RECORDING NUMBER 20140903900007

EQUIPMENT & PROCEDURES

METHOD OF SURVEY:
SURVEY PERFORMED BY FIELD TRAVERSE
INSTRUMENTATION:
LEICA MS-50 ROBOTIC TOTAL STATION WITH DATA COLLECTOR AND LEICA GPS MAINTAINED IN ADJUSTMENT TO MANUFACTURERS SPECIFICATIONS AS REQUIRED BY WAC 332-130-100
PRECISION:
MEETS OR EXCEEDS STATE STANDARDS WAC 332-130-090

LEGEND

- SET HUB AND LATH ON RIGHT-OF-WAY
- FOUND REBAR AS NOTED
- MONUMENT FOUND
- ⊕ TEMPORARY BENCHMARK SET REBAR AND CAP
- MONITORING WELL
- ⊕ SECTION CORNER FOUND
- ⊕ SECTION QTR CORNER FOUND
- BANK BOUNDARY LINE AREA = 75.2 ACRES

NOTE:

BANK BOUNDARIES MAY VARY FROM PARCEL BOUNDARY.

ADAPTED FROM LDC SURVEY & ENGINEERING DRAWING - 03

NOTE:
THIS DEVELOPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2016 CITY OF REDMOND STANDARD SPECIFICATIONS AND DETAILS.

APPROVED FOR CONSTRUCTION

FOR: _____
Director of Public Works
City of Redmond
Date: _____
Plan Chk Engr: _____
Storm: _____
Utility: _____
Fire: _____
Trans/Engr: _____
Planning: _____

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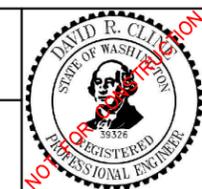
Filename: I:\E\F\21-1 SE\12500s\12566 Keller Farm\CAD\SHETS\BODR Drawings\21-1-12566-241 3 SURVEY EXHIBIT MAP.dwg Date: 04-25-2019 Login: awp

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DESIGNED BY
DRAWN BY
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DATE
April 2019

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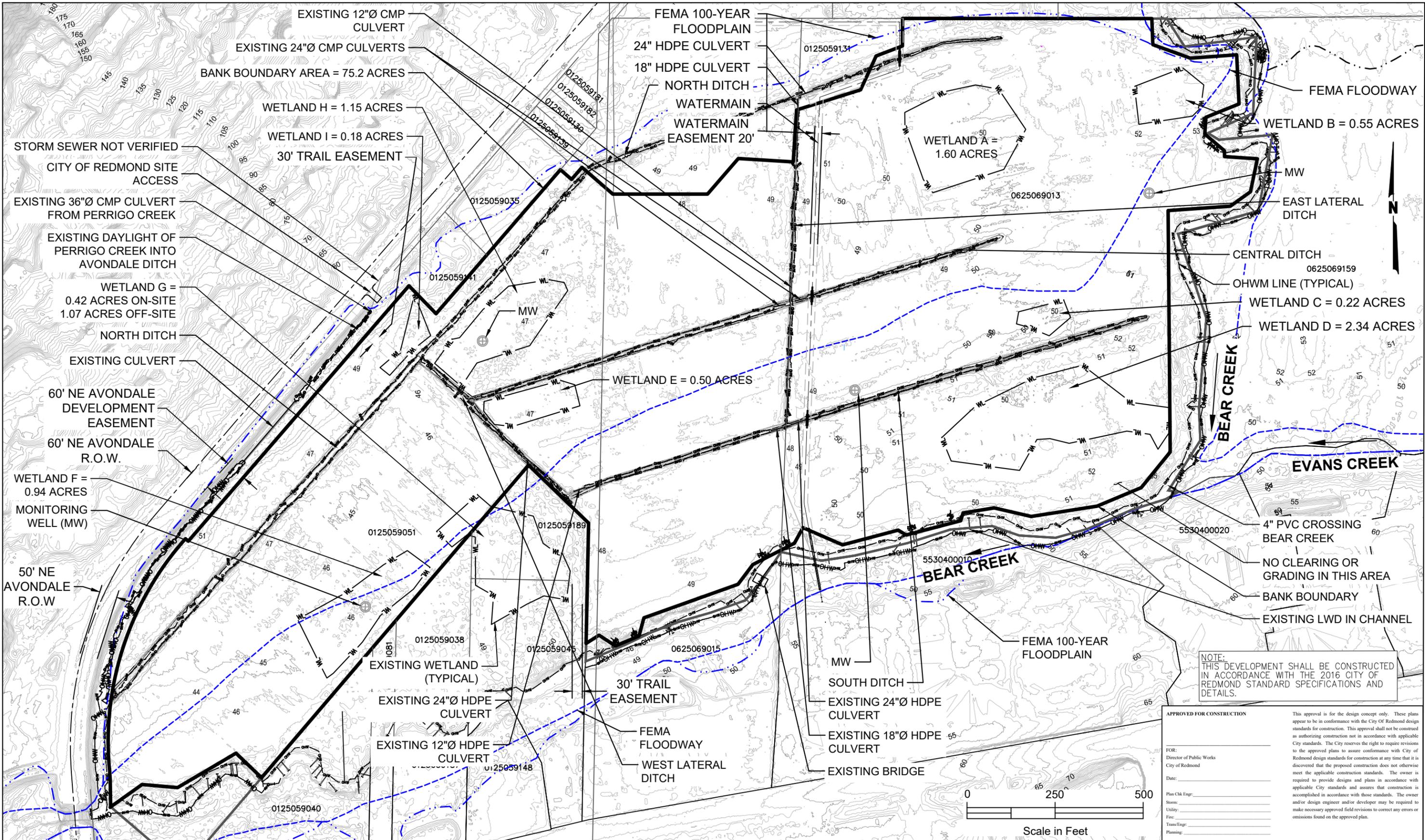
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KELLER FARM MITIGATION BANK
SURVEY EXHIBIT MAP
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-3

Filename: I:\EFV21-1 SEA12500s\12566 Keller Farm\CAD\SHSHEETS\BODR Drawings\21-1-12566-241 4 Existing Conditions.dwg Date: 04-25-2019 Login: awp

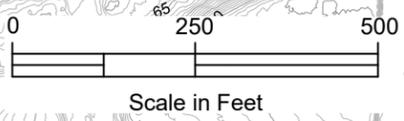


NOTE:
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REDMOND STANDARD SPECIFICATIONS AND
DETAILS.

APPROVED FOR CONSTRUCTION

FOR:
Director of Public Works
City of Redmond
Date:
Plan Chk Engr:
Storm:
Utility:
Fire:
Trans/Engr:
Planning:

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DESIGNED BY *SJH*
DRAWN BY *SJH*
CHECKED BY *DRC*
APPROVED BY
DATE April 2019

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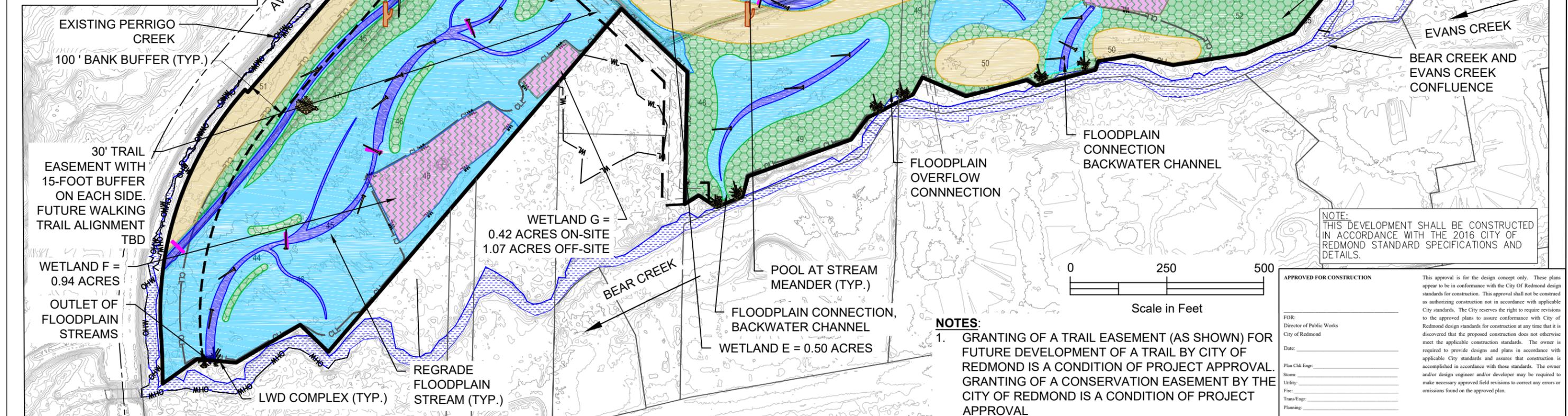
KELLER FARM MITIGATION BANK
EXISTING CONDITIONS
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-4

ELEV. (FT)	NEW HABITAT AREAS	EXISTING ACREAGE	PROPOSED ACREAGE		
			CREDIT AREAS	BUFFER	EASEMENTS
46-54	RIPARIAN UPLAND FOREST (UPL) (ENHANCEMENT)		6.7	5.1	0.1
45-53	RIPARIAN FOREST WETLAND (PFD) (RE-ESTABLISHMENT)		17.5	1.5	0.1
44-53	SHRUB-SCRUB WITH EMERGENT WETLAND POCKETS (PSS/PEM) (RE-ESTABLISHMENT)		28.7	2.8	0.5
44-50	RIPARIAN WETLAND/STREAM CHANNEL COMPLEX (PEM) (REHABILITATION)	1.7	3.9	0.3	0.1
46-52	EXISTING WETLAND (PFO/PSS MIX) (REHABILITATION)	7.9	7.7	0.1	0.1
	EXISTING GRASS UPLAND	65.6			
	BUFFER/EASEMENT SUBTOTAL			9.8	0.9
	SUBTOTAL	75.2	64.5	9.8	0.9
	BANK BOUNDARY	75.2		75.2	

LEGEND

- STREAM CHANNEL COMPLEX (IN BANK)
7,114 FT EXISTING LENGTH
12,276 FT PROPOSED LENGTH
- CREEKS
- BRUSH PILES (MIN 11)
- PERCH POLES (MIN 9)
- KEY LWD PIECE (MIN 52)
- LWD COMPLEX (MIN 10)
- BANK BOUNDARY (75.2 AC.)
- BUFFER
- EASEMENT
- EXISTING CONTOUR
- PROPOSED CONTOUR
- RIFFLE WITH LWD (21) (NTS)
- CONSTRUCTION LINE LIMIT

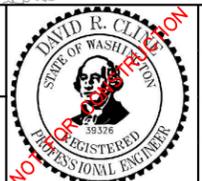


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2	3/27/18	REV. 1			
3	6/23/18	REV. 2			
4	10/05/18	REV. 3			
5	10/25/18	REV. 4			
6	04/25/19	REV. 5			

DESIGNED BY	HABITAT BANK, LLC
DRAWN BY	
CHECKED BY	
APPROVED BY	
DATE	April 2019

HABITAT BANK, LLC
P.O. BOX 354, KIRKLAND WA, 98083
(425) 205-0279

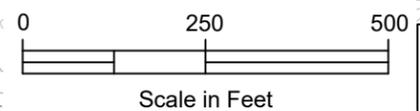
SHANNON & WILSON, INC.
SEATTLE, WASHINGTON
(206) 632-8020 www.shannonwilson.com



KELLER FARM MITIGATION BANK
SITE DESIGN PLAN
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-5

NOTES:
1. GRANTING OF A TRAIL EASEMENT (AS SHOWN) FOR FUTURE DEVELOPMENT OF A TRAIL BY CITY OF REDMOND IS A CONDITION OF PROJECT APPROVAL. GRANTING OF A CONSERVATION EASEMENT BY THE CITY OF REDMOND IS A CONDITION OF PROJECT APPROVAL.



NOTE: THIS DEVELOPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2016 CITY OF REDMOND STANDARD SPECIFICATIONS AND DETAILS.

APPROVED FOR CONSTRUCTION

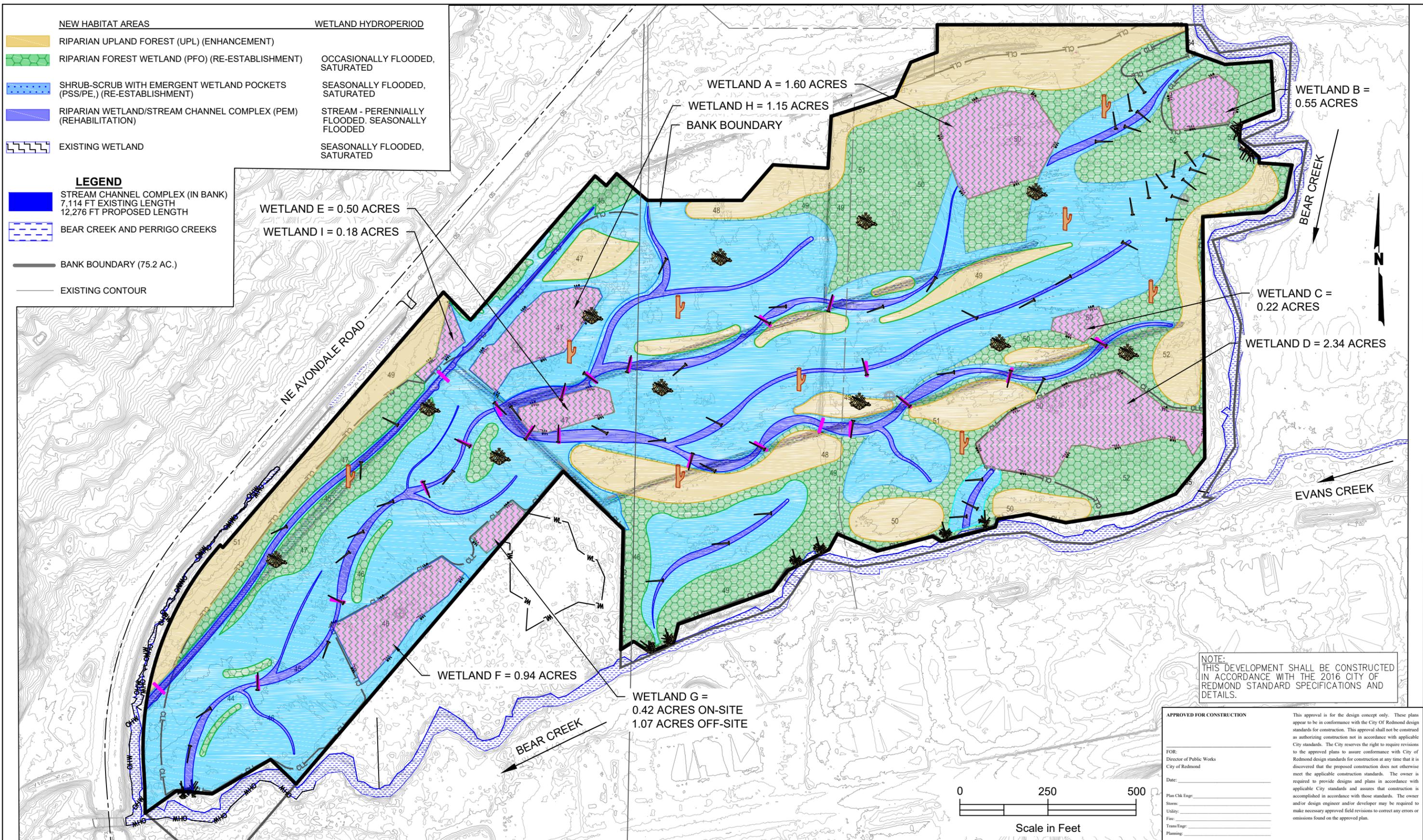
FOR: Director of Public Works
City of Redmond

Date: _____

Plan Chk Engr: _____
Storm: _____
Utility: _____
Fire: _____
Trans/Engr: _____
Planning: _____

This approval is for the design concept only. These plans appear to be in conformance with the City of Redmond design standards for construction. This approval shall not be construed as authorizing construction not in accordance with applicable City standards. The City reserves the right to require revisions to the approved plans to assure conformance with City of Redmond design standards for construction at any time that it is discovered that the proposed construction does not otherwise meet the applicable construction standards. The owner is required to provide designs and plans in accordance with applicable City standards and assures that construction is accomplished in accordance with those standards. The owner and/or design engineer and/or developer may be required to make necessary approved field revisions to correct any errors or omissions found on the approved plan.

Filename: I:\EF\21-1 SE\12500s\12566 Keller Farm\CAD\SHEET\BODR Drawings\21-1-12566-241 5 Grading Plan.dwg Date: 04-25-2019 Login: awp



NOTE:
THIS DEVELOPMENT SHALL BE CONSTRUCTED
IN ACCORDANCE WITH THE 2016 CITY OF
REDMOND STANDARD SPECIFICATIONS AND
DETAILS.

APPROVED FOR CONSTRUCTION

FOR: _____
Director of Public Works
City of Redmond

Date: _____

Plan Chk Engr: _____
Storm: _____
Utility: _____
Fire: _____
Trans Engr: _____
Planning: _____

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4	10/05/18	REV. 3		
5	10/25/18	REV. 4		
6	04/25/19	REV. 5		

DESIGNED BY: *SJH*
DRAWN BY: *SJH*
CHECKED BY: *DRC*
APPROVED BY: _____
DATE: April 2019

HABITAT BANK LLC

HABITAT BANK, LLC
P.O. BOX 354, KIRKLAND WA, 98083
(425) 205-0279

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
Seattle, Washington
(206) 632-8020 www.shannonwilson.com



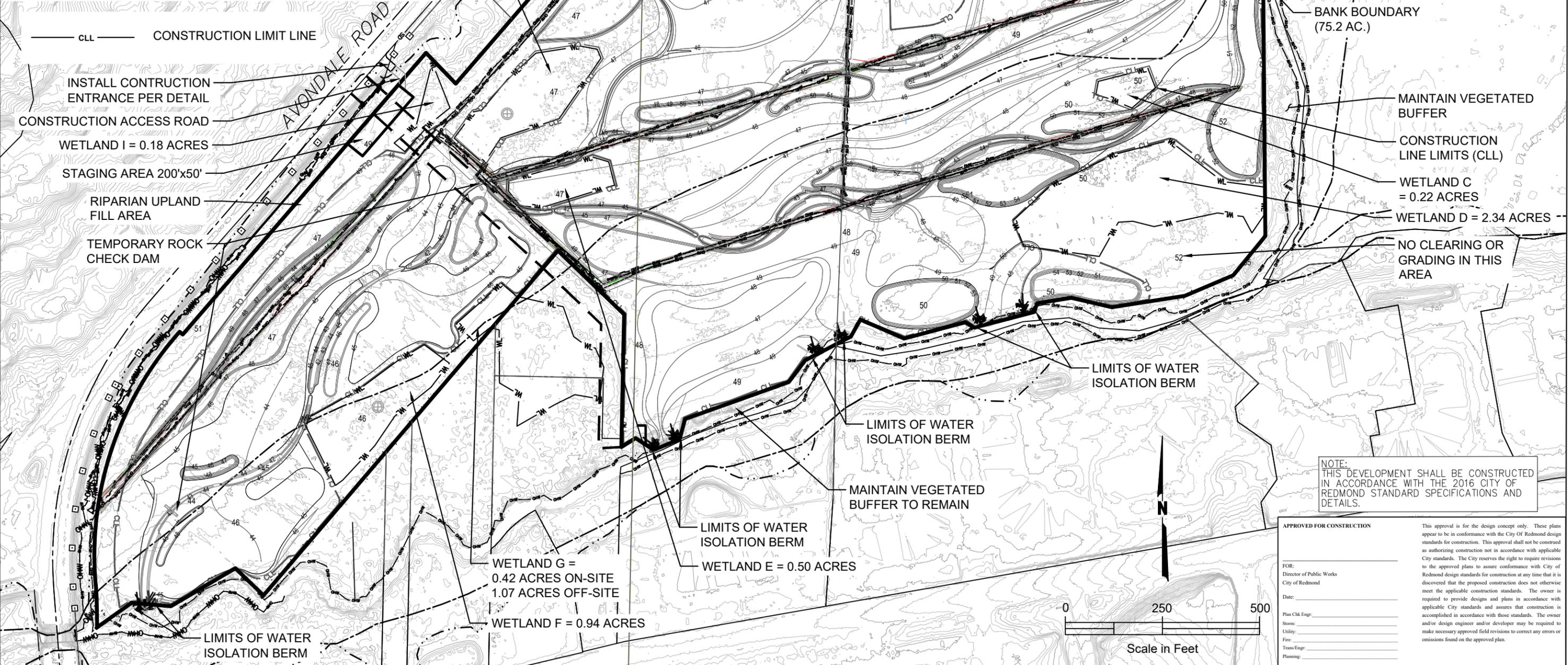
KELLER FARM MITIGATION BANK
WETLAND HYDROPERIOD
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-6

Filename: I:\EF21-1 SEAI12500s\12566 Keller Farm\CAD\SHEETS\BODR Drawings\21-1-12566-241 6 Erosion Control.dwg Date: 04-25-2019 Login: awp

NOTES

1. PLACE HIGH VISIBILITY STAKING AROUND WETLAND LIMITS.
2. MAINTAIN VEGETATED BUFFER AND SOIL PLUGS BETWEEN GRADING AREAS AND BEAR CREEK.
3. PRE-EXCAVATE AND GRADE FLOODPLAIN STREAM CHANNELS AND WETLAND AREAS PRIOR TO DOWNSTREAM CONNECTION TO BEAR CREEK. SEED AND PLANT STREAM BANKS PRIOR TO BEAR CREEK CONNECTION.
4. DEFISH EXISTING DITCHES PRIOR TO FILLING. DEFISH AREAS INSIDE SILT FENCES. MAINTAIN DEFISHING DURING CONSTRUCTION.
5. HYDROSEED AND IRRIGATE EXPOSED FINISH GRADES WITH STERILE WHEAT GRASS SEED MIX SHOWN ON PLANTING PLAN. ALL SEEDING TO BE COMPLETED BY AUG. 15TH. IRRIGATE OR WATER AREAS TO ESTABLISH GRASS SEED UNTIL OCT. 15TH.
6. CONTRACTOR TO SUBMIT AND UPDATE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND TESC.



NOTE: THIS DEVELOPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2016 CITY OF REDMOND STANDARD SPECIFICATIONS AND DETAILS.

APPROVED FOR CONSTRUCTION

FOR: Director of Public Works
City of Redmond
Date: _____
Plan Chk Engr: _____
Storm: _____
Utility: _____
Fire: _____
Trans/Engr: _____
Planning: _____

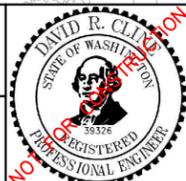
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5	10/25/18	REV. 4			
6	04/25/19	REV. 5			

DESIGNED BY: SJH
DRAWN BY: SJH
CHECKED BY: DRC
APPROVED BY: _____
DATE: April 2019

HABITAT BANK LLC
HABITAT BANK, LLC
P.O. BOX 354, KIRKLAND WA, 98083
(425) 205-0279

SHANNON & WILSON, INC.
TECHNICAL AND ENVIRONMENTAL CONSULTANTS
Seattle, Washington
(206) 632-8020 www.shannonwilson.com



KELLER FARM MITIGATION BANK
TEMPORARY SEDIMENT & EROSION CONTROL PLAN
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-7

GRADING VOLUME SUMMARY
 CUT: 64,000 CY
 FILL: 64,000 CY
 COMPENSATORY STORAGE: 25,000 CY
 GRADING IN WETLAND: 0 CY
 GRADING BELOW OHWM: 1.26 ACRES

	NEW HABITAT AREAS	ELEVATION RANGE (MIN-MAX)
	RIPARIAN UPLAND FOREST (UPL) (ENHANCEMENT)	46'-54'
	RIPARIAN FOREST WETLAND (PFD) (RE-ESTABLISHMENT)	45'-53'
	SHRUB-SHRUB WITH EMERGENT WETLAND POCKETS (PSS/PEM) (RE-ESTABLISHMENT)	44'-53'
	RIPARIAN WETLAND/STREAM CHANNEL COMPLEX (PEM) (REHABILITATION)	44'-50'
	EXISTING WETLAND (PFO/PSS MIX) (REHABILITATION)	46'-52'

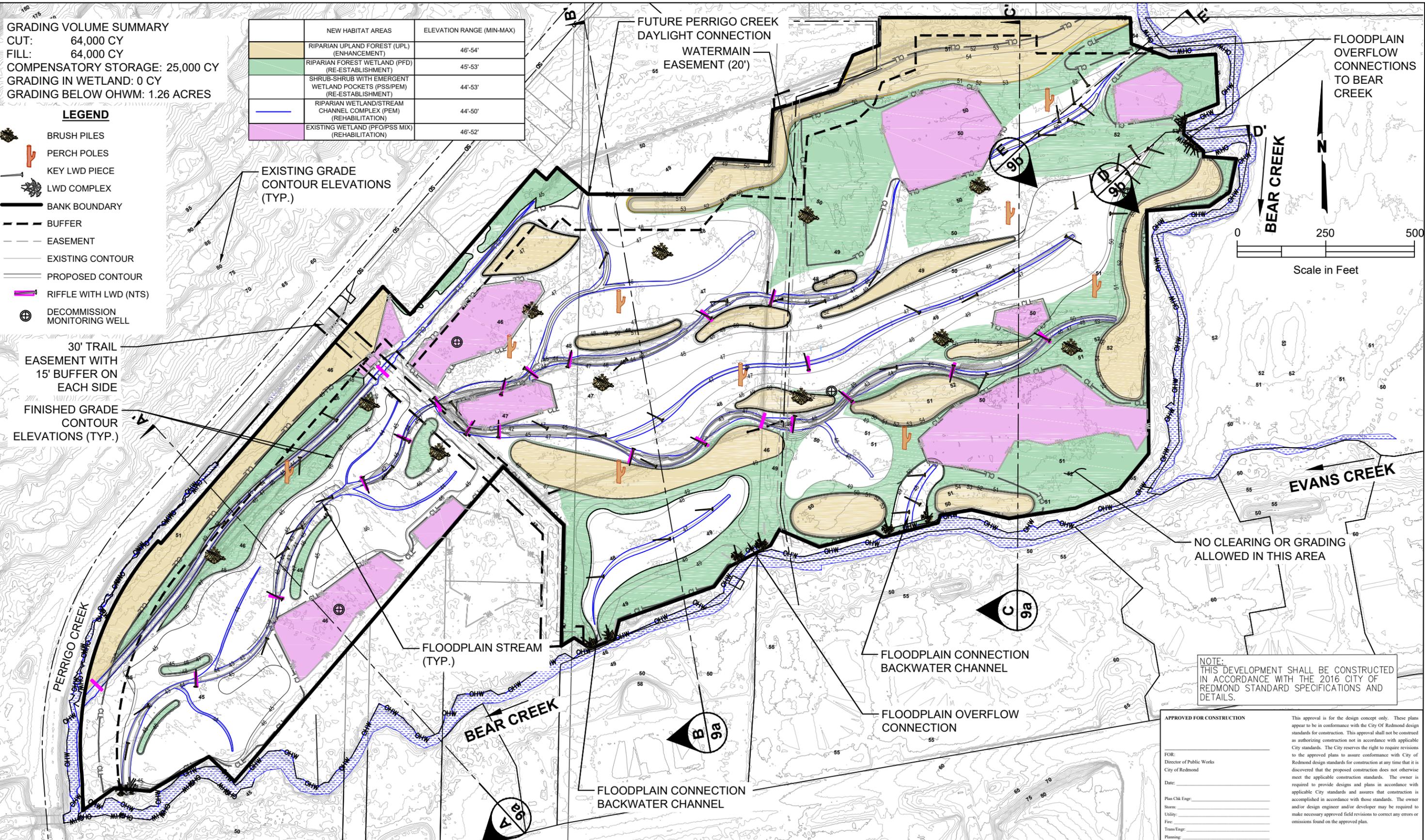
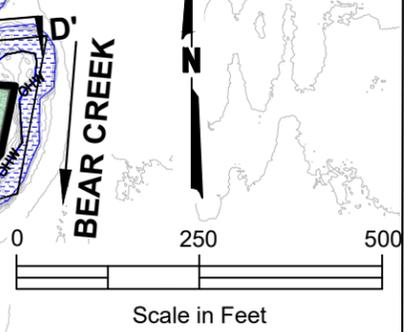
- LEGEND**
- BRUSH PILES
 - PERCH POLES
 - KEY LWD PIECE
 - LWD COMPLEX
 - BANK BOUNDARY
 - BUFFER
 - EASEMENT
 - EXISTING CONTOUR
 - PROPOSED CONTOUR
 - RIFFLE WITH LWD (NTS)
 - DECOMMISSION MONITORING WELL

30' TRAIL EASEMENT WITH 15' BUFFER ON EACH SIDE
 FINISHED GRADE CONTOUR ELEVATIONS (TYP.)

EXISTING GRADE CONTOUR ELEVATIONS (TYP.)

