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Fish and Wildlife Site Assessment: Dike District 12 Levee Certification (PL12 – 0191)

Prepared for:

Skagit County Dike, Drainage and Irrigation District 12
C/O John Semrau
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Prepared by:

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February 27, 2013

Ex 8

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Attachments

Summary

Applicant:	Skagit County Dike, Drainage and Irrigation District 12 C/O John Semrau Semrau Engineering and Surveying, PLLC 2118 Riverside Drive, Suite 208 Mount Vernon, WA 98273-5454
Site:	The project area is located along the right bank of the Skagit River extending from Lafayette Road in the north to Gardner Road in the south within Section 4, Township 34 North Range 4 East and Section 33 Township 35 North, Range 4 East, W.M., Skagit County, Washington.
Areas Assessed:	Gages Slough: Type F (Fish Habitat) Skagit River Side Channel: Type S (Shoreline) Skagit River Type S (Shoreline) I Wetland Mosaic (Category I Wetland)
Project:	The subject proposal is to modify both the width and height of the existing Skagit River levee. The top of levee will be extended approximately 4 feet in height and the width will be increased by 60 feet (landward of the existing toe) in specified areas. Construction will be limited to the top and landward of the existing levee.
Critical Area Impact:	Proposed expansion has been designed to "avoid" riparian impacts by expanding landward of the existing levee. No impacts to the riparian buffer beyond the existing baseline condition have been identified. Impacts occur within required 155 foot Category I Wetland buffer. Gages Slough Segment (Type F: Standard Buffer 150'): Separated from project area by Public Road (SCC 14.24. 530(4). No Impact. Side Channel Segment (Type S: Standard Riparian Buffer 200') New fill within 200' will be placed on top or landward side slope of existing levee. No vegetation removal or fill on native soil is proposed. Closest fill will be on existing levee 120 feet landward of OHWM. No impact. Skagit River Segment (Type S: Standard Riparian Buffer 200') New fill within 200' will be placed on top or landward side slope of existing levee. No vegetation removal or fill on native soil is proposed. Closest fill will be 10 feet landward of OHWM. No impact. Wetland Mosaic Segment (Category I Wetland: 155' Optional Buffer) Buffer averaging plan has been prepared to reduce standard buffer to 116.25'. New fill within 155 foot wetland buffer will be placed on native soil vegetated with pasture grass creating an expanded area of impervious surface landward of the levee.

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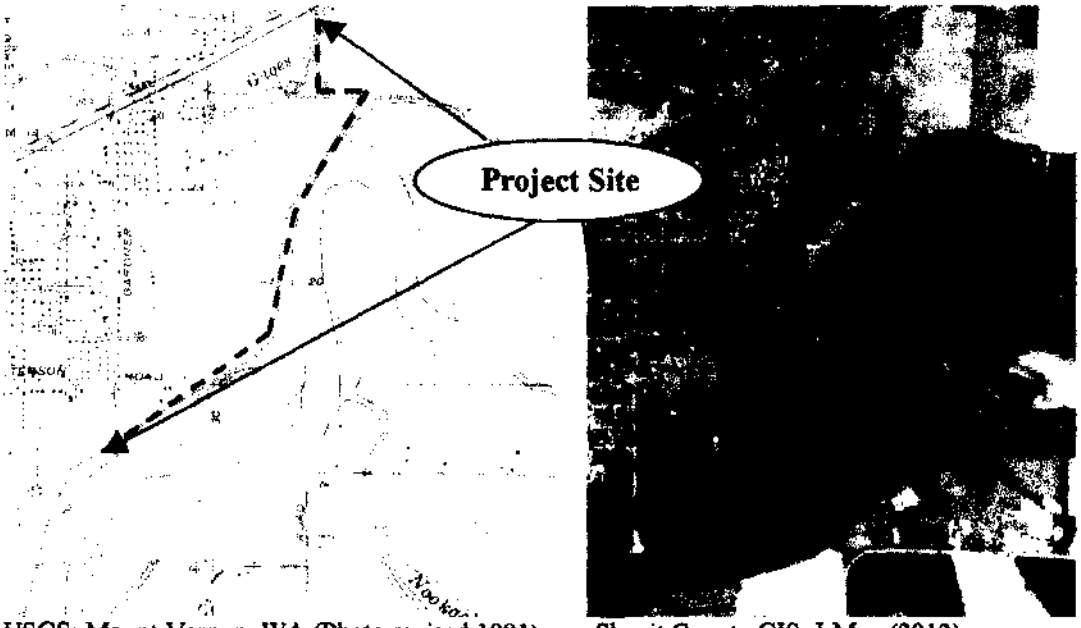
Fish and Wildlife Site Assessment (PL12-0191): Proposed Levee Modifications (Parcels 38223, 38305, 38304, 38302, 38307, 38303, 38220, 38308)

1. Introduction

At the request of Mr. John Semrau, Graham-Bunting Associates (GBA) have conducted a site investigation and prepared the following report addressing fish and wildlife habitat conservation areas within and adjacent to the above referenced parcels. The report is prepared in conjunction with levee modifications proposed by Skagit County Dike District 12 and is intended to provide technical information to assist with review of an application for a Shoreline Substantial Development Permit. The report addresses the site assessment requirements listed under SCC 14.24.520 of the Skagit County Critical Areas Ordinance (CAO) and includes a characterization of existing site conditions, project description, impact assessment, regulatory analysis and mitigation recommendations. The report is also responsive to the requirements of the Flood Damage Prevention Ordinance and addresses potential impacts to species listed under the Endangered Species Act (ESA) pursuant to the Habitat Protection Standards of SCC 14.34.220. The report concludes with a proposed effects determination relative to listed species. This Fish and Wildlife Site Assessment should be reviewed along with the companion Wetland Site Assessment prepared by GBA, (November 8, 2012).

2. Existing Conditions

The project area is located along the right bank of the Skagit River extending from Lafayette Road in the north to Gardner Road in the south within Section 4, Township 34 North Range 4 East and Section 33 Township 35 North, Range 4 East, W.M., Skagit County, Washington.



