OMB Number: 4040-0004
Expiration Date: 01/31/2009

Application for Federal Assistance SF-424 — Version 02

* 1. Type of Submission:	* 2. Type of Application:	* If Revision, select appropriate letter(s):
☐ Preapplication	☒ New	
☒ Application	☐ Continuation	* Other (Specify)
☐ Changed/Corrected Application	☐ Revision	

* 3. Date Received:
4. Applicant Identifier:
5a. Federal Entity Identifier:
* 5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:
7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: Tillamook County

* b. Employer/Taxpayer Identification Number (EIN/TIN): 93-6002312

* c. Organizational DUNS: 06-058-4554

d. Address:

* Street1: 201 Laurel Avenue
Street2:
* City: Tillamook
County:
* State: Oregon
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 97141

e. Organizational Unit:

Department Name:
Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:
* First Name: Rachel
Middle Name:
* Last Name: Hagerty
Suffix:

Title: Habitat Restoration Manager

Organizational Affiliation:
Tillamook Estuaries Partnership

* Telephone Number: 503 322-2222
Fax Number: 503 322-2261

* Email: rachel@tbnep.org

OMB Number: 4040-0004
Expiration Date: 01/31/2009

Application for Federal Assistance SF-424 Version 02

9. Type of Applicant 1: Select Applicant Type:

B. County Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

National Marine Fisheries Service - National Ocean & Atmospheric Administration - Department of Commerce

11. Catalog of Federal Domestic Assistance Number:

11.463

CFDA Title:

Habitat Conservation

*** 12. Funding Opportunity Number:**

NOAA-NMFS-HCPO-2013-2003587

* Title:

FY 2013 Coastal and Marine Habitat Restoration Project Grants

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

City of Tillamook, Tillamook County

*** 15. Descriptive Title of Applicant's Project:**

Southern Flow Corridor - Landowner Preferred Alternative (SFC)

Attach supporting documents as specified in agency instructions.

OMB Number: 4040-0004
Expiration Date: 01/31/2009

Application for Federal Assistance SF-424 — Version 02

16. Congressional Districts Of:

* a. Applicant: 5

* b. Program/Project: 5

Attach an additional list of Program/Project Congressional Districts if needed.

17. Proposed Project:

* a. Start Date: 10/2013

* b. End Date: 09/2016

18. Estimated Funding ($):

* a. Federal	2,699,851.00
* b. Applicant	21,094.00
* c. State	2,754,654.00
* d. Local	0.00
* e. Other	3,771,928.00
* f. Program Income	0.00
* g. TOTAL	9,247,527.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☑ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes", provide explanation.)**

☐ Yes ☑ No

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☐ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix:

* First Name: Bill

Middle Name:

* Last Name: Baertlein

Suffix:

* Title: Vice Chair - Tillamook County Board of Commissioners

* Telephone Number: 503 842-3403

Fax Number: 503 842-1384

* Email: bbaertle@co.tillamook.or.us

* Signature of Authorized Representative: Bill Baertlein by [initials]

* Date Signed: 2-15-13

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Standard Form 424 (Revised 10/2005)
Prescribed by OMB Circular A-102

BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. SFC	11.463	$	$	$ 2,699,851.00	$ 3,322,676.00	$ 6,022,527.00
2.						0.00
3.						0.00
4.						0.00
5. Totals		$ 0.00	$ 0.00	$ 2,699,851.00	$ 3,322,676.00	$ 6,022,527.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1) SFC	(2)	(3)		
a. Personnel	$ 110,701.00	$	$	$	$ 110,701.00
b. Fringe Benefits	43,300.00				43,300.00
c. Travel					0.00
d. Equipment					0.00
e. Supplies					0.00
f. Contractual	3,874,699.00				3,874,699.00
g. Construction					0.00
h. Other	1,993,827.00				1,993,827.00
i. Total Direct Charges *(sum of 6a-6h)*	6,022,527.00	0.00	0.00	0.00	6,022,527.00
j. Indirect Charges					0.00
k. TOTALS *(sum of 6i and 6j)*	$ 6,022,527.00	$ 0.00	$ 0.00	$ 0.00	$ 6,022,527.00
7. Program Income	$	$	$	$	$ 0.00

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SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8. SFC - Landowner Preferred Alternative	$ 21,094.00	$ 2,754,654.00	$ 546,928.00	$ 3,322,676.00
9.				0.00
10.				0.00
11.				0.00
12. TOTAL *(sum of lines 8-11)*	$ 21,094.00	$ 2,754,654.00	$ 546,928.00	$ 3,322,676.00

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 241,908.00	$ 60,477.00	$ 60,477.00	$ 60,477.00	$ 60,477.00
14. Non-Federal	1,322,573.00	330,643.00	330,643.00	330,643.00	330,644.00
15. TOTAL *(sum of lines 13 and 14)*	$ 1,564,481.00	$ 391,120.00	$ 391,120.00	$ 391,120.00	$ 391,121.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16.SFC - Landowner Preferred Alternative	$ 241,908.00	$ 1,811,999.00	$ 645,944.00	$
17.				
18.				
19.				
20. TOTAL *(sum of lines 16-19)*	$ 241,908.00	$ 1,811,999.00	$ 645,944.00	$ 0.00

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges:	22. Indirect Charges:
23. Remarks:	

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OMB Approval No. 0348-0040

ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.

10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.

16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE
Bill Baertlein by	Vice Chair, Tillamook Cty Board of Commissioners
APPLICANT ORGANIZATION	DATE SUBMITTED
Tillamook County	2-15-13

FORM CD-511
(REV 1-05)

U.S. DEPARTMENT OF COMMERCE

CERTIFICATION REGARDING LOBBYING

Applicants should also review the instructions for certification included in the regulations before completing this form. Signature on this form provides for compliance with certification requirements under 15 CFR Part 28, "New Restrictions on Lobbying." The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of Commerce determines to award the covered transaction, grant, or cooperative agreement.

LOBBYING

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 15 CFR Part 28, for persons entering into a grant, cooperative agreement or contract over $100,000 or a loan or loan guarantee over $150,000 as defined at 15 CFR Part 28, Sections 28.105 and 28.110, the applicant certifies that to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in conncection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying." in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure occurring on or before October 23, 1996, and of not less than $11,000 and not more than $110,000 for each such failure occurring after October 23, 1996.

Statement for Loan Guarantees and Loan Insurance

The undersigned states, to the best of his or her knowledge and belief, that:

In any funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

Submission of this statement is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required statement shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure occurring on or before October 23, 1996, and of not less than $11,000 and not more than $110,000 for each such failure occurring after October 23, 1996.

As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above applicable certification.

NAME OF APPLICANT	AWARD NUMBER AND/OR PROJECT NAME
Tillamook County	Southern Flow Corridor - Landowner Preferred Alt

PRINTED NAME AND TITLE OF AUTHORIZED REPRESENTATIVE

Bill Baertlein, Vice Chair, Tillamook County Board of Commissioners

SIGNATURE	DATE
Bill Baertlein by [illegible]	2-15-13

SOUTHERN FLOW CORRIDOR – LANDOWNER PREFERRED ALTERNATIVE
FY 2013 Coastal and Marine Habitat Restoration Project Grant Application

PROJECT SUMMARY

- **Applicant Organization:** Tillamook County
- **Project Title:** Southern Flow Corridor-Landowner Preferred Alternative (SFC)
- **Site Location:** Tillamook, Oregon (mouth of Wilson and Trask Rivers in Tillamook Bay estuary) 45°27-28'N 123° 50-53'W

EXECUTIVE SUMMARY

Listed as "threatened" under the federal Endangered Species Act (ESA), Oregon coastal coho populations have been severely impacted by the loss of off-channel and tidal wetland habitats. In few places is this impact more pronounced than in Oregon's Tillamook Bay, where almost 90% of the estuaries' tidal wetlands have been lost to agricultural and urban/residential development. The resulting lack of available tidal wetland habitats has been a primary contributor to the decline of Tillamook Bay coho, and today's runs (just over 2,000 fish in 2012) represent a fraction of estimated historic abundance (~200,000). Likewise, the lack of available tidal wetland habitats has been identified as a key impediment to species recovery both in Tillamook Bay and across the Evolutionary Significant Unit (ESU). These tidal habitat losses have impacted the Bay's four other anadromous species, as well, particularly Chinook which use tidal wetlands extensively for rearing.

The Project. Working with a diverse set of partners, Tillamook County proposes to permanently protect and restore 521 acres of tidal wetland habitats at the confluence of the Bay's two most productive salmon systems, the Wilson and Trask Rivers. Representing 10% of the watershed's historic tidal acreage and a far greater percentage of the "restorable" tidal lands, the project site contains an expansive mosaic of tidal wetlands, disconnected freshwater wetlands, and drained pasture lands. Once restored to a tidal regime, the resulting range of habitats (including mud flats, aquatic beds, emergent marsh, scrub-shrub wetlands, forested wetlands and sloughs) will provide substantial habitat benefits to not only threatened coho, but also chum and Chinook salmon, and cutthroat trout.

By delivering full tidal inundation to 521 acres of restored marsh and wetland fringe habitats, this project directly addresses the loss and simplification of estuarine rearing habitat for the project's five Target salmonid species. Coupled with the re-creation of 14 miles of high quality off-channel areas on-site, this project represents a crown jewel of tidal wetlands conservation efforts in the Pacific Northwest. The project will proceed in three phases:

- Phase 1: Design and Acquisition: In addition to 398 acres within the project area that are currently in public ownership and slated for restoration, Tillamook County will acquire or lease an additional 248 acres (not using NOAA funds). As these lands are being leased/acquired, the County will work with project partners to complete the final design and engineering; acquire permits; develop a monitoring plan; and undertake baseline monitoring. (Timeline: October 2013 - April 2015)

- Phase 2: Construction: The project will result in the removal of seven miles of existing levees, 85,000 cubic yards of material, and 2.1 miles of road. Nine tidal channels will be reconnected, resulting in the restoration of over 14 miles of tidal channels on site. Over three miles of drainage ditches will be filled to restore a natural drainage regime. Additional construction activities will include lowering 2.1 miles of levee; upgrading and constructing 2.1 miles of dikes; removing and/or relocating seven tidegates and one floodgate; and removing four structures. The project will also undertake extensive large wood placement. (Timeline May 2013 - November 2015)

- Phase 3: Post-project Monitoring: The preliminary monitoring plan proposes monitoring changes in soil and vegetation, groundwater levels, tidal hydrology and channel morphology, sedimentation, fish distribution and density, fish use of large wood structures, and macro-invertebrates. (Timeline: October 2016 - October 2019)

The success of this project will be measured by: 1) the degree to which we can meet the restoration targets bulleted above and 2) the resulting habitat improvements demonstrated by post project monitoring. While no basin specific modeling exists to project anticipated increases in Target salmonid populations, we are confident that monitoring will demonstrate increases in both species distribution and density within the project area. Additional long term ecological and socio-economic outcomes will include:

- improved freshwater and estuarine water quality, including reductions in temperature, dissolved oxygen, and turbidity;
- increased habitat complexity and availability across the range of tidal wetlands habitats;
- enhanced ecological function benefitting other aquatic, terrestrial, and avian species; and
- reduced flooding in the Highway 101 business corridor, including measurable reductions in both flood elevation and duration.

Project Time Line: Phase 1 (October 2013-April 2015), Phase 2 (May-November 2015), Phase 3 (October 2016-October 2019)
Permits and Approvals required will include the following: US Army Corp of Engineers Nationwide Permit 27, Oregon Department of State Lands Removal/Fill General Authorization and Wetland Determination and Delineations, National Marine Fisheries Service SLOPES (IV), Oregon Department of Fish and Wildlife In-Water Timing Guidelines, Fish Passage Requirements, and Habitat Mitigation Recommendation, Oregon Department of Land Conservation & Development Coastal Zone Management Act Consistency Certification, Oregon Department of Environmental Quality 1200-C Storm Water Permit and 401 Water Quality Certification, Oregon State Historic Preservation Office National Historic Preservation Act Section 106, and Tillamook County Development Permit and Flood Hazard Assessment (all permits and approvals to be applied for in Phase 1).
Land Owner: Tillamook County. Contact Paul Levesque, 201 Laurel Avenue, Tillamook, OR 97141, 503-842-1809. For the project to occur four other properties will have construction or floodway easements (refer to Section 2.3).
Funding Requested per Year: Year 1-$241,908 Year 2-$1,811,999, Year 3-$645,944
Total Federal Funds Requested & Non-Federal Match Anticipated: $3,299,027
Total Other Federal Funds and Non-Federal Funds (Not-Matched): $5,948,500
Overall Project Cost: $9,247,527

PROJECT NARRATIVE

SECTION 1 - IMPORTANCE & APPLICABILITY

The goal of this project is to restore and permanently protect wetland function in the upper Tillamook Bay estuary, dramatically improving habitat conditions for anadromous salmon populations, as well as other wildlife and plant species. This massive 646-acre project represents an extraordinary and potentially fleeting opportunity to enhance 521 wetland acres, while also advancing a range of objectives held by a diverse and supportive local community.

1. TARGET SPECIES

The Oregon Department of Fish and Wildlife (ODFW) has identified five Target fish stocks that are among the numerous fish and wildlife species that will benefit from this project (Section 1.2).

Table 1. Target Fish Stocks for SFC Project.

Oregon Coast Fall Chinook Salmon[a]	Oregon Coast Coho Salmon[abc]
Oregon Coast Spring Chinook Salmon[a]	Oregon Coastal Cutthroat Trout[b]
Oregon Coast Chum Salmon[b]	
[a]Magnuson-Stevens Fisheries Conservation & Management Act Essential Fish Habitat (EFH) designated, [b]ODFW Conservation Strategy (OCS), Key Species. [c]ESA *Threatened*	

Chinook (Fall and Spring Races). Like many other Pacific salmon, Chinook salmon have evolved diverse life history strategies to take advantage of an array of estuarine habitats.[1] Chinook salmon (both fall and spring races) depend on estuarine habitat for juvenile rearing. Increased body growth from estuarine rearing has been directly correlated with smolt-adult-survival in Oregon coastal estuaries.[2] It is believed that estuarine rearing habitat for juvenile Chinook salmon in Tillamook Bay is at carrying capacity.[3] This density-dependent bottleneck (or limiting factor) stems from the extensive loss of wetland habitats utilized by juvenile Chinook. In Tillamook, 86% of tidal wetland rearing habitats have been lost since the 1850's.[4]

Coho. While it was once believed that juvenile coho migrated through the estuary relatively quickly as smolts destined for the ocean, research increasingly has confirmed that juvenile coho may utilize estuarine habitats for extended periods.[5] Current research suggests these fish may reside in the estuary through their first year of life or they may migrate upstream to rear in tributary habitats until their final ocean outmigration at Age 1+.

Chum. A chum salmon abundance remains at a fraction of historic levels. Degradation of freshwater spawning habitat and loss of estuarine rearing habitat, are believed to be the primary causes of this decline. ODFW field surveys in the project area have found that juvenile chum use backwater slough habitats and marsh fringe habitats.[6] Previous work by Ellis[7] showed that juvenile chum were relatively more abundant than other salmonids in the mid- to upper-bay during March and April.

Coastal Cutthroat Trout. ODFW monitoring of juvenile coastal cutthroat trout has demonstrated that cutthroat smolts leave their natal streams between April and May and migrate to the estuary and the near-shore ocean where they forage until returning to the rivers from midsummer to fall. Large adult sea-run cutthroat trout are generally most abundant in Pacific Northwest estuaries during late summer.

2. OTHER SPECIES

The following species, and numerous others, will benefit from restored project area habitats:

- **Fishes:** winter steelhead (NOAA Species of Concern, State *Sensitive*, OCS Key Species), Pacific lamprey (State *Sensitive*; OCS Key Species), white sturgeon, top smelt, three-spine stickleback, Pacific staghorn sculpin, shiner perch, English sole, and starry flounder
- **Birds:** California brown pelican (State *Endangered*, OCS Key Species), American peregrine falcon (State *Sensitive*, OCS Key Species), olive-sided flycatcher (State *Sensitive*; OCS Key Species), American bald eagle (OCS Key Species), Aleutian Canada goose (OCS Key Species), band-tailed pigeon (OCS Key Species), American bittern, great blue heron, green heron, belted kingfisher, rufous hummingbird, and miscellaneous waterfowl
- **Mammals:** Townsend's big-eared bat (State *Sensitive*, OCS Key Species), black-tailed deer, raccoon, beaver, river otter, and muskrat
- **Amphibians:** red-legged frog, Pacific tree frog, Western toad, Northwestern salamander, long-toed salamander, and roughskin newt
- **Invertebrates:** Many invertebrate species are sensitive to impaired water quality[8] and these species are important prey for juvenile salmon. Protecting the wetlands adjacent to Tillamook Bay is an essential part of maintaining the water quality that affects these invertebrates.

3. ECOLOGICAL IMPORTANCE

"Tidal wetlands serve many vital functions in the watershed. These functions include water quality protection, ecological support, and wildlife habitat. The value of tidal wetland functions may be enhanced by the location of these wetlands in the landscape—low in the watershed, in an economically important nursery zone for anadromous and marine organisms…"[4] The Southern Flow Corridor-Landowner Preferred Alternative (SFC) embodies these ecologic functions. Furthermore, the following elements are ecologically important in the Tillamook Bay estuary:

Habitat Loss and Simplification. An estimated 86% of the 6,035 acres of historic tidal wetlands in the Tillamook Bay estuary have been lost.[4] These tidal wetland habitats include forested and shrub tidal swamps and grassy tidal marsh. Remaining habitats also tend to be degraded and fragmented along outmigration corridors for Target fish species.

Water Quality. In addition to the habitat quality and quantity reductions, the lower Wilson and Trask mainstems are water quality limited for temperature and bacteria. In addition, sections of the rivers and sloughs are also water quality limited for dissolved oxygen (DO).

Flooding. Four of the five rivers draining into Tillamook Bay unite in the upper estuary just west of the City of Tillamook and Highway 101. Manmade alterations within the project area exacerbate flooding and disrupt the natural hydrological processes that shape and sustain critical habitats for Target species. Removal of these alterations will restore these processes, with a further benefit of a 1.5 foot floodwater level reduction in areas upstream of the project.

Climate Change. A recent Climate Leadership Initiative report states that sea-level rise in Oregon, driven by climate change, "will severely impact low-lying coastal areas".[9] TEP's draft climate change report estimates that local sea-level rise has been approximately two millimeters (mm)/year.[10] Projections indicate that by 2100, local sea-level rise will be approximately 62 centimeters (cm), with a possible range of 10-140 cm. It's likely that Tillamook Bay will also experience more severe storms. Conserving and restoring wetlands adjacent to the Bay is likely to help mitigate sea-level rise and storm surge. The project's location at the confluence of the three rivers ensures an abundant sediment supply that will reduce the possibility of sea-level rise exceeding marsh accretion rates.

Fish Use. The project area supports a variety of fishes, including the five Target salmonids. Tidal wetlands are important to salmon population size, diversity, and viability in Oregon and the Pacific Northwest. The health of salmon populations depends on a continuum of diverse habitats across freshwater, estuarine and marine zones.[11,4] Tidal wetlands are crucial, providing rearing habitat characterized by a productive food web, deep meandering channels for shelter from predators and high velocity flows, cool water temperatures, and a brackish-freshwater interface for physiological adaptation to marine salinities. These features contribute to accelerated juvenile salmon growth during estuarine rearing, in turn supporting increased ocean survival.[4]

Currently, the site's degraded habitats and water quality limit the project area's salmonid production. The ecological importance of this project lies in its ability to recover and restore critical habitats and increase fish production. The potential for this project to provide meaningful conservation and restoration of critical habitats and species recovery is substantial. Not only will effects be evident within the project area, but the scale allows for improved ecosystem function in surrounding areas. Ecological benefits are elaborated in Section 1.7 and Table 3 shows the status of Target species and the project's relationship to factors limiting their productivity.

4. LANDSCAPE DESCRIPTION

The project site is located at the head of Tillamook Bay, the third largest estuary in Oregon. Tillamook Bay averages only about two meters depth over a surface area of 34 square kilometers. Several deep channels wind through the intertidal mud and sand flats that are exposed at low tide. The Bay receives freshwater input from the Miami, Kilchis, Wilson, Trask, and Tillamook rivers and exchanges ocean water through a single channel in the northwest corner. "The estuary contains all of Oregon's tidal wetland habitat types: mud flats, aquatic bed, emergent marsh, scrub-shrub wetlands, and forested wetlands."[4] These habitats are widely recognized for their high biological productivity and critical importance to estuarine-dependent fish and wildlife species.[11] Salinity ranges from around 32 parts per thousand (ppt) near the ocean entrance to about 15 ppt at the upper (southern) end of the Bay at high tide during the summer. Relatively high levels of DO are maintained throughout the year and ranges average from about 6-12 milligrams per liter (mg/l).

5. SITE HISTORY

Early settlers altered tidal wetlands in the estuary for agriculture and dikes, tidegates, culverts, and ditching are prevalent. The lower floodplains of the five rivers draining into the Bay, once tidal but now largely diked, provide high quality pasture and support a dairy industry.[12] Reconstruction of historical maps show the site was located in the transition zone between spruce forest wetland and high salt marsh. Thus, historically, the project area was likely mostly composed of high and low salt marsh interspersed with intertidal sloughs, with dense floodplain forests in the higher elevations. Systematic removal of large wood from the estuary further disconnected streams and adjacent floodplains and wetlands. In the late 19th century, natural wood jams near the mouths of the Wilson and Trask were cleared and channels were modified for navigation in the lower Trask and Hoquarten Slough.

Major forest fires from the 1930s to the 1950s resulted in greatly increased sediment loads in the watershed. In the 1950s, the Bayocean spit was breached, resulting in an additional massive sediment load being added to the Bay before being repaired. River channels within tidal influence experienced aggradation which was compounded by extensive diking that prevented natural deltaic sediment distribution processes from operating in the confined channels. In more recent times, reforestation of burn zones has decreased riverine sediment loads, as evidenced by channel narrowing and gravel bar reforestation upstream.[13] Dredging of the Wilson River in the early 1970s resulted in the placement of the spoils onsite adjacent to the river dike.

6. CURRENT SITE CONDITIONS

Dikes surround nearly the entire project area and have isolated the historic marsh from tidal inundation for over 60 years (Section 7. Map 1). The area north of Blind Slough, which was not diked until the 1960s and appears to have never been farmed, has converted to a freshwater wetland with highly regulated water levels. The northwest portion of the site along Hall Slough has naturally higher elevations and supports a second growth spruce forest. South of and adjacent to Blind Slough, a large area was managed for waterfowl after the cessation of farming, resulting in the excavated water features visible. The southern half along the Trask River is under lease for agriculture until restoration activities begin. Pasture production is active in the southeast area, and land is protected from the Trask River and Hoquarten and Dougherty Sloughs by levees. The easternmost portion of the project is dominated by historic spruce swamp with dike remnants along Hoquarten Slough limiting full floodplain connections. Numerous tidegates connect the project site to adjacent channels, but limit both juvenile salmon access and natural hydrological processes. Relict tidal channels are still clearly visible throughout the site. Interior elevations average six-eight feet. Based on comparison with adjacent reference sites outside the dike, subsidence of up to one-two feet has occurred over a large area.

The site contains existing priority habitats, such as Sitka spruce forest and freshwater marsh, but also has high potential for restoration of additional priority habitats like tidal swamp. The Tidal Wetland Prioritization for the Tillamook Bay Estuary[4] recognizes the project site contains two of the last seven remaining intact tidal swamps in the estuary. Furthermore, the study references and supports several SFC construction elements.

Hoquarten Slough provides some of the last remaining transitional habitat for juvenile salmonids as they move from fresh to salt water. Hoquarten Slough is water quality limited for DO and is listed on the State's 303(d) list of impaired water bodies. The Tillamook Estuaries Partnership (TEP) collected DO data from Hoquarten Slough between 2007 and 2009 and found DO levels frequently below 2 mg/L, a lethal level to salmon. Despite some of the highest quality riparian areas and spruce forest wetland, these low DO levels are a barrier to habitat use. Levees along the Slough have limited the tidal prism and perhaps contributed to this problem.

The area is the terminus of a flood conveyance pathway for flows that leave the Wilson River valley. In recent decades flooding has increased in frequency and severity. Following the 1996 floods, a bank of ten, six-foot diameter tidegates were installed to discharge floodwaters that were trapped behind the dike. Most recently, a high capacity spillway consisting of four side-hinge 6x12 foot tidegates was installed to further increase flood drainage capacity.

7. ECOLOGICAL BENEFITS

The community-supported SFC project is the perfect blend of land protection, habitat restoration, and flood mitigation occurring at a scale large enough to yield measurable results that address the Target species' limiting factors (Table 3). The project offers an opportunity to fully restore 521 acres of estuarine areas, currently in predominately agricultural use or freshwater wetlands, to the range of priority habitat types listed in Table 2. Restoration of tidal flows to the project site will initiate long term changes in the lands that have been disconnected by the diking system for decades. Among the many ecological benefits afforded by this project, four stand out: increased habitat complexity and availability, increased Target species use, water quality enhancement, and increased climate change resilience.

Increased Habitat Complexity and Availability. The 646 acre project area makes the SFC one of the largest tidal restoration efforts on the Oregon Coast. Of this area, 513 acres will be permanently protected in public ownership (Table 4). (The public versus private ownership accounts for the eight acre difference between restored and protected acreages.) The project will create a large scale, contiguous land block composed entirely of priority habitats (Table 2) and restore approximately 10% of historic tidal wetlands.

Table 2. Existing and Expected Acres of Future Habitat Types.

Habitat Classification	Existing Acres	Future Acres
Fill	64	0
Pasture	289	0
Emergent Freshwater Wetland	34	0
Low Tidal Marsh	0	323
High Tidal Marsh	29	72
Scrub-Shrub Freshwater Wetland	11	0
Sitka Spruce Forested Wetland	59	86
Water-No/Limited Connectivity	31	0
Water-Full River Connectivity	4	40
Totals	**521**	**521**

Habitat Diversity and Hydrology. The project will protect and enable restoration of an ecologically diverse site that spans a rapid transition zone, from freshwater spruce forest, tidally influenced freshwater wetlands, high salt marsh down to low marsh and intertidal mudflats. Removing the levees surrounding the site and along the sloughs will allow full connection with the Wilson and Trask Rivers and tidal influence within the site. The tidal prism on the site is greater than would be expected under natural conditions due to subsidence. It is expected that water levels in the site will closely parallel those in the Wilson and Trask rivers.

Sediment and Morphology. The project site is located at the end of the diked reach of the Wilson River and is well positioned to capture riverine sediments. Dike removal combined with daily high tides and river flows will immediately begin delivering sediment to the site. Ultimately it is expected the lands will rebuild from their current subsided condition up to high marsh, which around the project site typically sit one-two feet higher than Mean Higher High Water (MHHW). Rates of marsh building are expected to occur on the timescale of decades. The abundant sediment supply and proximity to the rivers should help to accelerate the process. Areas close to the river and connected tidal channels will rebuild quicker, while more distant portions of the marsh will accrete slower.

An estimated 14 miles of tidal channels will re-establish through construction (excavation) and the restoration of natural processes. Blind Slough will undergo enlargement as it becomes an important flood flow channel, conveying flows both from new floodgates in the dike and from the Hall Slough connector channel. Other relict tidal channels within the marsh will also adjust as they begin to convey tidal flows in and out of the site again. Some lateral movement and change of the main river channels can also be expected where rock armoring is removed.

Vegetation. Change in vegetation will be largely driven by hydrology and salinity changes after levee removal. Existing vegetation is predominately characteristic of freshwater wetlands and pastures. If salinity pulses occur within the site, existing vegetation will be unable to tolerate the saline waters and will quickly die off. As the marsh accretes at differential rates across the site, greater diversity of species across varying elevation bands should occur. Given that the site is subsided by several feet, the lands will initially convert predominately to low marsh or mud flat. Lower portions of the spruce forests that have developed in diked areas in the northwest corner and southern project boundary will also likely die off, either from salinity or higher water levels.

Target Species Use. Loss of estuarine rearing habitat has limited the production of Target salmonids in the Tillamook Bay Basin[3] as summarized in Table 3[6]. Some of the key factors affecting Target species survival in estuarine environments are related to their ability to access habitats and the quality of the habitats that they occupy. These, combined with the quantity of suitable habitat, play a large role in determining the magnitude of the production bottlenecks.

Implementation of the SFC will directly benefit Target fish species by addressing these habitat-based factors (i.e. habitat access, quality, and quantity). The project will restore 521 acres of marsh and wetland fringe habitat by: 1) creating 14 miles of newly connected slough/channel habitat; and 2) creating new habitats, such as low salt marsh, through re-establishing natural hydrologic conditions. The project location is considered to be ideal, largely because it lies within the migration pathway of Target fish species that emigrate as juveniles from the Wilson, Trask, and Tillamook rivers, and is also within the potential home range of juveniles from other tributaries and rivers. Table 3 summarizes how the project is expected to increase fish productivity, thereby fostering species viability.

