DEVELOPMENT SERVICES DEPARTMENT
ENVIRONMENTAL COORDINATOR
450 110th Ave NE
BELLEVUE, WA 98009-9012

DETERMINATION OF NON-SIGNIFICANCE

PROPONENT: City of Bellevue Utilities Department, Bruce Jensen

LOCATION OF PROPOSAL: 14070 NE 20th Street

DESCRIPTION OF PROPOSAL: Critical Areas Land Use Permit to replace the culvert under NE 21st Street and to modify the channel of Valley Creek for flood control and habitat improvements.

FILE NUMBERS: 12-127243-LO **PLANNER:** Heidi M. Bedwell, Senior Planner

The Environmental Coordinator of the City of Bellevue has determined that this proposal does not have a probable significant adverse impact upon the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(C). This decision was made after the Bellevue Environmental Coordinator reviewed the completed environmental checklist and information filed with the Land Use Division of the Development Services Department. This information is available to the public on request.

☐ There is no comment period for this DNS. There is a 14-day appeal period. Only persons who submitted written comments before the DNS was issued may appeal the decision. A written appeal must be filed in the City Clerk's office by 5:00 p.m. on _____.

☒ This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS. There is a 14-day appeal period. Only persons who submitted written comments before the DNS was issued may appeal the decision. A written appeal must be filed in the City Clerk's Office by 5 p.m. on **1/23/2014**

☐ This DNS is issued under WAC 197-11-340(2) and is subject to a 14-day comment period from the date below. Comments must be submitted by 5 p.m. on _____. This DNS is also subject to appeal. A written appeal must be filed in the City Clerk's Office by 5:00 p.m. on _____.

This DNS may be withdrawn at any time if the proposal is modified so as to have significant adverse environmental impacts; if there is significant new information indicating a proposals probable significant adverse environmental impacts (unless a non-exempt license has been issued if the proposal is a private project): or if the DNS was procured by misrepresentation or lack of material disclosure.

_____ __**1/8/2014**_____
Environmental Coordinator Date

OTHERS TO RECEIVE THIS DOCUMENT:

☒ State Department of Fish and Wildlife / Stewart.Reinbold@dfw.gov; Christa.Heller@dfw.wa.gov;
☐ State Department of Ecology, Shoreline Planner N.W. Region / Jobu461@ecy.wa.gov; sepaunit@ecy.wa.gov
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☒ Muckleshoot Indian Tribe Karen.Walter@muckleshoot.nsn.us; Fisheries.fileroom@muckleshoot.nsn.us

City of Bellevue
Development Services Department
Land Use Staff Report

Proposal Name:	City of Bellevue Utilities Flood Control and Habitat Improvement project- Valley Creek
Proposal Address:	14070 NE 20th Street
Proposal Description:	Critical Areas Land Use Permit to replace the culvert under NE 21st Street and to modify the channel of Valley Creek for flood control and habitat improvements.
File Number:	**12-127243-LO**
Applicant:	Bruce Jensen, City of Bellevue Utilities Department
Decisions Included:	Critical Areas Land Use Permit (Process II. LUC 20.30P)
Planner:	Heidi M. Bedwell, Planner
State Environmental Policy Act Threshold Determination:	**Determination of Non-Significance** Carol V. Helland, Environmental Coordinator Development Services Department
Director's Decision:	**Approval with Conditions** Carol V. Helland, Land Use Director Development Services Department

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Application Date:	October 19, 2012
Notice of Application Publication Date:	November 29, 2012
Decision Publication Date:	January 9, 2014
Project/SEPA Appeal Deadline:	January 23, 2014

For information on how to appeal a proposal, visit Development Services Center at City Hall or call (425) 452-6800. Comments on State Environmental Policy Act (SEPA) Determinations can be made with or without appealing the proposal within the noted comment period for a SEPA Determination. Appeal of the Decision must be received in the City's Clerk's Office by 5 PM on the date noted for appeal of the decision.

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Attachments

1. Critical Areas Report – Habitat Improvement Plan, Flood Control Plan, Mitigation Plan including Project Plans
2. Environmental Checklist
3. Public Comment Letter and City Applicant Response to Public Comment
4. Floodplain Impact Memorandum prepared by Ralph Nelson, Leidos Engineering November 4, 2013

I. Proposal Description

This is an application for approval to replace the culvert under NE 21st Street and to modify the channel of Valley Creek for flood control and habitat improvements.

The proposed project includes removing the existing culvert crossing NE 21st Street and replacing it with a larger fish-passable box culvert, designed to meet Washington State Department of Fish and Wildlife stream-simulation design criteria. In addition to the culvert replacement, the project includes restoration of downstream habitat and channel geometry by increasing stream sinuosity and by removing sediment that have accumulated in the creek channel. Approximately, 150 feet of stream and adjoining wetland and riparian habitat will be restored. The channel will be restored by taking approximately 475 cubic yards of cut material and 307 cubic yards of fill to create the new stream channel with a bottom width of 7 feet with gravel suitable for macro-invertebrate and salmonid spawning. Large woody debris will be held in place with earth and anchor boulders and the slope will be stabilized with coir matting and live stakes. Work will be occurring in the stream channel, stream buffer, wetland and wetland buffer and regulated floodplain. The project is regulated by the city of Bellevue Land Use Code (LUC) Critical Areas Overlay District requirements found in LUC 20.25H.

The proposed habitat improvement and flood control work is allowed by LUC 20.25H.055.B subject to compliance with applicable performance standards. Proposed in-stream work constitutes modifications of the stream channel and is allowed under LUC 20.25H.080.B which specifies that the stream channel may be only be modified through a critical areas report in conjunction with a stream stabilization measure or a habitat improvement project where there is a net benefit in ecological function.

In response to this requirement, the applicant has obtained the services of a qualified professional who has prepared a critical areas report and has identified, in addition to required impact mitigation, how habitat improvements can be achieved. The critical areas report contains a complete project summary and outlines potential impacts and actions being taken to avoid or when unavoidable provide mitigation. The project critical areas report is included as **Attachment 1** along with the project plans.

II. Site Description, Zoning, Land Use and Critical Areas

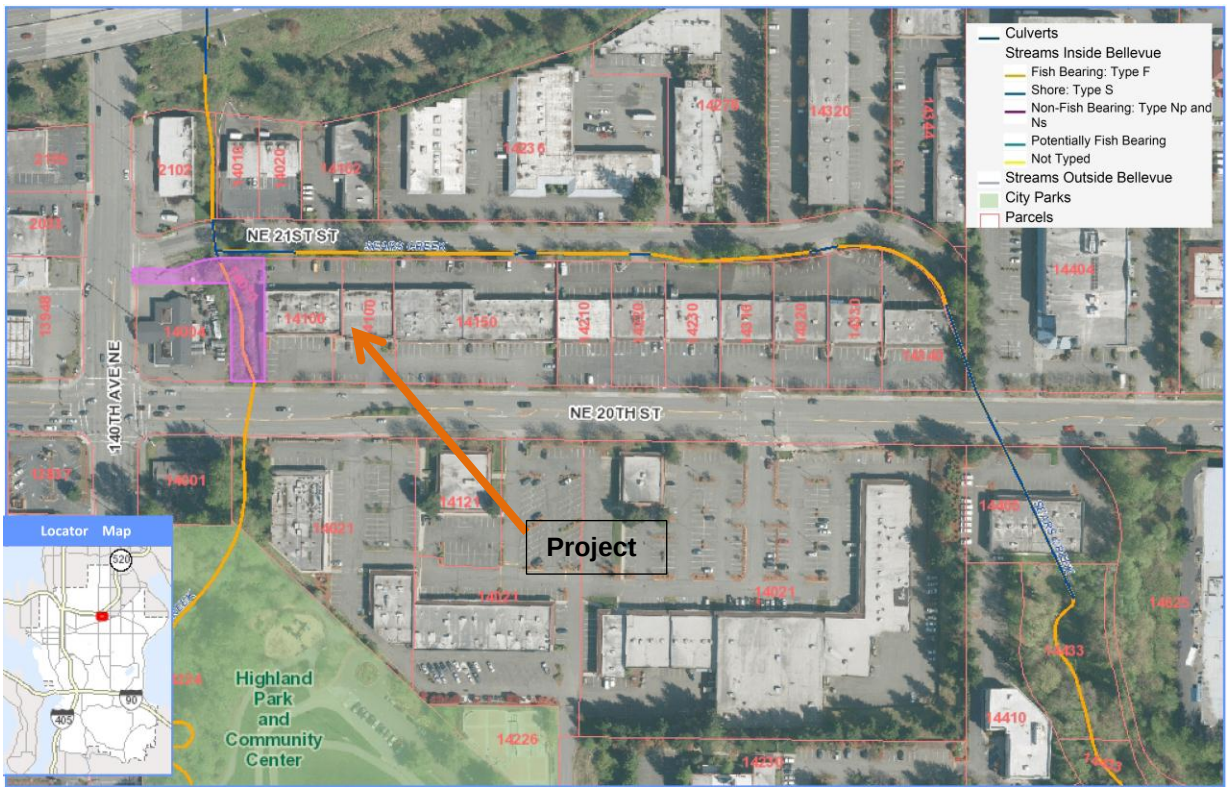
A. Site Description

The project vicinity is mostly developed and consists of commercial uses. The project area includes NE 21st Street, Valley Creek, Sears Creek at its confluence with Valley Creek, two wetlands, and vegetated uplands. Native vegetation is present, but the predominance of vegetation in the project vicinity is composed of non-native species such as Himalayan blackberry (*Rubus armeniacus*) and reed canarygrass (*Phalaris arundinacea*). Native species consist primarily of Pacific (*Salix lucida*) and Sitka (*S. sitchensis*) willow, which are most prevalent along the stream channel downstream of NE 21st Street. Stream habitat in

the project area is degraded due to the substrate being composed almost entirely of sand and silt, and blockages composed of pieces of Himalayan blackberry trapped in branches and trunks of fallen willows. These conditions, including the undersized culvert under NE 21st Street, are factors contributing to periodic flooding events that result in road and business closures.

The City proposes to reduce flooding by replacing the existing undersized culvert that does not meet WDFW design criteria with a larger culvert that does meet WDFW design criteria, and removing excess sediment downstream of NE 21st Street. Sediment has accumulated downstream of the crossing such that the channel bottom elevation is currently at approximately the same elevation as the top of the NE 21st Street culvert. This results in the stormwater highflow bypass system becoming engaged during base-flow, which then exasperates low-flow passage concerns downstream of NE 21st Street. The project would improve stream habitat by replacing the sand and silt with gravel, creating sinuosity, installing large woody debris (LWD) in the stream channel, and replacing non-native invasive species with native vegetation.

Figure 1 – Project Vicinity



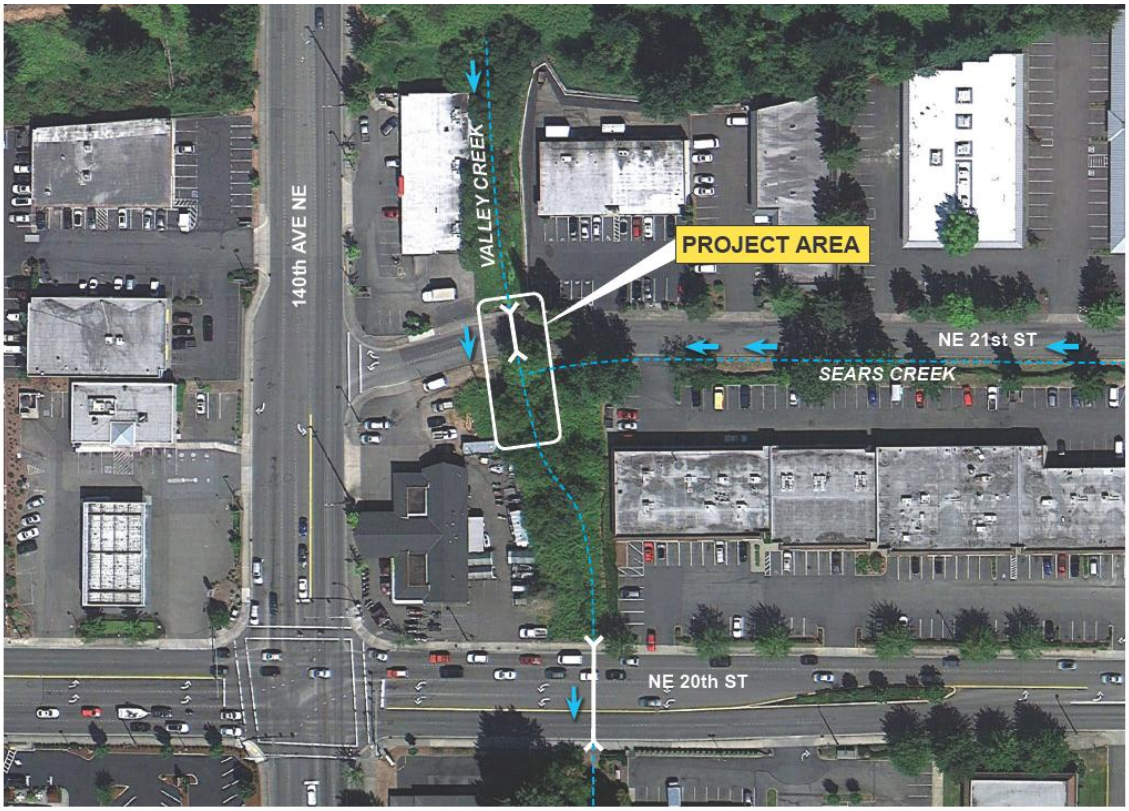
A complete description of the conditions of Valley Creek is available in the project critical areas report included as **Attachment 1**.

B. Zoning and Land Use Context

The downstream channel work will be conducted in the Bel Red CR district. The

culvert straddles two zoning districts, the BR-CR and BR-GC. The general dimensional standards in LUC 20.20.010 do not apply, because there is no structural development proposed. The existing uses on the affected property are permitted and there is no proposed change in use. Uses in the vicinity range from a retail uses (restaurant supply, motorcycle) to dental office will remain. The proposed habitat and flood control project will not affect existing land uses and will offer improved flood protection for existing development.

C. Critical Areas Functions and Values



i. Streams and Riparian Areas

a. <u>Stream and Riparian Area Functions:</u>

A healthy aquatic environment relies on processes sustained by dynamic interaction between the stream and the adjacent riparian area. Riparian vegetation in floodplains and along stream banks provides a buffer to help mitigate the impacts of urbanization. Healthy riparian areas support healthy stream conditions.

Upland and wetland riparian areas retain sediments, nutrients, pesticides, pathogens, and other pollutants that may be present in runoff, protecting water quality in streams. The roots of riparian plants also hold soil and prevent erosion and sedimentation that may affect spawning success or other behaviors, such as feeding.

Both upland and wetland riparian areas reduce the effects of flood flows. Riparian areas and wetlands reduce and desynchronize peak crests and flow rates of floods. Upland and wetland areas can infiltrate floodflows, which in turn, are released to the stream as baseflow.

Vegetated riparian areas also provide a source of large woody debris that helps create and maintain diverse in-stream habitat, as well as create woody debris jams that store sediments and moderate flood velocities.

b. Existing Stream conditions: Habitat conditions in Valley Creek within the immediate project vicinity are degraded. Upstream of NE 21st Street the stream channel is a linear glide with a substrate dominated by silt. No large woody debris is present and, except for a few shrubs, the adjoining riparian zone is composed primarily of mowed grasses and rushes. Upstream of NE 21st Street, Valley Creek flows under SR 520. Downstream of NE 21st Street sand is the dominant substrate type, which is intermixed with some gravel. This section of stream is primarily a linear low-gradient riffle, but changes to a glide immediately prior to flowing under NE 20th Street. Some woody debris is present, which tends to capture debris from the surrounding uplands. Sears Creek enters Valley Creek immediately downstream of NE 21st Street. Although Sears Creek has been ditched and abuts the south side of NE 21st Street, it contains a high percent of gravels. However, the stream has been ditched, pool habitat and large woody debris are absent, and the riparian zone is degraded. The increase in percent gravel in Sears Creek is due to an increase in gradient. A complete description of the conditions of project area stream reaches is available in the project critical areas report included as Attachment 1.

c. The project will result in approximately 2,010 square feet of temporary stream impact including the portion of stream channel that will be dewatered and where sediment will be removed, but will then be enhanced by adding stream bed gravels and LWD. The stream buffer impacts are the same as described above since these buffers overlap. A complete summary of potential impacts to affected stream segments including mitigation measures is available in the project critical areas report included as **Attachment 1**.

ii. Wetlands

a. Wetland Functions: Wetlands provide important functions and values for both the human and biological environment—these functions include flood control, water quality improvement, and nutrient production. The benefits provided depend on their size and location within a basin, as well as their diversity and quality. While Bellevue's wetlands provide various beneficial functions, not all wetlands perform all functions, nor do they perform all

functions equally well. However, the combined effect of functional processes of wetlands within basins provides benefits to both natural and human environments. For example, wetlands provide significant stormwater control, even if they are degraded and comprise only a small percentage of area within a basin.

b. Existing Wetland Conditions: Two wetlands (Wetlands A and B) were identified as occurring within the immediate project vicinity during the site investigation (see table below). Both wetlands were delineated and categorized by David Evans Associates. The project site has been historically cleared and graded and both Valley and Sears creeks have been channelized. Wetland indicators were observed at multiple locations.

Wetland	Ecology Category	Total Wetland Function Score	Water Quality Functions Score	Hydrology Functions Score	Wildlife Functions Score	Buffer Width
A	III	48	16	18	14	60 feet
B	III	45	16	18	11	60 feet

Wetlands A and B were both rated as Category III wetlands based on the *Washington State Wetland Rating System for Western Washington – Revised* (Hruby 2004). They are both riverine wetlands located within the floodplain of Valley Creek. Wetland A is located to the north of NE 21st Street, while Wetland B is located to the south of NE 21st Street. Detailed descriptions of the wetlands are provided in the Critical Areas Report (**Attachment 1**).

c. Wetland Impacts: Approximately 129 square feet of permanent impact to Wetland B, 158 square feet of permanent stream and wetland buffer impact. The 129 square feet of permanent impact to Wetland B is the result of adding sinuosity to the stream channel. After construction, these areas will be part of the active stream channel bottom that will be composed of gravel. The 158 square feet of permanent stream and wetland buffer impact also includes areas converted to stream channel.

iii. Areas of Special Flood Hazard

a. Areas of Special Flood Hazard Functions:
The value of floodplains can be described in terms of both the hydrologic and ecological functions that they provide. Flooding of occurs when either runoff exceeds the capacity of rivers and streams to convey water within their banks, or when engineered stormwater systems become overwhelmed. Studies have linked urbanization with increased peak

discharge and channel degradation (Dunne and Leopold 1978; Booth and Jackson 1997; Konrad 2000). Floodplains diminish the effects of urbanization by temporarily storing water and mediating flow to downstream reaches. The capacity of a floodplain to buffer upstream fluctuations in discharge may vary according to valley confinement, gradient, local relief, and flow resistance provided by vegetation. Development within the floodplain can dramatically affect the storage capacity of a floodplain, impact the hydrologic regime of a basin and present a risk to public health and safety and to property and infrastructure.

b. Existing Area of Special Flood Hazard Conditions:
A special flood hazard area is defined in LUC 20.25H.175 as land subject to the 100-year flood including areas identified on Flood Insurance Rate Maps (FIRM) as within the base floodplain. The project area falls within a special flood hazard area because it lies within the 100-year floodplain. Flood Hazard Areas within the project vicinity are depicted on the project plans included as **Attachment 5**.

c. Impacts To Areas of Special Flood Hazard: The applicant has provided a letter from the project engineer describing the floodplain impacts anticipated by the proposed project (see Attachment 4). The analysis revealed that the existing FEMA data were not representative of the actual existing conditions on the site therefore the analysis was based on current, “pre-project” conditions relative to proposed, “post-project” data. Increasing the size of the NE 21st Street culvert and restoring channel function between NE 21st and NE 20th Street will result in slightly lower water surface elevations for the 100-year flow. The project will not cause a net rise in the base flood elevation. NE 21st Street will continue to flood for large storms due to the restriction caused by the NE 20th Street culvert; however the frequency of flooding at NE 21st is anticipated to be significantly reduced. Furthermore, by increasing culvert capacity, reducing clogging of the inlet bypass system, removing the sediment wedge, and improving stream channel flow capacity, flooding should be minimized.

iv. Habitat Associated With Species of Local Importance

a. Habitat Functions:

Urbanization, the increase in human settlement density and associated intensification of land use, has a profound and lasting effect on the natural environment and wildlife habitat (McKinney 2002, Blair 2004, Marzluff 2005 Munns 2006), is a major cause of native species local extinctions (Czech et al 2000), and is likely to become the primary cause of extinctions in the coming century (Marzluff et al. 2001a).

Cities are typically located along rivers, on coastlines, or near large bodies of water. The associated floodplains and riparian systems make up a relatively small percentage of land cover in the western United States, yet they provide habitat for rich wildlife communities (Knopf et al. 1988), which in turn provide a source for urban habitat patches or reserves. Consequently, urban areas can support rich wildlife communities. In fact, species richness peaks for some groups, including songbirds, at an intermediate level of development (Blair 1999, Marzluff 2005).

Protected wild areas alone cannot be depended on to conserve wildlife species. Impacts from catastrophic events, environmental changes, and evolutionary processes (genetic drift, inbreeding, colonization) can be magnified when a taxonomic group or unit is confined to a specific area, and no one area or group of areas is likely to support the biological processes necessary to maintain biodiversity over a range of geographic scales (Shaughnessy and O'Neil 2001). As well, typological approaches to taxonomy or the use of indicators present the risk that evolutionary potential will be lost when depending on reserves for preservation (Rojas 2007). Urban habitat is a vital link in the process of wildlife conservation in the U.S.

b. Existing Habitat Features

To evaluate habitat conditions in the project area and vicinity, biologists surveyed the area to identify dominant species, forest maturity, concentrations of native an invasive plant populations, other habitat features (e.g., snags, logs), habitat potential to support protected wildlife species and indications of use by these species. In addition, Herrera reviewed information provided by WDFW's Priority Habitats and Species (PHS) Program (WDFW 2010a), fish usage information from the Salmonscape mapping program (WDFW 2010b), and fish survey data collected as part of the City of Bellevue stream inventory (Watershed Company 2001). There are no PHS areas or documented occurrences of protected species in the project vicinity (WDFW 2010a), except for coho and Chinook salmon, and pileated woodpeckers. Project biologists concluded that out of all of the species listed in LUC 20.25H.055 as

Species of Local Importance, only Chinook salmon, coho salmon, green heron, pileated woodpecker, and red-tailed hawk may use the project area or the area downstream of the project.

c. Impacts to Habitat Features:

There will be no permanent impacts to the habitat features identified above. While there will be a temporal loss of forested habitat that may affect the pileated woodpecker, the future condition of the project area will provide improved forest habitat. Non-native invasive species will be removed and native species diversity and structural diversity will be increased. The addition of large wood to the stream channel will enhance in-stream habitat and create habitat diversity and cover for fish. Also, restored riparian and wetland habitat will provide shade for the stream, potential food sources (aquatic insects and other fauna) for fish and other aquatic species. All temporarily disturbed vegetation will be restored following construction. Noise impacts from the project are not expected to be of sufficient magnitude or duration to disturb wildlife species. Sensitive species may move away from construction activity during active work periods, but are expected to return once work is completed. During construction the channel will be dewatered and all flow bypassed to the outlet culvert. After construction, water quality will be monitored and turbid water will be discharged to the sewer. Only after turbidity has been reduced to meet water quality standards will the flow be directed to downstream receiving waters. Therefore no effect on downstream water quality will occur.

III. Consistency with Land Use Code Requirements:

A. Zoning District Dimensional Requirements:

This is a proposal to replace a culvert, modify stream channel conditions and improve riparian habitat. Work is limited to culvert installation, grading, the placement of wood and rock, and planting of native vegetation. Standard zoning district development standards do not apply.

B. Consistency with Critical Areas Performance Standards LUC 20.25H:

i. Performance Standards for New or Expanded Bridges and Culverts LUC 20.25H.055.C.2 and LUC 20.25H.055.C.3.e

The proposed culvert replacement and stream channel modification to regrade and reduce flooding and protect against stream erosion may be approved in accordance with these subsections if:

-There is no technically feasible alternative with less impact; and

-New culvert designed in accordance with WA State Department of Fish and Wildlife “design of Road Culverts for Fish Passage”.

The applicant has submitted as part of the Critical Areas report an analysis of alternatives considered and has demonstrated that no technically feasible alternative with less impact on the critical area or critical are buffer exists. Areas of permanent and temporary disturbance shall be mitigated per the mitigation and restoration plan. Project-related impacts are limited to 129 square feet of permanent impact where wetland is being converted to stream, and an additional 1,811 square feet of temporary impact where sediment is being removed from the stream channel. Permanent wetland impacts are to a Category III wetland (Wetland B). The applicant proposes to mitigate for the 129 square feet of permanent impact through enhancement at a ratio of 8:1, which results in a requirement to provide 1,032 square feet of wetland enhancement. This will be accomplished by enhancing Wetland B, which is dominated by Himalayan blackberry. Himalayan blackberry will be removed and replaced with native vegetation. Temporary impacts to approximately 150 linear feet (1,811 square feet) of stream channel will occur as a result of removing sediment. This section of stream will be restored by increasing sinuosity, adding LWD, and adding streambed gravel. See Section IX for conditions of approval.

ii. Performance Standards for Habitat Improvement Projects LUC 20.25H.055.C.3.j

The project is also classified as a habitat improvement project. It is classified as such because it has been approved by the Director in accordance with the provisions of an approved Critical Areas Report. The primary habitat improvement is the addition of large woody debris to the stream channel to improve habitat diversity and incorporate a source of organic material to improve overall long term stream conditions.

In order to improve overall habitat conditions for fish and wildlife, the City is also proposing to restore riparian habitat along Valley Creek within the project reach. Additional restoration actions include enhancing 473 square feet of Wetland B and 7,276 square feet of stream/wetland buffer. The mitigation plan will replace non-native invasive species with a diverse assemblage of native species. The plan includes installation of a minimum of 68 trees (7 species), 460 willow and dogwood cuttings (4 species), and 269 shrubs (12 species) and meets or exceeds the planting standards recommended in the City's Critical Areas Handbook.

iii. Performance Standards for Stream Critical Areas LUC 20.25H.080.A and LUC 20.25H.080.B

The proposed project has met the criteria of an "allowed use" under LUC 20.25H.055. It includes activities consistent with the uses of a habitat improvement project and public flood protection measures. An approved Critical Areas Report has been prepared and submitted to support the design of the project and its desired objectives.

iv. Performance Standards for Wetland Critical Areas LUC 20.25H.100

Applicable performance standards have been considered and incorporated into the design of proposed project. There is no current or additional lighting associated with the project that will affect stream or wetlands. The project is not proposing the creation of any noise generating activities other than those temporary noises associated with the construction activity. There will be no new impervious surface as part of the project. Wetland area that will be temporarily and permanently disturbed will be restored. The site will be actively monitored and maintained for a period of 5 years to ensure success of the restoration effort. The use of pesticides, insecticides and fertilizers within 150 feet of the edge of the stream buffer shall be in accordance with the City of Bellevue's "Environmental Best Management Practices," now or as hereafter amended. See Section IX for conditions of approval.

v. Performance Standards for Areas of Special Flood Hazard LUC 20.25H.180.C

The proposed project does not result in an increase in the Base Flood Elevation (BFE). Increasing the size of the NE 21st Street culvert and restoring the channel between NE 21st and NE 20th Streeet will result in a slightly lower water suface elevations for the 100-year flow. The streambed elevation is lowered by approximately 1.41 feet. The area of special flood hazard will maintain its hydraulic connectivity to the source of flooding. The construction is proposed to occur all in the same season/work window. The proposed project has been evaluated by a qualified engineer and demonstrates that the compensatory storage will not be adversely affected. The applicant has submitted a report prepared by a qualified engineer demonstrating the likely impacts to the base flood elevation (See Attachment 4).

C. Consistency with Critical Areas Report LUC 20.25.230:

The applicant supplied a complete critical areas report prepared by a qualified professional. The report meets the minimum requirements in LUC 20.25H.250 demonstrates that the proposed stream channel modifications will lead to a reduction in flooding, and improvement in in-stream habitat and fish passage, and will enhance riparian areas within project limits. The report is included as Attachment 1 to this staff report.

IV. Public Notice and Comment

Application Date:	October 19, 2012
Public Notice (500 feet):	November 29, 2012
Minimum Comment Period:	December 13, 2012

The Notice of Application for this project was published in the City of Bellevue weekly permit bulletin on November 29, 2012. It was mailed to agencies, tribes, and property

owners within 500 feet of the project site. One public comment letter was received from the Muckleshoot Indian Tribe Fisheries Division. The letter included several technical questions and comments related to the following issues:

1. What WDFW culvert design method was used for the new box culvert? We recommend that this new culvert be designed using WDFW's stream simulation design to best ensure adult and juvenile fish passage. We would appreciate a copy of the culvert design calculations if available now.

2. With changes in the upstream highflow by-pass (removal) and a new trash rack on the downstream by-pass, at what flows will the high flow by-pass be activated and how will the diversion of these flows affect channel processes downstream? How will the City monitor the high flow by-pass structure to ensure that it works as intended?

3. How will the project ensure that juvenile salmon do not enter the high flow by-pass? How will this be monitored?

4. More complex wood should be added to the project instead of the single proposed logs shown on Sheet 5. A variety of wood types, particularly with rootwads should be added where wood is proposed to create lower velocity habitat in the margins for juvenile salmon.

5. The stream channel banks should be graded at a 3:1 ratio to create more margin habitat for juvenile fish instead of the proposed 2:1. A more varied channel design should be used than the trapezoidal design shown on Sheet 6.

The comment letter and applicant response to the comments is included as **Attachment 3**. The applicant has agreed to make the following modifications to the proposed plans:

- Include at least 17 total pieces of wood and additional logs and complexity to the log structures and retain on-site wood ranging down to 4-inches in diameter and 6.5 feet in length
- Modify channel geometry within constraints of property lines and easement.

The changes will increase proposed stream roughness, complexity and provide for more suitable habitat for juvenile fish. The changes will be incorporated into the clearing and grading permit as conditioned in Section IX of this report.

V. Summary of Technical Reviews

Clearing and Grading:

The Clearing and Grading Division of the Development Services Department has reviewed the proposed development for compliance with Clearing and Grading codes and standards. The Clearing and Grading staff found no issues with the proposed development.

VI. State Environmental Policy Act (SEPA)

The environmental review indicates no probability of significant adverse environmental impacts occurring as a result of the proposal. The Environmental Checklist submitted with the application adequately discloses expected environmental impacts associated with the project. The City codes and requirements, including the Clear and Grade Code, Utility Code, Land Use Code, Noise Ordinance, Building Code and other construction codes are expected to mitigate potential environmental impacts. Therefore, issuance of a Determination of Non-Significance (DNS) is the appropriate threshold determination under the State Environmental Policy Act (SEPA) requirements.

A. Earth and Water

A temporary erosion and sedimentation control plan is included in the project plans (Attachment 1), and addresses all requirements for construction management and restoring the site to an improved post construction condition. Erosion and sediment control best management practices include the use of a dewatering plan to dry out as much as feasible during the proposed construction activity. The proposal also includes a Turbidity Monitoring Plan, installation of silt fencing around the work area and appropriate stockpiling and construction staging techniques. Final approval of the temporary erosion and sedimentation control plan will happen with the required Clearing and Grading Permit. The applicant will also be required to submit information regarding the use of pesticides, insecticides, and fertilizers to avoid impacts to water resources. See Section IX for related conditions of approval.

B. Animals

The project site is located around and within a regulated stream, riparian wetlands and part of a habitat corridor. Fish use has been documented throughout the Kelsey Creek Basin. Of note is the presence of cutthroat trout, Coho salmon, and Western Brook lamprey. To improve in stream habitat, the applicant is proposing to replace the culvert under NE 21st Street with a fish passable culvert, increase stream sinuosity within the reach by installing large woody debris in the stream channel, replaced stream substrate with more suitable gravel substrate for macro-invertebrate and salmonid spawning purposes, and replacing non-native vegetation with native vegetation along the stream channel and buffer. Impacts are anticipated to be limited due to the temporary status of construction associated with the project and the beneficial long term objectives of the stream enhancement. The restoration plan for areas of temporary disturbance and mitigation plan for permanent disturbance has been designed to further enhance the vegetation structure on the site, which is expected to have a positive impact on the wildlife resource. The applicant is required to submit a final restoration and mitigation plan as part of the Clearing and Grading Permit application. See Section IX for related conditions of approval.

C. Plants

Mitigation for temporary and permanent disturbance will be approved pursuant to an approved mitigation and enhancement plan. A complete restoration plan with monitoring performance standards and contingency plan has been submitted as part of the critical areas report (**Attachment 1**). It will be implemented as a condition of the subsequent clearing and grading permit. See Section IX for related conditions of approval.

D. Noise

Construction noise will be limited by the City's Noise Ordinance (Chapter 9.18 BCC) which regulates construction hours and noise levels. See Section IX for a related condition of approval.

VII. Decision Criteria

A. Critical Areas Report Decision Criteria- General Criteria LUC 20.25H.255

The Director may approve, or approve with modifications, the proposed modification where the applicant demonstrates:

1. The modifications and performance standards included in the proposal lead to levels of protection of critical area functions and values at least as protective as application of the regulations and standards of this code;

Finding: The applicant has provided a complete critical areas report that demonstrates that the proposal leads to levels of protection of critical area functions and values that area at least as protective as the regulations and standards of this code. Through the critical areas report process, it is clear that habitat functions will be improved. The planting of native vegetation, installation of woody material, removal of invasive species, and increased stream roughness will enhance the instream habitat in the project reach.

2. Adequate resources to ensure completion of any required mitigation and monitoring efforts;

Finding: The applicant, the City of Bellevue, has adequate resources to complete the required mitigation and monitoring efforts.

3. The modifications and performance standards included in the proposal are not detrimental to the functions and values of critical area and critical area buffers off-site; and

Finding: The proposal complies with all of the applicable performance standards for streams, wetlands, habitat areas, and areas of special flood hazard and includes an appropriate mitigation and restoration plan to offset identified short and long term impacts.

4. The resulting development is compatible with other uses and development in the same land use district.

Finding: The construction of the stream modification and habitat improvement work is consistent with the surrounding land uses. There is no change in use on the site or any of the adjacent sites.

B. Critical Areas Land Use Permit Decision Criteria 20.30P

The Director may approve or approve with modifications an application for a critical areas land use permit if:

1. The proposal obtains all other permits required by the Land Use Code;

Finding: The proposed activity is required to obtain a clearing and grading permit and right-of-way use permit from the City of Bellevue. The activity is also required to obtain permission from the Washington State Departments of Ecology and Fish & Wildlife, as well as the Army Corps of Engineers. A copy of the permit approvals granted by other agencies shall be submitted to City of Bellevue prior to the issuance of the clearing and grading permit. See Section IX for related conditions of approval.

2. The proposal utilizes to the maximum extent possible the best available construction, design and development techniques which result in the least impact on the critical area and critical area buffer;

Finding: The proposal has been designed by qualified professionals from David Evans and Associates with consultation with City of Bellevue, in order to ensure the best available design and techniques have been incorporated. In response to public comment on the project, the applicant is also proposing to modify the channel geometry further in order to create a more varied channel design and install additional pieces of wood to add to the channel complexity. See Section IX for related conditions of approval.

3. The proposal incorporates the performance standards of Part 20.25H to the maximum extent applicable, and ;

Finding: Section III above discusses how project designs incorporate applicable performance standards.

4. The proposal will be served by adequate public facilities including street, fire protection, and utilities; and;

Finding: The area is adequately serviced by public facilities. The proposal will not change the need for public facilities.

5. **The proposal includes a mitigation or restoration plan consistent with the requirements of LUC Section 20.25H.210; and**

   Finding: A mitigation and restoration plan consistent with the requirement of LUC 20.25H.210 has been prepared and submitted along with the project's critical areas report. The applicant is required to submit a final restoration and mitigation plan as part of the Clearing and Grading Permit application. See Section IX for related conditions of approval.

6. **The proposal complies with other applicable requirements of this code.**

   Finding: As discussed in Section IV & V of this report, the proposal complies with all other applicable requirements of the Land Use Code.

VIII. Conclusion and Decision

After conducting the various administrative reviews associated with this proposal, including Land Use Code consistency, SEPA, City Code and Standard compliance reviews, the Development Services Director does hereby **approve with conditions** the proposal to replace the culvert under NE 21st for flood control and associated habitat improvements within the stream channel of Valley Creek.

Note- Expiration of Approval: In accordance with LUC 20.30P.150 a Critical Areas Land Use Permit automatically expires and is void if the applicant fails to file for a Clearing and Grading Permit or other necessary development permits within one year of the effective date of the approval.

IX. Conditions of Approval

The applicant shall comply with all applicable Bellevue City Codes and Ordinances including but not limited to:

Applicable Ordinances	Contact Person
Clearing and Grading Code- BCC 23.76	Savina Uzunow, 425-452-7860
Land Use Code- BCC 20.25H	Heidi M. Bedwell, 425-452-4862
Noise Control- BCC 9.18	Heidi M. Bedwell, 425-452-4862

The following conditions are imposed under the Bellevue City Code or SEPA authority referenced:

1. **Revised Design Plans:** As part of the required clearing and grading permit, the applicant shall incorporate design changes as noted in discussion above, response to Public Comment, including revising the proposed plans to include:
    a. At least 17 total pieces of wood and additional logs and complexity to the log structures and retain on-site wood ranging down to 4-inches in diameter and 6.5 feet in length.
    b. Modify channel geometry within constraints of property lines and easement. A narrative describing how channel design has been modified to maximum extent feasible to at least a 3:1 slope within the project limits shall be included along with the revised plans.

    Authority: Land Use Code 20.25H.220.H
    Reviewer: Heidi M. Bedwell, Development Services Department

2. **Clearing and Grading Permit:** Before commencing any construction activity the applicant must apply for and obtain a Clearing and Grading Permit. On-going turbidity monitoring and submittal of turbidity monitoring data sheets will be required as part of the clearing and grading permit inspection process.

    Authority: Bellevue City Code Section 23.76.025
    Reviewer: Savina Uzunow, Development Services Department

3. **Mitigation, Maintenance, and Monitoring Plan:** To ensure the proposed restoration plan is successful, the mitigation, maintenance, and monitoring plan submitted as part of this application (See Attachment 1 Critical Areas Report) shall be submitted as part of the underlying clearing and grading permit required to implement the project. Any modifications to the mitigation ratios included with the mitigation plans submitted under this application must be approved prior to issuance of the clearing and grading permit.

    Authority: Land Use Code 20.25H.220, 20.25H.180.C.5
    Comprehensive Plan Policies EN-1, EN-10, EN-28, EN-30
    Reviewer: Heidi M. Bedwell, Land Use

4. **Mitigation Installation:** Mitigation installation shall commence immediately following permit issuance where technically feasible and shall be installed according to the mitigation plans submitted as part of this application within one year of project completion.

    Authority: Land Use Code 20.25H.220, 20.25H.180.C.5
    Reviewer: Heidi M. Bedwell, Land Use

5. **Mitigation Maintenance:** Maintenance of mitigation plantings shall include, at a minimum, two entries per year. During each entry, plant growth will be evaluated, soils amended as needed, and invasives will be suppressed.

Authority: Land Use Code 20.25H.220, 20.25H.180.C.5
Reviewer: Heidi M. Bedwell, Land Use

6. **Submittal of Mitigation Maintenance and Monitoring Reports:** As part of the required five years of mitigation maintenance and monitoring, the applicant shall submit annual monitoring reports to the Development Services Department Land Use Division at the end of the growing season by no later than November 30 for each year monitored.

   Authority: Land Use Code 20.25H.220.D
   Reviewer: Heidi M. Bedwell, Land Use

7. **Rainy Season Restrictions:** Due to the proximity to Richards and East Creeks and associated wetlands, no clearing and grading activity may occur during the rainy season, which is defined as November 1 through April 30 without written authorization of the Development Services Department. Should approval be granted for work during the rainy season, increased erosion and sedimentation measures, representing the best available technology must be implemented prior to beginning or resuming site work.

   Authority: Bellevue City Code 23.76.093.A,
   Reviewer: Savina Uzunow, Development Services Department

8. **In-Water Work Window:** Work below the Ordinary High Water mark approved by the underlying Clearing and Grading Permit must be completed during an in-water work window of July 1 through August 31, unless otherwise authorized in writing by the Washington State Department of Fish and Wildlife.

   Authority: Land Use Code 20.25H.160
   Reviewer: Heidi M. Bedwell, Land Use

9. **Pesticides, Insecticides, and Fertilizers:** The applicant must submit as part of the required Clearing and Grading Permit information regarding the use of pesticides, insecticides, and fertilizers in accordance with the City of Bellevue's "Environmental Best Management Practices".

   Authority: Land Use Code 20.25H.220.H
   Reviewer: Heidi M. Bedwell, Development Services Department

10. **Noise Control:** Noise related to construction is exempt from the provisions of BCC 9.18 between the hours of 7 am to 6 pm Monday through Friday and 9 am to 6 pm on Saturdays, except for Federal holidays and as further defined by the Bellevue City Code. Noise emanating from construction is prohibited on Sundays or legal holidays unless expanded hours of operation are specifically authorized in advance. Requests for construction hour extension must be done in advance with submittal of a construction noise expanded exempt hours permit.