USGS: Mount Vernon, WA (Photo revised 1981) Skagit County GIS: I-Map (2012)

The project site consists of the existing right bank levee of the Skagit River, farmland landward of the levee and a mix of uplands and wetlands waterward of the levee. The levee is managed and maintained by Skagit County Dike, Drainage and Irrigation District Number 12. The existing levee ranges from approximately 8 to 12 feet in height (measured from toe to top) and 80 feet in width (measured toe to toe). The toe of the levee is located approximately 100 feet from the river at its closest point in the north and approximately 1,100 feet from the river at its furthest point in the south. The project site includes four (4) distinct segments identified as waters of the state pursuant to WAC 222-16.031. The segments are listed below from north to south. (Attachment A: Critical Area Site Plan)

Gages Slough (Type F Water) - Gages Slough is located along the northern portion of the site and is separated from the project site by Lafayette Road. The slough receives its hydrologic charge from a culvert leading from the north end of a forested wetland at Hart Island and is seasonally flooded from October through May. The portion of the slough adjacent to the project site is vegetated with a thicket of scrub shrub and tree species dominated by willow *(Salix spp.)* and alder *(Alnus rubra)*.

Side Channel of Skagit River (Type S Water) - The existing levee extends from Layfayette Road east to a side channel of the Skagit River. The side channel discharges to the mainstem Skagit during high flows. The bottom of the channel is vegetated with a vigorous community of water pepper *(Polygonum hydropiperoides)*. The landward bank and area between the channel and mainstem of the river consists of a deciduous forest dominated by cottonwood *(Populus balsamifera)*, willow, and alder.

Photo 1 – View from shoulder of Lafayette Road west showing mixed deciduous trees in foreground, Gages Slough (Type F Water) and scrub shrubs vegetation in background.

Photo 2 – View from top of bank northeast showing flooded side channel of Skagit River (Type S Water), during moderate winter flow, woody debris and forested wetlands to right.

Skagit River (Type F Water) – The Skagit River extends from the side channel south to the area identified as a wetland mosaic and exhibits armored banks. The banks are vegetated with Himalayan blackberry *(Rubus discolor)*, willow and Japanese knotweed *(Polygonum cuspidatum)* which is subject to an ongoing eradication program as an invasive species. A mix of newly installed hardwoods and conifers are present in the middle portion of the segment. A mature deciduous forest community is present in the southern portion of the segment adjacent to the Wetland Mosaic.

Wetland Mosaic (Type F Water) – A wetland mosaic is located between the waterward toe of the levee and the active channel of the river. The mosaic extends from the Skagit River Segment to the terminus of the project site at Gardner Road. A linear seasonally flooded component of the mosaic is located adjacent to the existing levee. The linear feature is classified as a Type F Water and is delineated as part of a wetland mosaic in the Wetland Site Assessment (GBA, November 8, 2012).

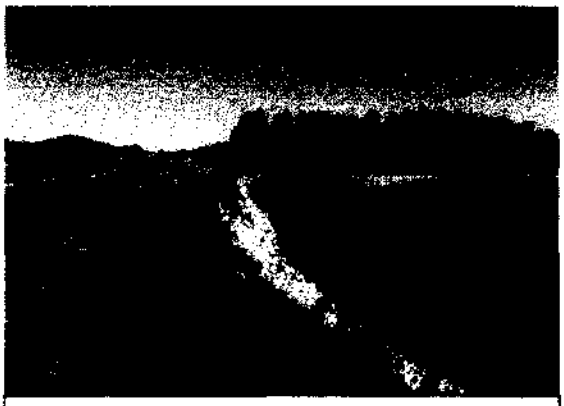


Photo 3 – View upstream (north) showing typical armored right bank of Skagit River. Forested area in background is side channel shown in Photo 2.

Photo 4 – View from waterward toe of existing Skagit River Levee southeast showing linear seasonally flooded seture (Type F Water) and wetland mosaic to right.

3. Project Description

The subject proposal is to expand both the width and height of the existing Skagit River levee along the entire 1.53 mile project site. Approximately 3,550 linear feet of the levee is within the riparian and wetland buffers required under the CAO:

- Approximately 2,150 linear feet are within the riparian buffer of 200 feet specified for Type S Waters
- Approximately 1,400 linear feet are within the optional buffer of 155 feet specified for Category I Wetlands
- Approximately 4,400 linear feet are outside of the required riparian and wetland buffers

The top of levee will be expanded approximately 4 feet in height and the increased toe width varies in a landward direction from 0 to 60 feet. All construction within the riparian buffer will consist of fill on top of the existing levee. Construction within the wetland buffer will expand the toe onto native soil. No expansion is proposed waterward of the existing levee. The project is proposed by Skagit County Dike, Drainage and Irrigation District Number 12 for the purpose of protecting lives and property from Skagit River flooding. Detailed plans have been submitted to Skagit County Planning and Development Services in support of an application for a Shoreline Substantial Development Permit.

4. Impact Assessment

Graham-Bunting Associates conducted a wetland site assessment during the summer and fall of 2012. A fish and wildlife site investigation was conducted on February 27, 2013 to identify Fish and Wildlife Habitat Conservation Areas (HCAs), observe existing site conditions, and identify potential impacts and mitigation/conservation measures. The County CAO (14.24.500) classifies the following as Fish and Wildlife HCAs; asterisked HCAs were found within the project area and are addressed below.

(a) An area with which anadromous fish, endangered, threatened or sensitive species have a primary association and/or their habitat such as those designated and mapped by the Washington State Department of Fish and Wildlife, Priority Habitats and Species Program. *
(b) A water of the State as defined under WAC 222-16-030. *
(c) Any public or private tidelands available for shellfish harvest, kelp or eelgrass beds, herring or smelt spawning areas such as those designated in the priority habitats and species map of Skagit County.
(d) A critical biological area as designated and mapped by the Department of Ecology Coastal Zone Atlas dated June 1978 and/or the maps.
(e) Designated species and habitats of local importance pursuant to SCC 14.24.500.
(f) Naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish or wildlife habitat.
(g) Lakes, ponds, streams, and rivers planted with game fish by a government or tribal entity*
(h) Areas with which anadromous fish species have a primary association*
(i) State Natural Area Preserves and Natural Resource Conservation Areas.

4.1 Threatened and Endangered Species

The National Marine Fisheries Service, United States Fish and Wildlife Services and WDFW have afforded the following Puget Sound Salmonid species various levels of protective status: Puget Sound Evolutionarily Significant Unit (ESU) of Chinook salmon *(Oncorhynchus tshawytscha)*, Puget Sound Distinct Population Segment (DPS) of steelhead *(Oncorhynchus mykiss)* are listed as Threatened under the Endangered Species Act (ESA) and as Candidate species by the State. Coastal-Puget Sound DPS bull trout *(Salvelinus confluentus)*, are also listed as Threatened under the ESA and Candidate by the State.