FUTURE PERRIGO CREEK DAYLIGHT CONNECTION WATERMAIN EASEMENT (20')

FLOODPLAIN OVERFLOW CONNECTIONS TO BEAR CREEK



NO CLEARING OR GRADING ALLOWED IN THIS AREA

NOTE: THIS DEVELOPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2016 CITY OF REDMOND STANDARD SPECIFICATIONS AND DETAILS.

APPROVED FOR CONSTRUCTION

FOR: Director of Public Works
 City of Redmond
 Date: _____
 Plan Chk Engr: _____
 Storm: _____
 Utility: _____
 Fire: _____
 Trans/Engr: _____
 Planning: _____

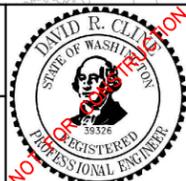
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5	10/25/18	REV. 4			
6	04/25/19	REV. 5			

DESIGNED BY: *SJH*
 DRAWN BY: *SJH*
 CHECKED BY: *DRC*
 APPROVED BY: _____
 DATE: April 2019

HABITAT BANK LLC
HABITAT BANK, LLC
 P.O. BOX 354, KIRKLAND WA, 98083
 (425) 205-0279

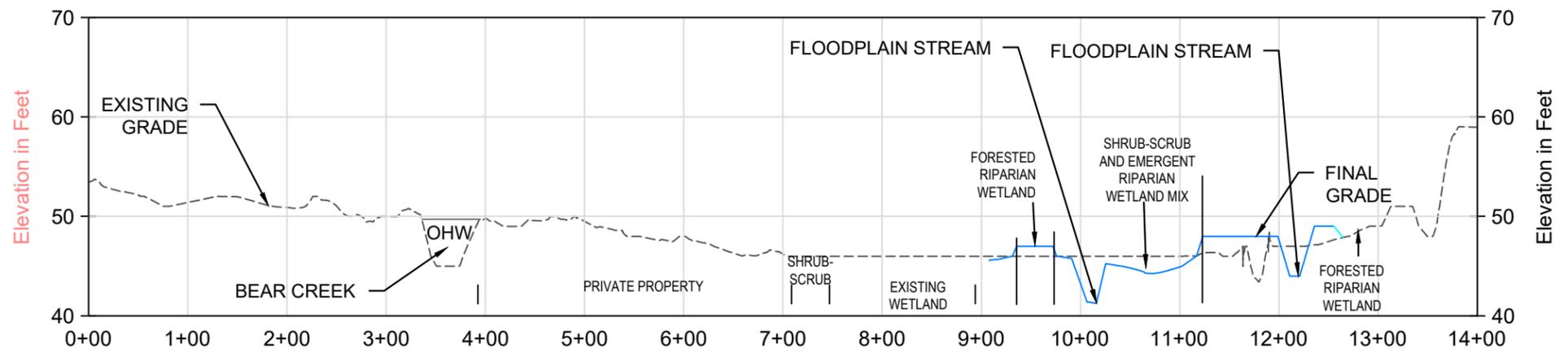
SHANNON & WILSON, INC.
 TECHNICAL AND ENVIRONMENTAL CONSULTANTS
 Seattle, Washington
 (206) 632-8020 www.shannonwilson.com



KELLER FARM MITIGATION BANK
 PROPOSED GRADING PLAN
 SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

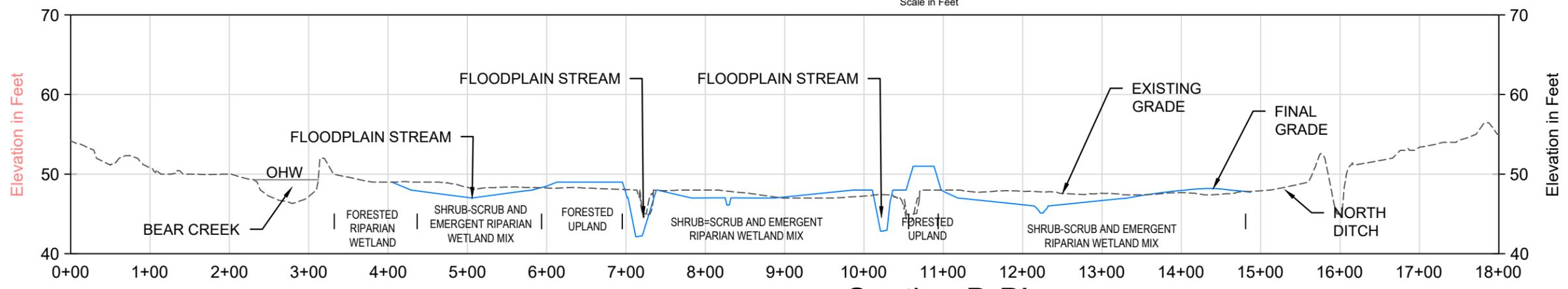
FIGURE
B-8

Filename: I:\EF21-1_SEA112500s\12566 Keller Farm\CAD\SHEETS\BODR Drawings\21-1-1-12566-241 8 CROSS SECTIONS.dwg Date: 04-25-2019 Login: awp



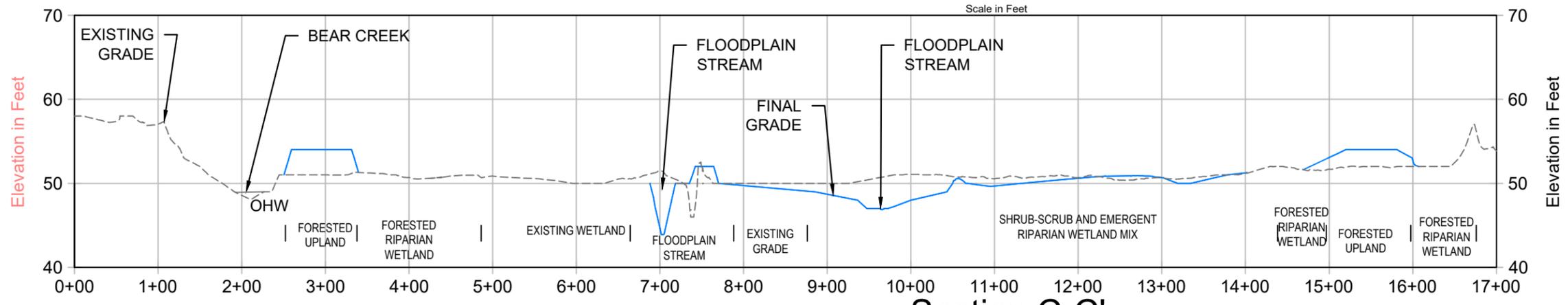
Section A-A'

10H:1V
 0 100 200
 Scale in Feet



Section B-B'

10H:1V
 0 100 200
 Scale in Feet



Section C-C'

10H:1V
 0 100 200
 Scale in Feet

NOTE:
 THIS DEVELOPMENT SHALL BE CONSTRUCTED
 IN ACCORDANCE WITH THE 2016 CITY OF
 REDMOND STANDARD SPECIFICATIONS AND
 DETAILS.

APPROVED FOR CONSTRUCTION

FOR: _____
 Director of Public Works
 City of Redmond

Date: _____

Plan Chk Engr: _____
 Storm: _____
 Utility: _____
 Fire: _____
 Trans/Engr: _____
 Planning: _____

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DESIGNED BY: *SJH*
 DRAWN BY: *SJH*
 CHECKED BY: *DRC*
 APPROVED BY: _____
 DATE: April 2019

HABITAT BANK, LLC
 P.O. BOX 354, KIRKLAND WA, 98083
 (425) 205-0279

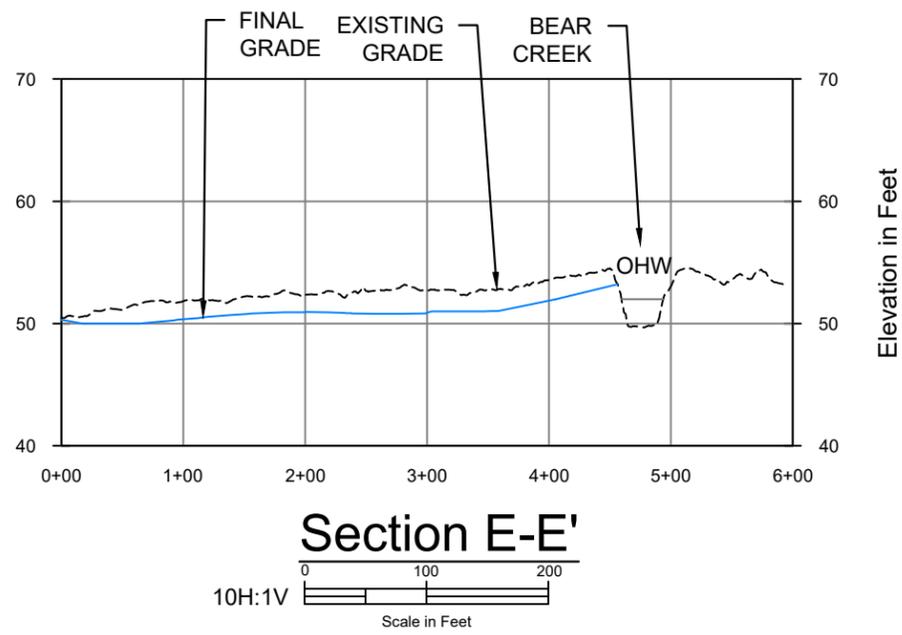
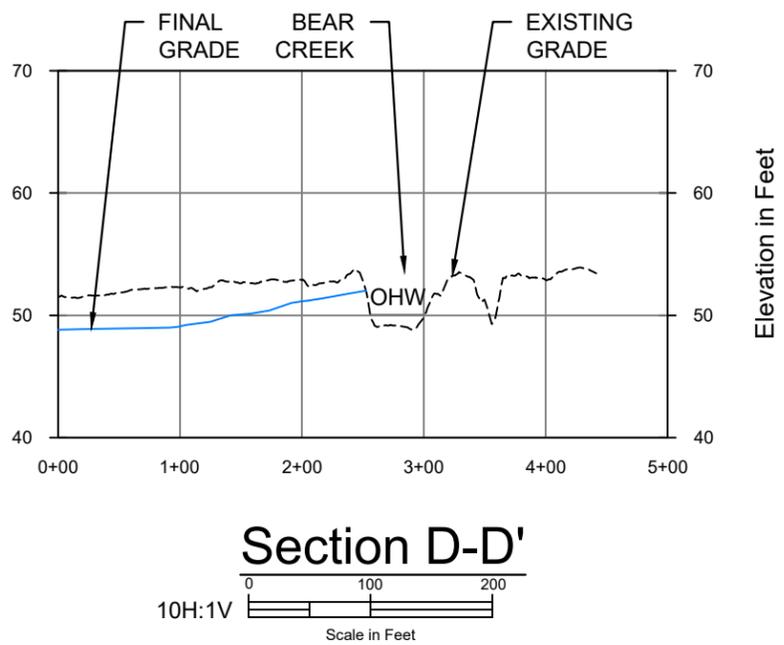
SHANNON & WILSON, INC.
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
 Seattle, Washington
 (206) 632-8020 www.shannonwilson.com



KELLER FARM MITIGATION BANK
 CROSS SECTIONS
 SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-9A

Filename: I:\EF21-1 SE\12500s\12566 Keller Farm\CAD\SHEETS\BODR Drawings\21-1-1-12566-241 8 CROSS SECTIONS.dwg Date: 04-25-2019 Login: awp



NOTE:
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APPROVED FOR CONSTRUCTION

FOR: _____
Director of Public Works
City of Redmond

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Plan Chk Engr: _____
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DESIGNED BY *SJH*
DRAWN BY *SJH*
CHECKED BY *DRC*
APPROVED BY _____
DATE April 2019

HABITAT BANK, LLC
P.O. BOX 354, KIRKLAND WA, 98083
(425) 205-0279

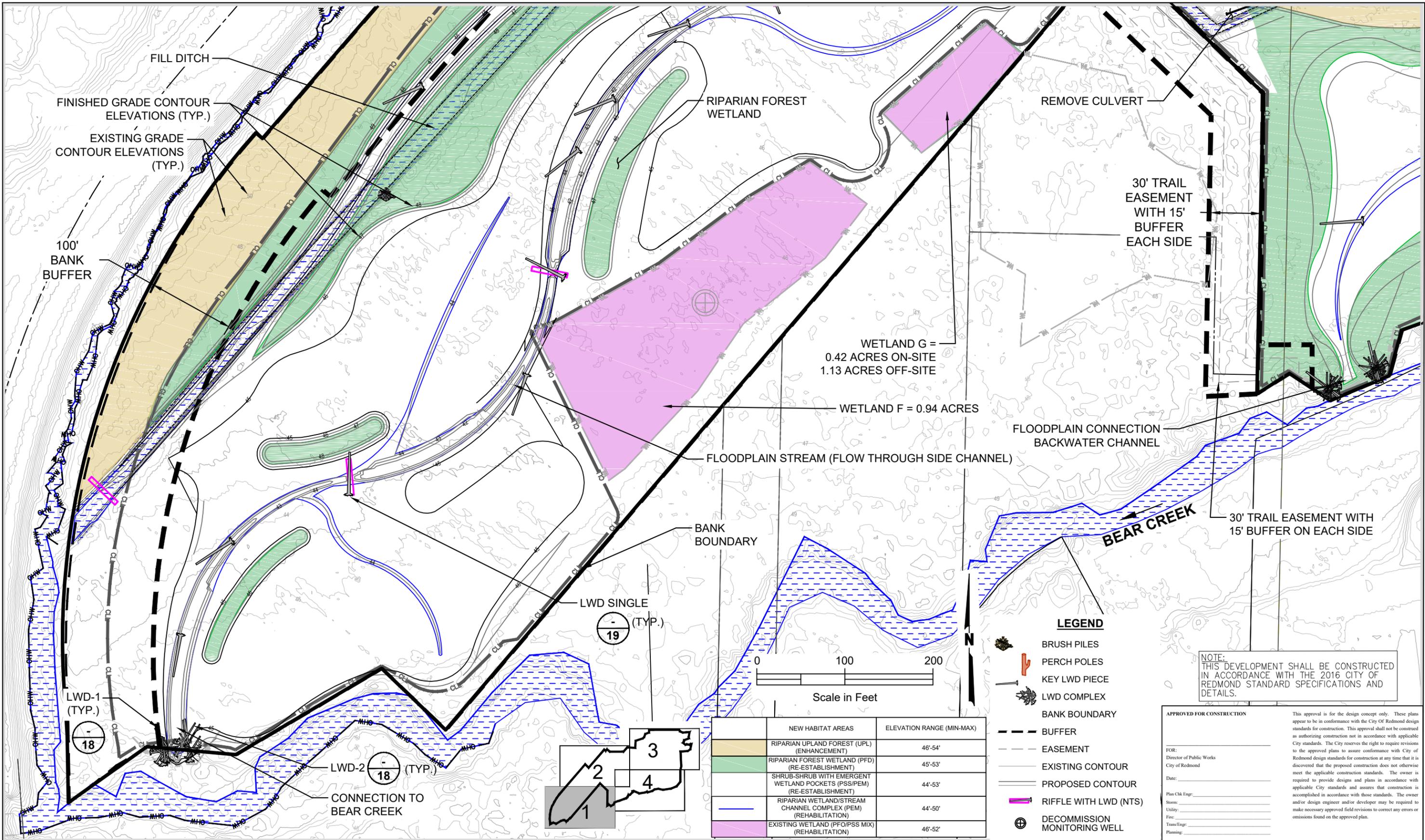
SHANNON & WILSON, INC.
ENGINEERING AND ENVIRONMENTAL CONSULTANTS
Seattle, Washington
(206) 632-8020 www.shannonwilson.com



KELLER FARM MITIGATION BANK
CROSS SECTIONS
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-9B

Filename: I:\EFV21-1\SEA12500s\12566 Keller Farm\CAD\SHSHEETS\BODR Drawings\21-1-1-12566-241 9 Site Plan - Area 1.dwg Date: 04-25-2019 Login: awp



REV	DATE	DESCRIPTION	BY	SUB	APP
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5	10/25/18	REV. 4			
6	04/25/19	REV. 5			

DESIGNED BY *SJH*
 DRAWN BY *SJH*
 CHECKED BY *DRC*
 APPROVED BY _____
 DATE April 2019

HABITAT BANK LLC
HABITAT BANK, LLC
 P.O. BOX 354, KIRKLAND WA, 98083
 (425) 205-0279

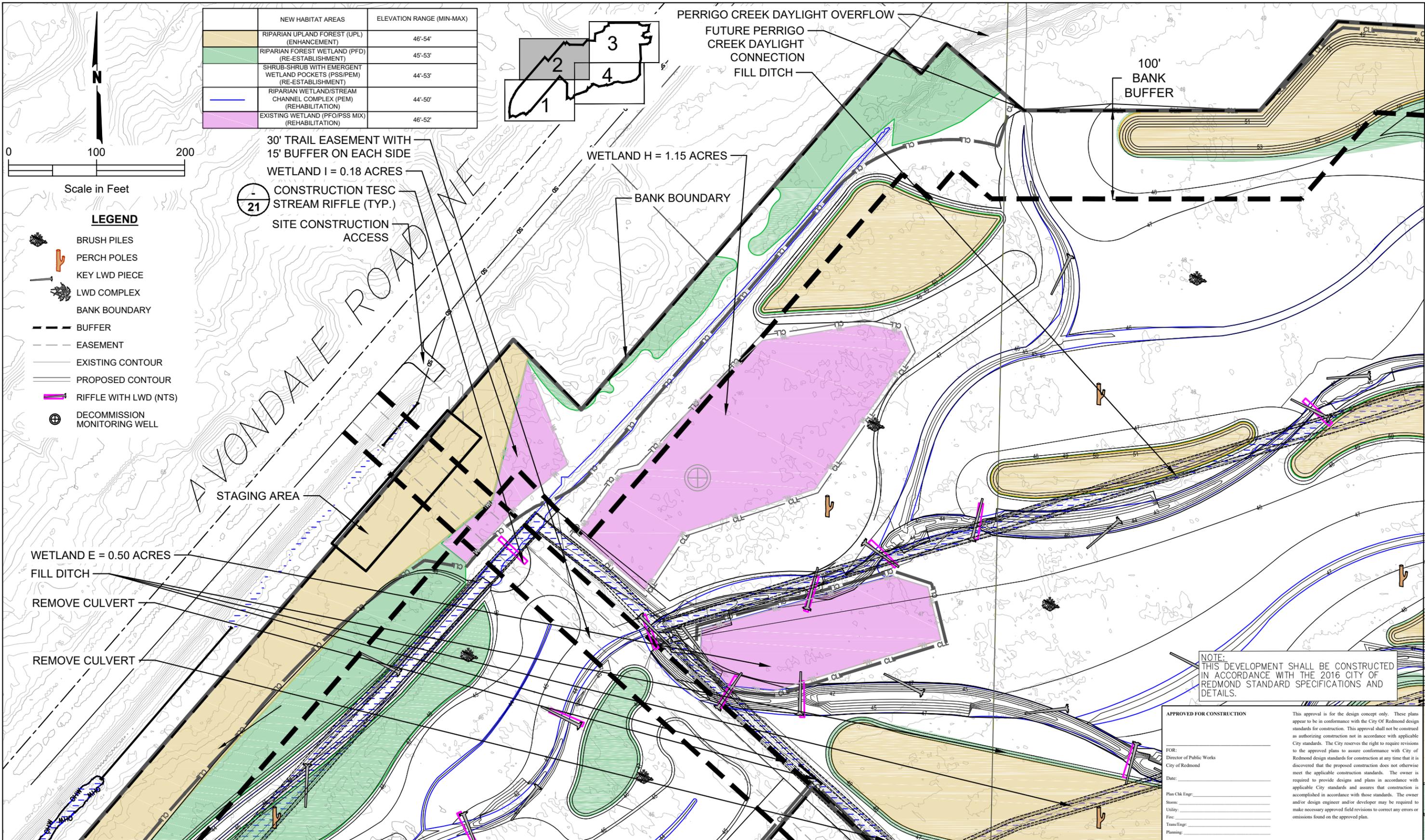
SHANNON & WILSON, INC.
 TECHNICAL AND ENVIRONMENTAL CONSULTANTS
 Seattle, Washington
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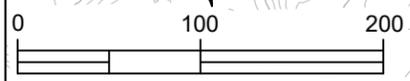
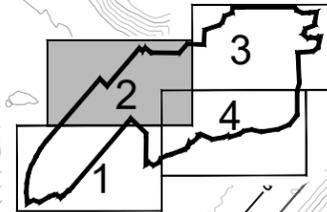
KELLER FARM MITIGATION BANK
 SITE PLAN - AREA 1
 SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-10

Filename: I:\EFV21-1 SEA12500s\12566 Keller Farm\CAD\SHEETS\BODR Drawings\21-1-1-12566-241 10 SITE PLAN - AREA 2.dwg Date: 04-25-2019 Login: awp



	NEW HABITAT AREAS	ELEVATION RANGE (MIN-MAX)
[Yellow Box]	RIPARIAN UPLAND FOREST (UPL) (ENHANCEMENT)	46'-54'
[Green Box]	RIPARIAN FOREST WETLAND (PFD) (RE-ESTABLISHMENT)	45'-53'
[Light Green Box]	SHRUB-SHRUB WITH EMERGENT WETLAND POCKETS (PSS/PEM) (RE-ESTABLISHMENT)	44'-53'
[Blue Box]	RIPARIAN WETLAND/STREAM CHANNEL COMPLEX (PEM) (REHABILITATION)	44'-50'
[Purple Box]	EXISTING WETLAND (PFO/PSS MIX) (REHABILITATION)	46'-52'



- Scale in Feet
- LEGEND**
- BRUSH PILES
 - PERCH POLES
 - KEY LWD PIECE
 - LWD COMPLEX
 - BANK BOUNDARY
 - BUFFER
 - EASEMENT
 - EXISTING CONTOUR
 - PROPOSED CONTOUR
 - RIFFLE WITH LWD (NTS)
 - DECOMMISSION MONITORING WELL

30' TRAIL EASEMENT WITH 15' BUFFER ON EACH SIDE

WETLAND I = 0.18 ACRES

CONSTRUCTION TESC

STREAM RIFFLE (TYP.)

SITE CONSTRUCTION ACCESS

WETLAND H = 1.15 ACRES

BANK BOUNDARY

100' BANK BUFFER

WETLAND E = 0.50 ACRES

FILL DITCH

REMOVE CULVERT

REMOVE CULVERT

STAGING AREA

NOTE: THIS DEVELOPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2016 CITY OF REDMOND STANDARD SPECIFICATIONS AND DETAILS.

APPROVED FOR CONSTRUCTION

FOR: Director of Public Works
City of Redmond

Date: _____

Plan Chk Engr: _____

Storm: _____

Utility: _____

Fire: _____

Trans/Engr: _____

Planning: _____

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6	04/25/19	REV. 5			

DESIGNED BY: *SJH*

DRAWN BY: *SJH*

CHECKED BY: *DRC*

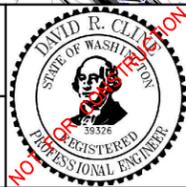
APPROVED BY: _____

DATE: April 2019

HABITAT BANK LLC

HABITAT BANK, LLC
P.O. BOX 354, KIRKLAND WA, 98083
(425) 205-0279

SHANNON & WILSON, INC.
TECHNICAL AND ENVIRONMENTAL CONSULTANTS
Seattle, Washington
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KELLER FARM MITIGATION BANK

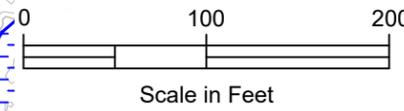
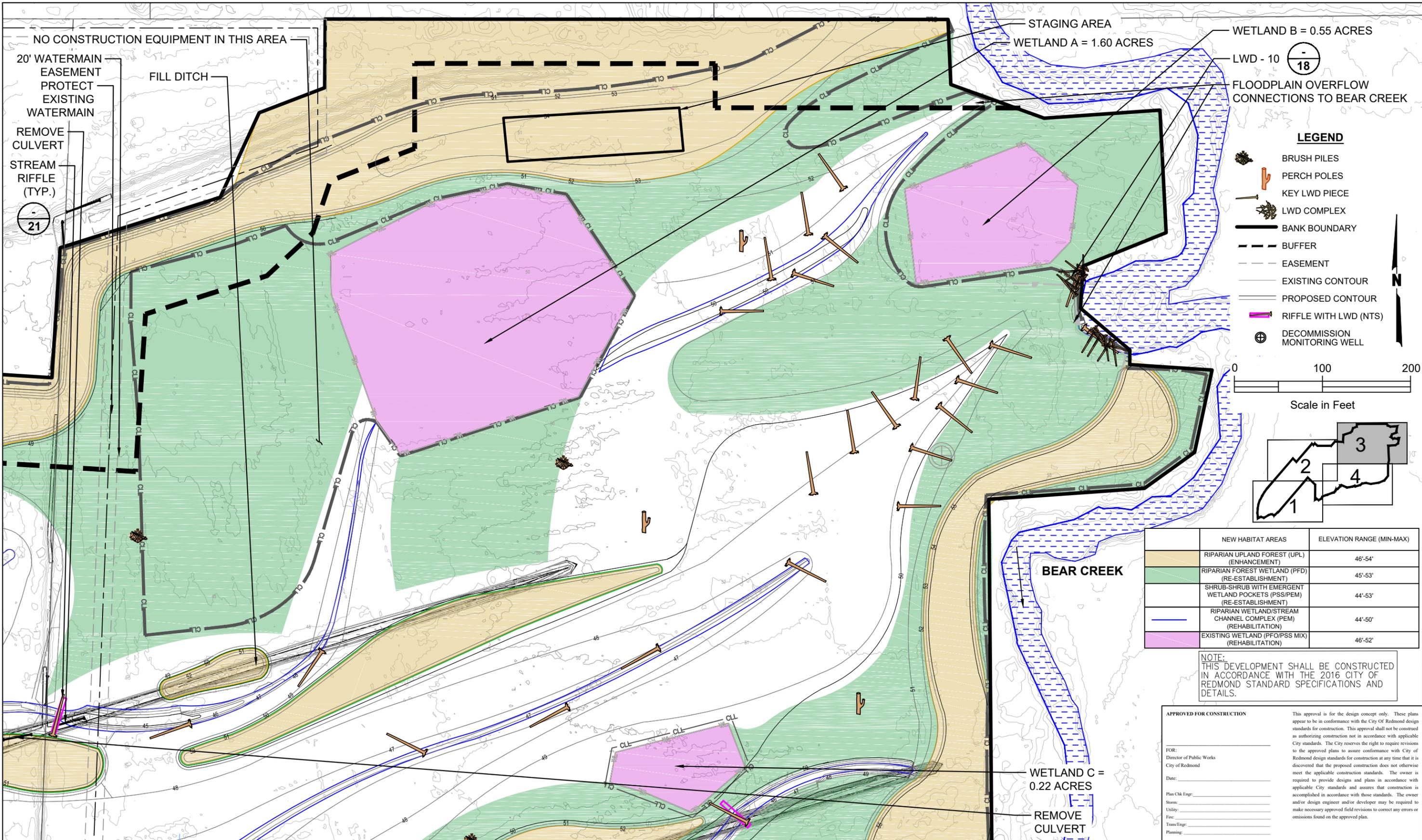
SITE PLAN - AREA 2

SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE

B-11

Filename: I:\EFV21-1 SEAI12500s\12566 Keller Farm\CAD\SHSHEETS\BODR Drawings\21-1-12566-241 11 SITE PLAN - AREA 3.dwg Date: 04-25-2019 Login: awp



NEW HABITAT AREAS	ELEVATION RANGE (MIN-MAX)
RIPARIAN UPLAND FOREST (UPL) (ENHANCEMENT)	46'-54'
RIPARIAN FOREST WETLAND (PFD) (RE-ESTABLISHMENT)	45'-53'
SHRUB-SHRUB WITH EMERGENT WETLAND POCKETS (PSS/PEM) (RE-ESTABLISHMENT)	44'-53'
RIPARIAN WETLAND/STREAM CHANNEL COMPLEX (PEM) (REHABILITATION)	44'-50'
EXISTING WETLAND (PFO/PSS MIX) (REHABILITATION)	46'-52'

NOTE:
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APPROVED FOR CONSTRUCTION

FOR: _____
Director of Public Works
City of Redmond

Date: _____

Plan Chk Engr: _____
Storm: _____
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Fire: _____
Trans/Engr: _____
Planning: _____

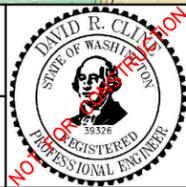
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5	10/25/18	REV. 4			
6	04/25/19	REV. 5			