    Authority: Bellevue City Code 9.18
    Reviewer: Heidi M. Bedwell, Development Services Department

11. **Obtain All Other Applicable State and/or Federal Permits:** Before issuance of construction permit, all applicable state and federal permits must be presented to the Development Services Department and copies placed in the project file.

    Authority: Land Use Code 20.25H.180.C.2
    Reviewer: Heidi M. Bedwell, Development Services Department

12. **Temporary Erosion and Sedimentation Control Plan:** Prior to the initiation of any clearing or grading activities, a Temporary Erosion and Sedimentation Control Plan must be approved as part of a Clearing and Grading permit and all clearing limits and the location of temporary erosion and sedimentation control measures shall be field staked for approval by the on-site clearing and grading inspector's approval.

    Authority: Bellevue City Code 23.76.060 and 23.76.090
    Reviewer: Savina Uzunow, Development Services Department

13. **Dewatering Plan**: To ensure the work area is free of moving water and turbid water generated during construction is not able to flow downstream from the work site, a satisfactory dewatering plan must be submitted and approved as part of the underlying clearing and grading permit.

    Authority: Bellevue City Code 23.76
    Reviewer: Savina Uzunow, Development Services Department

14. **Turbidity Monitoring Plan:** A turbidity monitoring plan that meets the requirements of BCC 23.76 must be submitted and approved as part of the underlying clearing and grading permit.

    Authority: Bellevue City Code 23.76
    Reviewer: Savina Uzunow, Development Services Department

15. **Storm Water Pollution Prevention Plan:** To ensure contaminated stormwater or construction-related runoff does not pollute adjacent surface water, a construction stormwater pollution prevention plan (CSWPPP) is required for all clearing and grading permit applications for industrial, commercial, multi-family, plat and short plat developments. The CSWPPP outline should be generally consistent with the SWPPP requirements of the National Pollutant Discharge Elimination System (NPDES) General Storm water Permit for Construction Activities.

    Turbidity and pH monitoring will be required during the site grading. A monitoring plan must be submitted as part of the CSWPPP with the Clearing & Grading permit application or during review of the Clearing and Grading permit application.

    Authority: Clearing and Grading Code BCC 23.76
    Reviewer: Savina Uzunow, Development Services Department

19. **Stream Channel Maintenance and Monitoring Plan and Reporting:** To ensure successful performance of the proposed channel modifications, the applicant shall submit a final stream channel modification maintenance and monitoring plan identifying channel restoration goals and monitoring metrics for a period five years. Following completion of stream channel improvements, the applicant shall complete an as-built survey of the channel to serve as a baseline for future monitoring efforts and submit annual monitoring reports to the Development Services Department Land Use Division by no later than November 30 for each year monitored demonstrating compliance with restoration goals outlined in the Stream Channel Maintenance and Monitoring Report.

Authority: Land Use Code 20.25H.220, 20.25H.180.C.5
Comprehensive Plan Policies EN-1, EN-10, EN-28, EN-30
Reviewer: Heidi M. Bedwell, Land Use

Attachment 1

CITY OF BELLEVUE

VALLEY CREEK – NE 21ST STREET FLOOD CONTROL PROJECT

CRITICAL AREAS REPORT

King County, Washington

SEEI0000-0003

Prepared for:

CITY OF BELLEVUE
Utilities Department
450 110th Avenue NE
P.O. Box 90012
Bellevue, WA 98009

Prepared by:

DAVID EVANS AND ASSOCIATES, INC.
415 118th Avenue SE
Bellevue, WA 98005

October 11, 2012

CITY OF BELLEVUE

VALLEY CREEK - NE 21ST STREET FLOOD CONTROL PROJECT

CRITICAL AREAS REPORT

King County, Washington

SEEI0000-0003

Prepared for:

CITY OF BELLEVUE
Utilities Department
405 110th Avenue NE
P.O. Box 98009
Bellevue, WA 98009

Prepared by:

Scott Swarts
Senior Fish and Wildlife Biologist

DAVID EVANS AND ASSOCIATES, INC.
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October 11, 2012

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ACRONYMS

BMPs	Best Management Practices
CESCL	Certified Erosion Sediment Control Lead
CMP	Corrugated metal pipe
Corps	U.S. Army Corps of Engineers
DEA	David Evans and Associates, Inc.
DP	Data plot
Ecology	Washington State Department of Ecology
EFH	Essential fish habitat
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HPA	Hydraulic Project Approval
HUC	Hydrologic Unit Code
LWD	Large woody debris
NHP	Natural Heritage Program
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
NTU	Nephelometric turbidity unit
OHWM	Ordinary High Water Mark
PEM	Palustrine emergent
PHS	Priority habitats and species
SCS	Soil Conservation Service
SPIF	Specific Project Information Form
SR	State Route
TESC	Temporary Erosion and Sediment Control
USBEAM	Urban Stream Baseline Evaluation Method
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WRIA	Water Resource Inventory Area
WSGA	Washington State Gap Analysis

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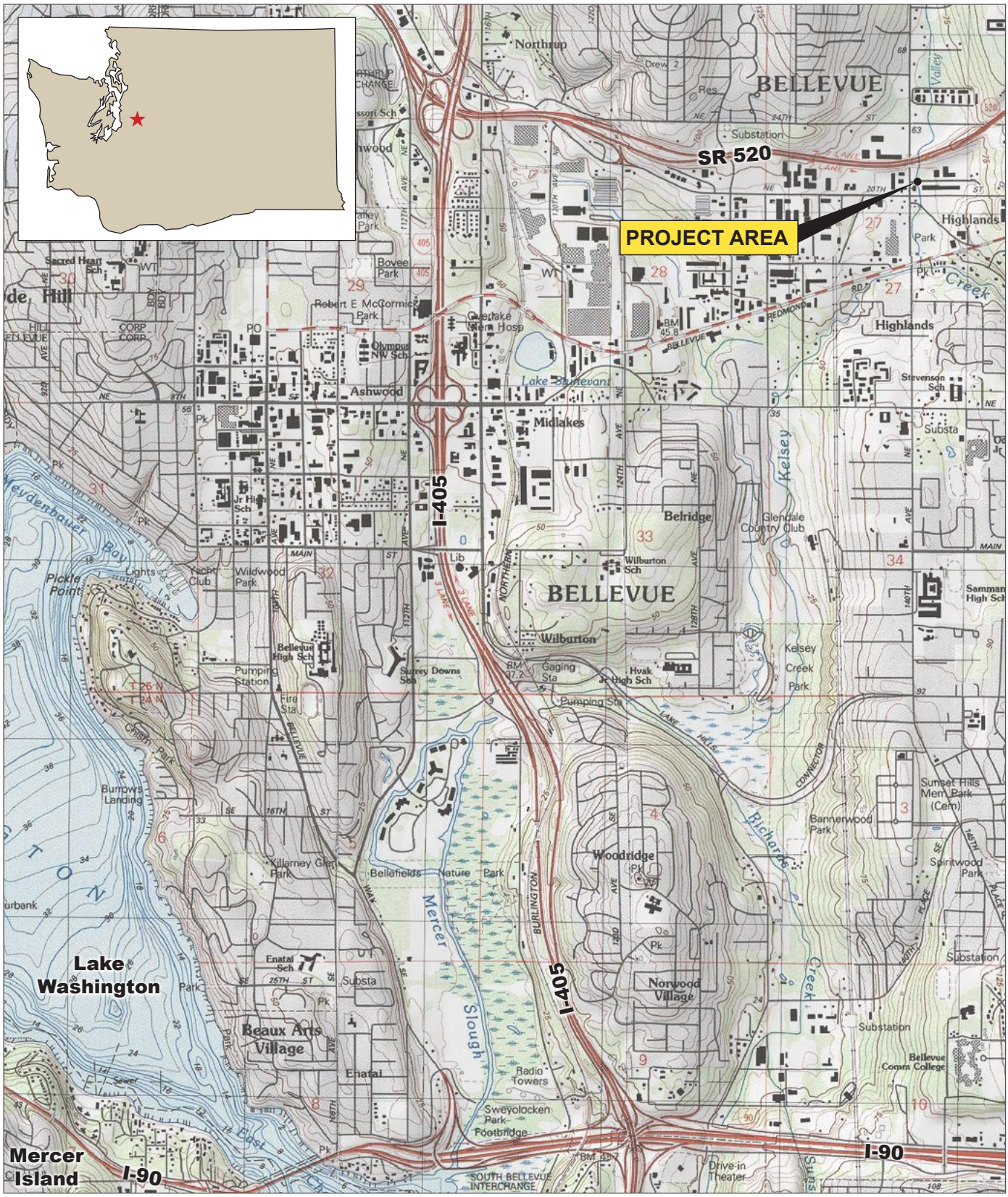
1.0 INTRODUCTION

At the request of the City of Bellevue (City), David Evans and Associates, Inc. (DEA) conducted this investigation to document the presence of critical areas, existing habitat conditions, level of potential wildlife use, potential project-related impacts, and mitigation associated with the Valley Creek Flood Control Project (Project). Regulated critical areas within the City include streams, wetlands, buffers, shorelines, geological hazard areas (landslide hazards, steep slopes, and coal mine hazard areas), habitats associated with species of local importance, and areas of special flood hazard. This investigation also evaluated priority habitats and species (PHS) as identified by the Washington Department of Fish and Wildlife (WDFW) and federally listed species, critical habitat, and essential fish habitat (EFH) that could occur in the project vicinity.

The project area is within Lake Washington Hydrologic Unit Code (HUC) 17110012, while the project site is at approximate latitude and longitude 47.62859° N by -122.15307° W in Section 27, Township 25 north, Range 05 east, (W.M.). The project site encompasses 0.4 acre and includes the culvert crossing under NE 21st Street and an approximately 150-foot-long section of Valley Creek between NE 21st Street and NE 20th Street (**Figures 1** and **2**). Valley Creek is tributary to Kelsey Creek within Water Resource Inventory Area (WRIA) 8: Cedar–Sammamish Basin. All project-related activities are within City right-of-way and parcel number 2725059003. The City is currently negotiating the purchase of parcel 2725059003, which will preserve and protect the stream channel, wetland, and associated vegetated uplands from future encroachment.

The project vicinity is mostly developed and consists of commercial uses. The project area includes NE 21st Street, Valley Creek, Sears Creek at its confluence with Valley Creek, two wetlands, and vegetated uplands. Native vegetation is present, but the predominance of vegetation in the project vicinity is composed of non-native species such as Himalayan blackberry (*Rubus armeniacus*) and reed canarygrass (*Phalaris arundinacea*). Native species consist primarily of Pacific (*Salix lucida*) and Sitka (*S. sitchensis*) willow, which are most prevalent along the stream channel downstream of NE 21st Street. Stream habitat in the project area is degraded due to the substrate being composed almost entirely of sand and silt, and blockages composed of pieces of Himalayan blackberry trapped in branches and trunks of fallen willows. These conditions, including the undersized culvert under NE 21st Street, are factors contributing to periodic flooding events that result in road and business closures.

The City proposes to reduce flooding by replacing the existing undersized culvert that does not meet WDFW design criteria with a larger culvert that does meet WDFW design criteria, and removing excess sediment downstream of NE 21st Street. Sediment has accumulated downstream of the crossing such that the channel bottom elevation is currently at approximately the same elevation as the top of the NE 21st Street culvert. This results in the stormwater high-flow bypass system becoming engaged during base-flow, which then exasperates low-flow passage concerns downstream of NE 21st Street. The project would improve stream habitat by replacing the sand and silt with gravel, creating sinuosity, installing large woody debris (LWD) in the stream channel, and replacing non-native invasive species with native vegetation. Minor permanent wetland impacts are being mitigated by enhancing degraded wetland at a 11.7:1 ratio, which exceeds the required 8:1 mitigation ratio. Minor permanent buffer impacts are being mitigated by enhancing degraded buffer at a 56.6:1 ratio, which far exceeds the typical 1:1 mitigation ratio for buffer impacts. In summary, the proposed project would improve fish and wildlife habitat between NE 21st Street and NE 20th Street while reducing localized flooding.



Source: www.nationalgeographic.com/topo

N

0 .25 .5

Scale in Miles

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Valley Creek at NE 21st Flood Control Project

Critical Areas Report

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Figure 1 – Site Map

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LEGEND

Source: Google Earth Pro

- Flow Direction
- Stream
- Culvert

0 250
Scale in Feet

N

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September 2012

Figure 2 – Aerial View

DAVID EVANS AND ASSOCIATES INC.

2.0 METHODS

This report was prepared following the review of the public domain resource data and multiple site visits.

2.1 PRELIMINARY DATA GATHERING AND REVIEW

Published information about local critical areas was reviewed for evidence of wetlands, streams, PHS, steep slopes, coal mine hazards, erosion hazards, floodplains, and aquifer recharge zones.

The WDFW–PHS program and the Washington State Department of Natural Resources (WDNR) - Natural Heritage Program (NHP) (WDNR 2012) were consulted for documented occurrences of priority habitats or species, rare plants, and high quality native ecosystems in the general vicinity of the site. Priority habitats include, but are not limited to, such features as wetlands, riparian areas, snag-rich areas, caves, cliffs, oak woodlands, rocky shorelines, and old-growth forests. Priority species are plants and animals listed by the state or federal government as endangered, threatened, sensitive, candidate, or species of concern. The potential use of the project area by mammals, birds, amphibians, and reptiles was investigated through review of Washington State Gap Analysis (WSGA) data and a review of existing habitat conditions. The information reviewed included:

- Sensitive Areas Map Folio, King County, Washington (1990)
  - *A Catalog of Washington Streams and Salmon Utilization, Volume 1, Puget Sound Region*. Washington Department of Fisheries (Williams et al. 1975)
  - *Salmon and Steelhead Habitat Limiting Factors Report for the Cedar–Sammamish Basin (Water Resource Inventory Area 8)* (Kerwin 2001)
  - Breeding Birds of Washington State: Location Data and Predicted Distributions (Smith et al. 1997).
  - Terrestrial Mammals of Washington State: Location Data and Predicted Distributions (Johnson and Cassidy 1997).
  - Amphibians and Reptiles of Washington State: Location Data and Predicted Distributions (Dvornich, McAllister, and Aubry 1997).
  - WDNR–NHP data (accessed 2012): *Sections that Contain Natural Heritage Features Associated with Wetlands*. Available at: http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf
  - WDNR–NHP Geographic Information System (GIS) data. Available at: http://www1.dnr.wa.gov/nhp/refdesk/gis/index.html
  - National Wetlands Inventory (NWI) Online Mapper, U.S. Fish and Wildlife Service (USFWS): http://www.fws.gov/wetlands/Data/mapper.html
  - City of Bellevue – Sensitive Areas Notebook. April 1987.
  - City of Bellevue Mapping Services – Drainage Basin Maps. Available at: http://www.ci.bellevue.wa.us/drainage-basins.htm
  - United States Geological Survey (USGS) mapping via National Geographic TOPO mapping software.

- United States Department of Agriculture (USDA) – Natural Resources Conservation Service (NRCS): Web Soil Survey. Available at: http://websoilsurvey.nrcs.usda.gov/app/
- 2008 - 2011 Salmon Spawner Surveys Kelsey Creek, West Tributary, and Coal Creek – Bellevue Salmon Spawning Surveys. City of Bellevue, Utilities Engineering Division.
- City of Bellevue 2010 Kelsey Creek Basin – Juvenile Fish Use Report. City of Bellevue, Utilities Department. December 2010.
- Final Report – City of Bellevue Stream Typing Inventory. City of Bellevue, Utilities Division. 20 May 2009.
- Bellevue Critical Areas Update – Streams Inventory. City of Bellevue. March 2003.
- Fish Use in Kelsey, Valley, Coal and Richards Creeks. City of Bellevue, Utilities Environment Division. November 2002.
- Assessing Stream-Dwelling Fishes in Basins of the Lake Washington Watershed, Summer 1996. King County Department of Natural Resources, Washington Department of Fish and Wildlife, and Muckleshoot Indian Tribe. June 1997.
- King County Stream and River Water Quality Monitoring Data – King County Water and Land Resources Division. Data available at: http://green.kingcounty.gov/WLR/Waterres/StreamsData/WaterShedInfo.aspx?Locator=0440

2.2 FIELD INVESTIGATION

DEA performed site visits in July and September 2012 to verify preliminary data findings, flag the ordinary high water mark (OHWM) of Valley and Sears creeks, delineate wetland boundaries, and document existing habitat conditions and wildlife use.

Wetlands were delineated based on the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2)* dated May 2010 (U. S. Army Corps of Engineers [Corps] 2010). Wetlands were categorized based on the Washington State Department of Ecology (Ecology) Washington State Wetland Rating System for Western Washington (Ecology 2004) with the updated wetland rating form (updated October 2008).

3.0 RESULTS

3.1 PRELIMINARY DATA GATHERING AND REVIEW

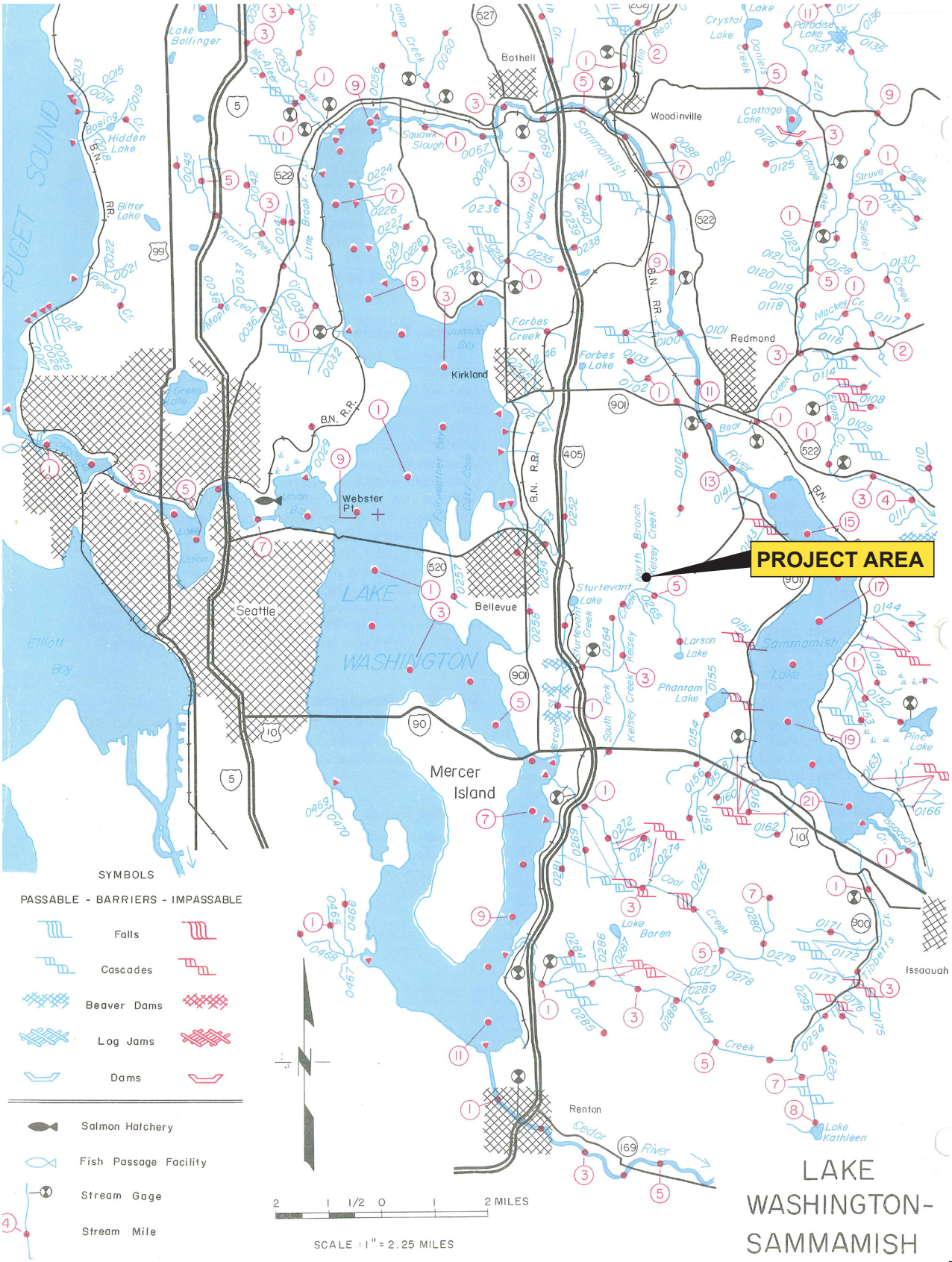
3.1.1 WDFW PHS Data

The WDFW–PHS data obtained for this project identified Valley Creek as being utilized by priority fish including coho salmon (*Oncorhynchus kisutch*), fall Chinook salmon (*O. tshawytscha*), and resident cutthroat trout (*O. clarki*) (WDFW 2012). Other salmonids documented in the overall Kelsey Creek Basin include sockeye salmon (*O. nerka*) and rainbow trout (*O. mykiss*). No other PHS have been identified as existing on-site or within the project vicinity. Priority fish use of Sears Creek was not identified in the WDFW–PHS data. The closest PHS polygon is a wetland located approximately 0.2 mile north of NE 21st Street. No other PHS are mapped within approximately one mile of the project area.

3.1.2 Streams

The project area includes an approximately 150-foot-long reach of Valley Creek in the vicinity of where Sears Creek enters Valley Creek between NE 21st Street and NE 20th Street. Valley Creek merges with Kelsey Creek near river mile 4.8, which eventually flows into Mercer Slough (**Figure 3**). Kelsey Creek (Stream Number 08-0259) is described as a 6.3-mile-long tributary to Lake Washington (Williams et al. 1975). The Kelsey Creek Basin includes Valley Creek, Goff Creek, Richards Creek, Sturtevant Creek, Sears Creek, and Mercer Slough. The Kelsey Creek Basin contains 10,870 acres and over 19 miles of stream channel. The mainstem of Kelsey Creek originates from the Larsen Lake/Lake Hills Greenbelt wetlands. Both Valley and Sears creeks are considered Type F streams. They both contain year-round flow and are used by salmonids. The stream buffer width of a Type F stream within the City of Bellevue depends on if the site is considered undeveloped (100 feet) or developed (50 feet). The project area is abutted by commercial development, so the stream buffer should be 50 feet wide. Since the existing riparian zone is very narrow, a 50-foot-wide buffer extends onto existing commercial developments.

Fish Use. Fish use in the Kelsey Creek Basin has been monitored extensively. Initial studies in 1996 (Ludwa et al. 1997) documented eight species in Kelsey Creek including coho salmon, cutthroat and rainbow trout, sculpin (*Cottus* sp.), western brook lamprey (*Lampetra richardsoni*), dace (*Rhinichthys* spp.), bluegill (*Lepomis macrochirus*), and large scale sucker (*Catostomus macrocheilus*). Additional species documented during more recent salmon spawner and juvenile use surveys includes Chinook and sockeye salmon, three-spine stickleback (*Gasterosteus aculeatus*), pumpkinseed (*Lepomis gibbosus*), carp (*Cyprinus carpio*), crappie (*Pomoxis* sp.), and largemouth bass (*Micropterus salmoides*). Two of the sample sites in the 1996 study were in Valley Creek, which captured coho salmon, cutthroat trout, and bluegill. One site in the 2010 Kelsey Creek Basin Juvenile Fish Use Report (DEA and City of Bellevue 2010) was in Valley Creek, which captured western brook lamprey, coho salmon, and cutthroat trout (**Figure 4**). Resident cutthroat trout are the most widely distributed and abundant salmonid species in the Kelsey Creek Basin. Based on weekly spawning ground surveys conducted from 2000 to 2010 alive adult Chinook salmon have been observed in Kelsey Creek from August 30 to November 1; sockeye salmon from August 30 to November 8; coho salmon from October 11 to December 20; and anadromous or adfluvial cutthroat trout from November 22 to December 13. August 30 is the earliest start date for these surveys so some species could be present earlier.



Source: Washington Department of Fisheries, 1975.

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Figure 3 – Streams Map

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Cutthroat trout	Crappie	Sampling Location
Western brook Lamprey	Carp	Stream
Dace	Coho salmon	
Bluegill	Large scale sucker	
Largemouth bass	Three-spine stickleback	

0 0.25 0.5 Miles

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Valley Creek at NE 21st Flood Control Project

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Figure 4 – Juvenile Fish Distribution Map

DAVID EVANS AND ASSOCIATES INC.

Anadromous Salmon Abundance and Production. Salmon abundance in the Kelsey Creek Basin has been highly variable over the past decade. Individual adult Chinook salmon have been documented throughout the basin. In 1999, the WDFW spawner surveys reported a return of 228 Chinook salmon in Kelsey Creek, but in more recent years the number observed has ranged from a low of one in 2010 and 2011, to a maximum of 81 in 2004. Coho salmon are now rarely observed in Kelsey Creek, ranging from a low of zero in 2004, 2008, 2009, 2010, and 2011, to a high of three in 2007. Sockeye salmon use is also variable, ranging from a high of 37 in 2006 and 10 in 2004, but none were observed in any of the other years surveyed. No steelhead trout or bull trout have been observed in the Kelsey Creek Basin during the WDFW surveys. Suitable habitat for bull trout is not present due to high water temperature, low elevation of headwaters, and overall degraded habitat conditions.

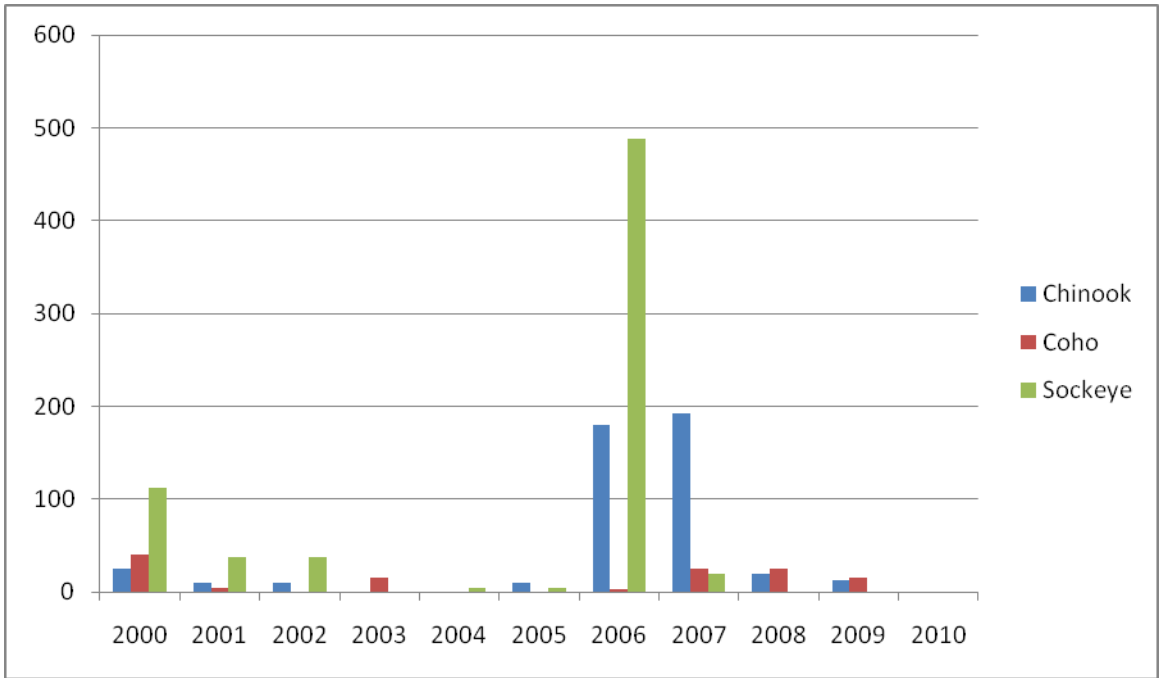
One method used to estimate salmonid production of a stream or basin is to use the redd-based method to generate an escapement estimate by taking the total number of redds documented in each stream, and then multiplying that number by the average number of fish per redd. In this case, the spawning ground escapement, ***E*r**, is estimated by:

$$E\mathrm{r} = R * \Phi$$

where R is the total number of redds and Φ represents the average number of fish per redd. In the Cedar/Sammamish watershed, we assume that Φ is 2.5 with one female and 1.5 males per redd. The reason the ratio is 1.5 males per redd is to account for the fact that males often fertilize more than one redd.

In 2010 and 2011, salmon spawning escapement (redd-based) for Kelsey Creek was estimated at zero Chinook, zero sockeye, and zero coho. Estimated salmon escapement from 2000 through 2010 in Kelsey Creek is depicted below in **Figure 5**.

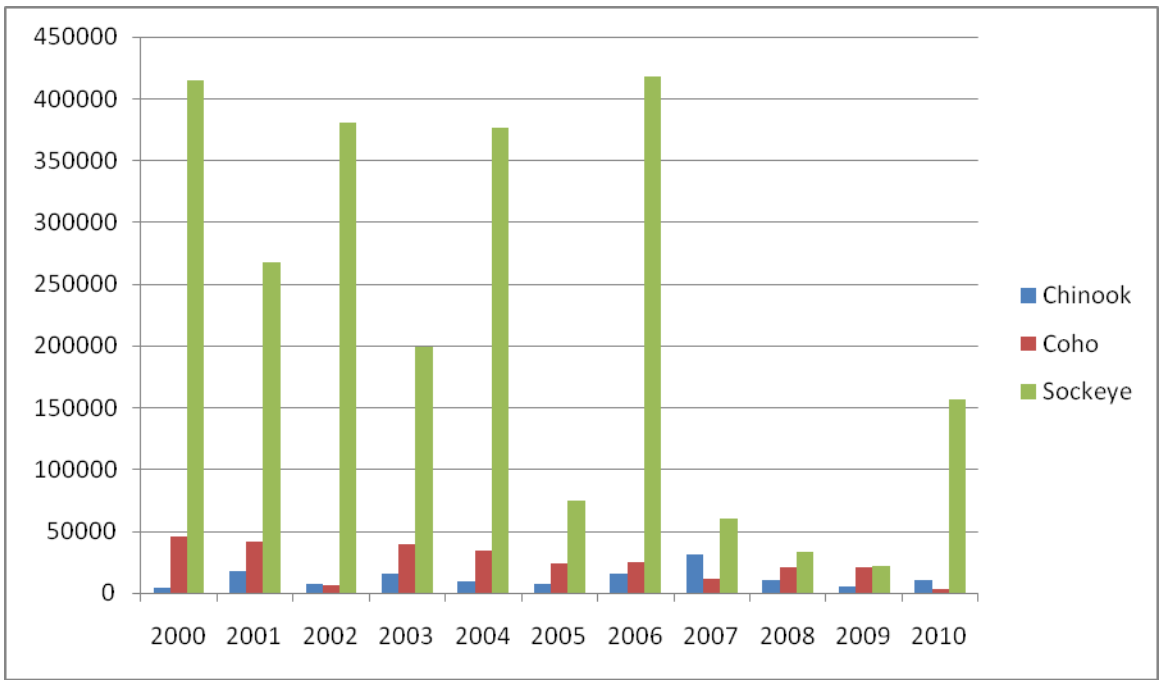
Figure 5: Kelsey Creek Salmon Redd-Based Escapement.



Chinook salmon escapement in the Kelsey Creek Basin is typically below 20, while the arithmetic mean is approximately 46. The mean of 46 is skewed due to high escapement estimates in 2006 and 2007 that ranged from 180 to 193. Coho salmon escapement is variable, and ranged from zero in 2002, 2004, 2005, and 2010, to a peak of 40 during 2000. Sockeye salmon escapement is also variable, ranging from zero in 2003, 2008, 2009, and 2010, to a peak of 488 in 2006 and 178 in 2000. The peak sockeye escapement estimates in 2000 and 2006 mirror peak counts through the Chittenden Locks when 414,976 were counted in 2000 and 418,015 in 2006. Based on the available data from 2000 through 2010, the arithmetic mean escapement for sockeye salmon in Kelsey Creek is approximately 71, while the mean passing through the Chittenden Locks during this same time period is 240,516.

The results of salmonid spawning surveys in the Kelsey Creek basin indicate production of anadromous salmonids is lower than expected for all species. The absence of coho salmon mirrors the overall decline of this species based on total counts at the Chittenden Locks from 2000 through 2010 (**Figure 6**).

Figure 6: Chinook, Coho, and Sockeye Salmon Counts from the Chittenden Locks from 2000 to 2010.



Chinook salmon have not declined as drastically as coho salmon in the Lake Washington watershed, but their numbers are augmented by hatchery production as well as natural production in the Cedar River and other streams in the Sammamish basin. The low abundance of Chinook salmon in Kelsey Creek is likely due to several factors. On the local scale, Kelsey Creek does not contain an independent population of Chinook salmon, but is part of the Sammamish population and receives strays from other systems/hatcheries. Other factors that could potentially reduce or limit the use of Kelsey Creek by Chinook salmon include the presence of numerous natural and artificial blockages, degraded habitat conditions, elevated stream temperatures, poor water quality, and predation. The blockages, especially the beaver dams in the lower reaches, would primarily impact Chinook that return early in the season prior to the fall rains.

Stream Habitat. Stream habitat conditions in the Kelsey Creek Basin were previously assessed by the City of Bellevue (2003). Stream habitat conditions were assessed based on the Urban Stream Baseline Evaluation Method (USBEM). The results are summarized below in **Table 1**.

Table 1: USBEM Summary

	Kelsey Creek	Valley Creek	Sears Creek
Percent of culvert in stream with salmonids	5	5	22
Percent over 12% gradient	8	0	0
Percent length used by salmonids	72	35	71
Percent length in culvert	12	15	43
Ratio drainage/open channel	5	4	20
Total impervious area of storm drainage basin	42	32	64
Percent impervious area within 100 feet	21	23	48
Biological Integrity	15	No data	No data

In-stream habitat conditions in the Kelsey Creek Basin are variable, but typical of most urbanized streams in that they have been degraded by urbanization. According to the WRIA 8 Steering Committee (2002) (City of Bellevue 2003), percent fines in Kelsey Creek is a limiting factor, ranging from 22 percent in 1982 to 39 percent in 1996. According to May (1996), percent fines of around 15 percent is suggested as the upper limit to ensure acceptable spawning and incubating success. Average pool frequency was less than 13 per mile, while the average amount of woody debris per mile was less than 17. Based on data from 1996, less than 5 percent mature riparian forest remains in the basin.

Water Quality. Kelsey Creek is categorized as "Core Summer Salmonid Habitat" for aquatic life use and "Primary Contact" for recreational use. Kelsey Creek has also been assigned an additional "Supplemental Spawning and Incubation Protection" temperature criteria of 13ºC, which is to be applied from September 15 through May 15.

Water Quality issues identified by Ecology through the 2008 303(d) listing process include violations of dissolved oxygen and fecal coliform. Overall water quality is considered degraded due to high levels of bacteria, high nutrient levels, pesticides, high summer temperatures, and low summer dissolved oxygen levels. The City studied stormwater runoff at 10-year intervals, which indicated lead concentrations have decreased but concentrations of other heavy metals has increased. Copper was noted as exceeding the acute toxicity criteria in 50 percent or more of the stormwater samples taken at each site (Kerwin 2001). Furthermore, based on benthic invertebrate index scores, monitoring conducted by King County indicate that conditions in Kelsey Creek were very poor for benthic invertebrates. No long-lived species were found, and only one individual that was considered sensitive to degraded conditions was found during two years of monitoring. **Table 2** summarizes King County water quality data collected at Station 0444 from 1977 to 2008.

Table 2: Water Quality Summary

	Minimum	Maximum	Mean
Dissolved Oxygen (mg/L)	6.5	13.0	9.4
Temperature (°C)	-1.0	19.1	10.6
Turbidity (NTU)	0	135	4
pH	6.5	8.2	7.3
Conductivity (mSIEMS/cm)	98	255	203
Total Suspended Solids	0.7	116.0	7.1
Ortho-Phosphorus (mg/L)	0.020	0.130	0.050
Total Phosphorus (mg/L)	0.019	0.491	0.085
Ammonia (mg/L)	0.007	0.262	0.031
Nitrate (mg/L)	0.119	2.700	0.616
Total Nitrogen (mg/L)	0.274	1.840	0.906
Fecal Coliform (CFU/100ML)	0	14700	488

The University of Washington and U.S. Geological Survey have conducted several hydrological studies in Kelsey Creek, which revealed that although the total volume expressed as a monthly average increased only slightly, storm peaks increased two to three times over the same historical period. This is due to the high percent of impervious surface in the basin, which for the most part is immediately directed towards the stream channel.

3.1.3 WDNR–NHP Data

A review of *Sections that Contain Natural Heritage Features Associated with Wetlands* did not include T25N R05E S27 (data current as of November 4, 2011). The WDNR reports that 27 rare plants occur in King County (**Table 3**).

The 27 rare plants identified as potentially occurring in King County by the WDNR typically have very specific habitat requirements. These range from being associated with prairie/grassland habitats, bogs and fens, freshwater wetlands or lake margins, high elevation/subalpine habitats, old growth forests, or coniferous forests. These types of habitats are generally not present in the project vicinity, while the on-site wetlands are degraded. A search of the WDNR–NHP GIS data did not produce any records of rare plants or high quality native ecosystems in the project vicinity.

Table 3: Rare Plants of King County

Common Name	Scientific Name	State Status [1]	Federal Status [1]	Historic Record
Swamp Sandwort	*Arenaria paludicola*	X	LE	Yes
Vancouver Ground Cone	*Boschniakia hookeri*	R1		No
Stalked Moonwort	*Botrychium pedunculosum*	S	SC	No
Alaska Harebell	*Campanula lasiocarpa*	S	None	No
Bristly Sedge	*Carex comosa*	S	None	No
Large-awn Sedge	*Carex macrochaeta*	T	None	Yes
Few-flowered Sedge	*Carex pauciflora*	S	None	No
Long-styled Sedge	*Carex stylosa*	S	None	No
Clubmoss Cassiope	*Cassiope lycopodioides*	T	None	No
Golden Paintbrush	*Castilleja levisecta*	E	LT	Yes
Golden Chinquapin	*Chrysolepis chrysophylla*	S	None	No
Tall Bugbane	*Cimicifuga elata*	S	SC	Yes
Spleenwort-leaved Goldthread	*Coptis aspleniifolia*	S	None	No
Toothed Wood Fern	*Dryopteris carthusiana*	R1	None	No
Black Lily	*Fritillaria camschatcensis*	S	None	No
Canadian St. John's-wort	*Hypericum majus*	S	None	No
Water Lobelia	*Lobelia dortmanna*	T	None	No
Bog Clubmoss	*Lycopodiella inundata*	S	None	Yes
Treelike Clubmoss	*Lycopodium dendroideum*	S	None	No
White Meconella	*Meconella oregana*	T	SC	Yes
Branching Montia	*Montia diffusa*	S	None	Yes
Choris' Bog-orchid	*Platanthera chorisiana*	T	None	No
Humped Bladderwort	*Utricularia gibba*	R1	None	Yes
Flat-leaved Bladderwort	*Utricularia intermedia*	S	None	No
Lesser Bladderwort	*Utricularia minor*	R1	None	No

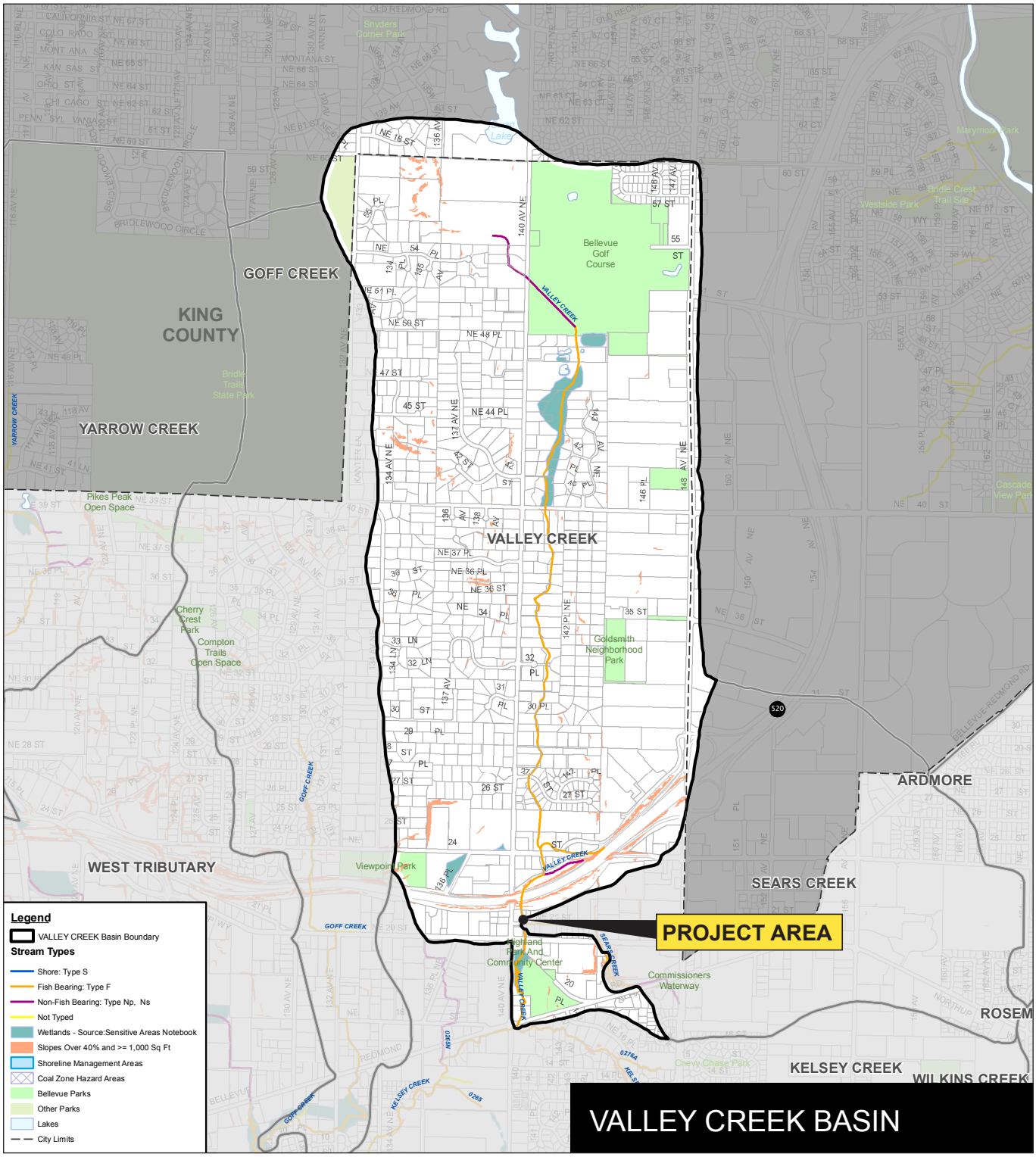
Note 1. Status Key: E = endangered, T = threatened, S = sensitive, R1 = review group 1 (potential concern but need more field work), R2 review group 2 (potential concern but unresolved taxonomic questions), LT = listed threatened, SC = species of concern, and Yes under Historic Record indicates the most recent sighting in the county is before 1977.