A review of the Washington State Priority Habitats and Species Data Base did not indicate the presence of additional endangered, threatened or sensitive species within the immediate vicinity of the project site although biotic detection of a gray wolf *(Canis lupus)* was documented within the project vicinity in 1993. Bald eagle *(Haliaeetus leucocephalus)*, recently de-listed under the ESA and now managed as a sensitive species by the State, occur commonly throughout the area. Mature trees in the vicinity of the project site are considered suitable perching or roosting habitat for bald eagle.

In addition the Distinct Population Segment (DPS) of Southern Resident Killer Whale *(Orcinus orca)* listed under the ESA as Threatened is required to be considered pursuant to recent amendments to the Skagit County Critical Areas and Flood Damage Prevention Ordinances. Southern Resident of Killer Whale and their primary prey source (Chinook salmon) are addressed in a Biological Opinion prepared by the National Marine Fisheries Services (NMFS, September 22, 2008). All of the above species, with the exception of killer whale are assumed to be present in the Skagit River and its associated side channel. Species presence in Gages slough is unknown. Similarly species presence in the wetland mosaic, including the linear seasonally flooded feature located waterward toe of levee, is unknown. It is our working assumption that the seasonally flooded portion of the wetland mosaic may be accessed by salmonids during flood flows. Unidentified fish (possibly juvenile salmonids) were observed during the February site investigation.

4.2 Waters of the State

The Skagit River and side channel are classified "Type S (Shoreline) Waters" and are also designated as a "Shorelines of statewide significance" (WAC 222-16-031, RCW 90.58). Gages

Slough and the wetland mosaic including the seasonally flooded linear feature are classified as "Type F (Fish Habitat) Waters".

4.3 Lakes, Ponds, Streams, and Rivers Planted with Game Fish

WDFW propagates coho *(Oncorhynchus kisutch)*, Chinook and steelhead at the Marblemount Hatchery on the Cascade River. The Upper Skagit Tribe raises chum salmon *(Oncorhynchus keta)* associated with Hanson Creek near Sedro Woolley. Puget Sound Energy propagates sockeye *(Oncorhynchus nerka)*, and coho on the Baker River system. All the above mentioned streams and rivers are associated with the Skagit watershed. The presence of self sustaining populations of planted game fish in Gages Slough is unlikely. The presence of planted game fish in the linear seasonally flooded feature is considered incidental and likely associated with very high river flows. Stranding is a possibility for fish accessing the wetland.

4.4 Anadromous Fish Species

The Skagit River is a system with which anadromous fish have a primary association. Primary association is defined as the fundamental link between a species and a land or aquatic area where anadromous fish, endangered, threatened or sensitive species breed or feed. Anadromous fish occurring in the river are: Chinook, coho, pink *(Oncorhynchus gorbuscha)*, sockeye, and chum salmon; steelhead; coastal cutthroat trout *(Salmo clarki clarki)*; and bull trout. Anadromous fish species utilize the Skagit River and its side channels for breeding and feeding. Self sustaining populations of anadromous fish species are very unlikely to occur in Gages Slough due to unfavorable habitat conditions. The seasonally flooded linear wetland may be accessed as refugia during high river flows, however there is a distinct possibility of stranding as flow recedes.

4.5 Riparian Functions

The above HCAs are linked directly to the functions provided by vegetation communities along the banks of the slough and river. These functions include:

Large woody debris (LWD) recruitment – LWD contributes to stable channel morphology in smaller streams. In larger streams such as the Skagit River, LWD plays an important role in providing in-water habitat structures. These structures range from isolated root wads and anchored logs to large semi-permanent log jams. The structures improve salmon habitat by creating refugia that provides safe havens from heavy flow velocities and predators and improved foraging conditions. LWD also traps additional woody debris which in turn further enhances habitat conditions. LWD is "recruited" from adjacent riparian forests when trees fall into the stream. A sufficient forest contiguous to the stream is essential to assure a source of LWD over the long term.

Shade and Temperature – The primary factors influencing water temperature are shade, humidity, ambient air temperature, channel size groundwater and overhead vegetation cover. Shade, provided by a forest canopy is the most valuable contributor to the maintenance of cool stream temperatures.

Bank Stabilization – Riparian vegetation is generally recognized as contributing to the stability of stream banks. This function is accomplished through the network of tree roots, brush and soil/rock that weaves soil and rock together in a manner that withstands increased flows and velocity. In addition to stream bank vegetation and root structure, large woody debris (LWD) also promotes stable banks on smaller streams by slowing velocities and capturing sediments as they are transported downstream thereby promoting water quality.

Water Quality - Sediment contributions to streams is generally supplied by erosion and upland processes. Sediment input to higher order streams such as the Skagit River is typically driven by fluvial or stream action processes. In undeveloped or unmodified watersheds, aquatic systems and their associated organisms are adapted to the natural rate of sediment input. Slope aspect, soils and vegetation act together in a manner which promotes a natural equilibrium. Modifications which remove native vegetation and increase the area of impervious surfaces, are accompanied by increased stormwater runoff. Such modifications alter the balance of the aquatic regime resulting in higher flow rates and increases in turbidity and nutrient concentrations.

Wildlife Habitat - While riparian habitat performs many functions that are essential to fish species, these areas are also of critical importance to wildlife. Up to 80% of Washington States vertebrate species use riparian habitat for essential life activities. Forested riparian habitat includes an abundance of snags, downed logs and multi layered vegetation communities which provide habitat for birds amphibians, reptiles and small animals as well as the fish species which inhabit the stream itself. Overall, riparian wildlife habitat is based on structural complexity, ecological connectivity, food and water availability and moderate microclimate. Riparian areas serve as refuges and travel corridors for wildlife. The number of wildlife species present in riparian areas is directly proportional to the width of the vegetated riparian zone.

4.6 Digest of Impacts to Riparian Functions

Because all proposed modifications within the 250 foot Protected Review Area (PRA) would occur on top of and landward of the existing levee, no direct impacts above the existing baseline are anticipated with the exception of the Wetland Mosaic Segment. An assessment of project activities relating to the each of the four project segments follows.