DESIGNED BY *SJH*
DRAWN BY *SJH*
CHECKED BY *DRC*
APPROVED BY _____
DATE April 2019

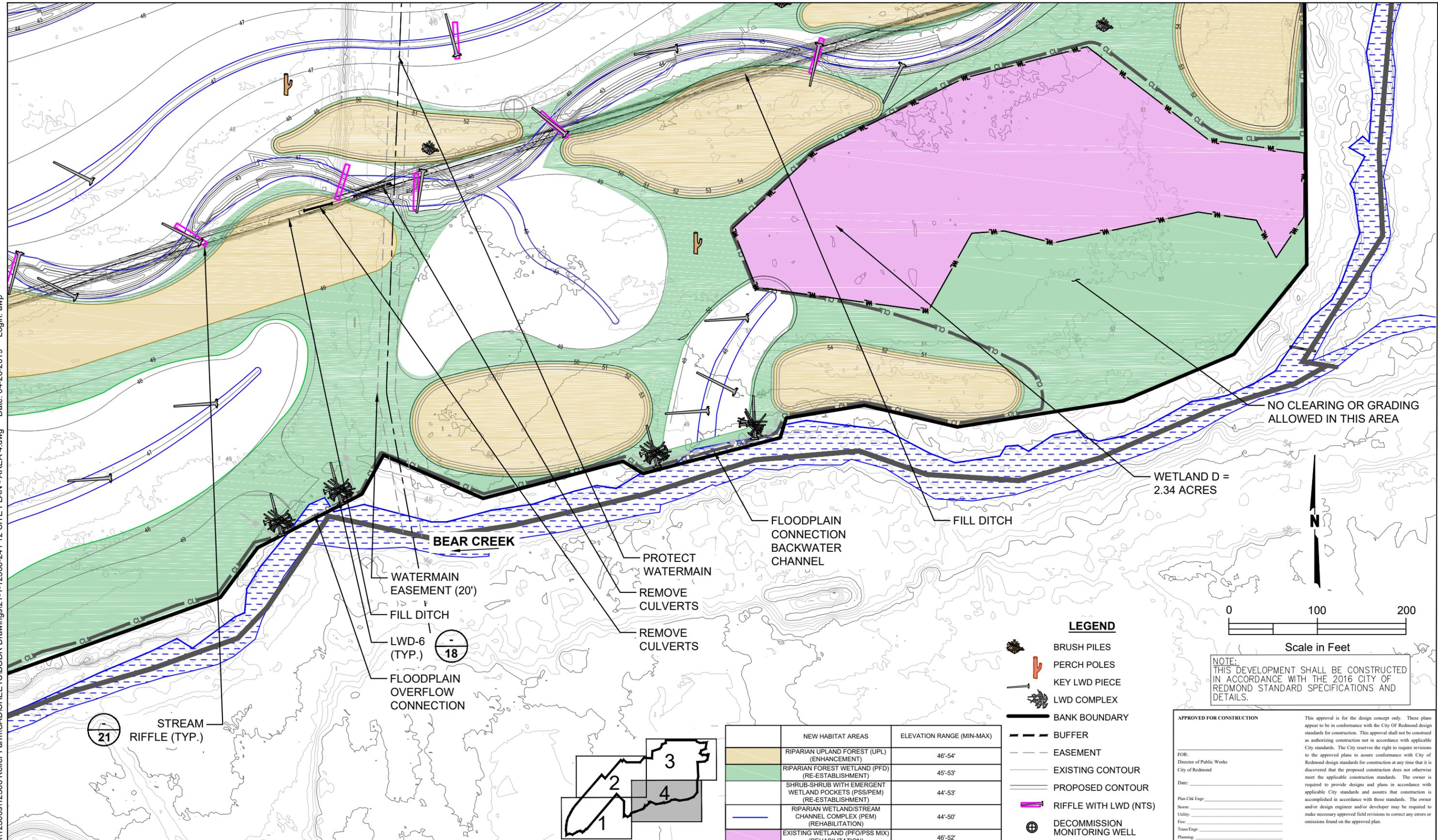
HABITAT BANK LLC
HABITAT BANK, LLC
P.O. BOX 354, KIRKLAND WA, 98083
(425) 205-0279

SHANNON & WILSON, INC.
TECHNICAL AND ENVIRONMENTAL CONSULTANTS
Seattle, Washington
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KELLER FARM MITIGATION BANK
SITE PLAN - AREA 3
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-12



21
STREAM RIFFLE (TYP.)

WATERMAIN EASEMENT (20')
FILL DITCH
LWD-6 (TYP.) 18
FLOODPLAIN OVERFLOW CONNECTION

BEAR CREEK

PROTECT WATERMAIN
REMOVE CULVERTS
REMOVE CULVERTS

FLOODPLAIN CONNECTION BACKWATER CHANNEL

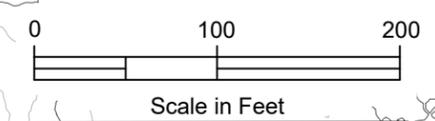
FILL DITCH

WETLAND D = 2.34 ACRES

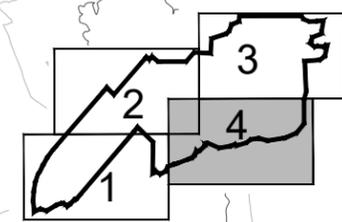
NO CLEARING OR GRADING ALLOWED IN THIS AREA

LEGEND

- BRUSH PILES
- PERCH POLES
- KEY LWD PIECE
- LWD COMPLEX
- BANK BOUNDARY
- BUFFER
- EASEMENT
- EXISTING CONTOUR
- PROPOSED CONTOUR
- RIFFLE WITH LWD (NTS)
- DECOMMISSION MONITORING WELL



NOTE: THIS DEVELOPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2016 CITY OF REDMOND STANDARD SPECIFICATIONS AND DETAILS.



NEW HABITAT AREAS	ELEVATION RANGE (MIN-MAX)
RIPARIAN UPLAND FOREST (UPL) (ENHANCEMENT)	46'-54'
RIPARIAN FOREST WETLAND (PFD) (RE-ESTABLISHMENT)	45'-53'
SHRUB-SHRUB WITH EMERGENT WETLAND POCKETS (PSS/PEM) (RE-ESTABLISHMENT)	44'-53'
RIPARIAN WETLAND/STREAM CHANNEL COMPLEX (PEM) (REHABILITATION)	44'-50'
EXISTING WETLAND (PFO/PSS MIX) (REHABILITATION)	46'-52'

APPROVED FOR CONSTRUCTION

FOR: _____
Director of Public Works
City of Redmond

Date: _____

Plan Chk Engr: _____
Storm: _____
Utility: _____
Fire: _____
Trans/Engr: _____
Planning: _____

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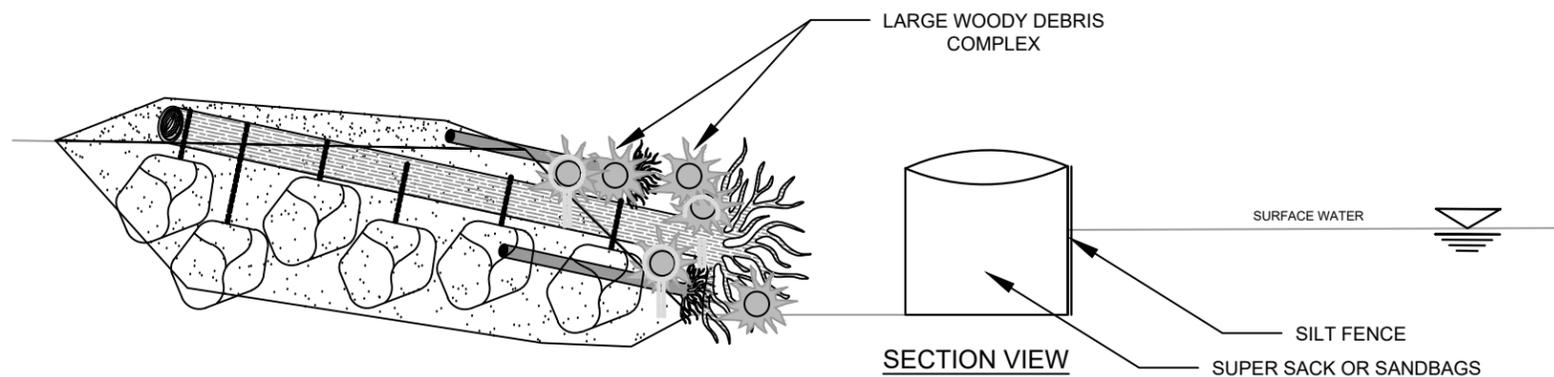
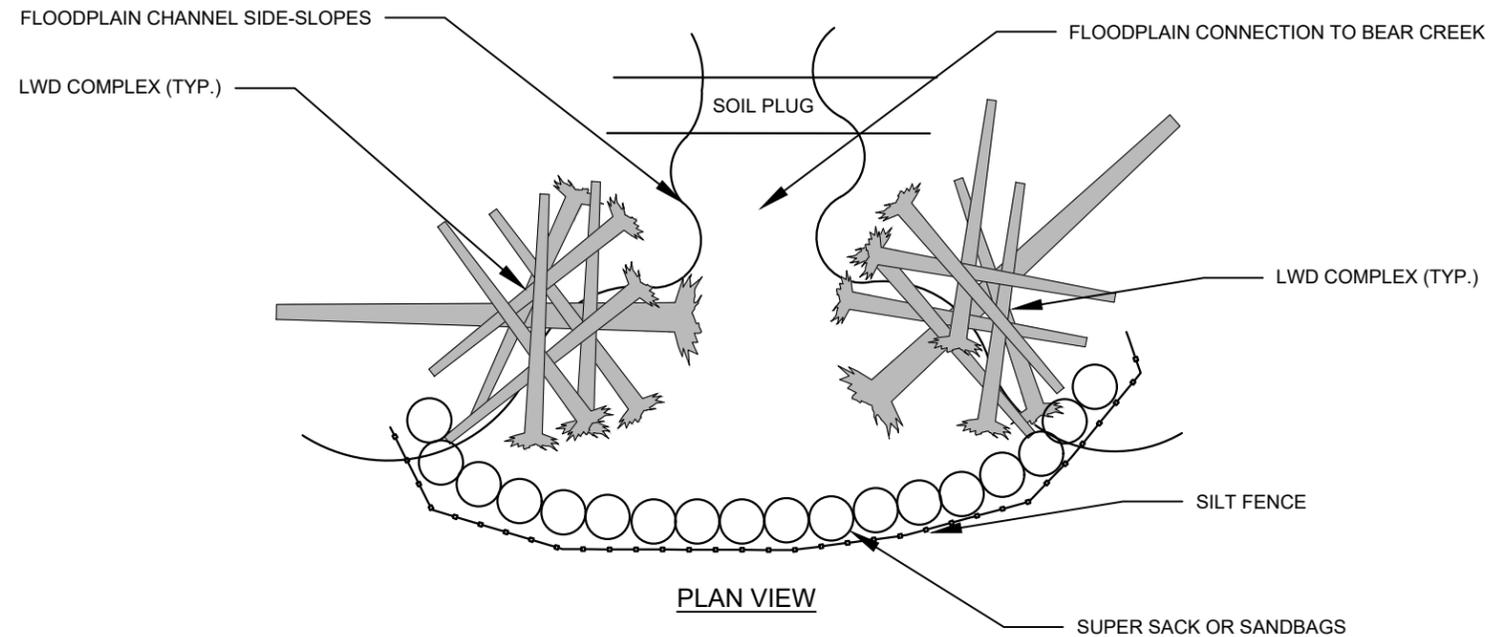


KELLER FARM MITIGATION BANK
SITE PLAN - AREA 4
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-13

Filename: I:\E\21-1 SEA\12500s\12566 Keller Farm\CAD\SHEETS\BODR Drawings\21-1-12566-241 13 Erosion Control Details.dwg Date: 04-25-2019 Login: awp

LARGE WOODY DEBRIS COMPLEX WATER ISOLATION BERM



INSTALLATION INSTRUCTIONS

- 1) FILL SUPER SACKS ON-SHORE WITH ROCKY MATERIAL. AVOID USING SILTY MATERIAL.
- 2) WIPE THE OUTSIDE AND BOTTOMS OF BAGS CLEAN BEFORE INSTALLATION INTO THE WATER BODY.
- 3) SLOWLY LOWER SUPER SACKS INTO CREEK.
- 4) START INSTALLING THE FIRST SUPER SACK AT THE UPSTREAM TOE OF SLOPE.
- 5) PLACE A SECOND SUPER SACK UPHILL ON THE BANK ADJACENT FIRST BAG.
- 6) CONTINUE TO PLACE SUPER SACKS IN AN ARC TO CREATE A CLEAN POOL TO CONTAIN SEDIMENT WHEN INSTALLING LWD COMPLEXES.
- 7) LINE TOP, INSIDE EDGE AND BOTTOM OF CREEK WITH A GEO-TEXTILE EROSION CONTROL FILTER FABRIC.
- 8) DO NOT DISTURB BOTTOM OF CREEK OR SIDE-SLOPES.

MAINTENANCE AND INSPECTION

- 1) WHILE INSTALLED DURING WORK HOURS, INSPECT CONDITION OF BAGS.
- 2) REMOVE ANY BAGS WITH ANY SIGNS OF TEARING OR RIPPING
- 3) LIFT BAGS WITH PROPER EQUIPMENT TO PROTECT THE BAGS DURING MOVING

NOTE:
THIS DEVELOPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2016 CITY OF REDMOND STANDARD SPECIFICATIONS AND DETAILS.

APPROVED FOR CONSTRUCTION

FOR: _____
Director of Public Works
City of Redmond
Date: _____
Plan Chk Engr: _____
Storm: _____
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Fire: _____
Trans/Eng: _____
Planning: _____

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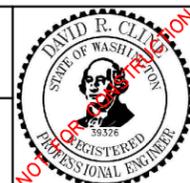
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KELLER FARM MITIGATION BANK
EROSION CONTROL DETAILS
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

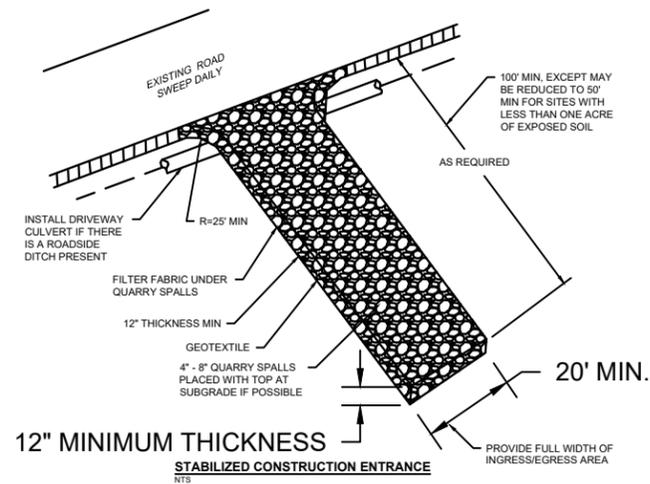
FIGURE

B-14

Filename: I:\E\21-1 SE\12500s\12566 Keller Farm\CAD\SHSHEETS\BODR Drawings\21-1-12566-241 14 TESC Details 2.dwg Date: 04-25-2019 Login: awp

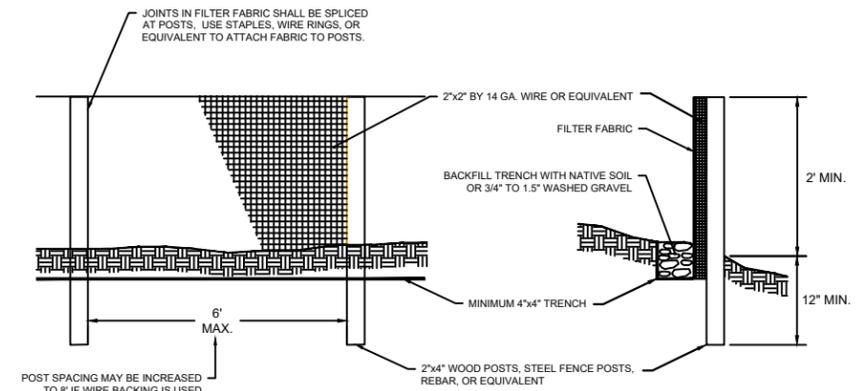
TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) DETAILS

CONSTRUCTION ENTRANCE DETAIL



NOTES:

1. STONE SIZE - USE 4" STONE OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - AS REQUIRED BUT NOT LESS THAN 50' (EXCEPT ON SINGLE RESIDENCE LOT WHERE A 30' MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN 12".
4. WIDTH - 20' MINIMUM BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. "FILTER FABRIC SHALL BE WOVEN STABILIZATION FABRIC WITH A MINIMUM PERMITTIVITY OF 0.9(SEC-1). PLACE FILTER FABRIC OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE. FILTER FABRIC IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENCE LOT."
6. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.
7. WHEEL WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
8. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

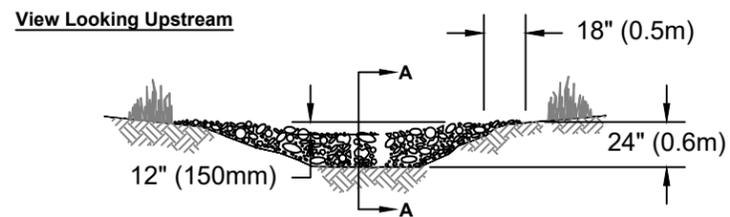


NOTE: FILTER FABRIC FENCES SHALL BE INSTALLED ALONG CONTOUR WHENEVER POSSIBLE.

SILT FENCE DETAIL

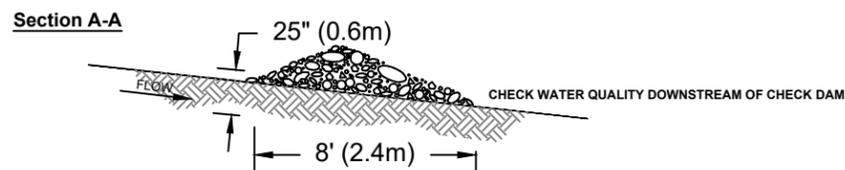
N.T.S.

ROCK CHECK DAM DETAIL



NOTE:

1. KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" (0.5M) TO PREVENT FLOW AROUND DAM.
2. STREAM AND RIFFLE BED MATERIALS ACCEPTABLE FOR GRAVEL CHECK DAMS.



NOTE: THIS DEVELOPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2016 CITY OF REDMOND STANDARD SPECIFICATIONS AND DETAILS.

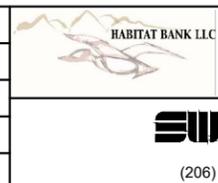
APPROVED FOR CONSTRUCTION

FOR: _____
 Director of Public Works
 City of Redmond
 Date: _____
 Plan Chk Engr: _____
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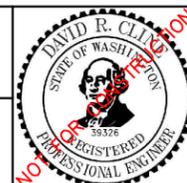
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DESIGNED BY: *SJH*
 DRAWN BY: *SJH*
 CHECKED BY: *DRC*
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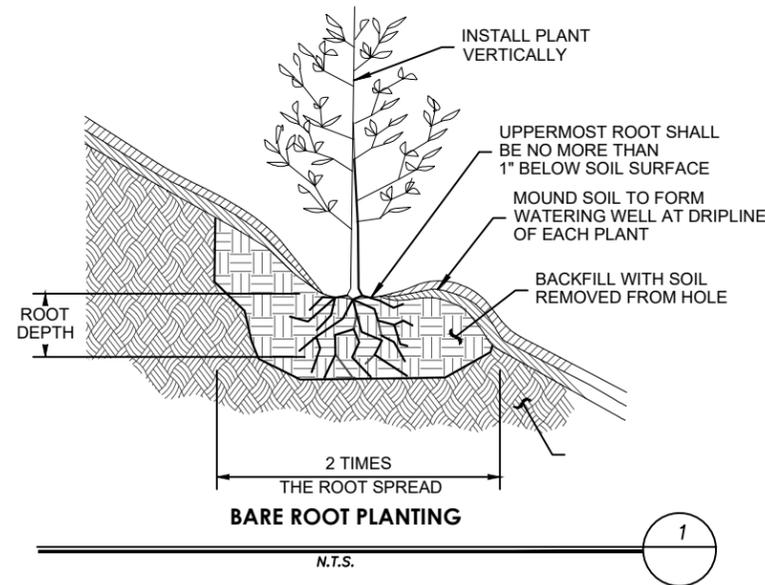
HABITAT BANK, LLC
 P.O. BOX 354, KIRKLAND WA, 98083
 (425) 205-0279



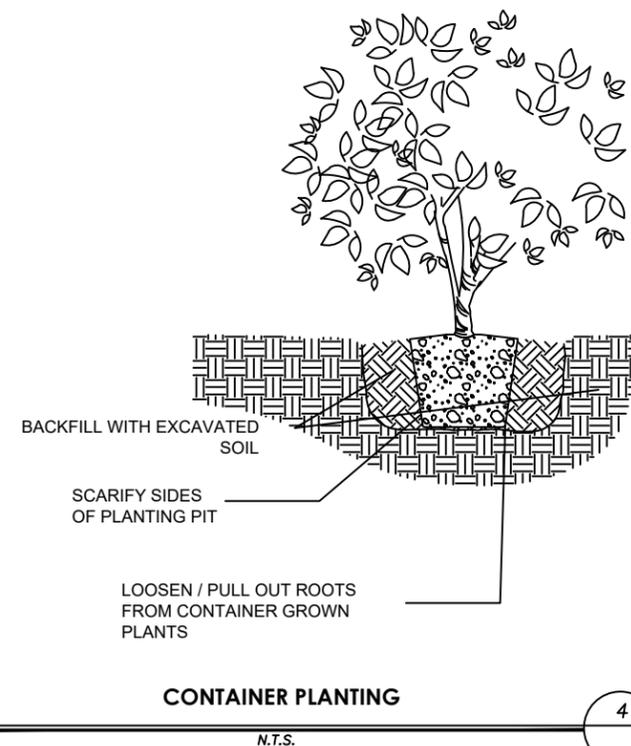
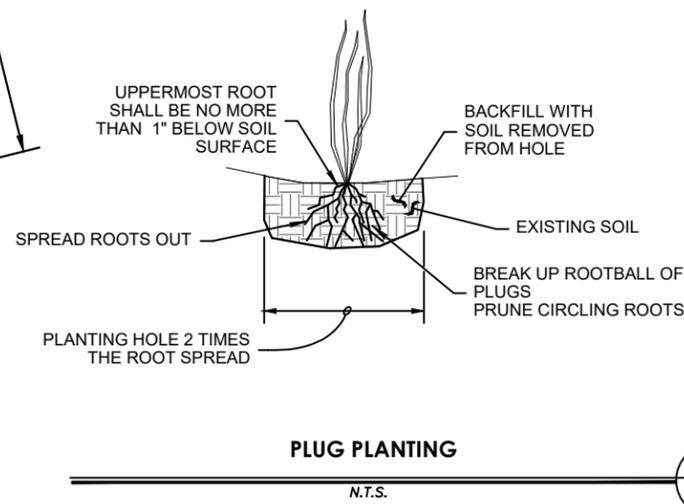
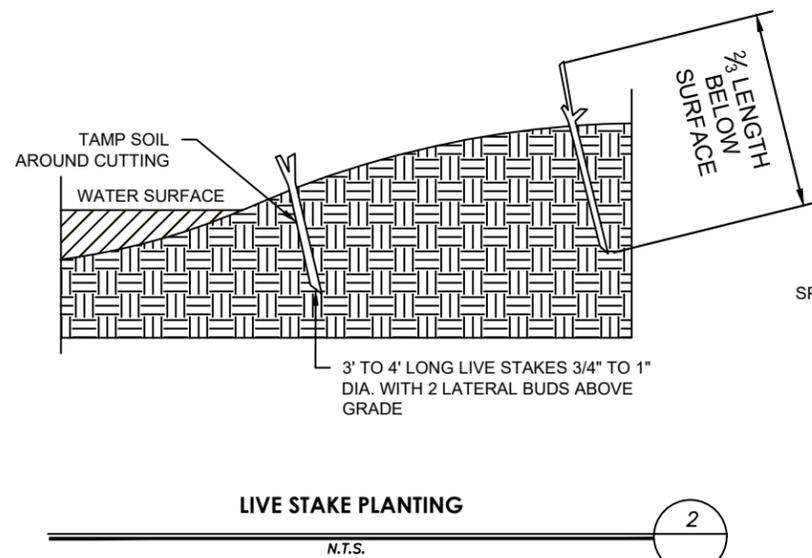
KELLER FARM MITIGATION BANK
 TESC DETAILS
 SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-15

1. THE BANK SPONSOR, IN CONSULTATION WITH THEIR CONTRACTORS, WILL DETERMINE THE TYPES OF PLANTINGS USED WITH EACH HABITAT AREA. PLANTING TOTALS, DENSITIES AND SPACINGS WILL BE AGREED UPON BY THE SPONSOR AND CONTRACTOR PRIOR TO PLANTING.
2. MULCHING WILL BE PLACED AT THE DISCRETION OF THE BANK SPONSOR AND AGREED UPON WITH THE CONTRACTOR.
3. HYDROSEEDING OR MECHANICAL SEED APPLICATION METHODS WILL BE UTILIZED AT THE DISCRETION OF THE BANK SPONSOR AND AGREED UPON BY THE CONTRACTOR.
4. PLANTING SHALL COMPLY WITH STANDARDS IN APPENDIX B OF THE KELLER FARM MITIGATION BANK MBI.
5. ALL PLANTING AREAS SHALL BE STRIPPED AND CLEARED OF ALL EXISTING ROOTS, NOXIOUS WEEDS, ROCKS, AND DEBRIS OR CONTAMINATED SOIL. RAKE SUB GRADE TO A SMOOTH AND EVEN GRADE FREE OF STONES LARGER THAN 1" AVERAGE DIAMETER. DO NOT STRIP OR CLEAR AREAS WITH EXISTING VEGETATION TO BE PRESERVED OR WHERE DOING SO WOULD DAMAGE ROOTS OF PLANTS TO REMAIN.
6. THE CONTRACTOR SHALL VERIFY ALL PLANT MATERIAL QUANTITIES PRIOR TO INSTALLATION. ANY PLANT MATERIAL QUANTITIES LISTED ARE FOR THE CONVENIENCE OF THE CONTRACTOR. ACTUAL NUMBER OF SYMBOLS SHALL HAVE PRIORITY OVER QUANTITY DESIGNATED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COUNTING THE TOTAL NUMBER OF PLANTS INDICATED ON THE PLANS AND ESTIMATING GROUND COVER QUANTITIES.
7. THE CONTRACTOR SHALL FURNISH AND PAY FOR ALL PLANTINGS.
8. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE AND PAY FOR: PLANTING OF ALL PLANT MATERIALS; THE SPECIFIED GUARANTEE OF ALL PLANT MATERIALS; THE STAKING AND GUYING OF TREES AND THE CONTINUOUS PROTECTION OF ALL PLANT MATERIALS UPON THEIR ARRIVAL AT THE SITE.
9. CONTRACTOR SHALL REPAIR/RESTORE ANY AREAS DISTURBED BY CONSTRUCTION TO PLANTING PLAN CONDITION