Table 3. Target Species Status, Limiting Factors, & SFC Relationship.[14]

Target Species Status	Habitat Limiting Factors	Primary Limiting Factor(s) Addressed by Project
Fall Chinook: Well below historic abundance (~50% of	Primary: Loss and simplification of estuarine rearing habitat	This area will be utilized by rearing juvenile fall Chinook. Improved water quality and increased critical

historic), but stable.	<u>Secondary:</u> Excess fines in spawning areas	transitional salmonid habitat is expected to attract Target fish species. This additional habitat will increase the productive capacity of fall and spring Chinook in the Tillamook Bay Basin.
<u>Spring Chinook:</u> Well below historic abundance (~10% of historic) and decreasing slightly.	<u>Primary:</u> Loss and simplification of estuarine rearing habitat <u>Secondary:</u> Water quality (excess temperature) in summer freshwater areas	
<u>Coho:</u> Well below historic abundance (~10% of historic), but stable or slightly increasing.	<u>Primary:</u> Over-winter rearing habitat, may include upper estuary for age 0+ outmigrants <u>Secondary:</u> Water quality (excess temperature) in freshwater habitat	The project will provide additional slow water over-winter habitat for juvenile that migrate from natal streams at age 0+ or from age 1 migrants the second winter of life. The 521 acres of restored wetlands will annually produce 6,000-9,000 adult coho (average) and 9,000-14,000 (good ocean conditions).[15]
<u>Chum:</u> Well below historic abundance (~20% of historic), but currently stable.	<u>Primary:</u> Excess fines in spawning areas <u>Secondary:</u> Loss and simplification of estuarine rearing habitat	The project will provide additional rearing areas for juvenile chum in the estuary from April-May.
<u>Coastal Cutthroat Trout (Sea-Run):</u> Historical information is scarce, but anecdotal reports suggest the population is lower than historic, but likely stable.	<u>Primary:</u> Loss and simplification of estuarine rearing habitat <u>Secondary:</u> Quality and quantity of freshwater spawning habitat	The project will provide additional habitat for foraging and will improve prey base during estuarine occupancy.

<u>Water Quality Enhancement.</u> The project area in the upper Bay is in the transition zone between freshwater and saltwater tidal habitats. Similar salinity conditions identified in the lower Bay are also present in the upper Bay and lower, tidally influenced portions of the mainstem rivers. Temperature, salinity, and DO should parallel those measured outside the site. Salinity in salt marsh channels near the project site was measured at values from less than 1 to 10 ppt between May and July over three years.[7] Recent measurements in Blind, Hoquarten, and Hall Sloughs in the project area show similar results.[16] Dike breaching will allow a greater natural exchange of water between the Trask River, which has high levels of DO, and Hoquarten Slough. This will enhance salmon habitat by improving DO levels in the Slough.

<u>Resilience to Climate Change.</u> Removing the levees that currently isolate the project area will facilitate natural marsh accretion and allow the site to keep pace with sea-level rise, fostering species' resilience and adaptability.

8. SYNERGIES WITH RESTORATION AND CONSERVATION PLANS

Since 2001, dozens of partners have injected over $50 million into wetland, instream, and riparian projects that have resulted in over 100 stream miles and 450 acres of improved and/or protected habitats. The TEP, which will serve as the lead SFC project manager, recently implemented a 58-acre wetland restoration project at the mouth of the Miami River. In partnership with TEP, The Nature Conservancy is restoring 67 acres in the lower Kilchis River.

The project meets NOAA's mission to protect and restore marine and coastal habitat through ecosystem-based management. Furthermore, the project aligns with the priorities stated in the Request for Proposal by helping recover one ESA species, three MSA species, and one other NMFS-managed species. Project justification is widely documented and supported. The following plans target recovery of ESA *Threatened* Oregon Coast Coho Salmon populations:
Tillamook Bay Comprehensive Conservation and Management Plan (CCMP) (TBNEP, 1999). This plan calls for the protection and restoration 750 acres of tidal wetlands, 70% of which is met through the SFC. The project will also meet nine CCMP actions aimed at protecting and enhancing wetland, instream, removing salmon migration barriers, reconnecting sloughs and rivers, and improving sediment storage and routing.
Pacific Coast Salmon Management Plan (Pacific Fisheries Management Council, 1997). Pacific coast salmon fisheries in Council-managed waters focus on Chinook and coho salmon. The core of the plan includes conservation objectives and harvest allocations across fisheries. The Council must comply with laws such as the ESA. SFC implementation will help meet conservation goals and provide more fish available for harvest.
The Oregon Coastal Coho Assessment (ODFW, 2007). This assessment identifies several 'risk factors' that threaten the viability of the Coastal Coho Evolutionary Significant Unit. This project addresses the risk factors associated with stream complexity and water quality.
The Oregon Plan for Salmon and Watersheds (State of Oregon, 1997). The SFC advances the *Oregon Plan* by enhancing high priority habitat types for numerous fish and wildlife species, including ESA listed Oregon coast coho salmon.
Oregon Conservation Strategy (Oregon Department of Fish and Wildlife 2005). The project is consistent with several actions in the *Strategy* that aim to conserve fish species. Actions include maintaining and restoring channel complexity and habitat quality.
The Tidal Wetland Prioritization for the Tillamook Bay Estuary.[4] This study delineates 'sites' that have contiguous wetland areas with strong internal hydrologic connectivity and consistent alteration levels. Sites were then prioritized for the highest likelihood of contributing to tidal wetland function once restored (if restoration was necessary). The SFC includes seven sites, four of which received a high and three a medium-high ranking.

This project also advances: TBNEP's *Trask Watershed Assessment* (1998), US Fish and Wildlife Service's *Regional Wetlands Concept Plan* (1990) and *Strategic Plan: The Coastal Program* (2007), Oregon Wetlands Joint Venture's *Joint Venture Implementation Plans: Northern Oregon Coast* (1994), Oregon Division of State Lands and Oregon State Parks and Recreation Division's *Oregon Wetlands Priority Plan* (1989), Oregon Department of Land Conservation and Development's *The Oregon Estuary Plan* (1987), and the Oregon Department of Environmental Quality's *Tillamook Bay Watershed Total Maximum Daily Load* (2001).

9. SOCIO-ECONOMIC EFFECTS
The major socio-economic benefits of this project will be: reduced flood damages to local businesses and increased local spending on outdoor recreation.

Flood Mitigation. The positive economic and social effects that this project will have on flood drainage reduction cannot be over-stated in a community that has been ravaged by flooding in recent years. Modeling shows a flood reduction of 1.5 feet during all floods from small, infrequent events through a 100-year event.[17] This will significantly reduce damages to businesses in the commercial area along Highway 101. (Recent major floods have cost these local businesses and government relief programs hundreds of millions of dollars since the flood of 1996.) Indirect benefits also include fewer road closures and associated business disruptions.

Recreational Spending. The project site is within close driving distance to the state's population centers and offers excellent public use opportunities. As predominately publicly owned land managed for fish, wildlife, and associated resource values, this site will provide expanded opportunities for kayaking, hunting, fishing, hiking, wildlife viewing, and interpretive activities. These activities are vital to regional and local economies. Spending on outdoor recreation, sport fishing, and hunting provides sustainable revenue for local businesses, government, and natural resources agencies. In Oregon in 2008, over $2.5 billion was expended on shellfishing, fishing, hunting, and wildlife viewing.[18] In Tillamook County $63.5 million was generated in travel-related expenditures, much of which was recreation based. Wildlife viewing alone generated $18.6 million in travel-generated expenditures in 2008.

Jobs. Finally, over the life of the project and for varying periods, an estimated 50 jobs will be supported. The majority of the jobs will perform construction, monitoring, and engineering design services. As contractors use local services such as restaurants, supplies, and other contractors, the local economy will also receive a boost.

SECTION 2 - TECHNICAL & SCIENTIFIC MERIT

1. PROJECT BACKGROUND

In order to understand this proposal, some knowledge of the land acquisitions, restoration, and flood planning efforts undertaken over the last 10 years is necessary.

In 2001, Tillamook County, in concert with numerous partners, purchased 377 acres from private landowners specifically for the purposes of habitat restoration. Tillamook County holds title to the land, but the *Wetlands Management Plan*[11], developed by multiple stakeholders, governs its use. The County’s efforts to restore the 377 acres stalled when hydraulic analyses, modeled by the US Army Corps of Engineers, concluded that full restoration of the entire site would cause unacceptable increases within the City of Tillamook’s Highway 101 business district. The study concluded partial restoration of the 377 acres was possible, but flood level reductions were nil.

In 2006 and 2007, Tillamook County suffered large floods and extensive damages. After the 2006 flood, Governor Ted Kulongoski established the flood mitigation effort as an “Oregon Solutions” (OS) project. The OS process provides a structure and process for public and private sectors to collaborate in addressing technically and politically challenging community needs. Subsequently, a 37-member Project Team (PT) of federal, state, and local government agencies as well as community groups, business organizations, and individuals was assembled. In 2007, the PT prioritized projects and began implementation.

New hydraulic analyses were performed to evaluate projects for flood mitigation benefits. In addition to its extraordinary habitat benefits, the SFC was shown to be the most cost effective flood level reduction measure by creating a flow corridor from Highway 101 out to Tillamook Bay. The SFC project was approved by the OS "Design Team" (DT) comprised of 14 federal, state, and local agencies and private parties, and subsequently the PT. The SFC is named for its function as a natural overflow path for Wilson River floodwaters, but it is truly a habitat restoration project. Implementing the SFC requires the County to purchase an additional 248 acres of private land and easements, 16 acres of which have been acquired. Options are secured on the remaining parcels.

2. PROJECT GOALS

The purpose of this project is to restore habitats and ecological processes in the upper estuary of Tillamook Bay and the Wilson and Trask river deltas in order to: 1) improve habitat for native fish and wildlife, 2) improve water quality and reduce sedimentation, 3) reduce flood hazards, and 4) enhance the overall ecological health of Tillamook Bay.

3. PROJECT IMPLEMENTATION PLAN

The restoration strategy depends upon re-establishing tidal exchange with the Bay, as well as hydrologic connectivity between the Wilson and Trask Rivers and their floodplains. The SFC project focuses on removing human alterations to allow the natural processes to restore the site's ecosystem functions. "Removal of human alterations is the most practical restoration approach and generally the approach with the highest chances of success because it re-establishes the natural processes that form and maintain tidal wetlands. These natural processes are necessary for the return of tidal wetland functions over time. Successful re-establishment of natural forces minimizes the need for further human intervention after restoration, maximizing long-term restoration effectiveness."[4]

The engineering consulting firm, overseen by the DT, has taken great measures to ensure the approach is technically and biologically sound and publicly safe. The approach is consistent with the *Management Plan*[11] and no negative impacts are expected to surrounding properties.
To meet the project goals, Tillamook County and the DT will undertake the following activities, which are generally presented in chronological order by Phases 1-3. The project schedule is provided in Section 2.5 and personnel qualifications are provided in Sections 3 and 8.

<u>Phase 1: Design and Land/Easement Acquisition</u>

Acquisition will leverage and enable implementation of the 646-acre project. In addition to the current 398 acres in public ownership (predominately Tillamook County), an additional 128 acres of acquired/leased land and 120 acres of temporary construction and permanent floodway easements are necessary. 513 acres of the project area will be permanently protected in public ownership, thereby ensuring the longevity of the restoration (Table 4).

Tillamook County is not requesting NOAA support for acquisitions. The County will acquire these during the NOAA grant award period and some of the value will be used as match. The floodway easement properties contain levees that must be lowered for increased conveyance over them. The easements will allow continued agricultural use but no other development. The easements and floodway designation provide strong regulatory and legal protections against development, so acquisition was deemed unnecessary for SFC implementation. On two other parcels, temporary construction easements are being obtained to remove remnant levees and dredge spoils. These parcels will remain in private ownership.

Table 4. Land Easement & Acquisition Summary.

	Total Acres	Restored Habitat Acres
Current Public Ownership	398	392*
County to Acquire Property for Restoration	128	121*
Construction Easements to Acquire	35	8
Flood Easements to Acquire	85	0
TOTAL PROJECT AREA	**646**	**521**
**513 acres of restored habitat is publicly-owned and will be permanently protected.*		

Monitoring Plan Development & Pre-Project Monitoring. The consultant, with DT guidance, will develop a long-term monitoring plan that aims to demonstrate progress toward project goals and Target species recovery. Monitoring results will also provide future guidance for other restoration projects.

Implementation monitoring to document the status of project construction elements will be conducted by the engineering firm as part of as-built documentation included in project construction contracts. Effectiveness monitoring will be conducted using a before-after/control-impact design. The consultant will use well-tested monitoring parameters used in similar efforts in the region recommended by both regionally and nationally relevant sources. Effectiveness monitoring will be conducted starting with one year of baseline data collection, then every other year until ten years post construction, and every five years thereafter. This proposal requests funds for baseline monitoring. Future monitoring will be funded through partners and perhaps NOAA. The monitoring plan outline below describes proposed goals, objectives and parameters.

Goal 1: Confirm the project is implemented according to project construction specifications (implementation monitoring/as-built construction documents).

- **Objective 1:** Verify full tidal hydrology has been restored to the site (quantify inundation frequency).
- **Objective 2:** Verify number of tidegates and number and length of dikes and constructed channels specified for removal or fill have been removed or filled to contract specifications (map and quantify culvert and dike removal/ditch fill).
- **Objective 3:** Verify floodplains have been graded and dike material disposed of per contract specifications (quantify floodplain elevations and document fate of dike material).
- **Objective 4:** Verify re-vegetation and large wood have been established according to contract specifications (map and quantify re-vegetated areas and large wood placements).
- **Objective 5:** Verify other restoration tasks included in contract specifications have been completed per contract specifications (number, dimensions, and locations of set-back levees constructed, existing levees upgraded, and channels reconnected).

Goal 2: Determine the level of structural and functional recovery taking place at the project site as a result of restoration actions and to determine whether adaptive

management measures are needed at the site (<u>effectiveness monitoring</u>).

- **Objective 1:** Quantify metric changes relating to Target salmonid and lamprey species at site.
  - <u>Structural</u>: presence, density, species richness, <u>Functional</u>: population dynamics
  - <u>Controlling factors</u>: water temp, salinity, DO, channel morphology, and others
- **Objective 2:** Quantity reduction of flood levels in the project vicinity during flooding events and the capacity of the project site to accumulate sediments.
  - <u>Structural</u>: range of tidal and river levels, <u>Functional</u>: sediment accumulation
  - <u>Controlling factors</u>: tidal regime, river discharge, marsh plain elevation, and others
- **Objective 3:** Quantify development of emergent vegetation communities including early detection of invasive plant species.
  - <u>Structural</u>: species richness, herbaceous cover, woody stem density and diameter
  - <u>Controlling factors</u>: groundwater regime, soil characteristics, vertical accretion, and others

<u>Permit Submittal.</u> With DT input, the engineering firm will refine the 25% plans included in this application and submit permits. A combination of local, state, and federal permits and regulatory approvals are required for this project (Table 7), none of which have been initiated.

<u>Final Design.</u> The engineering firm will develop final plans and specifications upon resolving any permitting agency comments and a review by the DT. Key tasks will include topographic surveys, geotechnical investigations, and updated hydraulic modeling. The project will be analyzed using the new Federal Emergency Management Agency (FEMA) model for regulatory compliance. The deliverable will be a construction ready plans, specifications, and engineering package. These will be bundled into a bid package that will be released by Tillamook County.

<u>Phase 2: Construction</u>

Table 5. Construction Elements to be Undertaken in Phase 2.

Infrastructure	Levee Removal / Lowering	6.9 miles / 2.1 miles
	Levee, Dredge Spoil, & Fill Removal	85,000 cy
	New / Upgraded Tidal Dikes	1.4 miles / 0.7 miles
	Floodgate / Drainage Tidegates	1 / 7
	Roads / Structures Removed	2.1 miles / 1 house and 3 barns
	Ditches	3.3 miles filled
Channels	Reconnections	9
	New Tidal Channels	0.9 miles (14 miles post restoration)
	Large Wood Installation	determined on site

Construction sequencing is described in the supplemental information in Section 8.

<u>Phase 3: Post Project Monitoring (Implementation and Effectiveness).</u> Following Phase 2 completion, post construction monitoring will commence, according to the monitoring plan developed in Phase 1 (Section 2.3).

<u>Long Term Management & Maintenance.</u> Ultimately, Tillamook County is the land owner and manager over the majority of the project area and will be responsible for levee and structure maintenance. An updated *Management Plan*, as well as landowner agreements and easements, will ensure that restoration elements are implemented to maximize the project goals and the site is allowed to reach its long term function and species benefits. With improved and higher quality infrastructure in place, long term maintenance needs on County land and dikes are expected to decrease after project implementation. Infrastructure requiring maintenance will consist of the setback dikes and associated floodgates. Annual maintenance costs are projected at $20,000 for floodgate seals and bearing replacements, and dike inspection, mowing, and floodwater repairs.

4. PROJECT SUSTAINABILITY

This project has extremely strong support from the community, and has been a target for implementation since the initial land acquisition in 2001. A Letter of Commitment from Tillamook County, and letters of support from Oregon Governor John Kitzhaber, Congressional delegation, OS stakeholders, and private landowners are included in Section 8.

Ecological Sustainability. As with many coastal restoration projects, impacts of sea-level rise on long term project performance is potentially an issue. Sea-level rise projections are uncertain and given recent projections[10,19], it appears likely that sea-level rises will not be matched by overall Bay sediment accretion. From a habitat perspective, there will be a shift of habitat zones towards the upper Bay and project site. However, sediment accretion has been greatest in the highest portions of the Bay. Due to its location at the confluence of major sediment sources, this project is well suited to maximize accretion and, if not match sea-level rise, have a shorter response lag and hence be able to continue to provide functional habitat value long term. "Since duration of inundation is a controlling factor for sediment deposition, diked sites will have little deposition because they have little inundation (compared to undiked sites). Thus, [SFC] dike removal greatly increases the potential for subsided sites to equilibrate with rising sea levels".[20]

5. PROJECT SCHEDULE

Table 6. Proposed Project Schedule.

PHASE 1	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Acquisitions	Sep 2013-Apr 2015						
Monitoring Plan		Jun-Aug					
Baseline Monitoring		Oct	Jan-Oct				
Final Design/Permitting	Sep 2013-Dec 2014						
Bidding			Jan-Mar				
PHASE 2 - CONSTRUCTION							
Site Preparation			May-Jun				
Interior Perimeter Work			Jun-Sept				
Interior Restoration			Jul-Sept				
New Levees			Jul-Oct				
Final Breaching			Oct-Nov				
PHASE 3	*Year 3 NOAA proposal ends September 2016*						
Post-Project Monitoring				Oct	Jan-Oct	Oct	Jan-Oct

The permits and consultations in Table 7 will be initiated and acquired in Phase 1. These elements will support the NEPA analysis that will be led by NOAA and has yet to be initiated. Tillamook County and the DT, which includes permitting agency representatives, are committed to responding to NOAA requests for information in a timely manner.

Table 7. Project Permits and Consultations.

Agency	Permit/Consultation
US Army Corp of Engineers	Nationwide Permit 27
OR Division of State Lands	Removal/Fill General Authorization, Wetland Determination & Delineations
National Marine Fisheries Service	SLOPES (IV)
OR Dept. of Fish & Wildlife	In-Water Timing Guidelines, Fish Passage Requirements, Habitat Mitigation Recommendation
OR Dept. of Land Conservation & Development	Coastal Zone Management Act Consistency Cert.
OR Dept. of Environmental Quality	1200-C Storm Water Permit, 401 Water Quality Cert.
OR State Historic Preservation Office	National Historic Preservation Act Section 106
Tillamook County	Development Permit, Flood Hazard Assessment

SECTION 3 - OVERALL QUALIFICATIONS OF APPLICANT

1. PROJECT MANAGEMENT: TILLAMOOK ESTUARIES PARNTERSHIP

TEP is a non-profit dedicated to the conservation and restoration of Tillamook County's estuaries and watersheds. TEP is a National Estuary Project which leads and facilitates the implementation of the CCMP (Section 1.8). TEP pursues its stewardship, water quality enhancement, salmonid population recovery, and flood reduction goals by providing project leadership, coordination, and fundraising to pool the strengths of partners.

TEP has implemented nearly 150 restoration projects along Tillamook County's coast, all of which involved extensive partnering. Since becoming a non-profit in 2001, $7.1 million has protected and/or restored 25 miles of stream habitats, 222 acres of riparian habitats, and 460 acres of tidal wetlands. Another $2 million has gone into research and monitoring and education and outreach. TEP recently completed the $2 million, 58-acre Miami Wetland Restoration project, the largest wetland restoration effort undertaken in Oregon on private land. TEP's typical annual budget is $2.2 million. Rachel Hagerty has managed nearly all the restoration projects undertaken by TEP, including the Miami Wetlands Project, and she will serve as the overall project manager for the SFC. As TEP's Habitat Restoration Manager for the last ten years, Mrs. Hagerty develops and implements on-the-ground projects, providing overall leadership and coordination, bringing together diverse partners, acquiring and administering grants, and managing construction and consultant contracts. She brings 14 years of experience in natural resources specific to the local area. Her resume is included in Section 8.

2. ENGINEERING & CONSTRUCTION MANGEMENT: NHC & HBH

Northwest Hydraulic Consultants (NHC) will lead a team to provide permitting, final design, and construction management services. NHC has prepared the 25% designs and are under contract to compete the SFC project. Assisting NHC will be HBH Engineers (civil design), Shannon & Wilson (geotechnical), and ICF (permitting).

NHC is an internationally known firm specializing in hydraulic and hydrologic engineering, water resources engineering, river engineering, fluvial morphology, aquatic habitat restoration, and numerical and physical modeling. Vaughn Collins, P.E. is the lead designer for the SFC project. Mr. Collins has 21 years of experience in the analysis and design of numerous flood control and habitat restoration projects, including multiple projects in estuarine environments similar to Tillamook Bay. His resume is included in Section 8.

3. MONITORING: GREEN POINT CONSULTING

GPC will lead monitoring plan development and implementation. Laura Brophy, Principal of GPC, has led or participated in technical teams for over a dozen Oregon tidal wetland restoration projects. She has extensive knowledge of estuarine wetland ecology, landscape processes, and resource management strategies. Since 1994, Brophy has conducted multi-site landscape scale inventories, assessments, prioritizations, monitoring programs, and restoration planning in 10 of Oregon's largest estuaries, including the Tillamook. She has contracted and teamed with all of the major resource management agencies on the Oregon coast, as well as watershed councils, estuary management entities, governments, and non-profits. Her resume is included in Section 8.

SECTION 4 - OUTREACH AND EDUCATION

1. PARTNERSHIPS

The SFC project contains the hallmarks of a truly cooperative restoration effort with far-reaching, permanent benefits for the Tillamook Bay estuary. Over the last ten years, dozens of partners have supported this project. The SFC is an outcome of Governor Ted Kulongoski's designation of Tillamook flood mitigation efforts as an OS project. The 37-member OS PT prioritized a list of projects and successful project implementation has begun. The equally diverse 14-member DT guides the SFC effort. Active proponents are identified in the support letters from Governor Kitzhaber, Congressional delegation, OS, and private landowners (Section 8).

2. EDUCATIONAL OPPORTUNITIES

The close proximity of this site to the state's population centers offers an excellent opportunity for public use, appreciation, and understanding of the functions and values of an exceptional coastal wetland. Project outreach will enhance public understanding of the ecological and economic values of wetland restoration and complement other efforts occurring in the Tillamook Bay Watershed (e.g., the Miami and Kilchis projects). We are confident that such increased public understanding can encourage future coastal restoration opportunities. A few (of the many) specific educational opportunities generated from this project will include the following.

- With support from the TEP, Tillamook Bay Watershed Council, and Oregon Community Foundation, Tillamook High School students are collecting data to evaluate environmental variables, such as water quality, vegetation, and aquatic species, on the project site. Future plans include continuing the monitoring regime and participating in long term monitoring.
- Tillamook County joined with the TEP, ODFW, and the Oregon Hunter's Association to construct a parking lot at the site, upgrade a gate, and provide an information kiosk for non-motorized access to waterfowl hunting and other recreational opportunities.
- In 2012, the National Park Service designated the Tillamook County Water Trail a National Recreation Trail. Hoquarten Slough, which passes through the project area, is included in TEP's Tillamook Bay Water Trail Guidebook and is regularly used by recreationists.

Project information will be disseminated according to the Data Sharing Plan (Section 5).

SECTION 5 – DATA SHARING PLAN

The Southern Flow Corridor-Landowner Preferred Alternative (SFC), implemented by Tillamook County, will generate environmental data and information, including pre- and post-restoration assessments of vegetation, groundwater levels, tidal hydrology, tidal channel morphology, soil samples, sedimentation, fish distribution and density, fish use of large wood structures, and macro-invertebrates.

Datasets will include inundation frequencies, groundwater level dynamics, floodplain elevations, sediment accumulation, soil characteristics, soil salinity, tidal channel cross-sections, large wood abundance and instream effects, upstream flood control structure integrity, population dynamics of salmonid and lamprey species, abundance and species composition of prey resources, species richness, percent herbaceous cover, woody stem density and diameter, and tidal channel water temperatures, salinity, and dissolved oxygen. Baseline data will be collected between October 2014 and October 2015. Post-project monitoring will occur beginning October 2016 and continue every other year for 10 years, and every five years thereafter. Refer to Section 2.3 for the monitoring plan framework.

Data will be collected by Green Point Consulting (GPC) of Corvallis, Oregon, Northwest Hydraulic Consultants of Seattle, Washington, and, at the recommendation of GPC, the Confederated Tribes of the Siletz Indians of Siletz, Oregon according to the procedures described in the monitoring plan. Data will be initially collected in field notebooks and transferred to electronic spreadsheets for storage and analysis. Data will be stored with GPC and TEP. Published reports will be available on GPC, TEP, Tillamook County, and other partner websites. In the past, similar data has also been shared through grant progress reports, local media, and partner presentations and websites. Requests for data will be available to the public upon request starting December 2015. Contact Laura Brophy at laura@appliedeco.org, (541) 752-7671 for more information or to make a data request.

No plans exist to submit results to a peer-reviewed scientific journal though the site represents an extraordinary laboratory and unique opportunity for future peer-reviewed investigations.

SOUTHERN FLOW CORRIDOR – LANDOWNER PREFERRED ALTERNATIVE
FY 2013 Coastal and Marine Habitat Restoration Project Grant Application

SECTION 6 - PROJECT COSTS

Table 8. Project Budget Summary.

		LEVERAGED FUNDS				MATCH		
		FEDERAL		NON-FEDERAL		NON-FEDERAL		
	TOTAL	NOAA	FEMA	OWEB	State Bonds	OS Cash	Private Cash	Inkind
Administration								
Salary								
TEP-Hagerty	$80,292	$40,146			$40,146			
TEP-Phipps	$6,827	$3,412			$3,415			
County-Levesque	$10,912							$10,912
County-Clark	$2,484							$2,484
ODFW-Knutsen	$10,186							$10,186
	$110,701	*$43,558*	*$0*	*$0*	*$43,561*	*$0*	*$0*	*$23,582*
Fringe								
TEP-Hagerty	$27,312	$13,656			$13,656			
TEP-Phipps	$2,322	$1,161			$1,161			
County-Levesque	$6,240							$6,240
County-Clark	$1,458							$1,458
ODFW-Knutsen	$5,968							$5,968
	$43,300	*$14,817*	*$0*	*$0*	*$14,817*	*$0*	*$0*	*$13,666*
Phase 1-Design & Acquisitions								
Contractual								
Monitoring Plan	$16,867	$16,867						
Baseline Monitoring	$222,771	$222,771						
ODFW Sampling	$8,000							$8,000
Permitting	$250,000	$121,500	$121,500			$7,000		
Final Design	$760,000	$150,000	$450,000		$160,000			
	$1,257,638	*$511,138*	*$571,500*	*$0*	*$160,000*	*$7,000*	*$0*	*$8,000*
Other								
Land/Easements	$1,993,827			$1,648,500			$245,327	$100,000
	$1,993,827	*$0*	*$0*	*$1,648,500*	*$0*	*$0*	*$245,327*	*$100,000*
Phase 2-Construction								
Contractual								
Restoration Work	$2,249,000	$1,611,914	$637,086					
North Dike	$1,003,525	$104,525	$215,000		$684,000			
Middle Dike	$938,750	$13,899	$752,229		$172,622			
South Dike	$576,535	$150,000	$426,535					
Levee Lowering	$413,650	$100,000	$313,650					
Mobilization	$459,000	$150,000	$309,000					
Subtotal Contract C	*$5,640,460*							
Utilities Removal	$11,601							$11,601
Rip Rap Value	$175,000							$175,000
Rip Rap Removal	$15,000							$15,000
	$5,842,061	*$2,130,338*	*$2,653,500*	*$0*	*$856,622*	*$0*	*$0*	*$201,601*
Total Direct Costs	$9,247,527	$2,699,851	$3,225,000	$1,648,500	$1,075,000	$7,000	$245,327	$346,849
Indirect Costs	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	**$9,247,527**	$2,699,851	$3,225,000	$1,648,500	$1,075,000	$7,000	$245,327	$346,849
						$7,000	*$240,000*	*$56,849*
						secured	*secured*	*secured*
PHASE 3 - Post-Project Monitoring								
Year 2 (2016-2017)	**$162,423**	*Additional effectiveness monitoring*						
Year 4 (2018-2019)	**$213,523**	*need as funding allows.*						
	$375,946							

1. *BUDGET NARRATIVE*

Primary funding for the estimated $9.25 million SFC project is split between NOAA ($2.7 million), and pending FEMA ($3.2 million), state bonds ($1 million), and the Oregon Watershed Enhancement Board (OWEB) ($1.65 million) funds. Another $599,176 of match is being contributed to the project. FEMA, state bond, and OWEB funds are unavailable for match but demonstrate additional leverage. Pending funds total $8,943,678 and secured funds total $303,849. A justification of Table 8 summary budget items, if warranted, is provided below or inclusion in Section 8 noted.

Management, Administration, and Support.

With expertise in restoration project management and administering multiple concurrent funding sources during implementation, TEP will serve as the overall project manager. Other support will include the following:

Salary: Salaries include a rate range to account for an average 1.5% cost of living increases.
TEP – Rachel Hagerty, Habitat Restoration Manager (2880 hrs @ $27-28/hr)
TEP – Lisa Phipps, Executive Director (180 hrs @ $37-39/hr)
Tillamook County – Paul Levesque, Chief of Staff (240 hrs @ $45-46/hr)
Tillamook County – Debbie Clark, County Treasurer (81 hrs @ $30-31/hr)
ODFW – Chris Knutsen, District Fish Biologist (326 hrs @ $30-32/hr)

Fringe: Fringe rates do not exceed 35%.