4.6.1 Gages Slough – The Gages slough segment extends along approximately 1,200 linear feet along Lafayette Road. Gages Slough is listed on the Environmental Protection Agency's 303d List of Impaired Waters. The slough segment includes a narrow band of deciduous trees between the channel and Lafayette Road. The trees provide a limited source of LWD recruitment, shade, bank stabilization, and wildlife habitat. While the slough is linear in nature and was a historic meander channel of the Skagit River it is currently isolated from the Skagit River by the levee system. The project site is separated from Gages Slough by the County road. The area proposed for levee construction consists of farmland along the eastern right of way of the road. While trees, shrubs and groundcover may be removed adjacent to the right of way, they do not contribute to the riparian functions of the slough because they are isolated from the slough by the public road. No work is proposed for the western right of way of the road. All fill material will be placed east of Lafayette Road.

4.6.2 Side Channel of Skagit River – The side channel segment measures approximately 700 linear feet in length with a channel width of approximately 40 feet. The existing levee is located approximately 120 feet landward of the ordinary high water mark (OHWM) of the side channel. The OHWM was identified during the wetland site assessment at a point near the waterward toe of bank at the transition from herbaceous species consisting of obligate and facultative wetland species to woody facultative wet and facultative upland species. The side channel itself includes many down trees and snags. The banks are dominated by large cottonwood and alder. The area waterward of the side channel consists of a mix of upland and wetland features which include a mature deciduous forest. Overall the side channel provides a full suite of high quality riparian functions, limited only by the relatively narrow band of trees (< 30 feet) along the landward bank. While the side channel is considered part of the Skagit River and is designated as a Type S Water, the character is distinct from the armored bank which extends downstream (south) of the confluence with the mainstem. All levee modifications including the placement of fill material

will occur on top of and landward of the existing levee or 120 feet from the OHWM. No impacts to the riparian buffer are anticipated.

Photo 5 – View south showing Lafayette Road, area proposed for levee (along dotted line) and Gages Slough to right of road at arrow.

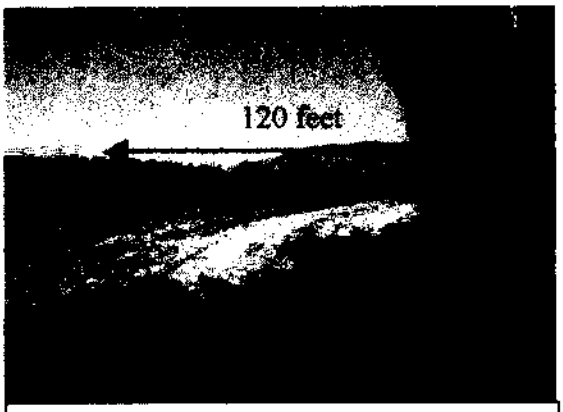


Photo 6 – View north along side channel (to right of trees) showing horizontal distance from OHWM to existing top of levee (project site).

4.6.3 Skagit River – The Skagit River segment extends 3,200 linear feet from the confluence of the side channel segment downstream to the buffer associated with the wetland mosaic. The banks are armored with heavy rock rip rap. Vegetation over the northern 2,100 feet is generally limited to willow, alder and invasive species including blackberry and Japanese knotweed located along the top of bank. The area between the top of riverbank and toe of levee is maintained in a mix of pasture grasses. The area has little functional riparian vegetation and no source of large woody debris recruitment with the exception of mixed hardwoods and conifers planted recently for approximately 1,000 linear feet of this segment. The southern 1,100 feet includes a narrow canopy of mature deciduous trees approximately 100 feet in width that extends to the northern boundary of the Wetland Mosaic Segment. No functional riparian vegetation will be removed as a result of the project. All levee modifications within the 200 foot riparian buffer will consist of fill upon the exiting levee. All modifications will occur landward of the existing top of levee at a minimum of 100 feet landward of the OHWM. (Attachment B: Cross Section at Skagit River Segment)

4.6.4 Wetland Mosaic - The Wetland Mosaic segment consists of approximately 25.5 acres. The segment extends from the wetland boundary along the waterward (southeastern) toe of the existing levee in the northwest, approximately 2,150 feet south to Gardner Road. The landward edge of the wetland varies from 200 to 900 feet from the active channel of the Skagit River. The linear wetland feature shown in Photo 8 represents the northwestern component of the mosaic and is classified as F (fish habitat). The wetland mosaic includes emergent scrub shrub, and forested classes. No functional riparian or wetland buffer vegetation will be removed. All modifications will occur on or landward of the existing levee structure. Impacts will be limited to fill placed on existing pasture grasses a minimum of 116.25 feet from the wetland edge. A buffer averaging plan included in the wetland site Assessment (GBA, November 8, 2012) was prepared to reduce the standard buffer from 155 feet to 116.25 feet. (Attachment C: Cross Section of Levee at Wetland Mosaic)

Photo 7 – View south showing Skagit River Segment: willows along top of bank at left, recent planting center and deciduous forest in background. Dashed line represents approximate 200 foot riparian buffer.

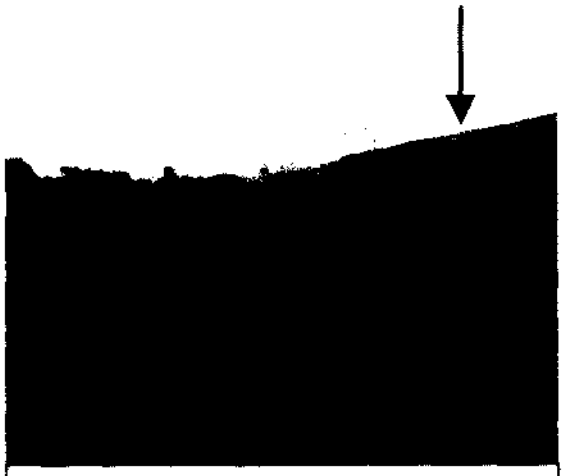


Photo 8: View south showing linear wetland component of Wetland Mosaic Segment. Wetland mosaic includes emergent, scrub shrub and forested vegetation classes. Existing levee and stockpiled material is shown at arrow.

5. Regulatory Analysis

Section 14.24.070 of the CAO provides for the specified categories of activities to occur without standard critical area review. Subsection 14.24.070 (7) addresses the subject proposal specifically:

"Provided that the requirements of SCC 14.24.120(4) (d) are met for ongoing agriculture, the lawful operation and maintenance of public and private diking and drainage systems which protect life and property along the Skagit and Samish Rivers and tidal estuaries in Skagit County. This exemption applies to the existing structures and design prism of levees, dikes, and artificial watercourses 40 feet landward of the landward toe of the structure or facility and 40 feet waterward of the waterward toe of the structure, measured horizontally from the face of the levee, dike or bank of the artificial drainage structure toward the ordinary high water mark. The exempt area for operation and maintenance may be managed to meet Federal standards for funding assistance established by the United States Army Corps of Engineers under Public Law 84-99 or other laws and regulations adopted to guide the diking and drainage functions. This exemption does not apply to public or private activities that expand the levee, dike, or drain beyond its design characteristics as of June 1, 1999, the time of adoption of this Subsection; nor activities that expland or create new facilities."