3.1.4 Wetlands

The USFWS NWI – Wetland Mapper, City of Bellevue – Valley Creek Drainage Basin Map (**Figure 7**), City of Bellevue – Sensitive Areas Notebook (**Figure 8**), and King County map folio did not include any known or mapped wetlands in the immediate vicinity of the Valley Creek crossing under NE 21st Street. The closest documented wetland is located approximately 200 feet south of NE 21st Street. This wetland is mapped as being along Valley Creek to the south (downstream) of NE 20th Street.

3.1.5 U.S. Department of Agriculture Soil Data

The USDA NRCS mapped soils in the project area as Bellingham silt loam. This soil type is formed in depressions and drainage ways, and is considered poorly drained. The typical profile consists of silt loam from 0 to 11 inches, and silty clay loam from 11 to 60 inches. The USDA Soil Conservation Service (SCS) Hydric Soils of the State of Washington list for King County includes Bellingham silt loam as a hydric soil (USDA 1991).



Source: City of Bellevue IT Department, GIS Services, 7/09

N

0 2,000

Scale in Feet

City of Bellevue
Valley Creek at NE 21st Flood Control Project

Critical Areas Report

SEEI0000-0003

September 2012

Figure 7 – City of Bellevue Stream Type Map

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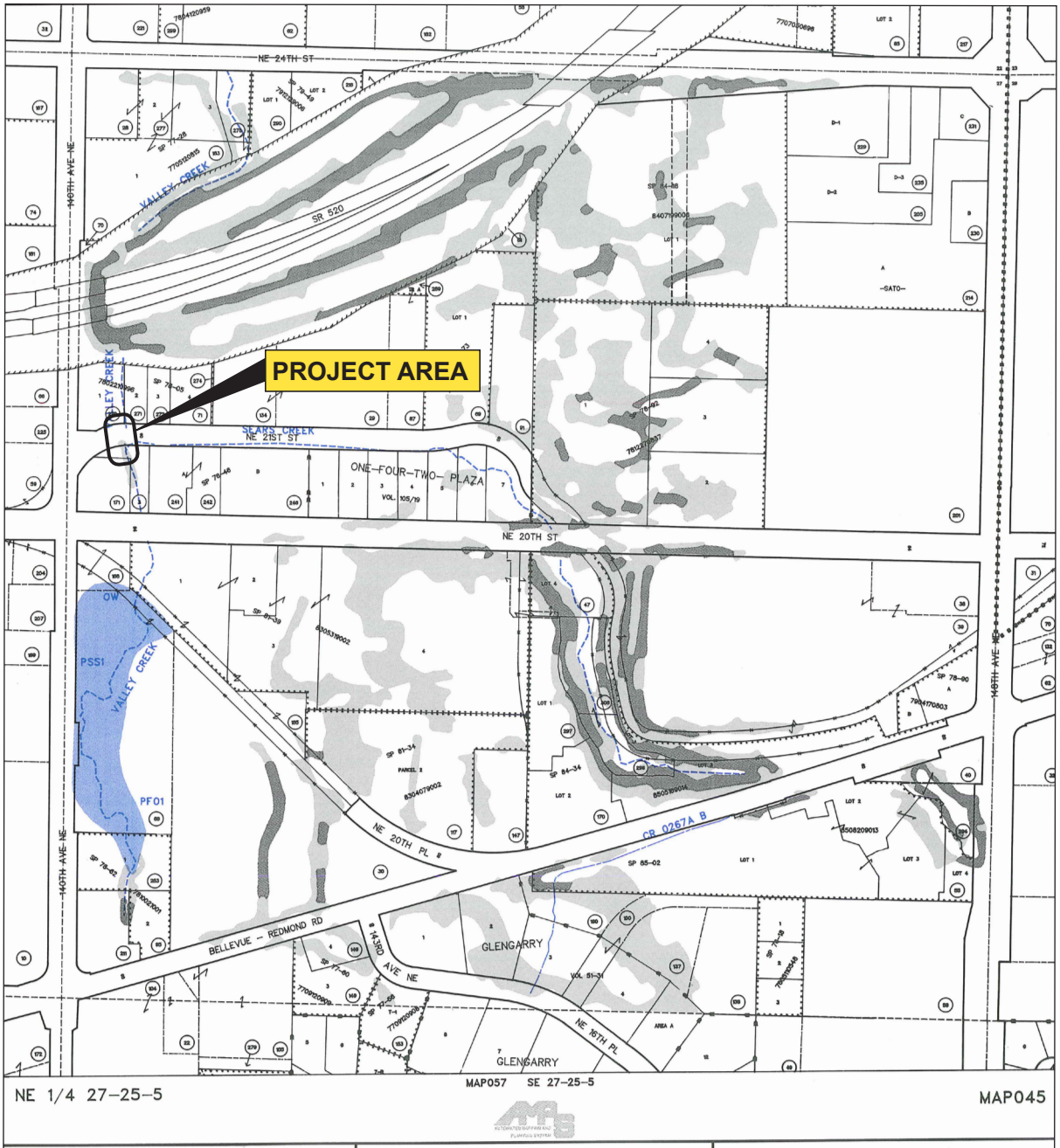

SLOPES

- 0%—15%
- 15%—40%
- 40% +

SEE SOILS/GEOLOGY REFERENCES SECTION 6

RIPARIAN CORRIDORS

- Type A
- Type B
- * STREAMSIDE WETLANDS

SEE REACH BOUNDARY DESCRIPTIONS IN SECTION 8A
SEE FEMA MAPS FOR FLOODPLAIN BOUNDARIES, SEC 8C

WETLANDS

PSS 1 / 7B / PEM — WETLAND NUMBER

WETLAND AREA

PEM / PSS 1 — VEGETATION CLASSIFICATION ZONES

SEE WETLAND SUMMARIES SECTION 8B

SENSITIVE AREAS

Information shown on this map is of a generalized nature. In all cases, actual field conditions determine location and extent of sensitive areas.

N

0 200

APRIL, 1987

CITY OF BELLEVUE WASHINGTON

City of Bellevue Valley Creek at NE 21st Flood Control Project	
Critical Areas Report	
SEEI0000-0003	Figure 8 – Sensitive Areas Map
September 2012	

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3.1.6 Geologic Hazard Areas

Geologic hazard areas include landslide hazard areas, steep slopes (>40 percent), and coal mine hazards. Landslide hazards areas typically have slopes of 15 percent or more with more than 10 feet of rise, and display specific criteria. Based on a review of the City of Bellevue Valley Creek and Sears Creek Basin – Critical Areas Maps and sight-specific topographic maps, no geologic hazard areas occur in the immediate project area. The closest geologic hazard area is mapped as occurring along the slopes of State Route (SR) 520, which is outside (north) of the project area.

3.1.7 Floodplains

The project area includes the mainstem of Valley Creek in the vicinity of NE 21st Street. This area includes a special flood hazard area that is inundated by the 100-year flood (**Figure 9**).

3.1.8 Shoreline Master Program

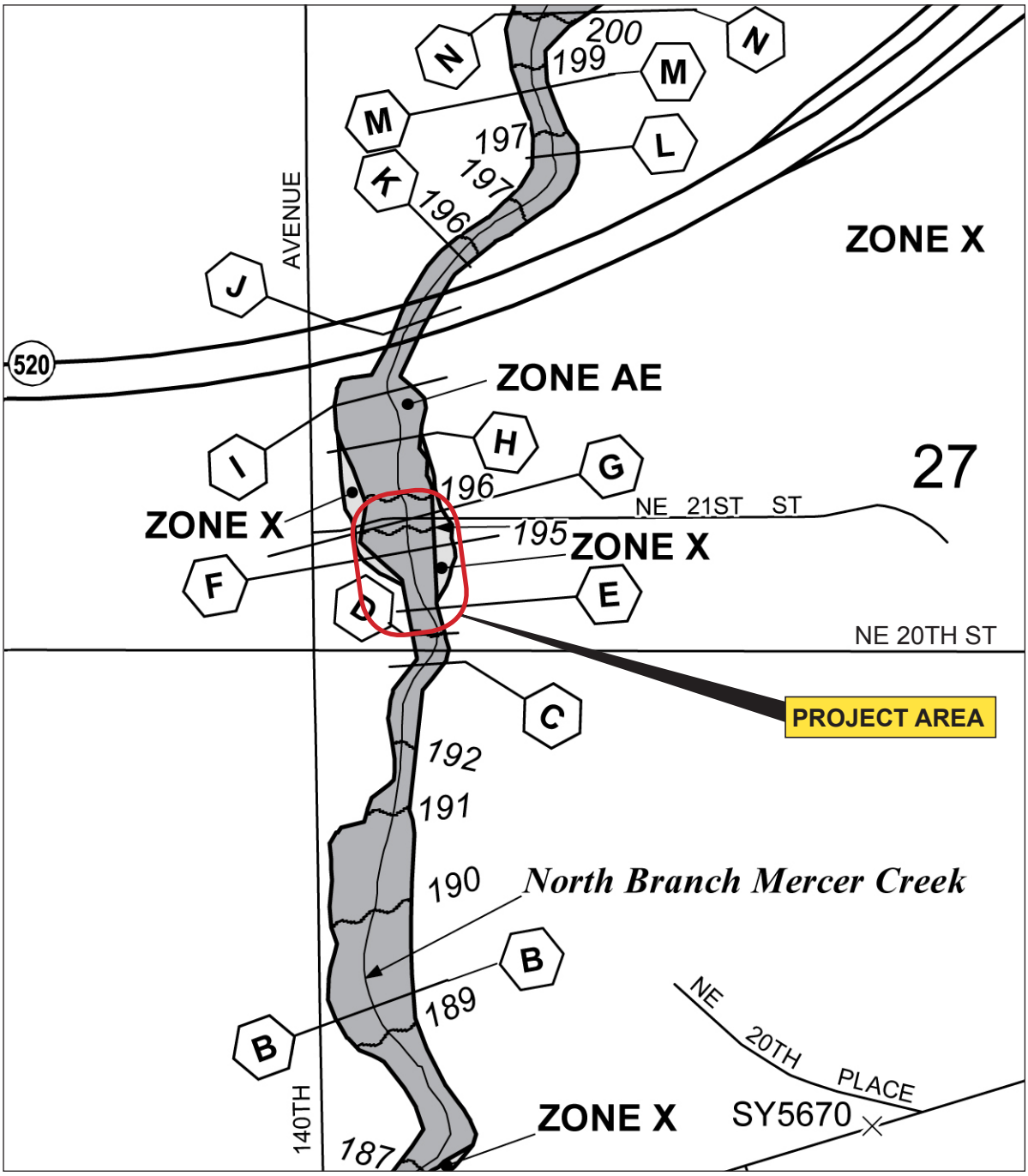
No shoreline management areas exist along either Valley Creek or Sears Creek.

3.1.9 Amphibians and Reptiles

The WSGA data for amphibians and reptiles contains limited site-specific occurrence data, but includes a map for each species outlining its core and peripheral zones (Dvornich, McAllister, and Aubry 1997). These zones represent the potential distribution of each species based on the presence of suitable habitat within each zone. Therefore, the species outlined in **Table 4** have the potential to occur in the general project vicinity where suitable habitat is present.

Table 4: Amphibians and Reptiles

Common Name	Scientific Name	Note
Northwestern Salamander	*Ambystoma gracile*	Potentially Present
Long-toed Salamander	*Ambystoma macrodactylum*	Unlikely Present
Pacific Giant Salamander	*Dicamptodon tenebrosus*	Unlikely Present
Roughskin Newt	*Taricha granulosa*	Unlikely Present
Western Redback Salamander	*Plethodon vehiculum*	Unlikely Present
Ensatina	*Ensatina eschscholtzii*	Unlikely Present due to a lack of coniferous downed wood
Western Toad	*Bufo boreas*	Unlikely Present; Federal species of concern and state candidate.
Pacific Treefrog	*Hyla regilla*	Potentially Present
Red-legged Frog	*Rana aurora*	Unlikely Present
Bullfrog	*Rana catesbeiana*	Introduced, common near stormwater ponds and lakes
Painted Turtle	*Chrysemys picta*	Introduced, common in/near lakes
Slider	*Trachemys scripta*	Introduced, common in/near lakes
Northern Alligator Lizard	*Elgaria coerulea*	Potentially Present
Western Terrestrial Garter Snake	*Thamnophis elegans*	Potentially Present
Northwestern Garter Snake	*Thamnophis ordinoides*	Potentially Present
Common Garter Snake	*Thamnophis sirtalis*	Potentially Present
Rubber Boa	*Charina bottae*	Unlikely Present



Source: FEMA Mapping Information Platform

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE AE Base Flood Elevations determined.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

Floodplain boundary

513 Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A—A Cross section line

0 250 500
Scale in Feet

N

City of Bellevue
Valley Creek at NE 21st Flood Control Project

Critical Areas Report

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September 2012

Figure 9 – FEMA Map

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3.1.10 Mammals

Based on a review of WSGA data (Johnson and Cassidy 1997), 21 mammals have been documented in Township 25 North by Range 05 East (**Table 5**). However, this list is not all-inclusive and only includes species that were documented in the WSGA database prior to 1997.

Table 5: Mammal Record Summary for T25N R05E

#	Common Name	Scientific Name
1.	Trowbridge's Shrew	*Sorex trowbridgii*
2.	Shrew-Mole	*Neurotrichus gibbsii*
3.	Coast Mole	*Scapanus orarius*
4.	Townsend's Mole	*Scapanus townsendii*
5.	Snowshoe Hare	*Lepus americanus*
6.	Mountain Beaver	*Aplodontia rufa*
7.	Townsend's Chipmunk	*Tamias townsendii*
8.	Eastern Gray Squirrel	*Sciurus carolinensis*
9.	Douglas' Squirrel	*Tamiasciurus douglasii*
10.	Northern Flying Squirrel	*Glaucomys sabrinus*
11.	Bushy-tailed Woodrat	*Neotoma cinerea*
12.	Forest Deer Mouse	*Peromyscus keeni*
13.	Creeping Vole	*Microtus oregoni*
14.	Townsend's Vole	*Microtus townsendii*
15.	Porcupine	*Erethizon dorsatum*
16.	Nutria	*Myocastor coypus*
17.	Norway Rat	*Rattus norvegicus*
18.	Coyote	*Canis latrans*
19.	Raccoon	*Procyon lotor*
20.	Long-tailed Weasel	*Mustela frenata*
21.	Mink	*Mustela vison*

Other species not documented in the WSGA database that could potentially utilize the project vicinity include Virginia opossum (*Didelphis virginiana*), vagrant shrew (*Sorex vagrans*), California myotis (*Myotis californicus*), little brown myotis (*Myotis lucifugus*), long-legged myotis (*Myotis volans*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris nocitvagans*), big brown bat (*Eptesicus fuscus*), Townsend's big-eared bat (*Plecotus townsendii*), eastern cottontail (*Sylvilagus floridnus*), beaver (*Castor canadensis*), deer mouse (*Peromyscus maniculatus*), creeping vole (*Microtus oregoni*), Townsend's vole (*Microtus townsendii*), muskrat (*Ondatra zibethicus*), pacific jumping mouse (*Zapus trinotatus*), house mouse (Mus musculus), black rat (*Rattus rattus*), red fox (*Vulpes vulpes*), ermine (*Mustela erminea*), striped skunk (*Mephitis mephitis*), spotted skunk (*Spilogale gracilis*), and black-tailed deer (*Odocoileus hemionus*).

3.1.11 Birds

Based on a review of WSGA data, 76 bird species could potentially nest in the general area in or adjacent to T25N R05E (Smith et al. 1997). This determination is based on combining confirmed, probable, and possible breeding evidence. It is important to note that the species listed in **Table 6** are not necessarily associated with the project area, but could potentially utilize the project vicinity for nesting, foraging, or during migration. Use by some of these species

would be extremely rare or limited to presence in or near greenbelts, open spaces, and ponds or seasonally during periods of migration.

Table 6: Breeding Bird Summary for T25N R05E

#	Common Name	Scientific Name	#	Common Name	Scientific Name
1.	Pied-billed Grebe	*Podilymbus podiceps*	39.	American Crow	*Corvus brachyrhynchos*
2.	Great Blue Heron	*Ardea herodias*	40.	Black-capped Chickadee	*Parus atricapillus*
3.	Green Heron	*Butorides virescens*	41.	Chestnut-backed Chickadee	*Parus rufescens*
4.	Canada Goose	*Branta canadensis*	42.	Bushtit	*Psaltriparus minimus*
5.	Wood Duck	*Aix sponsa*	43.	Red-breasted Nuthatch	*Sitta canadensis*
6.	Green-winged Teal	*Anas crecca*	44.	Brown Creeper	*Certhia americana*
7.	Mallard	*Anas platyrhynchos*	45.	Bewick's Wren	*Thryomanes bewickii*
8.	Gadwall	*Anas strepera*	46.	Winter Wren	*Troglodytes troglodytes*
9.	Common Merganser	*Mergus merganser*	47.	Marsh Wren	*Cistothorus palustris*
10.	Osprey	*Pandion haliaetus*	48.	Golden-crowned Kinglet	*Regulus satrapa*
11.	Bald Eagle	*Haliaeetus leucocephalus*	49.	Swainson's Thrush	*Catharus ustulatus*
12.	Cooper's Hawk	*Accipiter cooperii*	50.	American Robin	*Turdus migratorius*
13.	Red-tailed Hawk	*Buteo jamaicensis*	51.	Cedar Waxwing	*Bombycilla cedrorum*
14.	California Quail	*Callipepla californica*	52.	European Starling	*Sturnus vulgaris*
15.	Virginia Rail	*Rallus limicola*	53.	Hutton's Vireo	*Vireo huttoni*
16.	American Coot	*Fulica americana*	54.	Warbling Vireo	*Vireo gilvus*
17.	Killdeer	*Charadrius vociferus*	55.	Orange-crowned Warbler	*Vermivora celata*
18.	Spotted Sandpiper	*Actitis macularia*	56.	Yellow Warbler	*Dendroica petechia*
19.	Glaucous-winged Gull	*Larus glaucescens*	57.	Black-throated Gray Warbler	*Dendroica nigrescens*
20.	Rock Dove	*Columba livia*	58.	Common Yellowthroat	*Geothlypis trichas*
21.	Band-tailed Pigeon	*Columba fasciata*	59.	Wilson's Warbler	*Wilsonia pusilla*
22.	Vaux's Swift	*Chaetura vauxi*	60.	Western Tanager	*Piranga ludoviciana*
23.	Rufous Hummingbird	*Selasphorus rufus*	61.	Black-headed Grosbeak	*Pheucticus melanocephalus*
24.	Belted Kingfisher	*Ceryle alcyon*	62.	Spotted Towhee	*Pipilo maculatus*
25.	Red-breasted Sapsucker	*Sphyrapicus ruber*	63.	Savannah Sparrow	*Passerculus sandwichensis*
26.	Downy Woodpecker	*Picoides pubescens*	64.	Song Sparrow	*Melospiza melodia*
27.	Hairy Woodpecker	*Picoides villosus*	65.	White-crowned Sparrow	*Zonotrichia leucophrys*
28.	Northern Flicker	*Colaptes auratus*	66.	Dark-eyed Junco	*Junco hyemalis*
29.	Pileated Woodpecker	*Dryocopus pileatus*	67.	Red-winged Blackbird	*Agelaius phoeniceus*
30.	Olive-sided Flycatcher	*Contopus borealis*	68.	Brewer's Blackbird	*Euphagus cyanocephalus*
31.	Western Wood-Pewee	*Contopus sordidulus*	69.	Brown-headed Cowbird	*Molothrus ater*
32.	Willow Flycatcher	*Empidonax traillii*	70.	Bullock's Oriole	*Icterus bullockii*
33.	Pacific-slope Flycatcher	*Empidonax difficilis*	71.	Purple Finch	*Carpodacus purpureus*
34.	Tree Swallow	*Tachycineta bicolor*	72.	House Finch	*Carpodacus mexicanus*
35.	Violet-green Swallow	*Tachycineta thalassina*	73.	Red Crossbill	*Loxia curvirostra*
36.	Cliff Swallow	*Hirundo pyrrhonota*	74.	Pine Siskin	*Carduelis pinus*
37.	Barn Swallow	*Hirundo rustica*	75.	American Goldfinch	*Carduelis tristis*
38.	Steller's Jay	*Cyanocitta stelleri*	76.	House Sparrow	*Passer domesticus*

3.1.12 Federally Listed Species

The USFWS species list for King County includes 7 species listed as threatened or endangered, designated critical habitat for 3 species, 5 candidate species, and 21 species of concern. Based on a review of existing resource information and habitat conditions, federally-listed species under the jurisdiction of the USFWS do not exist within the immediate project area. The Kelsey Creek Basin does not provide suitable habitat for bull trout (*Salvelinus confluentus*), nor has it been designated as critical habitat. Lake Washington is designated as bull trout critical habitat, but is approximately 5 miles downstream of the project area.

The National Marine Fisheries Service (NMFS) has jurisdiction over federally-listed anadromous salmonids, marine mammals and turtles, designated Chinook salmon critical habitat, and EFH. Chinook salmon which are listed as a threatened species have been documented in the Kelsey Creek Basin (including Valley Creek). Kelsey Creek is not designated as Chinook salmon critical habitat. Lake Washington is designated as Chinook salmon critical habitat, but is approximately 5 miles downstream of the project area. Kelsey Creek, including Valley and Sears creeks, would be considered EFH.

3.2 FIELD INVESTIGATION

DEA performed site visits on July 9, 18, and 19, and September 12, 2012 to verify preliminary data findings, delineate wetland boundaries, document existing habitat conditions, and document wildlife use. DEA also flagged the OHWM of Valley and Sears creeks within the project area. **Appendix A** contains the survey map depicting wetland boundaries and the OHWM of both Valley and Sears creeks. Site photographs are contained within **Appendix B.**

3.2.1 Wetlands

Two wetlands (Wetlands A and B) were identified as occurring within the immediate project vicinity during the site investigation (**Table 6**). Both wetlands were delineated and categorized by DEA. The project site has been historically cleared and graded. Both creeks have been channelized. Wetland indicators were observed at multiple locations.

Table 6: Wetland Summary

Wetland ID	Ecology[1] Category	Ecology[1] Wetland Class	Total Wetland Functions Score	Water Quality Functions Score	Hydrology Functions Score	Wildlife Functions Score	City of Bellevue Buffer Width
A	III	Riverine	48	16	18	14	60 feet
B	III	Riverine	45	16	18	11	60 feet

[1] Washington State Department of Ecology

Wetlands A and B

Wetlands A and B were both rated as Category III wetlands based on the *Washington State Wetland Rating System for Western Washington – Revised* (Hruby 2004). They are both riverine wetlands located within the floodplain of Valley Creek. Wetland A is located to the north of NE 21st Street, while Wetland B is located to the south of NE 21st Street (**Appendix A**). The standard buffer width of a Category III wetland with a wildlife function score of less than 20 points is 60 feet. **Appendix C** contains a copy of the completed Ecology rating forms, and the wetland delineation data plot forms are in **Appendix D**. Site photographs are included in **Appendix B**.

Soils. Two data plots (DPs) were recorded for Wetland A and two for Wetland B. DP 1 was located on upland fill material between NE 21st Street and Wetland A. DP 2 was within the wetland. DP 3 was located on the east side of Valley Creek downstream (south) of NE 21st Street. DP 4 was located on the west side of Valley Creek downstream (south) of NE 21st Street. The exact locations of these DPs are depicted on **Appendix A**. A summary of the soils within each DP follows:

DP 1: The soil profile consisted of a single horizon of a very dark brown (10YR 2/2) silty sand with some gravels, primarily at a depth greater than 4 inches. One short piece of broken wire was encountered. No redox features were noted. Based on this information, it was determined these soils were not hydric, and were fill material related to roadway construction.

DP 2: The soil profile consisted of a single horizon of black (10YR 2/1) silt loam with some organics. These soils were consistent with the A12 (thick dark surface) hydric soil indicator, and are therefore considered hydric.

DP 3: The soil profile consisted of a very dark brown (10YR 3/2) silt loam from 0 to 16 inches above a brown (10YR 4/3) sand clay loam with sparse (<2%) redox concentrations. Based on this information, it was determined these soils were not hydric.

DP 4: The soil profile consisted of black (10YR 2/1) silt/clay loam from 0 to 16+ inches, but the amount of clay increased and redox features were observed below 16 inches. These soils were consistent with the A12 (thick dark surface) hydric soil indicator, and are therefore considered hydric.

Hydrology. Wetland A is very wet year-round, while hydrology of Wetland B appears to be restricted to the early portion of the growing season. Hydrology in Wetland A is supported by stream flow and groundwater. Soils in DP 2 were saturated to the surface, and groundwater was encountered at a depth of 15 inches. Soils in DP 4 (Wetland B) were very moist, but no groundwater was observed. Wetland B is within a swale that likely becomes saturated to the surface during the early portions of the growing season. Since the soils were very moist during the month of September of a "drought year," it appears highly probable that the hydrology indicator would be present for at least 10 percent of the growing season.

Vegetation. Wetland A is composed of several different species including reed canarygrass (*Phalaris arundinacea*), cat's-ear (*Hypochaeris radicata*), dandelion (*Taraxacum officinale*), curly dock (*Rumex crispus*), creeping buttercup (*Ranunculus repens*), toad rush (*Juncus bufonius*), small-fruited bulrush (*Scirpus microcarpus*), Himalayan blackberry (*Rubus armeniacus*), white clover (*Trifolium repens*), bittersweet nightshade (*Solanum dulcamara*), Pacific willow (*Salix lucida*), Sitka willow (*Salix sitchensis*), red-osier dogwood (*Cornus sericea*), salmonberry (*Rubus spectabilis*), field horsetail (*Equisetum arvense*), and other grasses and weeds. Most of Wetland A is frequently mowed, except for an area along the stream channel that is dominated by shrubs.

Wetland B is dominated by Himalayan blackberry (*Rubus armeniacus*), but Pacific willow (*Salix lucida*) and Sitka willow (*Salix sitchensis*) are present along the mainstem of Valley Creek; Douglas spirea (*Spiraea douglasii*) are also present along Sears Creek.

Classification. Wetland A was rated as a Category III wetland based on the Ecology Rating system. Wetland A received a total score of 49 points based on functions, which is at the higher end of this category (Category III = 30 to 50 points). Wetland B was also rated as a Category III wetland but scored fewer habitat points.

Functions. Both wetlands rated high for water quality (16 points), high for hydrologic (18 points) functions, and moderate for wildlife (Wet. A = 14, Wet. B = 11) functions. The score for water quality function would have been higher if the wetlands contained more shrubs or trees

and depressions. A multiplier of 2 was assigned to both wetlands since untreated pollutants discharge to the wetlands, a stream flows through them, and sediment and pollutants trapped by the wetlands benefit a stream. The high score for hydrology function is due to flooding issues in Valley Creek and the potential for high flows to damage downstream natural resources. A higher overbank storage ratio would have increased the hydrology function even further. The moderate score for wildlife function is due to the wetlands being degraded and isolated, an absence of functional buffer and relatively simplistic vegetative composition (especially Wetland B).

In summary, Wetlands A and B provide primarily water quality and hydrologic functions, but also some limited wildlife function. However, both could be enhanced, which would increase all of its functions. Although they provide limited wildlife function, both wetlands help buffer stream resources from anthropogenic influences. Enhancing both wetlands by adding more trees and shrubs would likely increase their rating to Category II.

3.2.2 Streams

Habitat conditions in Valley Creek within the immediate project vicinity are degraded. Upstream of NE 21st Street the stream channel is a linear glide with a substrate dominated by silt. No large woody debris is present and, except for a few shrubs, the adjoining riparian zone is composed primarily of mowed grasses and rushes. Upstream of NE 21st Street, Valley Creek flows under SR 520. Downstream of NE 21st Street sand is the dominant substrate type, which is intermixed with some gravel. This section of stream is primarily a linear low-gradient riffle, but changes to a glide immediately prior to flowing under NE 20th Street. Some woody debris is present, which tends to capture debris from the surrounding uplands. Sears Creek enters Valley Creek immediately downstream of NE 21st Street. Although Sears Creek has been ditched and abuts the south side of NE 21st Street, it contains a high percent of gravels. However, the stream has been ditched, pool habitat and large woody debris are absent, and the riparian zone is degraded. The increase in percent gravel in Sears Creek is due to an increase in gradient.

3.2.3 Uplands

The uplands in the project vicinity are primarily developed and consist of commercial uses. The project area is bisected by NE 21st Street, while 140th Avenue NE is located to the west and SR 520 to the north. A narrow vegetated corridor is present along Valley Creek, which is abutted by commercial buildings. Land use shifts to residential to the north of SR 520 and south of Bel-Red Road.

4.0 PROJECT DESCRIPTION

The City proposes to reduce flooding in the project area by replacing the existing undersized culvert with a larger culvert and removing excess sedimentation that has accumulated downstream of NE 21st Street. The existing culvert does not meet WDFW design criteria due to small size and not being countersunk. Sediment has accumulated downstream of the crossing such that the channel bottom elevation is currently at approximately the same elevation as the crown (top) of the NE 21st Street culvert. This results in the high-flow bypass system becoming engaged during base-flow, which then exasperates low-flow passage concerns downstream of the project area. The project would improve stream habitat by:

1) Replacing the existing undersized culvert under NE 21st Street that does not meet current WDFW design criteria with a culvert that does meet current WDFW design criteria;

2) Replacing the existing anthropogenic derived sand and silt substrate downstream of NE 21st Street with gravel suitable for macro-invertebrate and salmonid spawning purposes;

3) Increasing stream sinuosity within a reach previously linearized by adjoining land use practices;

4) Installing LWD in the stream channel to maintain sinuosity and provide lateral scour pool habitat; and

5) Replacing non-native invasive species along the stream channel with native vegetation.

The proposed project would improve fish and wildlife habitat between NE 21st Street and NE 20th Street, and as such, will reduce localized flooding and increase habitat functions in the project reach to the benefit of local businesses and fish and wildlife that utilize Valley Creek and adjoining wetlands and uplands.

The City has and is undertaking other actions on a basin scale to address source issues that have resulted in excessive flow and sedimentation inputs in this basin. These basin scale actions include the installation of detention facilities to trap sediment and stormwater runoff upstream of the project area. The Valley Creek pond (Drainage Master Plan) DMP 197 is about 1,300 feet upstream of the project site on NE 24th Street. The Commissioner's Pond is a detention pond that captures sediment on Sears Creek and is located south of Bel-Red Road about 3,000 feet upstream of the project site. The City of Redmond is currently designing a large detention vault on Sears Creek in the Overlake area. This vault will further reduce peak flows and the potential for sediment transport.

4.1 EXISTING SYSTEM

The existing culvert under NE 21st Street consists of a 47-foot-long x 8-foot-wide x 30-inch-high squashed corrugated metal pipe (CMP). In 1987, the City of Bellevue constructed a high flow bypass system to divert excess flows from Valley Creek through a 48-inch-diameter pipe along 140th Avenue NE that eventually outfalls to Kelsey Creek approximately 1,800 feet south/downstream from the points of diversion. There are two points of diversion, one immediately upstream of NE 21st Street and one immediately downstream of NE 21st Street. Both diversion inlets consist of drop structures with metal grates. In addition, the existing culvert under NE 21st Street does not meet WDFW design criteria. The City must perform maintenance

at the crossing to include excavation of sediment at the confluence of Sears Creek with Valley Creek, and remove sediment that accumulates within the existing culvert every few years to keep it clear.

4.2 FLOODING

The proposed project is being initiated to reduce flooding. NE 21st Street just east of 140th Avenue NE floods at an estimated 2 to 5-year frequency. NE 21st Street is a dead end and provides the only access to the properties along the roadway east of 140th Avenue NE. When the roadway floods it impedes access for the property owners, their customers and business associates, emergency vehicles, and results in a safety hazard. The flooding is due, in part, to the existing under-sized Valley Creek culvert under NE 21st Street and sediment that has accumulated in Valley Creek downstream of the NE 21st Street crossing. Sediment has accumulated downstream of the crossing such that the channel bottom elevation is currently at approximately the same elevation as the crown (top) of the NE 21st Street culvert. The sediment accumulation in the creek causes flow to back up, contributing to the flooding of the roadway.

4.3 PROJECT PROPOSAL

The City proposes to reduce flooding by replacing the existing 47-foot-long x 8-foot-wide x 30-inch-high squashed CMP with a 47-foot-long x 14-foot-wide x 42-inch-high precast reinforced concrete box culvert. The project also includes removing the sediment that has accumulated in the creek channel and restoring approximately 150 feet of degraded creek channel. In addition, the project includes removing the upstream high flow bypass structure and improving the trashrack on the high flow bypass structure downstream of NE 21st Street to reduce the potential for clogging. A set of design drawings is contained in **Appendix E**.

The overall project area is approximately 0.4 acre, which includes the culvert crossing under NE 21st Street, roadway adjacent to the culvert that will be removed and repaved, staging area, temporary construction access, approximately 150 linear feet of stream channel, and adjoining uplands that will be disturbed during construction and enhanced as part of the mitigation process. Cut and fill quantities below the OHWM associated with channel restoration include 160 cubic yards of sediment removal, over excavation for gravel, channel bank grading to increase sinuosity, and 92 cubic yards of fill composed primarily of new streambed gravel. Cut and fill quantities outside the OHWM include 315 cubic yards of cut and 215 cubic yards of fill. The project will result in a total of 475 cubic yards of cut and 307 cubic yards of fill (**Appendix E – Sheet 4 of 20**). The new stream channel will have a bottom width of 7 feet and will be composed of streambed gravel (**Appendix E – Sheet 6 of 20**). In order to keep a sinuous stream channel and improve in-stream habitat, LWD will be installed along the outside bends of the new channel. These logs will be held in place with earth anchors and anchor boulders. The stream bank above the OHWM will be cut at a 2:1 slope and stabilized with coir matting and live stakes. A Temporary Erosion and Sediment Control Plan (TESC) plan has been prepared for the project (**Appendix E – Sheets 9 – 11 of 20**). The TESC plan also includes a stream bypass plan and turbidity monitoring plan.

4.3.1 Construction Equipment

The project will require the use of various different types of construction equipment during various phases of project. Different construction phases include stream flow bypass, site

preparation, culvert removal, culvert installation, roadway work, utility relocate, sediment removal, stream restoration, and wetland and riparian restoration. Based on the project including various phases and that the construction contractor will select what equipment he will utilize based on their needs, the following construction equipment list in **Table 7** is provided for reference. **Table 7** includes a list of potential construction equipment, expected use, and maximum noise levels.

Table 7: Construction Equipment List, Use, and Reference Maximum Noise Levels

Equipment	Expected Use	Lmax (dBA) at 50 feet
Excavator	Unload and move supplies, install and remove culvert	81
Crane	Unload prefabricated culvert	81
Front End Loader	Move supplies and material	79
Backhoe	Move supplies, excavation, and clean-up	78
Concrete Saw	New pavement end-points and underground utilities.	90
Compactor	Roadway work.	83
Concrete Mixer Truck	Roadway, culvert, sidewalk, and finish work.	79
Concrete Pump Truck	Roadway, culvert, sidewalk, and finish work.	81
Dump Truck	Transport supplies and construction debris.	76
Flat Bed Truck	Transport supplies and construction debris.	74
Generator	General purpose	81
Paver	Roadway work	77
Pickup Truck	Day to day use, small tools and crew	75
Pneumatic Tools	As needed during removal and installation of culvert	85
Pumps	Water bypass	81
Roller	Roadway work	80
Vacuum Street Sweeper	Project area clean-up	82
Chain Saw	As needed to cut wood	84
Jack Hammer	Roadway, underground utility, and general demolition	89

4.3.2 Project Schedule

In-water work is proposed to occur from July 1, 2013 through September 30, 2013. This time period is the presumed WDFW in-water work window based on discussions with the WDFW local area habitat biologist. Upland work would start prior to in-water work and would likely extend beyond the month of September. Hours of construction are anticipated to generally occur between 7:00 a.m. and 6:00 p.m. on weekdays, and 9:00 a.m. and 6:00 p.m. on Saturdays. However, since the replacement of the culvert will require a temporary road closure, this action may require either night-time or weekend work to minimize impacts to commercial businesses along the road.

4.3.3 Noise Levels

Ambient noise levels in the project vicinity are assumed to generally range from 56 to 61 dBA based on ambient noise measurements reported during preparation of the *Preliminary Draft Noise and Vibration Report prepared for the Bellevue 120th Avenue NE Corridor Project* (City of Bellevue 2010). The most probable noise level for the project area is approximately 60 dBA based on a comparing similar site conditions. Noise generated by construction equipment will exceed ambient noise levels, but since the project vicinity includes several high capacity roads such as SR 520 and NE 140th Street, and is surrounded by relatively tall structures, all noise generated during construction are assumed to reach ambient levels within one-half mile from the project area.

5.0 IMPACT MINIMIZATION MEASURES

Potential impacts to fish, wildlife, habitat, and water quality could occur during construction activities. The overall project area is approximately 0.40 acre. The clearing limits where grading is required to restore the creek channel includes 0.07 acre with an additional 0.18 acre designated for clearing of invasive non-native vegetation for purposes of mitigation and habitat restoration. No new impervious area will be added as a result of this project. Potential impacts associated with construction can be reduced or avoided by implementation of the impact measures outlined below:

General

- A TESC Plan will be developed and implemented (**Appendix E – Sheets 9 and 10**).
- A qualified Erosion and Control Inspector will review all sediment control measures twice per week during construction. Qualified means the inspector will be a Certified Erosion and Sediment Control Lead (CESCL).
- Turbidity will be monitored per the Turbidity Monitoring Plan outlined in **Appendix E** and as required by the US Army Corps of Engineers Programmatic Biological Assessment. According to the Specific Project Information Form (SPIF), monitoring downstream sedimentation every 20 minutes during construction is required to verify/refine the turbidity estimate provided to the NMFS and USFWS in the SPIF.
- A Spill Prevention Control and Countermeasures plan that meets Ecology standards will be developed and implemented for the project to ensure that all pollutants and products will be controlled and contained.
- Seasonal restrictions applied to work conducted below the OHWM will be as required by a project specific Hydraulic Project Approval (HPA) issued by the WDFW.
- Construction impacts will be confined to the minimum area necessary to complete the project.
- Removal of native riparian vegetation will be minimized as much as possible.
- Native vegetation within the project area will be flagged prior to construction.

Water Quality/Erosion Control

- All best management practices (BMPs) will be installed according to City standards and will be inspected and maintained throughout the life of the project by the CESCL.
- Staging and soil stockpile areas will be limited to those outlined in the clearing and grading permit.
- Staging areas will be fenced.
- Spill kits will be kept on-site.
- Fuels and other potentially hazardous materials will be kept in a secured area. Secured means fenced, and locked during non-work hours.
- Secondary containment will be required for all hazardous materials. Spill containment is required for generators, parked equipment, porta-potty, fuels, solvents, etc.