Phase 1: Design and Land/Easement Acquisition.

Contractual: Detailed budgets for the monitoring plan and baseline monitoring (Contract A) are provided in Table 9. Permitting and final design budgets (Contract B) are provided in Section 8.

Sole Source Justification for Contract A: Partners concur that GPC has the specialized background and expertise to most successfully develop and implement the monitoring plan for the SFC project. GPC is highly regarded as a regional expert on wetland restoration monitoring. GPC is uniquely suited to perform these services because GPC:

- Is familiar with the project area and the construction elements;
- Has led or participated in technical teams for over a dozen similar tidal wetland restoration projects in Oregon;
- Has conducted multi-site landscape scale inventories, assessments, prioritizations, monitoring programs, research, and restoration planning in ten of Oregon's largest estuaries, including the Tillamook; and
- Has contracted and teamed with all of the major resource management agencies and conservation groups on the Oregon coast.

Other: The County will acquire 128 acres for $1,643,827, with an additional $250,000 in due diligence. NOAA is not requested to fund any land acquisitions. An additional $100,000 is estimated for inkind donations of the floodway and construction easements.

Table 9. Contract A – Monitoring Plan and Baseline Monitoring.

		Baseline	Yr2	Yr 4
		2014-15	2016-17	2018-19
Monitoring Plan Development	**Total**			
Research/ETG Consultation/draft plan development	$11,167	$11,167		
Technical consultation (1 day tech advisory meeting)	$1,452	$1,452		
DT Meeting Travel and Facilitation	$1,162	$1,162		
Meeting costs including participant travel	$908	$908		
Finalize and write plan	$2,178	$2,178		
Total Monitoring Plan Development	**$16,867**	$16,867		
Baseline and Effectiveness Monitoring	**Total**			
Vegetation % cover/stem density & diameter, species richness	$40,656	$16,262	$12,197	$12,197
Groundwater level dynamics	$45,779	$24,100	$10,840	$10,840
On Site Tidal Hydrology	$47,656	$28,804	$9,426	$9,426
Off-Site Tidal Hydrology Loggers	$8,645	$8,645	$0	$0
Tidal channel morphology	$30,492	$10,164	$10,164	$10,164
Monitoring infrastructure elevation survey	$1,742	$581	$581	$580
Soil characteristics including salinity	$7,405	$3,703	$0	$3,703
Sediment accumulation, vertical accretion	$5,251	$3,896	$678	$678
ETG Travel, Per Diem, Lodging	$18,788	$7,894	$5,447	$5,447
Validate/update flood model using tidal level/river stage data (3 events)				
Data processing	$6,000	$2,000	$2,000	$2,000
Model calibration	$15,000	$5,000	$5,000	$5,000
Model simulation	$9,000	$3,000	$3,000	$3,000
Reporting	$15,000	$5,000	$5,000	$5,000
Fish presence, abundance, species richness	$126,007	$42,003	$42,002	$42,002
Tidal channel prey resources (Macroinverts)	$92,649	$30,883	$30,883	$30,883
LWD abundance and instream effects (Yr 4 post-construction only)	$35,782	$0	$0	$35,782
CTSI Materials, Supplies, Travel, Per Diem, Lodging	$66,906	$22,302	$22,302	$22,302
Water Quality- Temp, DO, Salinity, pH, Depth, Turbidity (data logger)	$5,630	$5,630	$0	$0
Progress Report Writing	$8,712	$2,904	$2,904	$2,904
Final Report Writing	$11,616	$0	$0	$11,616
Total Baseline, Yr 2, and Yr 4 Monitoring	**$598,717**	$222,771	$162,423	$213,523
TOTAL	**$615,584**	**$239,638**	**$162,423**	**$213,523**
		NOAA Request	additional need as funds allow	
ETG = Institute for Applied Ecology's Estuary Technical Group, DT = Southern Flow Corridor Design Team				
NHC = Northwest Hydraulic Consultants				

Phase 2: Construction.

For ease of showing the larger budget picture, construction elements are lumped into broader groups. A detailed breakdown for the construction contract (Contract C) is provided in Section 8. Restoration activities are blended throughout the detailed budget as they fit within the landscape and construction sequencing. To highlight key restoration activities, restoration elements are delineated in the Table 8 budget summary. However, it is noteworthy to recognize that all activities budgeted, including set back levee construction and floodgate installation, are essential to the overall restoration project.

Construction cost estimates are based upon current prevailing wage information, and labor/equipment rate breakouts on construction based on recent projects. Costs were cross checked against similar projects NHC has been involved in. Extensive planning has been undertaken to account for bid results, levee settlement, suitability of existing levee for upgrades, and on-site fill for new levees while keeping tides out.

The Tillamook People's Utility District will vacate an existing overhead utility system accessing the barn and residence to be demolished for an in-kind value of $11,601. An estimated 5,000 cy of rip rap exists along the perimeter of the project area. The value and inkind labor to remove and locally reuse this rip rap is estimated at $190,000.

2. NOAA FUNDING SCHEDULE & ACCOMPLISHMENTS

Year 1: October 2013 – September 2014 **$241,908**
Phase 1: monitoring plan development, permitting, final design

Year 2: October 2014 – September 2015 **$1,811,999**
Phase 1: baseline monitoring, permitting, final design
Phase 2: all construction elements

Year 3: October 2015 – September 2016 **$645,944**
Phase 1: baseline monitoring
Phase 2: all construction elements

3. COST-BENEFIT

When combined, the cost-benefit ratios of restored tidal wetland function, increased fish production, and flood reduction of this project is significant.

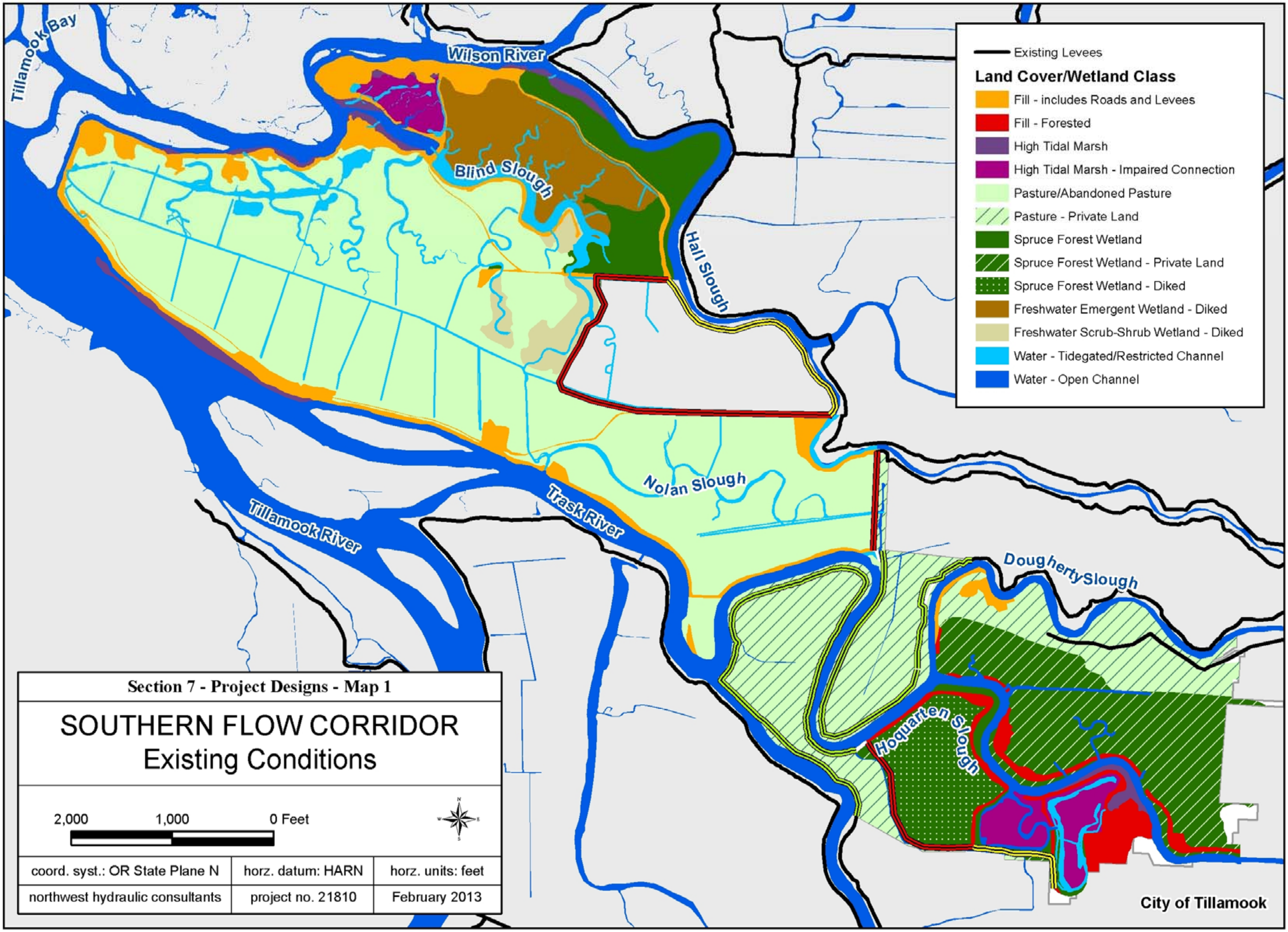
Costanza *et al.* (1997) determined the values shown in Table 10. Overall, the ecosystem services valuation of tidal marsh is estimated at a minimum of $4,043 per acre per year ($4,043/A/yr), placing it fourth among the highest-valued ecosystems on earth.[4]

Table 10. Annual Values of SFC Wetland Habitats.

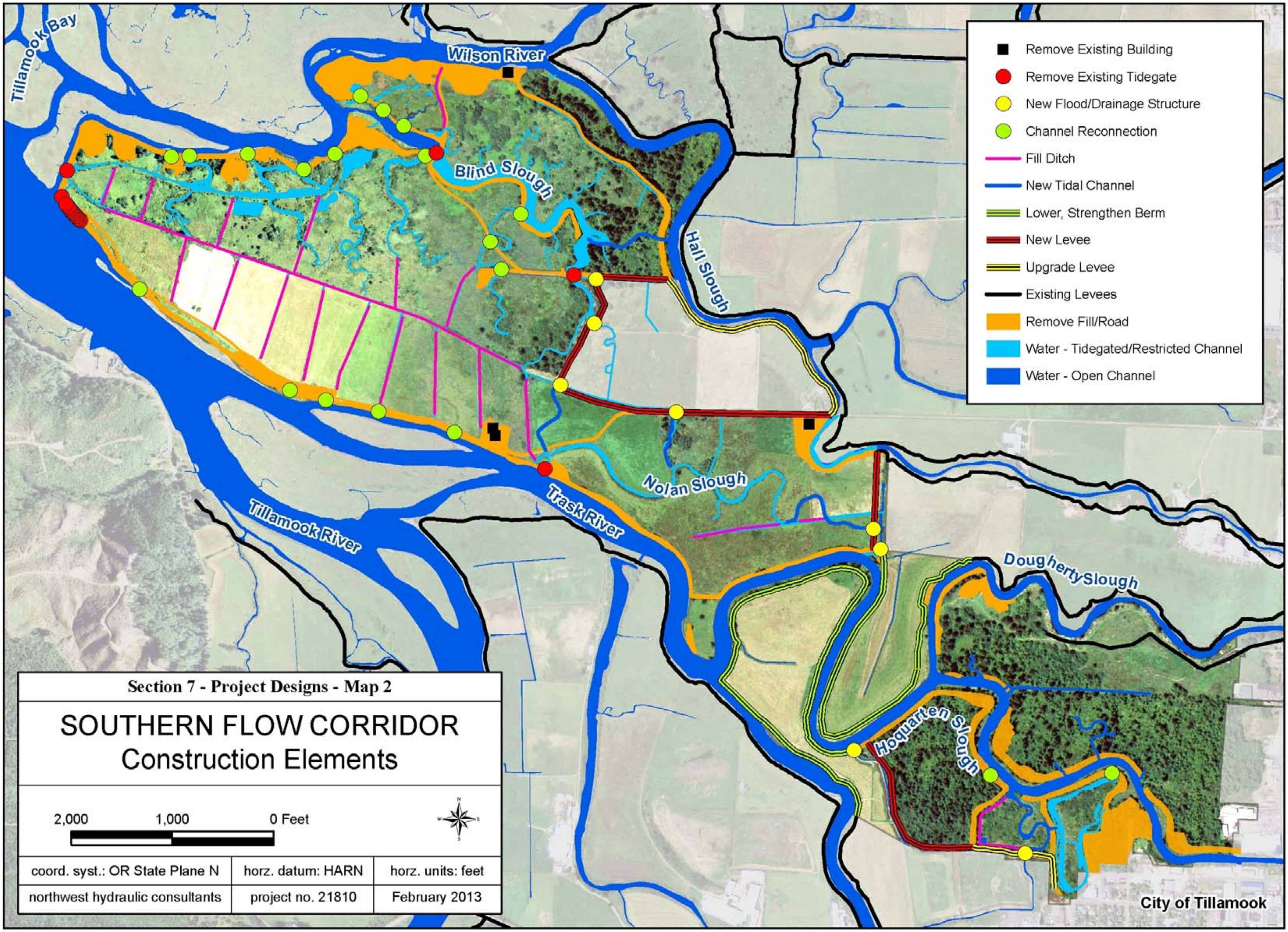
Habitat Type	Restored SFC Acres	Ecosystem Service	Value/ A/Yr	Total (Yearly)
High/Low Marsh	395	Ecosystem Services Valuation	$4,043	$1,596,985
Tidal Marsh/Swamp	481	Waste Treatment	$2,710	$1,303,510
All Marsh & Swamp	481	Environmental Capacitors	$1,873	$900,913
High/Low Marsh	395	Food production	$186	$73,470
High/Low Marsh	395	Habitat/refuge	$68	$26,860
High/Low Marsh	395	Recreation	$266	$105,070
			Total	**$4,006,808**

Moreover, direct economic benefits from increased sport fishery opportunities due to increased coho and chinook production are estimated at $4.6 million to $7.7 million over a 50-year project life.[16] In Tillamook County in 2008, travel-generated expenditures associated with not only fishing, but shellfishing, wildlife viewing, and hunting were a combined total of $63.5 million. Expenditures associated with saltwater fishing alone were $20.8 million. In a county of roughly 25,000 people, this amount flowing into the region is a significant economic driver and is dependent upon functioning watersheds and estuaries.

Finally, "it is estimated that water level reductions of up to 1.5 feet will be achieved for all flood from small, frequent events through a 100-year event. The area of flood level reduction is over 3,000 acres and encompasses the lower Wilson, Trask and Tillamook River floodplains. There are 540 residential, commercial and agricultural structures located in this area of benefit. A validated benefit-cost analysis calculated economic benefits due to avoided flood damages of $9.2 million to $10.7 million over a 50-year project life.”[16]



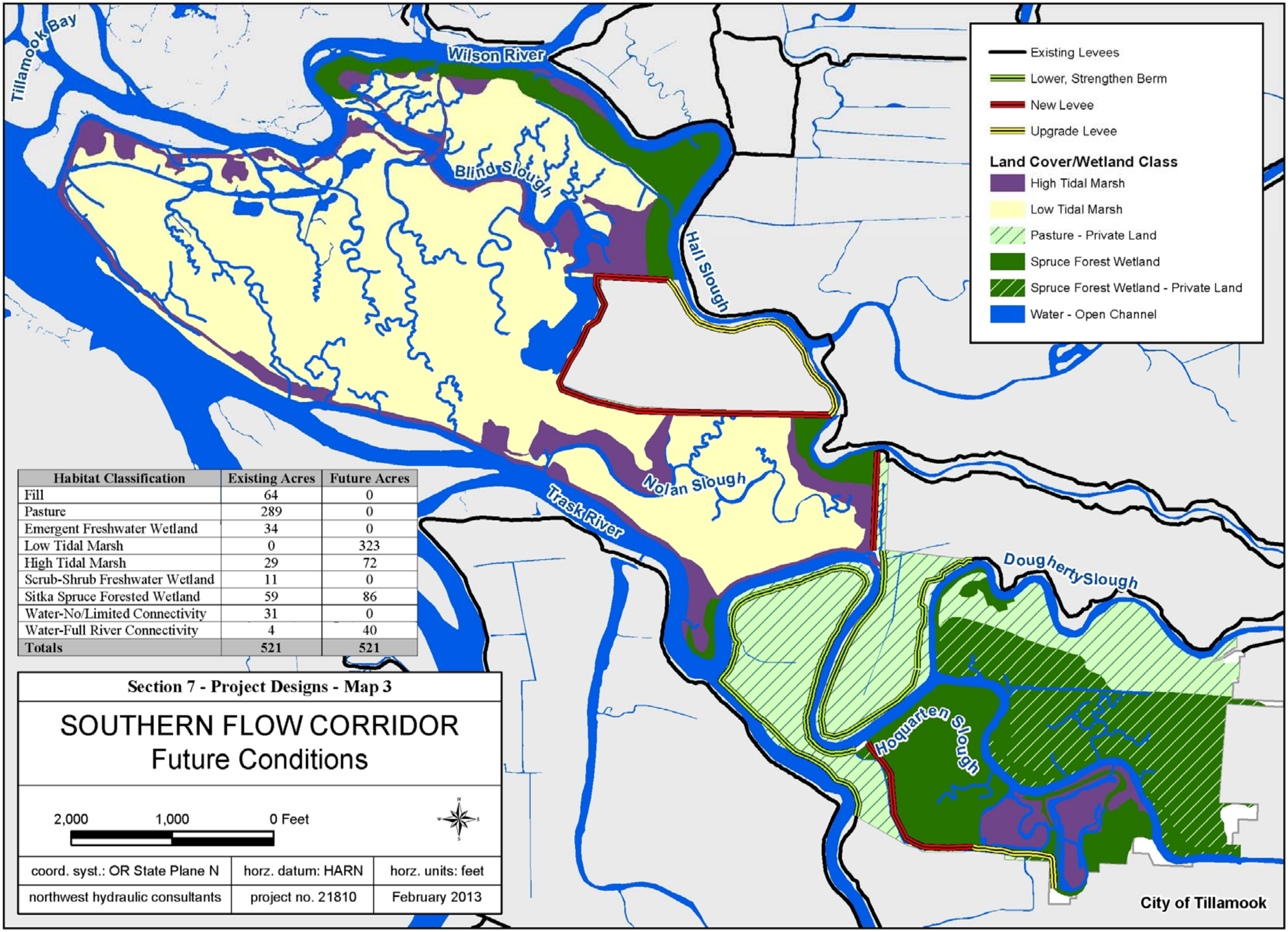
Tillamook Bay
Wilson River
Blind Slough
Hall Slough
Nolan Slough
Trask River
Tillamook River
Dougherty Slough
Hoquarten Slough
City of Tillamook
Existing Levees
Land Cover/Wetland Class
Fill - includes Roads and Levees
Fill - Forested
High Tidal Marsh
High Tidal Marsh - Impaired Connection
Pasture/Abandoned Pasture
Pasture - Private Land
Spruce Forest Wetland
Spruce Forest Wetland - Private Land
Spruce Forest Wetland - Diked
Freshwater Emergent Wetland - Diked
Freshwater Scrub-Shrub Wetland - Diked
Water - Tidegated/Restricted Channel
Water - Open Channel
Section 7 - Project Designs - Map 1
SOUTHERN FLOW CORRIDOR
Existing Conditions
2,000
1,000
0 Feet
coord. syst.: OR State Plane N
horz. datum: HARN
horz. units: feet
northwest hydraulic consultants
project no. 21810
February 2013



Section 7 - Project Designs - Map 2

SOUTHERN FLOW CORRIDOR
Construction Elements

coord. syst.: OR State Plane N	horz. datum: HARN	horz. units: feet
northwest hydraulic consultants	project no. 21810	February 2013



Habitat Classification	Existing Acres	Future Acres
Fill	64	0
Pasture	289	0
Emergent Freshwater Wetland	34	0
Low Tidal Marsh	0	323
High Tidal Marsh	29	72
Scrub-Shrub Freshwater Wetland	11	0
Sitka Spruce Forested Wetland	59	86
Water-No/Limited Connectivity	31	0
Water-Full River Connectivity	4	40
Totals	**521**	**521**

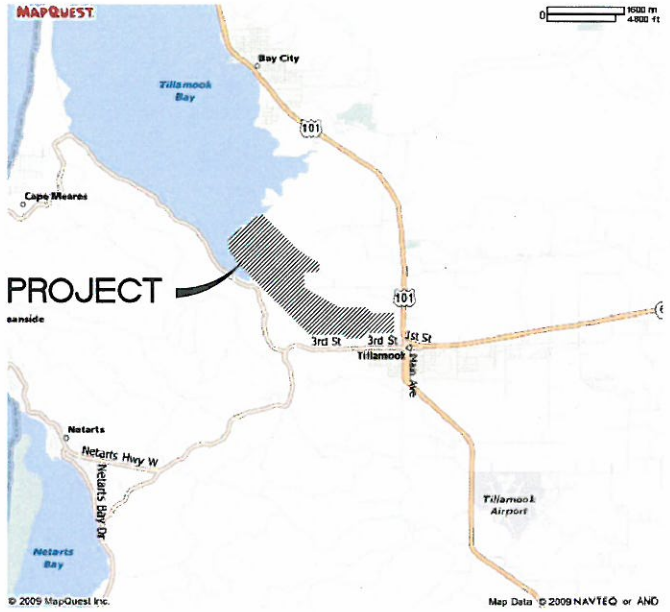
Section 7 - Project Designs - Map 3

SOUTHERN FLOW CORRIDOR
Future Conditions

coord. syst.: OR State Plane N	horz. datum: HARN	horz. units: feet
northwest hydraulic consultants	project no. 21810	February 2013

SOUTHERN FLOW CORRIDOR PRELIMINARY DESIGN

FEBRUARY 15, 2013



VICINITY MAP

APPLICANT:

TILLAMOOK COUNTY
201 LAUREL AVENUE
TILLAMOOK, OR 97141
PH: (503) 842-1809
CONTACT: PAUL LEVESQUE

ON BEHALF OF:

OREGON SOLUTIONS
PH: (503) 842-2741
CONTACT: RICK KLUMPH
DESIGN COMMITTEE CHAIR

CIVIL ENGINEER:

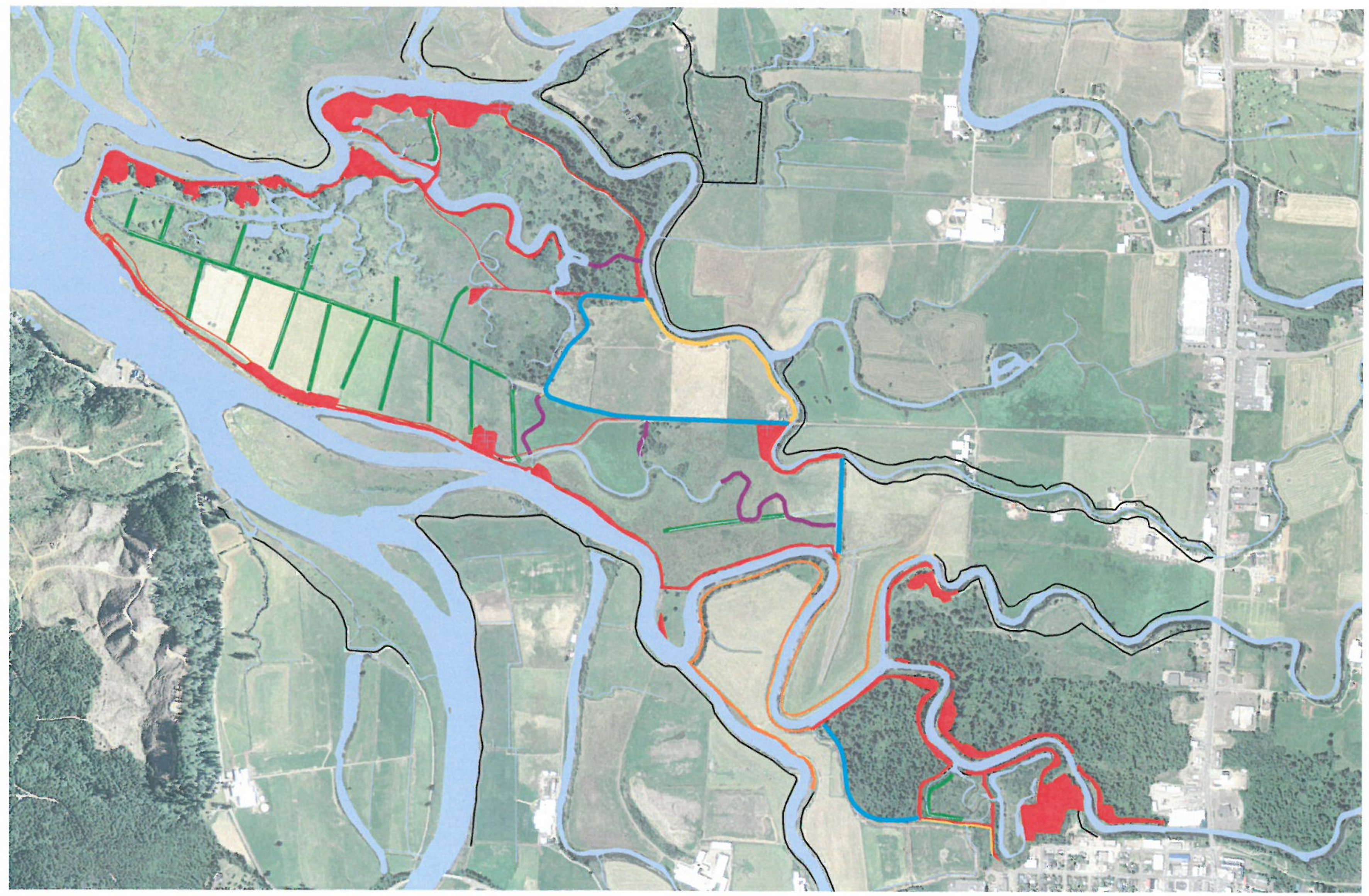
HBH CONSULTING ENGINEERS, INC.
2316 PORTLAND ROAD; STE. H
NEWBERG, OREGON 97132
PH: (503) 554-9553 - FAX: (503) 537-9554
EMAIL: bcrement@hbh-consulting.com
PROJECT MANAGER: BRADLEY J. CREMENT, P.E.

PROJECT DESIGN:

NORTHWEST HYDRAULIC CONSULTANTS
16300 CHRISTENSEN ROAD, STE. # 350
SEATTLE, WA 98188
PH: (206) 241-6000
EMAIL: vcollins@nhc-sea.com
CONTACT: VAUGHN COLLINS, P.E., CFM

OREGON SOLUTIONS

TILLAMOOK COUNTY — Land of Cheese, Trees and Ocean Breeze



LOCATION MAP

SCALE: 1" = 1600'

REV.	DATE	DESCRIPTION	BY

H B H Consulting Engineers
2316 Portland Road, Suite H
Newberg, Oregon 97132
Ph 503/554-9553
fax 503/537-9554
mail@hbh-consulting.com

nhc northwest hydraulic consultants

Designed By: BJC | Drawn By: BJC | Checked By: MDH | Submittal No: PRELIMINARY
File: L:/2009-003/DWG/COVER | Layout: COVER

0" 0.5"
IF THIS LINE IS NOT 0.5 INCH SCALE IS NOT AS SHOWN

OREGON SOLUTIONS
506 SW MILL STREET; PORTLAND, OREGON 97201

SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON
COVER SHEET

Date: 02-15-13
Sheet No. 1 of 19
2009-003

ABBREVIATIONS

@	AT
AC	ASPHALT
CB	CATCH BASIN
C/L	CENTERLINE
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
COTG	CLEAN OUT TO GRADE
CY	CUBIC YARDS
DR	DRIVE
DIP	DUCTILE IRON PIPE
E	EAST
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EX	EXISTING
FCS	FLOOD CONTROL STRUCTURE
GUT	GUTTER
HDPE	HIGH DENSITY POLYETHYLENE
HOR	HORIZONTAL
HP	HIGH POINT
HYD	HYDRANT
IE	INVERT ELEVATION
LF	LINEAR FEET
LN	LINE
LP	LOW POINT
LT	LEFT
MH	MANHOLE
N	NORTH
NE	NORTH EAST
NTS	NOT TO SCALE
NW	NORTH WEST
OHP	OVER HEAD POWER
P/L	PROPERTY LINE
PVC	POLYVINYL CHLORIDE
ROW	RIGHT OF WAY
RT	RIGHT
S	SOUTH
SE	SOUTH EAST
SW	SOUTH WEST
STM	STORM DRAIN
SF	SQUARE FEET
SAN	SANITARY SEWER
ST	STREET
STA	STATION
S=	SLOPE EQUALS
S/W	SIDEWALK
TB	THRUST BLOCK
TYP	TYPICAL
VER	VERTICAL
W	WEST
W/	WITH
WTR	WATER

TAX LOT INFORMATION

THIS PROJECT IS LOCATED IN A PORTION OF SECTION 22 AND 23 OF TOWNSHIP 1 SOUTH, RANGE 10 WEST OF THE WILLAMETTE MERIDIAN. COUNTY OF TILLAMOOK, STATE OF OREGON.

VERTICAL DATUM

THE ELEVATIONS SHOWN HEREON ARE BASED UPON NAVD 88 DATUM.