5.1 Standard Critical Area Review

While extending the levee vertically and in a landward direction may be viewed as expansion, the expansion is limited to the existing developed area and the area landward of the existing levee. Based on review of the subject proposal it is clear that the project meets two of the standards listed under SCC 14.24.070 (7) above:

1. The project is proposed to protect human life and property from Skagit River flooding.
2. The project area may be managed to meet federal funding assistance for diking and drainage functions pursuant to Public Law 84-99.

Table 1: Summary of Riparian and Wetland Buffer Impacts

Project area by Segment	Length in Linear Feet	Length of Project in Proximity of Wetland Buffer	Area of Buffer Impact	Description of Project & Impact
Cages Slough	1,200 lf	1,200 lf within standard riparian buffer of 150' for Type F water > 5' wide (SCC 14.24.530 (1) (C)	none	Buffer bisected by public road – all work landward of public road (SCC 14.24.530 (4) (Note criteria addressed in Wetland Site Assessment, GBA, November 8, 2012)
Slough Side Channel	700 lf	700 lf within 120 feet of OHWM – Standard riparian buffer for Type S water = 200' (SCC 14.24.530 (1) (c)	none	All new fill within 200' of OHWM will be placed on existing top of levee and existing landward side slope of levee within 120' of OHWM. No impacts to soil or vegetation are proposed.
Skagit River	3,200 lf	1,450 lf a portion of which will be within 100 feet of OHWM - Standard riparian buffer for Type S water = 200' (SCC 14.24.530 (1) (c)	None	All new fill within 200' of OHWM will be placed on top or landward side slope of existing levee. Closest work will be within 100 feet of OHWM. No impacts to soil or vegetation are proposed.
Wetland Mosaic	2,150 lf	1,400 lf within 116.25' of optional buffer for Category I Wetland (Habitat Score 28) (SCC 14.24.230 (1) (b)	Reduced buffer for 800 lf – Buffer will not be reduced below 25% of the optional buffer of 155'.	A buffer averaging plan has been prepared to reduce the standard wetland buffer of 155' to 116.25' Impact consists of fill on native soil and new impervious surface (SCC 14.24.240 (2) (see Wetland Site Assessment GBA, November 8, 2012)

5.2 Shoreline Master Program Review

Chapter 2, Subsection 2.05, item j. of the Skagit County Shoreline Master Program exempts the following category of development from the shoreline substantial development permit requirement:

"Operation and maintenance of any system of dikes, ditches, drains or other facilities existing on the effective date of this 1975 amendatory act which were created, developed or utilized primarily as a part of an agricultural drainage or diking system."

The subject Skagit River levee maintained by Dike District No. 12 was developed prior to the 1975 effective date as part of the agricultural diking system, which protects the agricultural lands of the Skagit Delta as well as the City of Burlington and portions of rural Skagit County. It would appear that reshaping of the landward portion of the existing levee could be considered operation and maintenance of the levee system if "operation and maintenance" is interpreted as maintaining the levee system in the serviceable manner for which it was intended. However, Skagit County Planning and Development Services has determined that a Shoreline Substantial Development Permit is required for the project.

5.3 Flood Damage Prevention Ordinance

Section 14.24.630 (3) of the CAO also requires compliance with SCC Chapter 14.34 (Flood Damage Prevention Ordinance). Subsection 14.24.630 (3) requires consideration of the Endangered Species Act as follows:

"The applicant shall demonstrate that the development is not likely to adversely affect species protected under the Endangered Species Act, consistent with the provisions of Chapter 14.34 SCC and this chapter..."

The Flood Damage Prevention Ordinance identifies the "Protected Review Area" as lands within the floodway, riparian habitat zone and the channel migration area. Although the project is not proposed for the floodway or channel migration area it is within the Riparian Habitat Zone which is defined as the area within 250 feet of all waters of the State (as defined under WAC 222-16-031) within the Special Flood Hazard Area. A portion of the proposed project activities will be located within the 250 foot Riparian Buffer Zone, the landward portion of which is also located within the Special Flood Hazard Area which is identified as an A7 Zone on Community Panel Number 530151-0250 C of the Flood Insurance Rate Map (Effective January 3, 1985). The A1 through A30 zones are identified as:

"Areas of 100-year flood; base flood elevation and flood hazard factors determined."

Because proposed project activities are located within the Protected Review Area, a fish and wildlife habitat conservation area site assessment has been required. Consistent with requirements of the Flood Damage Prevention Ordinance the assessment includes analysis of potential affects to Chinook salmon and Southern Resident Killer Whale resulting from activities proposed for both the Riparian Buffer Zone and Special Flood Hazard Area.

5.3.1 Action Area

The action area consists of an approximate 0.5-mile radius around project site. Construction activities will include noise and vibration from heavy equipment, trucks, power tools and hand tools. Noise from construction activities will be temporary and will not likely be discernable from back ground noise levels emanating from adjacent sources within the action area including State Route 20. Because all work will be conducted landward of the top of the existing levee, no impact to the aquatic area (Skagit River) is anticipated.

5.3.2 Existing Environmental Conditions

The right bank of the Skagit River adjacent to the project site includes areas armored with rock rip rap and generally absent of functional riparian vegetation. As noted under existing conditions there are no trees along the northern portion of The Skagit River Segment and consequently no potential for LWD recruitment. Similarly other riparian functions along the northern portion of the segment including shade, bank stability, and wildlife habitat are also generally absent. Other portions of the project area, however exhibit more favorable habitat conditions. The Side Channel Segment, and Wetland Mosaic Segment exhibit relatively high quality riparian habitat.