- The project will comply with water quality conditions identified by Ecology.
- Wash water resulting from wash down of equipment or work areas will be contained for proper treatment and/or disposal, and will not be directly discharged into state waters.
- There will be no discharge of oil, fuels, or chemicals to surface waters, or onto land where there is a potential for reentry into surface waters.
- No cleaning solvents or chemicals used for tools or equipment cleaning will be discharged to ground or surface waters.
- The contractor will regularly check fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc. for leaks, and will maintain and store materials properly to prevent spills.
- BMPs will be used on all project activities to control and prevent sediments from entering aquatic systems.

In-water and Over-water Work

- All fish will be removed from the work area prior to any in-water work activities per the Fish Salvage Plan in **Appendix F** of the Critical Areas Report.
- Dewatering will include provisions/methods outlined in **Appendix F** of the Critical Areas Report.
- Materials removed from below the OHWM will be placed in an upland location where they cannot enter water bodies.
- Materials, such as rock and LWD placed within the water, will be free of sediment and or other contaminants.
- Water pumped from work isolation areas will be treated to remove suspended sediments prior to returning to the water body. Discharge will occur in such a manner as not to cause erosion.
- Mechanical equipment will not enter the stream channel until the project area has been dewatered and fish salvage has been completed.
- Mechanical equipment operating in the project area will be inspected daily for leaks. Any equipment found to be leaking will immediately be fixed or removed from the project site.

6.0 PROJECT IMPACTS

The proposed project has been designed to avoid impacts to critical areas to the maximum extent possible while still achieving project goals. No impacts to Wetland A will occur. The project will not result in an increase in new impervious surface or riprap along the stream channel. However, the project will result in temporary impacts.

Wetland B: Approximately 129 square feet of permanent impact to Wetland B, 158 square feet of permanent stream and wetland buffer impact (**Appendix E – Sheet 12 of 20**). The 129 square feet of permanent impact to Wetland B is the result of adding sinuosity to the stream channel. After construction, these areas will be part of the active stream channel bottom that will be composed of gravel. The 158 square feet of permanent stream and wetland buffer impact also includes areas converted to stream channel.

Stream Impacts: The project will result in approximately 2,010 square feet of temporary stream impact including the portion of stream channel that will be dewatered and where sediment will be removed, but will then be enhanced by adding stream bed gravels and LWD. The stream buffer impacts are the same as described above since these buffers overlap.

Fish Salvage: Dewatering the project reach will require fish salvage. Cutthroat trout will likely be present, and it is possible (although unlikely) juvenile coho could also be in the project reach when construction is proposed. Other non-salmonid species such as bluegill or western brook lamprey could also be present. Non-fish species such as crawfish are also present. These species would need to be salvaged prior to construction. Fish salvage is required to occur per WDFW requirements and as outlined in **Appendix F**. The WDFW requires that fish salvage be conducted by qualified persons that have a valid Scientific Collection Permit. The protocol outlined in **Appendix F** is as required by the Corps when utilizing a SPIF. In this specific case, Protocol II is applicable since dewatering will occur outside an area with a high likelihood of listed fish being present.

Dewatering: The project reach will be dewatered prior to construction. This activity will result in a temporary increase in turbidity downstream of the project reach. Site-specific conditions that could lead to a temporary increase in turbidity that must be managed include the presence of a tributary stream (Sears Creek) entering the reach of Valley Creek to be dewatered immediately downstream of NE 21st Street and the stream substrate being dominated by highly mobile sediments (sand and silt). The presence of Sears Creek may require dewatering to occur during two different events, once for culvert replacement and again for sediment removal. Based on this possibility it is assumed a spike in downstream turbidity could occur during each dewatering event, plus when flow is re-routed back through the culver and again when flow is re-routed through the new stream channel. However, the peak would likely be smaller when flow is re-routed back into the stream channel since the stream bottom will be composed of newly installed gravels. Furthermore, the contractor will be required to install a rock pad or similar device to dissipate flow at the bypass outlet to minimize scour and the release of sediments that can result from concentrated flow exiting the bypass outlet. Based on this information it is assumed the peaks would be short-term and localized, and likely dissipating to background levels within 300 feet downstream of the project reach.

Flood Hazard Area: Impacts to the FEMA flood hazard area are not anticipated and may actually result in a reduction of the flood hazard zone. This outcome is anticipated since the

project will remove more material within the project area than is installed, resulting in a net increase in storage capacity. Furthermore, by increasing culvert capacity, reducing clogging of the inlet bypass system, removing the sediment wedge, and improving stream channel flow capacity, flooding should be minimized.

6.1 ANALYSIS OF ALTERNATIVES

An analysis of alternatives documents different methods of developing a project site, and states the justifications for each alternative. This assessment generally documents the three-tier process of first avoiding an impact, then minimizing the impact, and finally mitigating for unavoidable impacts. A memorandum prepared by SAIC dated November 28, 2011 was prepared to determine a preferred alternative. Alternatives considered included:

- Maintain existing conditions – provide maintenance to reduce, but not eliminate, the incidence of flooding;
- Increase culvert capacity – increase the capacity of the NE 21st and the NE 20th Street culverts. Two scenarios were considered: 1) enlarging just the NE 21st Street culvert and 2) enlarging both the NE 21st and NE 20th Street culverts combined;
- Regional detention – provide more detention upstream from the flooding site. The assessment also included consideration of the City of Redmond project currently under design for the Sears Creek Overlake area; and
- Bypassing more flows – divert more flows away from the flooding location. The evaluation included adding another diversion structure upstream from the site.

Based on the information contained within the memorandum and outcome of workshops between the City and project engineers, it was concluded the proposed project was the best alternative to address the purpose and need of the project.

6.2 SALMONID HABITAT IMPACTS

Based on project type (culvert replacement, sediment removal, and stream, wetland, and riparian restoration), implementation of impact minimization measures, and proposed mitigation/ restoration measures, project-related impacts to baseline salmonid habitat conditions would be temporary and beneficial over-time.

Existing stream and watershed conditions were quantified by using watershed and habitat parameters as defined by the “Matrix of Pathways and Indicators” developed by the NMFS. These pathways and indicators summarize important parameters for six major pathways. The following salmonid effects matrix has been developed to summarize potential project-related direct and indirect effects to baseline habitat conditions (**Table 8**).

Table 8: Salmonid Habitat Project Effects Matrix

PATHWAY	INDICATORS	BASELINE CONDITION	PROJECT EFFECTS TO BASELINE CONDITIONS Kelsey Creek Basin
Water Quality	Temperature	Functioning At Risk	Degrade → Maintain. The project will result in clearing existing vegetation along approximately 150 linear feet of stream channel that currently provides shade to Valley Creek. However, the project will replant this section of stream channel with fast growing willows and other native vegetation that will eventually provide equivalent shade potential. Therefore, this indicator will be temporarily degraded but will shift to maintain in approximately 3 to 4 years.
	Sediment	Not Properly Functioning	Degrade → Improve. The project will temporally disturb stream substrate that could increase turbidity. However, this increase in turbidity will be temporary and localized. The project will remove a wedge of sand and silt that would like continue to be transported further downstream during high-flow events, and replace it with streambed gravels. Therefore, the project will temporarily degrade the sediment indicator but provide a long-term improvement over existing conditions.
	Chemical Contamination and Nutrients	Not Properly Functioning	Maintain. The project will not result in an increase in pollution-generating impervious surface that would increase the abundance or distribution of chemical contaminants associated with motor vehicles. Although combustion engines will be used during construction, their use will be limited and of short duration. The use of fertilizers will be limited to amending planting pits.
Habitat Access	Physical Barriers	Functioning At Risk	Improve. The project will improve fish passage by replacing an undersized culvert and removing sediment and debris from within the stream channel. The project will also prevent the existing bypass system from being engaged during base flow. This action will improve the physical barriers indicator.
Habitat Elements	Substrate	Functioning At Risk	Improve. The project will remove a sediment wedge composed of sand and silt that has accumulated in the stream channel from anthropogenic sources, and replace it with gravels. This action will improve the substrate indicator.
	LWD	Not Properly Functioning	Improve. Existing LWD will not be permanently removed from the project reach. LWD will be added to the stream channel as part of the restoration plan. Therefore, the project will improve this indicator.
	Pool Frequency	Not Properly Functioning	Improve. The existing stream channel is dominated by low-gradient riffle habitat. After construction lateral scour pools will likely form near the LWD.
	Pool Quality	Not Properly Functioning	Improve. The pools created through restoration should be deep enough to be utilized by cutthroat trout during periods of base-flow and deep enough to be used by anadromous salmonids during higher flows.
	Off-Channel Habitat	Not Properly Functioning	Maintain. No change to this indicator is anticipated.
	Refugia	Not Properly Functioning	Improve. The addition of LWD and resulting lateral scour pools will increase the potential for refugia during base flow and periods of high flow.
Channel Conditions and Dynamics	Width/Depth Ratio	Functioning At Risk	Improve. A slight improvement should occur due to channel realignment.
	Streambank Condition	Properly Functioning	Improve. Although the existing streambank is vegetated and includes willows, Himalayan blackberry is abundant. The stream channel is also somewhat incised. After construction, the stream bank will be planted with native vegetation. No new riprap or other forms of bank armoring are proposed. Once the mitigation trees and shrubs become established, the streambank condition will improve within the project reach.
	Floodplain Connectivity	Not Properly Functioning	Maintain. No change to this indicator is anticipated.
Flow/ Hydrology	Change in Peak/Base Flows	Not Properly Functioning	Maintain. No change to this indicator is anticipated. Although the project will reduce the severity and frequency of localized flooding, no measurable change to basin wide peak/base flows will result from this specific project.
	Increase in Drainage Network	Not Properly Functioning	Maintain. No change to this indicator is anticipated.

PATHWAY	INDICATORS	BASELINE CONDITION	PROJECT EFFECTS TO BASELINE CONDITIONS
			Kelsey Creek Basin
Watershed Conditions	Road Density and Location	Not Properly Functioning	Maintain. No change to this indicator is anticipated.
	Disturbance History	Not Applicable	Degrade → Maintain. The disturbance history will be degraded during construction, but will shift to maintain once the restoration and mitigation measures have been implemented.
	Riparian Reserve	Not Properly Functioning	Degrade → Improve. The project will increase the abundance of trees in the project area. Implementing the mitigation plan will remove non-native invasive species, and will plant native trees and shrubs.

Based on the anticipated effects to the baseline conditions summarized above, six indicators will be *maintained*. Some indicators such as temperature, sediment, disturbance history, and riparian reserve will be *degraded* during construction, but degradation will be temporary and shift to maintain or improve once construction is complete and/or the installed plants become large enough to provide function. The predominance (nine) indicators are anticipated to *improve* after the project is completed. Based on this assessment, temporary impacts will occur, but after construction and once the installed plant community becomes established, up to nine indicators will improve and result in a net increase in functional lift to salmonid habitat.

6.3 WILDLIFE IMPACTS

Wildlife impacts could occur during construction. Construction activities are focused at the existing culvert crossing under NE 21st Street and along the stream channel, but include the lands adjoining Valley Creek. The project also involves clearing approximately 8,939 square feet (0.21 acre) of existing vegetation as part of the mitigation plan. Use of this area by wildlife is limited to those species typically associated with urban environments. This may include nesting and foraging by various species of birds. At least one small nest was observed in a thicket of Himalayan blackberry during the site visit, mallard ducks (including several ducklings) were observed immediately upstream of the project area, and a few other species were observed in the general project area. Use of the project area for nesting would be limited and seasonal, while use for foraging or refugia would be more prolonged. Use by small mammals would also be limited and likely restricted to small rodents, raccoons, and opossum. Although some wildlife species can and do utilize non-native vegetation, the subset is small compared to the number of species that can use native vegetation for nesting, foraging, or refuge. Since project activities would occur after most bird species have nested, no measurable impact to nesting birds is anticipated. Although project construction would remove existing vegetation and increase the level of disturbance in the project vicinity, these impacts would be temporary. Furthermore, the project will result in a net increase in habitat function by improving and increasing native plant species diversity and abundance. The species of vegetation selected in the mitigation plan are those known to be beneficial to wildlife.

7.0 MITIGATION

Project-related impacts to waters of the U.S. are limited to 129 square feet of permanent impact where wetland is being converted to stream, and an additional 1,811 square feet of temporary impact where sediment is being removed from the stream channel. Refer to **Appendix E – Sheet 12 of 20** for a summary table of impacts and mitigation.

Permanent wetland impacts are to a Category III wetland (Wetland B). The City proposes to mitigate for the 129 square feet of permanent impact through enhancement at a ratio of 8:1, which results in a requirement to provide 1,032 square feet of wetland enhancement. This will be accomplished by enhancing Wetland B, which is dominated by Himalayan blackberry. Himalayan blackberry will be removed and replaced with native vegetation.

Temporary impacts to approximately 150 linear feet (1,811 square feet) of stream channel will occur as a result of removing sediment. This section of stream will be restored by increasing sinuosity, adding LWD, and adding streambed gravel.

In order to improve overall habitat conditions for fish and wildlife, the City is also proposing to restore riparian habitat along Valley Creek within the project reach. Additional restoration actions include enhancing 473 square feet of Wetland B and 7,276 square feet of stream/wetland buffer. The mitigation plan will replace non-native invasive species with a diverse assemblage of native species. The plan includes installation of a minimum of 68 trees (7 species), 460 willow and dogwood cuttings (4 species), and 269 shrubs (12 species). **Appendix E – Sheet 16** summarizes the species selected and the quantities to be installed.

The following section summarizes the goals and objectives, planting plan, plant establishment and maintenance, performance standards, approval criteria, contingencies, and monitoring requirements. Refer to **Appendix E** for more detail. Within **Appendix E**, **Sheet 13** outlines the locations and areas of impact, restoration, and enhancement; **Sheet 14** outlines planting zones; **Sheet 15** includes general mitigation notes; **Sheet 16** outlines the planting and hydroseed schedule; **Sheet 17** outlines plant material spacing and layout; and **Sheets 18** and **19** provide planting details. The mitigation area will be fenced and Native Growth Protective Area (NGPA) signage will be installed around the perimeter.

7.1 GOALS AND OBJECTIVES

The primary goals of this mitigation plan are to improve stream, riparian, and wetland functions impacted by construction of the project, and improve fish and wildlife habitat in the project vicinity. This will be accomplished by improving in-stream habitat, removing non-native invasive species that currently dominate the site, and replacing them with a diverse assemblage of native species that, once established, will improve habitat for fish and wildlife.

7.2 MONITORING PLAN

All planting zones will be monitored annually for a minimum of five years, which includes the first year warranty inspection. Formal monitoring will occur in compliance with reporting requirements of the City and Corps. Monitoring reports will be submitted to the City and other resource agencies for review and comment. Reports will be prepared per the Corps format. These reports will address progress toward meeting the performance measures and success standards as

specified, and any recommended contingency actions taken to correct deficiencies that occurred in meeting these standards. Report submittals will occur following each monitoring period. Successful mitigation will be measured by attainment of the performance measures and success standards described in this mitigation plan.

The City or their designee will conduct the monitoring at the mitigation site. Compliance monitoring provides a means for tracking the development of the mitigation site over time, and for determining compliance with permits issued by federal, state, or local jurisdictions.

Monitoring will occur on a yearly basis until performance standards have been met. Mitigation site monitoring will utilize a variety of ecological monitoring techniques. Many standard techniques such as transect lines and sample plots may be used. Monitoring will also include tracking mortality, photo points (culvert, stream, LWD, and planting areas), as well as additional methods deemed necessary to adequately document development of the mitigation area over the monitoring period. Monitoring methodology will be included in the annual monitoring reports. The following items will be documented during yearly monitoring:

- Number of live trees and shrubs (Year 1 only).
- Number of live trees (Years 1 through 3 only).
- Percent cover (all years except Year 1).
- Continuity of live willow stakes along the stream channel (to identify and measure gaps of dead willows > five feet wide).
- Signs of herbivory by rodents (voles or beaver) on newly-installed plants.
- Signs of rapid or potentially unacceptable reestablishment of non-native species.
- Signs of vandalism or illegal dumping.
- Signs of high plant mortality other than herbivory. Potential causes could be disease, improper plant selection, or exposure to extreme weather conditions or events prior to initial plant established.
- Stream bank instability or erosion.
- Condition of bark mulch to include areas of erosion, thickness, and/or saturation.
- Condition of the hydroseeded area(s).
- Condition or exposure of coir matting.
- Condition and stability of LWD.
- Condition of trashracks to include accumulation of debris or engagement during periods of baseflow.
- Condition of the new culvert under NE 21st Street and downstream project reach to include fish passage potential, blockages from debris, stream flow, gravels, or accumulation of sediment, and debris.

7.3 PERFORMANCE STANDARDS

The following performance standards change on a yearly basis as the site develops and will be used to measure success.

Year 1

- All planting zones will achieve a 100 percent survival rate by the end of the first year.
- Cover of non-native or invasive species shall be less than 10 percent.
- All yearly maintenance requirements have been documented and corrected if deemed detrimental.

Year 2

- 95 percent survival of all trees by the end of the second year.
- No gaps of dead willows greater than 5 feet along the streambank. Gaps may be infilled with additional willow cuttings to meet this requirement.
- All planting zones achieve a minimum of 25 percent cover by the end of the second year.
- Cover of non-native or invasive species shall be less than 10 percent.
- All yearly maintenance requirements have been documented and corrected if deemed detrimental by the monitoring biologist.

Year 3

- 90 percent survival of all trees by the end of the third year.
- No gaps of dead willows greater than 5 feet along the streambank. Gaps may be infilled with additional willow cuttings to meet this requirement.
- All planting zones will achieve a minimum 30 percent cover by the end of the third year.
- Cover of non-native or invasive species shall be less than 10 percent.
- All yearly maintenance requirements have been documented and corrected if deemed detrimental by the monitoring biologist.

Year 5

- No gaps of dead willows greater than five feet along the streambank. Gaps may be infilled with additional willow cuttings to meet this requirement.
- All planting zones will achieve a minimum 60 percent cover by the end of the fifth year.
- Cover of non-native or invasive species shall be less than 10 percent.
- All yearly maintenance requirements have been documented and corrected if deemed detrimental by the monitoring biologist.

7.3.1 Contingencies

Failure to meet the proposed performance standards will result in implementation of contingency actions. The failure to meet performance actions and implementation of contingency actions will be documented in the monitoring reports. Failure to meet performance standards may result in some or all of the following contingency actions:

- Additional vegetation planting may be required to meet plant survival or cover standards. Plant species will be evaluated in relation to site conditions to determine if species substitutions will be required.
- Control of competitive weed species may be required if plant survival standards are not met. Methods of weed control could include hand or mechanical weeding, or mulching.

7.3.2 Year 5 Success and Mitigation Approval

Mitigation success will be achieved during Year 5 if all Year-5 success standards have been met and the required maintenance tasks completed.

7.4 MAINTENANCE

Maintenance will occur up to two times during year-one and then yearly throughout the five-year monitoring period as needed. The contractor shall correct erosion and drainage problems as specified on the TESC plans through the one-year warranty period. The contractor shall remove silt fencing at the end of the one-year warranty period and restore the fenced area by hand seeding between April 1st and October 15th all bare areas greater than one-square foot. Maintenance within the mitigation and restoration areas shall be performed by the contractor or City under direction of the mitigation monitor. Required maintenance activities are outlined below in **Table 9**.

Table 9: Maintenance Tasks

Task	Schedule	Notes
Replace all failed mitigation plantings.	One year following planting, then as required to meet performance standards.	By contractor the first year and the by owner after first year.
Temporary irrigation of new plantings.	Planting will occur in the fall at the end of the growing season and not require irrigation.	Monitoring may result in developing a watering plan depending on results.
Trash Removal.	Inspect during each maintenance and monitoring event.	By contractor during first year and owner after first year.
Stream channel debris.	Inspect during each maintenance and monitoring event.	By owner. Debris to be removed as needed to eliminate flow or fish blockages.
Repair of fencing and/or NGPA signage.	Inspect during each maintenance and monitoring event.	Replace as necessary.
Weeding	Inspect during each maintenance and monitoring event.	Trees and shrubs must be weeded to the dripline and mulch maintained at 3 inches deep. By contractor during first year and owner after first year.
Clear and grub undesirable invasive plants from the NGPA. Undesirable species include Himalayan blackberry, evergreen blackberry, scot's broom, English ivy, purple loose strife, morning glory, climbing nightshade, Japanese knotweed, and reed canarygrass, and all species outlined on the most current King County Noxious Weed List.	As required in annual monitoring reports.	Removal should be directed by the wetland biologist. Clearing and grubbing shall be by physically (non-mechanical) removing plant materials including root masses and trimming. Weeds must be properly disposed of off-site. By contractor the first year, by owner after the first year.

8.0 CONCLUSIONS

The City of Bellevue – Valley Creek Flood Reduction Project at NE 21st Street has been designed to reduce the frequency and severity of localized flooding that result in road closures, adversely impacts local commercial businesses, and creates safety concerns. The project will upgrade an existing undersized culvert under NE 21st Street, adjust the existing stormwater bypass inlets, and remove sediment that has accumulated in the stream channel downstream of the culvert.

As part of the permitting process, critical areas were identified and delineated so that these areas could be avoided to the maximum extent possible. Although impacts to critical areas were minimized, some unavoidable impacts would occur during construction. The project would result in both permanent and temporary impacts to critical areas. Permanent impacts would be limited to 129 square feet of wetland and 158 square feet of buffer impact. Temporary impacts would occur to 2,010 square feet within approximately 150 linear feet of stream channel due to sediment removal, dewatering, and restoration. The temporary stream impacts are being mitigated by restoring the stream channel. Stream restoration includes adding sinuosity, LWD, and stream gravels. The 129 square feet of permanent wetland impact is being mitigated by enhancing 1,505 square feet of existing wetland resulting in a 11.7:1 mitigation ratio, which exceeds the required 8:1 mitigation ratio. The 158 square feet of permanent buffer impact is being mitigated by enhancing 8,939 square feet of buffer resulting in a 56.6:1 ratio, which far exceeds the typical 1:1 mitigation ratio for buffer impacts. All areas currently vegetated that are disturbed during construction will be replanted. Based on a review of current site conditions, project design, impact minimization measures, and implementation of the outlined mitigation, the proposed project would result in short term and localized impacts, but would result in a net increase in fish and wildlife habitat. The project will occur within an area mapped as being within the FEMA 100 year floodplain, but will not result in a net increase in fill and would therefore not increase or adversely impact the floodplain. No other critical areas have been documented within the project area.

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APPENDIX A

EXISTING CONDITIONS

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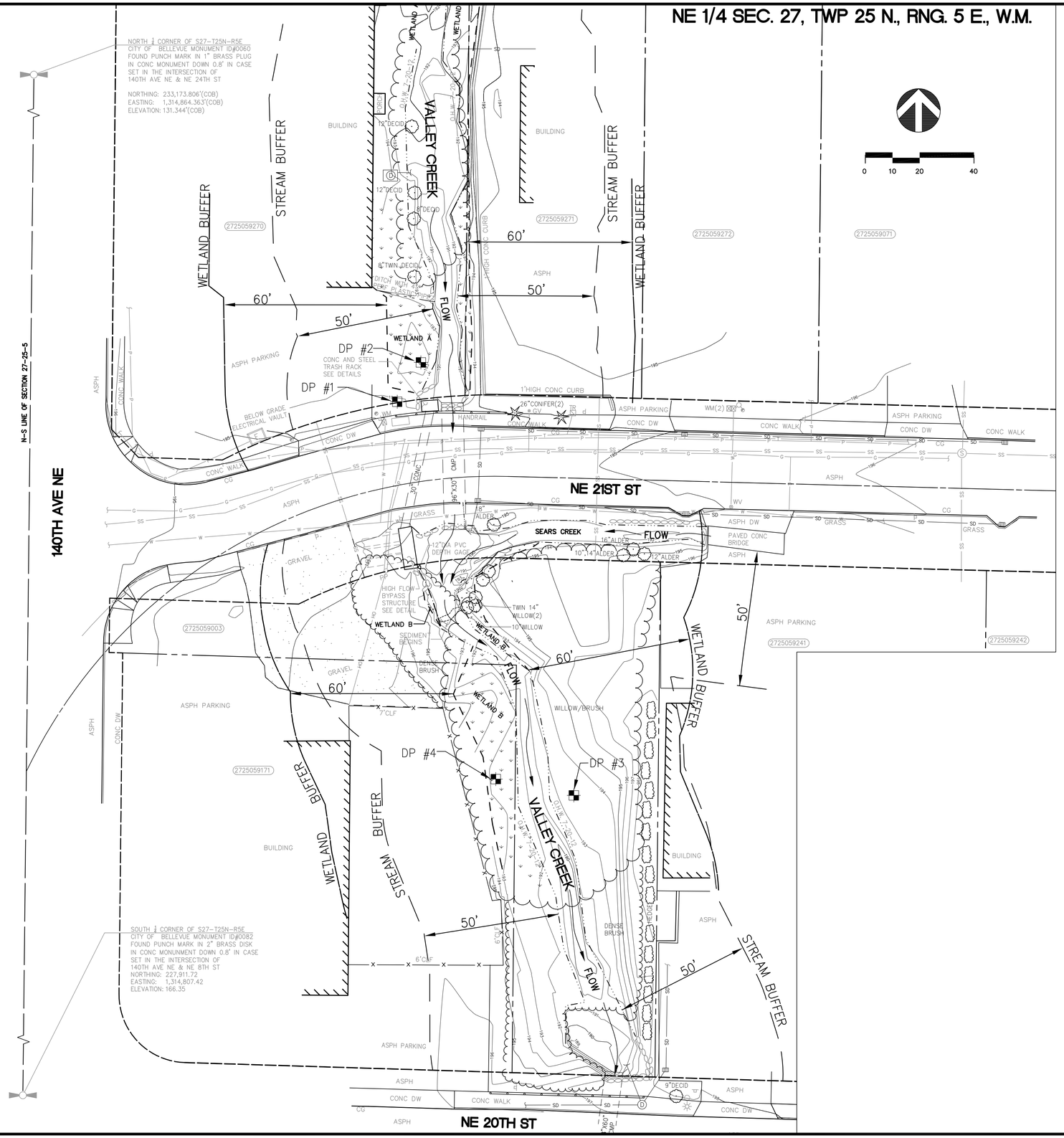
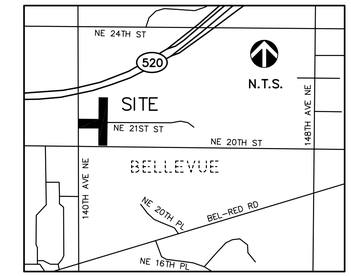


VICINITY MAP



LEGEND

	QUARTER CORNER		60' WETLAND BUFFER
312604900	TAX LOT / PARCEL NUMBER		50' STREAM BUFFER
	WHEEL CHAIR RAMP		ROAD CENTERLINE
	SIGN		DITCH/FLOW LINE
	POLE		WETLAND BOUNDARY
	TRAFFIC SIGNAL CABINET		EDGE OF GRAVEL OR DIRT
	STREET LIGHT W/ ARM		TRAFFIC STRIPING
	POST OR BOLLARD		ROCKERY
	DECIDUOUS TREE		FENCE LINE (TYPE AS NOTED)
	CONIFEROUS TREE		TREE/VEGETATION LINE
W	WATER MANHOLE		EASEMENT LINE
WV	WATER VALVE		PROPERTY LINE
WM	WATER METER		QUARTER SECTION LINE
	FIRE HYDRANT		EXISTING RIGHT-OF-WAY LINE
	SEWER MANHOLE	SS	SANITARY SEWER
D	STORM DRAIN MANHOLE	G	NATURAL OR PETROLEUM GAS
D	STORM DRAIN VAULT	P	UNDERGROUND POWER
	STORM CATCH BASIN	SD	STORM DRAIN
	STORM CULVERT	T	UNDER GROUND TELEPHONE
E	ELECTRIC MANHOLE	W	DOMESTIC WATER
E	ELECTRIC VAULT	ASPH	ASPHALT
T	TELEPHONE MANHOLE	CB	CATCH BASIN
TR	TELEPHONE RISER	CC	CONCRETE CURB
GV	GAS VALVE	CG	CURB AND GUTTER
		CLF	CHAIN LINK FENCE
		CMP	CORREGATED METAL PIPE
		CONC	CONCRETE
		DW	DRIVEWAY
		EP	EDGE OF PAVEMENT
		IE	INVERT ELEVATION
		OHWM	ORDINARY HIGH WATER MARK
		PP	POWER POLE
		WM	WATER METER
		WV	WATER VALVE

EXISTING CONDITIONS
VALLEY CREEK AT NE 21ST STREET
FOR
SAIC
CITY OF BELLEVUE, KING COUNTY, WASHINGTON

DAVID EVANS AND ASSOCIATES INC.
415 - 118th Avenue SE
Bellevue Washington 98005-3518
Phone: 425.519.6500

REVISIONS: APPD.

DATE: SEPT. 17, 2012
DESIGN:
DRAWN: JMDE,GBK
CHECKED: SASW
REVISION NUMBER:

SCALE: 1"=20'

PROJECT NUMBER:
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DRAWING FILE:
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SHEET NO.
1
OF 1

APPENDIX - A

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APPENDIX B

SITE PHOTOGRAPHS

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1 View of upstream or north side of NE 21st Street. 7/9/2012.

2 Close up view of upstream or north side of NE 21st Street. 7/9/2012.

City of Bellevue *Valley Creek at NE 21st Flood Control Project*		
Critical Areas Report		DAVID EVANS AND ASSOCIATES INC.
SEEI0000-0003	*Appendix B –* *Site Photographs*	
September 2012		

PHOTO 3

PHOTO 4

(3) View looking upstream/north at Valley Creek from NE 21st Street. 7/9/2012.	*City of Bellevue* *Valley Creek at NE 21st Flood Control Project*
(4) View looking down/west along NE 21st Street towards 140th Ave NE. 7/9/2012.	*Critical Areas Report*
	SEEI0000-0003 / *September 2012* — *Appendix B – Site Photographs*
	DAVID EVANS AND ASSOCIATES INC.

PHOTO 5

PHOTO 6

5 View of downstream high flow bypass opening. 7/9/2012.

6 Downstream excavated pool at confuluence of Sears and Valley Creeks. 9/12/2012.

City of Bellevue
Valley Creek at NE 21st Flood Control Project

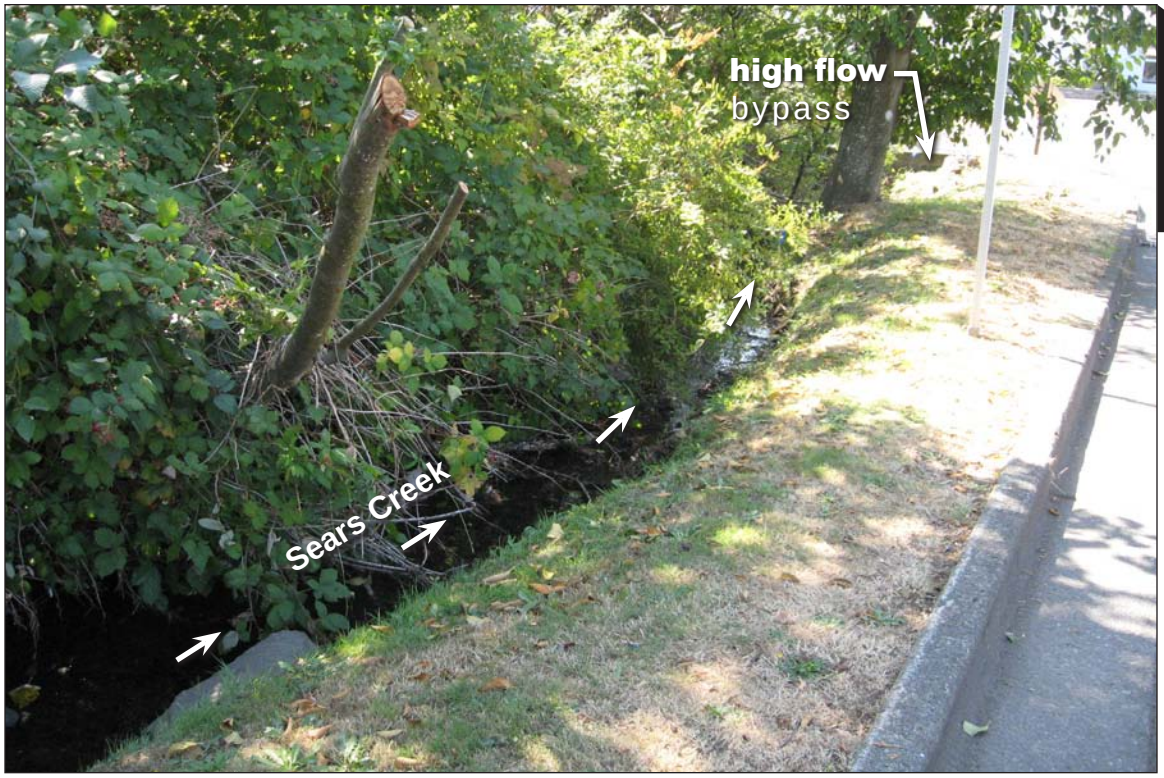
Critical Areas Report

SEEI0000-0003

September 2012

Appendix B – Site Photographs

DAVID EVANS AND ASSOCIATES INC.



(7) View looking east at the confluence of Sears with Valley Creek. 9/12/2012.	*City of Bellevue*
(8) View of Sears Creek looking west towards Valley Creek. 9/12/2012.	*Valley Creek at NE 21st Flood Control Project*
	Critical Areas Report
	SEEI0000-0003 / *September 2012* — *Appendix B – Site Photographs*
	DAVID EVANS AND ASSOCIATES INC.

PHOTO 9

PHOTO 10

9 Valley Creek restoration area downstream of NE 21st Street. 9/12/2012.

10 Valley Creek restoration area downstream of NE 21st Street. 9/12/2012.

City of Bellevue *Valley Creek at NE 21st Flood Control Project*		
Critical Areas Report		DAVID EVANS AND ASSOCIATES INC.
SEEI0000-0003	*Appendix B –* *Site Photographs*	
September 2012		

PHOTO 11

PHOTO 12

11 Middle section of Valley Creek restoration area. 9/12/2012.

12 Middle section of Valley Creek restoration area. 9/12/2012.

City of Bellevue *Valley Creek at NE 21st Flood Control Project*		
Critical Areas Report		DAVID EVANS AND ASSOCIATES INC.
SEEI0000-0003	*Appendix B –* *Site Photographs*	
September 2012		

PHOTO 13

PHOTO 14

13 View looking upstream along Valley Creek from NE 20th Street. 9/12/2012.

14 View looking upstream along Valley Creek from NE 20th Street. 9/12/2012.

City of Bellevue *Valley Creek at NE 21st Flood Control Project*		
Critical Areas Report		DAVID EVANS AND ASSOCIATES INC.
SEEI0000-0003	*Appendix B – Site Photographs*	
September 2012		

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APPENDIX C

WETLAND A AND B RATING FORMS

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Wetland name or number Wetland A____

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Wetland A Date of site visit: July 9, 2012

Rated by: Scott Swarts Trained by Ecology? Yes X No_____ Date of training: Nov 15, 2006

SEC: 27 TWNSHP: 25N RNGE: 5E Is S/T/R in Appendix D? Yes_____ No X_

Map of wetland unit: Figure_____ Estimated size one half acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland: I_____ II_____ III X IV_____

Category I =	Score > 70	Score for Water Quality Functions	16
Category II =	Score 51 - 69	Score for Hydrologic Functions	18
Category III =	Score 30 – 50	Score for Habitat Functions	14
Category IV =	Score < 30	TOTAL Score for Functions	48

Category based on SPECIAL CHARACTERISTCS of Wetland I_____ II_____ Does not apply X

Final Category (choose the "highest" category from above") **III**

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	
Natural Heritage Wetland		**Riverine**	X
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands in to those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number Wetland A____

Classification of Vegetated Wetlands for Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
   NO – go to 2 YES – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   YES – Freshwater Tidal Fringe **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. _____).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
   NO – go to 3 YES – The wetland class is **Flats**
   If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland meet both of the following criteria?
   _____ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   _____ At least 30% of the open water area is deeper than 6.6 (2 m)?
   NO – go to 4 YES – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland meet all of the following criteria?
   _____ The wetland is on a slope *(slope can be very gradual)*.
   _____ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   _____ The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   NO – go to 5 YES – The wetland class is **Slope**

5. Does the entire wetland meet all of the following criteria?
   X The unit is in a valley or stream channel where it gets inundated by overbank flooding from that stream or river.
   X The overbank flooding occurs at least once every two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   NO – go to 6 YES – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of the year. This means that any outlet, if present is higher than the interior of the wetland.
   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.
   No – go to 8 YES – The wetland class is Depressional

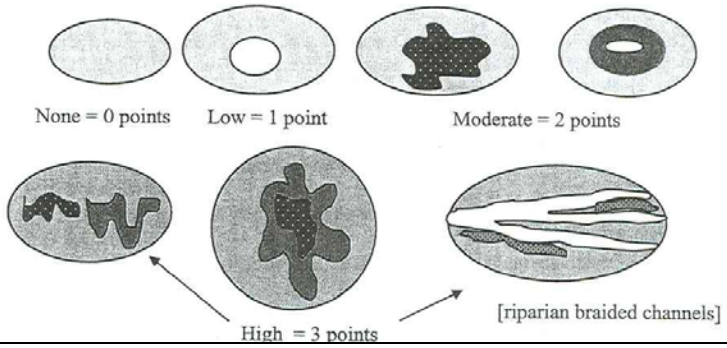
8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

Wetland name or number Wetland A____

R	Riverine and Freshwater Tidal Fringe Wetlands	Points (only 1 score per box)
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	
R 1	**Does the wetland have the <u>potential</u> to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 • Depressions cover > 1/2 area of wetland ..... points = 4 **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 • No depressions present ..... points = 0	**Figure ___** 2
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 • Trees or shrubs > 1/3 area of the wetland ..... points = 6 • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___** 6
	Add the points in the boxes above	8
R 2	**Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft _X_ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland _X_ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland _X_ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ____ Other _____ YES multiplier is 2 NO multiplier is 1	*(see p. 53)* Multiplier 2
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	16
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the <u>potential</u> to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 • If the ratio is between 10 – 20 ..... points = 6 • If the ratio is 5- <10 ..... points = 4 • If the ratio is 1- <5 ..... points = 2 • If the ratio is < 1 ..... points = 1 **Aerial photo or map showing average widths**	**Figure ___** 2
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 • Vegetation does not meet above criteria ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___** 7
	Add the points in the boxes above	9
R 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* _X_ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. _X_ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ____ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* YES multiplier is 2 NO multiplier is 1	*(see p.57)* Multiplier 2
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	18

Comments:

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.	**Points** (only 1 score per box)
H 1 Does the wetland have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____ Aquatic Bed __X__ Emergent plants __X__ Scrub/shrub (areas where shrubs have > 30% cover) ____ Forested (areas where trees have > 30% cover) *If the unit has a forested class check if:* ____ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon. *Add the number of vegetation types that qualify. If you have:* **Map of Cowardin vegetation classes** 4 structures or more..... points = 4 — 3 structures..... points = 2 $\boxed{\text{2 structures..... points = 1}}$ — 1 structure ..... points = 0	**Figure ___** 1
H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ____ Permanently flooded or inundated — $\boxed{\text{4 or more types present points = 3}}$ __X__ Seasonally flooded or inundated — 3 or more types present.....points = 2 __X__ Occasionally flooded or inundated — 2 types present.....points = 1 __X__ Saturated only — 1 type present .....points = 0 __X__ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ **Lake-fringe wetland..... = 2 points** ____ **Freshwater tidal wetland..... = 2 points** **Map of hydroperiods**	**Figure ___** 3
H 1.3 <u>Richness of Plant Species</u> *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* If you counted: > 19 species ..... points = 2 $\boxed{\text{5 – 19 species ..... points = 1}}$ List species below if you want to: < 5 species ..... points = 0 _____ _____ _____ _____	1
H 1.4 Interspersion of Habitats *(see p. 76)*: Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high". **Use map of Cowardin classes.**	**Figure ___** 1
H 1.5 <u>Special Habitat Features</u> *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* __X__ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) ____ Standing snags (diameter at the bottom > 4 inches) in the wetland ____ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m) ____ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* __X__ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	2
H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	8

H 2	**Does the wetland have the <u>opportunity</u> to provide habitat for many species?**	(only 1 score per box)
	H 2.1 <u>Buffers</u> *(see P. 80)*: *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed".* ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)..... **points = 5** ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference..... **points = 4** ____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference..... **points = 4** ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference..... **points = 3** ____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference ..... **points = 3** **If buffer does not meet any of the criteria above:** ____ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK ..... **points = 2** ____ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK..... **points = 2** ____ Heavy grazing in buffer ..... **points = 1** _X_ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland)..... **points = 0** ____ Buffer does not meet any of the criteria above ..... **points = 1** **Arial photo showing buffers**	**Figure ___** 0
	H 2.2 <u>Corridors and Connections</u> *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? *(Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).* YES = **4 points** (go to H 2.3) NO = go to H 2.2.2 H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (go to H 2.3) NO = go to H 2.2.3 H. 2.2.3 Is the wetland: • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR YES = 1 point • Within 1 mile of a lake greater than 20 acres? NO = 0 points	0

Comments:

	H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)* Which of the following priority habitats are within 330 ft. (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ____ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ____ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). __X__ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). __X__ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ____ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ____ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ____ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)	3
	H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)* • There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.....points = 5 • The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 5 • There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ..... points = 3 • The wetland fringe on a lake **with** disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 3 • There is at least 1 wetland within 1/2 mile .....points = 2 • There are no wetlands within 1/2 mile.....points = 0	3
	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	8
	TOTAL for H 1 from page 8	6
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	14