GENERAL LANDSCAPE NOTES



NOTE:
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City of Redmond
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Plan Chk Engr: _____
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Trans Engr: _____
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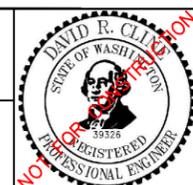
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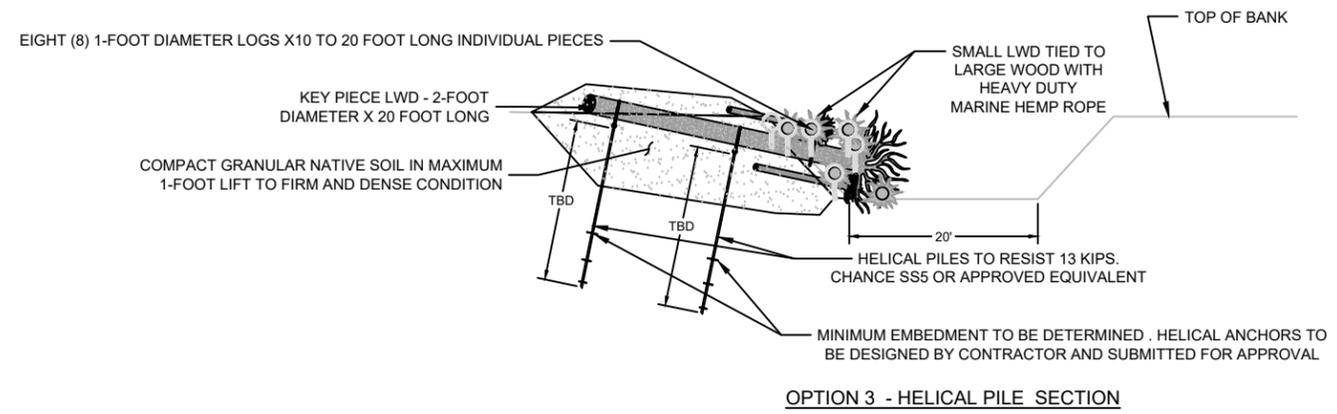
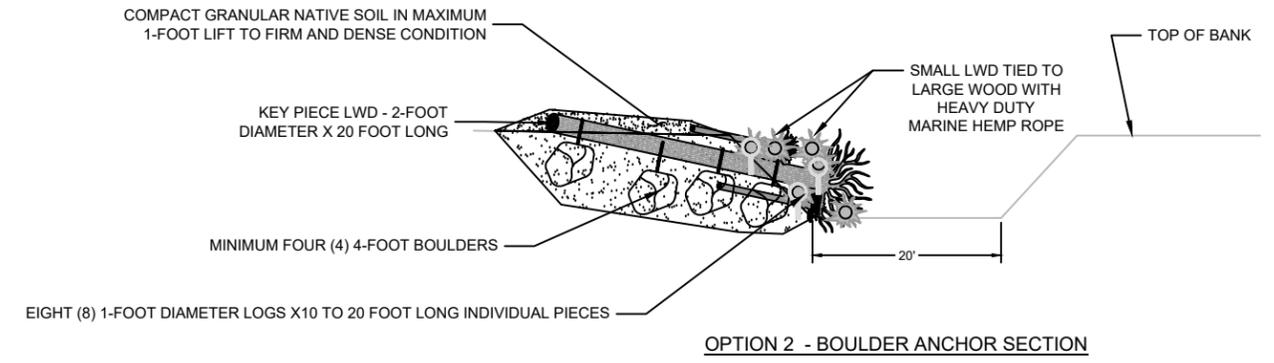
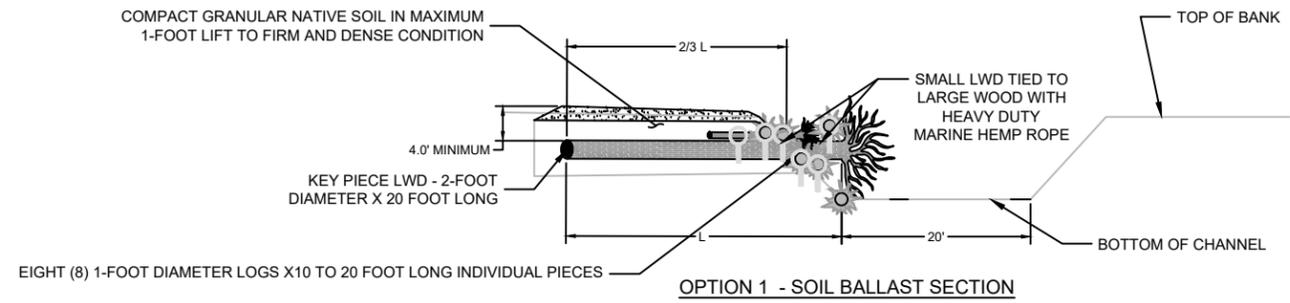
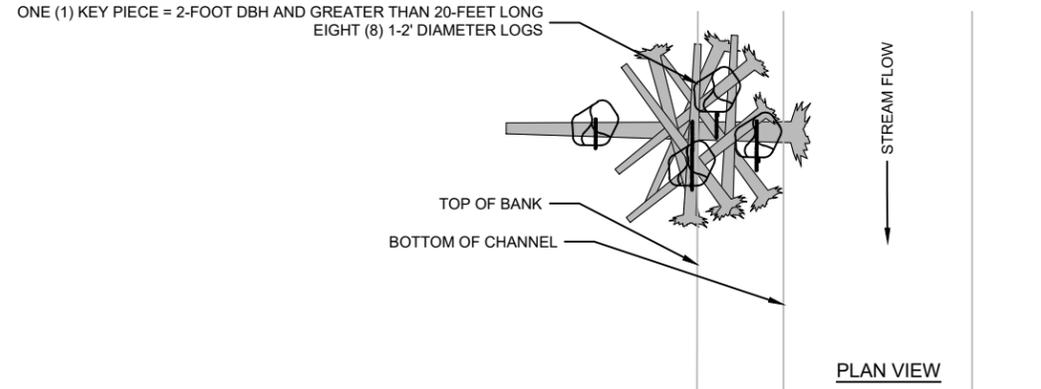


KELLER FARM MITIGATION BANK
PLANTING PLAN DETAILS
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-17

Filename: \\E:\21-1 SE\12500s\12566 Keller Farm\CAD\SHETS\BODR Drawings\21-1-12566-241 17 Engineered Log Jam 1.dwg Date: 04-25-2019 Login: awp

LWD COMPLEX DETAILS



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DRAWN BY *SJH*

CHECKED BY *DRC*

APPROVED BY _____

DATE April 2019

HABITAT BANK LLC

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KELLER FARM MITIGATION BANK

DETAILS - LARGE WOODY DEBRIS COMPLEXES

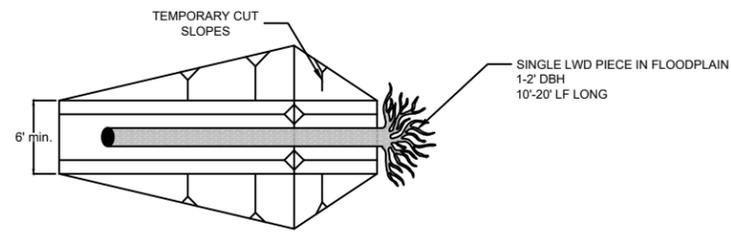
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE

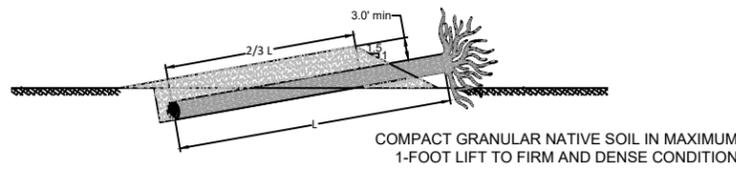
B-18

FLOODPLAIN LWD DETAIL

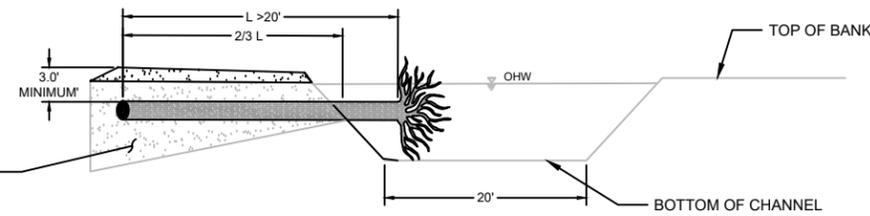
PLAN VIEW



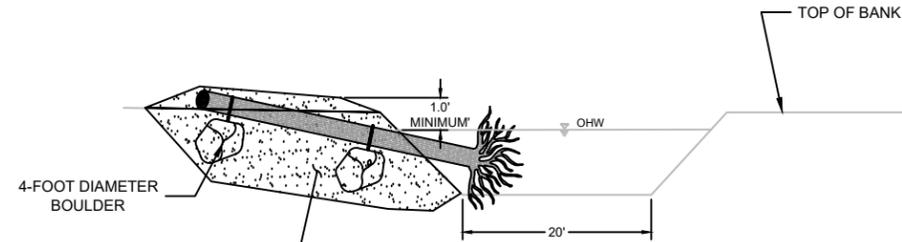
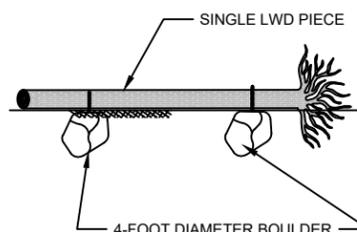
FLOODPLAIN WETLAND LAYOUT



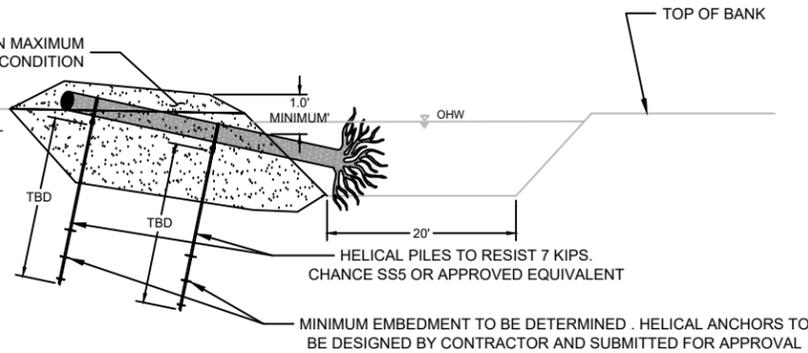
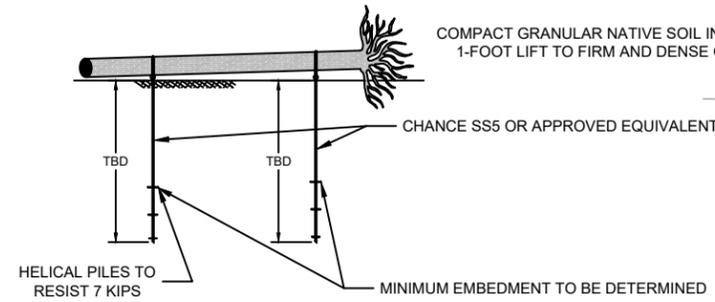
FLOODPLAIN STREAM LAYOUT



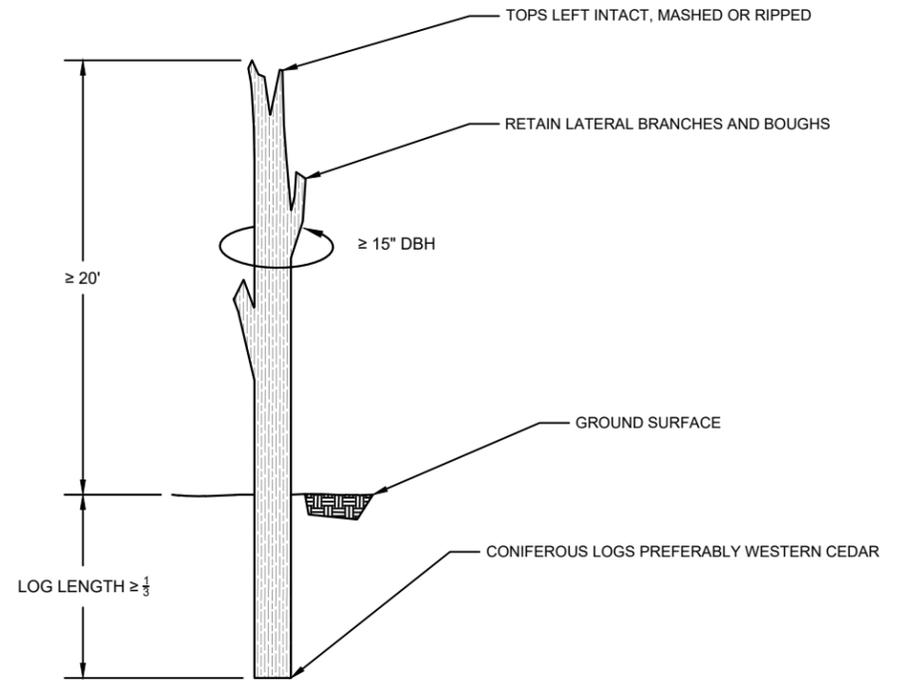
OPTION 1 - SOIL BALLAST SECTION



OPTION 2 - BOULDER BALLAST SECTION

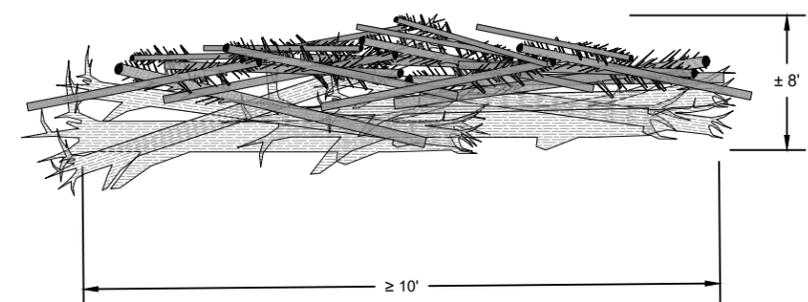


OPTION 3 - HELICAL PILE SECTION



PERCH POLE DETAIL

N.T.S.



BRUSH PILE DETAIL

N.T.S.

NOTE(S)

- CONTAINS 3 LAYERS OF BRUSH (RANGING FROM APPROXIMATELY 1/4" - 6" IN DIA.). THE LARGEST DIA. BRUSH LAYER ON THE BOTTOM OF THE PILE, WITH PROGRESSIVELY SMALLER DIA. BRUSH TOWARDS THE TOP OF THE PILE.

NOTE:
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APPROVED FOR CONSTRUCTION

FOR: _____
 Director of Public Works
 City of Redmond
 Date: _____
 Plan Chk Engr: _____
 Storm: _____
 Utility: _____
 Fire: _____
 Trans/Engr: _____
 Planning: _____

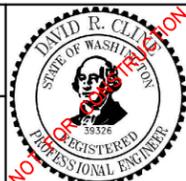
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REV	DATE	DESCRIPTION	BY	SUB	APP
1	11/3/17	DRAFT-FINAL			
2	3/27/18	REV. 1			
3	6/23/18	REV. 2			
4	10/05/18	REV. 3			
5	10/25/18	REV. 4			
6	04/25/19	REV. 5			

DESIGNED BY *SJH*
 DRAWN BY *SJH*
 CHECKED BY *DRC*
 APPROVED BY _____
 DATE April 2019

HABITAT BANK LLC
HABITAT BANK, LLC
 P.O. BOX 354, KIRKLAND WA, 98083
 (425) 205-0279

SHANNON & WILSON, INC.
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
 Seattle, Washington
 (206) 632-8020 www.shannonwilson.com

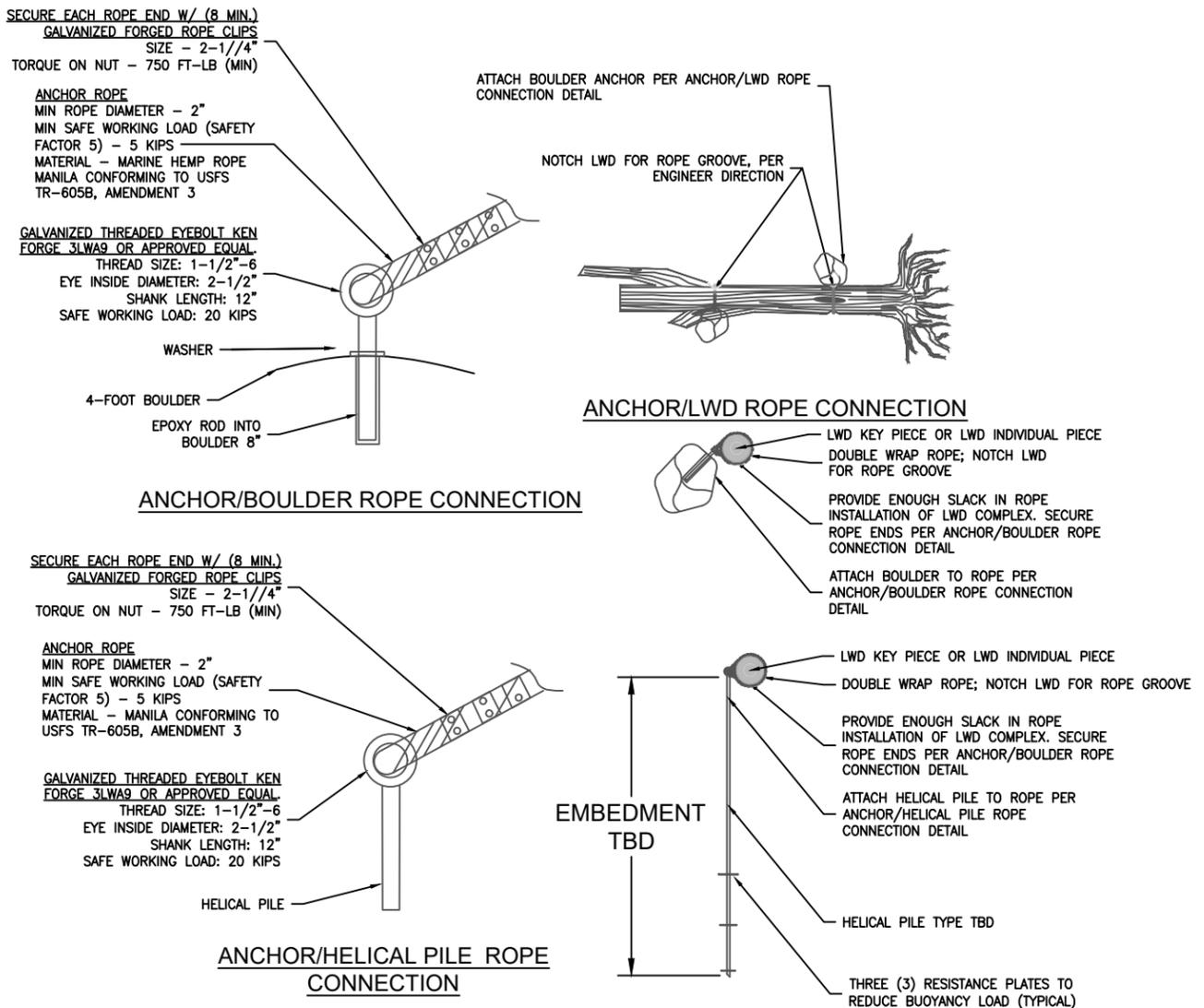


KELLER FARM MITIGATION BANK
 DETAILS - LARGE WOODY DEBRIS - SINGLE PIECE
 SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

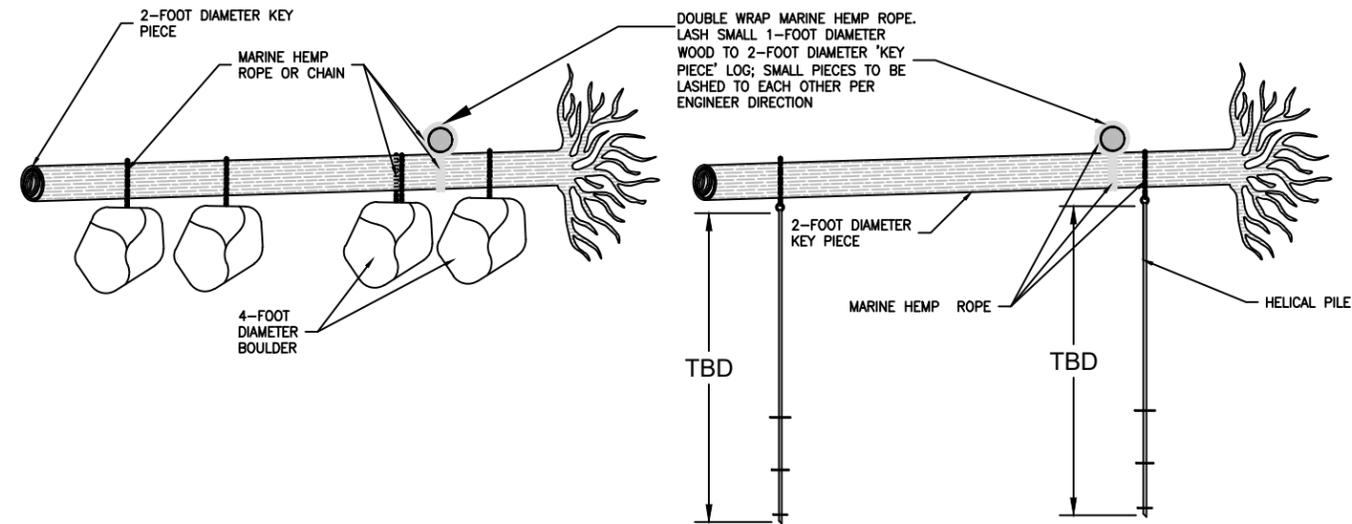
FIGURE
B-19

Filename: I:\E\F\21-1 SE\12500s\12566 Keller Farm\CAD\SHEETS\BODR Drawings\21-1-12566-241 17 Engineered Log Jam.dwg Date: 04-25-2019 Login: awp

LWD ANCHOR DETAIL



LWD KEY PIECE TO LOG CONNECTION DETAIL



- LWD ANCHORING NOTES**
1. ANCHOR LWD AT LOCATIONS SHOWN ON PLANS, LOCATIONS AT OR BELOW OHWM, AND AS DIRECTED BY ENGINEER
 2. DRILL 8" LONG 1-3/4" DIAMETER HOLE IN BOULDER.
 3. BLOW ALL DUST OUT OF DRILL HOLE USING OIL FREE COMPRESSED AIR AND WIRE BRUSH.
 4. FILL DRILL HOLE 1/2 TO 3/4 HOLE DEPTH WITH HILTE HIT-500-RE EPOXY.
 5. INSTALL THREADED ROD IN HOLE, TURNING COUNTER-CLOCKWISE UNTIL ANCHOR BOLT IS TOUCHING BOTTOM OF HOLE.
 6. NOTCH LWD WITH GROOVE FOR ANCHOR ROPE, OR DRILL HOLE THROUGH LWD.
 7. ATTACH ANCHOR ROPE TO THREADED ROD EYE. PROVIDE ENOUGH SLACK IN ROPE FOR BOULDER TO REST FIRMLY ON GROUND SURFACE W/O TENSION IN THE ROPE. BACKFILL AND COMPACT TO DENSE CONDITIONS FOR LWD'S IN TRENCH OR CUTS. USE SMALL VIBRATORY COMPACTOR TO ACHIEVE COMPACTION.

NOTE:
 THIS DEVELOPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2016 CITY OF REDMOND STANDARD SPECIFICATIONS AND DETAILS.

APPROVED FOR CONSTRUCTION

FOR: _____
 Director of Public Works
 City of Redmond

Date: _____

Plan Chk Engr: _____
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HABITAT BANK LLC

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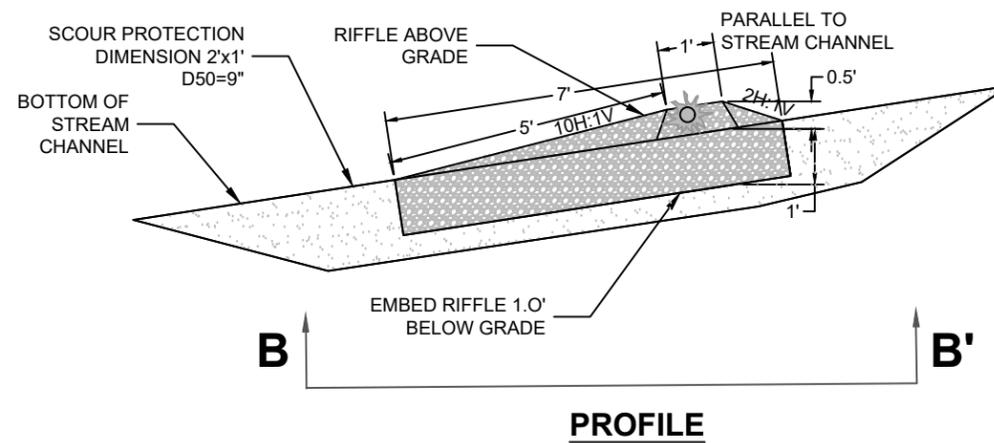
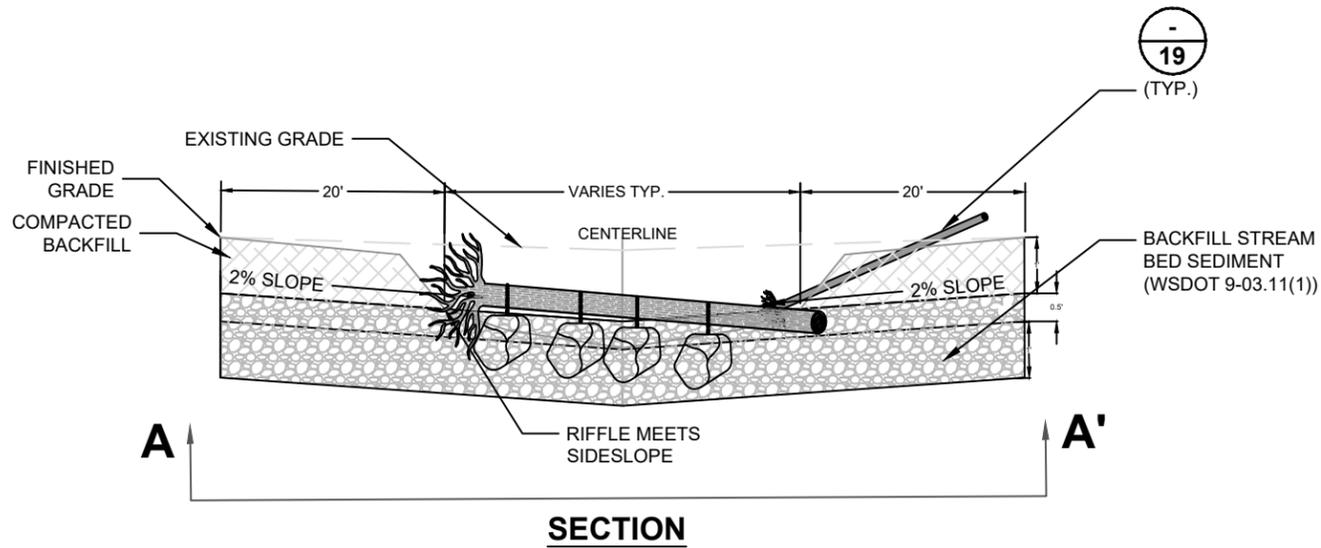
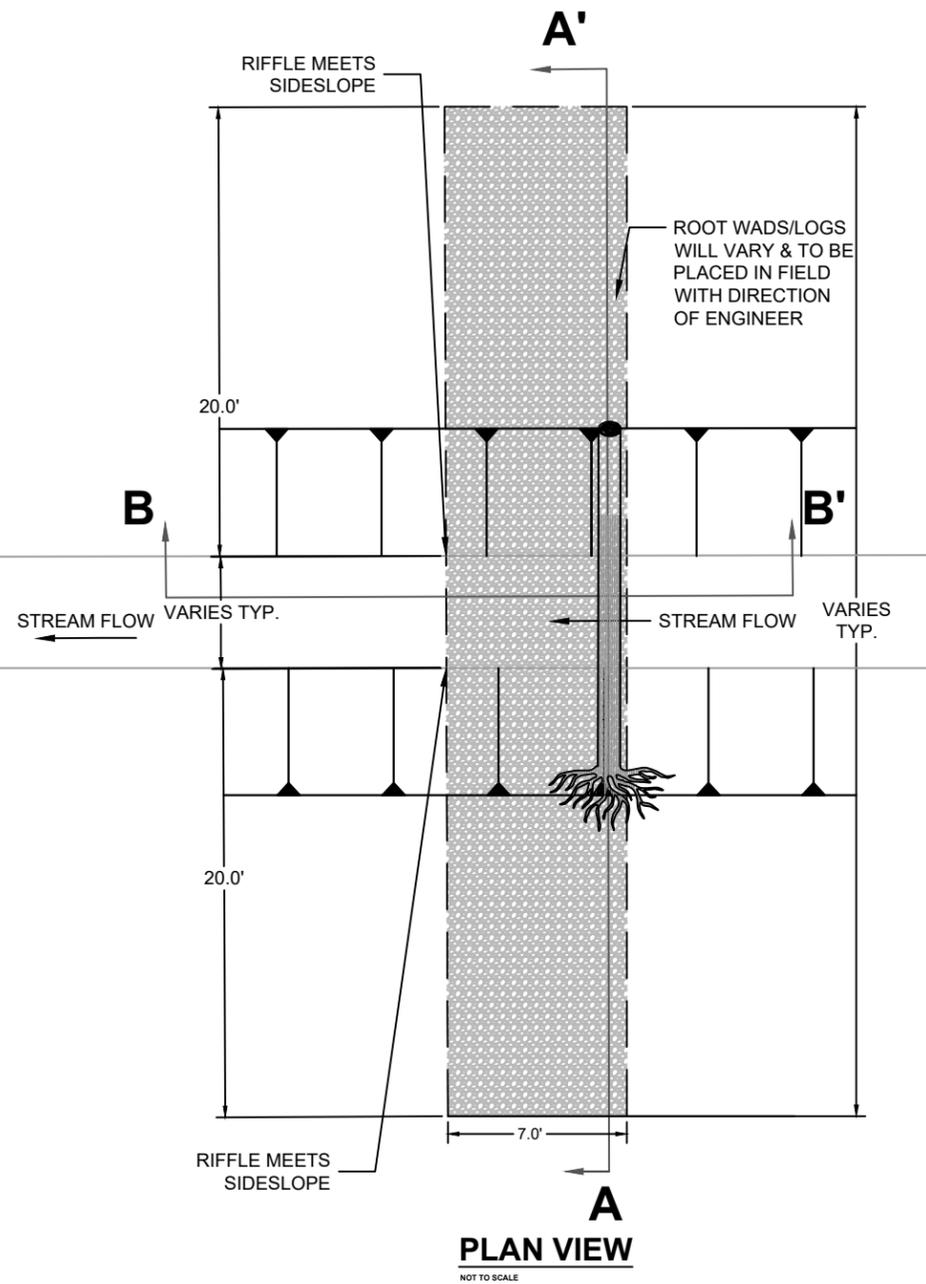
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KELLER FARM MITIGATION BANK
 LWD ANCHOR DETAIL
 SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-20

Filename: I:\E\21-1 SE\12500s\12566 Keller Farm\CAD\SHSHEETS\BODR Drawings\21-1-12566-241 19 Riffle Details.dwg Date: 04-25-2019 Login: awp



NOTE:
THIS DEVELOPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2016 CITY OF REDMOND STANDARD SPECIFICATIONS AND DETAILS.