LOCATE

(48 HOUR NOTICE PRIOR TO EXCAVATION)

OREGON LAW REQUIRES YOU TO FOLLOW THE RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH 952-001-0090 & ORS 757.542 THROUGH 757.562 & ORS 757.993. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER BY CALLING (503) 246-1987.
ONE CALL SYSTEM NUMBER 1-800-332-2344.

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO ALL STATE, FEDERAL AND LOCAL AGENCY REGULATIONS. THE CONTRACTOR SHALL REVIEW REGULATORY PERMIT REQUIREMENTS TO ENSURE CONFORMANCE TO THE RULES OF EACH AGENCIES.

2. THE CONTRACTOR SHALL PROVIDE A PLAN FOR WORK IN WATERWAYS THAT ARE ACCESSIBLE BY FISHERIES. THE CONSTRUCTION ACTIVITY SHALL BE LIMITED TO IN-WATER WORK PERIODS. A FISHERIES BIOLOGIST SHALL BE CONSULTED TO REVIEW THE WORK PLAN TO ENSURE THAT ALL REGULATIONS ARE STRICTLY ADHERED TO. THIS WORK MAY INCLUDE COFFERDAMS, REMOVAL OF FISH AND RELATED WORK. THE PLAN SHALL BE REVIEWED BY THE AFFECTED AGENCIES.

3. A PORTION OF THIS WORK IS TIDAL RELATED. THE CONTRACTOR SHALL COORDINATE THEIR ACTIVITIES WITH THE INSPECTOR AND LOCAL AGENCIES WHEN WORKING IN THIS ZONE. WORK HOURS MAY NEED TO BE ADJUSTED ACCORDINGLY.

4. ALL CONCRETE POURS SHALL NOT BE IN CONTACT WITH WATER. PUMPING WILL BE REQUIRED. A PUMPING PLAN SHALL BE SUBMITTED AND APPROVED PRIOR TO STARTING THIS PORTION OF WORK.

5. THE CONTRACTOR SHALL SUBMIT AN OVERALL WORKPLAN FOR THE SCHEDULED ACTIVITIES. THIS PLAN SHALL BE DETAILED INTO MONTHLY ACTIVITIES AND REVIEWED BIWEEKLY. THE PLAN SHALL BE FORWARDED TO PERMITTING AGENCIES FOR COMMENT.

6. THE CONTRACTOR SHALL PROTECT WATERWAYS FROM SILTATION DUE TO CONSTRUCTION ACTIVITIES. AN EROSION CONTROL PLAN SHALL BE SUBMITTED FOR REVIEW BY THE ENGINEER. NO MUD OR SILTATION SHALL LEAVE THE JOB SITE VIA ACCESS ROADWAYS. TIRES MUST BE CLEANED AT PROJECT LIMITS.

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SHEET 3	PROJECT OVERVIEW
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SHEET 6	FILL REMOVAL SECTIONS E-E & F-F
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SHEET 8	FILL REMOVAL SECTIONS J-J & K-K
SHEET 9	FILL REMOVAL SECTIONS L-L & M-M
SHEET 10	FILL REMOVAL SECTIONS N-N & O-O
SHEET 11	NORTH LEVEE PLAN AND PROFILE
SHEET 12	MIDDLE & SOUTH LEVEE PLAN AND PROFILE
SHEET 13	NORTH LEVEE TYPICAL SECTIONS
SHEET 14	MIDDLE & SOUTH LEVEE TYPICAL SECTIONS
SHEET 15	EXISTING STRUCTURES AND FILL REMOVAL
SHEET 16	EXISTING STRUCTURES AND FILL REMOVAL
SHEET 17	TYPICAL DETAILS
SHEET 18	TYPICAL DETAILS
SHEET 19	TYPICAL DETAILS

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File: L:/2009-003/DWG/COVER Layout: INDEX

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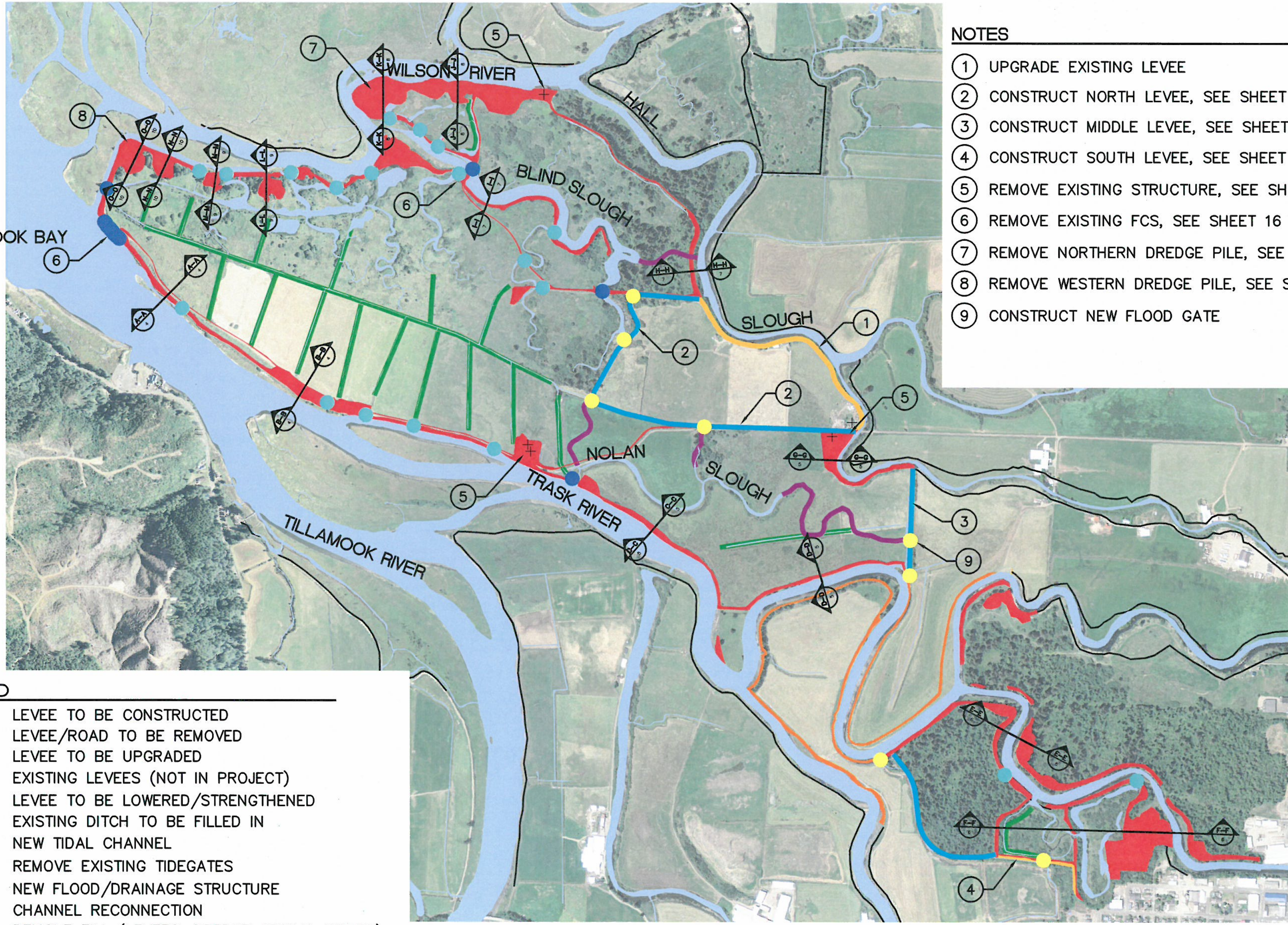
506 SW MILL STREET; PORTLAND, OREGON 97201

SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON
INDEX SHEET

Sheet No. 2 of 19
Date 02-15-13
2009-003



NOTES

1. UPGRADE EXISTING LEVEE
2. CONSTRUCT NORTH LEVEE, SEE SHEET 11
3. CONSTRUCT MIDDLE LEVEE, SEE SHEET 12
4. CONSTRUCT SOUTH LEVEE, SEE SHEET 12
5. REMOVE EXISTING STRUCTURE, SEE SHEET 15
6. REMOVE EXISTING FCS, SEE SHEET 16
7. REMOVE NORTHERN DREDGE PILE, SEE SHEET 8
8. REMOVE WESTERN DREDGE PILE, SEE SHEET 9 & 10
9. CONSTRUCT NEW FLOOD GATE

LEGEND

- LEVEE TO BE CONSTRUCTED
- LEVEE/ROAD TO BE REMOVED
- LEVEE TO BE UPGRADED
- EXISTING LEVEES (NOT IN PROJECT)
- LEVEE TO BE LOWERED/STRENGTHENED
- EXISTING DITCH TO BE FILLED IN
- NEW TIDAL CHANNEL
- REMOVE EXISTING TIDEGATES
- NEW FLOOD/DRAINAGE STRUCTURE
- CHANNEL RECONNECTION
- REMOVE FILL (LEVEES, DREDGE SPOILS, ROADS)
- WATER
- REMOVE EXISTING BUILDING
- FILL REMOVAL CROSS SECTIONS

PROJECT OVERVIEW

SCALE: 1" = 1000'

GRAPHIC SCALE

500 0 250 500 1000 2000

(IN FEET)
1 inch = 1000 ft.

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

PROJECT OVERVIEW

Sheet No. 3
Date 02-15-13
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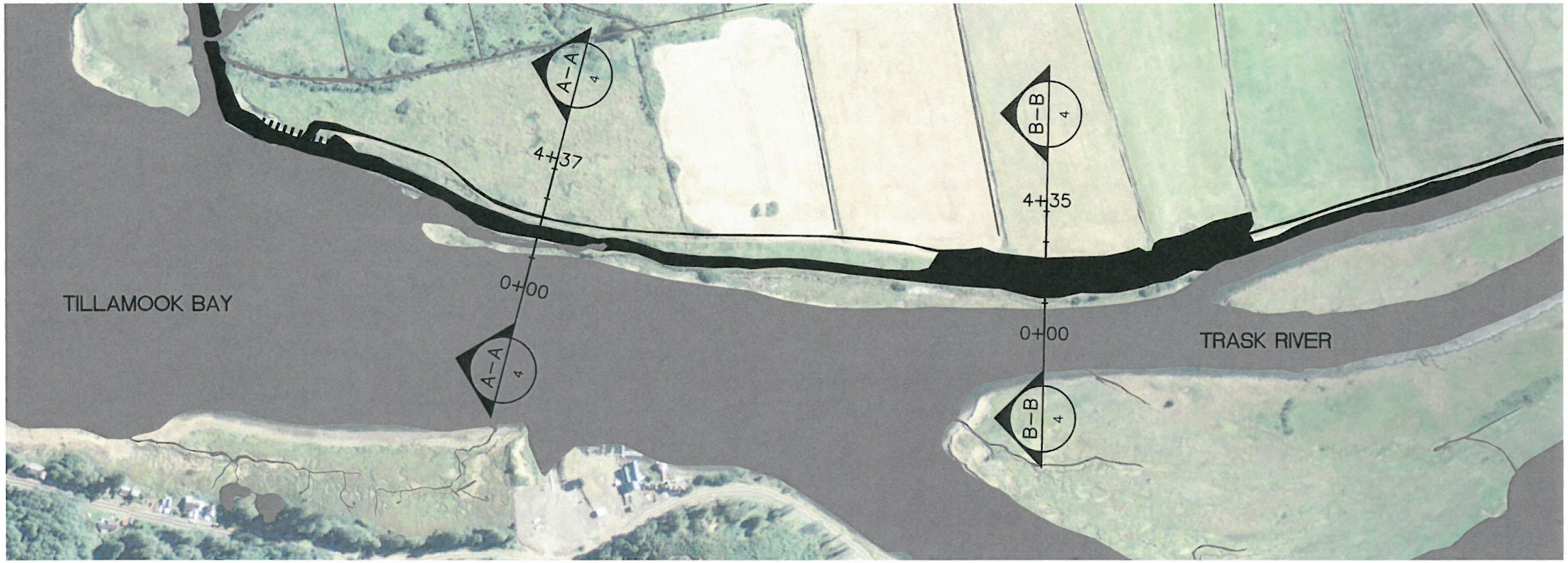
2009-003



SECTIONS A-A AND B-B

SCALE: 1" = 400'

GRAPHIC SCALE

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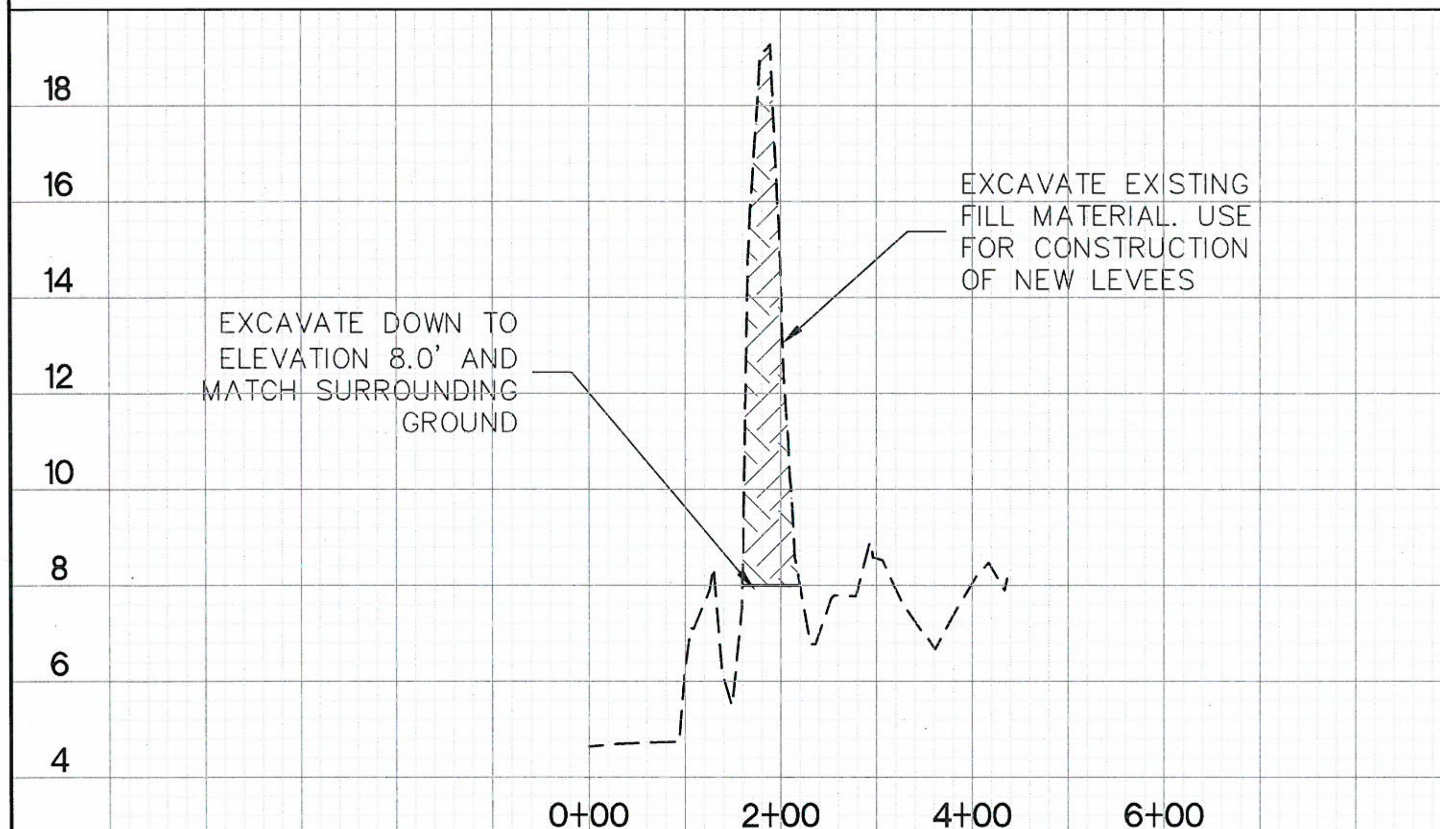
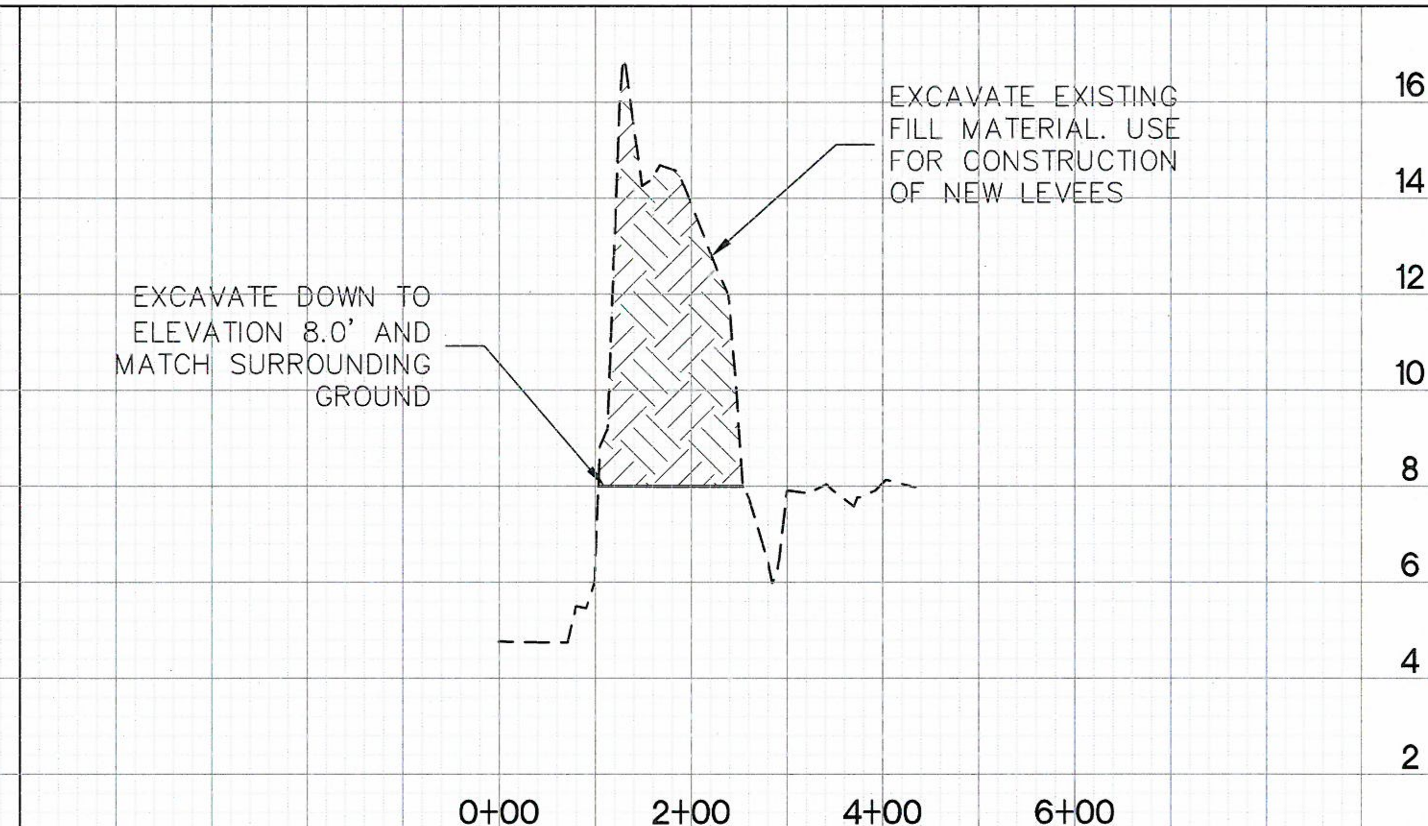
(IN FEET)
1 inch = 400 ft.



SECTION A-A PROFILE

SCALE: HOR: 1" = 200'
VER: 1" = 4'



SECTION B-B PROFILE

SCALE: HOR: 1" = 200'
VER: 1" = 4'

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

FIL REMOVAL
SECTIONS A-A AND B-B

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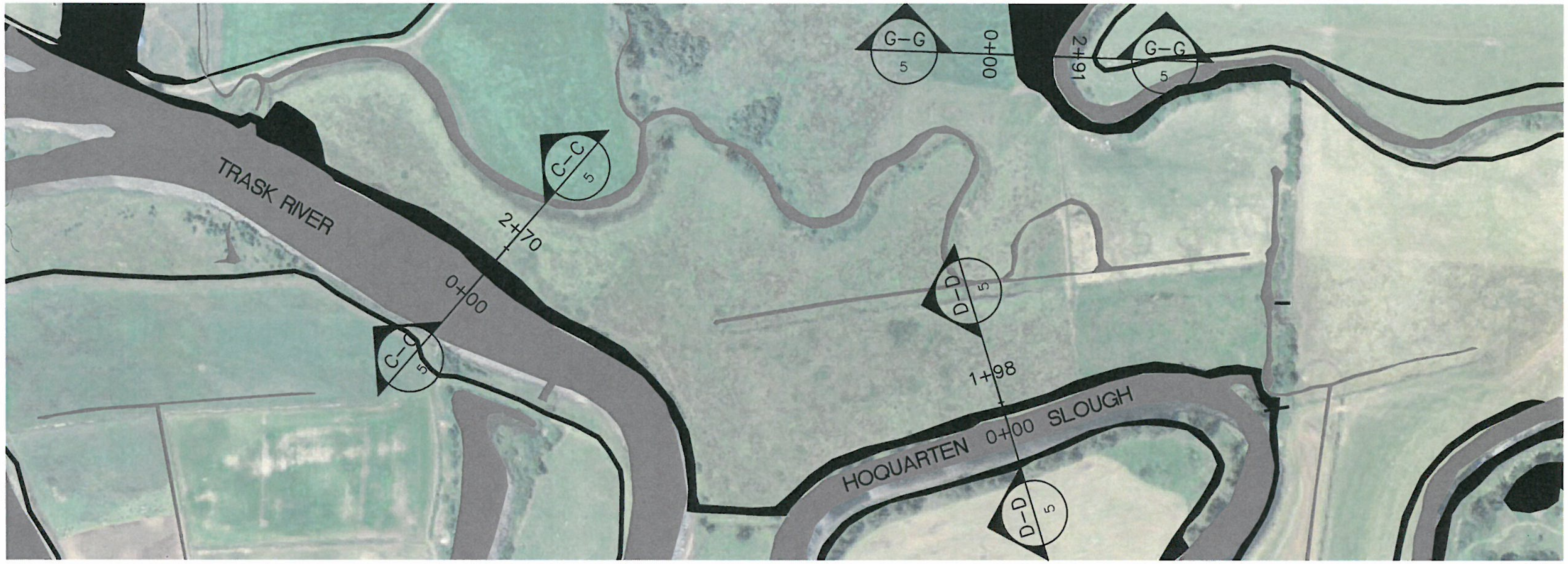
2009-003



SECTIONS C-C, D-D, AND G-G

SCALE: 1" = 400'

GRAPHIC SCALE

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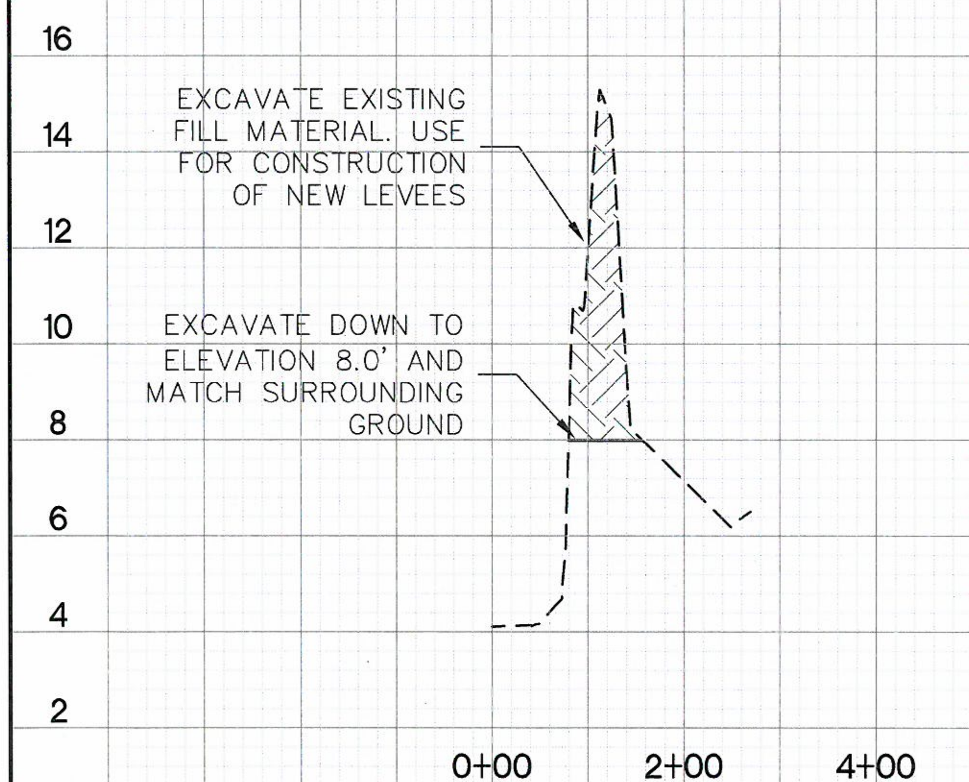
(IN FEET)
1 inch = 400 ft.



SECTION C-C PROFILE

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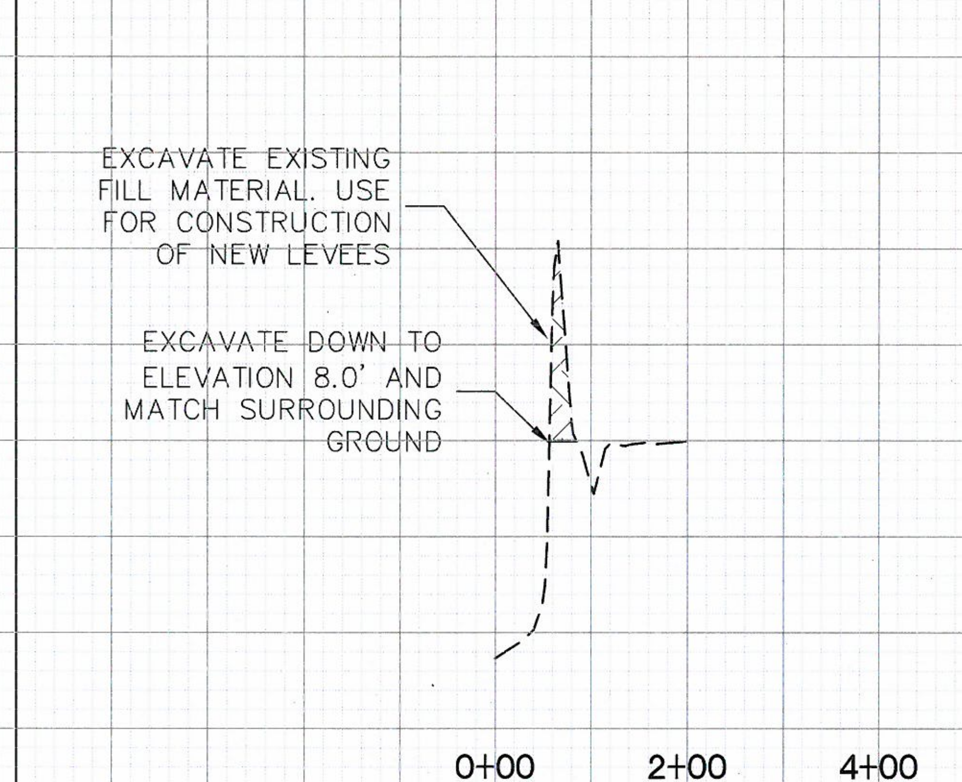

SECTION D-D PROFILE

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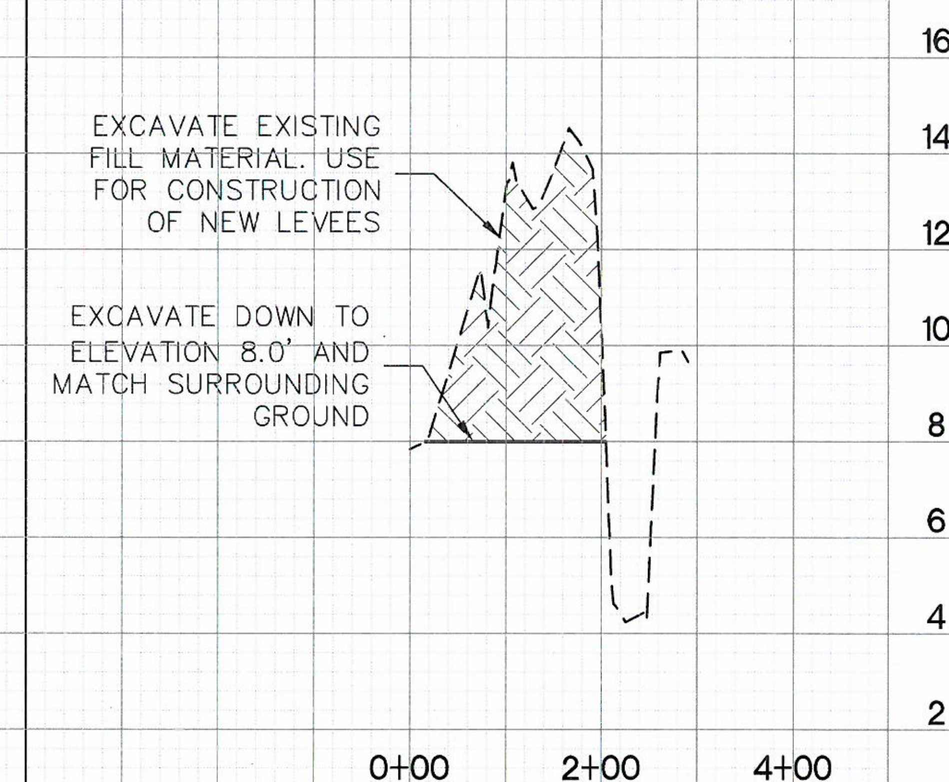

SECTION G-G PROFILE

SCALE: HOR: 1" = 200'
VER: 1" = 4'

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

FILL REMOVAL
SECTIONS C-C, D-D AND G-G

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2009-003

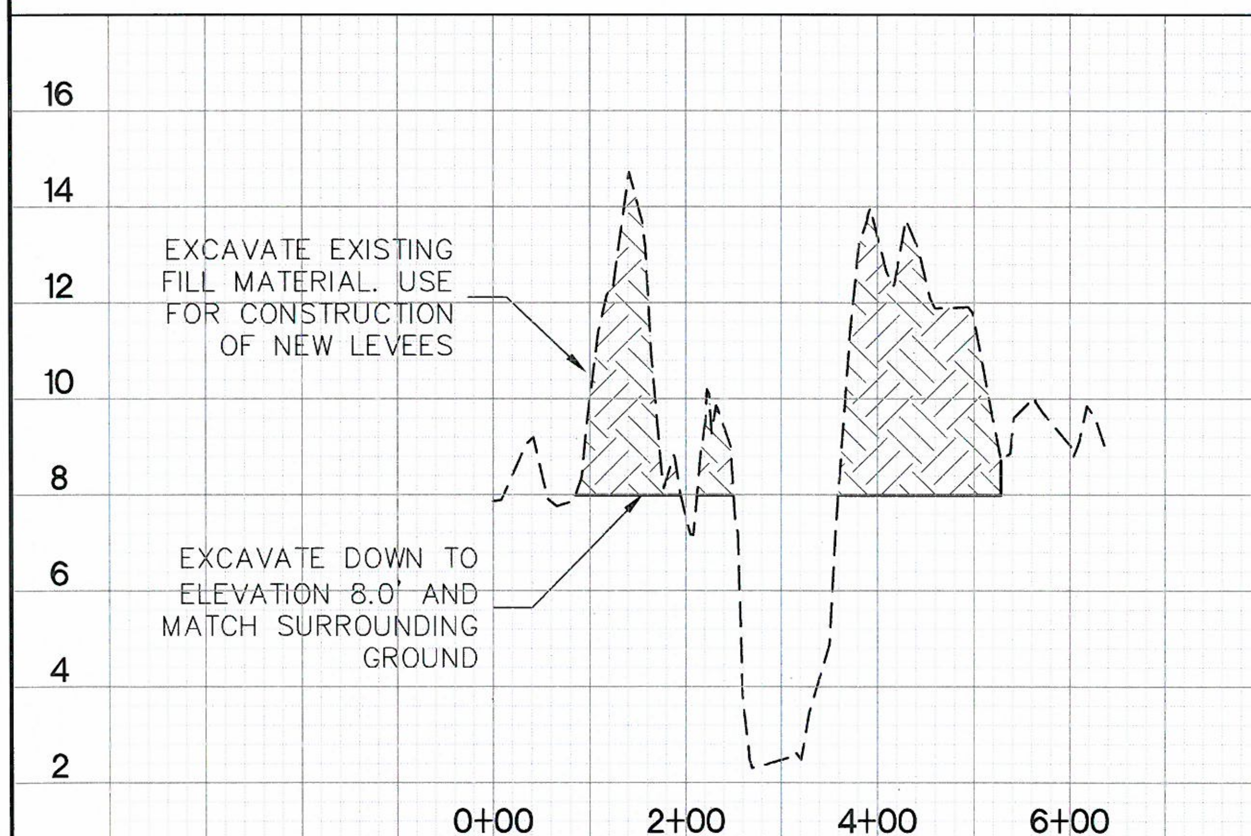
SECTIONS E-E AND F-F

SCALE: 1" = 400'

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 400 ft.