5.3.3 Species Information

All species of Pacific salmon, steelhead, bull trout and coastal cutthroat trout utilize the subject stream segment as out migrating juveniles and returning adults. Many other aquatic species utilize the river as well. The proposed project will occur above and landward of the top of the existing levee ranging from 100 to several hundred feet landward of the OHWM. While a number of species could be affected by the proposal, the scope of this assessment is limited under the Skagit County Flood Damage Prevention Ordinance to the species summarized in the following table:

Table 2: Species Status Table

Species	ESA Listing Status	Agency of Jurisdiction
Puget Sound ESU* Chinook salmon	Threatened*	NMFS*
Southern Resident killer Whale DPS*	Threatened	NMFS

*ESU = Evolutionarily significant unit/*NMFS = National Marine Fisheries Service/*DPS = Distinct population segment/*Threatened = any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range

5.3.4 Puget Sound (ESU) Chinook salmon – Chinook salmon were listed as threatened by NMFS (64FR 14308) on August 2, 1999. While no suitable spawning habitat within the action area was observed during our site assessment, adult and juvenile salmonids including Chinook migrate throughout the lower Skagit River. Wild Puget Sound Chinook spawn in the main stem of rivers at water depths of few inches to a depth of several feet in substrate ranging in size from small gravel to cobble. Fry emergence is dependent upon water temperature, but may begin as early as January. Ocean-type Chinook fry spawned in the main stem move downstream soon after hatching, although stream-type Chinook may spend up to a year in the river before out-migrating to Puget Sound during the winter and spring. Normally, Chinook fry seek pools and other low energy areas suitable for rearing as they move downstream. After a short period of acclimation to the marine environment, the juveniles begin to migrate throughout Puget Sound and finally to the open ocean. During this immature "blackmouth" phase Chinook salmon may residualize in Puget Sound and spend up to three years in the area. Rivers and large tributaries are considered Critical Habitat for Chinook salmon.

5.3.5 Southern Resident Killer Whale DPS – Southern resident killer whales were listed as threatened by NMFS (70FR 69903) on November 18, 2005. The DPS consists of three (3) pods identified as the J, K and L pods. Southern Resident Killer Whales may occur anywhere within the inland waters of Puget Sound during the summer and early fall. Southern resident killer whales are a long-lived species with late onset of sexual maturity. Females produce relatively few surviving calves during their reproductive life span. The DPS is highly mobile and can travel up to 86 miles in a single day. The DPS is more common in coastal waters from late fall to spring. There is little information relating to the distribution of and habitat use of the Southern Residents along the outer coast but indications are that they travel little more than 50 km offshore. Research indicates that the DPS exhibits a distinct preference for Chinook salmon which may constitute up to 72% of their prey. The Southern Residents are linked with Chinook salmon and their critical habitat as predator/prey. Critical habitat for the Southern Residents includes approximately 2,560 square mile of inland waters including Puget Sound.

5.3.6 Analysis of Effects

The existing levee will be extended 4 feet in height and up to 60 feet landward of the existing landward toe. Approximately 178,425 cubic yards of fill will be placed along the 1.53 mile project route. Approximately 86,000 cubic yards have already been permitted and stockpiled on site. Fill will be placed, compacted in stages and hydro seeded along the entire project route.

5.3.7 Direct Effects – Potential impacts to the riparian buffer zone and special flood hazard area resulting from reshaping of the existing levee may include:

- Temporary impacts to the riparian buffer zone may occur due to removal of surface vegetation and exposure of surface soils and newly placed fill material to forces of erosion. Unchecked it is possible that sediments could erode from the project site and enter the Skagit River resulting in increased turbidity.

- Other temporary impacts to water quality due to construction activities such as potential fuel, oil or hydraulic fluid spills.

Portions of the riparian buffer zone will be impacted on a temporary basis through the placement of fill material and reshaping of the levee. The impact will be short term for the period of construction. It is expected that the riparian buffer condition will return to the existing baseline within 6 months to a year following completion of the project. It should be recognized that the current condition consists of the existing levee structure.

5.3.8 Indirect Effects - No functional riparian vegetation is proposed to be removed as a result of project actions. In short no indirect effects to listed species have been identified. The discussion of effects to listed species, however, invites discussion of the effects of not undertaking the proposed levee modifications. If proposed modification to the levee do not occur and a major flood event results in failure of the existing levee, what are the anticipated effects of urban flooding on the Skagit River and associated species. Balancing management of the floodplain for fish habitat and human uses is subject to considerable public discussion. While this public policy issue is outside of the scope of this assessment it is deserving of open dialogue and compromise.

5.3.9 Conservation Measures

The following conservation measures are recommended to be incorporated into project activities to minimize impacts to the aquatic habitat, riparian buffer zone and special flood hazard area. In addition to the conditions included on the Mitigated Determination of Nonsignificance (dated October 9, 2012) as issued by the Skagit County Department of Planning and Development services, the following conservation measures should be followed.

1. To the extent practicable seasonal timing of the project should avoid conditions of high river flows and heavy precipitation.
2. The temporary erosion and sedimentation control plan described in the application materials should be implemented at groundbreaking and maintained throughout the construction and post construction phases.
3. All fill materials should be groomed to remove man-made debris and materials that may enter surface or groundwater. Any such materials found should be disposed of at a permitted upland location.
4. All sod and top soil excavated from the site should be stockpiled on the landward side of the levee and equipped with appropriate erosion controls.
5. All equipment should be inspected on a regular basis for fuel, oil and hydraulic leaks. The contractor should have appropriate materials on site to be used in the event of a petroleum product spill and measures to avoid petroleum products or other deleterious materials from entering surface or groundwater.

5.3.10 Determination of Effects

The following table summarizes the effects analysis for ESA listed species.

Table 3: Effects Determination Table

Puget Sound ESU Chinook salmon	NLTAA*	None
Southern Resident killer Whale DPS	NLTAA	None

*NLTAA = Not Likely to Adversely Affect/*Take = To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or to engage in any such conduct.

5.3.11 Puget Sound Chinook Salmon – The proposed project may affect but is not likely to adversely affect, Puget Sound Chinook salmon. Chinook migrate through the action area as out migrating juveniles and returning adults, however the project will occur landward of the existing levee and is not anticipated to impact the riparian buffer zone beyond the existing baseline. Existing baseline conditions reflect management of the riparian buffer zone for the primary purpose of flood control. Similarly he proposed project will not adversely modify critical habitat for Puget Sound Chinook salmon, in part, because the riparian buffer zone is currently modified for flood control purposes. In addition modification of the levee will result in an improved flood control which will assist in avoiding water quality impacts associated with urban flooding.

5.3.12 Southern Resident Killer Whale - The proposed project may affect but is not likely to adversely affect, southern resident killer whale. Because the proposal is not likely to adversely affect Chinook salmon there will be no corresponding affect on Southern Resident Killer Whales that prey upon Chinook salmon. Because the action area is located outside of the inland waters of Puget Sound the proposed project will not adversely modify critical habitat for southern resident killer whale.