APPROVED FOR CONSTRUCTION

FOR: _____
Director of Public Works
City of Redmond
Date: _____
Plan Chk Engr: _____
Storm: _____
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Fire: _____
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DESIGNED BY *SJH*
DRAWN BY *SJH*
CHECKED BY *DRC*
APPROVED BY _____
DATE April 2019



HABITAT BANK, LLC
P.O. BOX 354, KIRKLAND WA, 98083
(425) 205-0279



KELLER FARM MITIGATION BANK
FLOODPLAIN STREAM RIFFL DETAIL
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
B-21

APPENDIX C BANK OBJECTIVES AND PERFORMANCE STANDARDS

C.1. Requirements for Bank Objectives and Performance Standards

A. Implementation of the Keller Farm Mitigation Bank is anticipated to result in substantial gains in aquatic ecosystem functions, as compared to those now present as of the date of execution of the MBI, or those that would likely accrue on the site if the Bank were not constructed. The Sponsor must be able to demonstrate tangible aquatic ecosystem gains before Bank credits can be awarded for sale, use or other transfer, because these functional gains will be used to offset comparable losses to other components of the aquatic environment in the Bank service areas. The Bank's success will be measured by the enumerated objectives, each of which is subdivided into specific performance standards. The prescribed performance standards each provide a gauge for measuring the success of the ecological re-establishment and rehabilitation of wetland and stream areas and enhancement of upland areas at the Bank.

B. Unless otherwise noted, all documentation required for demonstrating attainment of performance standards will be submitted to the IRT for review and approval as a condition of credit award. Documentation can typically be included in required monitoring reports. IRT award of credits will be reflected in a letter issued using a joint letterhead and signed by the Corps and Ecology.

C. Recreational, educational, and scientific activities that do not conflict with the use limitations or other provisions of the conservation easement, do not interfere with the delineated purposes and goals of the Bank, and do not adversely affect the ecological viability and functionality of the Bank may take place on the Bank site. Specifically, the site may be used for walking, bird watching, and other passive recreation activities that are allowed by and within the City of Redmond. The City of Redmond properties included in the Bank may be accessed in the future by the public for the activities described above only through an elevated pedestrian trail, included as a separate easement on the Bank site¹.

D. All performance standards apply to the entirety of the Bank site including buffer areas, trail easement, and utility easements.

C.2. Bank Objectives and Performance Standards

Objective 1: Protect Aquatic Ecosystem Functions

Permanently protect aquatic ecosystem functions at the Bank by instituting the Instrument and implementing a conservation easement with permanent funding for site stewardship. Each of the performance standards associated with this objective must be met before any Bank credits may be awarded, and before any construction or implementation activities may be initiated pursuant to this Instrument. Any construction or implementation activities conducted on-site prior to the

¹ The City of Redmond Pedestrian Trail Easement refers to the reserved right of the City of Redmond to construct a pedestrian trail. This right may be conveyed as an easement to a third-party at some time in the future.

inception of the establishment period must cease as of the effective date of this Instrument pursuant to Article VI.B.1, until the Objective 1 performance standards 1.A through 1.E have been accomplished. The initial award of credits in recognition of accomplishment of these performance standards will serve as the IRT’s notification that construction and implementation activities are authorized to commence.

Performance Standard	Documentation
1A. Complete the development of an appropriate Mitigation Banking Instrument and Appendices.	Mitigation Banking Instrument has been signed by the Sponsor and the applicable regulatory agencies. An original signed Instrument must be provided to each of the signatories.
1B. Protect ecosystem function by placing an IRT-approved conservation easement on the property.	Provide the IRT copies of the signed, IRT-approved conservation easement and evidence that the document has been recorded with King County and placed on the property title.
1C. Provide financial assurance by establishing an IRT-accepted financial assurance mechanism pursuant to the requirements established in Article III.C.1. of the Instrument.	Demonstrate to the IRT that a compliant and acceptable financial assurance mechanism has been established to provide financial assurance for the establishment period.
1D. Establish a Long-Term Management and Maintenance Endowment Fund escrow account and develop an escrow agreement, all pursuant to the requirements established in Article III.C.2 of the Instrument.	Demonstrate to the IRT that a Long-Term Management and Maintenance Endowment Fund has been initiated through establishment of a compliant and acceptable escrow account. Enter into an escrow agreement with the Corps and Ecology.
1E. Obtain all appropriate environmental documentation, permits, and other authorizations needed to establish and maintain the Bank.	Provide IRT with copies of all environmental documentation, permits, and other authorizations.

Objective 2: Hydrology

Create additional wetland hydrology and fish accessible aquatic habitat in the graded portions of the Bank site and maintain existing wetland hydrology on the remainder of the site. Increase and improve floodplain connectivity and fish accessibility to riparian habitat, streams and wetland areas adjacent to Bear Creek. Restore hydrology to stream and riparian areas to increase fish access to off-channel habitat areas. Remove culverts and agricultural drainage ditches and re-meander ditches to re-establish and rehabilitate wetlands and improve riparian habitat areas.

Performance Standard	Documentation
<p>2A. Grading work and installation of stream riffle structures and large woody debris complexes on the site completed according to IRT approved grading plans. Remove and disable all culverts across the site.</p>	<p>As-built drawings and photographs showing grading, stream riffle structure installation and LWD complex installation completed per the approved plan with key elevations and cross sections are approved by the IRT. Documentation of culvert removal with photos of disabling and removal at the time of construction are submitted to and approved by the IRT. The grading as-built report for the project can be submitted before site planting is complete.</p>
<p>2B. A minimum of 54 acres on the site, not including the Bank buffer areas or easements, will have wetland hydrology present at Year 3.</p>	<p>A wetland determination will be performed in Year 3. To demonstrate wetland hydrology, soil will be saturated within 12 inches below the soil surface, or there will be free water in soil pits or shallow water wells at 12 inches or less below the soil surface for at least 30 consecutive days during the growing season, under normal precipitation or wetter conditions, where the growing season is defined as February 7 through December 1. Wetlands will be mapped across the Bank site (including buffers and easements). A monitoring report with maps and data from data loggers, wells, and/or soil pits sufficient to document the extent of wetland hydrology on the site is approved by the IRT. Refer to ERDC/EL TR_WRAP-00-1 and ERDC/EL TR_WRAP-05-2 to determine whether normal precipitation conditions are present and for water table monitoring methods.</p>
<p>2C. A minimum of 54 acres of wetland will be present on the Bank site, not including the Bank buffers or easements, at Years 5 and 10.</p>	<p>In years 5 and 10, wetlands will be delineated according to the 1987 Corps of Engineers Delineation Manual and appropriate regional supplement in effect at the time of delineation. In addition, the ordinary high-water mark (OHWM) of all streams will be delineated according to methodology approved by Washington State Department of Ecology and U.S. Army Corps of Engineers. Wetland and stream delineation reports are submitted to and approved by the IRT in Years 5 and 10. Wetlands and streams will be delineated on the entire Bank site including the buffers and easement areas.</p>

Objective 3: Vegetation

Remove noxious and invasive species and establish native wetland and adjoining upland vegetation communities, in accordance with the MBI planting plan and the targeted hydrologic regimes across the site.

Note: “Cover” is used in this MBI to mean the actual proportion of the ground surface of the sample plot that is covered by a vertical projection of foliage (by a single species or defined group of species) as viewed from above, or below for taller shrubs and trees, or by bare substrate.

Performance Standards for All Areas of the Site:

Performance Standard	Documentation
3A. Site planting completed according to IRT approved planting plan.	As-built planting plan showing completed planting submitted to and approved by the IRT. Include a species list, plant spacing and density measurements, seeding rate, and final planted acreages of vegetative community types.
3B. Within PEM, PSS, and PFO wetlands in the floodplain including the Riparian Upland Habitat, the following noxious and invasive species do not collectively exceed 10% cover at Years 3, 5, 7 and 10 : poison hemlock (<i>Conium maculatum</i>), Himalayan blackberry (<i>Rubus armeniacus</i>), evergreen blackberry (<i>Rubus laciniatus</i>), Scotch broom (<i>Cytisus scoparius</i>), tansy ragwort (<i>Senecio jacobaea</i>), common tansy (<i>Tanacetum vulgare</i>), Canada thistle (<i>Cirsium arvense</i>), jewelweed (<i>Impatiens capensis</i>), yellow-flag iris (<i>Iris pseudacorus</i>), and bull thistle (<i>Cirsium vulgare</i>). Cover is not averaged for the entire site – maximum applies to each habitat type. Additional species may be added pursuant to Article VI.B.2.	Monitoring reports documenting non-native invasive species presence and percent cover approved by IRT. Document the percent cover of invasive species in each habitat type and each data plot at Years 3, 5, 7 and 10.
3C. Cover of reed canarygrass (<i>Phalaris arundinacea</i>) does not exceed 30% within the Riparian Upland and PSS and PFO wetlands areas, and 15% within the PEM wetland areas at Years 3, 5, 7 and 10. Cover is not averaged for the entire site; the maximum applies to each habitat type.	Monitoring reports documenting non-native invasive species presence and percent cover are submitted to and approved by IRT. Document the percent cover of invasive species in each habitat type and each data plot at Years 3, 5, 7 and 10.
3D. Over the entire Bank site there will be zero presence of invasive knotweed [Japanese knotweed (<i>Polygonum cuspidatum</i>), giant knotweed (<i>Polygonum sachalinense</i>), Himalayan knotweed (<i>Polygonum polystachyum</i>), Bohemian knotweed	Monitoring reports documenting identification and eradication are submitted to and approved by the IRT. Inventory annually and include in monitoring reports at Years 1, 3, 5, 7 and 10.

<p>(<i>Polygonum x bohemicum</i>) and related hybrids], purple loosestrife (<i>Lythrum salicaria</i>), holly (<i>Ilex aquifolium</i>), English ivy (<i>Hedera helix</i>), and bindweed (<i>Convolvulus arvensis</i>, <i>Convolvulus sepium</i>, <i>Convolvulus silvaticus</i>, and <i>Fallopia convolvulus</i>). Any existing specimens will be mapped and eliminated. Map any specimens and eradicate during the growing season of each year. Additional species may be added pursuant to Article VI.B.2.</p>	
--	--

Performance Standards for Existing and Proposed Palustrine Emergent Wetland Areas:

Performance Standard	Documentation
<p>3E. In the PEM wetland areas, there will be at least 5 native herbaceous facultative or wetter species present. At least 3 native facultative or wetter species will each have a minimum of 5% cover at Years 3, 5, 7 and 10.</p>	<p>In each of Years 3, 5, 7 and 10 monitoring reports documenting species presence and percent cover in data plots and other locations as located by GPS and shown on the plot map are submitted to and approved by the IRT. Provide photos from established photo points.</p>
<p>3F. In the PEM wetland areas, native emergent plant species have a minimum of 30% cover at Year 1; 45% cover at Year 3; 60% cover at Year 5; 70% cover at Year 7; and 80% at Year 10.</p>	<p>In Years 1, 3, 5, 7 and 10 monitoring reports documenting native emergent plant species percent cover are submitted to and approved by the IRT.</p>

Performance Standards for Palustrine Scrub-shrub Wetland Areas:

Performance Standard	Documentation
<p>3G. In the created PSS habitat (including existing PEM converted to PSS), native tree and shrub species shall have a minimum density of at least 600 trees and shrubs per acre at Year 1; 400 per acre at Year 3; and will have a minimum of 60% cover at Year 5; 70% cover at Year 7; and 80% cover at Year 10.</p>	<p>Monitoring reports documenting density of native trees and shrubs in Years 1 and 3, and percent cover of native trees and shrubs in Years 5, 7 and 10 are submitted to and approved by the IRT.</p>

Performance Standards for Palustrine Forested Wetland Areas:

Performance Standard	Documentation
<p>3H. In the created PFO habitat (including existing PEM converted to PFO), PFO wetland areas shall have a minimum density of native trees of at least 350 trees per acre at Year 1; 300 trees/acre at Year 3; 250 trees/acre at Year 5; and 200 trees/acre at Year 7 and Year 10.</p> <p>NOTE: Trees are defined as those species that have the potential to reach greater than 20 feet in height at maturity.</p>	Monitoring reports documenting native tree density are submitted to and approved by the IRT. Density for native trees within PFO plots will be recorded for Years 1, 3, 5, 7 and 10.
<p>3I. In the created PFO habitat (including existing PEM converted to PFO), PFO wetland areas will have a minimum percent cover of native trees and shrubs of 25% cover at Year 3; 40% cover at Year 5; 60% cover at Year 7; and 70% cover at Year 10.</p>	Monitoring reports documenting cover of native trees and shrubs in Years 3, 5, 7 and 10 are submitted to and approved by the IRT.

Performance Standards for Riparian Upland Enhancement Areas:

Performance Standard	Documentation
<p>3J. Native woody species in the Riparian Upland enhancement areas shall have a minimum density of at least 600 trees and shrubs per acre at Year 1; and 500 trees and shrubs per acre at Year 3; and will have a minimum of 40% cover at Year 5; 60% cover at Year 7; and 70% cover at Year 10.</p>	Monitoring reports documenting density and percent cover of native trees and shrubs are submitted to and approved by the IRT in Years 1, 3, 5, 7 and 10.

Objective 4: Habitat

Create and improve habitat for fish and wildlife on the site by reconnecting Bear Creek to the floodplain, recontouring ditches, and providing structure, cover and a diversity of habitat types across the site and a reduction in water temperature. Install habitat features including perch poles, brush piles, LWD pieces (downed logs and root wads), and wood duck nest boxes, to create additional habitat for small mammals, birds, and amphibians. Improve fish passage and access to wetland habitat areas on site. Install site fencing and site protection signs. Remove derelict agricultural equipment, garbage, and debris from the site.

Performance Standard	Documentation
<p>4A. Remove derelict agricultural equipment, garbage and debris from the site. Install habitat features: perch poles, brush piles, LWD pieces (downed logs, root wads) and wood duck nest boxes per the approved drawings and habitat features plan. Install</p>	As-built photos showing installation of brush piles, perch poles, LWD pieces, and wood duck nest boxes (habitat features) are submitted to and approved by the IRT. As-built drawing showing installation locations of the habitat features, fencing, and signage

fencing and signage around Bank site, per City requirements.	around the Bank are submitted to and approved by the IRT.
4B. A minimum of 80% of the original number, as shown on the approved as-built drawings, of each type of habitat feature will be present and in functioning condition at Year 10. Habitat features include: perch poles, brush piles, LWD pieces (downed logs, root wads), and wood duck nest boxes.	Monitoring report documenting the location and condition of habitat features at Year 10 is submitted to and approved by the IRT. NOTE: LWD recruited and secured to the site by established vegetation will qualify towards the final 80% remaining calculation.
4C. Water temperatures measured at one point in the established floodplain stream just before it enters Bear Creek will be monitored in Years 1, 2, 3, 5, 7 and 10 from May through October. Temperature monitoring will show a decrease in maximum 7-day average daily temperature for Years 5, 7 and 10 as compared with the maximum 7-day average daily temperatures recorded in Years 1, 2 and 3. NOTE: Two data loggers will be installed at the monitoring location (one backup in case of failure) to record water temperatures on a 30-minute (minimum) time scale for each year.	Monitoring report documenting the decrease in water temperatures at Years 5, 7 and 10 are submitted to and approved by the IRT.

APPENDIX D CREDIT GENERATION AND AWARD SCHEDULE

D.1 Definition of Credit Values

A. “Credits” will be established and awarded to the Bank upon the Sponsor’s demonstration that the performance standards reflected in Appendix C, Section C.2. have been met.

B. A Credit is defined as a unit of measure representing the increase in the ecological values of different habitat types on the Bank site. A credit for this Bank represents the increase in functions and values, and areal extent of the wetland systems and riparian areas on the Bank site. This increase in functions results from the re-establishment and rehabilitation of wetlands and streams, and the enhancement of riparian uplands on the Bank site, as detailed in Appendix B and **Table D-1** below. Wetland restoration actions are grouped into “re-establishment” and “rehabilitation” categories, based on the type and level of restoration actions that will be performed on the Bank site. The anticipated number of credits reflected in **Table D-1** are determined based on the projection, if the performance standards are achieved, that the re-established and rehabilitated wetlands and streams, and the enhanced riparian upland habitat areas will rate as high functioning wetland, stream, or associated upland habitat, upon maturity.

C. The precise number of credits actually generated by the Bank cannot be determined until the project is constructed and the success of restoration and enhancement activities is assessed by the Corps and Ecology, in consultation with the IRT. The final number of Credits will be determined by the Corps and Ecology, in consultation with the IRT, and will be based on achievement of the performance standards set forth in Appendix C of this instrument.

D.2 Credit Generation

A. Credits generated by the Bank will be calculated as shown in **Table D-1** below. The total amount of Credit that can be generated at the Bank site is 53.34 Credits. This includes credits generated by 46.20 acres of reestablished wetlands, 11.60 acres of rehabilitated wetlands and stream channel habitat, and 6.70 acres of enhanced riparian uplands.

Table D-1: Credit Generation by Bank Development Activity

Bank Activity by Area and Cowardin Class	Acres of Creditable Area	Non-Creditable Acres (Bank Buffers and Easements*)	Credit Generation Ratio (Restoration Area: Credit generated)	Anticipated Number of Credits
Riparian Upland Forest (UPL) (Enhancement)	6.70	5.20	5:1	1.34
Riparian Forested Wetland (PFO) (Reestablishment)	17.50	1.60	1:1	17.50
Shrub-Scrub with Emergent Wetland Pockets (PSS/PEM) (Reestablishment)	28.70	3.30	1:1	28.70
Riparian Wetland/Stream Channel Complex (PEM) (Rehabilitation)	3.90	0.40	2:1	1.95
Existing Wetland (PFO/PSS Mix) (Rehabilitation)	7.70	0.20	2:1	3.85
Total Acres Creditable and Non- Creditable	64.50	10.70		
Total Bank Site Area:	75.20			
Total Credits Available:				53.34

*The City of Redmond Pedestrian Trail Easement refers to the reserved right of the City of Redmond to construct a pedestrian trail. This right may be conveyed as an easement to a third-party at some time in the future.

B. Non-creditable Bank buffers total 9.8 acres on the Bank site. The City’s pedestrian trail easement¹ and City waterline easement total 0.9 acres on the Bank site. Non-creditable Bank buffers protect the functions and values of the credit generating portions of the Bank site and are at widths of 30, 50 and 100 feet, based upon the current and expected adjacent land use intensities around the Bank, and the current and expected waterline and pedestrian trail easements within the Bank site. Where there is no buffer on the Bank site, the adjacent land use is either already buffered by a physical barrier between the Bank and the adjacent property (e.g., Bear Creek) or the adjacent land use is restricted and protected by a restrictive covenant, deed restriction, or conservation easement on that adjacent property.

If the City does not reserve the right in the Conservation Easement to construct a pedestrian trail over the Bank property, the Bank Sponsor may request through modification of this Instrument under Article VI.B., and the Co-Chairs will consider in consultation with the other members of the IRT, that credits be calculated and awarded associated with the achievement of the applicable performance standards associated with those restored habitat areas within the former trail easement and associated buffer across the Bank site.

¹ The City of Redmond Pedestrian Trail Easement refers to the reserved right of the City of Redmond to construct a pedestrian trail. This right may be conveyed as an easement to a third-party at some time in the future.

D.3 Credit Award Schedule:

A. Credits will be awarded to the Bank for sale, use, or other transfer as the performance standards associated with those credits are met, with the following exceptions: (1) no credits may be awarded prior to meeting all of the performance standards associated with Objective 1 in Appendix C, and (2) no credits associated with the Year 10 performance standards may be awarded until at least 60% of all possible credits associated with Years 0 through 9 have been awarded.

B. The Corps and Ecology, in consultation with the IRT, will typically approve the award of credits according to the schedule in **Table D-2**, below. Credits may not be awarded sooner than specified in **Table D-2**, except where otherwise noted or in extraordinary situations with the written approval of the Corps and Ecology, in consultation with the IRT. If the Bank is not able to meet a particular performance standard by the year indicated in **Table D-2**, the Sponsor may submit documentation of successful satisfaction of that performance standard during a subsequent year, and the Corps and Ecology, in consultation with the IRT, will give full consideration to the award of appropriate credits for sale, use, or transfer without reduction or other penalty.

C. The Corps and Ecology may, at their discretion, following consultation with the IRT, award partial credit for partial accomplishment of a performance standard. In the event a specific performance standard is not met, but the IRT feels that the site is progressing satisfactorily, the Corps and Ecology may at their discretion, following consultation with the IRT, award credits.

D. Once a credit is awarded, the Bank may sell, use, or otherwise transfer that credit at any time, subject to the provisions of this Instrument.

E. If the institution of an adaptive management or remedial action plan as described in Section F.4 of Appendix F causes delay in the achievement of a performance standard, the timeline for achievement of each subsequent milestone for that performance standard will be deferred for a like interval, unless otherwise specifically approved by the Corps and Ecology, following consultation with the IRT. The Corps and Ecology, following consultation with the IRT and with the Sponsor, will determine what remedial actions are necessary to correct the situation, pursuant to Article IV.H. and Section F.4, and direct their performance prior to the award of any additional mitigation credits.

**Keller Farm Mitigation Bank
Table D-2 Credit Release Schedule**

Appendix C Performance Standards	Pre-Construction Credits	Year 0 Credits*	Year 1 Credits**	Year 3 Credits	Year 5 Credits	Year 7 Credits	Year 10 Credits	Total Credits
Objective 1. Administrative Protections								
1A MBI Signed	1.60							1.60
1B Deed Restriction Recorded	1.60							1.60
1C Financial Assurances Completed	1.60							1.60
1D Long-Term M & M Fund Established	1.60							1.60
1E Obtain all Authorization and Permits	1.06							1.06
Objective 2. Hydrology								
2A Grading Plan As-built Approved by IRT		2.68						2.68
2B Minimum of 54 Acres of Wetlands Year 3				4.27				4.27
2C Wetlands Delineated Exceed 54 Ac Years 5, 10					4.27		3.21	7.48
Objective 3. Vegetation								
3A Planting Plan As-built Approved by IRT		2.66						2.66
3B Invasives and Noxious Weeds 3, 5, 7, 10				0.65	0.75	0.45	0.44	2.29
3C Maximum RCG Cover 3, 5, 7, 10				0.65	0.75	0.45	0.44	2.29
3D Zero Tolerance Invasives 1, 3, 5, 7, 10			0.27	0.44	0.88	0.43	0.34	2.36
3E PEM 5 Native Species, 3 with 5% Cover 3, 5, 7, 10				0.65	0.75	0.45	0.44	2.29
3F PEM % Cover native species 1, 3, 5, 7, 10			0.40	0.54	0.88	0.55	0.35	2.72
3G Created PSS Native Tree and Shrub Density and % Cover 1, 3, 5, 7, 10			0.53	0.60	1.01	1.09	0.35	3.58
3H Created PFO Native Tree Density 1, 3, 5, 7, 10			0.27	0.45	0.90	0.43	0.44	2.49
3I Created PFO Native Tree and Shrub Cover				0.54	0.90	0.45	0.44	2.33
3J Riparian Upland Native Tree and Shrub Density and Cover 1, 3, 5, 7, 10			0.40	0.57	0.88	0.55	0.44	2.84
Objective 5. Habitat								
4A Habitat Features Plan As-built Approved by IRT		2.66						2.66
4B 80% Survival of Habitat Features							1.07	1.07
4C Water Temperature in Stream 5, 7, 10					0.80	0.80	0.27	1.87
Total Credits Available	7.46	8.00	1.87	9.36	12.77	5.65	8.23	53.34
* Year 0 for Performance Standards 2A and 4A is the calendar year during which construction is completed and the grading as-built report is submitted by the Sponsor and approved by the IRT. □								
Year 0 for Performance Standard 3A is the calendar year during which planting is completed and the planting as-built report is submitted by the Sponsor and approved by the IRT.								
** Year 1 is the first year of site monitoring following approval of the as-built reports.								

APPENDIX E PROCEDURES FOR USE OF MITIGATION BANK CREDITS AND DEBITS

E.1 Mitigation Bank Service Area

Credits from the Keller Farm Mitigation Bank will be used within a Lake Sammamish Service Area or a Lake Washington Service Area which are both confined within Water Resource Inventory Area (WRIA) 8 (**Figures E-1 through E-3**). The Lake Sammamish Service Area will define the use of the Bank for projects within the Lake Sammamish sub-basin, and the Lake Washington Service Area will define the use of the Bank for projects within a portion of the Lake Washington sub-basin. The range of function impacts in the Lake Sammamish Service Area that can be ecologically compensated at the Bank is greater than those in the Lake Washington Service Area due to the different ecological connectivity of two Service Areas to the Bank Site.

The Bank may be used to compensate for permitted impacts that are located within the appropriate Service Area if specifically approved by the appropriate agency(ies) requiring mitigation, pursuant to the procedures and criteria prescribed below. The definition of the Lake Sammamish and Lake Washington Service Areas are as follows:

1. Lake Sammamish Service Area: The Lake Sammamish Service Area for the Bank encompasses the Lake Sammamish Watershed boundary including those portions located in both King and Snohomish Counties. Within the Lake Sammamish Watershed, impacts to aquatic resources may be compensated through the use of Bank credits, provided that the Bank cannot be used to compensate for direct impacts to known or potential salmonid-bearing streams unless specifically approved by the permitting agencies and the Corps and Ecology, following consultation with the IRT. “Known salmonid-bearing streams” are those mapped and documented in officially promulgated issuances of public and/or tribal entities include the WDFW, WDNR, Counties, Cities, and the Muckleshoot Indian Tribe Fisheries Division. In the absence of mapped or documented salmonid presence, potential salmonid use may be demonstrated for a stream that meets the physical parameters for fish use delineated in Washington Administrative Code (WAC) 222-16-031(3)(b)(i)(A-D) and (ii)(A-B), or as revised.

Lake Sammamish Sub-basins/Creeks Included in the Lake Sammamish Service Area:

- **Issaquah Creek Sub-basin:** Issaquah Creek, Carey Creek, Holder Creek, McDonald Creek, Fifteenmile Creek, Tibbetts Creek
- **Lake Sammamish Sub-basin:** Laughing Jacobs Creek, Pine Lake Creek, Ebright Creek, George Davis Creek, Lewis Creek, Squibbs Creek, Vasa Creek
- **Bear Creek Sub-basin:** Bear Creek, Evans Creek, Rutherford Creek, Cottage Lake Creek, Mackey Creek, Colin Creek, Struve Creek

- **Sammamish River Sub-basin:** Derby Creek, Gold Creek, Woodin Creek
- **Little Bear Creek Sub-basin:** Little Bear Creek
- **North Creek Sub-basin:** North Creek, Silver Creek, Smokehouse Creek
- **Swamp Creek Sub-basin:** Swamp Creek, Scriber Creek (WDFW SalmonScape).

2. Lake Washington Service Area: The Lake Washington Service Area for the Bank encompasses the portions of the Lake Washington Sub-basin located north of Interstate 90 (I-90) including those portions located in both King and Snohomish Counties. The Lake Washington Service Area excludes sub-basins in the City of Seattle, the small sub-basins that drain directly into Puget Sound, and those Lake Washington Sub-basins/Creeks specified below. Within the Lake Washington Service Area, the following impacts to aquatic resources may be compensated through the use of Bank credits: wetland buffer-only impacts; impacts to Category II, III, and IV Wetlands that are not directly adjoining known or potential salmonid-bearing streams (as defined for the Lake Sammamish Service Area) such as non-riverine wetlands as defined by Hraby, 2014; wetlands that do not qualify as Waters of the United States; and violation losses to those kinds of wetlands. Other types of impacts in the Lake Washington Service Area may be allowed to be compensated at the Bank on a case by case basis, with approval by the permitting agencies and the Corps and Ecology, following consultation with the IRT.

Lake Washington Sub-basins/Creeks Included in the Lake Washington Service Area:

- **Kelsey Creek Sub-basin:** Kelsey Creek, Richards Creek (not including areas south of I-90)
- **Lake Washington Sub-basin:** Goff Creek, Yarrow Creek, Valley Creek, Forbes Creek, Juanita Creek, Lyon Creek, and McAleer Creek (WDFW SalmonScape)

Lake Washington Sub-basins/Creeks excluded from the Lake Washington Service Area:

Portions of Kelsey Creek Sub-basin located south of I-90 (including Richards Creek Sub-basin, Sunset Creek Sub-basin, East Creek Sub-basin, etc.), May Creek, Coal Creek, Thornton Creek, Ravenna Creek, and Cedar River Watershed.

If IRT review is required, that review will commence once the “Bank Use Plan” (or similar document) is submitted to the IRT Co-chairs. The Bank Use Plan or similar document should show a summary of the project’s impacts including location, type, and amount of impacts, and solid rationale why Bank credits provide compensatory mitigation that would be practicable and environmentally preferable to other mitigation alternatives. The Bank Use Plan or similar document should detail efforts undertaken by the applicant (with specific examples) to find ecologically viable mitigation options in the basin/sub-basin of the proposed impacts.