SECTION E-E PROFILE

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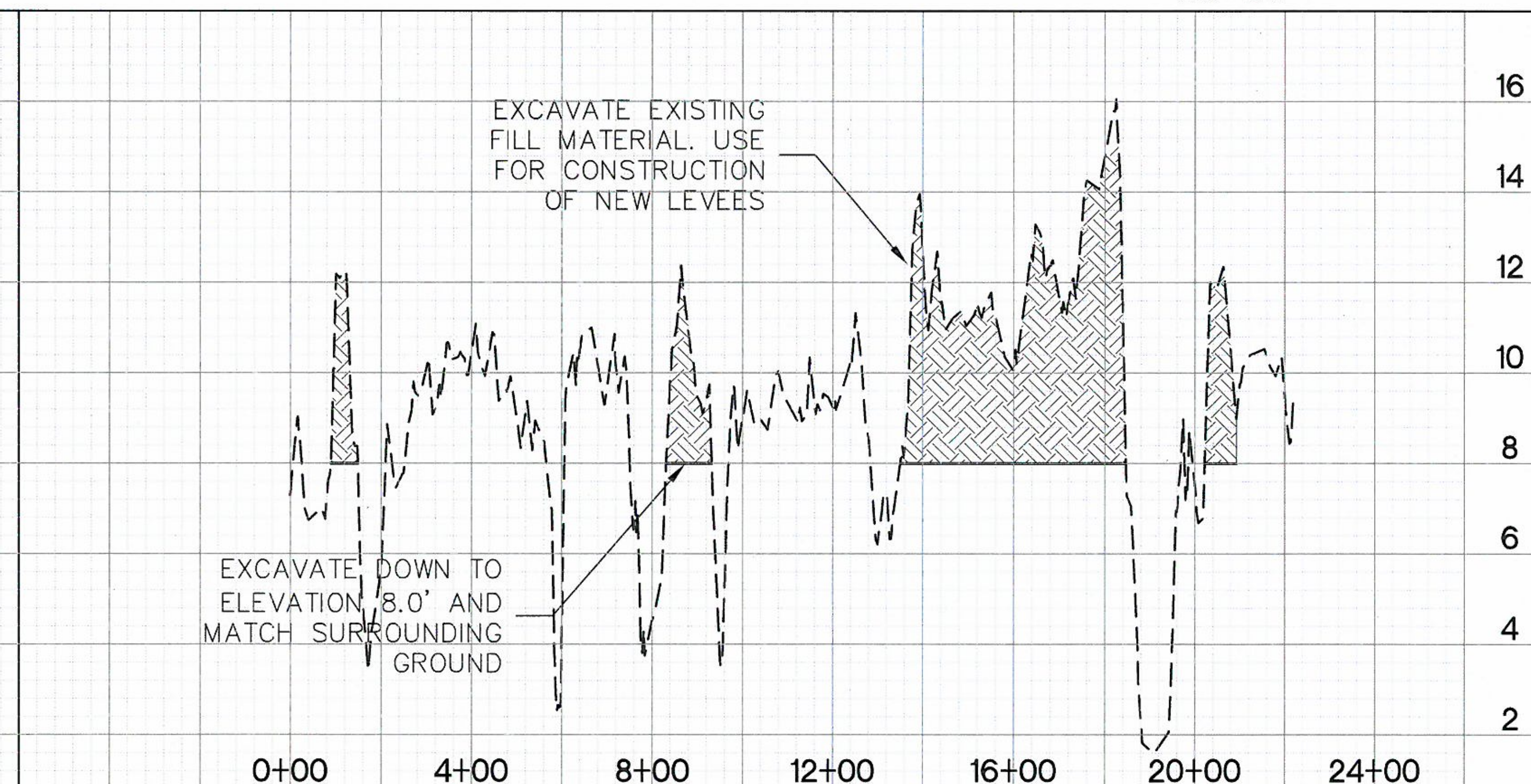
VER: 1" = 4'



SECTION F-F PROFILE

SCALE: HOR: 1" = 400'
VER: 1" = 4'

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

FILL REMOVAL
SECTIONS E-E AND F-F

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Date 02-15-13
2009-003

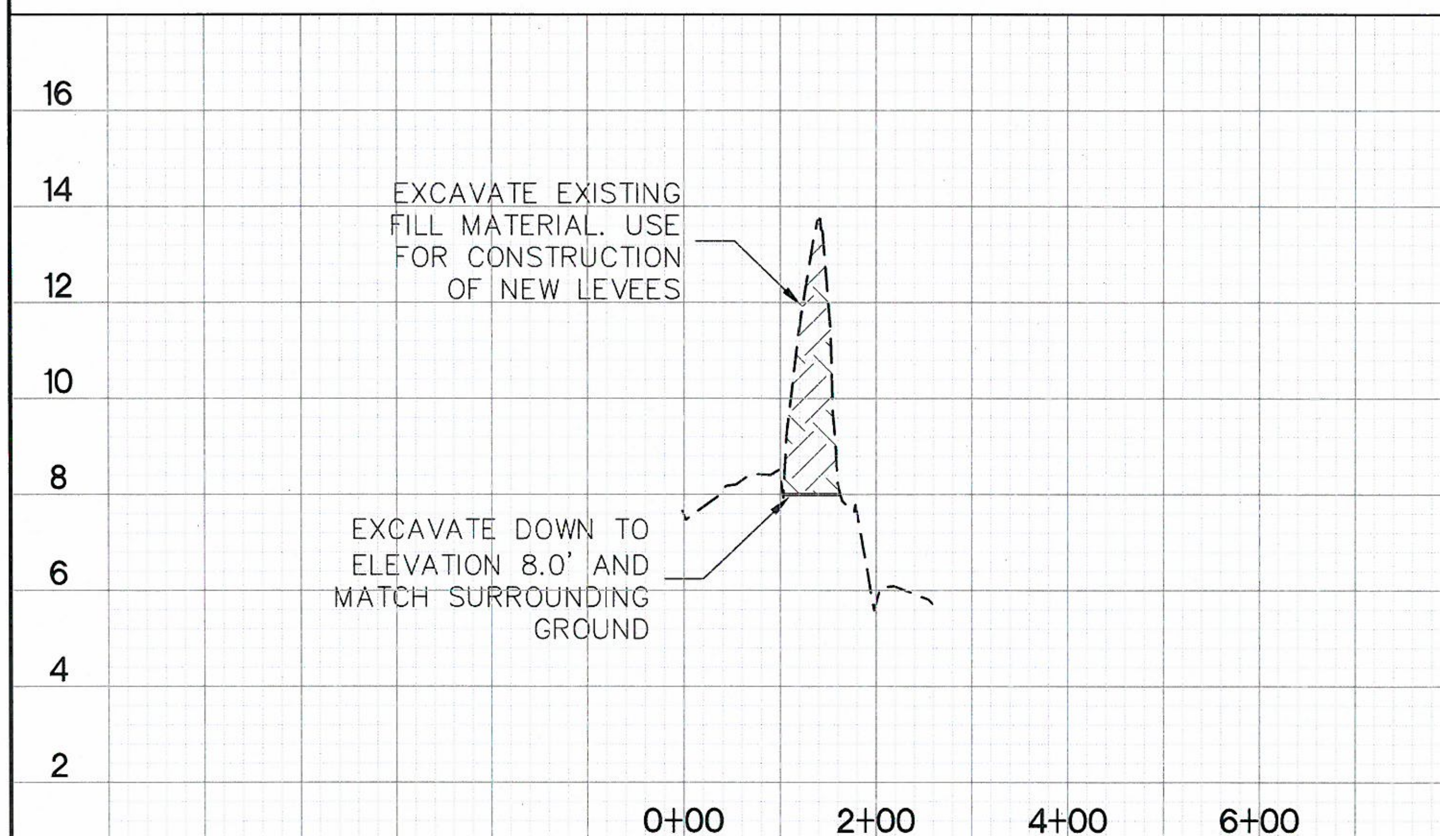
SECTIONS H-H AND I-I

SCALE: 1" = 400'

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 400 ft.



SECTION H-H PROFILE

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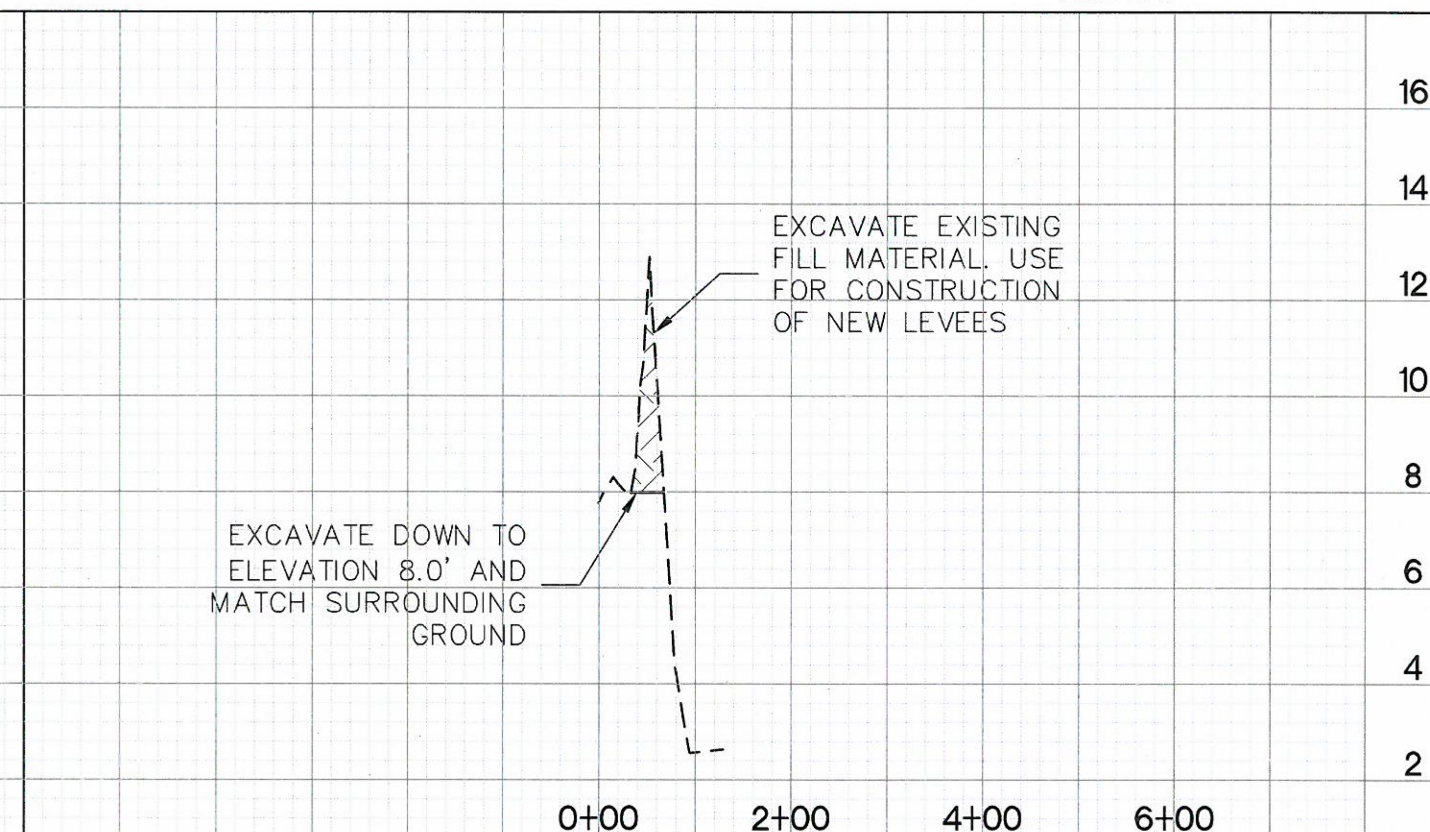

SECTION I-I PROFILE

SCALE: HOR: 1" = 200'
VER: 1" = 4'

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TILLAMOOK, OREGON

FILL REMOVAL
SECTIONS H-H AND I-I

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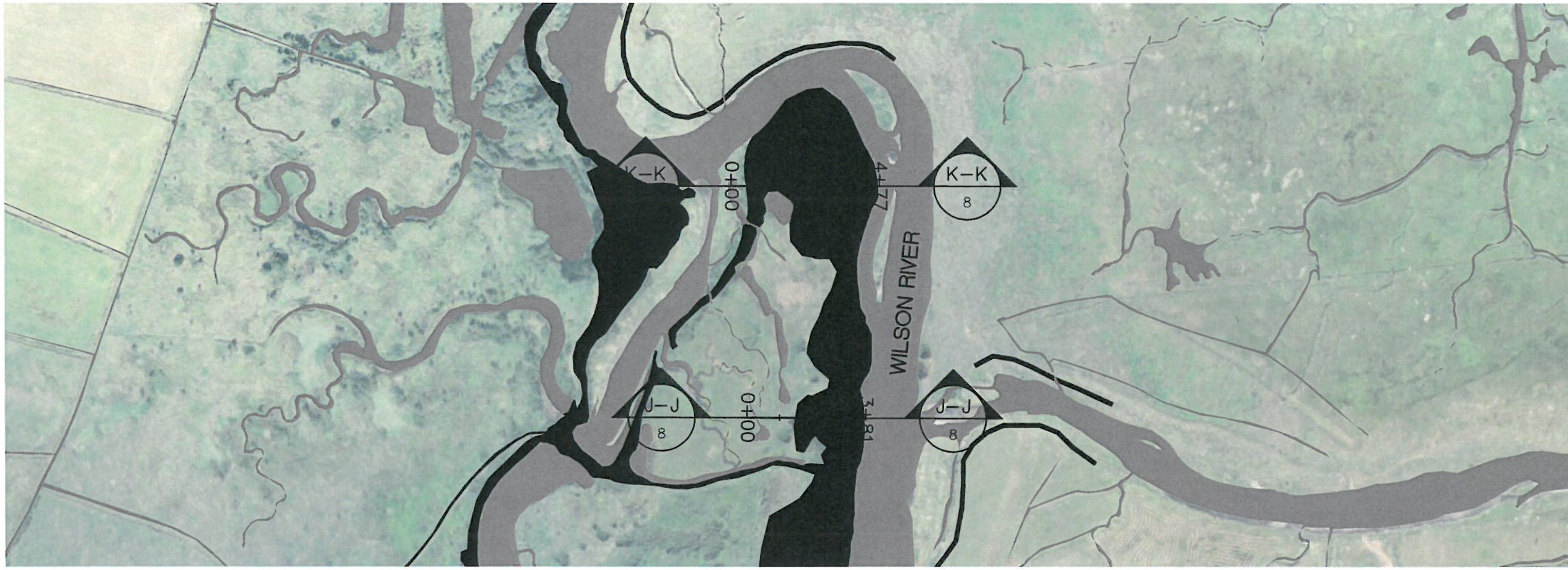

SECTIONS J-J AND K-K

SCALE: 1" = 400'

GRAPHIC SCALE

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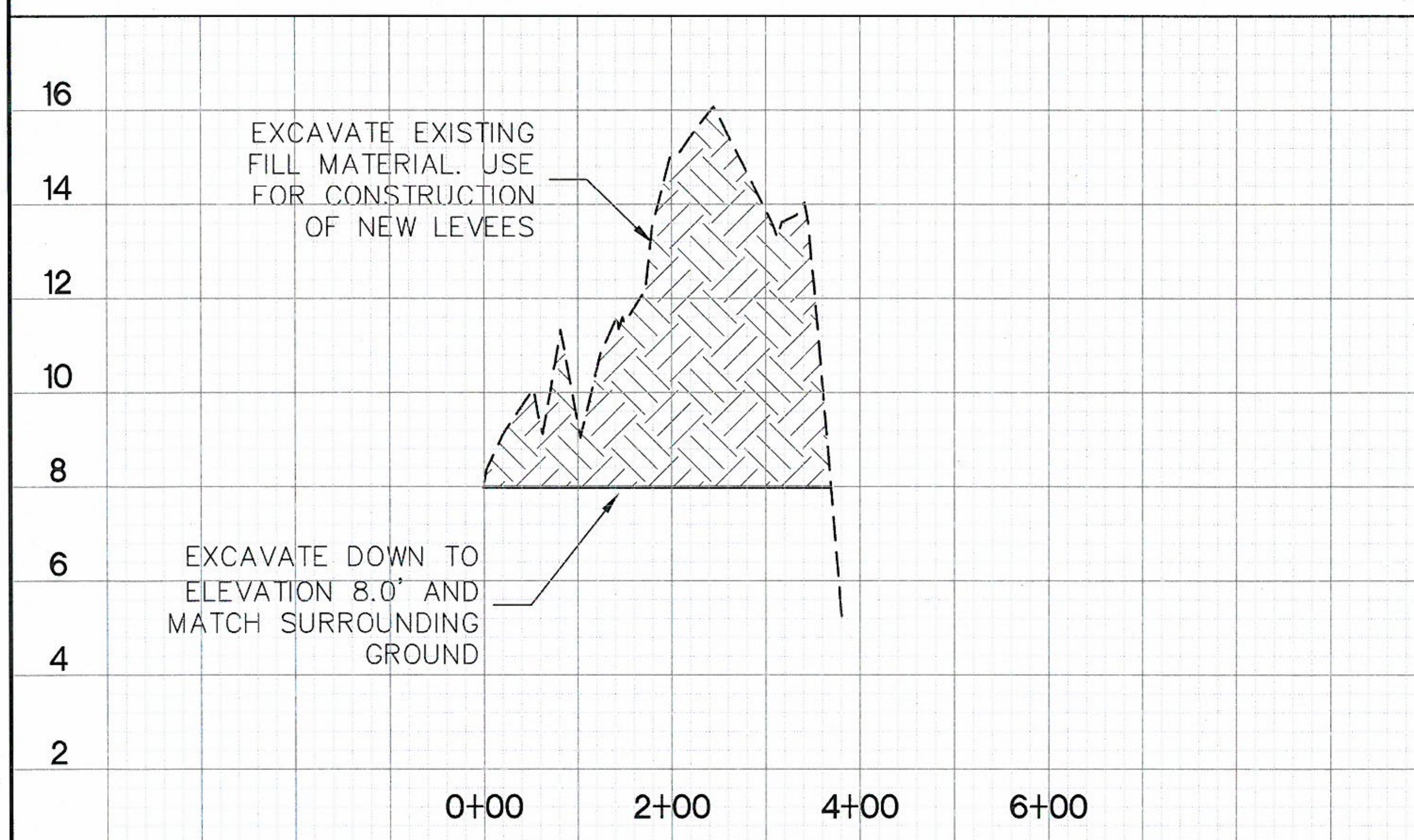
(IN FEET)
1 inch = 400 ft.



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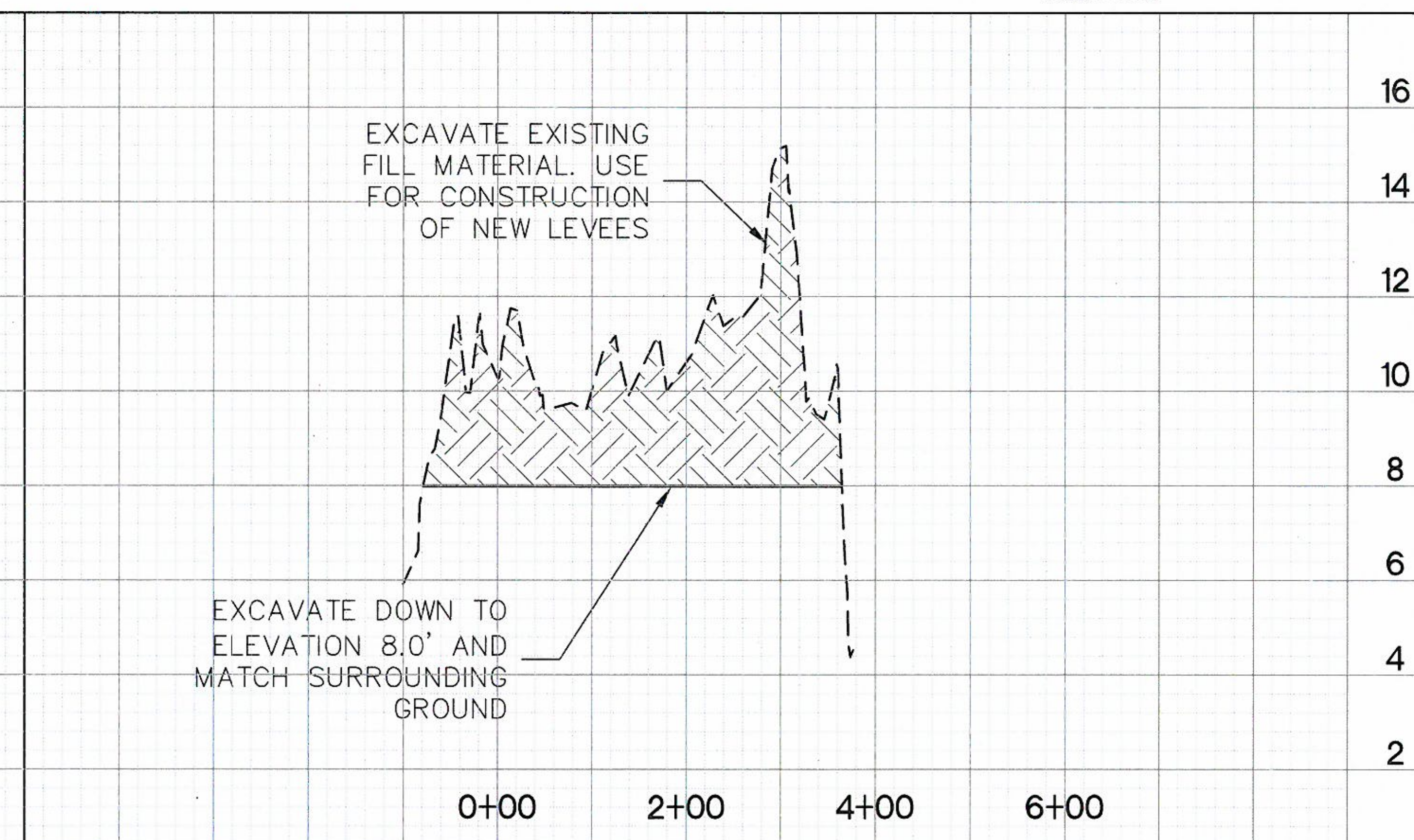

SECTION K-K PROFILE

SCALE: HOR: 1" = 200'
VER: 1" = 4'

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

FILL REMOVAL SECTIONS J-J AND K-K

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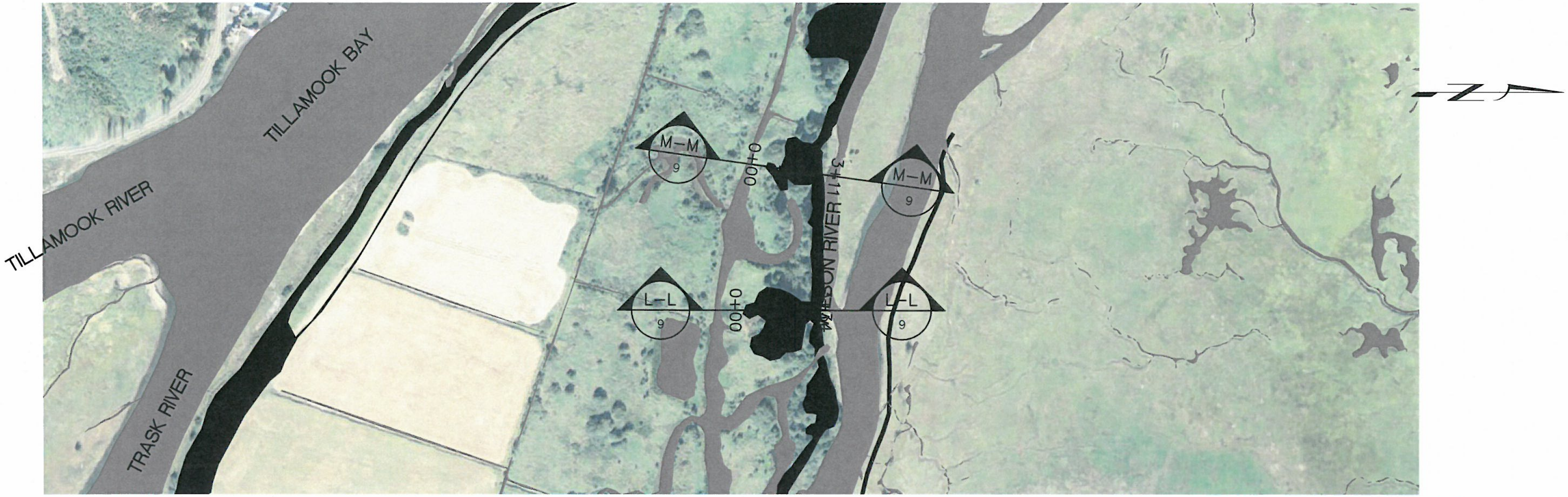
Date 02-15-13
2009-003



SECTIONS L-L AND M-M

SCALE: 1" = 400'

GRAPHIC SCALE

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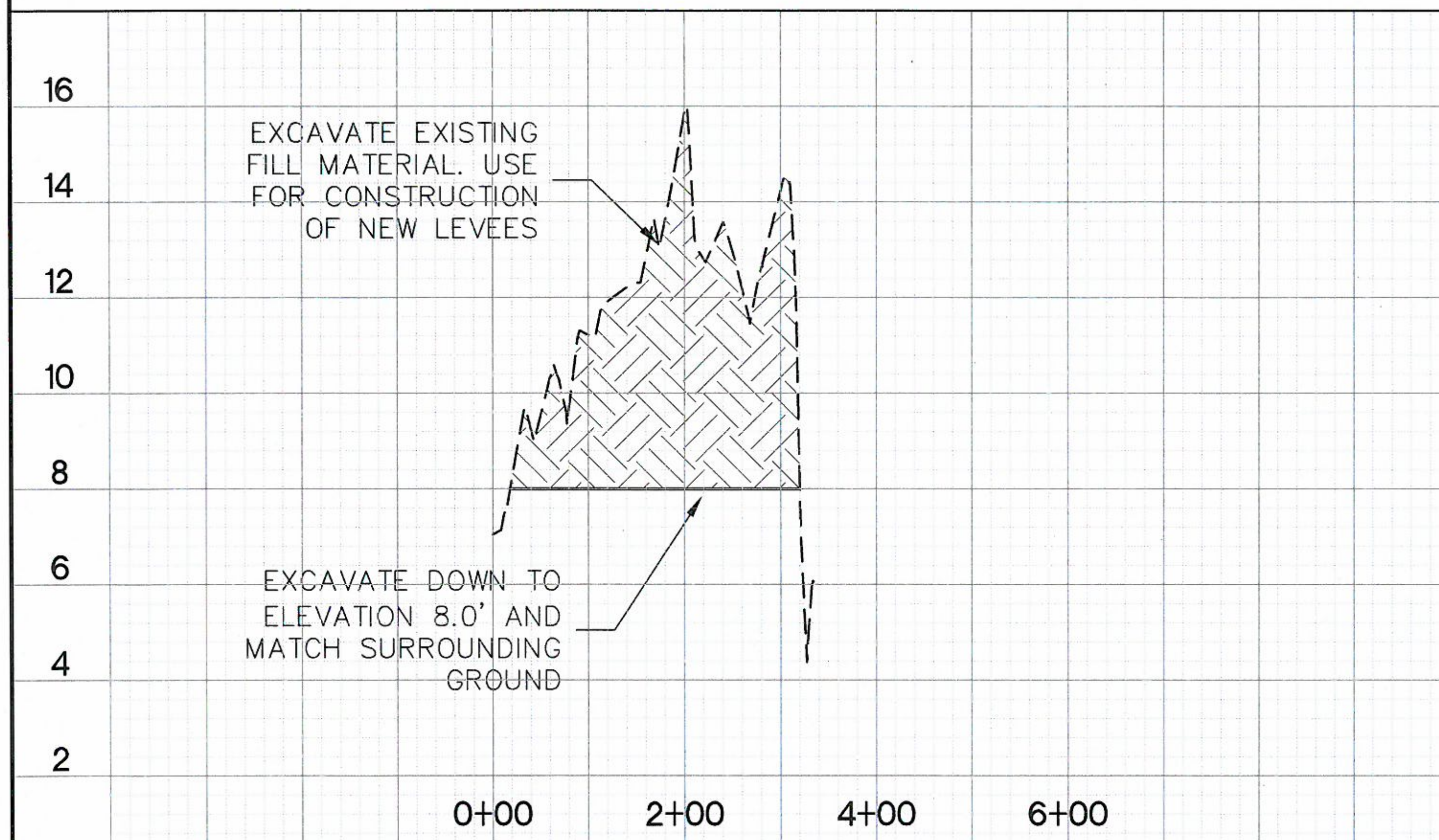
(IN FEET)
1 inch = 400 ft.