6. Summary and Closure

The project has been determined to require standard critical area review and a shoreline substantial development permit under the Skagit County Critical Areas Ordinance and Shoreline Master Program. While GBA utilized currently accepted methods and protocols for the identification of habitat conservation areas, and assessment of effects to ESA listed species, the findings and conclusions rendered in this report represent our best professional opinion. Concurrence should be obtained from Skagit County Planning and Development Services and other agencies of jurisdiction prior to initiating construction activities. Thank you for contacting us with your project. Please call either Patricia Bunting or myself with any questions relating to this report.

Patricia Bunting, Wetland Ecologist/PWS

Oscar Graham, Shoreline Planner

7. References

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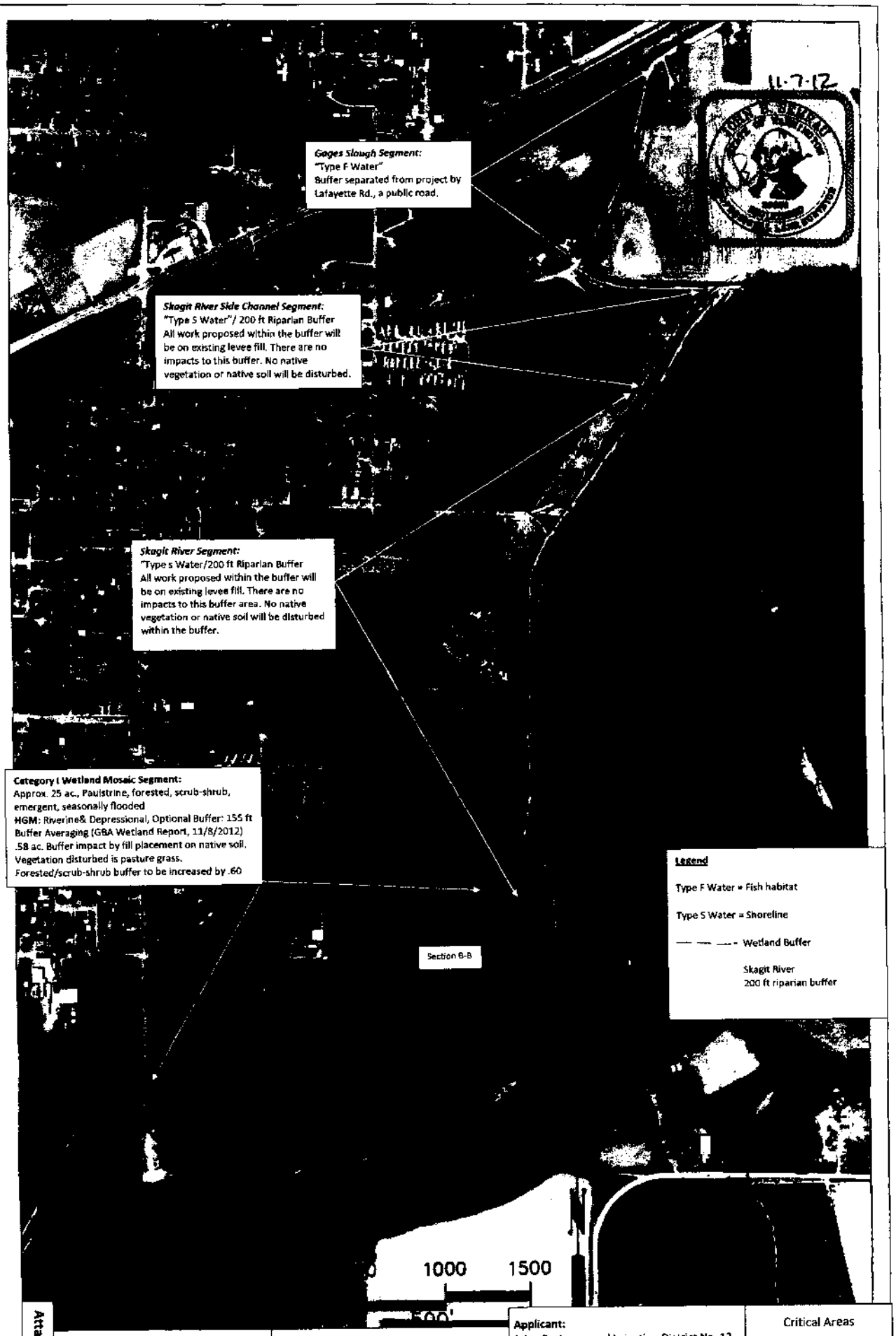
Semrau, John. Semrua Engineering and Surveying, PLLC; Telephone Consultation regarding project information relating to Proposed Dike District 12 Levee Modification: November 2012 – March 1013.



Attachment A

Surveying/Base Map Prepared by:
Semrau Engineering & Surveying
Mount Vernon, WA 98273
Ph: 360.424.9566