E.2 Ecological Characteristics of the Lake Sammamish and Lake Washington Service Areas

The Lake Sammamish and Lake Washington Service Areas of the Bank are both located within the Puget Lowlands, an area that was formed by glaciation of the Vashon Stade, which covered the Seattle area with an ice sheet up to a mile thick until approximately 18,000 to 15,000 years ago (as cited in Booth et al., 2003). The Puget Lowland formation follows a defined topographic pattern which has been classified as moving from the rocky alpine headwaters, following a steep descent into confined mountain valleys, and emerging into broad low-gradient lowland valleys where the channels are walled by unconsolidated fluvial sediments (Booth et al., 2003, Montgomery and Buffington, 1997). The underlying geology influences local hydrology and sediment transport, which establish local hydrologic conditions, including surface and sub-surface hydrology. According to Kerwin, 86% of WRIA 8 is within the Puget Lowlands, while 14% lies within the Cascade region (Kerwin, 2001). The service areas for the Bank exclude the Cascade region, because it is geologically distinct from the Puget Lowlands. They also exclude that portion of the Puget Lowlands located within the City of Seattle’s Cedar River watershed, and the City of Seattle itself.

Many of the tributaries within the Lake Sammamish and Lake Washington Service Areas share similar topography, and their ecological characteristics have been shaped by similar driving ecological processes (geology, which created pathways for surface and sub-surface water flows) resulting in similar ecological structure and function of riparian lowland forests, streams, and wetlands. In his discussion of the geology of Bear Creek in the 1990 Bear Creek Basin Plan, Booth notes: “The threshold of bank erosion is remarkably similar to that determined for mainstem channels in the Soos Creek Basin, ... about 30 miles south, and in generally equivalent geologic and vegetative settings.” (Bear Creek Basin Plan, 1990. P 95). Uniquely, WRIA 8 is the only major watershed tributary to Puget Sound that contains two major lake systems, Lake Washington and Lake Sammamish. As stated by Kerwin: “The division of the watershed by its topography and its two major lakes gives it ecological complexities not found in watersheds based on major rivers.” (Kerwin, 2001). With the exception of the Cedar River, all of the headwaters within the Puget Lowland stream systems within WRIA 8 receive their Lake Sammamish source of hydrology from groundwater and precipitation, rather than from snowmelt (Kerwin, 2001).

The Puget Lowlands within WRIA 8 are unified by a common geologic origin, and further defined by common topography, climate, soils, and hydrologic flow characteristics which have led to the establishment of similar vegetation types as characterized by Franklin and Dyrness (1973), and with respect to wetlands, by Kunze (1994) and Rocchio and Crawford (2009). Franklin and Dyrness note that the northern Puget Sound drainages were formed under glaciation of the Vashon Stade and share similar topography and soil conditions. The terminal moraine of the Vashon glacier reached just south of modern-day Olympia, roughly to Toledo. Within the moraine, the area coined as ‘the Puget Lowlands’ drains gently towards the Puget Sound, and contains many lakes and poorly drained depressions underlain by glacial drift. The region is subject to a wet, mild, maritime climate. Elevationally, this zone ranges from sea level to 600 or 700 meters (1,968 feet to 2,297 feet) at 49 degrees north latitude, and from 150 to 1,000 meters

(492 feet to 3,281 feet) at 45 degrees north latitude. (Franklin and Dyrness, 1973, p. 71). The soils in this region have been formed by coniferous forests over glacial materials (Franklin and Dyrness, 1973, 1988). Franklin and Dyrness note: “The Puget lowlands may be recognized as a separate vegetative zone...” Vegetation within this zone is part of the *Tsuga heterophylla* (western hemlock) zone, which is characterized by coniferous forests composed of mixed stands of western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja Plicata*), and Douglas fir (*Pseudotsuga menziesii*) (Franklin and Dyrness, 1973). Groundcover within the forest is comprised of a dense shrub and herbaceous layer of sword fern (*Polystichum munitum*), bracken fern (*Pteridium aquilinum*), salal (*Gaultheria shallon*), Oregon grape (*Mahonia aquifolium*), oceanspray (*Holodiscus discolor*), blackberry (*Rubus laciniatus*), red huckleberry (*Vaccinium parvifolium*) and red elderberry (*Sambucus racemose*). Forested wetlands within this zone are likely to be dominated by either western red cedar or red alder (*Alnus rubra*), although spruce (*Picea sitchensis*) and hemlock may also be present. The understory of the wetlands may be dominated by skunk cabbage (*Symplocarpus foetidus*) or slough sedge (*Carex obnupta*), but is also likely to comprise “a great variety of shrubby and herbaceous species...Some of the more characteristic are *Blechnum spicant*, *Athyrium felix-femina*, *Oenanthe sarmentosa*, *Stachys Mexicana*, *Mitella spp.* *Tolmeia menziesii*, *Spiraea douglasii*, *Salix hookeriana*, and *Rubus spectabilis*.” (Franklin and Dyrness, 1973, p. 68).

E.3 Use of Credits outside the Service Area

The Bank may be used to compensate for permitted impacts falling geographically outside of, and/or beyond the allowable impact types specified for, the service area(s) if specifically approved by the appropriate agencies requiring mitigation, and the Corps and Ecology, following consultation with the IRT, provided that such mitigation would be practicable and environmentally preferable to other mitigation alternatives. As such, out-of-service-area impacts will only be allowed in special circumstances, which will be evaluated on a case-by-case basis (e.g., projects that span multiple basins such as transportation and utility corridors and pipelines, and settlement of enforcement actions).

E.4 Credit-Debit Ratios

A. Credits may be used, subject to the approval of the regulatory agencies with jurisdiction over the impact, to compensate for authorized permanent or temporary impacts, as well as to resolve enforcement or permit compliance actions such as replacing previously implemented project-specific mitigation that has partially or completely failed.

B. Each credit withdrawal transaction agreement that is associated with a permit must indicate the permit number of the impacting project and which Service Area it is located in, date of permit issuance, the number of credits transacted, and must expressly specify that the Sponsor, and its successors and assigns, assume responsibility for accomplishment and maintenance of the permittee’s compensatory mitigation requirements associated with the impacting project, upon completion of the credit transfer.

C. The following table (Table E1-) depicts the approximate number of Bank Credits typically required by the IRT agencies to compensate for each unit of permanent loss of listed aquatic

resource type and functional level. The actual number of Bank Credits required to compensate for an adverse impact to aquatic resources in any particular situation depends on many factors (e.g., whether the impact is permanent or temporary) and will be determined on a case-by-case basis by the regulatory agency(ies) authorizing the impact. The wetland functional categories are based on the *Washington State Wetland Rating System for Western Washington: 2014 Update* (Ecology Publication # 04-06-029). Units of loss are measured in acres for wetland and buffer impacts and may be measured in either acres or linear feet for stream impacts. Due to the variety and typically high level of functioning of Category I wetlands, compensation for impacts to these resources by Bank credits will be determined by the regulatory agencies on a case-by-case basis.

Table E-1: Typical Debit-Credit Ratios for Wetland Impacts at the Bank

Resource Impact	Bank Credits: Impact Acreage
Wetland, Category I	Case-by-Case
Wetland, Category II	1.2 : 1
Wetland, Category III	1 : 1
Wetland, Category IV	0.85 : 1

E.5 Use of Bank Credits for Critical Area Buffer Mitigation

Impacts to critical area buffers for wetlands, streams, lakes and other critical habitat areas regulated by local jurisdictions within the Bank service area can be mitigated using Bank Credits with the approval of the appropriate regulatory agencies.

Since one Bank credit is generated by every 5 acres of wetland or riparian upland buffer that is created at the Bank site, a ratio of “0.3:1” for critical area buffer impacts results in a “1:1.5” ratio for area on the ground of a permitted buffer impact to buffer restoration at the Bank.. Critical area buffer functions and values vary based upon many factors (for example, impacts to riparian buffers may require a higher ratio than a wetland buffer) so the amount of credit required in each permit situation can be determined on a case-by-case basis by the regulatory agency reviewing the project, according to the local critical area regulations.

E.6 Procedures for Use of Mitigation Bank Credits

A. **Use of Mitigation Bank Credits:** Public and private proponents of activities regulated under Sections 401 and 404 of the Clean Water Act (33 U.S. Code §§ 1341, 1344), Section 10 of the Rivers and Harbors Act of 1899 (33 U.S. Code § 403), Washington State Water Pollution Control Act (Chapter 90.48, RCW), Shoreline Management Act (RCW 90.58), Growth Management Act (RCW 36.70A), Hydraulic Code (RCW 75.20), and other Federal, State, and local authorities may be eligible to use the Bank as mitigation for unavoidable impacts. The Bank will be eligible to serve public and private end users by providing advance compensatory mitigation for authorized impacts to regulated areas that require mitigation and to settle enforcement claims. The Bank is intended to provide replacement of lost functions and values including: wetlands, streams, riparian buffer habitat, and wetland buffer habitat.

B. An applicant seeking a permit for a project with adverse impacts to the aquatic environment within the service areas must generally obtain the approval of each regulatory agency with jurisdiction over that project, in order to use the Bank as a source of compensatory mitigation. To receive approval to use the Bank, the applicant must demonstrate to the satisfaction of the pertinent regulatory agencies that the project complies with all applicable requirements pertaining to alternatives and mitigation sequencing, and that purchasing credits from the Bank for compensatory mitigation would be in the best interest of the environment. Specifically, a permit applicant must generally be able to demonstrate to the satisfaction of the involved regulatory agencies that:

(1) There is no practicable less environmentally damaging alternative to adversely impacting the aquatic resource, critical area, buffer or other regulated area; and

(2) All appropriate and practicable measures to minimize adverse impacts to the aquatic ecosystem have been demonstrated and included in the project.

It is the determination of the agency(ies) permitting the project with adverse impacts, with concurrence of the Corps and Ecology, following consultation with the IRT, as to whether a proposed use of Bank credits within the service area is appropriate and environmentally preferable compared to other mitigation alternatives.

C. Upon receiving permission to utilize credits from the Bank, the permittee must contact the Sponsor to ensure that credits are available. Upon completion of the transaction, the Sponsor will inform the permitting agencies of each completed transaction, via email or letter with an attached copy of the accounting ledger.

D. Other types of credit users may include, but are not necessarily limited to, purchases made that will not be associated with a particular project or impact (i.e., “good will” purchase), purchases made by natural resource stewards resulting from expenditures from in-lieu-fees (or similar type funds), and other conservation purposes.

E. The Sponsor may use the Bank site to provide compensatory mitigation to offset impacts to environmental elements other than aquatic resources. Such use shall result in no physical

changes to the Bank site unless approved by the Corps and Ecology, in consultation with the IRT. The Sponsor must obtain approval from the Corps and Ecology, following consultation with the IRT, prior to establishing currencies other than wetland mitigation credits that are established by Appendix D of this Instrument. The agencies that regulate those specific environmental elements are responsible for establishing the value of the currency and release schedules, and determining the appropriateness of using the Bank as compensatory mitigation for impacts to those elements. The Corps and Ecology, in consultation with the IRT, will determine how withdrawal of those currencies will affect the amount of potential wetland mitigation credits remaining. The Sponsor shall record the award and use of all currencies on the Bank ledger and otherwise follow the procedures as outlined in Appendix E.8. Use of the Bank for compensatory mitigation for other environmental elements shall not conflict with the provisions of this Instrument.

E.7 Accounting Procedures

A. The Sponsor shall establish and maintain for inspection and reporting purposes a ledger of all credits that are awarded through the achievement of specified performance standards, as well as credits that are sold, used, or transferred. The Sponsor will record each credit withdrawal transaction that receives a permit with the King County Auditor and submit a copy of the recorded transaction to each member of the IRT within 30 days from the stamped registration date.

B. The ledger must follow the current ledger template approved by the Corps and Ecology. The following information, at a minimum, will be recorded in the ledger for each transaction:

(1) Date of transaction.

(2) Number of credits transacted.

(3) For credits awarded, reference the performance standard(s) to which the awarded credits correspond.

(4) For credit sales/use/transfers, include: the name, address, and telephone number of purchaser/user/transferee; and include all the following information that applies: permit number(s), permit issuance date, and name of the regulatory agency(ies) issuing permits; location, and Service Area of the project for which the credits are being purchased/used/transferred; the size of the impacts; and a brief description of the project impacts requiring compensatory mitigation (e.g., nature and quality of aquatic resources affected).

(5) For credits withdrawn from the ledger for reasons other than credit sale/use/transfer, include the specific reason for withdrawal.

(6) Bank credit balance after the award or transaction.

C. The Sponsor will provide an updated ledger to the IRT each time credits are awarded, sold, used, or otherwise transferred. This must be provided within 30 days of any credit transaction. The Sponsor will also submit an annual ledger by February 1 of each year. The annual ledger must show a cumulative tabulation of all credit transactions at the Bank through December 31. This ledger will be submitted in conjunction with the monitoring reports until (1) all credits have been awarded and sold, used, or transferred; or (2) until the Corps and Ecology, in consultation with the IRT, has approved the Sponsor's written request to permanently cease banking activity.

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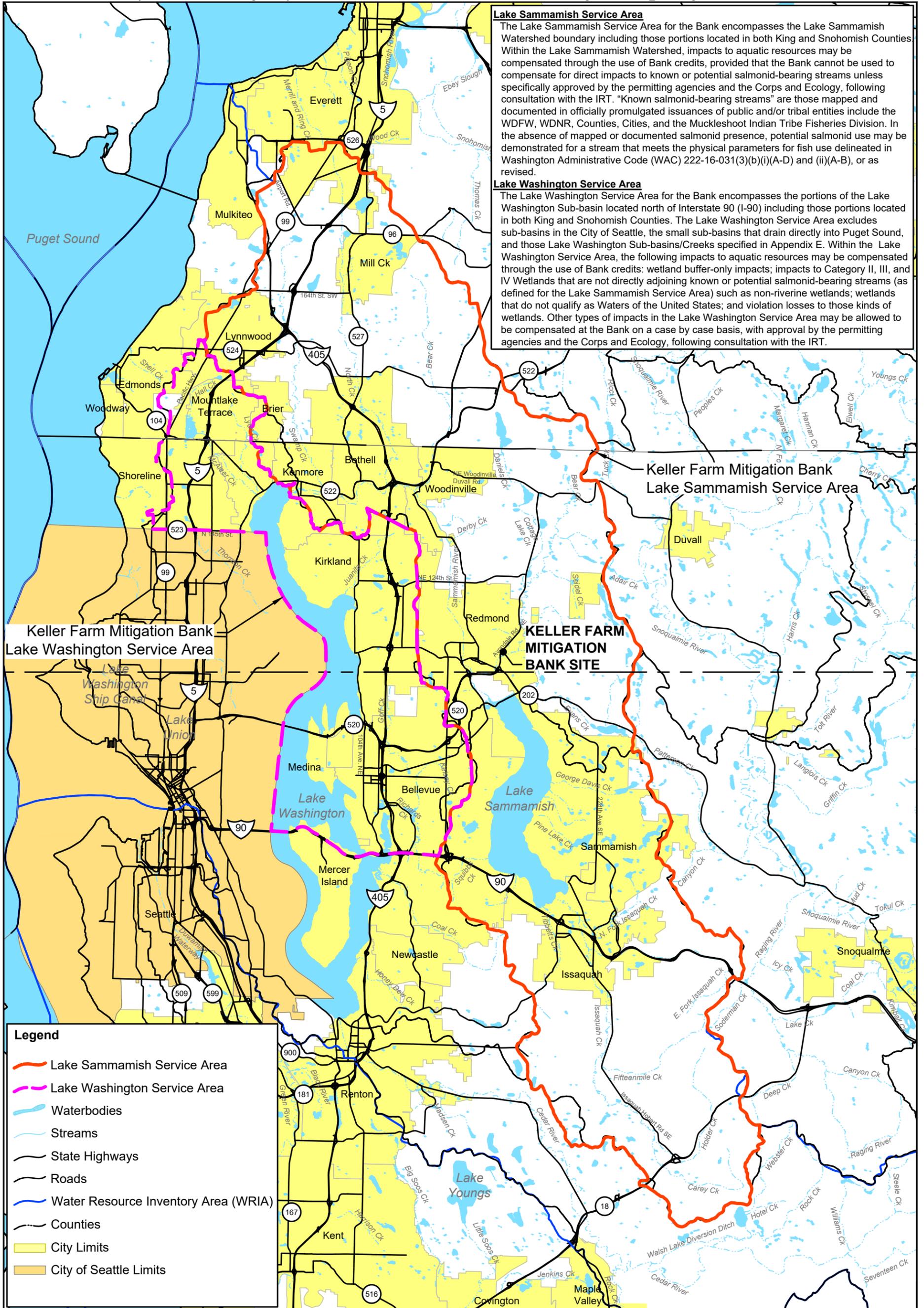


Figure E-1
KELLER FARM MITIGATION BANK SERVICE AREAS
 Lake Sammamish and Lake Washington Service Areas

Please contact bank sponsor for Google Earth™ KMZ Service Area Boundary lines.



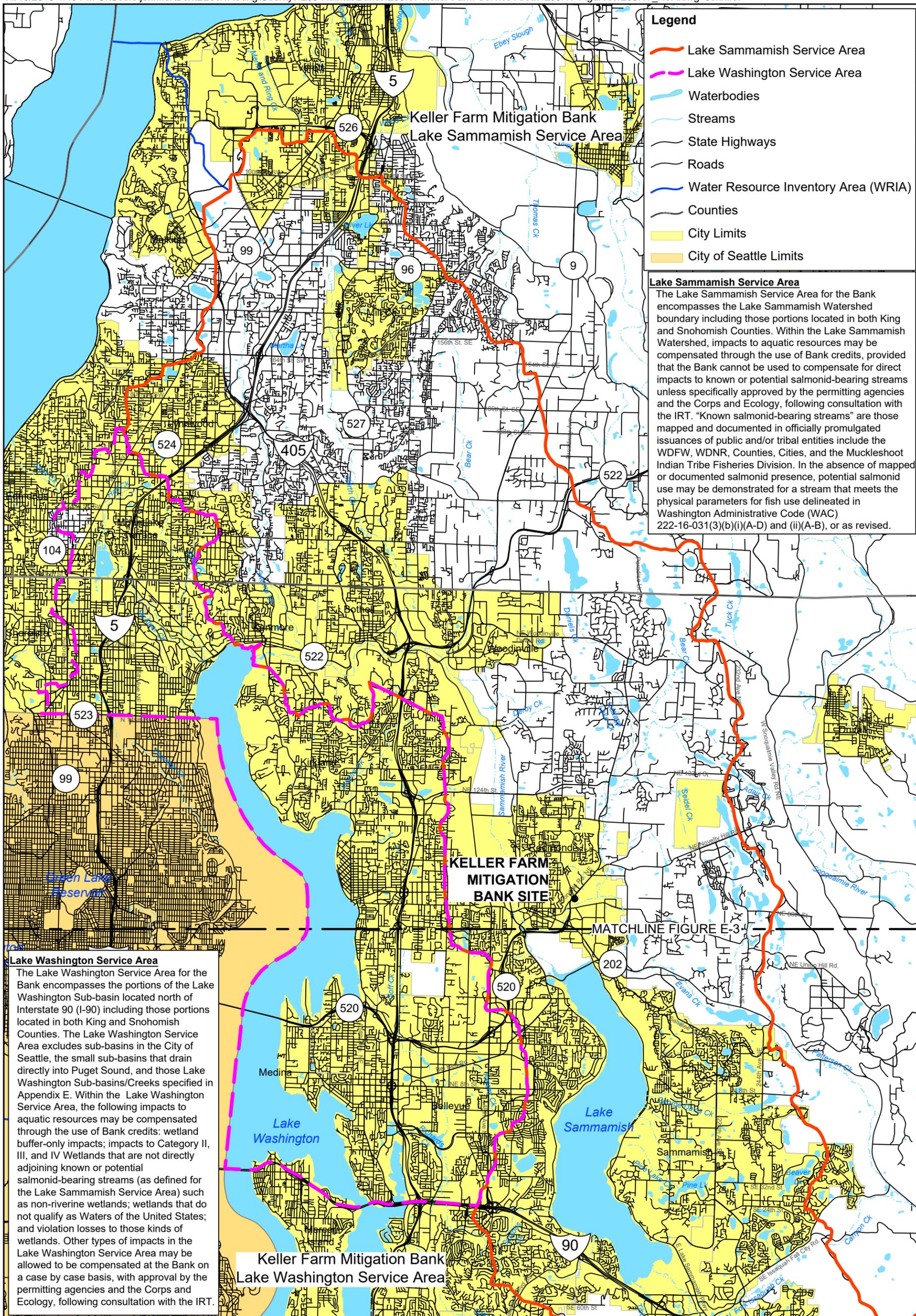


Figure E-2
KELLER FARM MITIGATION BANK SERVICE AREAS
 Lake Sammamish and Lake Washington Service Areas Northern Boundaries

Please contact bank sponsor for Google Earth™ KMZ Service Area Boundary lines.



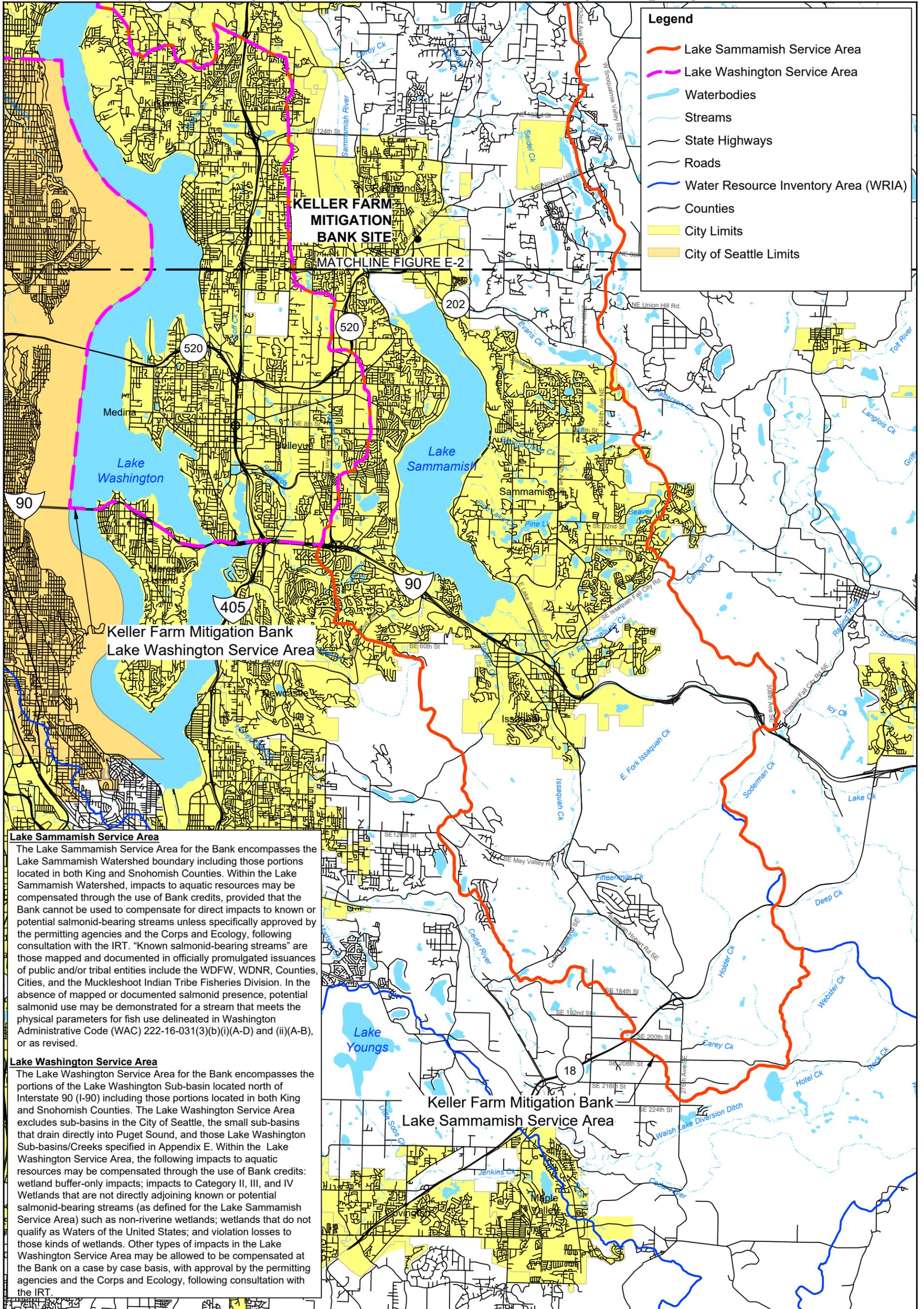


Figure E-3
KELLER FARM MITIGATION BANK SERVICE AREAS
Lake Sammamish and Lake Washington Service Areas
Southern Boundaries

APPENDIX F

ESTABLISHMENT PERIOD MONITORING, REPORTING, MAINTENANCE, AND REMEDIAL ACTION

During the establishment period, the Sponsor shall monitor and report on the progress of the Bank toward achieving the goals, objectives, and performance standards established by these Appendices and take all actions directed by the Corps and/or Ecology, following consultation with the IRT, to remediate any consideration that prevents a component of the Bank from achieving the goals, objectives and performance standards of the Bank. Procedures for as-built reports, monitoring reports and remedial actions are described below.

F.1 As-Built Reports

As-built reports will be submitted to the IRT upon the completion of construction to verify topography, hydrology, habitat features, and planting. The As-built drawings shall be signed and stamped by a licensed surveyor at one-foot elevation topographic intervals. This may be one report that describes all construction, or it may be separated into two reports that are submitted at different times, one following grading and related construction, the other following completion of planting. At a minimum, the following components should be included in one or both (as appropriate) of the as-built reports:

- Name and contact information for the parties responsible for the Bank construction site including the Bank Sponsor, engineers, and wetland professional on-site during construction
- Ecology, Corps, and Local permit numbers
- Dates when activities began and ended such as grading, installation of the floodplain stream riffle structures (ditch plugs) and large woody debris complexes, removal of invasive plants, installing plants, and installing habitat features
- Photographs of the site at as-built conditions taken from photo stations (panoramic photos are recommended)
- Description of any problems encountered, and solutions implemented (with reasons for changes) during construction of the Bank site
- List of any follow-up actions needed with a schedule
- 11x17 maps of the Bank site showing:
 - Topography with one-foot contours surveyed, signed, and stamped by a licensed surveyor and a description of how elevations were determined. Based on size of site and complexity of design, Sponsor may be required to submit an overview map and multiple individual maps that adequately show the Bank details.
 - Cross-sections and longitudinal sections (profile) of the overflow, back channel, and outlet connections to Bear Creek
 - All stream channels with labels
 - Installed planting scheme – quantities, densities, sizes, approximate locations, and the sources of plant material
 - Locations of hydrology and temperature dataloggers pre- and post-construction

- Locations of the floodplain stream riffle structures, detail figures (typicals) of the riffle structures including longitudinal (profile) and plan views, and locations and total number of large woody debris (LWD) key pieces installed.
- Locations of the large woody debris complexes
- Locations of habitat features: brush piles, perch poles, LWD pieces (downed logs and root wads), and nest boxes
- Locations of permanent photo stations
- Date when the maps were produced and, if applicable, when information was collected

As-built reports will be submitted to each member of the IRT within 90 days of completing construction of the Bank and must demonstrate compliance with Appendix B and any modifications to the Bank development plan and design, approved by the Corps and Ecology prior to their construction or implementation, following consultation with the other members of the IRT.

Permanent photo points will be established in Year 0 to document the progression of each habitat type. Photo point locations will be documented in the as-built report. A Keller Farm Mitigation Bank construction manager will document Year 0 post-construction conditions in the as-built reports for grading, floodplain stream riffle structures, large woody debris complexes, plantings, and habitat features and will include photographs and as-built drawings. The as-built reports will also establish baseline conditions for future monitoring.

F.2 Establishment Period Monitoring

A performance monitoring program will be implemented to determine the degree of success of the mitigation effort during the establishment period. Monitoring will include periodic surveys and site evaluations to establish the foundation on which the Bank can demonstrate to the IRT that pertinent performance standards have been achieved and continue to be maintained. Monitoring will include measurements and observations of site stabilization, wetland hydrology, vegetative cover, invasive cover, plant survival, vegetation structure and species composition, presence and condition of fences and signs, stream temperatures, and fish and wildlife observations.

F.2.1 Overview of Monitoring Requirements

As-built and on-going monitoring requirements specific to each performance standard (see Section C.2 of Appendix C) are summarized below.

Objective #1: Protect Aquatic Ecosystem Functions

Permanently protect aquatic ecosystem functions at the Bank by instituting the Instrument and implementing a conservation easement with creation of a permanent funding endowment for site stewardship. Each of the performance standards associated with this objective must be met before any Bank credits may be awarded, and before any construction or implementation activities may be initiated pursuant to this Instrument. Any construction or implementation activities conducted on-site prior to the inception of the establishment period must cease as of the effective date of this Instrument pursuant to Article VI.B.1, until the Objective 1 performance

standards 1.A through 1.E have been accomplished. The initial award of credits in recognition of accomplishment of these performance standards will serve as the IRT's notification that construction and implementation activities are authorized to commence.