Comments:

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
SC1	**Estuarine wetlands?** *(see p.86)* Does the wetland unit meet the following criteria for Estuarine wetlands? ____ The dominant water regime is tidal, ____ Vegetated, and ____ With a salinity greater than 0.5 ppt. YES = Go to SC 1.1 NO X	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES = Category I NO = go to SC 1.2	**Cat. 1**
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? YES = Category I NO = Category II ____ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp,. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category 1. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ____ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland ____ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual Rating I/II**
SC2	**Natural Heritage Wetlands** *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? *(This question is used to screen out most sites before you need to contact WNHP/DNR.)* S/T/R information from Appendix D _____ or accessed from WNHP/DNR web site _____ YES _____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 NO X SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? YES = Category 1 NO _____ not a Heritage Wetland	**Cat I**
SC3	**Bogs** *(see p. 87)* Does the wetland **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. ***If you answer yes you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? YES = go to question 3 NO = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? YES = go to question 3 NO = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? YES = Is a bog for purpose of rating NO = go to question 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cove*r)? YES = Category I NO = Is not a bog for purpose of rating	**Cat. I**

SC4	**<u>Forested Wetlands</u>** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its function.* ____ **Old-growth forests**: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ____ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO = __X__ not a forested wetland with special characteristics	**Cat. I**
SC5	**<u>Wetlands in Coastal Lagoons</u>** *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ____ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks. ____ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom.)* YES = Go to SC 5.1 NO __X__ not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following three conditions? ____ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing) and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ____ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland. ____ The wetland is larger than 1/10 acre (4350 square ft.) YES = Category I NO = Category II	**Cat. I** **Cat. II**
SC6	**<u>Interdunal Wetlands</u>** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES = Go to SC 6.1 NO __X__ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula -- lands west of SR 103 • Grayland-Westport -- lands west of SR 105 • Ocean Shores-Copalis – lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? YES = Category II NO = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. II** **Cat. III**
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p. 1	**NA**

Comments:

Wetland name or number Wetland B

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Wetland B Date of site visit: July 9, 2012

Rated by: Scott Swarts Trained by Ecology? Yes X No_____ Date of training: Nov 15, 2006

SEC: 27 TWNSHP: 25N RNGE: 5E Is S/T/R in Appendix D? Yes_____ No X_

Map of wetland unit: Figure_____ Estimated size one half acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland: I_____ II_____ III X IV_____

Category I =	Score > 70	Score for Water Quality Functions	16
Category II =	Score 51 - 69	Score for Hydrologic Functions	18
Category III =	Score 30 – 50	Score for Habitat Functions	11
Category IV =	Score < 30	TOTAL Score for Functions	45

Category based on SPECIAL CHARACTERISTCS of Wetland I_____ II_____ Does not apply X

Final Category (choose the "highest" category from above") **III**

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	
Natural Heritage Wetland		**Riverine**	X
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	**YES**	**NO**
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands in to those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands for Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
   NO – go to 2 YES – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   YES – Freshwater Tidal Fringe **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. _____).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
   NO – go to 3 YES – The wetland class is **Flats**
   If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland meet both of the following criteria?
   _____ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   _____ At least 30% of the open water area is deeper than 6.6 (2 m)?
   NO – go to 4 YES – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland meet all of the following criteria?
   _____ The wetland is on a slope *(slope can be very gradual)*.
   _____ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   _____ The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   NO – go to 5 YES – The wetland class is **Slope**

5. Does the entire wetland meet all of the following criteria?
   X The unit is in a valley or stream channel where it gets inundated by overbank flooding from that stream or river.
   X The overbank flooding occurs at least once every two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   NO – go to 6 YES – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of the year. This means that any outlet, if present is higher than the interior of the wetland.
   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.
   No – go to 8 YES – The wetland class is Depressional

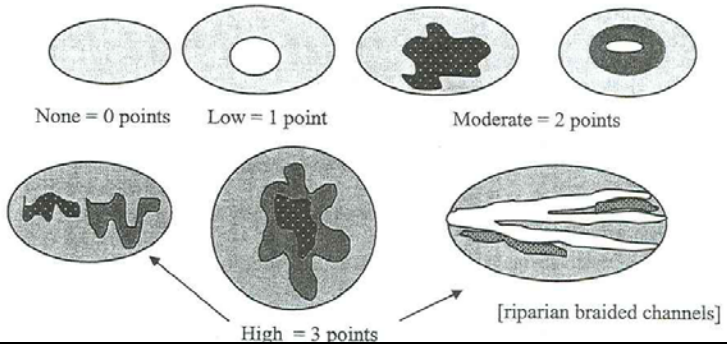
8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

Wetland name or number Wetland B

R	Riverine and Freshwater Tidal Fringe Wetlands	Points (only 1 score per box)
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	
R 1	**Does the wetland have the potential to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 • Depressions cover > 1/2 area of wetland ..... points = 4 **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 • No depressions present ..... points = 0	**Figure ___** 2
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 • Trees or shrubs > 1/3 area of the wetland ..... points = 6 • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___** 6
	Add the points in the boxes above	8
R 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft _X_ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland _X_ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland _X_ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ____ Other _____ YES multiplier is 2 NO multiplier is 1	*(see p. 53)* Multiplier 2
◆	**TOTAL – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	16
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 • If the ratio is between 10 – 20 ..... points = 6 • If the ratio is 5- <10 ..... points = 4 • If the ratio is 1- <5 ..... points = 2 • If the ratio is < 1 ..... points = 1 **Aerial photo or map showing average widths**	**Figure ___** 2
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 • Vegetation does not meet above criteria ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___** 7
	Add the points in the boxes above	9
R 4	**Does the wetland have the opportunity to reduce flooding and erosion?** Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* _X_ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. _X_ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ____ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* YES multiplier is 2 NO multiplier is 1	*(see p.57)* Multiplier 2
◆	**TOTAL – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	18

Comments:

These questions apply to wetlands of all HGM classes.	**Points** (only 1 score per box)
HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.	
H 1 Does the wetland have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____ Aquatic Bed ____ Emergent plants __X__ Scrub/shrub (areas where shrubs have > 30% cover) ____ Forested (areas where trees have > 30% cover) *If the unit has a forested class check if:* ____ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon. *Add the number of vegetation types that qualify. If you have:* **Map of Cowardin vegetation classes** 4 structures or more..... points = 4 3 structures..... points = 2 2 structures..... points = 1 1 structure ..... points = 0	**Figure ___** 0
H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ____ Permanently flooded or inundated 4 or more types present points = 3 __X__ Seasonally flooded or inundated 3 or more types present.....points = 2 __X__ Occasionally flooded or inundated 2 types present.....points = 1 __X__ Saturated only 1 type present .....points = 0 __X__ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ **Lake-fringe wetland..... = 2 points** ____ **Freshwater tidal wetland..... = 2 points** **Map of hydroperiods**	**Figure ___** 3
H 1.3 <u>Richness of Plant Species</u> *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* If you counted: > 19 species ..... points = 2 5 – 19 species..... points = 1 List species below if you want to: < 5 species ..... points = 0 _____ _____ _____ _____	0
H 1.4 Interspersion of Habitats *(see p. 76)*: Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high". **Use map of Cowardin classes.**	**Figure ___** 0
H 1.5 <u>Special Habitat Features</u> *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* __X__ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) ____ Standing snags (diameter at the bottom > 4 inches) in the wetland ____ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m) ____ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ____ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	1
H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	4

H 2	**Does the wetland have the <u>opportunity</u> to provide habitat for many species?**	(only 1 score per box)
	H 2.1 <u>Buffers</u> *(see P. 80)*: *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed".* ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)..... **points = 5** ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference..... **points = 4** ____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference..... **points = 4** ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference..... **points = 3** ____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference ..... **points = 3** **If buffer does not meet any of the criteria above:** ____ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK ..... **points = 2** ____ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK..... **points = 2** ____ Heavy grazing in buffer ..... **points = 1** ____ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland)..... **points = 0** _X_ Buffer does not meet any of the criteria above ..... **points = 1** **Arial photo showing buffers**	**Figure ___** 1
	H 2.2 <u>Corridors and Connections</u> *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? *(Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).* YES = **4 points** (go to H 2.3) NO = go to H 2.2.2 H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (go to H 2.3) NO = go to H 2.2.3 H. 2.2.3 Is the wetland: • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR YES = 1 point • Within 1 mile of a lake greater than 20 acres? NO = 0 points	0

Comments:

	H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)* Which of the following priority habitats are within 330 ft. (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ____ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ____ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). __X__ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). __X__ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ____ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ____ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ____ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)	3
	H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)* • There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.....points = 5 • The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 5 • There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ..... points = 3 • The wetland fringe on a lake **with** disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 3 • There is at least 1 wetland within 1/2 mile .....points = 2 • There are no wetlands within 1/2 mile.....points = 0	3
	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	7
	TOTAL for H 1 from page 8	4
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	11

Comments:

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
SC1	**Estuarine wetlands?** *(see p.86)* Does the wetland unit meet the following criteria for Estuarine wetlands? ____ The dominant water regime is tidal, ____ Vegetated, and ____ With a salinity greater than 0.5 ppt. YES = Go to SC 1.1 NO X	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES = Category I NO = go to SC 1.2	**Cat. 1**
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? YES = Category I NO = Category II ____ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp,. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category 1. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ____ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland ____ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual Rating I/II**
SC2	**Natural Heritage Wetlands** *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? *(This question is used to screen out most sites before you need to contact WNHP/DNR.)* S/T/R information from Appendix D _____ or accessed from WNHP/DNR web site _____ YES _____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 NO X SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? YES = Category 1 NO _____ not a Heritage Wetland	**Cat I**
SC3	**Bogs** *(see p. 87)* Does the wetland **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. ***If you answer yes you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? YES = go to question 3 NO = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? YES = go to question 3 NO = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? YES = Is a bog for purpose of rating NO = go to question 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cove*r)? YES = Category I NO = Is not a bog for purpose of rating	**Cat. I**

SC4	**<u>Forested Wetlands</u>** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its function.* ____ **Old-growth forests**: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ____ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO = __X__ not a forested wetland with special characteristics	**Cat. I**
SC5	**<u>Wetlands in Coastal Lagoons</u>** *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ____ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks. ____ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom.)* YES = Go to SC 5.1 NO __X__ not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following three conditions? ____ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing) and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ____ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland. ____ The wetland is larger than 1/10 acre (4350 square ft.) YES = Category I NO = Category II	**Cat. I** **Cat. II**
SC6	**<u>Interdunal Wetlands</u>** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES = Go to SC 6.1 NO __X__ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula -- lands west of SR 103 • Grayland-Westport -- lands west of SR 105 • Ocean Shores-Copalis – lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? YES = Category II NO = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. II** **Cat. III**
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p. 1	**NA**

Comments:

APPENDIX D

DATA PLOT FORMS 1–4

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

Project/Site: Valley Creek at NE 21st Street City/County: Bellevue/King Sampling Date: July 9, 2012

Applicant/Owner: City of Bellevue State: WA Sampling Point: DP 1 - upland

Investigator(s): Scott Swarts Section, Township, Range: S27, T25N, R5E

Landform (hillslope, terrace, etc.): roadway/sidewalk slope Local relief (concave, convex, none): none Slope (%): 40

Subregion (LRR): LRR - A Lat: 47.628742 Long: -122.153188 Datum: _____

Soil Map Unit Name: Bellingham silt loam NWI classification: None

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

Hydrophytic Vegetation Present?	Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks: Roadway/sidewalk slope higher than wetland/stream. This DP is on fill material. Area mowed.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft.)			
1. Cat's-ear (Hypochaeris radicata)	5	No	FACU
2. White clover (Trifolium repens)	20	Yes	FAC
3. Dandelion (Taraxacum officinale)	5	No	
4. Field horsetail (Equisetum arvense)	5	No	FAC
5. Reed canarygrass (Phalaris arundinacea)	30	Yes	FACW
6. Other mowed grass	30	Yes	FAC?
7. Creeping buttercup (Ranunculus repens)	5	No	FACW
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum zero

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Mowed slope of roadway/sidewalk. Higher than wetland and stream.

SOIL

Sampling Point: DP 1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 - 16+	10YR 2/2	100					silty sand	Gravels prevalent > 4 inches

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Fill material associated with road and sidewalk.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

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

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: Valley Creek at NE 21st Street City/County: Bellevue/King Sampling Date: July 9, 2012

Applicant/Owner: City of Bellevue State: WA Sampling Point: DP 2 - wetland

Investigator(s): Scott Swarts Section, Township, Range: S27, T25N, R5E

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

Subregion (LRR): LRR - A Lat: 47.628786 Long: -122.153151 Datum: _____

Soil Map Unit Name: Bellingham silt loam NWI classification: None

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft.)			
1. Toad rush (Juncus bufonius)	40	Yes	FACw
2. Creeping buttercup (Ranunculus repens)	45	Yes	FACW
3. Reed canarygrass (Phalaris arundinacea)	10	No	FACW
4. Curly dock (Rumex crispus)	5	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum zero

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Mowed slope of roadway/sidewalk. Higher than wetland and stream.

SOIL

Sampling Point: DP 2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 - 20+	10YR 2/1	100					silt loam	some organics present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Fill material associated with road and sidewalk.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☒ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches): _____
Water Table Present?	Yes ☒	No ☐	Depth (inches): 15 inches
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches): Surface

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: Valley Creek at NE 21st Street City/County: Bellevue/King Sampling Date: Sept. 12, 2012

Applicant/Owner: City of Bellevue State: WA Sampling Point: DP 3 - upland

Investigator(s): Greggory King Section, Township, Range: S27, T25N, R5E

Landform (hillslope, terrace, etc.): streambed bank Local relief (concave, convex, none): none Slope (%): 4

Subregion (LRR): LRR - A Lat: 47.628742 Long: -122.153188 Datum: _____

Soil Map Unit Name: Bellingham silt loam NWI classification: None

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: Streambed bank is above OHWM in a thicket of dense veg on a minimaly sloped bench.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lucida	90	Y	FACW
2.			
3.			
4.			
	90 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5 ft)			
1. Rubus armeniacus	10	Y	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum zero

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: minimal slope stream buffer bench. DP located above OHWM

SOIL

Sampling Point: DP 3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 - 16+	10YR 3/2	100					silty sand loam	
16+	10YR 4/3	100		< 2	C	M	sandy clay loam w/ mottles	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: well drained sandy soil with silts and organics mixed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

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

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

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

Project/Site: Valley Creek at NE 21st Street City/County: Bellevue/King Sampling Date: Sept. 13, 2012

Applicant/Owner: City of Bellevue State: WA Sampling Point: DP 4 -wetland

Investigator(s): Gregory King Section, Township, Range: S27, T25N, R5E

Landform (hillslope, terrace, etc.): flat wetland bench next to stream Local relief (concave, convex, none): convex Slope (%): 0

Subregion (LRR): LRR - A Lat: 47.628742 Long: -122.153188 Datum: _____

Soil Map Unit Name: Bellingham silt loam NWI classification: None

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

Hydrophytic Vegetation Present?	Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks: sample area in a bench/depression adjoining stream channel above OHWM.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lucida	75	Y	FACW
2. Salix scouleriana	20	N	FAC
3.			
4.			
	95	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 ft)			
1. Rubus armeniacus	2	Y	FAC
2.			
3.			
4.			
5.			
	2	= Total Cover	
Herb Stratum (Plot size: 5 ft.)			
1. Field horsetail (Equisetum arvense)	2	N	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	2	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 95

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Primarily open ground with organic debris, surrounded / salix canopy with understory of rubus and equisetum. DP situated on a depressed bench, above OHWM next to stream channel.

SOIL

Sampling Point: DP-4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 16	10YR 2/1	100						moist, sticky silt/clay loam
16+	10YR 2/1		gley1 2.5/5G	<5	C			sticky clay loam w.gley's @> 16"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: dark sticky clay loam with gleys at 16", on depressed stream channel bank bench, situated above OHWM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
- ☒ Drainage Patterns (B10)
- ☒ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

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

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): very moist

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soil very moist

APPENDIX E

DESIGN DRAWINGS

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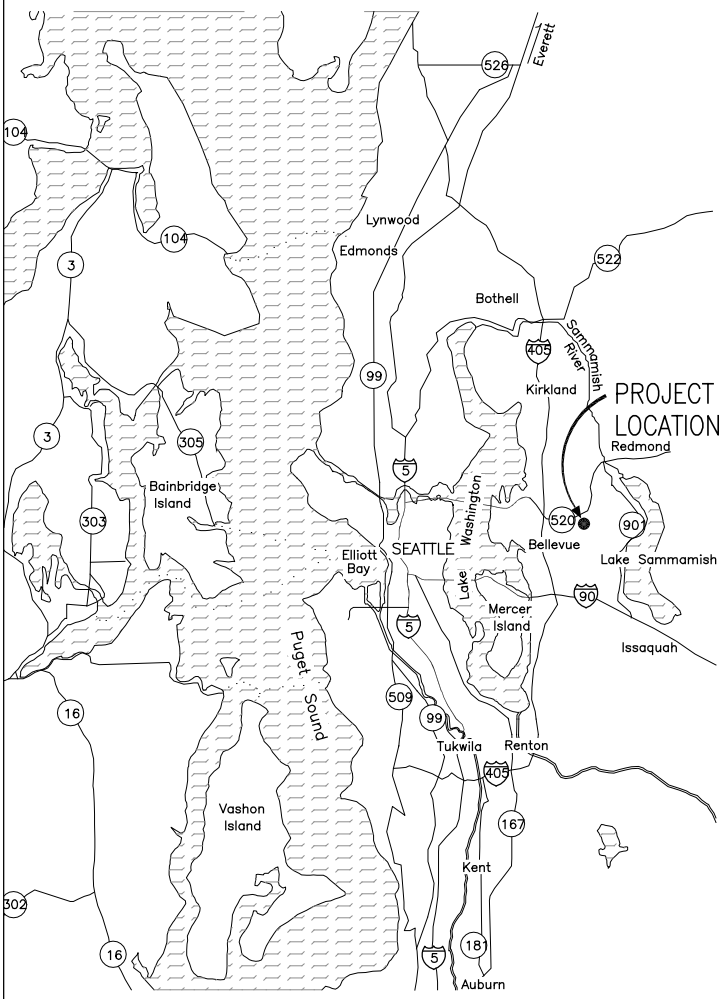
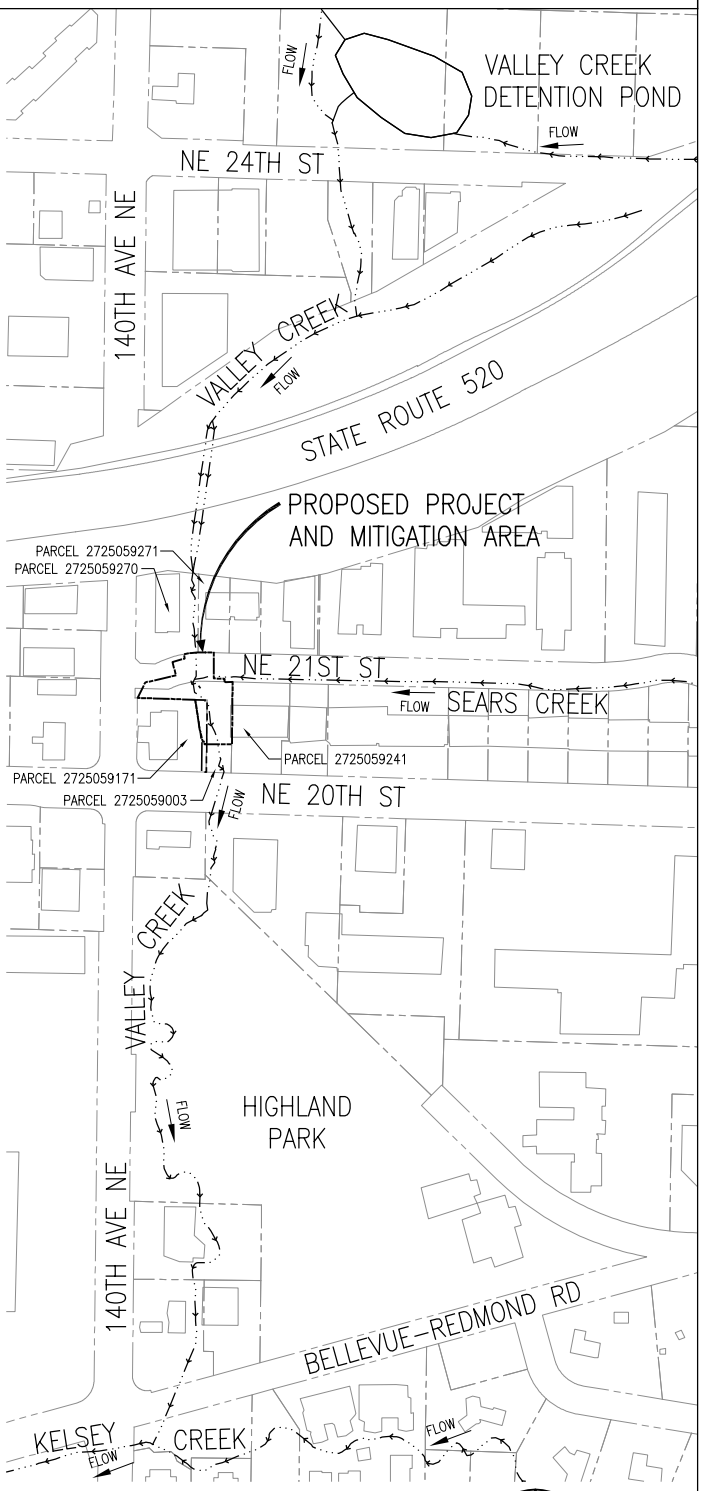
SECTION 27	TOWNSHIP 25N	RANGE 5E	LAT 47°37'43.25" N, LONG 122°09'11.27" W



LOCATION MAP

APPROMXIMATE SCALE :
1" = 8 MILES

1"=8 mi 4 0 4 8
Scale Miles



VICINITY MAP

SCALE: 1" = 400'

1"=400' 200 0 200 400
Scale Feet

PROJECT LOCATION MAPS

REFERENCE:

APPLICANT: CITY OF BELLEVUE

ADJACENT PROPERTY OWNERS:

PARCEL 2725059171 (EASEMENT) – ROCHEL, LE RON
PARCEL 2725059270 – SCHLAIFER, GERTRUDE
PARCEL 2725059271 – NOLO LLC
PARCEL 2725059241 – F-MAC JV LLC

LOCATION: NE 21ST STREET EAST OF 140TH AVE NE AND PARCEL 2725059003, BELLEVUE, WA 98007

LAT 47°37'43.25" N, LONG 122°09'11.27" W

DATUM: NAVD 88

WATER BODY: VALLEY CREEK
CITY: BELLEVUE
COUNTY: KING
STATE: WASHINGTON

PROPOSED PROJECT:

VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT WORK INCLUDES CULVERT REPLACEMENT, CHANNEL RESTORATION, AND MITIGATION.

DATE:

SYMBOL	DESCRIPTION
	QUARTER CORNER
312604900	TAX LOT / PARCEL NUMBER
	WHEEL CHAIR RAMP
	SIGN
	POLE
	TRAFFIC SIGNAL CABINET
	STREET LIGHT W/ ARM
	POST OR BOLLARD
	DECIDUOUS TREE
	CONIFEROUS TREE
W	WATER MANHOLE
WV	WATER VALVE
WM	WATER METER
	FIRE HYDRANT
S	SEWER MANHOLE
D	STORM DRAIN MANHOLE
D	STORM DRAIN VAULT
	STORM CATCH BASIN
	STORM CULVERT
E	ELECTRIC MANHOLE
E	ELECTRIC VAULT
T	TELEPHONE MANHOLE
TR	TELEPHONE RISER
GV	GAS VALVE
	TEMPORARY CONSTRUCTION ACCESS
	CONCRETE
	GRAVEL BACKFILL FOR PIPE ZONE BEDDING
	NATIVE MATERIAL
	TOPSOIL
	STREAMBED SEDIMENT
	WETLAND

SYMBOL	DESCRIPTION
	LOG WITH ROOTWAD
	LOG
	EARTH ANCHOR (SECTION, PLAN)
	BOULDER
	TEMPORARY SANDBAG DAM
	WATER SURFACE
M	TEMPORARY MONITORING STATION
	PROJECT LIMITS
	CLEARING AND GRADING LIMITS
	ROAD CENTERLINE
	STREAM FLOW LINE
	ORDINARY HIGH WATER MARK
	WETLAND BOUNDARY
	EDGE OF GRAVEL OR DIRT
	TRAFFIC STRIPING
	ROCKERY
x x x x x	FENCE LINE (TYPE AS NOTED)
	TREE/VEGETATION LINE
	EASEMENT LINE
	PROPERTY LINE
	QUARTER SECTION LINE
	EXISTING RIGHT-OF-WAY LINE
SS SS SS	SANITARY SEWER
G G G	NATURAL OR PETROLEUM GAS
P P P	UNDERGROUND POWER
SD SD SD	STORM DRAIN
T T T	UNDER GROUND TELEPHONE
W W W	DOMESTIC WATER
	COIR MATTING
	SELECTIVE CLEARING LIMIT
	60' WETLAND BUFFER
	50' STREAM BUFFER
	100-YEAR FLOODPLAIN

REFERENCE:

APPLICANT: CITY OF BELLEVUE

LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007

LEGEND

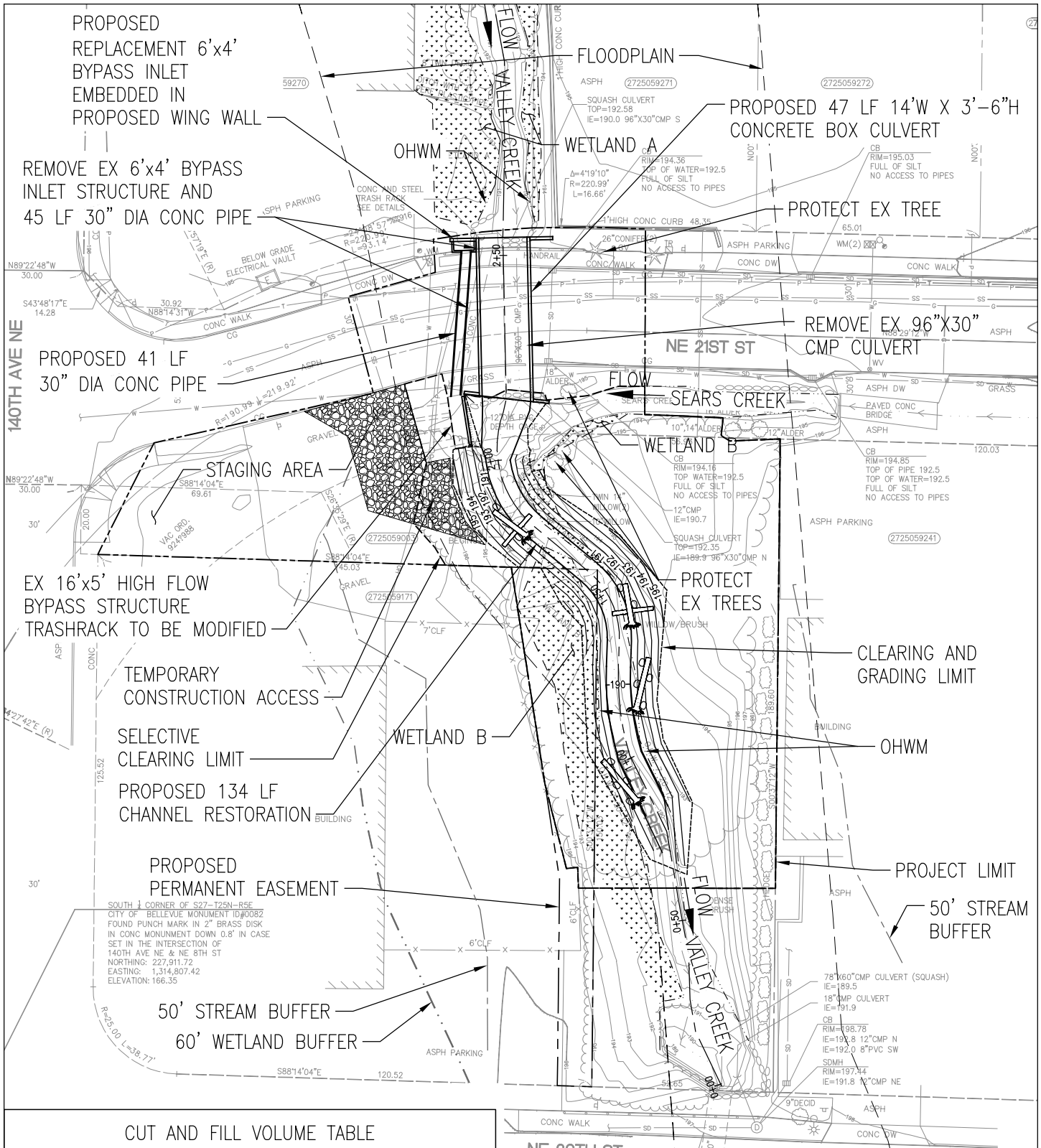
PROPOSED PROJECT:

VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT

DATE:

ABBREVIATIONS

AC	ACRE(S)
APPROX	APPROXIMATE
AVE	AVENUE
AVG	AVERAGE
ASPH	ASPHALT
CB	CATCH BASIN
CESCL	CONTRACTOR EROSION SEDIMENT CONTROL LEAD
CFS	CUBIC FEET PER SECOND
CG	CURB AND GUTTER
CHAN	CHANNEL
CLF	CHAIN LINK FENCE
CLR	CLEAR, CLEARANCE
℄	CENTERLINE
CMP	CORRUGATED METAL PIPE
COB	CITY OF BELLEVUE
CONC	CONCRETE
CSBC	CRUSHED SURFACING BASE COURSE
CSWPPP	CONTAMINATED STORMWATER POLLUTION PREVENTION PLAN
CY	CUBIC YARD(S)
DECID	DECIDUOUS
DIA, DIAM	DIAMETER
DIM	DIMENSION
DW	DRIVEWAY
E	EAST, EASTING
EC	EROSION CONTROL
EL, ELEV	ELEVATION
EX, EXIST	EXISTING
FT	FOOT, FEET
G	GAS
GV	GAS VALVE
GAL	GALLON(S)
H	HIGH
HORIZ	HORIZONTAL
IE	INVERT ELEVATION
L	LENGTH
LB	POUND
LF	LINEAR FOOT/FEET
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MON	MONUMENT
N	NORTH, NORTHING
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NE	NORTHEAST
NO	NUMBER
NTS	NOT TO SCALE
NW	NORTHWEST
OC	ON CENTER
OH	OVERHEAD POWER LINE
OHW	ORDINARY HIGH WATER
OHWM	ORDINARY HIGH WATER MARK
P	POWER
PP	POWER POLE
PVC	POLYVINYL CHLORIDE
R	RADIUS
RD	ROAD
ROW	RIGHT OF WAY
S	SOUTH, SLOPE
SD	STORM DRAIN
SE	SOUTHEAST
SF	SQUARE FOOT/FEET
SHT	SHEET
SS	SANITARY SEWER
ST	STREET
STA	STATION
SW	SOUTHWEST
T	TELECOMMUNICATIONS
TEMP	TEMPORARY
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
TYP	TYPICAL
V, VERT	VERTICAL
W	WEST, WATER, WIDE/WIDTH
W/	WITH
WAC	WASHINGTON ADMINISTRATIVE CODE
WM	WATER METER, WILLIAMETTE MERIDIAN
WSEL	WATER SURFACE ELEVATION
WV	WATER VALVE
YR	YEAR



CUT AND FILL VOLUME TABLE

DESCRIPTION	CUT (CY)	FILL (CY)
WATERWARD OF OHWM	160 CY	92 CY
OUTSIDE WATERWARD OF OHWM	315 CY	215 CY
TOTAL	475 CY	307 CY

REFERENCE:

APPLICANT: CITY OF BELLEVUE

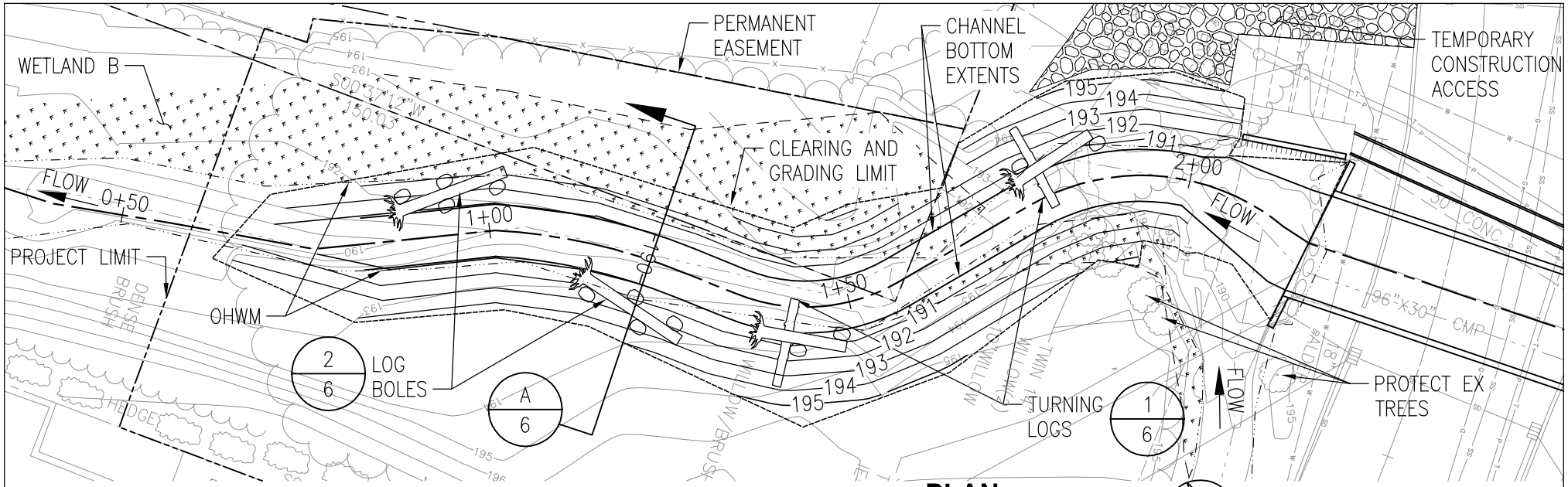
LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007

OVERALL SITE PLAN

PROPOSED PROJECT:

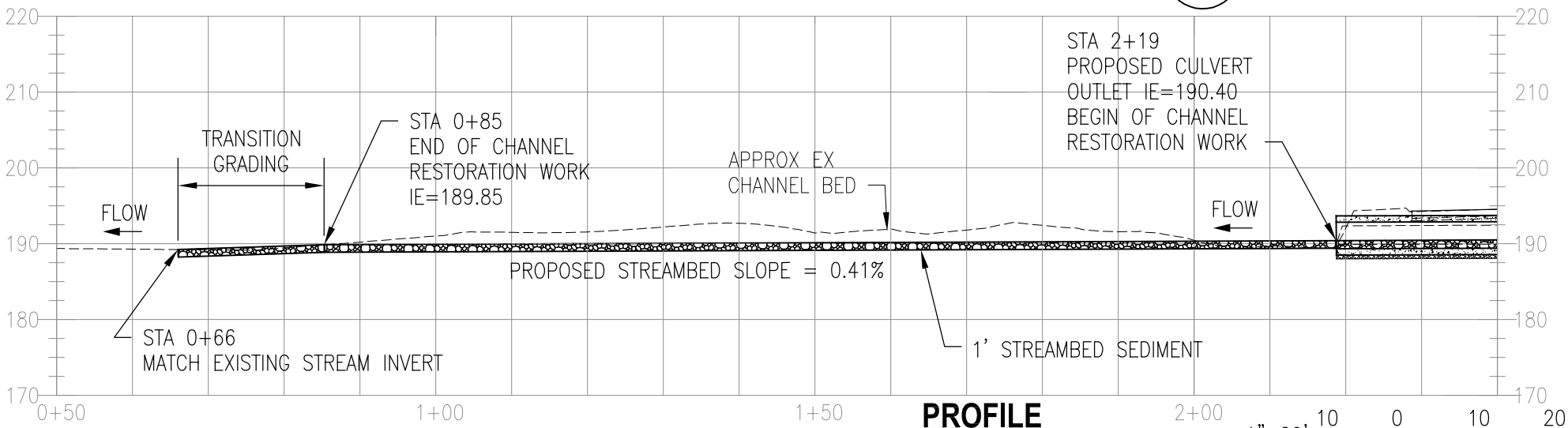
VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT

DATE:



PLAN

SCALE: 1" = 20'

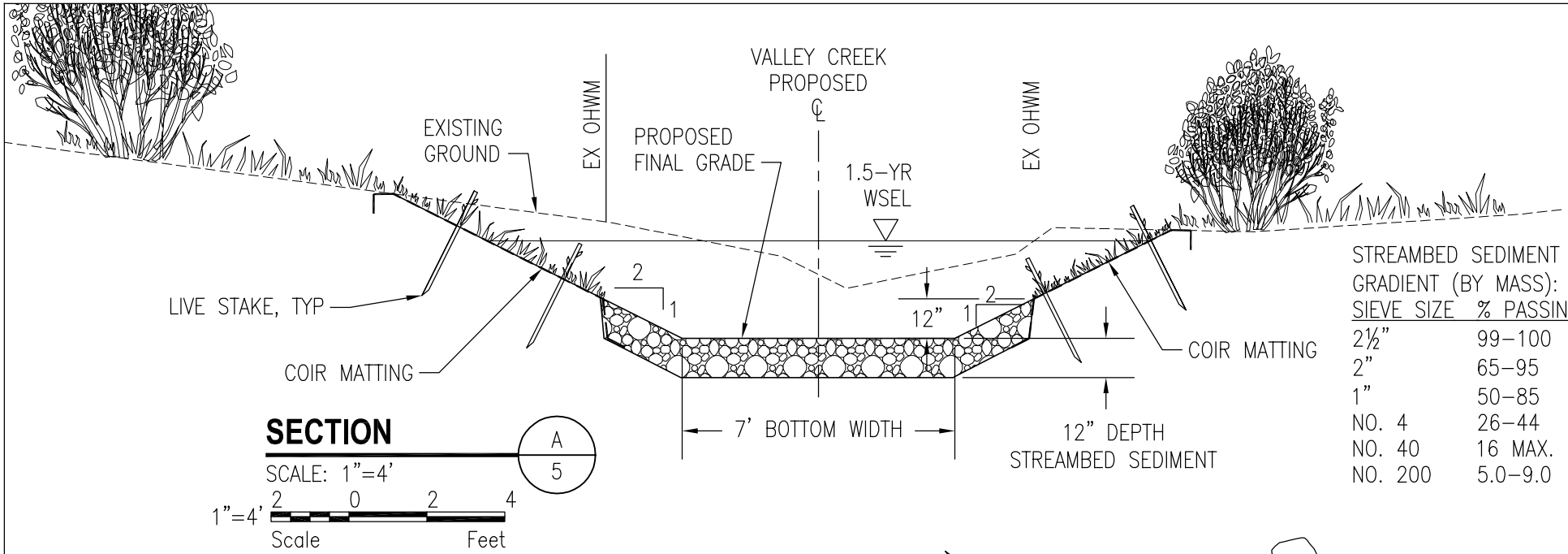


PROFILE

SCALE: 1" = 20'

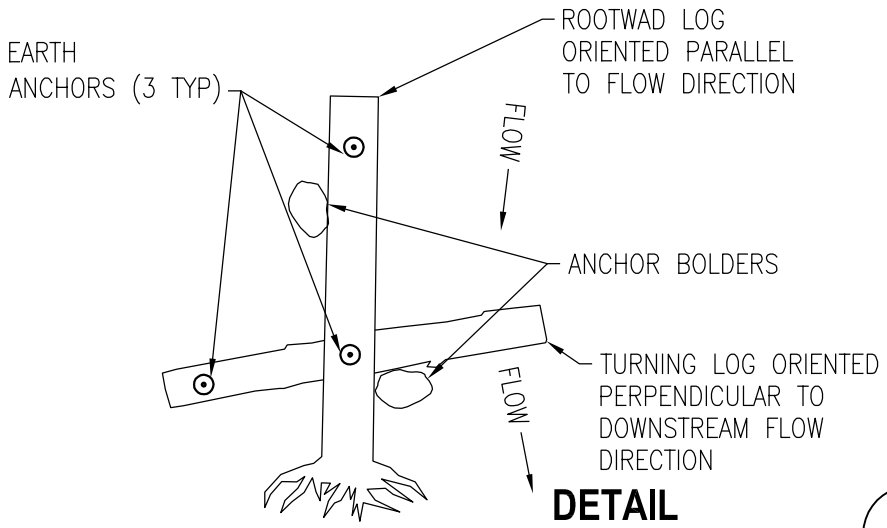
1"=20' 10 0 10 20
Scale Feet

REFERENCE:	APPLICANT: CITY OF BELLEVUE LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007	PROPOSED PROJECT: VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT	CHANNEL RESTORATION PLAN AND PROFILE DATE: SHEET 5 OF 20