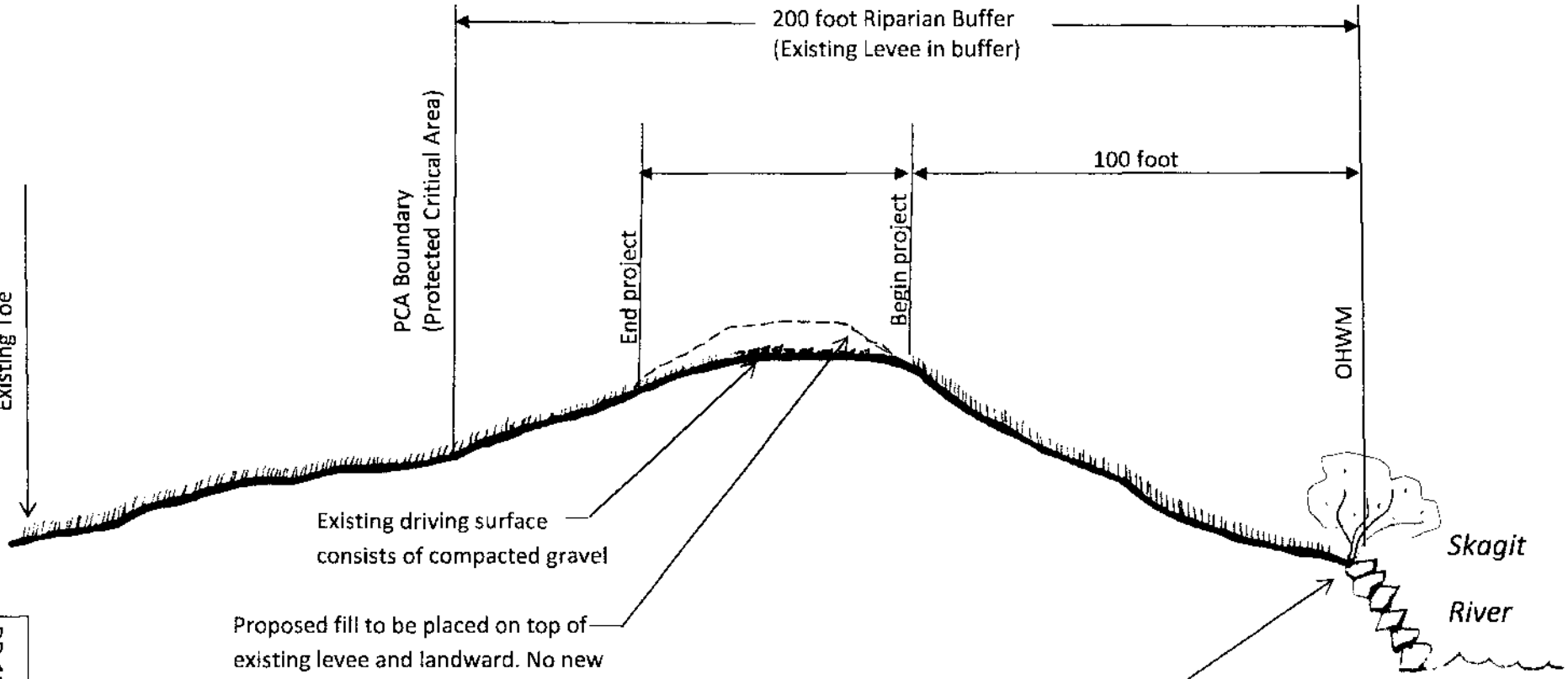
Prepared by: Graham-Bunting Associates
Environmental & Land Use Services
3643 Legg Rd., Bow, WA 98232
Ph: 360.766.4441

Applicant:
Dike, Drainage, and Irrigation District No. 12
Permit No: PL12-0207
Contact: John Semerau
Semrau Engineering & Surveying

Critical Areas

Site Plan

Date: February 27, 2013



Cross-Section A-A

Looking North Near STA 211+50 (Not to Scale)

This cross-section represents the closest point of the project to the OHWM.

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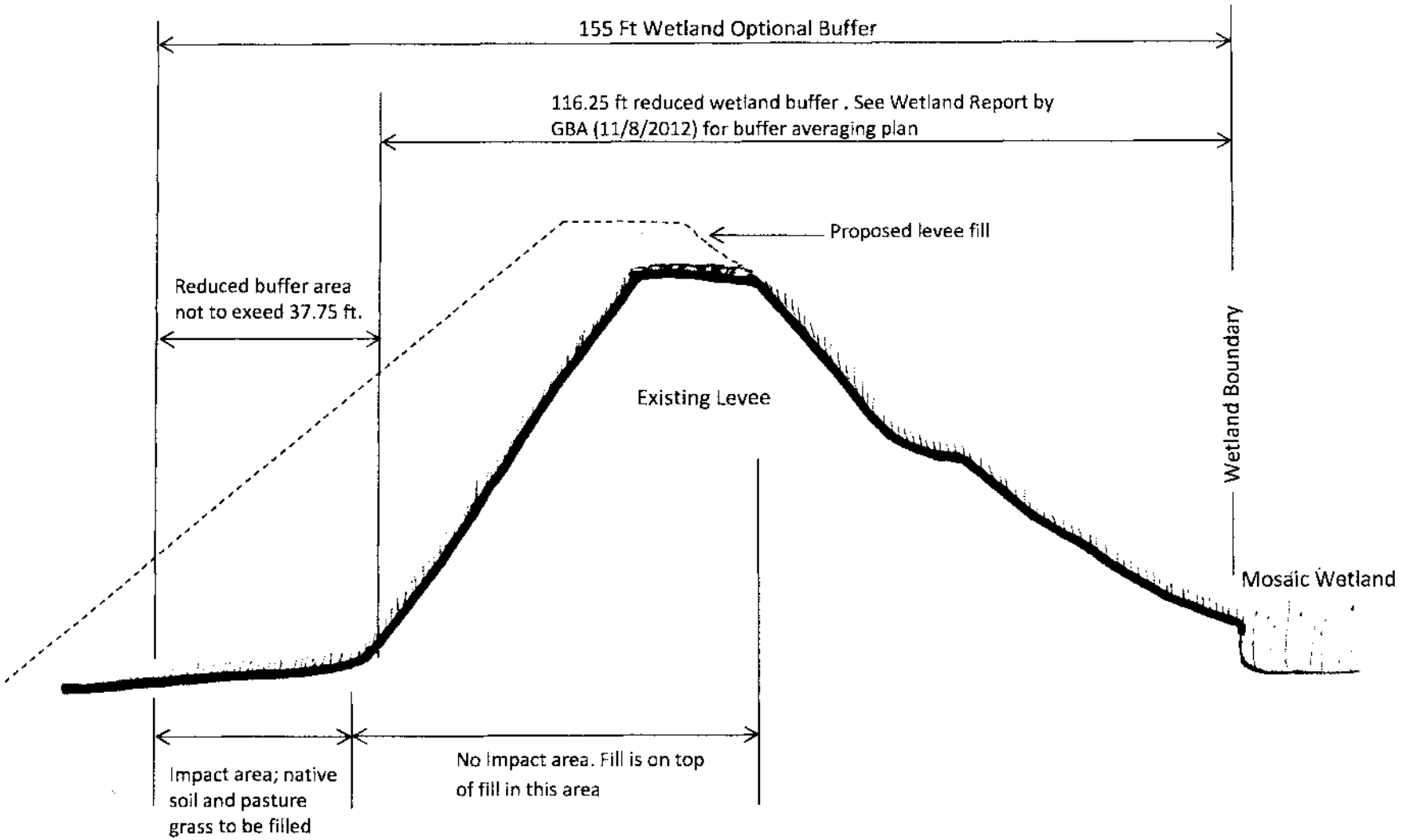
Fish & Wildlife Assessment

DD-12 Levee Certification Project

Attachment B



Cross-Section B-B

Looking East (Not to Scale)

This cross-section represents the area where the wetland buffer is reduced and mitigated by buffer averaging.

Graham-Bunting Associates: Feb. 27, 2013
Fish & Wildlife Assessment

DD-12 Levee Certification Project

Attachment C