Objective #2: Hydrology

Re-establish additional wetland hydrology in the graded portions of the Bank site and maintain existing wetland hydrology on the remainder of the site. Increase and improve floodplain connectivity and fish accessibility to streams and wetland areas adjacent to Bear Creek. Remove culverts and agricultural drainage ditches, and re-meander ditches to re-establish and rehabilitate wetlands and improve riparian habitat areas.

- Submit as-built drawings and photographs showing completed grading and installation of the floodplain stream riffle structures and large woody debris complexes per the approved plan with key elevations and cross sections. Document culvert removal with photos at the time of construction (Performance Standard 2A). Presence and condition of stream riffle structures and large woody debris complexes must be observed and documented in the monitoring reports for Years 1, 3, 5, 7, and 10.
- Monitor wetland hydrology for wetland hydrology determination in Year 3 (Performance Standard 2B) and wetland delineations in Years 5 and 10.
- Submit wetland and stream delineation reports in Years 5 and 10, documenting wetland acreage, vegetation and soil development, and the ordinary high-water mark delineations of all streams on site. In Year 10 include wetland ratings for all wetlands on the Bank site. (Performance Standard 2C).

Objective #3: Vegetation

Remove noxious and invasive species and establish native wetland and adjoining upland vegetation communities, in accordance with the MBI planting plan and the targeted hydrologic regimes across the site.

- Submit as-built report showing vegetation community locations, planted acreages, species, planting quantities, planting densities, and seeding rates (Performance Standard 3A).
- Submit monitoring reports for Years 3, 5, 7 and 10 documenting presence and cover for the following species: poison hemlock (*Conium maculatum*), Himalayan blackberry (*Rubus armeniacus*), evergreen blackberry (*Rubus laciniatus*), Scotch broom (*Cytisus scoparius*), tansy ragwort (*Senecio jacobaea*), common tansy (*Tanacetum vulgare*), Canada thistle (*Cirsium arvense*), jewelweed (*Impatiens capensis*), yellow-flag iris (*Iris pseudacorus*), and bull thistle (*Cirsium vulgare*) (Performance Standard 3B).
- Submit monitoring reports for Years 3, 5, 7 and 10 documenting cover of reed canarygrass (*Phalaris arundinacea*) (Performance Standard 3C).
- Conduct annual inventories for aggressive, non-native, noxious or invasive species including Japanese knotweed (*Polygonum cuspidatum*), giant knotweed (*Polygonum sachalinense*), Himalayan knotweed (*Polygonum polystachyum*), Bohemian knotweed (*Polygonum x bohemicum* and related hybrids), purple loosestrife (*Lythrum salicaria*), holly (*Ilex aquifolium*), English ivy (*Hedera helix*), and bindweed (*Convolvulus arvensis*, *Convolvulus sepium*, *Convolvulus silvaticus*, and *Fallopia convolvulus*), and document

presence and eradication in monitoring reports for Years 1, 3, 5, 7 and 10 (Performance Standard 3D).

For Palustrine Emergent Habitat Type:

- Document species presence and percent cover within sampling plots for Years 1, 3, 5, 7 and 10; PS 3E starts Year 3 due to the 5% cover requirement for individual species (Performance Standards 3E, 3F).

For Palustrine Scrub-shrub Habitat Type:

- In re-established and rehabilitated PSS habitat (including existing PEM converted to PSS), document density of native trees and shrubs in Years 1 and 3; and percent cover in Years 5, 7 and 10 (Performance Standard 3G).

For Palustrine Forested Habitat Type:

- In re-established and rehabilitated PFO habitat (including existing PEM converted to PFO), document density of native trees in Years 1, 3, 5, 7 and 10 (Performance Standard 3H); and cover of native trees and shrubs in Years 3, 5, 7 and 10 (Performance Standard 3I).

For Riparian Upland Enhancement Areas:

- Document density of native trees and shrubs in Years 1 and 3; and percent cover in Years 5, 7 and 10 (Performance Standard 3J).

Objective #4: Habitat

Create and improve habitat for fish and wildlife on the site by reconnecting Bear Creek to the floodplain, recontouring ditches, and providing structure, cover and a diversity of habitat types across the site. Install habitat features such as perch poles, brush piles, LWD pieces (downed logs and root wads), and bird nest boxes to create additional habitat for small mammals and amphibians. Improve fish passage and access to wetland habitat areas on site. Install site fencing and site protection signs. Remove derelict agricultural equipment, garbage, and debris from the site.

- Submit as-built drawings and photos documenting removal of old farm equipment and irrigation piping; installation of perch poles, brush piles, LWD pieces, bird nest boxes; and installation/locations of site fencing and signage. (Performance Standard 4A).
- Document locations, conditions, and numbers of habitat features present in Year 10 (Performance Standard 4B). Habitat features include perch poles, brush piles, LWD pieces (downed logs and root wads) and nest boxes.
- Collect and submit post-construction water temperature data for the floodplain streams on site in Years 1, 2, 3, 5, 7 and 10 (Performance Standard 4C).
- Fences and signs must be present and in functioning condition.

F.2.2 Monitoring Protocol

If the monitoring methodologies as written below do not accurately inform the IRT about the success of a particular habitat area, the Bank Sponsor will coordinate with the IRT about

changing the monitoring approach. Experience in the field may indicate that other performance monitoring methods would provide more useful information; the Corps and Ecology, following consultation with the IRT, must approve in advance any changes in the means of gathering or reporting performance data.

Formal monitoring will include both qualitative and quantitative monitoring to address fulfillment of the Bank objectives and performance standards (see Appendix C). Formal monitoring will occur throughout Years 1, 3, 5, 7 and 10 according to the monitoring schedule and sampling protocol described below. Year 0 is the calendar year during which the as-built/as-planted drawings are approved in writing by the Corps and Ecology, in consultation with the IRT. Year 1 is the first year of site monitoring after approval of the as-built/as-planted drawings. Wetland determinations will be conducted in areas intended to be wetland during Year 3. Complete wetland and stream delineations will be conducted throughout the entire Bank site in Years 5 and 10.

Informal monitoring provides a general overview of site progress, and will be conducted during Years 2, 4, 6, 8 and 9, for which there is no formal quantitative monitoring reporting requirement (with the exception of Performance Standard 4C in Year 2 and Performance Standard 3D in Years 2, 4, 6, 8 and 9), to ensure that the site appears to be progressing towards meeting performance standards. Specifically, a qualitative visual inspection of the Bank will be conducted during periodic site visits to identify concerns associated with meeting Bank objectives and performance standards, if any. Informal monitoring events will include the annual survey for the presence and cover by the zero-tolerance invasive species (Performance Standard 3D). Informal monitoring will usually include observation notes and site photos. Informal monitoring may quantitatively address some performance standards for upcoming years but may be less statistically rigorous than formal monitoring. Informal monitoring will be the only monitoring method during the years for which there are no performance standards, although it will also be employed during years of formal monitoring. Informal monitoring observations, as well as the results of the zero-tolerance invasive species surveys and Year 2 stream temperature monitoring, will be documented in the formal monitoring reports submitted for Years 1, 3, 5, 7 and 10.

Photo Documentation

Photo points will be established in areas that will provide general vantage points around the margin of the Bank, vantage points within the Bank, and at specific monitoring locations such as hydrology monitoring locations, vegetation sampling points, and habitat features, in sufficient numbers to give a visual representation of on-site conditions. Location of photo points will be recorded by hand-held GPS and marked in the field. Documentation of the location of the photo points will be provided on the site map included in as-built and formal monitoring reports.

F.2.3 Vegetation

Sampling plots will be established to measure species presence, percent cover and plant density of vegetation to determine site progress in meeting performance standards. A stratified random sampling approach as described in Elzinga et al. (1998) will be used to collect data to assess

attainment of performance standards related to vegetation (Performance Standards 3A through 3J).

The vegetation communities on the site are: Palustrine Emergent Wetland (PEM), Palustrine Scrub-Shrub Wetland (PSS), Palustrine Forested Wetland (PFO), and Riparian Upland (UPL). The performance standards address each vegetation community separately, and each vegetation community will be treated as a separate stratum to the extent possible. The mosaic vegetation PSS/PEM community will be considered PSS habitat for vegetation monitoring, unless as-built conditions determine that discrete PEM areas large enough to sample independently are present.

Using CAD or a similar program, grid patterns approximating sample plot sizes will be overlain onto each corresponding vegetation community as defined on the final as-built planting plan (**Figure F-1**). The length and distance of grid-pattern lines and intersections will be evenly spaced over each vegetation community at distances able to generate an adequate number of potential monitoring points within each community. Grid-pattern line intersections falling within the vegetation community will be used, while intersections falling outside the vegetation community will be discarded. Potential monitoring points will be identified at each grid pattern line intersection. Within each vegetation community, all grid-pattern line intersections will be assigned numbers, and monitoring points will be randomly selected using a random number generator, using that number set.

The number of randomly generated monitoring points that will be used to establish the monitoring plots will depend on the monitoring protocols for the vegetation community being sampled. A minimum of 1% of the total acreage (including non-credit generating areas) of PSS, PFO, and UPL vegetation communities will be sampled, and a minimum of 3 plots per acre of PEM habitat will be sampled (**Table F-1**). The minimum sampling area for each habitat type was determined based on methods described in Tiner (Wetland Indicators: A Guide to Wetland Identification, Delineation, Classification, and Mapping, 1999) and Krebs (Ecological Methodology, 1999), and in consultation with the IRT. Numbers of plots in non-creditable areas (buffers and easements¹) will be roughly proportional to relative acreages of creditable and non-creditable area for each vegetation community.

Sample Plot Sizes:

Forested communities (PFO and UPL) shall be sampled with a 15-foot radius circle (area of the sample plot equals 707 square feet).

Shrub communities (PSS) shall be sampled with a 15-foot radius circle (area of the sample plot equals 707 square feet).

Herbaceous communities (PEM) shall be sampled with a 3-foot radius circle (area of the sample plot equals 28 square feet).

The coordinates of each random monitoring plot location will be uploaded to a hand-held Global Positioning System (GPS) unit and located in the field. Plot locations will be field-verified. If a

¹ The City of Redmond Pedestrian Trail Easement refers to the reserved right of the City of Redmond to construct a pedestrian trail. This right may be conveyed as an easement to a third-party at some time in the future

plot is determined to be unusable during field sampling, (e.g., lies in the middle of an access path or affected by beaver activity), another randomly located plot in the same vegetation community will be substituted, and an explanation will be provided in the monitoring report.

Additional plots may be randomly added during field monitoring at the biologist's discretion or if deemed necessary by the Sponsor or by the IRT to increase site coverage and sample additional strata not previously identified. Where site conditions warrant, a different shaped monitoring plot may be used to limit the sample to a single habitat type or for other sampling reasons. The revised plot size should be approximately the same as the assigned circle. The plot shape, size, and location should be recorded in the field, documented in the monitoring report along with an explanation of why the change in plot shape was necessary, and the revised plot location should be designated on the monitoring plot map. Where it occurs in a sample plot, percent cover of bare soil and unvegetated open water will be estimated and counted towards the total percent cover of the community being monitored. Final plot locations will be shown on site maps in monitoring reports, and the same plot locations will be sampled during each monitoring period.

Table F-1 Sample Plots by Vegetation Community Strata

Vegetation Community	Proposed Acreage (total Bank acreage = 75.2 ac)		Minimum # Sample Plots Required (1% of area for PFO, PSS and UPL; 3 plots/acre for PEM)	Proposed # of Sample Plots ^a
	Creditable	Non-Creditable (Buffers and Easements)		
Riparian Upland Forest (UPL) – Enhancement	6.7	5.2	8	9 ^b
Riparian Forested Wetland (PFO) – Re-establishment	17.5	1.6	13	13 ^c
Shrub-Scrub with Emergent Wetland Pockets (PSS/PEM) – Re-establishment	28.7	3.3	20	20 ^b
Riparian Wetland/Stream Channel Complex (PEM) – Rehabilitation	3.9	0.4	13	13 ^c
Existing Wetlands A, B, C, D (PFO) – Rehabilitation	4.71	-	3	4 ^d
Existing Wetlands E, F, G, H, I (PSS) – Rehabilitation	2.99	0.2	3	5 ^d
TOTAL PLOTS			60	64

^aPlot sizes are: PFO, PSS and UPL = 15-ft radius circle (707 sf). PEM = 3-ft radius circle (28 sf).

^bFour plots will be located in non-creditable buffer area outside of easements.

^cTwo plots will be located in non-creditable buffer area outside of easements.

^dOne plot will be located in each existing wetland.

In all vegetation communities, non-native invasive species presence and percent cover will be documented at each sampling plot for Years 3, 5, 7 and 10 for the following species: reed canarygrass, poison hemlock, Himalayan blackberry, evergreen blackberry, Scotch broom, tansy ragwort, common tansy, Canada thistle, invasive jewelweed, yellow-flag iris, and bull thistle. Results shall be documented separately for each vegetation community, and presented in monitoring reports for Years 3, 5, 7 and 10. There shall be no presence of the zero tolerance species listed in Performance Standard 3D including Japanese knotweed (and hybrids), purple loosestrife, English ivy, English holly, and bindweed. Presence and eradication of these species must be noted in monitoring reports for Years 1, 3, 5, 7 and 10. In addition to recording the percent cover of the zero-tolerance species in the monitoring plots, annual surveys for these species shall occur across the entire Bank site.

Monitoring for vegetation will be conducted towards the end of the summer but before leaf drop (August through mid-September). Plants must have been in the ground for a minimum of five months prior to monitoring.

F.2.4 Hydrology

Both data loggers and field observations will be used to assess post-construction hydrology. Following construction and grading of the site, 11 permanent hydrologic monitoring devices (data loggers) will be installed in on-site stream channels and in shallow ground water monitoring wells in wetland areas. Approximate locations of post-construction data loggers to be installed at the Bank site are shown on Figure F-1. Final locations will be provided in the as-built report.

In wetland areas, data loggers will be placed within shallow wells at a total depth between 24 and 40 inches below the soil surface. Shallow well installation will follow guidance in Sprecher (2000 and 2008), U.S. Army Corps of Engineers (2005), Noble (2006), and Minnesota Board of Water and Soil Resources (2013). Two data loggers will be deployed in on-site streams in anchored perforated pipes driven into the substrate (USEPA 2014).

The wetland hydrology standard for this project requires presence of soil saturation within the top 12 inches below the soil surface, or free water in soils pits or water wells at 12 inches or less below the soil surface for at least 30 consecutive days during the growing season (February 7 through December 10), where the growing season is defined by the U.S. Army Corps of Engineers 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (or as updated), during years of normal or wetter precipitation.

Hydrologic data collected from data loggers, shallow wells, and/or shallow pits will be used to document the extent of wetland hydrology in Years 3, 5 and 10 using the methods referenced in USACOE 1987 and 2010 (Performance Standard 2B and as applicable to Performance Standard 2C). Observations in shallow soil pits (12-20 inches in depth) can document the presence of shallow groundwater, saturated soils, and other indicators of wetland hydrology, such as oxidized rhizospheres, that are not captured by data loggers. Indicators of hydric soil

development, such as low chroma colors and redoximorphic features, can also be seen in soil pits.

In Years 5 and 10, formal monitoring will include a full wetland delineation on the entire Bank site and the offsite portion of Wetland G, using the U.S. Army Corps of Engineers Wetland Delineation Manual (USACOE 1987) and the regional supplement (USACOE 2010) or as revised. The wetland edge(s) will be clearly marked in the field by a qualified wetland biologist. In addition, in Years 5 and 10 the ordinary high-water mark of all stream channels will be delineated according to methodology approved by Washington State Department of Ecology (Ecology) and the U.S. Army Corps of Engineers. The results, including data sheets and a wetland boundary map with sample plot locations, wetland acreages, and delineated stream channels will be included in the Year 5 and 10 monitoring reports. In Year 10, the wetland(s) will be rated according to the current version of Ecology's rating system.

Presence and condition of stream riffle structures and LWD complexes must be observed and documented in the monitoring reports for Years 1, 3, 5, 7, and 10.

F.2.5 Habitat

As-built drawings and photos will be submitted showing removal of old farm equipment and irrigation piping, locations of existing fences, installation of new fences and signs, and installation of habitat features (Performance Standard 4A). Habitat features include: perch poles, brush piles, LWD pieces (downed logs, root wads) and wood duck nest boxes. Locations, numbers, and conditions of habitat features present in Year 10 will be documented (Performance Standard 4B). Presence and condition of fences and signs must be observed and documented in the monitoring reports for Years 1, 3, 5, 7, and 10.

Performance Standard 4C relates to the effect of the project on floodplain stream temperatures. Two data loggers (one backup in case of failure) will be installed in one location at the outlet where the floodplain stream leaves the site and enters Bear Creek. Temperature readings will be collected at 30-minute (minimum) intervals from May 1 through October 31 from the time construction is complete. Year 1, 2 and 3 maximum temperature data will be collected and a summary including 7-day average daily (7-DADMax) temperatures will be submitted to the IRT. At Years 5, 7 and 10 the stream temperatures will be compared to Years 1, 2, and 3. Credit will be granted if it is shown that temperatures (7-DADMax) at the outlet stream in Years 5, 7 and 10 are lower than Years 1, 2 and 3. Temperature data from all other data loggers located on site will be provided in annual reports.

"1-DMax" or "1-day maximum temperature" is the highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or continuous monitoring probes having sampling intervals of thirty minutes or less. "7-DADMax" or "7-day average of the daily maximum temperatures" is the arithmetic average of seven consecutive measures of daily maximum temperatures. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date (WAC 173-201A-020).

The two temperature data loggers will be installed in anchored perforated PVC housing to hold the sensors in place at a constant elevation, to ensure circulation of stream water around the sensors, and to be protected from damage by moving debris or vandalism (EPA 2014).

F.3 Reports

The Sponsor will prepare and submit to the IRT monitoring reports that will inform the IRT of the status of Bank establishment and operation. These reports will include the name of the entity responsible for preparing the report, the names of the individuals who gathered the data and who authored the report, and a summary table comparing relevant performance standards for that year's report to monitoring results. These reports will document Bank conditions and provide the supporting information required to document the attainment of goals, objectives, and performance standards, as a basis for a decision whether to award credits. Monitoring reports are due for Years 1, 3, 5, 7 and 10. The results of formal and informal monitoring conducted in Years 2, 4, 6, 8 and 9 shall be included in the subsequent monitoring report. Monitoring reports for each calendar year will be submitted by February 1 of the following year, with a copy for each member of the IRT.

Each monitoring report will contain the following information:

A. An overview of the current ecological condition of the Bank, including a survey of the vegetative communities, effectiveness of the re-establishment, rehabilitation, and enhancement activities accomplished to date, and progress of the Bank in achieving the specific performance standards of the Bank. Vegetation data in forested, scrub-shrub, emergent, and riparian upland areas will include: species presence, percent aerial cover by species, and density as identified in individual performance standards. The monitoring report must document any IRT-approved changes to the monitoring methods.

All monitoring will be conducted by qualified personnel, and the monitoring report must include the names of the people who conducted the monitoring and the date(s) when the monitoring activities occurred. A description of the methods used to collect the monitoring data must be included in an appendix to the report. The monitoring data will be summarized in the monitoring report using tables and/or graphs, and the raw data used for compiling the summary will be located in the report appendix for reference. The monitoring report will also contain tables which list the applicable performance standards for the monitoring year, and whether or not each performance standard was met, along with any corrective actions proposed. The monitoring report must also include a description of the presence and assessment of the functioning condition of the floodplain stream riffle structures, LWD complexes, fences, and signs.

B. A detailed discussion about the likely causes and impacts of any setback or failure that occurred and recommendations for future actions and strategies that might resolve those problems.

C. Pertinent additional information on such aspects of the Bank as hydrology, soils, vegetation, fish and wildlife use of the area, recreational and scientific use of the Bank, and natural events such as disease, wildfire, and flooding that occurred.

D. A description and schedule of maintenance actions undertaken since the previous monitoring report, and maintenance actions recommended to keep the Bank site on course to satisfy Performance Standards and to ensure the presence and functioning of stream riffle structures, LWD complexes, fences, and signs; and to ensure conveyance in the North Ditch. Explanations of the need for any contingency or remedial measures, and detailed proposals for their implementation.

E. Photographs of the Bank taken from permanent locations that are accurately identified on the as-built drawings. The photographs are intended to document the progress of each component of the Bank, as well as the Bank in general, toward achieving the objectives and performance standards of the Bank. Such photo monitoring will include general vantage points around the margin of the Bank, vantage points within the Bank, and at specific monitoring locations such as sampling points or habitat features.

F. A monitoring map showing the vegetation communities (differentiating between re-established and rehabilitated habitats) and locations of all vegetation monitoring plots; and the locations of photo points, data loggers (flow, hydrology, temperature), habitat features, floodplain stream riffle structures, LWD complexes, fences, and signs.

Table F-2 Summary of Annual Monitoring Tasks

Bank Year*	Report name	Performance Standard	Monitoring Task	Monitoring Area	Expected Site Visits
Year 0	Baseline	2B, 2C	Collect hydrology data over site after grading and before planting	Entire Bank site	Multiple August - March
		4C	Collect stream temperature data before construction	On-site ditches	May-October
	As-built Report	2A	Submittal of grading as-built	Entire Bank site	90 days after completion
		3A	Submittal of planting as-built	Entire Bank site	90 days after completion
		4A	Habitat features, fences, and signs installed	Entire Bank Site	90 days after completion
Year 1	Year 1 Monitoring Report	2B, 2C	Collect hydrology data over site	Entire Bank site	Multiple February-June
		3D	Full site survey for zero-tolerance invasives: invasive knotweed, purple loosestrife, English holly, English ivy, and bindweed	Entire Bank Site	June-Sept, one time in year
		3F	Collect cover data for native emergent species	PEM	August-Sept, one time in year
		3G	Collect plant density data for native tree and shrub species	PSS re-establishment and rehabilitation Areas	August-Sept, one time in year
		3H	Collect plant density data for native tree species	PFO re-establishment and rehabilitation Areas	August-Sept, one time in year
		3J	Collect plant density data for native tree and shrub species	Riparian Upland Enhancement Areas	August-Sept, one time in year
		4C	Collect stream temperature data	Floodplain streams	May-October
Year 2		2B, 2C	Collect hydrology data over site	Entire Bank site	Multiple March-June
		4C	Collect stream temperature data	Floodplain streams	May-October
Year 3	Year 3 Monitoring Report	2B	Collect hydrology data over site	Entire Bank site	March-June, one time in year
		3B, 3C	Monitor for non-native invasive species	Within each Vegetation Community	August-Sept, one time in year
		3D	Full site survey for zero-tolerance invasives	Entire Bank Site	June-Sept, one time in year
		3E, 3F	Collect emergent species presence and cover data for native species	PEM	August-Sept, one time in year
		3G	Collect plant density and species presence data for native tree and shrub species	PSS re-establishment and rehabilitation Areas	August-Sept, one time in year
		3H, 3I	Collect plant density data for native tree species and cover data for native tree and shrub species	PFO re-establishment and rehabilitation Areas	August-Sept, one time in year
		3J	Collect plant density data for native tree and shrub species	Riparian Upland Enhancement Areas	August-Sept, one time in year
		4C	Collect stream temperature data	Floodplain streams	May-October
Year 4		2C	Collect hydrology data over site	Entire Bank site	Multiple March-June

Year 5	Year 5 Monitoring Report	2C	Conduct wetland and stream delineations	Entire Bank site and Wetland G	Single event, April-June
		3B, 3C	Monitor for non-native invasive species	Within each Vegetation Community	August-Sept, one time in year
		3D	Full site survey for zero-tolerance invasives	Entire Bank Site	June-Sept, one time in year
		3E, 3F	Collect emergent species presence and cover data for native species	PEM	August-Sept, one time in year
		3G	Collect cover and species presence data for native tree and shrub species	PSS re-establishment and rehabilitation Areas	August-Sept, one time in year
		3H, 3I	Collect plant density data for native tree species and cover data for native tree and shrub species	PFO re-establishment and rehabilitation Areas	August-Sept, one time in year
		3J	Collect cover data for native tree and shrub species	Riparian Upland Enhancement Areas	August-Sept, one time in year
		4C	Collect stream temperature data	Floodplain streams and Bear Creek	May-October
Year 7	Year 7 Monitoring Report	3B, 3C	Monitor for non-native invasive species	Within each Vegetation Community	August-Sept, one time in year
		3D	Full site survey for zero-tolerance invasives	Entire Bank Site	June-Sept, one time in year
		3E, 3F	Collect emergent species presence and cover data for native species	PEM	August-Sept, one time in year
		3G	Collect cover and species presence data for native tree and shrub species	PSS re-establishment and rehabilitation Areas	August-Sept, one time in year
		3H, 3I	Collect plant density data for native tree species and cover data for native tree and shrub species	PFO re-establishment and rehabilitation Areas	August-Sept, one time in year
		3J	Collect cover data for native tree and shrub species	Riparian Upland Enhancement Areas	August-Sept, one time in year
		4C	Collect stream temperature data	Floodplain streams	May-October
Year 10	Year 10 Monitoring Report	2C	Conduct wetland and stream delineations, and rate the wetland(s)	Entire Bank Site and Wetland G	Single event, April-June
		3B, 3C	Monitor for non-native invasive species	Within each Vegetation Community	August-Sept, one time in year
		3D	Full site survey for zero-tolerance invasives	Entire Bank Site	June-Sept, one time in year
		3E, 3F	Collect emergent species presence and cover data for native species	PEM	August-Sept, one time in year
		3G	Collect cover and species presence data for native tree and shrub species	PSS re-establishment and rehabilitation Areas	August-Sept, one time in year
		3H, 3I	Collect plant density data for native tree species and cover data for native tree and shrub species	PFO re-establishment and rehabilitation Areas	August-Sept, one time in year
		3J	Collect cover data for native tree and shrub species	Riparian Upland Enhancement Areas	August-Sept, one time in year
		4B	Document numbers, locations, and conditions of habitat features	Entire Bank site	June-Sept, one time in Year
		4C	Collect stream temperature data	Floodplain streams	May-October

* Year 0 for Performance Standards 2A and 4A is the calendar year during which construction is completed and the grading as-built report is submitted by the Sponsor and approved by the IRT. Year 0 for Performance Standard 3A is the calendar year during which planting is completed and the planting as-built report is submitted by the Sponsor and approved by the IRT. Year 1 is the first year of site monitoring following approval of the as-built reports.

F.4 Remedial Action during the Establishment Period of the Bank

In the event that one or more components of the Bank do not achieve performance standards or comply with any other requirement of this Instrument, the following sequence of remedial actions will be taken.

A. If the monitoring reports, or inspection by representatives of the IRT agencies, indicate persistent failure to achieve and maintain the prescribed performance standards, the Sponsor will propose adaptive management actions to correct the shortcomings. A thorough analysis of vegetation, wetland, and stream monitoring data may result in the identification of other factors, not identified in the performance standards or monitoring data, causing the project to fall short of its objectives. The Corps and/or Ecology, following consultation with the IRT and the Sponsor, may also direct adaptive management actions if the Corps and/or Ecology identify a need for corrective action and no adaptive management plan acceptable to the IRT has been submitted within a reasonable period of time. The adaptive management plan shall specify the nature of further examination of areas for potential causes of failure and/or corrective action to be conducted, the schedule of completion for those activities, and a monitoring plan for assessing the effectiveness of the corrective action. The objective of the adaptive management plan shall be to attain the originally prescribed Bank objectives, either through achieving the original performance standards or through new standards subsequently developed based on evaluation of the Bank site as it matures and is assessed. The Sponsor shall also implement all mitigation that the Corps and/or Ecology, in consultation with the IRT, determine is reasonably necessary to compensate for those authorized impacts to the aquatic environment that have not been successfully redressed by the Bank pursuant to the requirements of this Instrument. If modified or replacement performance standards are proposed, the Sponsor may not initiate activities designed to achieve those replacement standards until those performance standards are approved by the Corps and/or Ecology, following consultation with the IRT. During the period that a specific component of the Bank is out of compliance, the Corps and/or Ecology, following consultation with the IRT, may direct that credits generated by that Bank component may not be sold, used, or otherwise transferred.

B. If remedial actions taken by the Sponsor under the provisions of the preceding paragraph do not bring that performance standard of the Bank into compliance with the requirements of this Instrument, including any approved changes to the Instrument, the Sponsor may request approval to discontinue efforts to achieve one or more performance standards for the Bank. If the Corps and Ecology, following consultation with the IRT, approve of the proposal to discontinue efforts to achieve one or more performance standards, they need not be accomplished but no additional credits may be awarded for those performance standard(s). At the discretion of the Corps and Ecology, following consultation with the IRT, the Sponsor may also be released from future maintenance and monitoring obligations for those performance standard(s), provided that

releasing the Sponsor from those obligations does not adversely affect the remainder of the Bank, or affect credits already sold, used, or transferred to date.

C. If the Corps and Ecology, following consultation with the IRT, determine that the failure of one or more performance standards of the Bank to comply with the requirements of this Instrument adversely affects the ability of the Bank to achieve its goals or objectives, or if the Sponsor does not make a reasonable effort to bring the Bank into compliance with this Instrument, the Corps and Ecology, following consultation with the IRT, may terminate this Instrument and the operation of the Bank pursuant to Article IV.J.