SECTION L-L PROFILE

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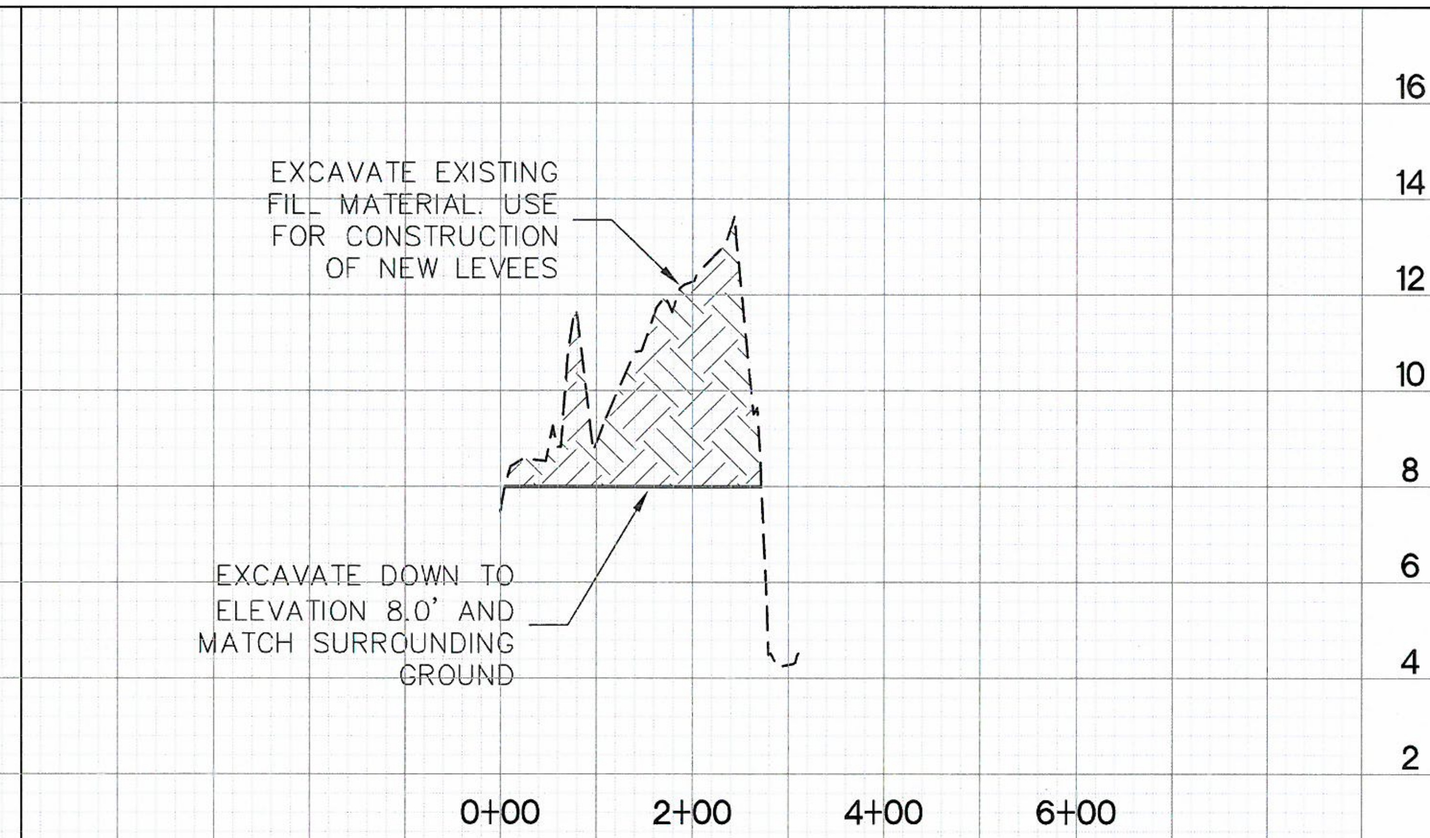

SECTION M-M PROFILE

SCALE: HOR: 1" = 200'
VER: 1" = 4'

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

FILL REMOVAL
SECTIONS L-L AND M-M

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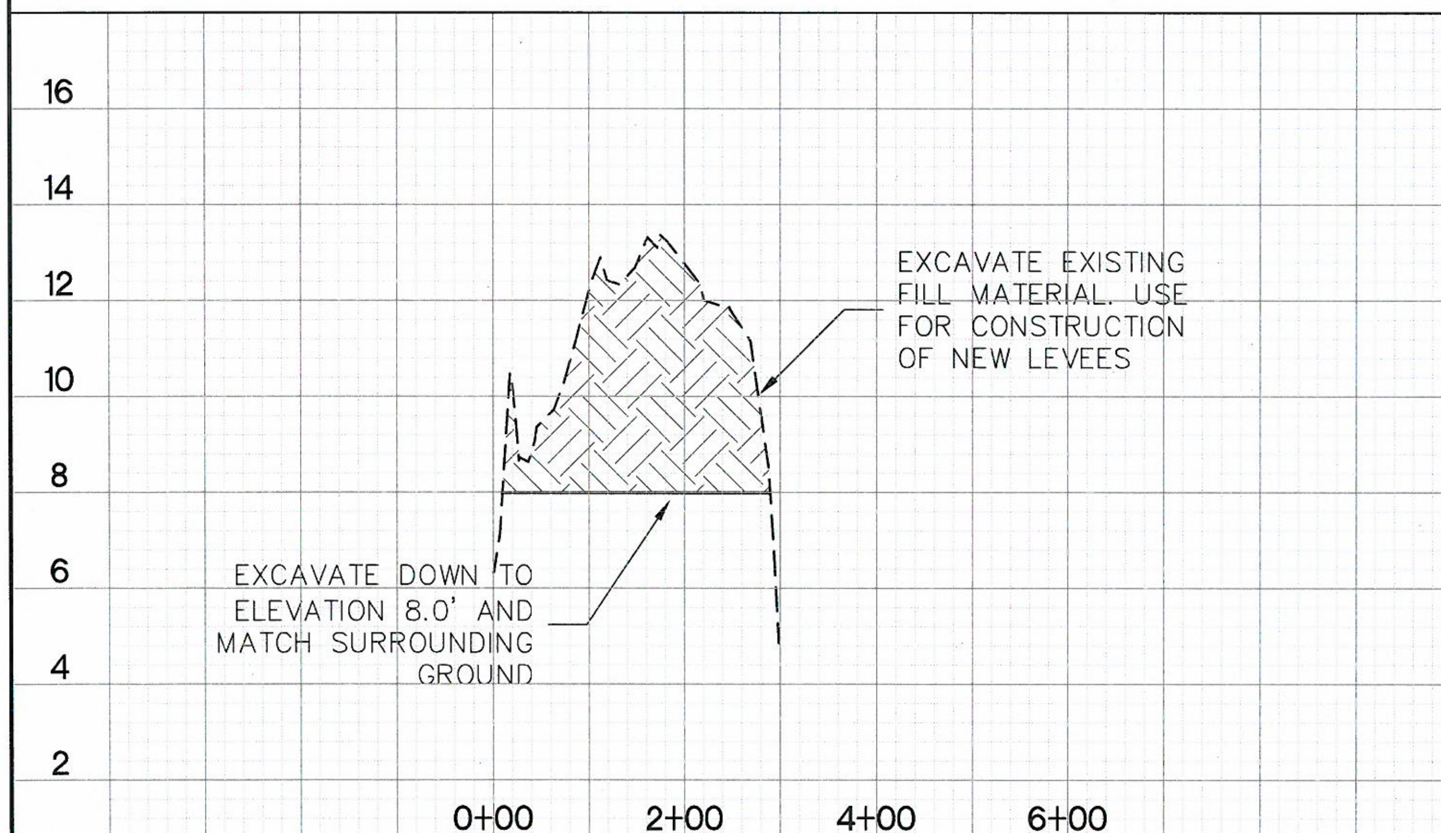
Date 02-15-13
2009-003

SECTIONS N-N AND O-O

SCALE: 1" = 400'

GRAPHIC SCALE
200 0 100 200 400 800
(IN FEET)
1 inch = 400 ft.



SECTION N-N PROFILE

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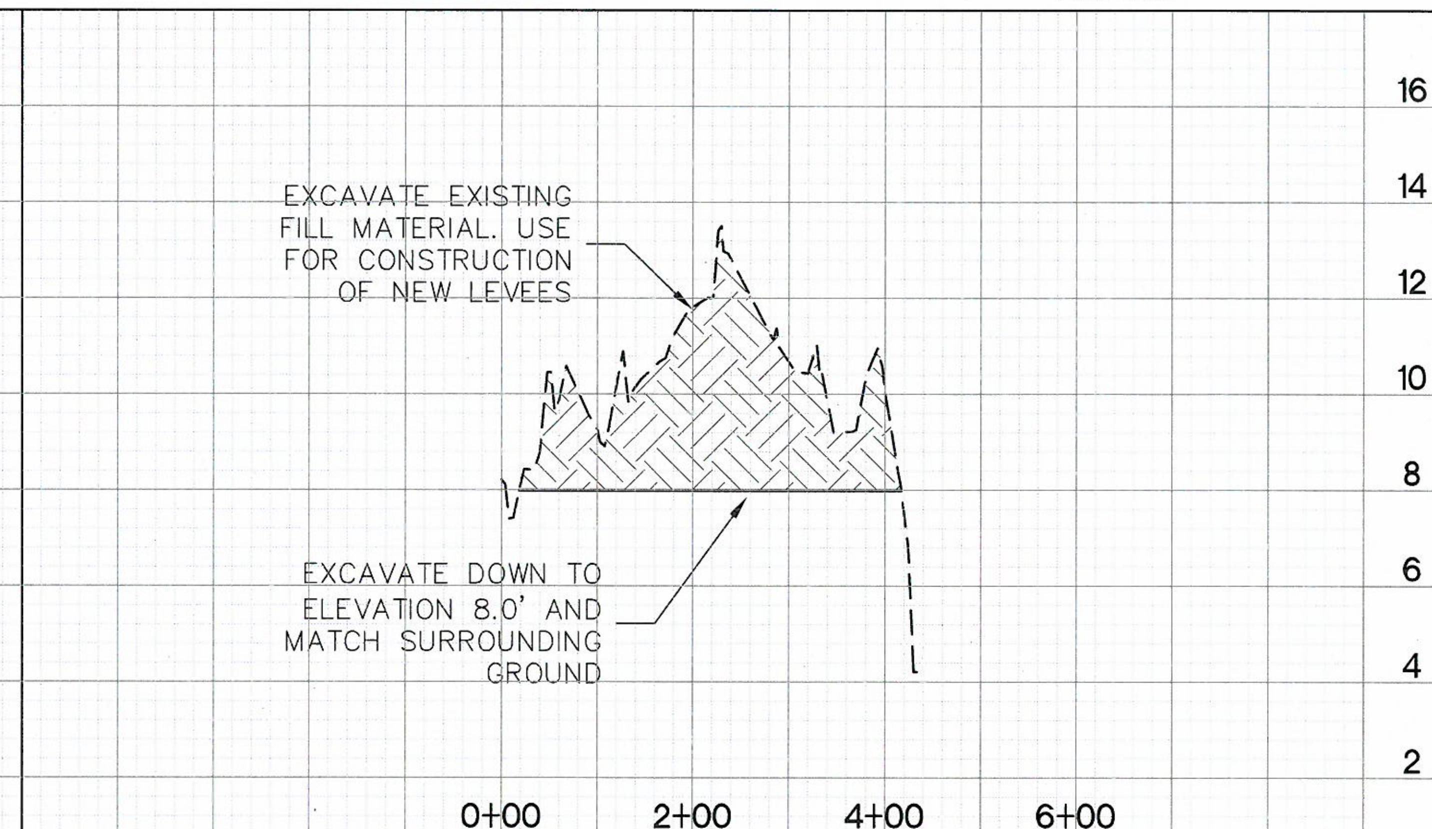

SECTION O-O PROFILE

SCALE: HOR: 1" = 200'
VER: 1" = 4'

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

FILL REMOVAL
SECTIONS N-N AND O-O

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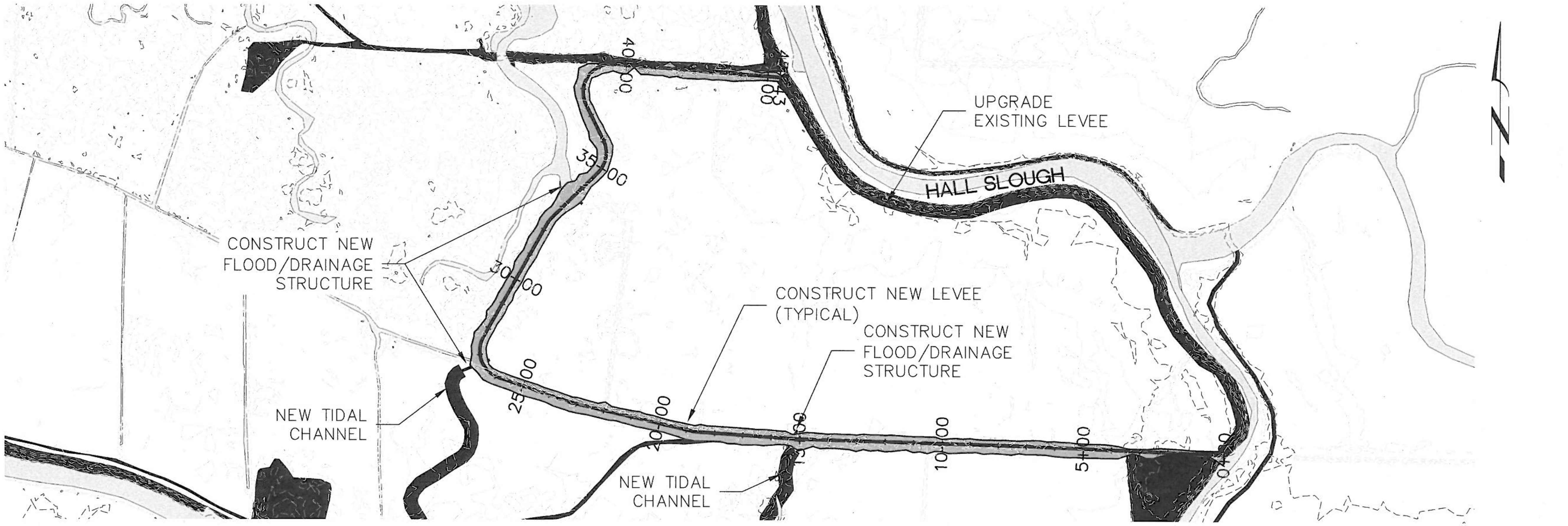
Date 02-15-13
2009-003



NORTH LEVEE PLAN

SCALE: 1" = 400'

GRAPHIC SCALE

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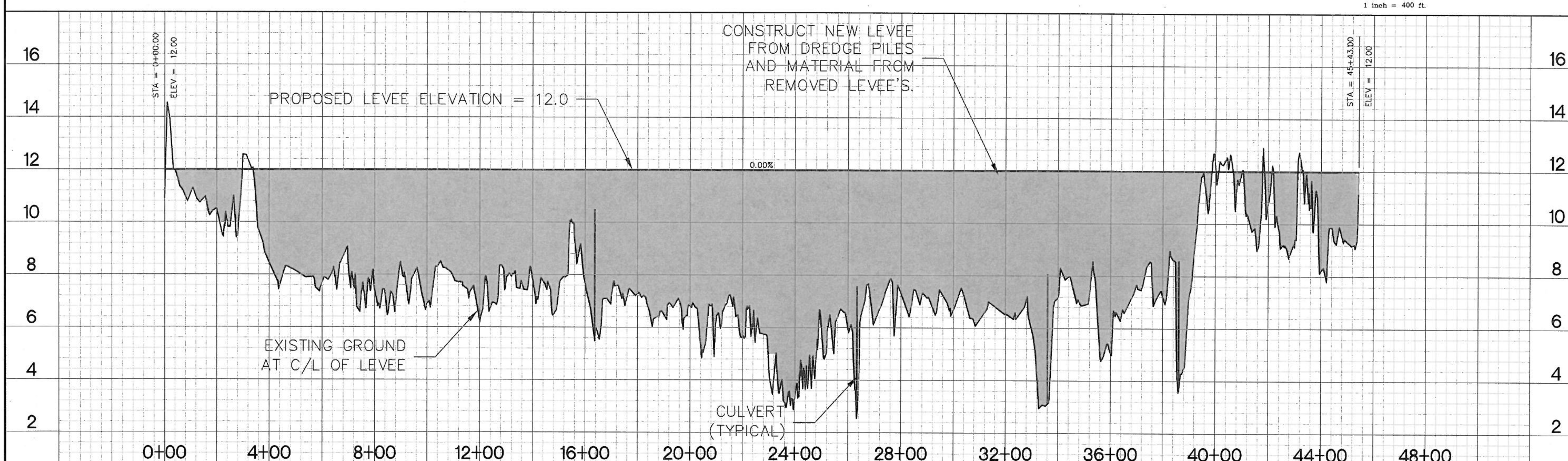
(IN FEET)
1 inch = 400 ft.



NORTH LEVEE PROFILE

SCALE: HOR: 1" = 400'
VER: 1" = 4'

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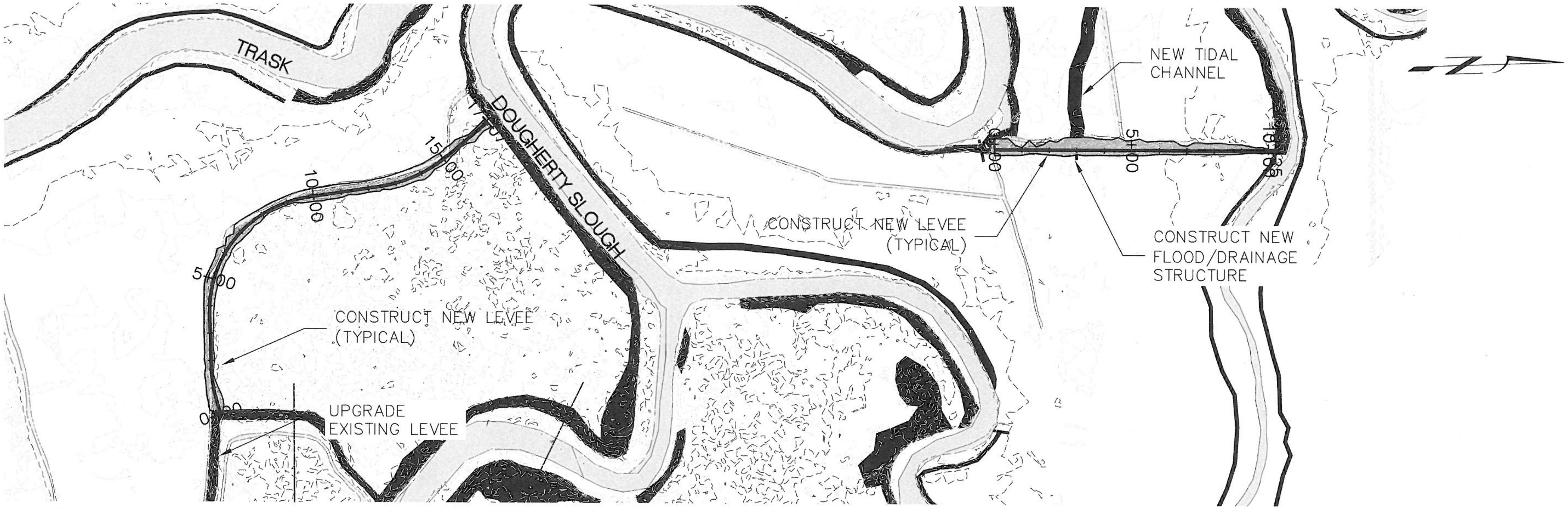
SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

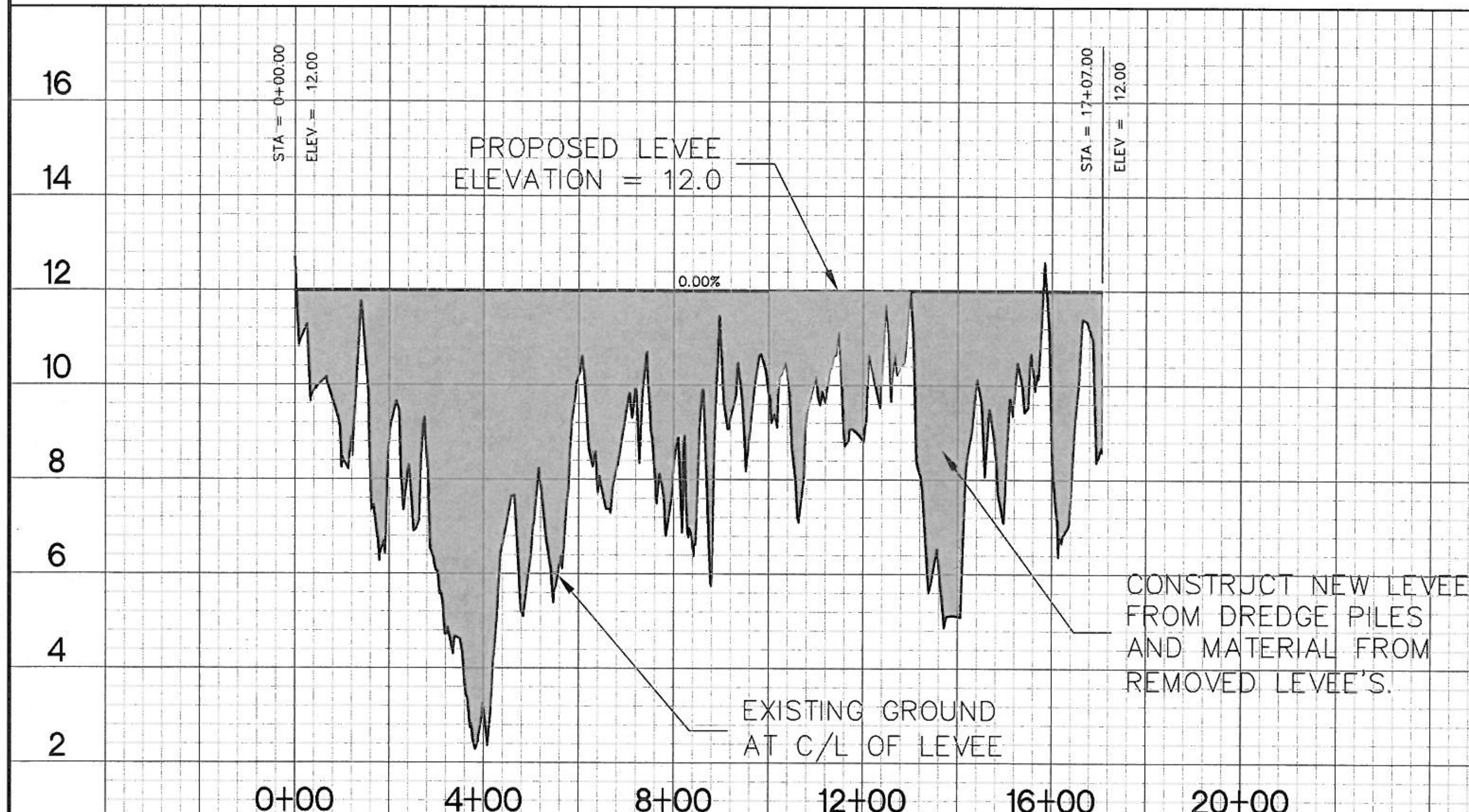
NORTH LEVEE
PLAN + PROFILE

Sheet No. 11 of 19
Date 02-15-13
2009-003



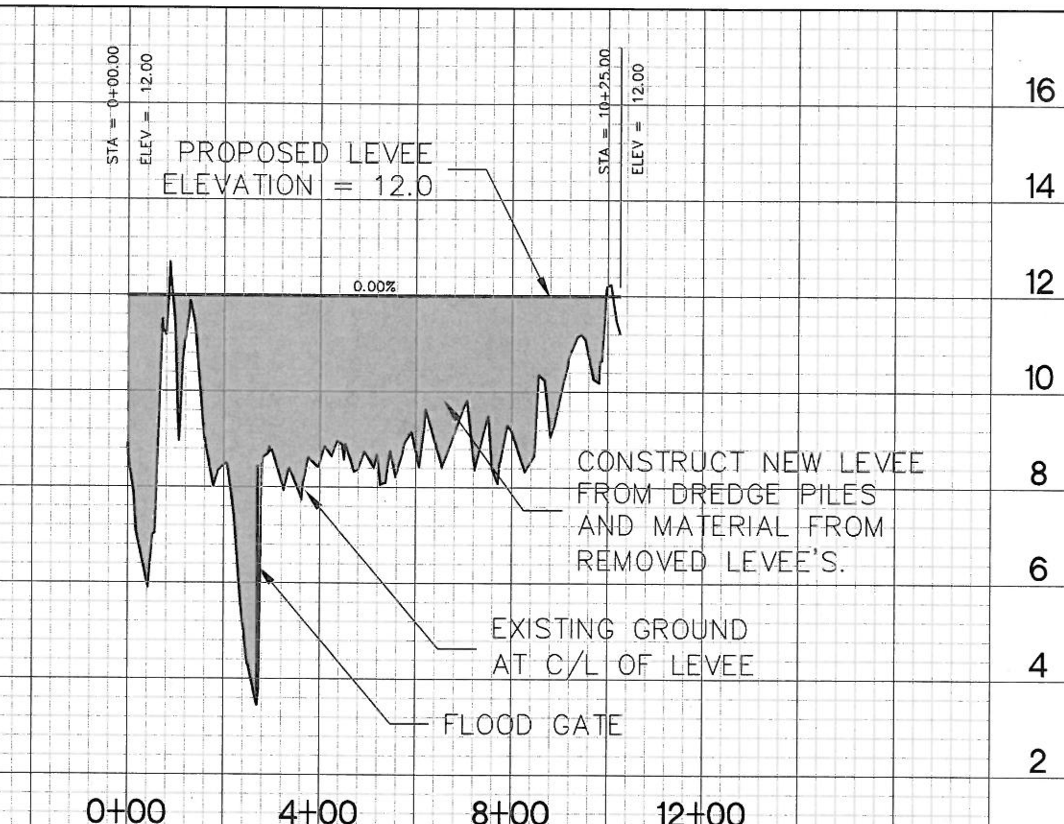
MIDDLE + SOUTH LEVEE PLAN

SCALE: 1" = 400'



SOUTH LEVEE PROFILE

SCALE: HOR: 1" = 400'
VER: 1" = 4'



MIDDLE LEVEE PROFILE

SCALE: HOR: 1" = 400'
VER: 1" = 4'