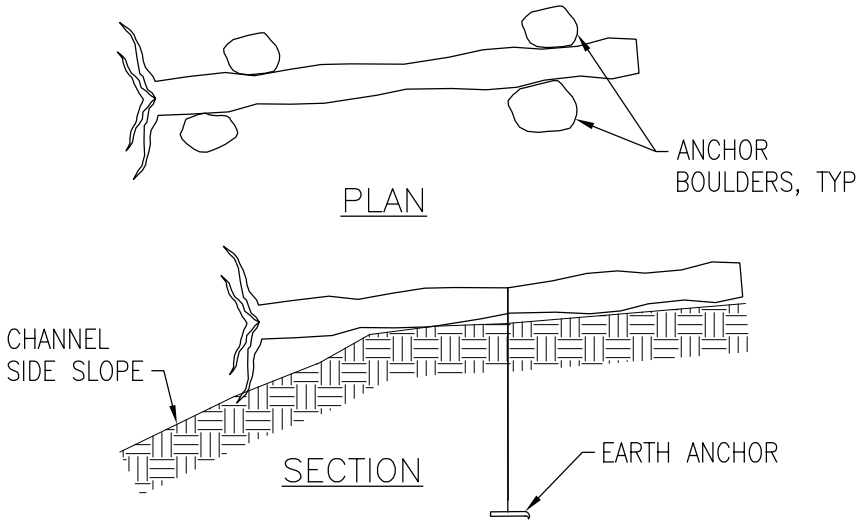
STREAMBED SEDIMENT GRADIENT (BY MASS):

SIEVE SIZE	% PASSING
2½"	99–100
2"	65–95
1"	50–85
NO. 4	26–44
NO. 40	16 MAX.
NO. 200	5.0–9.0



DETAIL 1/5

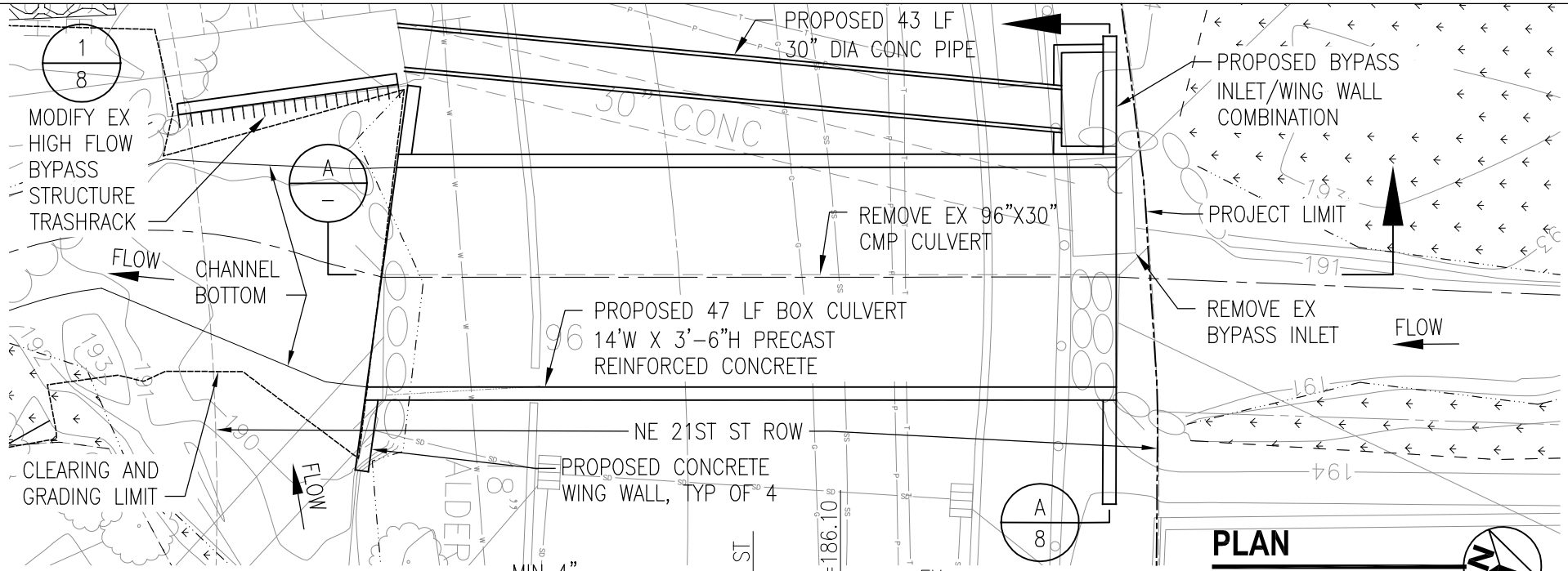
TURNING LOGS
SCALE: NONE

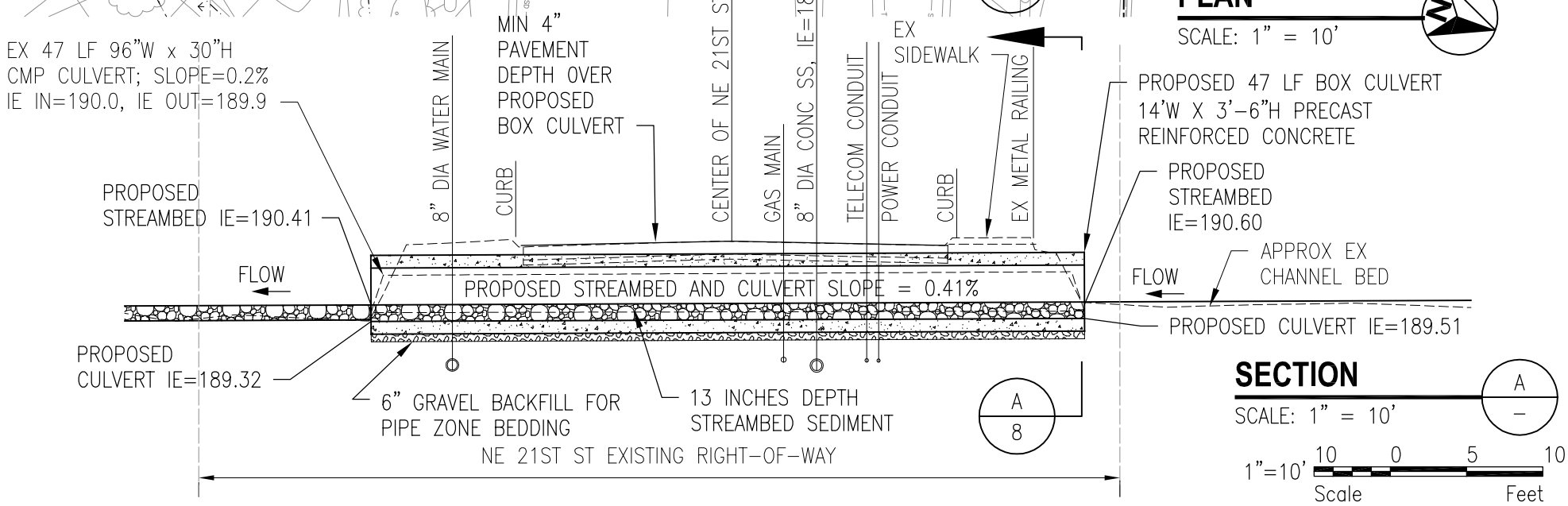


DETAIL 2/5

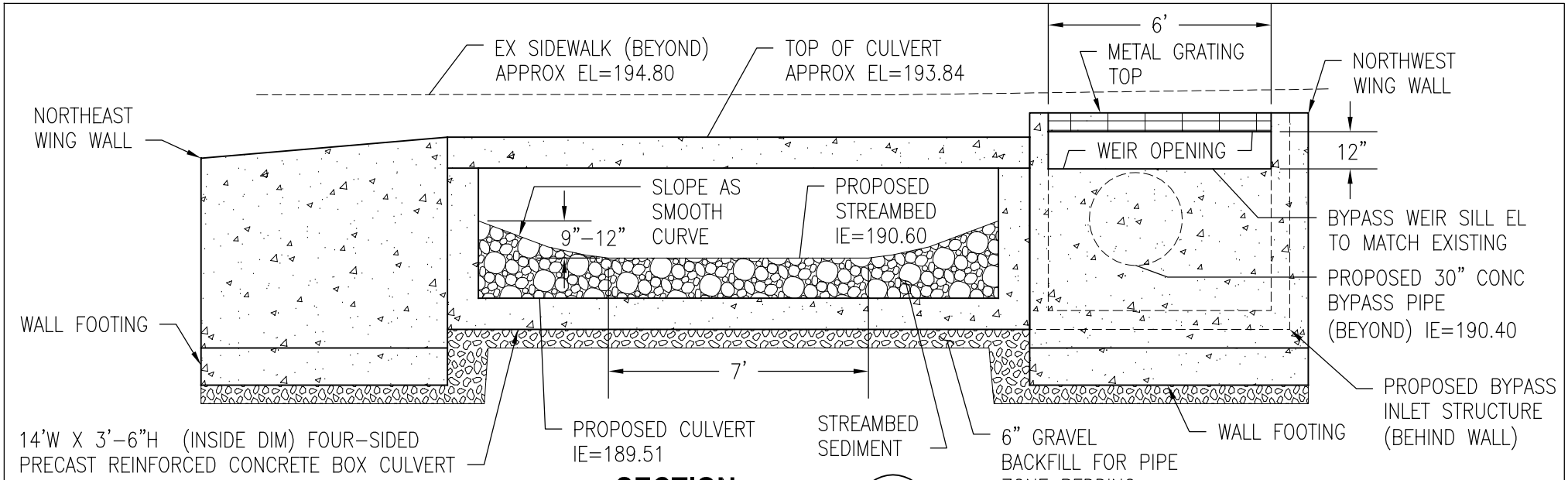
LOG BOLE
SCALE: NONE

REFERENCE:	APPLICANT: CITY OF BELLEVUE LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007	PROPOSED PROJECT: VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT	CHANNEL SECTION AND DETAILS DATE: SHEET 6 OF 20





REFERENCE:	APPLICANT: CITY OF BELLEVUE LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007	PROPOSED PROJECT: VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT	CULVERT PLAN AND PROFILE DATE: SHEET 7 OF 20



SECTION A/7

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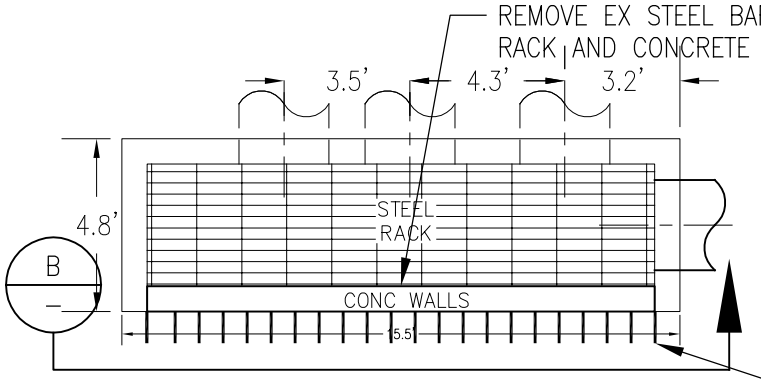
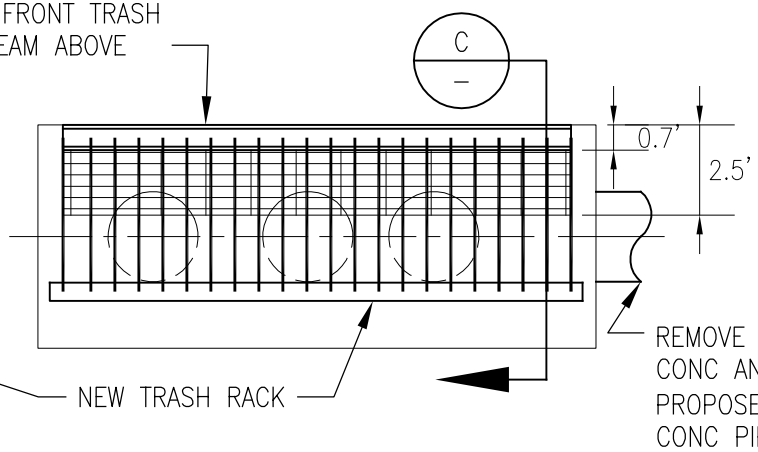


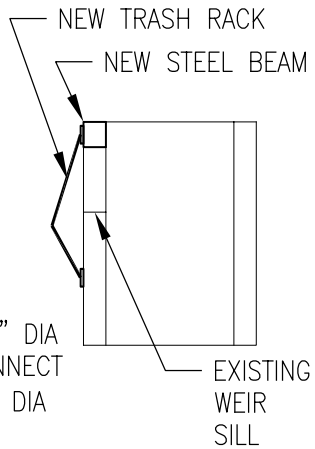
DETAIL 1/4

OVERFLOW STRUCTURE
SCALE: NONE



SECTION B/–

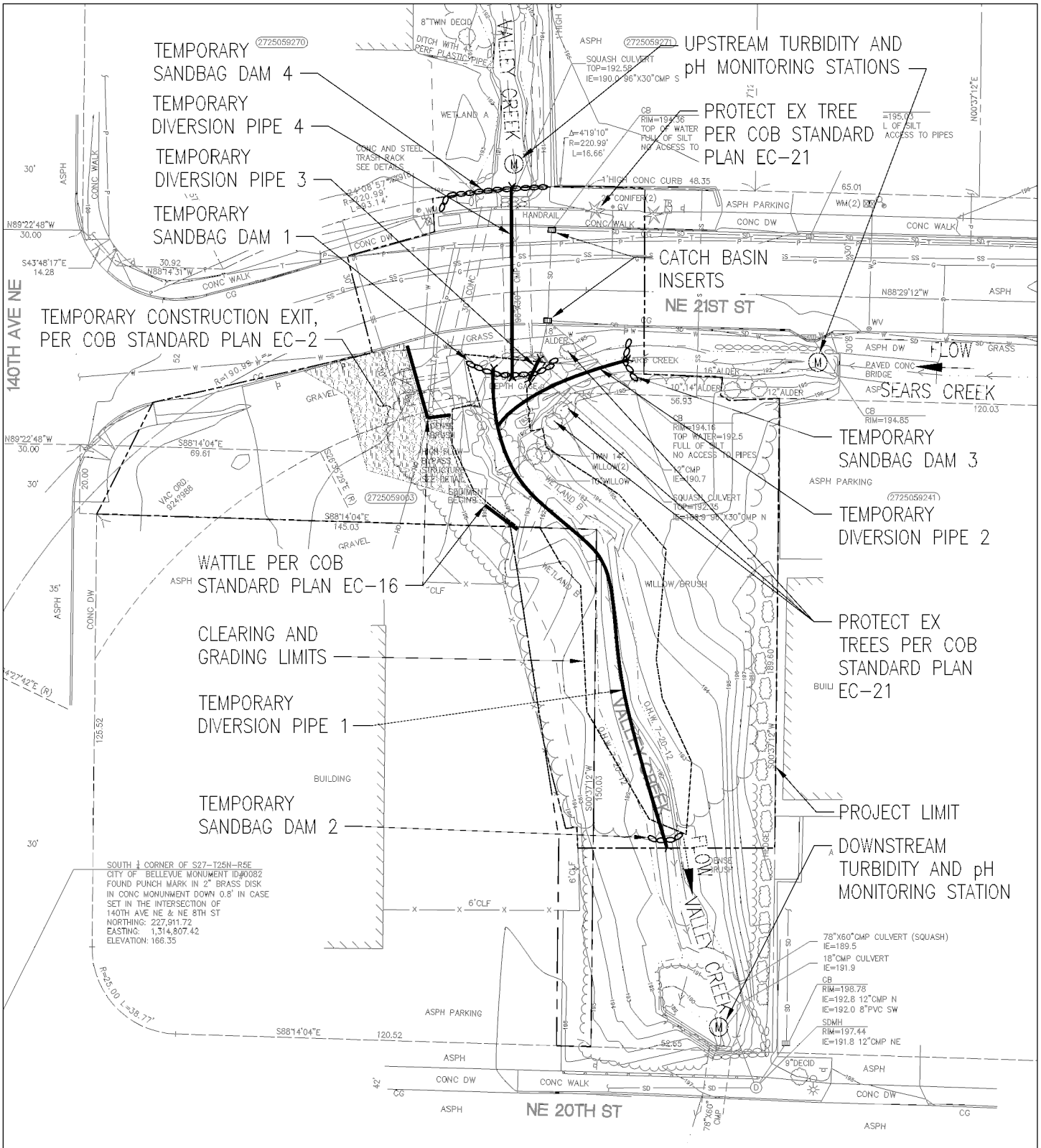
SCALE: NONE



SECTION C/–

SCALE: NONE

REFERENCE:	APPLICANT: CITY OF BELLEVUE LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007	PROPOSED PROJECT: VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT	CULVERT SECTION AND MISCELLANEOUS DETAILS DATE: SHEET 8 OF 20



PLAN

SCALE: 1" = 40'

1"=40' 20 0 20 40 Scale Feet

REFERENCE:	TEMPORARY EROSION AND SEDIMENT CONTROL PLAN
APPLICANT: CITY OF BELLEVUE	PROPOSED PROJECT: VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT
LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007	DATE: SHEET 9 OF 20

TEMPORARY EROSION AND SEDIMENT CONTROL NOTES

1. THE IMPLEMENTATION OF THE TESC PLANS, AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, UPGRADING, AND REMOVAL OF THE TESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS APPROVED AND THE SITE IS STABILIZED.

2. THE TESC FACILITIES MUST BE CONSTRUCTED PRIOR TO, AND IN CONJUNCTION WITH, ALL WORK SO AS TO ENSURE THAT THE TRANSPORT OF SEDIMENT IS MINIMIZED.

3. THE TESC FACILITIES SHALL BE INSPECTED WEEKLY DURING THE DRY SEASON AND DAILY DURING THE WET SEASON BY A CESCL-QUALIFIED CONTRACTOR'S REPRESENTATIVE, AND MAINTAINED TO ENSURE CONTINUED PROPER FUNCTIONING. ALL TESC MEASURES SHALL BE IN COMPLIANCE WITH THE NPDES PERMIT FOR GENERAL CONSTRUCTION. THE CONTRACTOR SHALL TRACK THE INSPECTION RESULTS AND MAINTENANCE ACTIVITIES IN THE MONITORING LOG.

4. TO REDUCE THE POTENTIAL FOR EROSION OF EXPOSED SOILS, OR WHEN RAINY SEASON CONSTRUCTION IS PERMITTED, THE FOLLOWING BEST MANAGEMENT PRACTICES (BMPS) ARE REQUIRED:
   - PRESERVE NATURAL VEGETATION FOR AS LONG AS POSSIBLE OR AS REQUIRED BY THE CLEARING AND GRADING INSPECTOR.
   - PROTECT EXPOSED SOIL USING PLASTIC (EC-14), EROSION CONTROL BLANKETS (EC-15), STRAW OR MULCH (COB GUIDE TO MULCH MATERIALS, RATES, AND USE CHART), OR AS DIRECTED BY THE CLEANING AND GRADING INSPECTOR.
   - INSTALL A TEMPORARY SEDIMENT POND, A SERIES OF SEDIMENT TANKS, TEMPORARY FILTER VAULTS, OR OTHER SEDIMENT CONTROL FACILITIES.

5. PRIOR TO CLEARING AND GRADING, STRAW WATTLE MUST BE INSTALLED IN ACCORDANCE WITH COB EC-16 AND SHALL BE LOCATED AS SHOWN ON THE APPROVED PLANS OR PER THE CLEARING AND GRADING INSPECTOR, ALONG SLOPE CONTOURS AND DOWN-SLOPE OF ANY AREAS DISTURBED DURING CONSTRUCTION.

6. CLEARING SHALL BE LIMITED TO THE AREAS WITHIN THE APPROVED CLEARING LIMITS. EXPOSED SOILS MUST BE COVERED AT THE END OF EACH WORKING DAY WHEN WORKING FROM OCTOBER 1ST THOUGH APRIL 30TH (WET SEASON). FROM MAY 1ST THOUGH SEPTEMBER 30TH (DRY SEASON), EXPOSED SOILS MUST BE COVERED WHEN RAIN IS FORECASTED.

7. THE CONTRACTOR SHALL BE AWARE OF THE FOLLOWING ESTIMATED CONSTRUCTION SEASON PEAK FLOWS FOR VALLEY CREEK AND SEARS CREEK:
   VALLEY CREEK: 2-YR = 18 CFS; 10-YR = 25.5 CFS
   SEARS CREEK: 2-YR = 44 CFS; 10-YR = 64 CFS
   THE CONTRACTOR SHALL TAKE ALL ACTIONS TO ANTICIPATE CHANGES IN WEATHER CONDITIONS THAT MAY AFFECT FLOWS AND ADJUST BYPASS PLAN ACCORDINGLY.

8. ANY AREAS OF EXPOSED SOILS THAT WILL NOT BE DISTURBED FOR SEVEN DAYS OR MORE, SHALL BE STABILIZED WITH APPROVED TESC METHODS (E.G., SEEDING, MULCHING, PLASTIC COVERING). WHERE STRAW MULCH FOR TEMPORARY EROSION CONTROL IS REQUIRED, IT SHALL BE APPLIED AT A MINIMUM THICKNESS OF 2 TO 3 INCHES

9. THE TESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH, OR WITHIN FORTY-EIGHT (48) HOURS FOLLOWING A STORM EVENT.

10. AT NO TIME SHALL MORE THAN 3 FEET OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A SEDIMENT TRAP.

12. REFUELING AND MAINTENANCE OF CONSTRUCTION EQUIPMENT SHALL OCCUR A MIN OF 50 FEET FROM ANY STREAM OHWM.

13. A HARD-SURFACE CONSTRUCTION ACCESS PAD IS REQUIRED PER CLEARING & GRADING STANDARD DETAIL EC-2. THIS PAD MUST REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETED.

14. THE CONTRACTOR MUST HAVE A SWEEPER AVAILABLE DURING EARTHWORK AND IMMEDIATELY REMOVE SOIL THAT HAS BEEN TRACKED ONTO PAVED AREAS AS A RESULT OF CONSTRUCTION. THE PAVEMENT SHALL BE CLEANED AT THE END OF EACH CONSTRUCTION DAY IF SEDIMENT IS DEPOSITED ONTO THE PAVEMENT DUE TO CONSTRUCTION ACTIVITY AND/OR VEHICLES.

15. ALL SANDBAGS SHALL BE FILLED WITH WASHED GRAVEL; SAND IS NOT ALLOWED.

16. IN-STREAM WORK SHALL BE LIMITED TO THE FISH WINDOW: JULY 1 THROUGH AUGUST 31.

17. THE CONTRACTOR SHALL MONITOR DISCHARGE FROM THE SITE. SITE DISCHARGE SHALL MEET ALL LOCAL, CITY, STATE AND FEDERAL REQUIREMENTS FOR WATER QUALITY INCLUDING TURBIDITY AND PH.

18. SOIL STOCKPILES MUST BE STABILIZED FROM EROSION BY USING A COVERING TESC BMP METHOD SUCH AS PLASTIC SHEETING AND LOCATED AWAY FROM STORM DRAIN INLETS, DRAINAGE CHANNELS AND WATERWAYS.

19. CONCRETE TRUCK CHUTES, PUMPS AS WELL AS HAND TOOLS, INCLUDING, BUT NOT LIMITED TO SCREEDS, SHOVELS, RAKES, FLOATS AND TROWELS, SHALL BE WASHED OUT ONLY INTO FORMED AREAS AWAITING INSTALLATION OF CONCRETE OR ASPHALT; OR, WITH THE APPROVAL OF THE ENGINEER, AN AREA TO BE EXCAVATED THAT DOES NOT RUNOFF INTO A CRITICAL AREA. WHEN NO FORMED AREAS OR AREAS TO BE EXCAVATED ARE AVAILABLE, WASHDOWN AND LEFTOVER PRODUCT SHALL BE CONTAINED IN A LINED CONTAINER. CONTAINED WASHDOWN WATER AND CONCRETE SHALL BE DISPOSED OF IN A MANNER THAT DOES NOT VIOLATE GROUNDWATER OR SURFACE WATER QUALITY STANDARDS. UNUSED CONCRETE REMAINING IN THE TRUCK AND PUMP SHALL BE RETURNED TO THE ORIGINATING BATCH PLANT FOR RECYCLING.

20. EQUIPMENT THAT CANNOT BE EASILY MOVED SHALL ONLY BE WASHED IN AREAS THAT DO NOT DIRECTLY DRAIN TO NATURAL OR CONSTRUCTED STORMWATER CONVEYANCES.

21. WASHDOWN FROM AREAS SUCH AS THE PROPOSED CULVERT AND TRASH RACK MODIFICATIONS TO EXISTING BYPASS STRUCTURE SHALL NOT DRAIN DIRECTLY TO NATURAL OR CONSTRUCTED STORMWATER CONVEYANCES.

22. ALL TEMPORARY EROSION AND SEDIMENT CONTROL BMPS SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPS ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON SITE. DISTURBED SOIL RESULTING FROM REMOVAL OF BMPS OR VEGETATION SHALL BE PERMANENTLY STABILIZED.

REFERENCE:	TEMP EROSION AND SEDIMENT CONTROL NOTES 1 OF 2
	PROPOSED PROJECT:
APPLICANT: CITY OF BELLEVUE	VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT
LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007	DATE: SHEET 10 OF 20

Weber, Mary B. – 10/10/2012 8:57:31 AM – R:\Seattle\001158 CITY OF BELLEVUE\2651211007 Valley Crk Phase II\Data Analytical\CAD\JARPA Figures\10-tesc notes 1 of 2.dwg

RECOMMENDED CONSTRUCTION SEQUENCE

1. PREPARE CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN AND SUBMIT IT AT THE PRECONSTRUCTION CONFERENCE.

2. SURVEY AND FLAG CONSTRUCTION LIMITS WITH HIGH VISIBILITY FENCE ADJACENT TO CRITICAL AREAS. LATH AND FLAGGING MAY BE USED ELSEWHERE. FLAG TREES TO BE SAVED OR REMOVED FOR THE APPROVAL OF THE ENGINEER. PROTECT TREES TO REMAIN (EC-21).

3. ACTIVATE WATER QUALITY MONITORING PLAN.

4. INSTALL TESC MEASURES INCLUDING TEMPORARY CONSTRUCTION EXIT.

5. INSTALL TEMPORARY CREEK BYPASS SYSTEM USING TEMPORARY SANDBAG DAMS 1, 2, AND 3 AND TEMPORARY DIVERSION PIPES 1 AND 2 TO INTERCEPT FLOWS WITHIN CONSTRUCTION LIMITS UPSTREAM OF PROPOSED CLEARING AND GRADING LIMITS. DISCHARGE FLOW WITHIN CONSTRUCTION LIMITS DOWNSTREAM OF PROPOSED CLEARING AND GRADING LIMITS. BYPASSED FLOW SHALL BE DISCHARGED IN A MANNER WHICH PREVENTS RE-SUSPENSION OF SEDIMENT OR EROSION IN THE CREEK.

6. COORDINATE WITH OWNER TO INSTALL FISH BLOCK NETS AND HAND NET FISH FROM WORK AREA PER PERMIT REQUIREMENTS.

7. ACTIVATE TEMPORARY CREEK BYPASS SYSTEM. PUMP ANY WATER REMAINING IN THE BYPASSED STREAMBED TO BAKER TANKS FOR TREATMENT AND DISCHARGE TO EXISTING STORM DRAIN OR SANITARY SEWER LINE. THE CONTRACTOR IS RESPONSIBLE FOR ANY PERMITS ASSOCIATED WITH DISCHARGE.

8. COMPLETE CHANNEL RESTORATION WORK.

9. RESTORE STREAMBED TO FINAL CONDITION. ESTABLISH PLANTINGS, INSTALL HABITAT FEATURES, AND STABILIZE SITE.

10. REMOVE TEMPORARY SANDBAG DAMS 2 AND 3. REMOVE TEMPORARY DIVERSION PIPES 1 AND 2 AND RETURN STREAM FLOWS TO THE RESTORED CHANNEL.

11. INSTALL TEMPORARY CREEK SANDBAG DAM 4 AND TEMPORARY DIVERSION PIPES 3 AND 4 AND BYPASSED FLOW THROUGH THE CULVERT. DISCHARGE FLOW INTO THE STABILIZED CHANNEL BED. BYPASSED FLOW SHALL BE DISCHARGED IN A MANNER WHICH PREVENTS RE-SUSPENSION OF SEDIMENT OR EROSION IN THE CREEK. CONTRACTOR SHALL BE PREPARED TO MOVE OPERATIONS OUT OF THE CREEK AND STABILIZE WORK AREA IN ANTICIPATION OF HIGH FLOWS.

12. COORDINATE WITH OWNER TO INSTALL FISH BLOCK NETS AND HAND NET FISH FROM WORK AREA PER PERMIT REQUIREMENTS.

13. ACTIVATE TEMPORARY CREEK BYPASS SYSTEM. PUMP ANY WATER REMAINING IN THE BYPASSED STREAMBED/CULVERT TO BAKER TANKS FOR TREATMENT AND DISCHARGE TO EXISTING STORM DRAIN OR SANITARY SEWER LINE. THE CONTRACTOR IS RESPONSIBLE FOR ANY PERMITS ASSOCIATED WITH DISCHARGE.

14. COMPLETE CULVERT REPLACEMENT.

15. PERFORM FINAL RESTORATION AND CLEAN UP. ANY AREAS OF EXPOSED SOILS SHALL BE STABILIZED AND SEEDED.

16. REMOVE TESC MEASURES ONLY AFTER SITE IS STABILIZED AND VEGETATION HAS BEEN ESTABLISHED. TESC MEASURES REMOVAL MUST HAVE PRIOR APPROVAL FROM THE PROJECT ENGINEER AND CESCL.

-catherstev, Jenn . 9/28/2012 2:24:55 PM \\SHADAIAM\Proje.Sen..d$\00'1:58 cl × 0- R- IHV.-\265'21'007 Valley Crk Phase I\Jate Analytical\CAD\JAEPA -igures\'1 .esc. notes 2 of 2.dwg

CITY OF BELLEVUE MITIGATION SUMMARY			
WETLAND IMPACT		**PROPOSED MITIGATION**	
PERMANENT IMPACT (CONVERTED TO STREAM)	129 SF (0.003 AC)	@8:1 REQUIRED ENHANCEMENT	1,032 SF (0.024 AC)
		ADDITIONAL PROPOSED ENHANCEMENT	473 SF (0.011 AC)
		TOTAL	1,505 SF (0.035 AC)
WETLAND / STREAM BUFFER IMPACT		**PROPOSED MITIGATION**	
PERMANENT IMPACT (CONVERTED TO STREAM)	158 SF (0.003 AC)	@1:1 REQUIRED ENHANCEMENT	158 SF (0.003 AC)
		ADDITIONAL PROPOSED ENHANCEMENT	7,276 SF (0.167 AC)
		TOTAL	7,434 SF (0.171 AC)
STREAM IMPACT		**PROPOSED MITIGATION**	
TEMPORARY IMPACT (DEWATERING AND RESTORATION)	1,811 SF (0.042 AC)	RESTORATION	1,983 SF (0.046 AC)
TEMPORARY IMPACT (DEWATERING)	199 SF (0.005 AC)	REQUIRED ENHANCEMENT	NONE
		TOTAL	1,983 SF (0.046 AC)

NOTE: STREAM RESTORATION AREA INCLUDES PERMANENT IMPACTS AREAS FROM WETLAND AND BUFFERS AS A RESULT OF STREAM WIDENING.

REFERENCE:

APPLICANT: CITY OF BELLEVUE

LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007

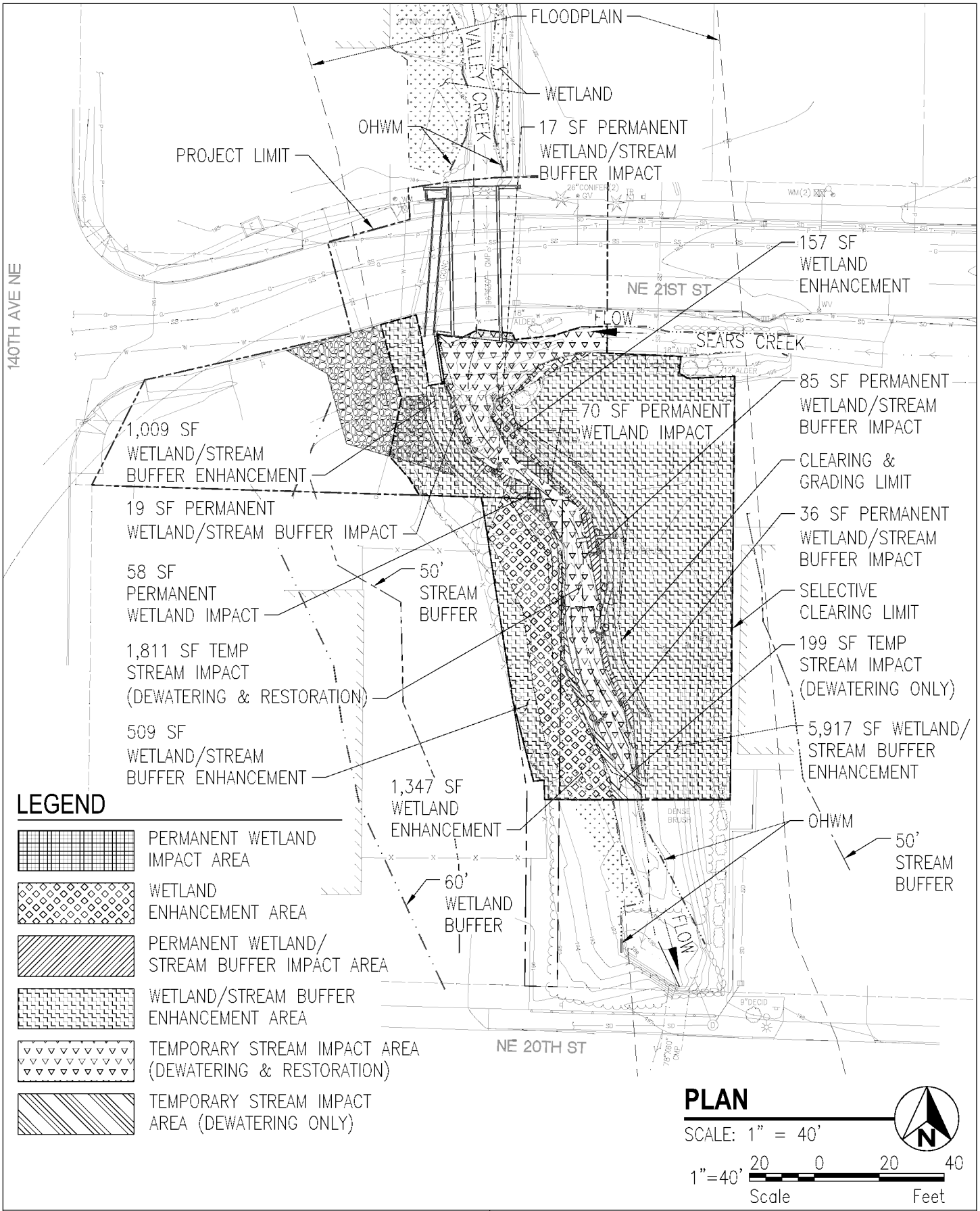
MITIGATION SUMMARY TABLE

PROPOSED PROJECT:

VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT

DATE:

-catherstev, Jenn . 9/28/2017 8:56:35 AM \\SHADAIA\Projects...d$\60158 C Y 0- B- HVJ-\265 21 007 Valley Crk Phase I\Data Analytical\CAD\JAHA -figures\2 -mitigation summary table.dw



REFERENCE:

APPLICANT: CITY OF BELLEVUE

LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007

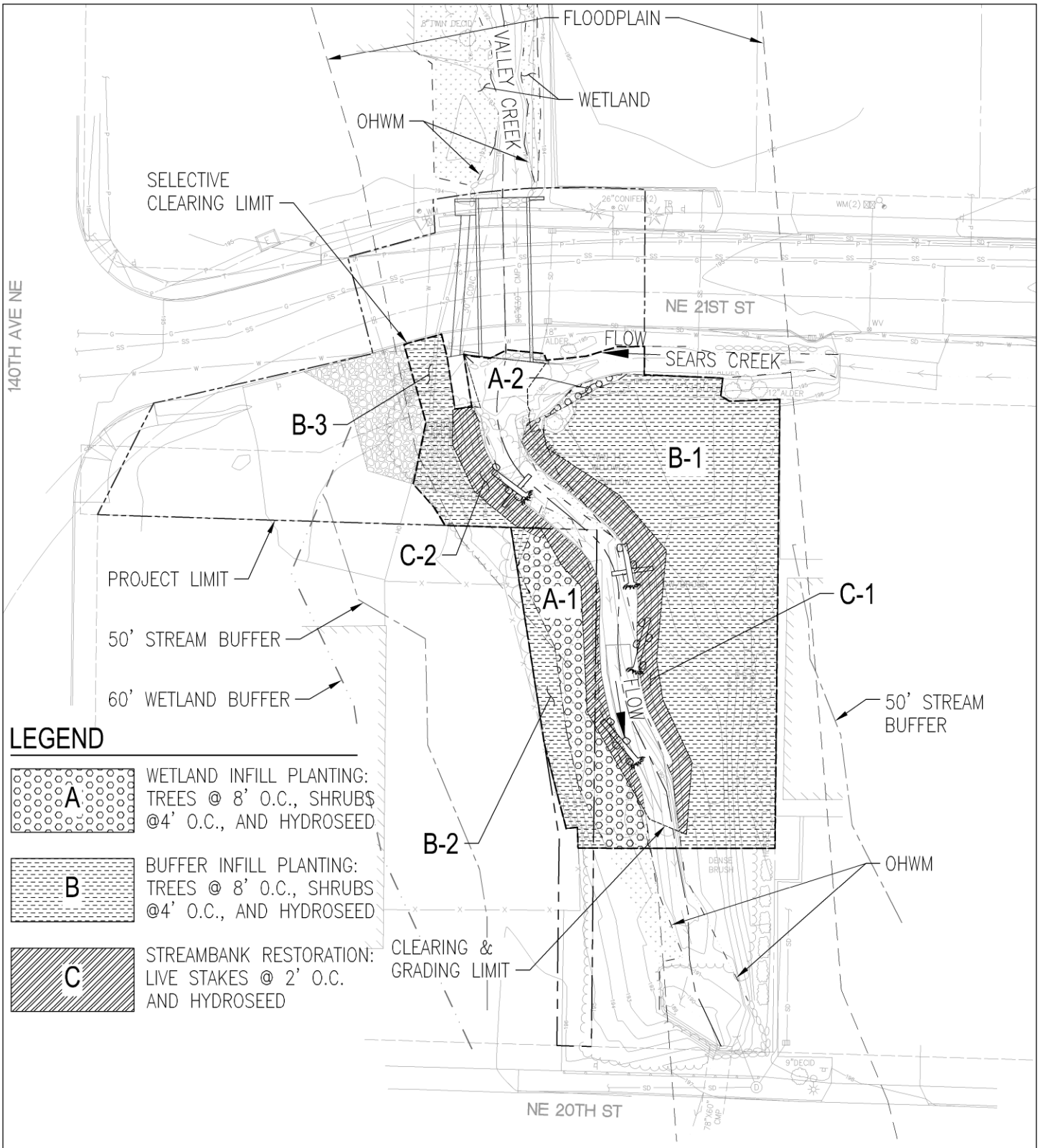
MITIGATION SUMMARY PLAN

PROPOSED PROJECT:

VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT

DATE:

SHEET 13 OF 20



LEGEND

A	WETLAND INFILL PLANTING: TREES @ 8' O.C., SHRUB$ @4' O.C., AND HYDROSEED
B	BUFFER INFILL PLANTING: TREES @ 8' O.C., SHRUBS @4' O.C., AND HYDROSEED
C	STREAMBANK RESTORATION: LIVE STAKES @ 2' O.C. AND HYDROSEED

PLAN

SCALE: 1" = 40'

1"=40' 20 0 20 40

Scale Feet

NOTE: SELECTIVE CLEARING AREA IS APPROXIMATE. INVASIVE SPECIES SHALL BE REMOVED WHERE FOUND WITHIN THE SELECTIVE CLEARING LIMIT.