D. If the Corps and/or Ecology, following consultation with the IRT, direct remedial or adaptive management action pursuant to Section F.4.A. and compliance with the performance standards is not restored within a further reasonable period of time, and the Sponsor does not obtain approval of any request to discontinue efforts pursuant to Section F.4.B, the Corps and/or Ecology may alternatively implement remedial action on their own initiative, acting through a Third Party Designee, by accessing the financial assurance instrument pursuant to Article III.C.1. and Section H.1 of Appendix H to this Instrument.

F.5 Maintenance during the Establishment Period of the Bank

General maintenance will be performed throughout the year to address conditions that may limit the success of the Bank and attainment of performance standards and objectives. The Sponsor is responsible for all site maintenance activities throughout the establishment period of the Bank, including obtaining any necessary permits for the work. Maintenance actions will include inspecting and assessing the functioning condition of the floodplain stream riffle structures and large woody debris complexes and providing repairs as necessary; and annually inspecting and assessing the North Ditch for obstructions and maintaining conveyance in the Ditch. All areas disturbed as a result of repairing the stream riffle structures and large woody debris complexes, and maintaining the North Ditch, will be restored as soon as possible. In addition, maintenance activities will include, but are not limited to, vegetative maintenance (including replanting, repair of any areas subject to erosion, weed control around plantings, mowing, control of invasive species, control and discouragement of voles, beaver, and deer foraging on plants) and general maintenance (including fence repair, signage replacement, cleaning and repair of nesting boxes, access maintenance, and cleanup of trash).

F.5.1 Beaver Management

Beaver are native to the Bear Creek watershed and are expected to use portions of the Bank site. Beaver activity, including building lodges and dams, is considered a naturally occurring process in the development of natural, self-sustaining habitat. Neighbors of the Bank are concerned about potential flooding from beaver activity, so it is critical that the Bank site is designed to prevent impact to adjacent property owners, and that appropriate maintenance activities are approved in advance if they are required to prevent flooding of neighboring properties.

Beaver activity anywhere on the Bank site that raises water levels so that it flows back into Bear Creek along the eastern and southern Bank boundaries (including the parcels between the Bank

and Bear Creek on the south side which are NGPAs) will be allowed. Along the north and western boundaries of the Bank, the North Ditch will be maintained in its current unobstructed condition so that surface water from adjacent parcels can pass freely onto the Bank site and not back up onto adjacent parcels. Modeling of potential flood conditions across the site shows that keeping open the conveyance of water in the upper part of the North Ditch is an important aspect of flood protection for adjacent properties around the Bank. In addition, there is a 4 to 5-foot high berm along the north Bank boundary extending from Bear Creek to the west that will decrease the possibility of water being pushed towards the residences along Bear Creek to the north of the Bank.

Prevention of offsite flooding to the north and west of the Bank will depend on the North Ditch to be maintained so that flows can pass freely and drain to Bear Creek. This may require beaver management once the Bank site is vegetated. The Beaver Management Area consists of two segments of the North Ditch located on the Bank site (designated in red on **Figure F-2**), located upstream of the permanent Bank access point. The Beaver Management Area will be kept free of beaver dams or other obstructions. The lower portion of the North Ditch located from south of the permanent Bank access point to where the North Ditch enters Bear Creek is not expected to require management since the banks of the North Ditch in this area are 46 feet in elevation. At that elevation, surface water backed up in the lower section will re-enter the Bank or flood to the east through the Bank site.

Included in the Beaver Management Area section located immediately north of the permanent Bank access point (within the Bank's buffer), a 12-foot wide maintenance path will run along the west side of the North Ditch. This maintenance path will be vegetated, primarily with native herbaceous species. From this path along the ditch, obstructions in the North Ditch could be removed by hand or with small mechanical equipment, such as a backhoe by the Sponsor, or in the future by City of Redmond personnel. All sections of the North Ditch located on the Bank site will be inspected for obstructions every year at the end of September. Prior to October 15, all obstructions will be removed from the Beaver Management Area. The Sponsor or the City of Redmond will be responsible for obtaining any permits necessary for the North Ditch maintenance work. Descriptions of North Ditch conditions and maintenance actions taken and/or needed will be included in the annual monitoring report. All disturbances to the Bank site resulting from the ditch maintenance actions will be restored.

It is expected that beavers will eventually alter or affect hydrology within the Bank site. If beaver activity occurs that requires additional action on the part of the Sponsor or City of Redmond in the future, the IRT and appropriate regulatory agencies will be consulted.

References

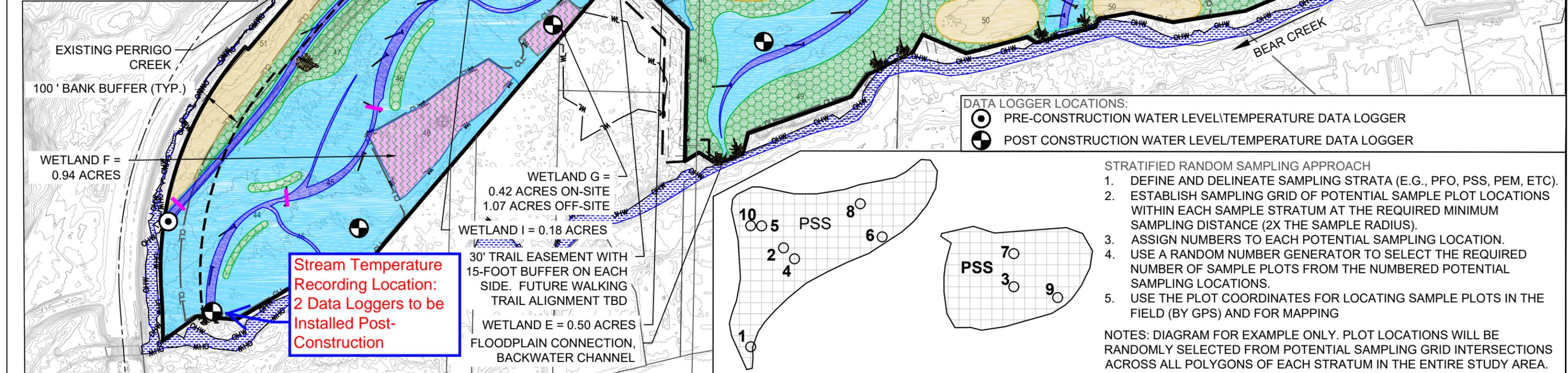
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Elev. (ft.)	Vegetation Community	Proposed Acreage (total Bank acreage = 75.2 ac)		Min. # Sample Plots Req. (1% of area for PFO, PSS & UPL; 3 plots/acre for PEM)	Proposed # of Sample Plots ^a
		Creditable	Non-Creditable (Buffers & Easements)		
46-54	Riparian Upland Forest (UPL) - Enhancement	6.70	5.20	8	9 ^b
45-53	Riparian Forested Wetland (PFO) - Re-establishment	17.50	1.60	13	13 ^c
44-53	Shrub-Scrub with Emergent Wetland Pockets (PSS/PEM) - Re-establishment	28.70	3.30	20	20 ^b
44-50	Riparian Wetland/Stream Channel Complex (PEM) - Rehabilitation	3.90	0.40	13	13 ^c
46-52	Existing Wetlands A,B,C,D (PFO) - Rehabilitation	4.71	0.00	3	4 ^d
	Existing Wetlands E,F,G,H,I (PSS) - Rehabilitation	2.99	0.20	3	5 ^d
Table Notes		Total Plots		71	75

^aPlot sizes are: PFO and UPL = 15-ft radius circle (707 sf). PSS = 15-ft radius circle (707 sf). PEM = 3-ft radius circle (28 sf).
^bFour plots will be located in non-creditable buffer area outside of easements.
^cTwo plots will be located in non-creditable buffer area outside of easements.
^dOne plot will be located in each existing wetland.

LEGEND

- STREAM CHANNEL COMPLEX (IN BANK) 7,114 FT EXISTING LENGTH 12,276 FT PROPOSED LENGTH
- EXISTING STREAMS (OFFSITE)
- BRUSH PILES (MIN 11)
- PERCH POLES (MIN 9)
- KEY LWD PIECE (MIN 52)
- LWD COMPLEX (MIN 10)
- BANK BOUNDARY (75.2 AC.)
- BUFFER
- EASEMENT
- EXISTING CONTOUR
- PROPOSED CONTOUR
- RIFFLE WITH LWD (21) (NTS)



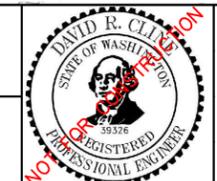
REV	DATE	DESCRIPTION	BY	SUB	APP
1	11/3/17	DRAFT-FINAL			
2	3/27/18	REV. 1			
3	6/23/18	REV. 2			
4	10/05/18	REV. 3			
5	10/25/18	REV. 4			

DESIGNED BY	SJH
DRAWN BY	SJH
CHECKED BY	DRC
APPROVED BY	
DATE	October 2018

HABITAT BANK LLC

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 Seattle, Washington
 (206) 632-8020 www.shannonwilson.com



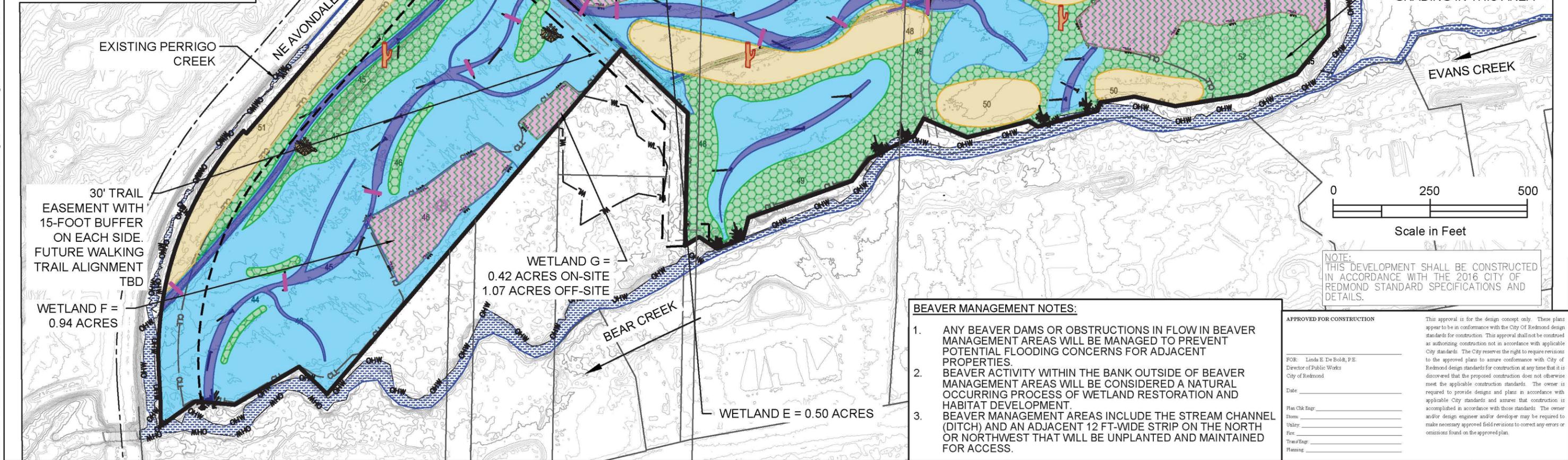
KELLER FARM MITIGATION BANK
 VEGETATION MONITORING & DATA LOGGER LOCATIONS
 SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

Filename: \\SEA-FS1\Vol1\IEF21-1 SEAI2500s\12566 Keller Farm\CAD\SHEETS\BODR Drawings\F - Drawings\21-1-12566-241 5 Grading Plan.dwg Date: 11-29-2018 Login: awp

ELEV. (FT)	NEW HABITAT AREAS
46-54	RIPARIAN UPLAND FOREST (UPL) (ENHANCEMENT)
45-53	RIPARIAN FOREST WETLAND (PFD) (RE-ESTABLISHMENT)
44-53	SHRUB-SHRUB WITH EMERGENT WETLAND POCKETS (PSS/PEM) (RE-ESTABLISHMENT)
44-50	RIPARIAN WETLAND/STREAM CHANNEL COMPLEX (PEM) (REHABILITATION)
46-52	EXISTING WETLAND (PFO/PSS MIX) (REHABILITATION)

LEGEND

- STREAM CHANNEL COMPLEX (IN BANK)
7,114 FT EXISTING LENGTH
12,276 FT PROPOSED LENGTH
- EXISTING STREAMS (OFFSITE)
- BRUSH PILES (MIN 11)
- PERCH POLES (MIN 9)
- KEY LWD PIECE (MIN 52)
- LWD COMPLEX (MIN 10)
- BANK BOUNDARY (75.2 AC.)
- BUFFER
- EASEMENT
- EXISTING CONTOUR
- PROPOSED CONTOUR
- RIFFLE WITH LWD (21) (NTS)
- BEAVER MANAGEMENT AREAS



NOTE:
THIS DEVELOPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2016 CITY OF REDMOND STANDARD SPECIFICATIONS AND DETAILS.

- BEAVER MANAGEMENT NOTES:**
- ANY BEAVER DAMS OR OBSTRUCTIONS IN FLOW IN BEAVER MANAGEMENT AREAS WILL BE MANAGED TO PREVENT POTENTIAL FLOODING CONCERNS FOR ADJACENT PROPERTIES.
 - BEAVER ACTIVITY WITHIN THE BANK OUTSIDE OF BEAVER MANAGEMENT AREAS WILL BE CONSIDERED A NATURAL OCCURRING PROCESS OF WETLAND RESTORATION AND HABITAT DEVELOPMENT.
 - BEAVER MANAGEMENT AREAS INCLUDE THE STREAM CHANNEL (DITCH) AND AN ADJACENT 12 FT-WIDE STRIP ON THE NORTH OR NORTHWEST THAT WILL BE UNPLANTED AND MAINTAINED FOR ACCESS.

APPROVED FOR CONSTRUCTION

FOR: Linda E. De Boldt, P.E.
Director of Public Works
City of Redmond

Date: _____

Plan Ck: Engr: _____
Stem: _____
Utility: _____
Fire: _____
Trans: Engr: _____
Planning: _____

This approval is for the design concept only. These plans appear to be in conformance with the City of Redmond design standards for construction. This approval shall not be construed as authorizing construction not in accordance with applicable City standards. The City reserves the right to require revisions to the approved plans to assure conformance with City of Redmond design standards for construction at any time that it is discovered that the proposed construction does not otherwise meet the applicable construction standards. The owner is required to provide designs and plans in accordance with applicable City standards and assures that construction is accomplished in accordance with those standards. The owner and/or design engineer and/or developer may be required to make necessary approved field revisions to correct any errors or omissions found on the approved plan.

REV	DATE	DESCRIPTION	BY	SUB	APP
1	11/3/17	DRAFT-FINAL			
2	3/27/18	REV. 1			
3	6/23/18	REV. 2			
4	10/05/18	REV. 3			
5	10/25/18	REV. 4			

DESIGNED BY: *SJH*
DRAWN BY: *SJH*
CHECKED BY: *DRC*
APPROVED BY: _____
DATE: October 2018

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GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
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KELLER FARM MITIGATION BANK
BEAVER MANAGEMENT PLAN
SE 1/4 SEC. 1, T25N, R5E & SW 1/4 SEC. 6, T25N, R6E

FIGURE
F-2

APPENDIX G LONG-TERM PROTECTION AND MANAGEMENT

G.1 Conservation Easements

A. The Sponsor will ensure, pursuant to Article III.D. of this Instrument, that an appropriate Conservation Easement is granted by the City of Redmond and recorded dedicating in perpetuity the property constituting the Bank, that is to be created, restored, or enhanced for credit. The conservation easement must be approved by the Corps and Ecology, following consultation with the IRT, and shall be recorded with the King County Auditor. A copy of the recorded conservation easement shall be provided to all members of the IRT. The conservation easement shall reflect that it may not be removed, modified, or transferred without written approval of the Corps and Ecology, in consultation with the IRT. The Corps and Ecology may consider any alteration or rescission of the conservation easement a default of the Sponsor's obligations under this Instrument and may institute appropriate action pursuant to Article IV.J. The Sponsor shall provide no less than 60 days written notice to the IRT of any transfer of fee title or any portion of the ownership interest in the Bank real property to another party. Use prohibitions reflected in the conservation easement will preclude the site from being used for activities that would be incompatible with the establishment and operation of the Bank. All restrictions shall be granted in perpetuity without encumbrances or other reservations, except those encumbrances or reservations approved by the Corps and Ecology and not adversely affecting the ecological viability of the Bank. Any portion of the site not encumbered by the conservation easement will not be credited for use in the Bank.

B. The conservation easement shall provide that all structures, facilities, and improvements within the Bank, including roads, trails and fences, that are merely incidental to the functionality of the mitigation site but are necessary to the Bank management and maintenance activities, shall be maintained by the Sponsor or its assignee, or the City of Redmond as landowner, for as long as it is necessary to serve the needs of long-term management and maintenance. All structures, facilities and improvements that directly and substantially contribute to the functionality of the mitigation site will be included within the responsibilities delineated in the Long-Term Management and Maintenance Plan.

G.2 Long-Term Management and Maintenance Plan

A. The Sponsor is responsible for ensuring that a Long-Term Management and Maintenance Plan is developed and implemented to protect and maintain in perpetuity the aquatic functions and values of the Bank site. This plan must be approved by the Corps and Ecology, following consultation with the IRT, prior to the termination of the establishment period of the Bank. Once the establishment period of the Bank has terminated pursuant to Article IV.K. of this Instrument, pursuant to a Long Term Management and Maintenance Agreement the Sponsor will assume responsibility for

implementing that Plan, as provided in Article IV.M. of this Instrument, unless the Sponsor assigns this responsibility pursuant to the provisions of Article IV.M. and Section G.2.D. of this Appendix. The Long-Term Steward will enter into a Long-Term Management and Maintenance Agreement with the Corps and Ecology, which will document the commitment on the part of the Long-Term Steward to adhere to the Long-Term Management and Maintenance Plan as well as memorialize the approval of the Long-Term Management and Maintenance Plan by the Corps and Ecology.

B. To gain IRT approval, the Long-Term Management and Maintenance Plan will consist of enumerated objectives. The Bank will document that it is achieving each objective by submitting status reports to the IRT on a schedule approved by the IRT. A primary goal of the Bank is to create a self-sustaining natural aquatic system that achieves the intended level of aquatic ecosystem functionality with minimal human intervention, including long-term site maintenance. As such, natural changes to the vegetative community, other than changes caused by noxious weeds, that occur after all Bank performance standards have been met are not expected to require remediation.

C. The Long-Term Management and Maintenance Plan will include those elements necessary to provide long-term protection for the aquatic ecosystem and habitat resources of the Bank site. The specific elements of the Plan must be tailored to meet the specific protection needs of the site. At minimum, the IRT will likely find the following core elements to be necessary for inclusion in the Long-Term Management and Maintenance Plan. The particular characteristics of the Bank site at the end of the establishment period may necessitate including other elements not specified below, that are needed to protect the ecosystem resources present at the Bank.

(1) Periodically patrol the Bank site for signs of trespass and vandalism. Maintenance will include reasonable actions to deter trespass and repair vandalized Bank features.

(2) Monitor the condition of structural elements and facilities of the Bank site such as signage, fencing, roads, and trails. The Long-Term Management and Maintenance Plan will include provisions to maintain and repair these improvements as necessary to achieve the objectives and functional performance goals of the Bank and comply with the provisions of the conservation easement. Improvements that are no longer needed to facilitate or protect the ecological function of the Bank site may be removed or abandoned if consistent with the terms and conditions of the conservation easement.

(3) Inspect the Bank site annually to locate and eradicate any occurrence of knotweed. The IRT anticipates that this long-term control will involve identifying and eradicating a relatively small number of recurrences each year. In the event the Corps and Ecology, in consultation with the IRT, determines that the watershed within which the Bank is located becomes infested with knotweed in the future, so that its effective control on the Bank site is either no longer practicable or unreasonably expensive, the IRT will consider appropriate changes to the Long-Term Management and Maintenance Plan.

(4) Inspect the site annually to locate and control noxious weeds other than knotweed. Noxious weed control measures may include mechanical vegetation control, herbicide treatments, and new plantings.

D. If the Sponsor elects to request the approval of the IRT to assign long-term management and maintenance to a Long-Term Steward pursuant to Article IV.M.2., the long-term management and maintenance assignment agreement will reflect that the assignee has assumed (1) the obligation, owed to the IRT and manifested through execution of a Long-Term Management and Maintenance Agreement with the Corps and Ecology, of accomplishing the Long-Term Management and Maintenance Plan; as well as (2) the legal responsibility for continued accomplishment and maintenance of the compensatory mitigation requirements associated with all impacting projects that satisfied their mitigation requirements through the application of Bank credits. The Corps and Ecology will also execute this assignment agreement. In exchange for the assignee's promise to achieve the Long-Term Management and Maintenance Plan, contemporaneously with the assignment of long-term management and maintenance responsibilities the Corps and Ecology will direct disbursement of the "full funding" amount specified in Article III.C.2.c. of this Instrument from the Long-Term Management and Maintenance Endowment Fund escrow account, pursuant to Article III.C.2.e. of this Instrument. In the event the responsibility for executing the Long-Term Management and Maintenance Plan is not assigned to a third-party assignee, at the termination of the establishment period of the Bank the "full funding" amount specified in Article III.C.2.c. of this Instrument will be disbursed from the Long-Term Management and Maintenance Endowment Fund escrow account to the Sponsor.

APPENDIX H FINANCIAL ASSURANCES

The Sponsor will institute and maintain financial assurances in accordance with the subsections immediately below. The Sponsor will provide a Letter of Credit to provide financial assurance underlying the establishment and initial functionality of the Bank.

H.1 Letter of Credit

A. The Irrevocable Letter of Credit prescribed in Article III.C.1. of this Instrument, underlying the establishment and functionality of the Bank, will adhere to the following form and contents.

B. Each Letter of Credit will be irrevocable and without condition other than those specifically authorized in this Instrument. Each Letter of Credit may not be withdrawn or canceled by the issuing financial institution prior to the designated expiration date, which may be no earlier than 12 years from the date of issuance. If the Letter of Credit applicable to the Bank shall expire by its own terms prior to the termination of the establishment period of the Bank as specified in Article IV.K. of this Instrument, the Sponsor must reinitiate an acceptable Letter of Credit so that there is no interval in which there is no Letter of Credit in effect. In lieu of a Letter of Credit with an effective period of 12 years, the Sponsor may elect to submit a Letter of Credit with an initial expiration date that is a minimum period of one year from the date of issuance. The Letter of Credit shall provide that, unless the issuer provides the Beneficiaries written notice of non-renewal at least 60 days in advance of the current expiration date, the Letter of Credit is automatically extended without amendment for one year from the expiration date, or any future expiration date, until a period of 12 years commencing with the date of first issuance is completed. If the Sponsor does not furnish an acceptable replacement Letter of Credit, or other acceptable financial assurance, at least 30 days before a Letter of Credit's expiration, the Corps and/or Ecology may immediately draw on the existing Letter of Credit up to its full value without any notice to the Sponsor. If the Corps and Ecology determine that the issuing financial institution's rating has dropped below the requirements specified in Article III.C.1. of this Instrument, the Corps and Ecology may direct the Sponsor to provide an acceptable substitute Letter of Credit within 30 days. If an acceptable substitute is not provided within the prescribed period, the Corps and/or Ecology may immediately draw on the Letter of Credit up to its full value without any further notice to the Sponsor. No further credits will be awarded from the Bank without an effective Letter of Credit. Each Letter of Credit will provide that the issuing financial institution shall honor the credit engagement and pay to the Third-Party Designee the directed sum without inquiring whether the directing Beneficiary agency or the receiving Third Party Designee has a right to make such a demand.

C. Each Letter of Credit will be issued to, and will designate, the Corps and Ecology as distinct and independent Beneficiaries. If the IRT has informed the Sponsor that one has been so designated, each Letter of Credit shall identify and designate the Third-Party Designee. Upon presentation of a sight draft by either the Corps or Ecology, in writing on agency letterhead, accompanied by no other documentation other than the original Letter of Credit, the issuing financial institution shall disburse from the credit funds account to the Third-Party Designee the

amount specified by the Corps or Ecology, up to a maximum cumulative amount as reflected in the Letter of Credit. The Corps or Ecology shall be authorized to direct or make partial drawings, and multiple successive drawings, upon the credit account. The Corps and Ecology shall have the exclusive authority to direct disbursement of funds from the credit funds account, and the direction of only one of these two agencies is required in order to accomplish a disbursement.

D. Each Letter of Credit shall acknowledge that, from time to time, the Beneficiary agencies may authorize a reduction in the required level of credit during the effective period of the Letter of Credit. Any such reduction must be authorized by both the Corps and Ecology, as Beneficiary agencies. Upon receipt of both authorizations, in writing on agency letterhead, the issuing financial institution will be authorized to reduce the level of maximum extended credit, and it may, as arranged between the Sponsor and the issuing financial institution, reissue or amend the applicable Letter of Credit accordingly to reflect that change.

E. Each Letter of Credit shall acknowledge that the Beneficiary agencies may authorize cancellation of the Letter of Credit prior to the scheduled expiration date reflected therein. Any such cancellation must be authorized by both the Corps and Ecology, as Beneficiary agencies. Upon receipt of both authorizations, in writing on agency letterhead, the issuing financial institution will be authorized to withdraw or rescind, as arranged between the Sponsor and the issuing financial institution, the applicable Letter of Credit.

F. If so directed by the Corps and Ecology, the Sponsor agrees to substitute the identification of the Third-Party Designee with a replacement entity for each applicable Letter of Credit. The Sponsor agrees that it shall execute either an amendment or replacement of each applicable Letter of Credit in order to affect such a substitution. If substitution of the Third-Party Designee is directed, all other terms and conditions of the applicable Letter of Credit shall remain unchanged, particularly including the credit amount and the expiration date.

G. Upon request of the Sponsor, the Corps and Ecology, in consultation with the IRT, may authorize reductions in the required credit account limits of each of the Letters of Credit when the Corps and Ecology have determined, in consultation with the other members of the IRT and the Sponsor, that the Bank objectives and performance standards reflected in Appendix C are being timely met.

H. The Sponsor is solely responsible for any costs, fees, or premiums associated with the issuance, modification, continuation in force, or termination of each Letter of Credit. Any such costs may not be deducted from the principal of the Letter of Credit.

H.2 Long-Term Management and Maintenance Endowment Fund

A. In order to implement the Long-Term Management and Maintenance Endowment Fund, prescribed in Article III.C.2. of this Instrument and underlying management and maintenance actions to be taken following completion of the establishment period of the Bank, the Sponsor will establish an escrow account in an accredited and Federally-insured financial institution, as follows.

B. The Long-Term Management and Maintenance Endowment Fund escrow account will be incrementally funded until it is fully funded, as prescribed in Articles III.C.2.b. and III.C.2.c. of this Instrument. Once the Long-Term Management and Maintenance Endowment Fund is fully funded, the Sponsor will be released from any further obligation to deposit a designated sum corresponding to each sale, use, or transfer of credits. The Sponsor will be permitted to accelerate contributions to the Long-Term Management and Maintenance Endowment Fund, and by doing so, the Sponsor may defer subsequent contributions until the balance in the Endowment Fund no longer matches or exceeds the balance required by the computation in Article III.C.2.b. The Sponsor will provide to the IRT an annual account statement displaying a cumulative tabulation of all deposits into the Long-Term Management and Maintenance Endowment Fund escrow account, with each deposit referencing the associated sale/use/transfer transaction, as well as the principal balance and total account balance, as of December 31 of the previous calendar year, by February 1 of each year. This statement will be submitted until (1) the Long-Term Management and Maintenance Endowment Fund is fully funded or (2) until approval by the Corps and Ecology, in consultation with the IRT, of the Sponsor's written request to permanently cease banking activities.

C. The Long-Term Management and Maintenance Endowment Fund escrow account may bear interest or other earnings. Any earnings generated by the escrow funds shall remain deposited with other escrow account funds. Earnings in excess of the full funding amount specified in Article III.C.2.c. of this Instrument will be returned to the Sponsor at the time that the full funding amount is disbursed to the Long-Term Steward. The Long-Term Management and Maintenance Fund account contents may be invested only in the following: an interest-bearing savings or passbook account, savings certificate, or certificate of deposit, held in each case by an institution that is insured by the Federal Deposit Insurance Corporation; alternatively, the Fund principal and earnings may be invested in direct obligations of the Government of the United States of America, in obligations of agencies or insurers that are guaranteed by the Government of the United States of America, or in a money market mutual fund consisting solely of such obligations.

D. The Sponsor will be responsible for all escrow agency and associated account fees, including account termination and final reconciliation costs, which may not be paid out of escrow account funds, or out of the interest or earnings generated thereon.

E. The terms of the escrow instructions will permit regular recurring deposits to the escrow principal as sales, use, or transfers of credits are made and designated sums corresponding to those sales, use, or transfers are deposited to the escrow account.