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

MIDDLE AND SOUTH LEVEE
PLAN + PROFILE

Date 02-15-13
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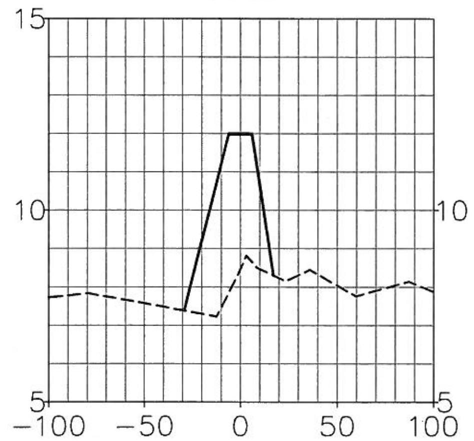
2009-003

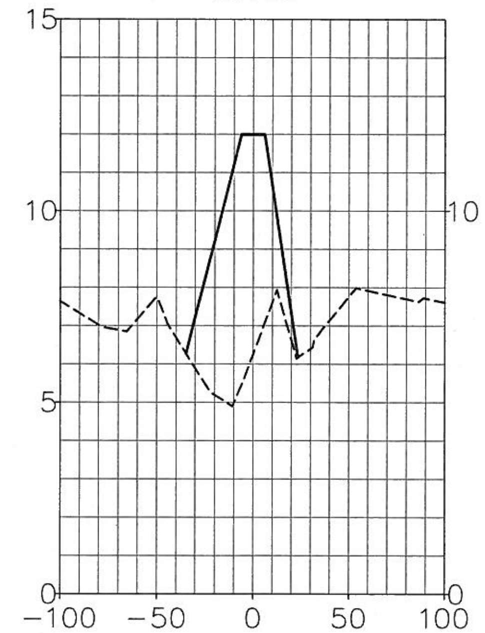
4+00



NORTH LEVEE SECTION

SCALE: HOR: 1" = 100'
VER: 1" = 5'

12+00



NORTH LEVEE SECTION

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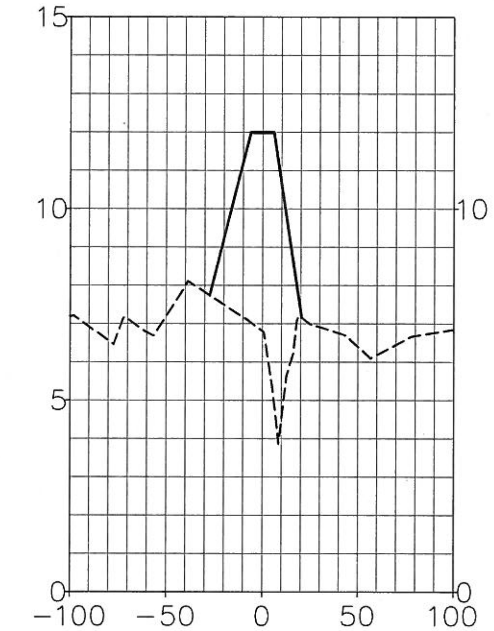
VER: 1" = 5'

20+00



NORTH LEVEE SECTION

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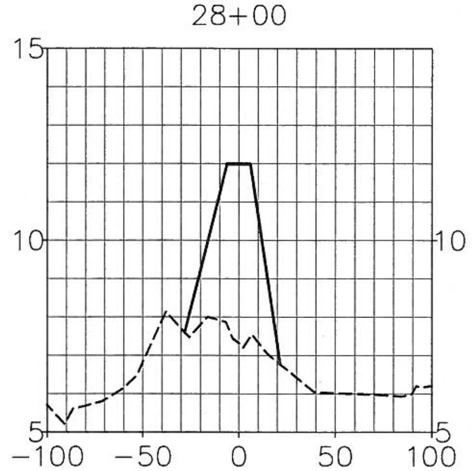
VER: 1" = 5'

28+00



NORTH LEVEE SECTION

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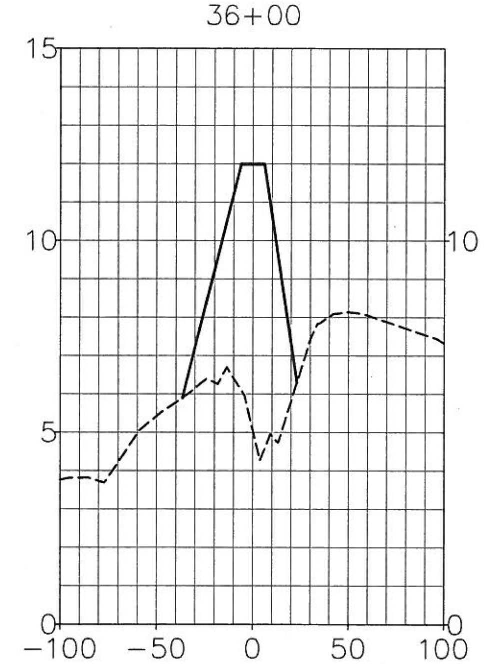
VER: 1" = 5'

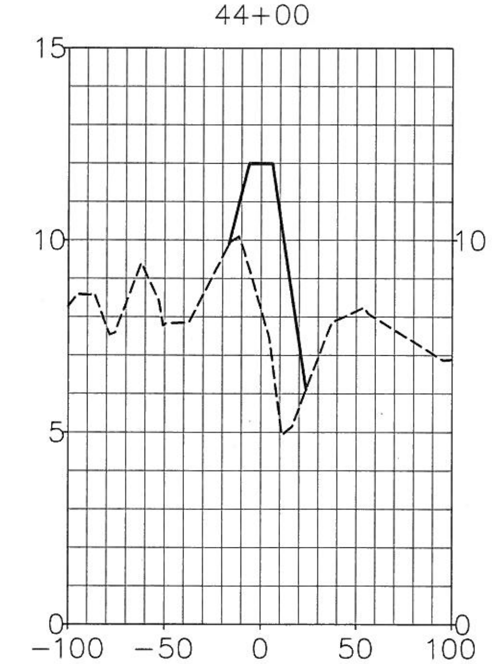
36+00



NORTH LEVEE SECTION

SCALE: HOR: 1" = 100'
VER: 1" = 5'

44+00



NORTH LEVEE SECTION

SCALE: HOR: 1" = 100'
VER: 1" = 5'

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File: L:/2009-003/DWG/LEVEE NEW | Layout: NORTH SECTIONS

REV.	DATE	DESCRIPTION	BY

0" 0.5"
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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

NORTH LEVEE
TYPICAL SECTIONS

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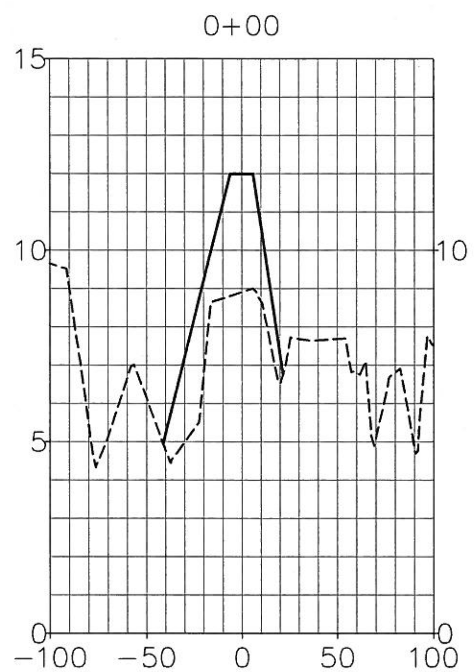
2009-003



MIDDLE LEVEE SECTION

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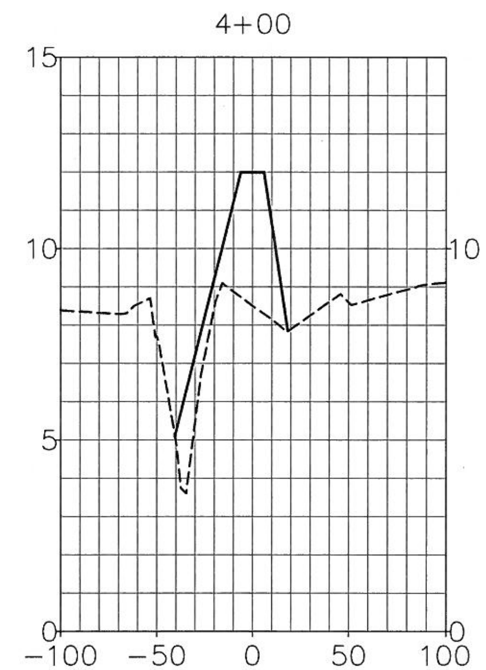
VER: 1" = 5'



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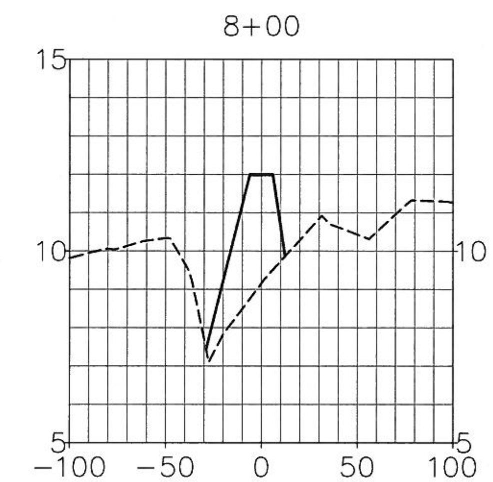

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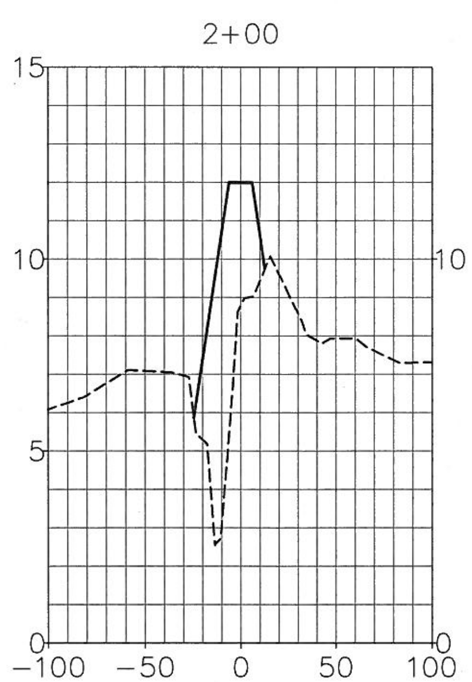

SOUTH LEVEE SECTION

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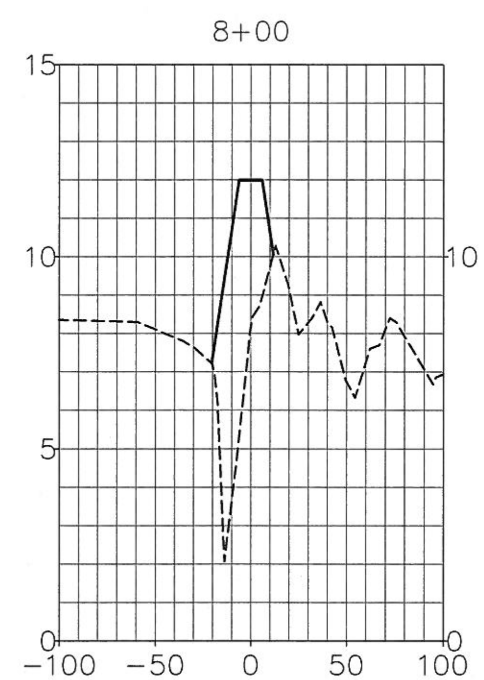
VER: 1" = 5'



SOUTH LEVEE SECTION

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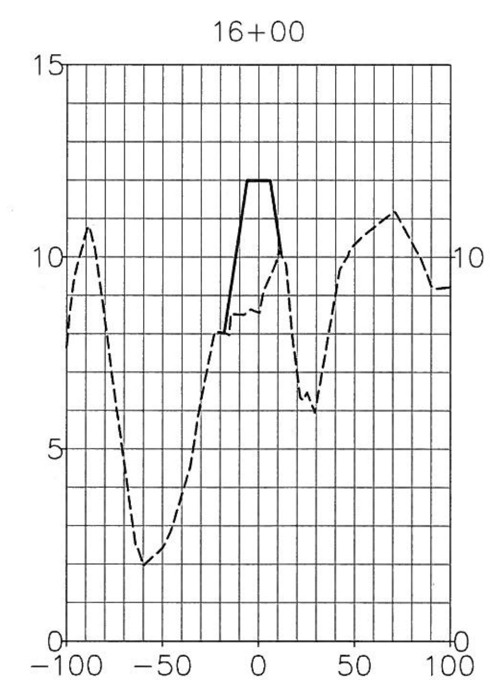
VER: 1" = 5'



SOUTH LEVEE SECTION

SCALE: HOR: 1" = 100'
VER: 1" = 5'

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

MIDDLE + SOUTH LEVEE
TYPICAL SECTIONS

Sheet No. 14
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Date 02-15-13
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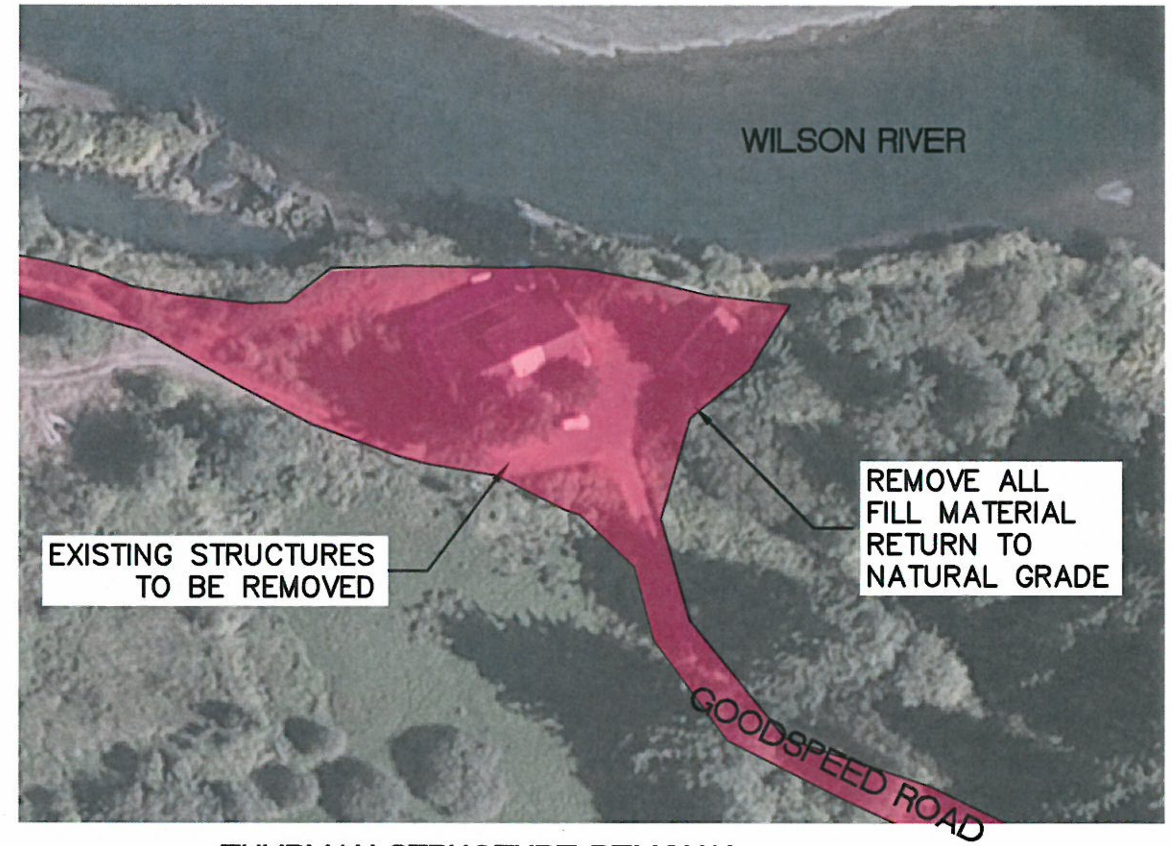
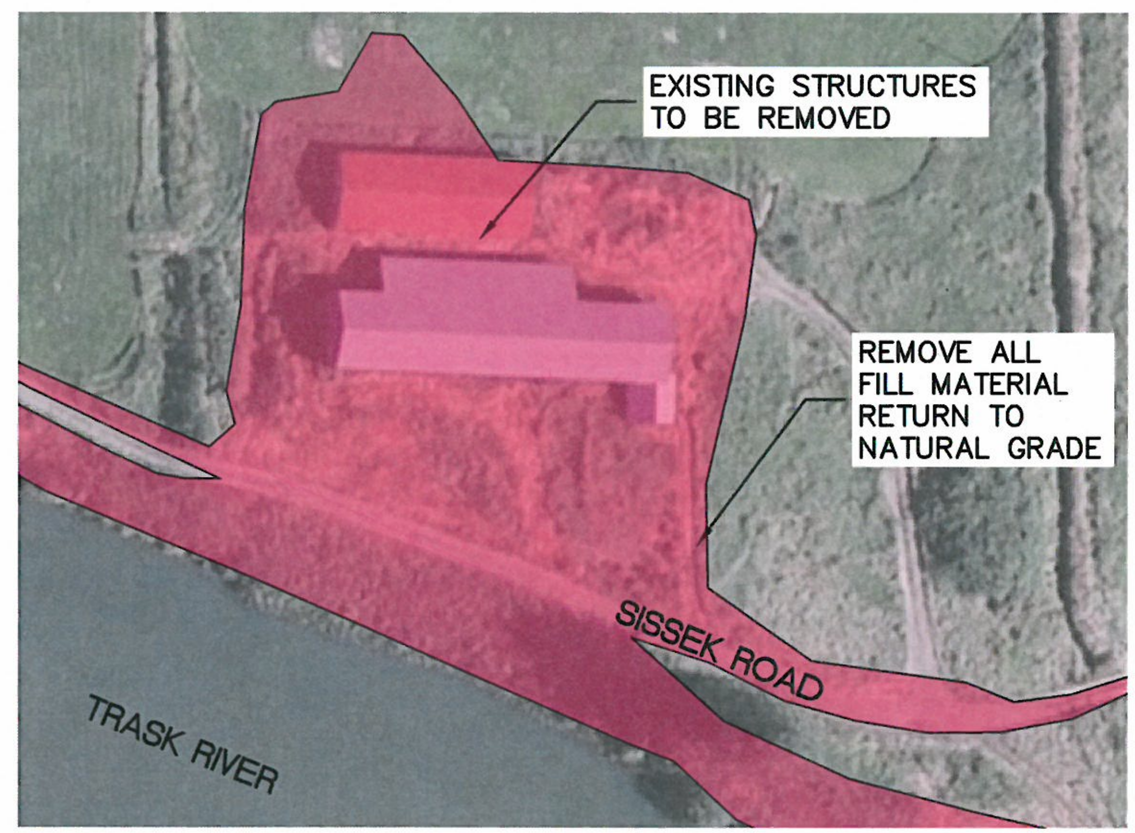
JONES STRUCTURE REMOVAL

SCALE: 1" = 100'



FUHRMAN STRUCTURE REMOVAL

SCALE: 1" = 100'



BARN REMOVAL

SCALE: 1" = 100'

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 100 ft.

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0" 0.5"
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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

STRUCTURE AND FILL REMOVAL

Sheet No. 15

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Date 02-15-13

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BLIND SLOUGH TIDAL GATES

SCALE: 1" = 100'

TILLAMOOK BAY TIDAL GATES

SCALE: 1" = 100'

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 100 ft.

NOT USED

SCALE: 1" = 100'

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Submittal No: PRELIMINARY

Layout: LAYOUT2

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

STRUCTURE AND FILL REMOVAL

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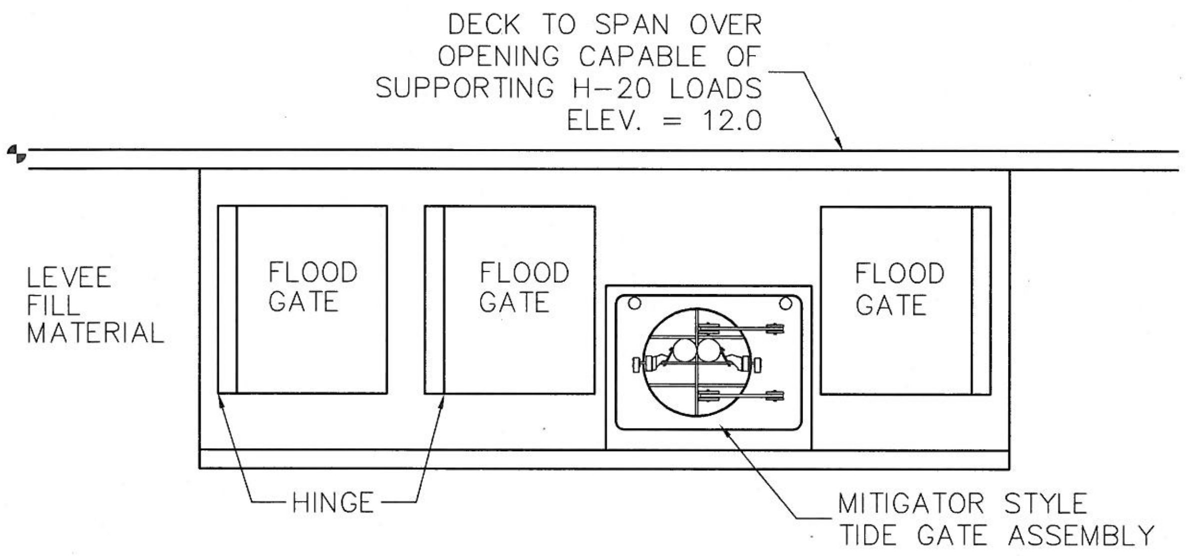
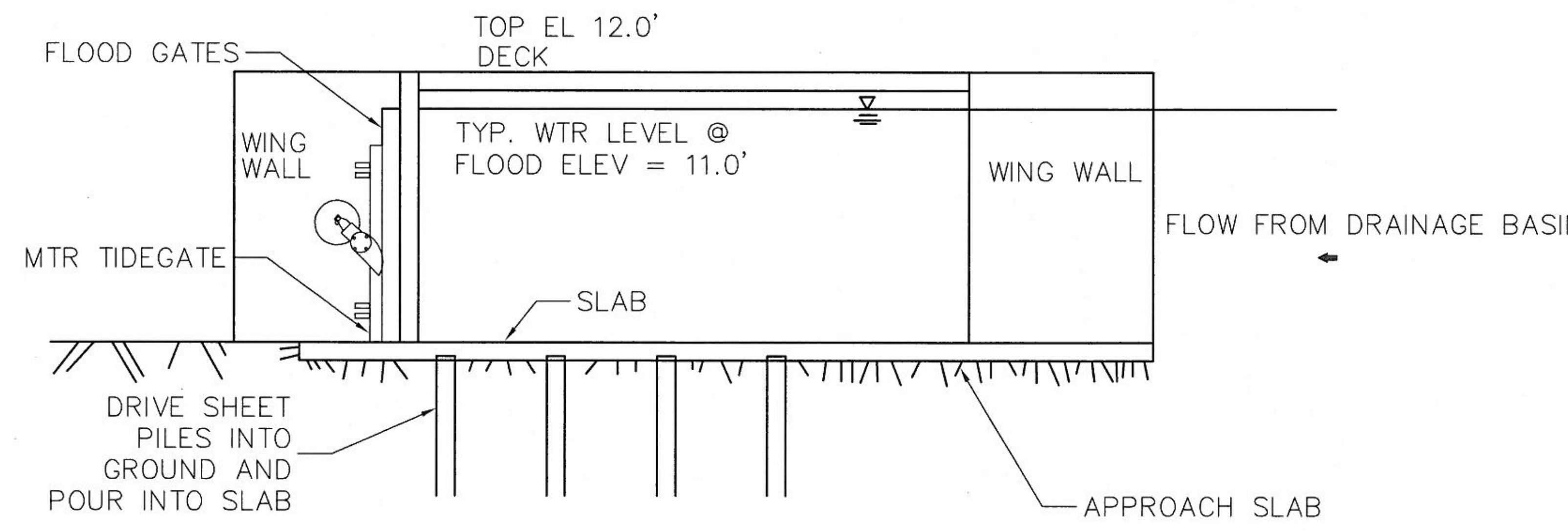
Date 02-15-13

2009-003



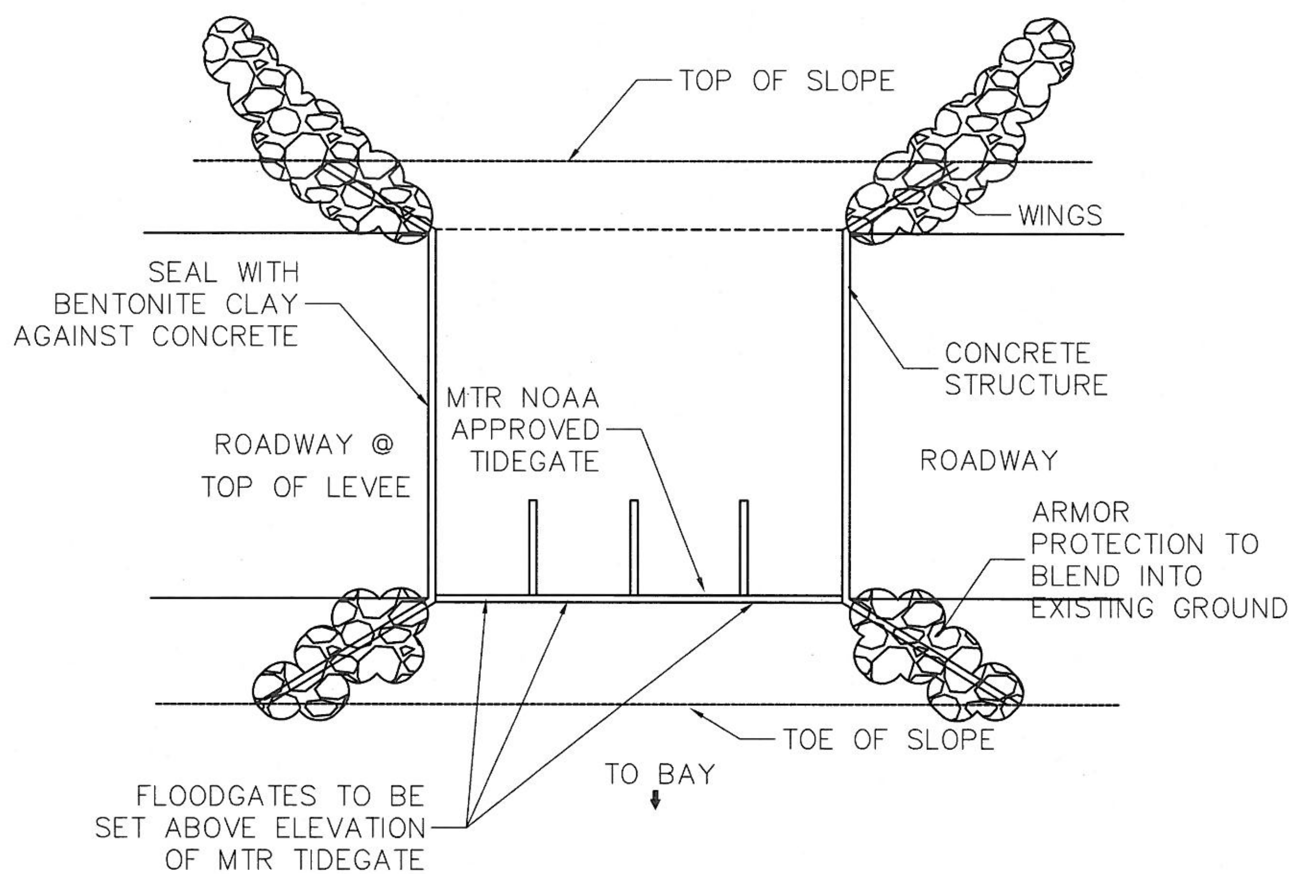
PROPOSED FLOOD GATE ELEVATION VIEW

N.T.S.



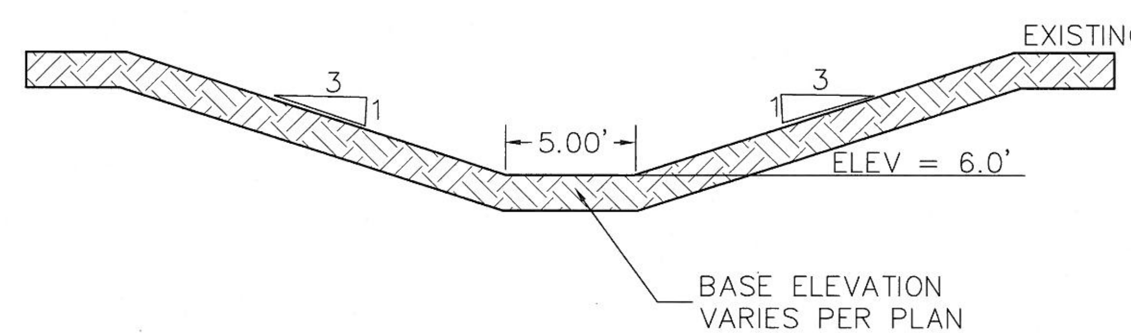
PROPOSED FLOOD GATE SECTION VIEW

N.T.S.



PROPOSED FLOOD GATE PLAN VIEW

N.T.S.



NEW TIDAL CHANNEL TYPICAL SECTION

N.T.S.