REFERENCE:

APPLICANT: CITY OF BELLEVUE

LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007

MITIGATION PLAN

PROPOSED PROJECT:

VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT

DATE:

SHEET 14 OF

Greenberg, Allisona B. – 9/27/2012 3:24:18 PM – R:\Seattle\001158 CITY OF BELLEVUE\265121 1007 Valley Crk Phase II\Data Analytical\CAD\JARPA Figures\14-mitigation plan.dwg

GENERAL MITIGATION NOTES:

1. PRIOR TO CONSTRUCTION A LICENSED SURVEYOR SHALL SURVEY, STAKE, AND FLAG LIMITS OF WORK AND WETLAND BOUNDARIES AS SHOWN ON THE PLANS.
2. SELECTIVELY CLEAR AND GRUB BUFFERS AND WETLAND INFILL PLANTING AREAS. FIELD ADJUST PLANTING AROUND EXISTING VEGETATION AS NECESSARY. WETLAND BIOLOGIST / LANDSCAPE ARCHITECT SHALL APPROVE FINAL LAYOUT IN FIELD.
3. BUFFER AND WETLAND INFILL PLANTING AREAS SHALL BE PIT AMENDED WITH TOPSOIL TYPE A AS SPECIFIED.
4. PLACE 18" DIAMETER X 3" DEEP BARK MULCH RINGS AROUND TREES AND SHRUBS IN BUFFER INFILL AREAS. WETLAND INFILL AREAS SHALL RECEIVE COMPOST MULCH RINGS.
5. ALL PLANTINGS SHALL RECEIVE DRIWATER GEL OR APPROVED EQUAL. PLANTS SALL BE MANUALLY WATERED (E.G. WATERING TRUCK, OR IRRIGATION BAGS) BY THE CONTRACTOR DURING THE PLANT ESTABLISHMENT PERIOD. CONTRACTOR SHALL SUBMIT IRRIGATION METHOD FOR APPROVAL BY OWNER'S REPRESENTATIVE. ALL PLANTS SHALL BE WATERED AS NEEDED DURING INSTALLATION AND THROUGHOUT THE GROWING SEASON PERIOD (MARCH 15 TO OCTOBER 31).
6. PLANTING DATES: OCTOBER 1 THROUGH APRIL 15.

Greenberg, Allisona B. – 10/10/2012 9:15:35 AM – R:\Seattle\001158 CITY OF BELLEVUE\2651211007 Valley Crk Phase II\Data Analytical\CAD\JARPA Figures\15-mitigation notes.cwg

MITIGATION PLANTING SCHEDULE

BOTANICAL NAME	COMMON NAME	SIZE	SPACING	QUANTITY A-1	A-2	B-1	B-2	B-3	C-1	C-2
TREES										
FRAXINUS LATIFOLIA	OREGON ASH	2 GAL.	8' O.C.	1		9	1	3		
PICEA SITCHENSIS	SITKA SPRUCE	2 GAL.	8' O.C.	1						
POPULUS TRICHOCARPA	BLACK COTTONWOOD	2 GAL.	8' O.C.	1		3	1			
PRUNUS EMARGINATA	BITTER CHERRY	2 GAL.	8' O.C.	2						
PSEUDOTSUGA MENZIESII	DOUGLAS FIR	2 GAL.	8' O.C.	2	1	15	2	3		
THUJA PLICATA	WESTERN RED CEDAR	2 GAL.	8' O.C.	1		10	1			
TSUGA HETEROPHYLLA	WESTERN HEMLOCK	2 GAL.	8' O.C.	1		9				
SHRUBS										
ACER CIRCINATUM	VINE MAPLE	2 GAL.	4' O.C.	3						
CORNUS STOLONIFERA	RED-OSIER DOGWOOD	2 GAL.	4' O.C.	3		18		3		
CORYLUS CORNUTA	WESTERN BEAKED HAZEL	2 GAL.	4' O.C.	3						
HOLODISCUS DISCOLOR	OCEAN SPRAY	2 GAL.	4' O.C.	3						
LONICERA INVOLUCRATA	BLACK TWINBERRY	2 GAL.	4' O.C.	6	3	18		3		
MAHONIA AQUIFOLIUM	TALL OREGON GRAPE	2 GAL.	4' O.C.	5		25	5	5		
OEMLERIA CERASIFORMIS	INDIAN PLUM	2 GAL.	4' O.C.	3		17				
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	2 GAL.	4' O.C.	5		17				
ROSA GYMNOCARPA	DWARF ROSE	2 GAL.	4' O.C.			25	5	5		
RUBUS SPECTABILIS	SALMONBERRY	2 GAL.	4' O.C.	3		22		3		
SAMBUCUS RACEMOSA	RED ELDERBERRY	2 GAL.	4' O.C.	3		22	3	3		
SYMPHORICARPOS ALBUS	SNOWBERRY	2 GAL.	4' O.C.			22	5	3		
CORNUS STOLONIFERA	RED-OSIER DOGWOOD	LIVE STAKES	2' O.C.						60	55
SALIX LUCIDA	PACIFIC WILLOW	LIVE STAKES	2' O.C.						60	55
SALIX SCOULERIANA	SCOULER'S WILLOW	LIVE STAKES	2' O.C.						52	40
SALIX SITCHENISIS	SITKA WILLOW	LIVE STAKES	2' O.C.						75	63

NOTE: SHRUBS SHALL BE PLANTED IN CLUSTERS OF 3-5 OF THE SAME SPECIES.

HYDROSEED SCHEDULE

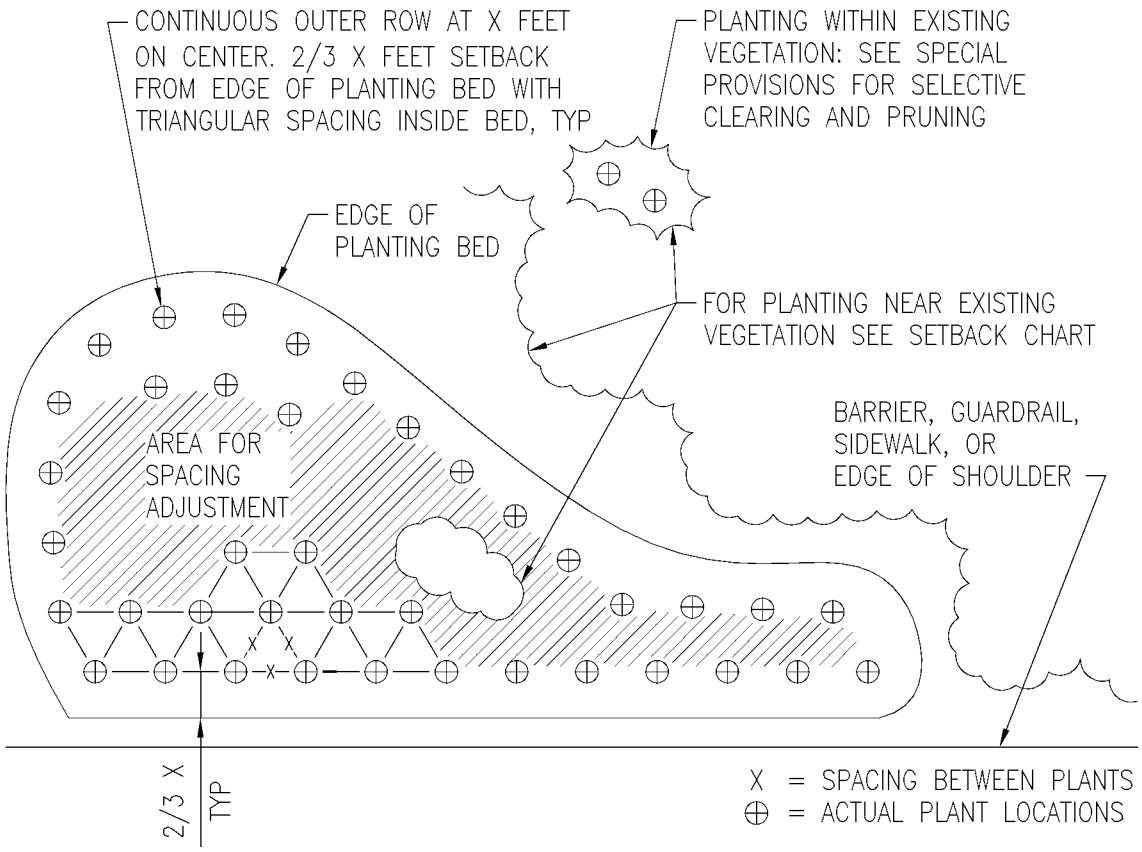
VARIETY	% BY WEIGHT	MIN % GERM.
COLONIAL BENTGRASS	10%	85%
RED CREEPING FESCUE	45%	80%
PERENNIAL RYEGRASS	45%	90%
APPLICATION RATE:		90 LBS/ACRE
CANFOR WOOD CELLULOSE ECO-FIBER MULCH:		2,000 LBS/ACRE
NUTRICULTURE SEED STARTER FERTILIZER (16-45-7):		200 LBS/ACRE
CANFOR ECO-TAC GUAR TACKIFIER:		60 LBS/ACRE
STAY MOIST MOISTURE RETENTION AGENT:		60 LBS/ACRE

REFERENCE:	APPLICANT: CITY OF BELLEVUE LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007	PROPOSED PROJECT: VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT	MITIGATION PLANTING SCHEDULE DATE: SHEET 16 OF

PLANT MATERIAL SETBACK CHART

PLANT TYPE	GUARDRAIL BARRIER	EDGE OF ROADWAY	WALL	FENCE	SIGNS	EX. TREE TRUNK	EX. VEG. MASS
EVERGREEN TREE	10'	10'	10'	10'	15'	15'	10'
DECIDUOUS TREE	10'	10'	10'	10'	15'	15'	10'
SHRUB	5'	10'	5'	6'	6'	10'	10'

TYPICAL SETBACKS FOR PLANT MATERIAL UNLESS OTHERWISE DIRECTED BY THE ENGINEER DURING LAYOUT AND STAKING OF PLANT LOCATIONS. DISTANCE NOTED IS TO STEM OR TRUNK OF PLANT.



DETAIL

PLANTING AREA LAYOUT
SCALE: NTS

REFERENCE:	MITIGATION DETAILS
APPLICANT: CITY OF BELLEVUE	PROPOSED PROJECT: VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT
LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007	DATE: SHEET 17 OF 20

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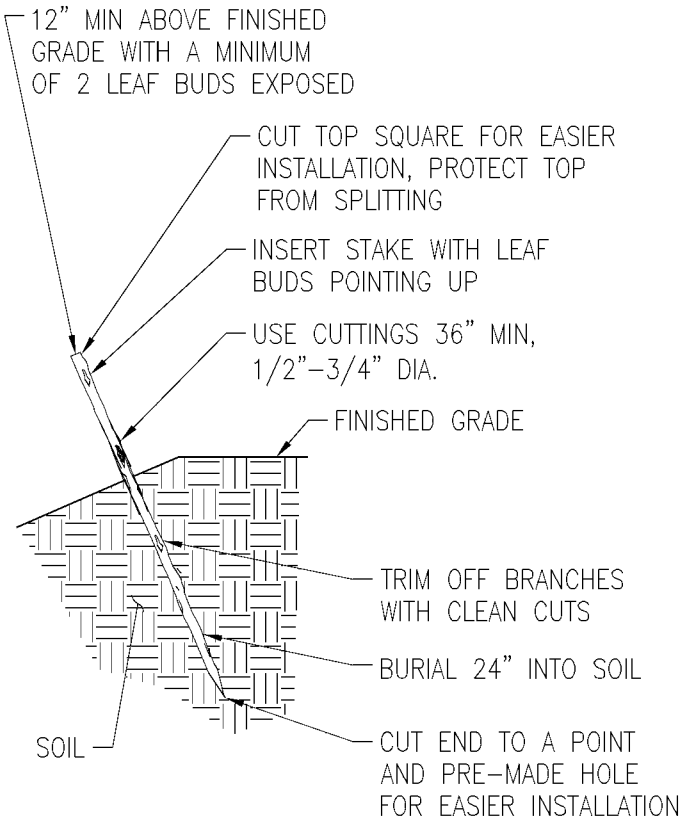
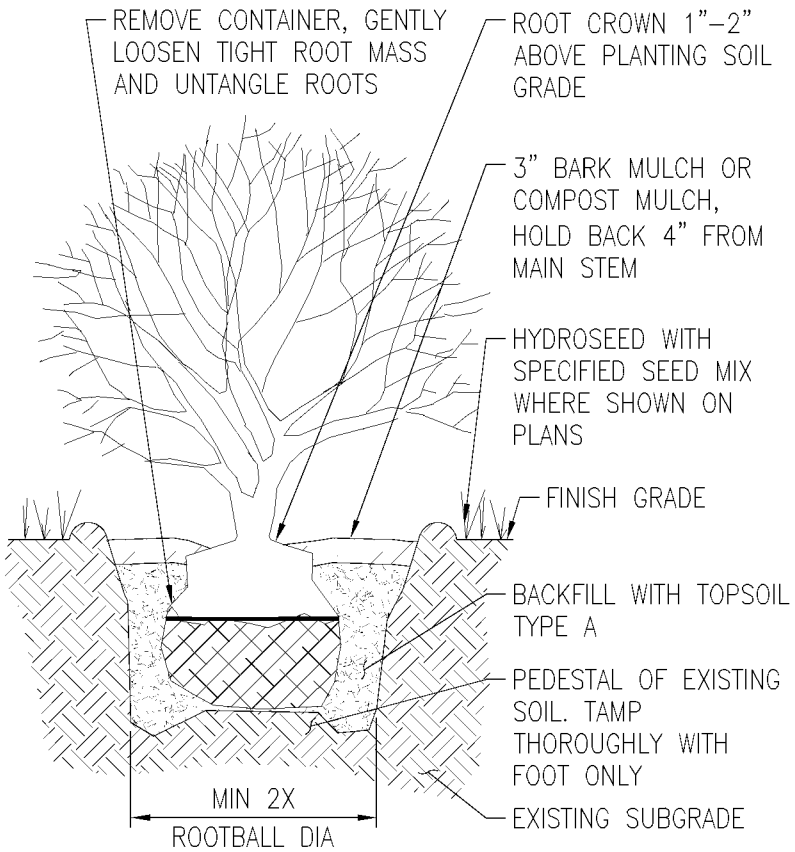


DETAIL

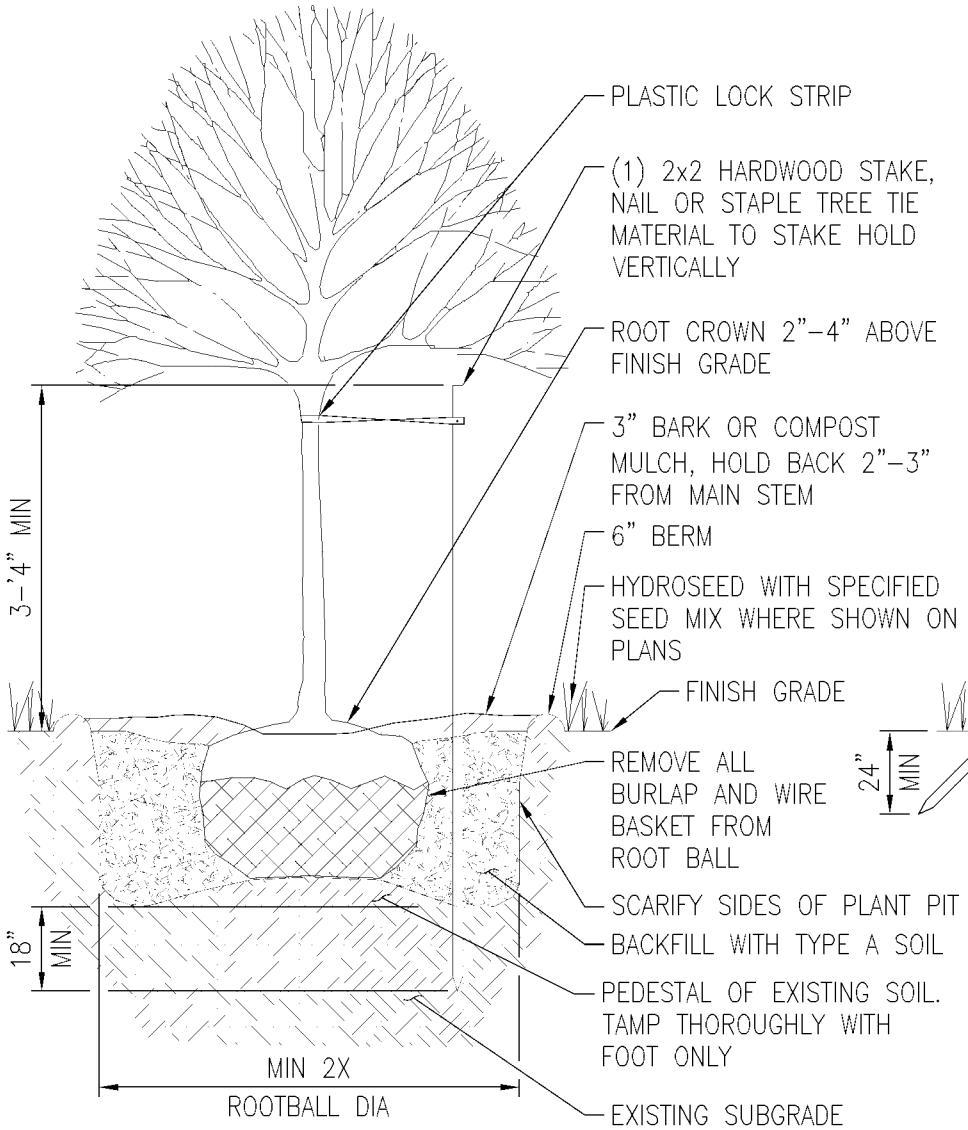
LIVE STAKING PLANTING
SCALE: NTS



DETAIL

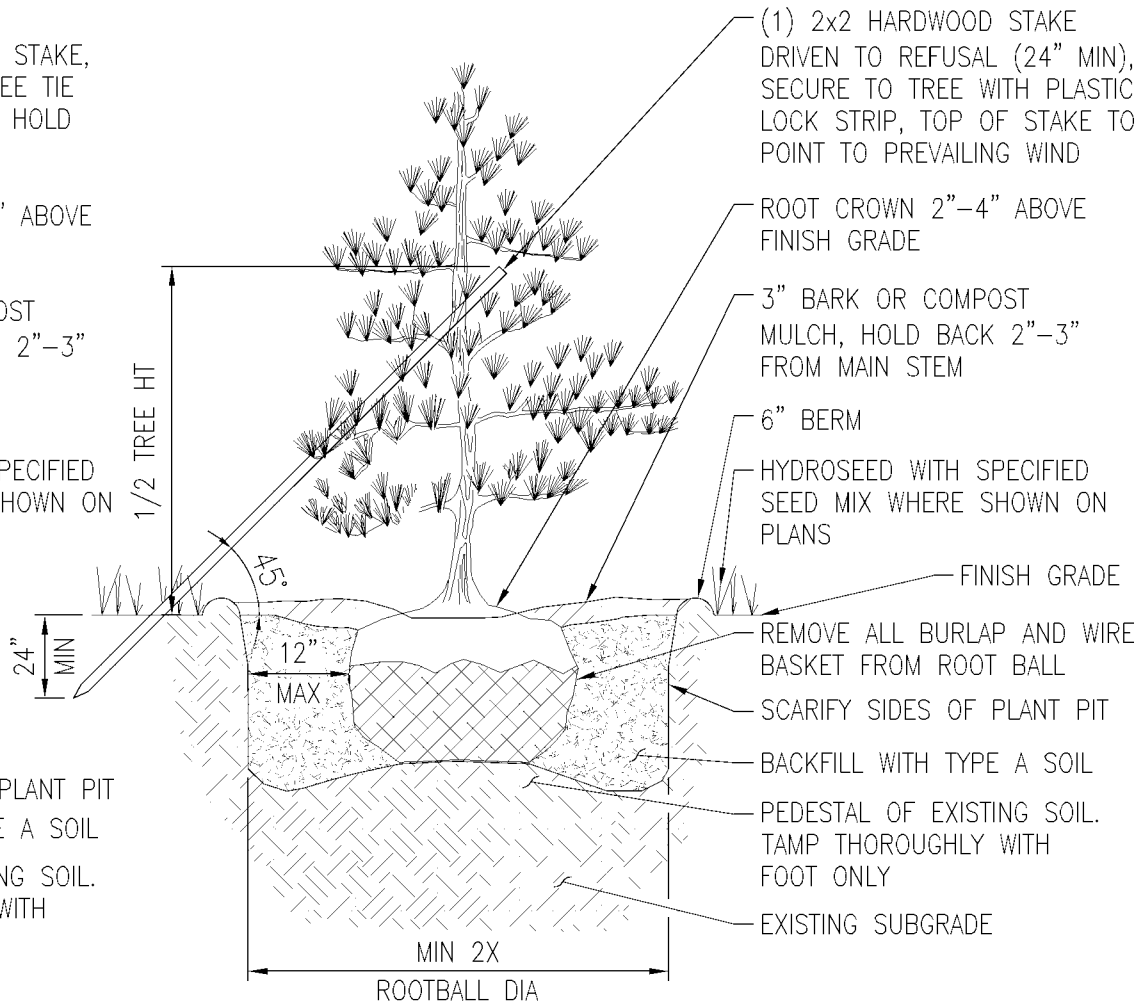
SHRUB PLANTING
SCALE: NTS

REFERENCE:	APPLICANT: CITY OF BELLEVUE LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007	PROPOSED PROJECT: VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT	MITIGATION PLANTING DETAILS DATE: SHEET 18 OF 20



DETAIL

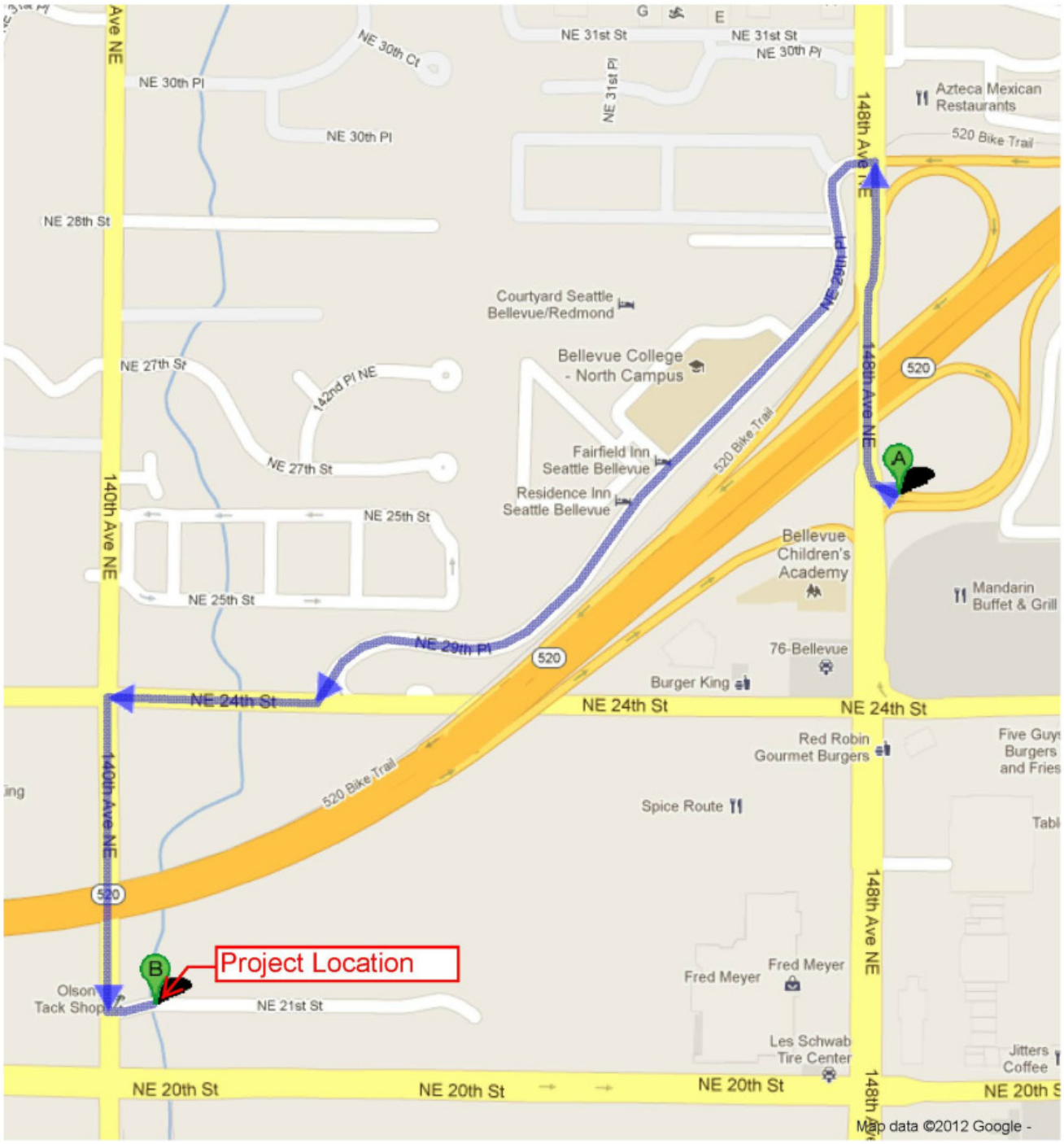
DECIDUOUS TREE PLANTING
SCALE: NTS



DETAIL

EVERGREEN TREE PLANTING
SCALE: NTS

REFERENCE:	APPLICANT: CITY OF BELLEVUE LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007	PROPOSED PROJECT: VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT	MITIGATION PLANTING DETAILS DATE: SHEET 19 OF 20



REFERENCE:	DRIVING DIRECTIONS FROM SR 520
APPLICANT: CITY OF BELLEVUE	PROPOSED PROJECT: VALLEY CREEK – NE 21ST ST FLOOD CONTROL PROJECT
LOCATION: NE 21ST STREET EAST OF 140TH AVE NE, BELLEVUE, WA 98007	DATE: SHEET 20 OF 20

Featherstone, John L. – 9/28/2012 12:57:03 PM – \\SEADATA4\ProjectSeattle$\001158 CITY OF BELLEVUE\2651211007 Valley Crk Phase II\Data Analytical\CAD\JARPA Figures\20-driving directions.dwg

APPENDIX F

FISH SALVAGE AND DEWATERING

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The following Dewatering and Fish Capture Protocol is as required by the U.S. Army Corps of Engineers when using the Restoration Programmatic for the State of Washington – Specific Project Information Form. Use of this protocol is required when obtaining a permit from the Corps for restoration projects that falls within the range of the nine restoration activities considered by National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) during its Section 7 of the Endangered Species Act (ESA) consultation (NMFS Reference No. 2008/03598; USFWS Reference No. 13410-2008-F-0209).

APPENDIX A (FROM SPIF): DEWATERING AND FISH CAPTURE PROTOCOL

Work to facilitate habitat restoration may occur in isolation from flowing waters or in flowing water depending on site conditions to minimize impacts to salmonids.

If bull trout or other listed salmonids could be present in the vicinity of the project use the following dichotomous key to determine which dewatering protocol and timing window you need to implement for your project. This key references information within the *Draft Recovery Plan for the Coastal-Puget Sound Distinct Population Segment of Bull Trout Volumes I and II* (USFWS 2004a; USFWS 2004b), and the *Draft Recovery Plan for the Columbia River Distinct Population Segment of Bull Trout* (USFWS 2002). http://www.fws.gov/pacific/bulltrout/recovery.html. If you have questions, contact the USFWS.

1. Is the project located within a documented or potential bull trout Local Population Area that is excluded from coverage under this programmatic consultation (see Table 1)?
    a. Yes – Dewatering in a documented or potential bull trout Local Population Area in eastern Washington is not covered under this programmatic consultation. Complete an individual section 7 consultation for the project. Please contact the USFWS office in Spokane or Wenatchee for assistance.
    b. No – go to 2

2. Is the project located within a water body where any listed salmonids are likely to be present? For specific bull trout areas where projects are permitted see Table 2.
    a. Yes – go to 3
    b. No - use “Protocol for Dewatering Outside High Likelihood Listed Fish Areas”;

3. Is the stream flow at the time of project construction anticipated to be greater than or equal to 5 cubic feet per second **and** is the dewatered stream length (not including the culvert and plunge pool length, if present) greater than or equal to 33 ft?
    a. No - use “Protocol for Dewatering Outside High Likelihood Listed Fish Areas”;
    b. Yes - use “Protocol I Dewatering Within High Likelihood Listed Fish Areas”; and consult with a USFWS bull trout biologist staff on appropriate timing window.

Table 1 List of streams and marine areas that important for bull trout recovery where in-water work is permitted

Management Unit	Bull Trout Areas
Olympic Peninsula - Marine	Hood Canal and independent tributaries Strait of Juan de Fuca and independent tributaries (includes Bell, Morse, Ennis, Siebert Creeks) Pacific Ocean and independent coastal tributaries (includes Goodman, Mosquito, Cedar, Steamboat, Kalaloch and Joe Creeks, Raft, Moclips and Copalis Rivers) Lower Chehalis River/Grays Harbor and independent Tributaries (includes Humptulips, Wishkah, Wynoochee and Satsop Rivers)
Olympic Peninsula - Freshwater	**Dungeness River** – mouth to RM 10 **Skokomish River** – mouth to head of Cushman Reservoir **Hoh River** – mouth to headwaters **Queets River** – mouth to headwaters **Quinault River** - mouth to headwaters
Puget Sound - Marine	All marine shorelines including North Puget Sound, Main Basin, Whidbey Basin, and South Puget Sound
Puget Sound - Freshwater	Samish River, Whatcom Creek, Squalicum Creek, Duwamish and lower Green River, and Lower Nisqually River including the Nisqually River estuary and McAllister Creek (FMO areas outside of core areas)
	Lake Washington including the following: lower Cedar River; Sammamish River; Lakes Washington, Sammamish, and Union; and Ship Canal
	Nooksack River – mouth to National Forest boundary (North and South Forks) **Skagit River** – mouth to National Forest boundary **Stillaguamish River** – mouth to headwaters of N Fork; Deer Creek – mouth to National Forest boundary; S Fork and Canyon Cr – mouth to National Forest boundary **Snohomish/Skykomish** – mouth to confluence of Skykomish and Snoqualmie Rivers; Pilchuck River; Snoqualmie River to falls; Tolt River; Skykomish River – mouth to National Forest boundary, including Sultan River, Woods Creek and Wallace River; S Fk Skykomish to National Forest boundary **Puyallup River** – mouth, including Mowich River, to National Park boundary; **Carbon River** – mouth to National Forest boundary; **White River** – mouth to National Forest boundary
Lower Columbia	**Lewis River** – mouth to RM 75 (Upper Falls), including Swift, Yale, and Mervin Reservoirs **Klickitat River** – mouth to confluence of W FK Klickitat
	Mainstems of the Columbia, Snake, Walla Walla, Pend Oreille, and Grande Ronde Rivers

Management Unit	Bull Trout Areas
Middle Columbia River Basin	**Ahtanum Creek** – mouth to confluence of N and S Forks **Naches River** – mouth to confluence of Little Naches and Bumping River **Tieton River** – mouth to Rimrock Lake **Yakima River** – mouth to Easton (RM 203) and Teanaway River
Upper Columbia River Basin	**Wenatchee River** – mouth to confluence of the Chiwawa; **Peshastin Cr** – mouth to confluence of Ingalls Cr; **Chewack River** – confluence with Wenatchee to RM 20; **Beaver Cr** – mouth to Blue Buck Cr **Entiat River** – mouth to confluence with Mad River **Methow River** – mouth to confluence of Lost River
Northeast Washington Pend Oreille River	**Pend Oreille River**; **Tacoma Cr -** mouth to Little Tacoma; **Small Creek** – mouth to forks; **Sullivan Creek** to and including Sullivan Lake
Walla Walla River Basin	**Touchet River** – mouth to forks; **S Fk Touchet River** – to confluence of Griffin Cr **N Fk Touchet** to Wolf Fork; **Wolf Fork** to confluence of Coates Cr **Mill Creek** and tributaries
Snake River Basin	Mainstem **Snake and Grande Ronde Rivers**; **Asotin Creek** – mouth to confluence of N Fk Asotin and Charley Cr; **Tucannon River** – mouth to confluence of Hixon Cr

Protocol I Dewatering Within High Likelihood Listed Fish Areas

A. Fish Capture – General Guidelines

1. Fish Capture Methods
    a. Minnow traps. Optional. Traps may be left in place prior to dewatering and may be used in conjunction with seining. Once dewatering starts, minnow traps should only be used if there is someone present to check the traps every few hours, and remove the traps once the water level becomes too low.
    b. Seining. Required. Use seine with mesh of a size to ensure entrapment of the residing ESA-listed fish and age classes.
    c. Sanctuary dip nets. Required. Use in conjunction with other methods as area is dewatered.
    d. Electrofishing. Optional. Use electrofishing only after other means of fish capture have been exhausted or where other means of fish capture are not be feasible. Applicants shall adhere to NMFS Backpack Electrofishing Guidelines (NMFS 2000).

2. Fish capture operations will be conducted by or under the supervision of a fishery biologist experienced in such efforts and all staff working with the capture operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.

3. The applicant must obtain any other Federal, State and local permits and authorizations necessary for the conduct of fish capture activities.

4. A description of any capture and release effort will be included in a post-project report, including the name and address of the supervisory fish biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions before and following placement and removal of barriers; the means of fish removal; the number and size of fish removed by species and age class; condition upon release of all fish handled; and any incidence of observed injury or mortality.

5. Storage and Release. ESA-listed fish must be handled with extreme care and kept in water at all times during transfer procedures. The transfer of ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, whenever necessary to prevent the added stress of an out-of-water transfer. A healthy environment for non-ESA listed fish shall be provided by large buckets (five gallon minimum to prevent overcrowding) and minimal handling of fish. The water temperature in the transfer buckets shall not exceed the temperature of cold pool water in the subject stream. Retain fish the minimum time possible to ensure that stress is minimized, temperatures do not rise, and dissolved oxygen remains suitable. Release fish as near as possible to the isolated reach in a pool or area that provides cover and flow refuge.

B. Dewater Instream Work Area and Fish Capture

Fish screen. Except for gravity diversions that have gradual and small outfall drops directly into water, all water intake structures must have a fish screen installed, operated, and maintained in accordance with NMFS Guidelines (NMFS 1997; Chapter 11 in NMFS 2008).

The sequence for stream flow diversion will be:
Note: this sequence will take one 24-hour period prior to construction to complete (of which 12 hours are for staged dewatering with 6 hours overnight). We suggest you start in the morning the day before project construction is scheduled and leave the reach dewatered overnight according to instruction below.

1. Install flow conveyance devices (pumps, discharge lines, gravity drain lines, conduits, and channels), but do not divert flow.
2. Install upstream barrier. Allow water to flow over upstream barrier.
3. Install block net at upstream end of work area. Block nets will be checked every 4 hours, 24 hours a day. If any fish are impinged or killed on the nets they will be checked hourly.
4. Reduce flow over upstream barrier by one-third for a minimum of 6 hours.
5. Inspect as discharge is diminishing and in dewatered areas for stranded and trapped fish and remove them with sanctuary dip nets.
6. Reduce flow over upstream barrier by an additional one-third for a minimum of 6 hours.
7. Again, inspect dewatered areas for stranded and trapped fish and remove them with sanctuary dip nets.
8. Leave the project area in a stable, low flow (one third of flow) condition, overnight, allowing fish to leave the area volitionally.
9. In the morning, remove any remaining fish from the area to be dewatered using seines and/or hand held sanctuary dip-nets.
10. Divert upstream flow completely.
11. Install downstream barrier if necessary (only in low gradient, backwatered reaches).
12. If water remains within the work area; seine, dip net, and lastly electrofish (if using this technique), the project area until catch rates have reached no fish for 3 consecutive passes. Move rocks as needed to flush fish and effectively electrofish the work area.
13. If needed, pump water out of isolated pools within the project area to a temporary storage and treatment site or into upland areas and filter through vegetation prior to reentering the stream channel. Continue to seine, dip net and electrofish while pumping.
14. If fish continue to be captured, shut pump off before average water depths reach one foot. Continue to seine, dip net and electrofish until no fish are caught for 3 consecutive passes.
15. Pump dry and check substrate for remaining fish.
16. Continue to pump water from the project area as needed for the duration of the project.

The diversion structure is typically a temporary dam built just upstream of the project site with sand bags that are filled with clean gravel or stream/floodplain rock and covered with plastic sheeting. A portable bladder dam or other non-erosive diversion technologies may be used to contain stream flow. Mining of stream or floodplain rock can be used for diversion dam construction if it does not result in significant additional floodplain or stream disturbance. Often

gravel has to be moved to key in logs in which case it makes sense to use this gravel for the diversion structure.

The temporary bypass system must consist of non-erosive techniques, such as a pipe or a plastic-lined channel, both of which must be sized large enough to accommodate the predicted peak flow rate during construction. In cases of channel rerouting, water can be diverted to one side of the existing channel.

Dissipate flow at the outfall of the bypass system to diffuse erosive energy of the flow. Place the outflow in an area that minimizes or prevents damage to riparian vegetation. If the diversion inlet is a gravity diversion and is not screened to allow for downstream passage of fish, place diversion outlet in a location that facilitates gradual and safe reentry of fish into the stream channel.

C. Rewater Instream Work Area

Remove stream diversion and restore stream flow. Heavy machinery operating from the bank may be used to aid in removal of diversion structures. Slowly re-water the construction site to prevent loss of surface water downstream as the construction site streambed absorbs water and to prevent a sudden increase in stream turbidity. Look downstream during re-watering to prevent stranding of aquatic organisms below the construction site.

All stream diversion devices, equipment, pipe, and conduits will be removed and disturbed soil and vegetation will be restored after the diversion is no longer needed.

Protocol II Dewatering Outside High Likelihood Listed Fish Areas

If bull trout or other listed salmonids are captured at any time during the dewatering process, immediately notify a USFWS bull trout biologist or NMFS biologist and obtain guidance to either continue to dewater and remove fish or stop activities and re-water the project site.

Normal guidance:

1. If you encounter listed fish at or prior to step 3 switch to Protocol I
2. If you encounter listed fish after step 3, continue to dewater and remove fish, paying close attention to presence of additional listed salmonids.

A. Fish Capture – General Guidelines

1. Fish Capture Methods
    a. Minnow traps. Optional. Traps may be left in place prior to dewatering and may be used in conjunction with seining. Once dewatering starts, minnow traps should only be used if there is someone present to check the traps every few hours, and remove the traps once the water level becomes too low.
    b. Seining. Required. Use seine with mesh of such a size to ensure entrapment of the residing ESA-listed fish and age classes.
    c. Sanctuary dip nets. Required. Use in conjunction with other methods as area is dewatered.

d. Electrofishing. Optional. Use electrofishing only after other means of fish capture have been exhausted or where other means of fish capture are not be feasible. Applicants shall adhere to NMFS Backpack Electrofishing Guidelines.

2. Fish capture operations will be conducted by or under the supervision of a fishery biologist experienced in such efforts and all staff working with the seining operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.

3. The applicant must obtain any other Federal, State and local permits and authorizations necessary for the conduct of fish capture activities.

4. A description of any seine and release effort will be included in a post-project report, including the name and address of the supervisory fish biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions before and following placement and removal of barriers; the means of fish removal; the number and size of fish removed by species; conditions upon release of all fish handled; and any incidence of observed injury or mortality.

5. Storage and Release. Fish must be handled with extreme care and kept in water to the maximum extent possible during transfer procedures. A healthy environment for the stressed fish shall be provided by large buckets (five gallon minimum to prevent overcrowding) and minimal handling of fish. The temperature of the water shall not exceed the temperature in large deep holding pools of the subject system. The transfer of any ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, to prevent the added stress of an out-of-water transfer. Retain fish the minimum time possible to ensure that stress is minimized, temperatures do not rise, and dissolved oxygen remains suitable. Release fish as near as possible to the isolated reach in a pool or area that provides cover and flow refuge.

B. Dewater Instream Work Area and Fish Capture

Fish screen. Except for gravity diversions that have gradual and small outfall drops directly into water, all water intake structures must have a fish screen installed, operated, and maintained in accordance with the NMFS Guidelines (NMFS 1997; Chapter 11 in NMFS 2008). The sequence for stream flow diversion would be as follows:

1. Install flow conveyance devices (pumps, discharge lines, gravity drain lines, conduits, and channels), but do not divert flow.
2. Install block net at upstream end or work area.
3. Seine and dip net through the entire project area in a downstream direction, starting at the upstream end; thereby moving fish out of the project area. Then, if necessary electrofish.
4. Install upstream barrier and divert upstream flow completely.
5. Capture any remaining fish using hand held dip-nets.
6. Install downstream barrier if necessary (only in low gradient backwatered reaches).
7. If water remains within the work area; seine and dip net, if necessary electrofish the project area until catch rates have reached no fish for 3 consecutive passes.

8. Pump water out of isolated pools within the project area to a temporary storage and treatment site or into upland areas and filter through vegetation prior to re-entering the stream channel. Continue to seine, dip net, or electrofish while pumping.
9. If fish continue to be captured, shut pump off before average water depths reach one foot. Continue to seine, dip net, or electrofish until no fish are caught for 3 consecutive passes.
10. Pump dry and check substrate for remaining fish and remove them.
11. Continue to pump water from the project area as needed for the duration of the project.

The diversion structure is typically a temporary dam built just upstream of the project site with sand bags that are filled with clean gravel or stream/floodplain rock and covered with plastic sheeting. A portable bladder dam or other non-erosive diversion technologies may be used to contain stream flow. Mining of stream or floodplain rock can be used for diversion dam construction if it does not result in significant additional floodplain or stream disturbance. Often gravel has to be moved to key in logs in which case it makes sense to use this gravel for the diversion structure.

The temporary bypass system must consist of non-erosive techniques, such as a pipe or a plastic-lined channel, both of which must be sized large enough to accommodate the predicted peak flow rate during construction. In cases of channel rerouting, water can be diverted to one side of the existing channel.

Dissipate flow at the outfall of the bypass system to diffuse erosive energy of the flow. Place the outflow in an area that minimizes or prevents damage to riparian vegetation. If the diversion inlet is a gravity diversion and is not screened to allow for downstream passage of fish, place diversion outlet in a location that facilitates gradual and safe reentry of fish into the stream channel.

C. Rewater Instream Work Area

Remove stream diversion and restore stream flow. Heavy machinery operating from the bank may be used to aid in removal of diversion structures. Slowly re-water the construction site to prevent loss of surface water downstream as the construction site streambed absorbs water and to prevent a sudden increase in stream turbidity. Look downstream during re-watering to prevent stranding of aquatic organisms below the construction site.

All stream diversion devices, equipment, pipe, and conduits will be removed and disturbed soil and vegetation will be restored after the diversion is no longer needed.

Literature Cited

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NMFS (National Marine Fisheries Service). 2000. Guidelines for Electrofishing Waters Containing Salmonids Listed Under the ESA. http://www.nwr.noaa.gov/ESA-Salmon-Regulations-Permits/4d-Rules/upload/electro2000.pdf

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USFWS (USFWS). 2002. Bull trout (*Salvelinus confluentus*) draft recovery plan. Chapter One. Fish and Wildlife Service, Portland, Oregon. 137 pp.

USFWS (USFWS). 2004a. Draft Recovery Plan for the Coastal-Puget Sound Distinct Population Segment of Bull Trout (*Salvelinus confluentus*). Volume I (of II): Puget Sound Management Unit. Portland, Oregon. 389 + xvii pp.

USFWS (USFWS). 2004b. Draft Recovery Plan for the Coastal-Puget Sound Distinct Population Segment of Bull Trout (*Salvelinus confluentus*). Volume II (of II): Olympic Peninsula Management Unit. Portland, Oregon. 277 + xvi pp.

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Bates, K., B. Bernard, B. Heiner, J.P. Klavas, and P.D. Powers. 2003. Design of Road Culverts for Fish Passage. Washington Department of Fish and Wildlife, Olympia, WA. http://wdfw.wa.gov/hab/engineer/cm/culvert_manual_final.pdf

NMFS (National Marine Fisheries Service). 2000. Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act.

Attachment 2

WAC 197-11-960 Environmental checklist.

ENVIRONMENTAL CHECKLIST

Purpose of checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. Name of proposed project, if applicable:

Valley Creek NE 21st Street Flood Control Project

2. Name of applicant:

City of Bellevue, WA

3. Address and phone number of applicant and contact person:

Contact Person: Bruce Jensen (425) 452-7240

City of Bellevue Utilities Department
450 110th Avenue NE
P.O. Box 90012
Bellevue, WA 98009

4. Date checklist prepared: **August 30, 2012**
5. Agency requesting checklist: **City of Bellevue, WA**

6. Proposed timing or schedule (including phasing, if applicable):

The target dates for construction are June 15, 2013 through September 30, 2013. All in-water construction would occur during the in-water work windows defined by the Washington Department of Fish and Wildlife (WDFW).

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Critical Areas Report (David Evans Associates (DEA))
Biological Assessment (DEA)
Cultural Resources Overview (Northwest Archaeology Associates)
Geotechnical Report (Landau Associates)
Wetland and Stream Delineation (DEA)

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No applications for governmental approvals directly affecting the property covered by this project are known.

10. List any government approvals or permits that will be needed for your proposal, if known.

City of Bellevue Critical Areas Review
U.S. Army Corps of Engineers 404 permit
Washington State Department of Ecology 401 Water Quality Certification
Washington State Department of Fish and Wildlife for Hydraulic Project Approval
City of Bellevue Clearing and Grading
City of Bellevue Right-of-Way Use Permit

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

NE 21st Street just east of 140th Avenue NE floods at an estimate 2 to 5-year frequency. NE 21st Street is a dead end and provides the only access to properties along the roadway east of 140th Avenue NE. As a result, when the roadway floods, the flooding impedes access not only for the property owners, their customers and business associates, but also for emergency vehicles. The flooding is primarily the result of an under-sized Valley Creek culvert under the roadway as well as sediment accumulation in Valley Creek downstream of the NE 21st Street crossing exacerbated by a thick mesh of invasive Himalayan blackberries causing backwater in the channel. Sediment has accumulated downstream of the crossing such that the channel bottom elevation is currently at approximately the same elevation as the crown (top) of the NE 21st Street culvert. The sediment and debris

accumulation in the creek causes flow to back up contributing to the flooding of the roadway and also causes some of the base flow to be bypassed. In addition, the existing culvert under NE 21st Street does not meet Washington State Department of Fish and Wildlife (WDFW) design criteria.

The project includes removing the existing 96-inch-wide by 30-inch-high by 47-feet-long Valley Creek cmp culvert crossing of NE 21st Street and replacing it with a larger fish-passable 14-foot-wide by 3-foot-and-6-inch-high 47-foot-long box culvert that meets WDFW design criteria. The project also includes removing the sediment that has accumulated in the creek channel and restoring approximately 150 linear feet of stream channel (plus 17 linear feet of where the restored channel transitions to existing where streambed gravel will be added only) and adjoining wetland and riparian habitat. In addition, the project includes removing and replacing the upstream high flow bypass structure with a structure that matches the elevation and capacity of the existing high flow bypass structure. In addition, the project includes improving the trashrack on the high flow bypass structure downstream of NE 21st Street to reduce the potential for clogging. Please refer to Attachment A, Sheets 4-8.

This project will help reduce the frequency of flooding of the roadway and minimize the potential of losing access to the properties along NE 21st Street. Fish passage and stream processes will be improved by installing a properly designed culvert and stopping the bypass system from intercepting base-flow, which will further facilitate fish passage. The project will improve in-stream habitat by replacing sand and silt that has washed into the stream channel from anthropogenic sources with stream gravel and large woody debris (LWD). The adjoining riparian zone will be enhanced by removing Himalayan blackberry and reed canarygrass, and replacing them with native species per the mitigation plan. The existing amount of debris that is composed primarily of Himalayan blackberry branches will be removed, which will further improve fish passage. The installation of LWD will improve in-stream habitat conditions by creating scour pools that can be utilized by salmonids.

Neither Valley Creek nor Sears Creek are expected to produce a significant amount of sediment in the future. Both creeks are routed through detention facilities which act as traps for sediment immediately upstream of the project site. The Valley Creek pond DMP 197 is about 1300 feet upstream of the project site on NE 24th Street. The Commissioner's Pond is a detention pond that captures sediment on Sears Creek and is located south of Bel-Red Road about 3000 feet upstream. There are no known sediment sources between the project and the ponds. In addition, the City of Redmond is currently designing a large detention vault on Sears Creek in the Overlake area. This vault will further reduce peak flows and the potential for sediment transport. In addition, by removing the sediment wedge and Himalayan blackberry debris in the creek channel, velocities through the culvert and restored channel will increase, decreasing the potential for aggradation.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The project is located at the NE 21st Street crossing of Valley Creek just east of 140th Avenue NE, Bellevue, WA in the roadway right-of-way, on Parcel 2725059003 (purchase by the City pending) as well as an easement on Parcel 2725059171. Section SE 27, T25N R5E. Please refer to Attachment A, Sheets 1 and 4.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

B. ENVIRONMENTAL ELEMENTS

1. **Earth**

a. General description of the site (circle one): **Flat**, rolling, hilly, steep slopes, mountainous, other . . . . . .

b. What is the steepest slope on the site (approximate percent slope)?

The existing side slopes of the channel are as steep as 20 percent (5 horizontal to 1 vertical), however the overall gradient of the channel is 0.4 percent.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

The soils at the project site consist primarily of Bellingham silt loam.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

The project will require the excavation of approximately 250 cubic yards of material in order to remove and replace the existing culvert. Approximately 220 cubic yards of fill will be required to backfill the NE 21st Street roadway embankment around the new culvert.

In addition, 225 cubic yards of excavation and 87 cubic yards of fill in the form of streambed gravel will be required to restore the creek channel downstream of the culvert crossing.

Fill material will be on-site excavated materials, imported backfill, subgrade crushed rock backfill and streambed gravel.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

As with any ground clearing and excavation, the erosion hazard will be increased. Excavation erosion may occur when Valley Creek flow is diverted around the project site and again when flows are returned to the channel to flow through the new culvert. However, erosion control measures, including bypassing the flow around the project site during construction, will be implemented to minimize or eliminate this concern.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

No additional impervious will be added as a result of this project. NE 21st Street will be restored within its existing foot print.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Potential impacts associated with construction can be reduced or avoided by implementation of the conservation and performance measures outlined below:

Conservation and Performance Measures

General

- **A Temporary Erosion Sediment Control (TESC) Plan will be developed and implemented.**
- **A qualified Erosion and Control Inspector will review all sediment control measures twice per week during construction. Qualified means the inspector will be a Certified Erosion Sediment Control Lead (CESCL).**
- **Turbidity will be monitored per the Turbidity Monitoring Plan outlined in** Appendix G **of the Critical Areas Report.**
- **A Spill Prevention Control and Countermeasures plan that meets Ecology standards will be developed and implemented for the project to ensure that all pollutants and products will be controlled and contained.**
- **Seasonal restrictions applied to work conducted below the ordinary high water mark (OHWM) will be as required by a project specific hydraulic project approval (HPA) issued by the WDFW.**
- **Construction impacts will be confined to the minimum area necessary to complete the project.**
- **Removal of riparian vegetation will be minimized as much as possible.**

Water Quality/Erosion Control

- **All best management practices (BMPs) will be installed according to City of Bellevue standards and will be inspected and maintained throughout the life of the project.**
- **Staging and soil stockpile areas will be limited to those outlined in the clearing and grading permit. Staging areas will be fenced.**
- **Spill kits will be kept on-site.**
- **Fuels and other potentially hazardous materials will be kept in a secured area. Secured means fenced, and locked during non-work hours.**
- **Secondary containment will be required for all hazardous materials. Spill containment is required for generators, parked equipment, porta-potty, fuels, solvents, etc.**
- **The project will comply with water quality conditions identified by Ecology.**
- **Wash water resulting from wash down of equipment or work areas will be contained for proper treatment and/or disposal, and will not be directly discharged into state waters.**
- **There will be no discharge of oil, fuels, or chemicals to surface waters, or onto land where there is a potential for reentry into surface waters.**
- **No cleaning solvents or chemicals used for tools or equipment cleaning will be discharged to ground or surface waters.**
- **The contractor will regularly check fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc. for leaks, and will maintain and store materials properly to prevent spills.**
- **BMPs will be used on all project activities to control and prevent sediments from entering aquatic systems.**

In-water and Over-water Work

- **All fish will be removed from the work area prior to any in-water work activities per the Fish Salvage Plan in** Appendix F **of the Critical Areas Report.**
- **Materials removed from below the OHWM, will be placed in an upland location where they cannot enter water bodies.**
- **Materials, such as rock and LWD, placed within the water, will be free of sediment and or other contaminants.**
- **Water pumped from work isolation areas will be treated to remove suspended sediments prior to returning to the water body. Discharge will occur in such a manner as not to cause erosion.**

• Mechanical equipment will not enter the stream channel until the project area has been dewatered and fish salvage has been completed.

• Mechanical equipment operating in the project area will be inspected daily for leaks. Any equipment found to be leaking will immediately be fixed or removed from the project site.

a. **Air**

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Potential emissions include dust associated with moving soil on the site during the earthwork phase (e.g., land clearing and excavation). The extent of dust emitted to the air at any given time is dependent on the level of activity, soil content and moisture, wind speed and type of equipment.

Emissions also include equipment exhaust and short-term odors associated with some construction activities (e.g., asphalt paving).

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

None known.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Possible BMPs to reduce or control emissions include:

Cover, wet or lower freeboard on material transported by truck
Clear roadways of mud and particulate matter
Route and schedule construction truck activity to avoid traffic delays and congestion to abate concentrations of exhaust emissions and
Revegetate exposed soils as quickly as possible after grading activities.

3. **Water**

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Wetlands and other waters of the U.S. have been delineated on the project site by David Evans and Associates, Inc. (DEA 2012).

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes, the majority of the project work will occur over and within Valley Creek and its associated wetlands at the NE 21st Street crossing to approximately 150 feet downstream. Please refer to Attachment A Sheet 4-8.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

The amounts of excavation or fill to be removed or placed below ordinary high water (OHW) or in wetlands are as follows:

- **Channel restoration 139 cubic yards of excavation and 71 cubic yards of backfill below OHW.**
- **Channel restoration 26 cubic yards of excavation and 7 cubic yards of backfill in wetlands.**
- **Culvert replacement 21 cubic yards of excavation and 21 cubic yards of backfill below OHW.**

Note that 71 cubic yards of excavation in the channel is to over-excavate in order to place 71 cubic yards of streambed gravel to restore the channel. Fill material will be on-site excavated materials, imported backfill, subgrade crushed rock backfill and streambed gravel.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

A temporary stream diversion around the site will be required during construction. Cofferdams will be installed to isolate the project site from Valley Creek in order to prevent sediment disturbance during the culvert installation and channel restoration from affecting Valley Creek. Stream flows will be diverted around the project site via gravity pipes. Fish will be salvaged from the project-reach, and block nets will be used to isolate the work area. The diversion will only be activated once the fish have been removed from the work area. Refer to Attachment A, Sheets 9, 10 and 11.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

Yes, please refer to Attachment A, Sheet 4.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

The project does not involve any discharges of waste materials to surface waters.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

It is not anticipated that groundwater will be withdrawn nor will water be discharged to groundwater.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Not applicable.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

The project will not expand the existing roadway nor will it modify the existing street drainage. No stormwater discharges are associated with this project.

2) Could waste materials enter ground or surface waters? If so, generally describe.

No waste materials will be generated from this project.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

The contractor will be required to isolate the work area from streamflow during construction and provide a Spill Prevention, Control and Containment (SPCC) Plan. The plan would include specific notification procedures, cleanup and disposal instructions for different products and quick-response control, containment and cleanup measure that will be available on-site prior to the start of construction. As noted above in erosion and sediment control BMPs would be used to reduce and control sediment impacts.

4. **Plants**

a. Check or circle types of vegetation found on the site:

__X__ deciduous tree: alder, maple, aspen, other (Willow)
____ evergreen tree: fir, cedar, pine, other
__X__ shrubs
__X__ grass
____ pasture
____ crop or grain
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
__X__ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

The predominance of vegetation in the project vicinity that will be removed or altered is composed of non-native species such as Himalayan blackberry (Rubus armeniacus) and reed canarygrass (Phalaris arundinacea). Native species consist primarily of Pacific (Salix lucida) and Sitka (S. sitchensis) willow, which are most prevalent along the stream channel downstream of NE 21st Street.

c. List threatened or endangered species known to be on or near the site.

No threatened or endangered plant species occur in the project vicinity.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Native plants within the project footprint will be avoided to the maximum extent practicable. However, restoring the stream channel will require removing some native willows along the stream bank. The mitigation plan includes replacing native plants impacted by construction, but also includes removing non-native invasive plants that dominate the riparian zone and Wetland B and replacing them with native trees and shrubs. The mitigation plan has been designed to increase the overall abundance and diversity of native vegetation in the project area.

Please refer to Attachment A, Sheets 12-19.

5. **Animals**

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other: **(raccoon, and small rodents)**
fish: bass, salmon, trout, herring, shellfish, other: **(western brook lamprey and sunfish)**

b. List any threatened or endangered species known to be on or near the site.

No threatened or endangered animals occur in the project vicinity. Suitable habitat for Chinook salmon and steelhead trout is potentially present in Valley Creek, but highly degraded. No suitable habitat for bull trout occurs in Valley Creek or Kelsey Creek. Valley Creek is tributary to Kelsey Creek, which flows into Lake Washington via Mercer Slough. The Kelsey Creek basin does not support a self-sustaining population of Chinook salmon or steelhead and bull trout. This basin has been extensively surveyed for salmonids, including both annual spawner surveys and periodic juvenile surveys. Bull trout and steelhead trout have never been documented in the Kelsey Creek basin. However, "rainbow" trout were observed in 1996. Chinook salmon sometimes stray into the Kelsey Creek basin, with abundance being highly variable. In 1999, the WDFW spawner surveys reported a return of 228 Chinook salmon in Kelsey Creek, but in more recent years the number observed has ranged from a low of one in 2010 and 2011, to a maximum of 81 in 2004.

The nearest critical habitat for bull trout and Chinook salmon is in Lake Washington, which is approximately 5.2 miles downstream from the project area. No spawning habitat occurs in the project area as the substrate is dominated by sand and silt. Kelsey Creek, which does contain some spawning and rearing habitat, is located approximately 0.3-mile downstream of the project area.

The proposed project would improve stream habitat by replacing the sand and silt with gravel, creating sinuosity, installing large woody debris (LWD) in the stream channel, and replacing non-native invasive species with native vegetation. The project would improve fish and wildlife habitat between NE 21st Street and NE 20th Street while reducing localized flooding.

c. Is the site part of a migration route? If so, explain.

No.

d. Proposed measures to preserve or enhance wildlife, if any:

The mitigation plan has been designed to improve wildlife function of the riparian corridor and associated wetlands along Valley Creek. This will be accomplished by increasing the overall abundance and diversity of native plants that can be used as cover and refugia, but also for foraging and nesting habitat.

6. **Energy and natural resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

N/A

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

N/A

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

N/A

7. **Environmental health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

A natural gas pipeline will be relocated from its current locations such that it passes underneath the new culvert.

1) Describe special emergency services that might be required.

No special emergency services are required.

2) Proposed measures to reduce or control environmental health hazards, if any:

The natural gas line will be shut off and cleared prior to relocation to prevent risk of explosion.

b. **Noise**

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

None. The project site resides within an area of commercial businesses. Noise levels include vehicular traffic routed by or through the project area.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Increased short-term noise levels would occur from construction equipment during working hours throughout the construction period. Construction hours would occur primarily from 7:30 am to 4:00 pm Monday through Friday and 9:00 am to 6 pm Saturdays which are not legal holidays and in accordance with the City of Bellevue Noise Ordinance. However, since the replacement of the culvert will require a temporary road closure, this action may require either night-time or weekend work to minimize impacts to commercial businesses along the dead end road.

3) Proposed measures to reduce or control noise impacts, if any:

None.

8. **Land and shoreline use**

a. What is the current use of the site and adjacent properties?

The site is currently a 2-lane City street providing access to adjacent commercial businesses. In addition, the southern portion of the project site is currently used as a natural stream corridor.

b. Has the site been used for agriculture? If so, describe.

No

c. Describe any structures on the site.

The structures on the site include an existing 96-inch by 30-inch corrugated metal culvert, a high flow bypass weir structure at the north side NE 21st Street and an additional high flow bypass weir structure at the south side of the NE 21st Street crossing.

d. Will any structures be demolished? If so, what?

The existing culvert and upstream high flow bypass structures will be removed in their entirety. The high flow bypass structure on the downstream side of the NE 21st Street crossing will be modified to improve the trashrack to reduce the tendency to clog.

e. What is the current zoning classification of the site?

Commercial Land Use

f. What is the current comprehensive plan designation of the site?

Commercial Land Use

g. If applicable, what is the current shoreline master program designation of the site?

The shoreline master program does not provide a designation for the project site.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

Yes, Valley Creek and associated riparian area as well as wetlands lie within the project area.

i. Approximately how many people would reside or work in the completed project?

None

j. Approximately how many people would the completed project displace?

None

k. Proposed measures to avoid or reduce displacement impacts, if any:

N/A

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project would replace the existing culvert crossing and restore the stream channel downstream and therefore the land use of the site would not be altered.

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

N/A

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

N/A

c. Proposed measures to reduce or control housing impacts, if any:

N/A

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The project will replace the existing culvert within the existing roadway prism without increasing the height of the roadway.

b. What views in the immediate vicinity would be altered or obstructed?

None

c. Proposed measures to reduce or control aesthetic impacts, if any:

The new features of the culvert and roadway will be similar to those that currently exist. Invasive non-native vegetation will be removed from the project site and native vegetation planted as part of the project.

11. **Light and glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None

b. Could light or glare from the finished project be a safety hazard or interfere with views?

N/A

c. What existing off-site sources of light or glare may affect your proposal?

None

d. Proposed measures to reduce or control light and glare impacts, if any:

N/A

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

There are no designated recreational opportunities in the area.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None

13. **Historic and cultural preservation**

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

None known. A cultural and historic investigation is being conducted as part of the permitting process. The results are expected to be available in the fall of 2012.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

None known. A cultural and historic investigation is being conducted as part of the permitting process. The results are expected to be available in the fall of 2012.

c. Proposed measures to reduce or control impacts, if any:

A cultural and historic investigation is being conducted as part of the permitting process. The results are expected to be available in the fall of 2012.

14. **Transportation**

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

The project will occur partially on a segment of NE 21st Street east of 140th Avenue NE. Refer to Attachment A, Sheets 1 and 4.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

There is no public transit stops within the project limits. The nearest transit stop is located on 140th Avenue NE about 200 feet from the project site.

c. How many parking spaces would the completed project have? How many would the project eliminate?

None

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No new roads or streets are proposed with this project. The existing NE 21st Street will be reconstructed after the new culvert is installed.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

None

g. Proposed measures to reduce or control transportation impacts, if any:

The culvert crossing will be constructed one half at a time in order to preserve access to businesses east of the creek during construction.

15. **Public services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No.

b. Proposed measures to reduce or control direct impacts on public services, if any.

N/A

16. **Utilities**

a. Circle utilities currently available at the site: **electricity**, **natural gas**, **water**, refuse service, **telephone**, **sanitary sewer**, septic system, other.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

No new utilities are proposed as part of the project. The existing water, gas, power and communications will be relocated under the culvert crossing.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: .....

Date Submitted: ..... 10/19/12 .....

April 18, 2013

Attachment 3

Valley Creek- NE 21st Street Flood Control Project
City of Bellevue Utilities Department
Critical Areas Land Use Permit 12-127243-LO
Corps Reference Number NWS-2012-1160
Muckleshoot Tribe Comments and Responses

1. ***Comment:*** *What WDFW culvert design method was used for the new box culvert? We recommend that this new culvert be designed using WDFW's stream simulation design to best ensure adult and juvenile fish passage. We would appreciate a copy of the culvert design calculations if available now.*

   Response: Yes, the WDFW stream simulation design method was used to size the new box culvert. The calculations are attached.

2. ***Comment (2a):*** *With changes in the upstream highflow by-pass (removal) and a new trash rack on the downstream by-pass, at what flows will the high flow by-pass be activated and how will the diversion of these flows affect channel processes downstream?*

   Response: The proposed project improvements do not change the number of by-pass structures (upstream and downstream of NE 21st), or their overflow elevations, <u>but we are decreasing the frequency of use</u> by restoring downstream channel geometry and improving channel hydraulics.

   Under current conditions, the bypass on the upstream side of NE 21st Street is engaged about 6 percent of the time. Once the culvert and downstream conditions are improved, the upstream bypass will be engaged less than 1 percent of the time. The bypass on the downstream side of NE 21st Street is currently engaged about 40 percent of the time. Once the downstream channel is restored, the bypass will also be engaged less than 1 percent of the time. These estimates are based on a continuous stream flow simulation model using rainfall records spanning 61 years.

   Here are some additional details:
   The existing high flow bypass includes a high flow overflow on the upstream side of NE 21st Street and an additional structure on the downstream side of NE 21st Street. The existing upstream bypass consists of a box structure where flow can overtop on three sides. The north wall of the structure is about 6 feet wide and has an overflow elevation at about 193.2. The east and west sides of the structure are 3.9 feet long and slope up from Elevation 193.2 to 194.0. When water level reaches the top of the structure it can enter the structure through the grating over the top at elevation 194.0.

   The existing downstream bypass structure is 4.8 feet wide and 15.5 feet long. The length of the overflow weir is about 14 feet and its rim is at about elevation 192.42. When water rises to elevation 194.22, the opening at the front of the structure starts to act as a 1.8-foot-high by 14-foot-wide rectangular orifice. When water rises further to elevation 194.92, flow can then also pass through the steel grating covering the top of the structure.

   The upstream structure will be replaced with an overflow weir within the west wingwall. The weir elevation will be set at the same elevation as the existing upstream overflow structure. The weir length will be the same (6 feet wide) as on the face of the existing overflow structure. However, due to site constrains, the weir capacity on the east and west sides of the existing structure will not be replicated in the proposed weir structure. The only change made to the downstream structure is to replace the trashrack with a rack that is designed to pass flow even with some debris clogging it. The capacity and weir elevation at the downstream structure will not be affected by this change.

Because the proposed project does not change the overflow elevations of the high flow bypass system, the system will become engaged at the same elevations as the existing system. However, due to downstream restoration, the water surface elevations at which the bypass is engaged will happen much less often.

Comment (2b): *How will the City monitor the high flow by-pass structure to ensure that it works as intended?*

Response: The key to the highflow by-pass structure working as intended is the continued unimpeded function of the restored reach downstream. To that end, on an ongoing basis, the downstream reach will be checked to see that wood or debris obstructions have not begun to form, particularly after significant storm events. If obstructions to flow are observed, the City's maintenance crews will remove them in a timely manner.

In addition, during the first year after construction, peak stage elevation measurements will be collected adjacent to NE 21st Street, to verify that predicted water surface elevations are in line with what has been predicted by the model.

3. ***Comment (3a):*** *How will the project ensure that juvenile salmon do not enter the high flow by-pass?*

Response: The project proposes to protect juvenile salmon by reducing the overflow frequency to the high flow bypass system. As described above, it is estimated that the amount of time that the bypass is engaged will drop from a high of 40 percent under current conditions, to less than 1 percent once the improvements are made.

Comment (3b): *How will this be monitored?*

Response: The most important effort the City can make to protect juvenile salmon from entering the high flow by-pass is to regularly check that downstream channel flow has not become impeded by wood or debris obstructions (see Response to Comment 2 above). Some additional refuge areas will also be created with logs or rootwads placed in the vicinity of the overflow structures.

In addition, during the first year after construction, peak stage elevation measurements will be collected adjacent to NE 21st Street, to verify that predicted water surface elevations are in line with what has been predicted by the model (see Response to Comment 2 above).

4. ***Comment:*** *More complex wood should be added to the project instead of the single proposed logs shown on Sheet 5. A variety of wood types, particularly with rootwads should be added where wood is proposed to create lower velocity habitat in the margins for juvenile salmon.*

Response: The pieces of wood shown on the plans for the proposed channel restoration are "*key pieces*", based on *A Regional and Geomorphic Reference for Quantities and Volumes of Instream Wood in Unmanaged Forested Basins of Washington State* (Fox and Bolton, 2007).

According to Table 4, in Fox and Bolton, 2007, 5 key pieces are required to achieve the 75th percentile, for this stream channel length of 150 feet (the plans currently show 6 *key* pieces). However, the *total* number of pieces to achieve the 75th percentile suggested by Table 4 is 17 pieces for 150 feet of stream, which include pieces as small as 4 inches in diameter and 6 ½ feet in length.

We will revise the plans to show at least 17 total pieces of wood, and we will add additional logs and complexity to the log structures. However, since we hope to have wood stay in place and last for number of years, we do not intend to use wood as small as the minimum sizes counted in

the Fox-Bolton surveys. The minimum diameter logs we will import for the log structures will be 8-inches, and will range up to at least 18-inches (at least half with rootwads), so in-effect, most of this wood will also qualify as key pieces.

In addition to these 17 total pieces, we will retain on-site wood ranging down to 4-inches in diameter and 6 ½ feet in length, and add them to the log structures for additional complexity.

All of the logs and rootwads we are placing in the stream channel should help to lower velocities and create refuge areas for juvenile salmon.

5. ***Comment:*** *The stream channel banks should be graded at a 3:1 ratio to create more margin habitat for juvenile fish instead of the proposed 2:1. A more varied channel design should be used than the trapezoidal design shown on Sheet 6.*

   Response: The creek channel geometry is based on a reference reach just downstream of the project. We agree that a varied channel geometry will be beneficial and will adjust the bank slopes accordingly, within the constraints presented by adjacent property lines and easements.

Valley Creek Stream Simulation

Wch=	10	feet	width of the bankfull channel
Wculvertbed=	14	feet	1.2*Wch+2

Unit Discharge Bed Design

D84=3.45*S^0.747*(1.25*qc)^0.667/g^0.333

D84=	0.109474	feet	84th percentile particle
D84=	1.313683	inch	
S=	0.0041	ft/ft	Energy slope
Qc=	121		25-year flow
qc=	12.1		critical discharge divide by Wch at which D84 moves
g=	32.2		gravity

D100=	3.284208	inches	D84/0.4
D84=	1.313683		
D50=	0.525473	inches	D84/2.5
D16=	0.16421	inches	D84/8

D84=3.45*S^0.747*(1.25*qc)^0.667/g^0.333

D84=	0.119506	feet	84th percentile particle
D84=	1.434076	inch	
S=	0.0041	ft/ft	Energy slope
Qc=	138		100-year flow
qc=	13.8		critical discharge divide by Wch at which D84 moves
g=	32.2		gravity

D100=	3.58519	inches	D84/0.4
D84=	1.434076		
D50=	0.57363	inches	D84/2.5
D16=	0.17926	inches	D84/8

Use WSDOT Streambed Sediment. D100 is less than desirable based on WDFW's gradiation, but it still won't move in the 100-year flow, so OK.

Sieve Size	**Percent Passing**
2½"	99-100
2"	65-95
1"	50-85
No. 4	26-44
No. 40	16 max.
No. 200	5.0-9.0

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MEMORANDUM

Attachment 4

To: Bruce Jensen

From: Ralph Nelson

Subject: Valley Creek Floodplain Impacts Memorandum

Date: November 4, 2013

Background

Valley Creek in the vicinity of NE 21st Street and 140th Ave NE experiences recurrent flooding leading to periodic roadway closures and damages to adjacent properties. The City of Bellevue retained SAIC Energy, Environment & Infrastructure, LLC (now Leidos Engineering, LLC) to evaluate the causes of the flooding and design a solution.

The existing NE 21st St culvert is a 96-inch wide by 30-inch high corrugated metal pipe. Flows passing through the culvert from the north to the south are joined with Sears Creek, entering from the east near the culvert outlet. The combined flows then travel about 200 feet southward before crossing beneath NE 20th Street via another culvert.

A high flow bypass was constructed in 1987 at NE 21st Street to divert high flows away from the site. An intake to the bypass is located next to the entrance to the culvert (on the north side of NE 21st Street). A second bypass intake is located along the western bank at the culvert outlet (on the south side of NE 21st Street. The bypass carries overflows from NE 21st Street via a pipe that discharges to Kelsey Creek below the confluence with Valley Creek.

Leidos conducted analyses to identify factors contributing to flooding at the site. Preliminary analyses were documented in a memorandum to the City of Bellevue dated November 28, 2011 and have since been updated based on additional data gathering and design development. The analyses found that the existing culvert passing beneath NE 21st Street has limited capacity resulting in flooding over the roadway expected to occur on the average of about once every 2 years. Flooding is compounded by Sears Creek joining Valley Creek on the downstream side of NE 21st Street. In addition, the channel between NE 20th and NE 21st Streets is choked by invasive vegetation and sediment deposition has raised the bed of the channel causing a perpetual backwater condition extending to the NE 21st Street culvert.

The proposed project includes removing the existing culvert crossing NE 21st Street and replacing it with a larger fish-passable 14-foot-wide by 3-foot-and-6-inch-high box culvert that meets Washington State Department of Fish and Wildlife stream-simulation design criteria. The project also includes restoration of downstream habitat and channel geometry, which includes removing the sediment that has accumulated in the creek channel and restoring approximately 150 feet of stream and adjoining wetland and riparian habitat.

This section of Valley Creek is within a Federal Emergency Management Agency (FEMA) regulated floodplain. Any proposed changes within this area must be evaluated for conformance with the City of Bellevue floodplain regulations. An initial meeting with the City was held on June 21, 2013 to review the project and discuss potential effects on the floodplain. The purpose of this memorandum is to summarize anticipated effects to the floodplain and demonstrate compliance with City regulations.

Received
NOV 05 2013
Permit Processing
City of Bellevue

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Comparison of Regulated Floodplain to Current Conditions

The proposed project is located within a FEMA mapped floodplain covering Mercer Creek. Valley Creek is identified as within the North Branch of Mercer Creek and is referred to as "North Valley Creek". Documentation concerning the regulated floodplain was reviewed to compare recorded information against current information developed as a part of the NE 21st Street culvert replacement project.

Significant discrepancies were discovered with respect to flows and instream structures. These discrepancies led to the conclusion that the FEMA data were outdated and did not accurately represent current conditions.

Table 1 compares current flows with those reported by FEMA. Current flows are based on a long-term simulation using the Kelsey Creek HSPF model provided by the City. Both represent flows expected at the mouth of Valley Creek before it joins Kelsey Creek. The total tributary area is 3.1 square miles. Flows based on HSPF predictions for current conditions are higher than those used by FEMA to determine flood levels. It is important to note that the HSPF simulated flows include the regional detention ponds constructed by the City as well as the high flow bypass at NE 21st Street. It is not known if the FEMA flows are based on these features.

Table 1
Comparison of Flows (cubic feet per second) at the Mouth of Valley Creek

Flow Frequency	Current Flows	FEMA Flows
10-year	141	111
100-year	253	177

FEMA flood profiles were also reviewed to compare flood levels and streambed elevations to current conditions. The primary area of focus is in the project vicinity, between NE 20th Street and NE 21st Street. Table 2 provides a comparison between the published FEMA data and current conditions. Current conditions are based on recent topographic surveys and a HEC-RAS model used to predict water surface elevations. All elevations are reported as NAVD88.

Table 2
Comparison of Elevations between FEMA and Current Conditions

	Cross Section		Streambed Elevation		100-year Water Surface Elevation	
Location	**FEMA**	**HEC-RAS**	**FEMA**	**Current**	**FEMA**	**Current**
Above NE 20th St	D	12	189.24	188.97	194.49	194.81
70 feet upstream from NE 20th St	E	14	189.59	191.34	194.49	195.30
214 feet upstream from NE 20th St	F	17	190.04	189.61	194.99	195.80
Above NE 21st St	G	18	190.02	190.48	194.99	197.44

Under current conditions, the streambed elevation is up to 1.75 feet higher upstream from NE 20th Street (at cross section E). This is due to the sediment deposition that is creating a backwater condition extending upstream to the NE 21st St culvert. The predicted 100-year water surface elevation (based on current flows and the recent topographic survey) is 0.81 feet higher at cross section F and 2.45 feet higher immediately upstream from NE 21st Street. Under current conditions, the NE 20th Street culvert surcharges causing a backwater that extends upstream to NE 21st Street. The FEMA profile indicates the NE 20th Street culvert to have an invert elevation of 189.24 feet and a height of 7.7 feet. Recent survey data indicates the NE 20th Street culvert has an invert elevation of 189.48 feet with a height of only 4.28 feet. The existing culvert is an arch corrugated metal culvert with a 7.5 foot span. The type of culvert represented in the FEMA profile is not known at this time.

Based on the comparison of current conditions with the published FEMA data, it was concluded that the regulated floodplain map does not represent current conditions. The attached figure shows the approximate extents of the current 100-year floodplain based on the recent analyses.

Effects of Proposed Project

The proposed project was reviewed to determine what, if any, impacts it may have on the floodplain in the vicinity of NE 21st Street. It was determined the published FEMA data were not representative, so the comparison was made on the basis of current ("pre-project") and proposed ("post-project") data using the latest topographic survey and hydrologic/hydraulic analyses. The comparison is summarized in Table 3.

Table 3
Comparison of Elevations between Current and Proposed Conditions

Location		Streambed Elevation		100-year Water Surface Elevation	
	Cross section	Current	Proposed	Current	Proposed
Above NE 20th St	12	188.97	188.97	194.81	194.80
70 feet upstream from NE 20th St	14	191.34	189.93	195.30	195.05
214 feet upstream from NE 20th St	17	189.61	189.61	195.80	195.13
Above NE 21st St	18	190.48	190.48	197.44	197.18

Increasing the size of the NE 21st Street culvert and restoring the channel between NE 21st Street and NE 20th Street will result in slightly lower water surface elevations for the 100-year flow. The biggest drop in the 100-year flood level is 0.67 feet at cross section 17. The streambed elevation is lowered by 1.41 feet at cross section 14. The project will not cause a net rise in the base flood elevation and is therefore assumed to be compliant with the City's requirements.

NE 21st Street will continue to flood for large storms due to the restriction caused by the NE 20th Street culvert; however the frequency of flooding at NE 21st Street will be significantly reduced. Under current conditions, NE 21st Street is predicted to flood on the average of about once every 2 years. With the

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proposed improvements, flooding is expected to occur less than once every 10 years. The capacity of the NE 21st Street culvert will be increased from about 24 cubic feet per second (before flooding occurs) to about 83 cubic feet per second.

It should be noted that other factors can influence flooding at the site. If the bypass inlets become plugged, then the flows passing through this section of Valley Creek could increase by up to 90 cubic feet per second. Sears Creek has also on occasion overflowed onto NE 21st Street, producing overland flow that travels down the street to the vicinity of the confluence with Valley Creek.

Changes in the operation of the regional ponds can also affect flows passing through this area. The City of Redmond is currently planning on building a regional pond (Overlake) serving a portion of the Sears Creek basin. The Redmond Overlake pond will reduce flows entering the existing City of Bellevue pond along Sears Creek. Once constructed, the City of Bellevue may want to consider modifying the controls of their pond to optimize flow reductions along Sears Creek.

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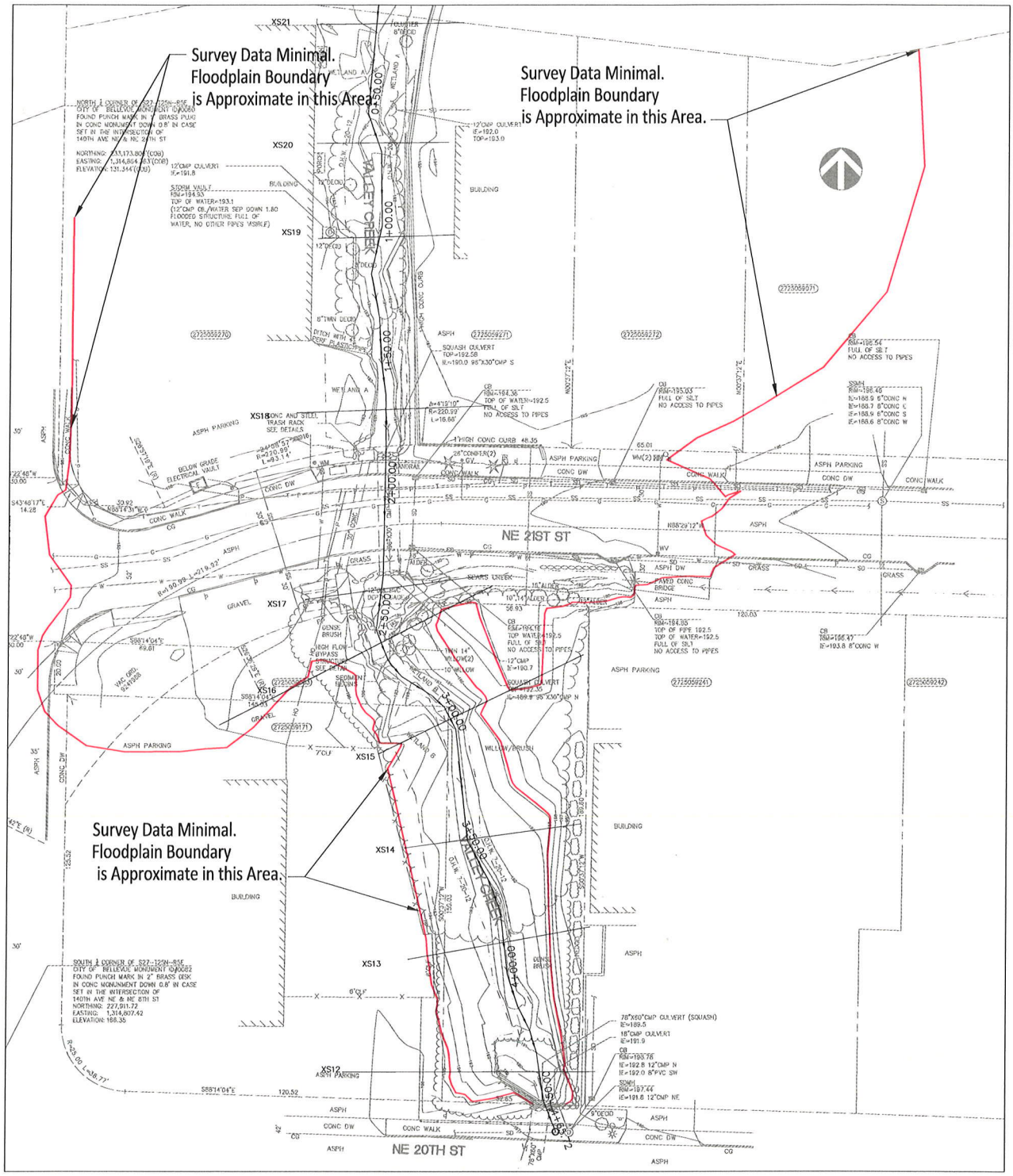

PLAN
SCALE: 1"=25'

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100-year Floodplain boundary