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

TYPICAL DETAILS

Sheet No. 17 of 19
Date 02-15-13
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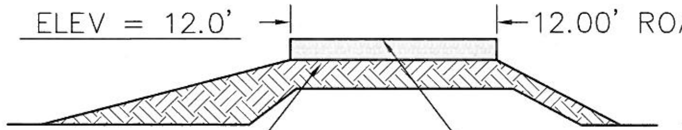
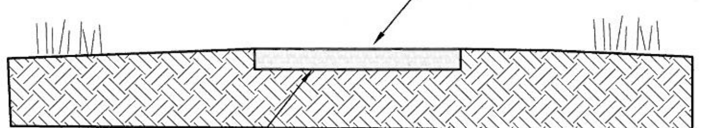


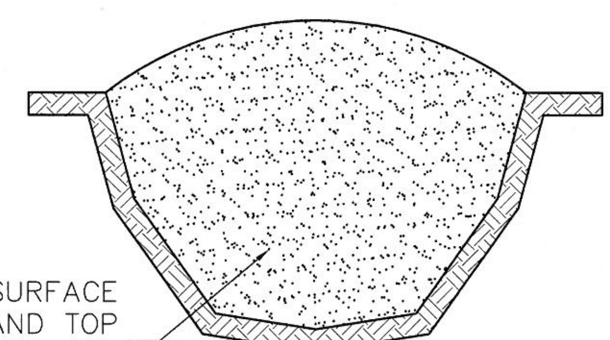
TYPICAL ROAD SECTION TOP OF LEVEE

N.T.S.



ROAD DE-COMMISIONING DETAIL

N.T.S.



DRAINAGE DITCH DETAILS

N.T.S.

LEVEE NOTES:

1. INSTALL WOODY DEBRIS OVER ORGANIC FILL ON THE WINDWARD SIDE OF THE LEVEE. CONCENTRATE DEBRIS NEAR THE TOP OF THE LEVEE TO DISPERSE WAVE ACTION.
2. INSTALL 12" OF PIT-RUN AGGREGATE BASE FOR THE ROADWAY TO A WIDTH OF 12 FEET.
3. COMPACTION OF THE FILL FOR THE LEVEE SHALL BE A COMBINATION OF MEANS AND METHODS PLUS A TEST SECTION OF FILL. THE FILL WILL BE TESTED WITH A GOAL OF 88% MDD FOR THE MODIFIED PROCTOR DENSITY. IF THE SUBGRADE BEGINS TO PUMP, THE CONTRACTOR SHALL WORK WITH THE OWNER'S REPRESENTATIVE TO DETERMINE THE OPTIMAL METHOD OF COMPACTION. NO FURTHER TESTING WILL BE NECESSARY AS LONG AS THE CONTRACTOR FOLLOWS THE APPROVED PROCEDURE.
4. THE CONTRACTOR SHALL USE ALL AVAILABLE MATERIAL IDENTIFIED THAT IS SUITABLE FOR BUILDING STRUCTURAL FILLS. UPON EXHAUSTING THIS RESOURCE, THE CONTRACTOR SHALL HAUL IN APPROVED FILL MATERIAL FROM AN OFFSITE SOURCE. THE MATERIAL SHALL BE TESTED FOR COMPACTION SUITABILITY.
5. THE CONTRACTOR SHALL PLACE A LAYER OF BENTONITE CLAY BETWEEN THE CONCRETE FLOOD CONTROL STRUCTURAL AND THE LEVEE CORE MATERIAL TO SEAL THE SEAM.
6. TURNOUT LEVEE EXTENSIONS WILL BE CONSTRUCTED AT 500' O.C. EXTENDING TOWARD THE STORAGE SIDE. THEY SHALL BE 20' IN TOP WIDTH FOR A LENGTH OF 30 FEET WITH 20' RADIUS CORNERS.
7. JUTE MAT SHALL BE PLACED ON THE SIDE SLOPES BETWEEN THE TOP OF FILL AND THE EXISTING GROUND ELEVATION FOR BOTH SIDES OF THE LEVEE.

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON
TYPICAL DETAILS

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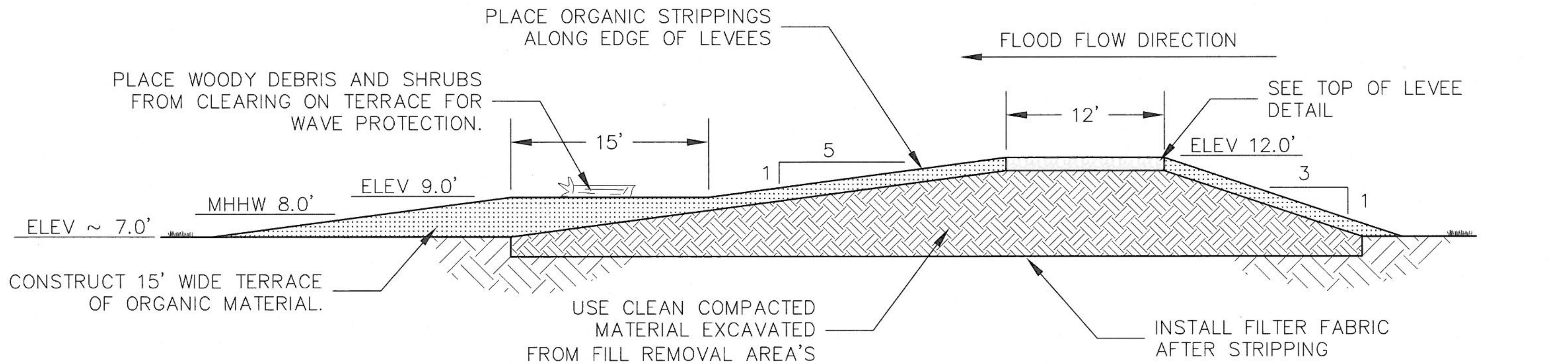
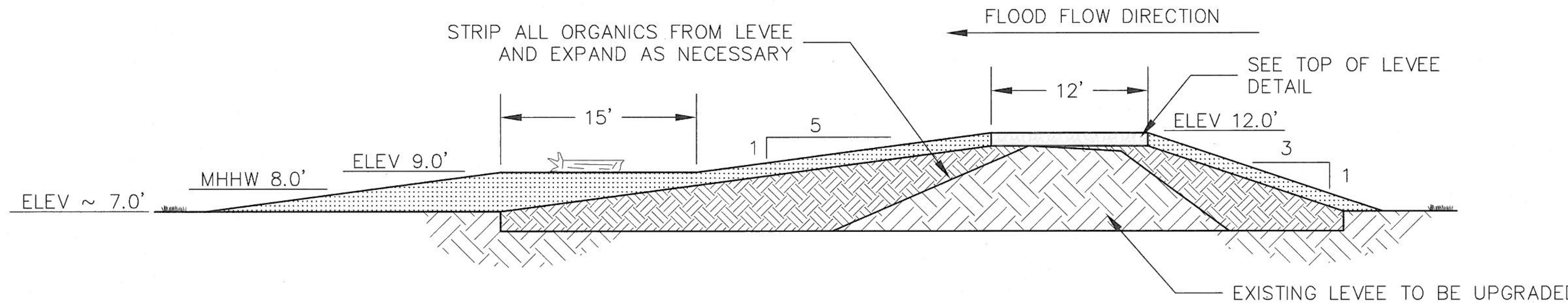
Date 02-15-13
2009-003



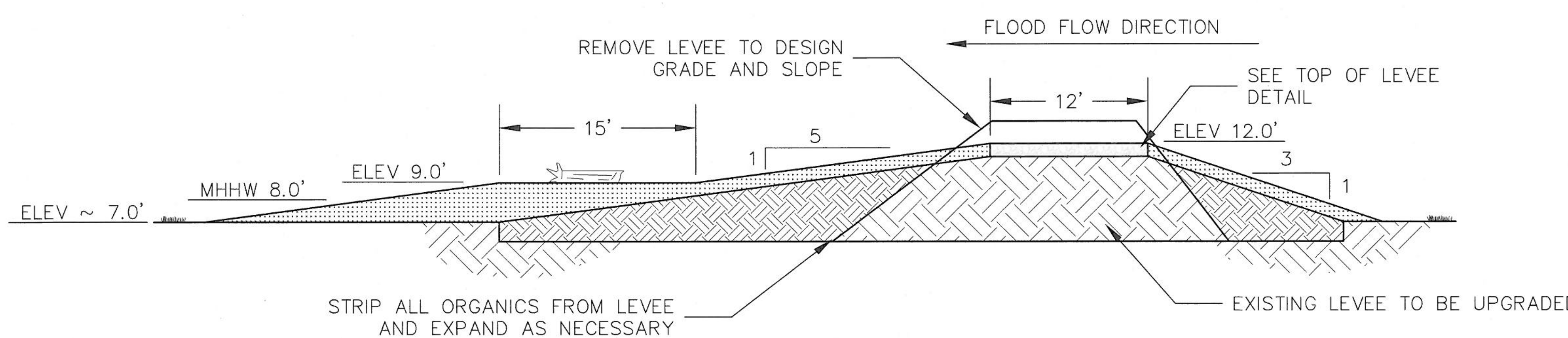
TYPICAL NEW LEVEE SECTION

SCALE: 1" = 10'



TYPICAL UPGRADED LEVEE SECTION

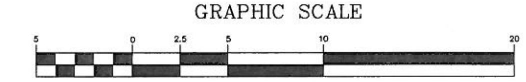
SCALE: 1" = 10'



TYPICAL LOWER LEVEE SECTION

SCALE: 1" = 10'

GRAPHIC SCALE



(IN FEET)
1 inch = 10 ft.

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SOUTHERN FLOW CORRIDOR
TILLAMOOK, OREGON

TYPICAL DETAILS

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Date 02-15-13
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SECTION 8 – SUPPLEMENTAL INFORMATION

CONSTRUCTION SEQUENCING (refer to Section 7. Map 2)

Temporary Construction, Site Preparation: Existing levees and roads that will serve as haul roads will be upgraded as needed to withstand construction traffic. All existing tidegates will have fish mitigation devices removed to maximize interior drainage and lower water levels for construction. Fish exclusion nets will be installed on existing tidegates to prevent ingress during construction. Designated refueling and stockpile areas will be constructed.

Clearing and Grubbing: The new levee alignment, landward sides of perimeter levees, and dredge spoil piles will be cleared of vegetation and topsoils. Native shrubs and trees will be stockpiled for placement in the restoration area. Non-native species will be removed. Topsoils will be used to fill existing interior ditches in order to ensure natural tidal channels can develop without being short-circuited by the linear ditches. Topsoils may also be stockpiled for use on the levee face.

First Phase of Levee Removal and Levee Construction: Levee removal will provide the conveyance capacity increase that results in reduction of flood levels over a wide area of the lower Wilson River floodplain. In general, material will be removed to slightly below natural floodplain/marsh level. This elevation is around 9 feet at the mouth of the Wilson River, increasing to 10+ feet farther upstream. Lowering areas further than this could provide some additional flood level reduction, but the cost increase would be large and the benefits temporary. The fill to be removed will be used for the new dikes and ditch filling, with any remaining soils spread on site to speed rebuilding to natural salt marsh elevations.

Because of land subsidence from diking and draining, the existing land elevations in the southeastern project area are too low to support continued use as pasture without the dikes. Given the lack of landowner interest in selling their property and the importance of preservation of agricultural lands for Tillamook County, these dikes will be lowered to 12 feet to convey floodwaters.

New and upgraded existing tidal dikes will be constructed in three segments (north, middle, and south) in order to protect adjacent agricultural lands from tidal influence in the project area. Most of the dikes will be built to the design elevation of 12 feet, with some adjustments where they tie into existing dikes or high ground. This elevation will pass river flood flows out while preventing high tides and coastal storm surges from getting in. The downstream side of each dike will have a 5:1 slope in order to pass overtopping floodwaters with minimal damage.

Levee construction will begin with excavation of interior levees and dredge spoils. The exterior will be excavated to design grade, which is just above summer high tides. If necessary, a small 1-2 foot berm will be left on the riverward side of the exterior levees to prevent tidal overtopping. Material will be trucked to the new levee alignments, laid down in lifts and compacted. There is not enough material from the existing levees to be removed on the south side of Hoquarten Slough to construct the new South Dike and therefore, material from the northern area will need to be transported over. The material will be hauled via truck or a temporary bridge may be used to move material across Hoquarten Slough. Organic soils will be used to cap the levee faces to promote vegetation. A crushed rock driving surface will top the new levee.

Drainage Structures: A new high capacity floodgate structure will be incorporated in the middle dike to replace the existing gates, provide additional conveyance capacity, and allow rapid post flood drainage. The four 5x12 foot side hinge gates on the existing flood gate at the western end of the project area will be reused on the new floodgate, and an additional four gates added. The structure is anticipated to be a cast in place concrete structure with a sheet pile seepage cut off wall. The gates are designed to function only during floods and so will be set around floodplain elevation rather than in a channel. The upper end of the relict Nolan Slough channel will be excavated to the outlet of the new floodgates to serve as the exit channel from the gates. Flood flows will pass through the gates every second or third year, a sufficient frequency which will keep the channel open and able to convey flood flows out to the main river channels and bay. Seven tidegates will be installed in the new dikes to provide equal or better drainage from adjacent pasture lands. Existing 5 and 6 foot diameter round tidegates currently installed on the western end of the site will be reused on these replacement pipes if their condition allows.

Road Decommissioning and Channel Excavation: The few roads on site, including one accessing a residence to be demolished, will have gravel surfaces removed and the roadbed de-compacted. Existing relict tidal channels will have plugs and culverts removed to allow full tidal access. In the north dike, the outlet channels will use existing or constructed sinuous tidal channels to provide connections to the main river. Excavation of a Hall Slough-Blind Slough channel will further increase connectivity. Improvements to the existing drainage ditches inside the new dike will be made as necessary to connect them to the new tidegates and ensure that equal or better drainage is maintained once the project is implemented. Note that while 1 mile of tidal channels will be excavated during construction to provide drainage from diked lands and/or improve habitat connectivity, <u>14 miles of tidal channels</u> will ultimately be restored throughout the site.

Large Wood Placement: Large spruce and other trees exist along the levees and in other construction areas. Trees removed in order to implement project elements will be placed opportunistically in the wetland and channel habitats to offer predation cover for fish. Wood placement will complete the interior area work. At this point the new flood and drainage gates must be functional and the new levees built up with a minimum crest elevation of 10 feet.

Levee Removal: Once all interior work is completed the site will be ready to receive tidal waters. The levees will be breached and access to the interior floodplain will no longer be feasible. Exterior tidegates will be removed and relict channels connected to the river. Final excavation will require working within tide cycles, working back out of the project site without the benefit of loop haul roads, and more difficult sediment control measures.

Construction Completion: Final grading of new levees to design height, installation of permanent erosion control measures, hydroseeding the new levees, and repair of any damage to County or City roads used for hauling will complete construction of the project.

Re-vegetation: Native vegetation re-establishment in saline environments often occurs naturally, given the appropriate hydrological conditions. With the difficulty in predicting salinity gradients, which guides the planting strategy, a passive re-vegetation approach may be employed. Following construction and post-project monitoring, the need for a re-vegetation plan, likely focusing on higher elevation areas, will be evaluated, and developed and implemented as needed.

CONTRACTS B & C BUDGETS – Permitting, Final Design, and Construction

	Item	Unit	Quantity	Unit Price	Total Amount
New North Dike &	Clearing & Grubbing (Stockpile to Re-spread on Levee Face)	LS	1	$27,500	$27,500
Interior Wetlands	Construction Staking	LS	1	$10,000	$10,000
Work	Construction Compaction Testing	LS	1	$15,000	$15,000
	Erosion Control Measures	LS	1	$32,500	$32,500
	Filter Fabric at Levee Base and Haul Roads	SY	32,600	$3.25	$105,950
	Spread Organics on Levee Face	CY	10,800	$10	$108,000
	Temporary Access Road Aggregate Base Improvements	CY	1,800	$37.50	$67,500
	Temporary Access Road Pavement Repair	TON	250	$125	$31,250
	Remove Old Levee and use in New Levee Core	CY	40,000	$27.50	$1,100,000
	Construction Fencing/Protection	LF	10,000	$3.75	$37,500
	Levee Finish Slopes	LS	1	$50,000	$50,000
	Levee Roadway Aggregate Base (12" depth)	CY	2,000	$37.50	$75,000
	Channel Reconnection Excavation & Haul	CY	2,000	$17.50	$35,000
	6' Diameter Culverts with Reuse Tidegates	EA	4	$37,500	$150,000
	Demo Existing Structures and Culverts	LS	1	$75,000	$75,000
	Removal of Plugs/Tidegates, Disposal of Rubbish, Tires	LS	1	$30,000	$30,000
	Install Woody Debris	LS	1	$62,500	$62,500
	Ditch Fill w/ Organics & Levee Spoils	CY	18000	$15	$270,000
	Floating Sedimentation Fences	LS	1	$62,500	$62,500
	Excavate Swale at Fuhrman Road and Spread on Levee Sides	CY	1,100	$17.50	$19,250
	Temporary Dewatering	LS	1	$35,000	$35,000
	Riprap Removal/use for new levee	CY	3000	$40	$120,000
	Hydroseed Levee	AC	5	$5,000	$25,000
North Dike Upgrade	Clearing & Grubbing (Stockpile to Re-spread on Levee Face)	CY	700	$10	$7,000
	Construction Staking	LS	1	$3,750	$3,750
	Construction Compaction Testing	LS	1	$6,250	$6,250
	Erosion Control Measures	LS	1	$6,250	$6,250
	Filter Fabric at Levee Base and Haul Road	SY	5,600	$3.25	$18,200
	Spread Organics on Levee Face	CY	700	$5.00	$3,500
	Temporary Access Road Aggregate Base Improvements	CY	1,000	$37.50	$37,500
	Haul in Material for New Levee from Spoils Pile	CY	1,600	$27.50	$44,000
	Levee Finish Slopes	LS	1	$6,250	$6,250
	Hydroseed Levee	AC	0.5	$5,000	$2,500
	Levee Roadway Aggregate Base (12" depth)	CY	950	$37.50	$35,625
New Middle Dike	Clearing & Grubbing	LS	1	$11,625	$11,625
	Construction Staking	LS	1	$5,000	$5,000
	Construction Compaction Testing	LS	1	$3,750	$3,750
	Erosion Control Measures	LS	1	$625	$625
	Filter Fabric at Levee Base and Haul Road	SY	6,800	$3.25	$22,100
	Spread Organics on Levee Face	CY	730	$5.00	$3,650
	Temporary Access Road Aggregate Base Improvements	CY	900	$37.50	$33,750
	Temporary Access Road Pavement Repair	TON	50	$125	$6,250
	Remove Old Levee and use in Ditches on Field (short haul)	CY	900	$27.50	$24,750
	Haul in Material for New Levee from Spoils Pile	CY	5,400	$35	$189,000
	Levee Finish Slopes	LS	1	$6,250	$6,250
	Levee Roadway Aggregate Base (12" depth)	CY	500	$37.50	$18,750
	New Flood Structure (8) 5x12 S.H. Gates	EA	1	$625,000	$625,000
	Hydroseed Levee	AC	1	$5,000	$5,000
	Armor Protection	CY	200	$40	$8,000
	Excavate Tidal Channel (Upper Nolan Slough)	CY	8000	$17.50	$140,000

	Item	Unit	Quantity	Unit Price	Total Amount
New South Dike	Clearing & Grubbing (Stockpile to Re-spread on Levee Face)	LS	1	$35,400	$35,400
	Construction Staking	LS	1	$5,000	$5,000
	Construction Compaction Testing	LS	1	$5,000	$5,000
	Erosion Control Measures	LS	1	$7,500	$7,500
	Filter Fabric at Levee Base	SY	7,080	$3.25	$23,010
	Temporary Trestle/Pontoon Bridge	LS	1	$62,500	$62,500
	Spread Organics on Levee Face	CY	1100	$10	$11,000
	Temporary Access Road Aggregate Base Improvements	CY	2,000	$37.50	$75,000
	Remove Old Levee and use in New Levee Core (South Levee)	CY	2,000	$27.50	$55,000
	Haul Excess Material from South Levees to Field	CY	10,000	$17.50	$175,000
	Excavate & Haul N. Hoquarten Spoils	CY	2,000	$40	$80,000
	Haul in Material for New Levee from Spoils Pile	CY	8,300	$27.50	$228,250
	Construction Fencing/Protection	LF	2,000	$3.75	$7,500
	Levee Finish Slopes	LS	1	$10,000	$10,000
	Hydroseed Levee	AC	2	$5,000	$10,000
	Levee Roadway Aggregate Base (12" depth)	CY	800	$27.50	$22,000
South Dike Upgrade	Clearing & Grubbing (Stockpile to Re-spread on Levee Face)	LS	1	$5,000	$5,000
	Construction Staking	LS	1	$3,750	$3,750
	Construction Compaction Testing	LS	1	$3,750	$3,750
	Erosion Control Measures	LS	1	$2,500	$2,500
	Spread Organics from Levee Removal on Levee Face	CY	1,100	$10	$11,000
	Haul in Material for New Levee from Spoils Pile	CY	1,600	$27.50	$44,000
	Levee Finish Slopes	LS	1	$12,500	$12,500
	Levee Roadway Aggregate Base (12" depth)	CY	450	$37.50	$16,875
	6' Diameter Culverts with Reuse Tidegates	EA	1	$37,500	$37,500
Lower Levee Property 1	Clearing & Grubbing	LS	1	$11,250	$11,250
	Construction Staking	LS	1	$3,750	$3,750
	Construction Compaction Testing	LS	1	$3,750	$3,750
	Erosion Control Measures	LS	1	$6,250	$6,250
	Grade Levee/Place spoils on levee slope	CY	1900	$10	$19,000
	Levee Finish Slopes	LS	1	$12,500	$12,500
	Levee Roadway Aggregate Base (12" depth)	CY	2,050	$37.50	$76,875
	6' Diameter Culverts with Reuse Tidegates	EA	1	$37,500	$37,500
Lower Levee Property 2	Clearing & Grubbing	LS	1	$11,250	$11,250
	Construction Staking	LS	1	$3,750	$3,750
	Construction Compaction Testing	LS	1	$3,750	$3,750
	Erosion Control Measures	LS	1	$10,000	$10,000
	Grade Levee/Place spoils on levee slope	CY	1900	$10	$19,000
	Levee Finish Slopes	LS	1	$25,000	$25,000
	Levee Roadway Aggregate Base (12" depth)	CY	2,400	$37.50	$90,000
	6' Diameter Culverts with Reuse Tidegates	EA	1	$37,500	$37,500
	Temporary Access Road Aggregate Base (2000 lf)	CY	900	$37.50	$33,750
	Temporary Access Road Filter Fabric	SY	2700	$3.25	$8,775
	Mobilization @~ 9%				$459,000
CONTRACT C	**Subtotal Construction Costs**				**$5,640,460**

	Design/ Permitting/Const. Management	% of Construction Cost			
	Project Management/Admin	1.0%			$56,000
	Permitting	4.4%			$250,000
	Geotechnical Investigations	2.5%			$140,000
	Hydraulic Investigations	1.2%			$65,000
	Civil Design	5.1%			$285,000
	Bid Package	0.8%			$45,000
	Construction Management	3.0%			$169,000
CONTRACT B	**Subtotal Design/Permitting/Construction Management**	**17.9%**			**$1,010,000**

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SOUTHERN FLOW CORRIDOR – LANDOWNER PREFERRED ALTERNATIVE
FY 2013 Coastal and Marine Habitat Restoration Project Grant Application

SECTION 8 – SUPPLEMENTAL INFORMATION

1939 Aerial
(note channel connections and lack of ditches)

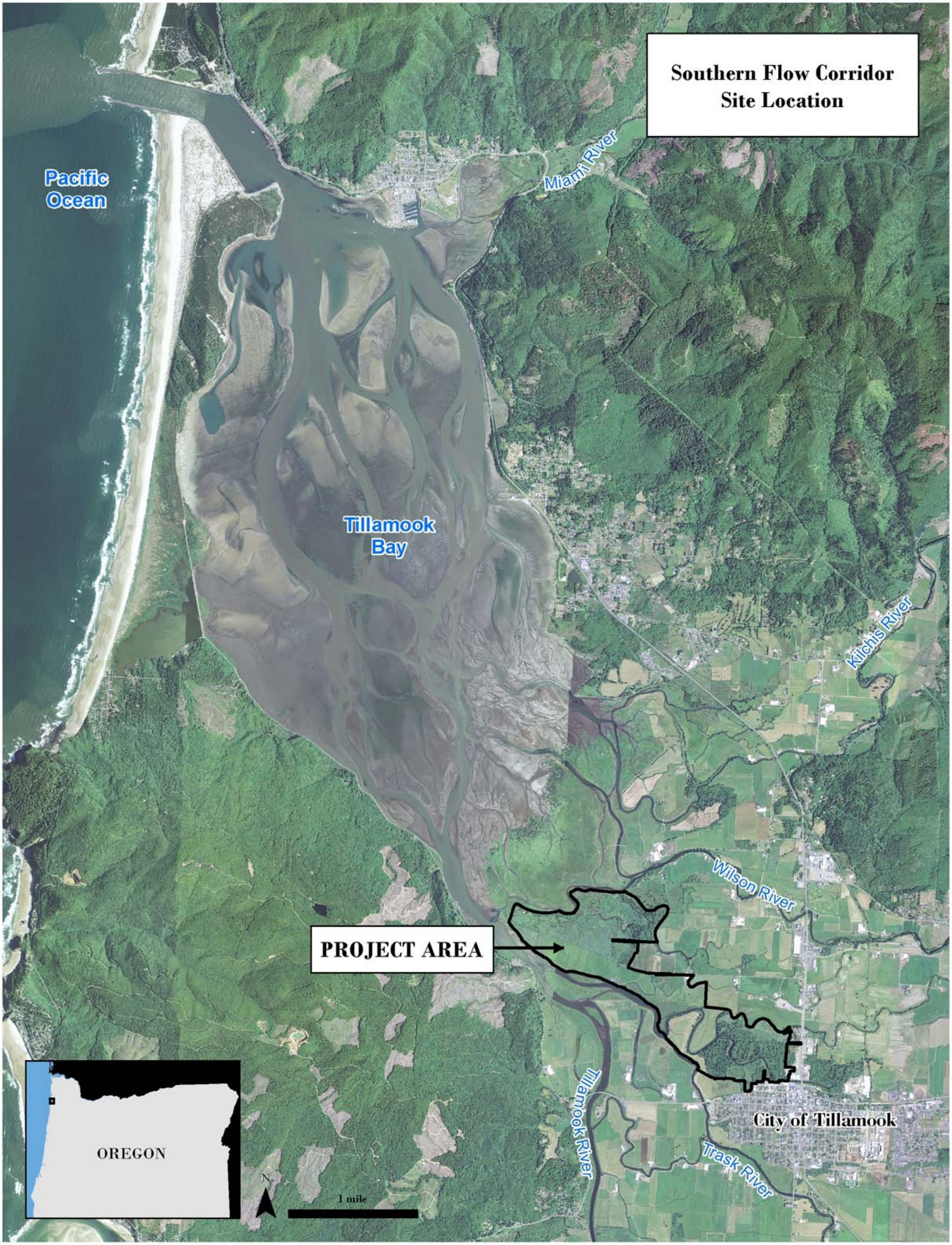
2011 Aerial
(note blocked channels and extensive ditching)

1998

Receding 1996 Flood Water
(depicts ~MHHW which closely represents tidal inundation levels post levee removal)

Blind Slough (depicts existing complex tidal habitat)

Bank of 10 Tidegates in South Levee
(tidegates and levee will be removed to restore full tidal inundation)


Southern Flow Corridor
Site Location
Pacific Ocean
Miami River
Tillamook Bay
Kilchis River
Wilson River
PROJECT AREA
Tillamook River
City of Tillamook
Trask River
OREGON
N
1 mile

Rachel Hagerty

Tillamook Estuaries Partnership
503.322.2222
PO Box 493, Garibaldi, Oregon 97118

rachel@tbnep.org
www.tbnep.org

Professional Profile

Experienced, efficient project manager with diverse background in coastal salmon habitat restoration techniques, biological surveying, and all aspects of project implementation.

- Lead Project Manager
- Technical Design Review
- Permitting
- Contract Administration
- Multi-Faceted Projects
- Construction Management
- Extensive Partnerships Facilitation
- Grant Administration

Professional Accomplishments

Coastal Salmon Habitat Restoration

- 44 acres of wetland restoration
- 72 acres of riparian enhancement
- 19 stream miles with restored salmon migration access
- 4 miles of large wood placement
- 40 grants totaling $3.4 million

Partnerships

- Effectively bridges federal, state, and local agency and private interests

Awards

- Oregon Department of State Lands Stream Project of the Year Award 2008
- Oregon Department of State Lands Wetland Project of the Year Award 2010

Work History

Habitat Restoration Manager
Tillamook Estuaries Partnership, Garibaldi, Oregon (2003-Present)

Fisheries Biologist
Bureau of Land Management, Tillamook, Oregon (2002-2003)

Salmon Habitat, Spawning, and Creel Surveyor
Oregon Department of Fish and Wildlife, Tillamook, Oregon (2000-2002)

Culvert Surveyor
Tillamook County Creamery Association, Tillamook, Oregon (1999)

Education

Bachelor of Science Zoology, **Minor** Fisheries & Wildlife Science (2002)
Oregon State University, Corvallis, Oregon

Trainings

Project Management
Bureau of Labor & Industries Prevailing Wage
Managing Construction Projects
Stream Restoration Design
Wetlands & Global Climate Change
Tidegate Symposium
Engineering Survey Basics

Affiliations

Central Coast Land Conservancy Board Member – 8 years
Tillamook Rotary Club -2 years

VAUGHN COLLINS, P.E., CFM

Senior Engineer

Education

B.Sc., Civil Engineering, University of Washington

License/Affiliations

Registered Professional Engineer: Washington, Oregon, Idaho

Member, Association of State Floodplain Managers

Member, Northwest Floodplain Management Association

Certified Floodplain Manager

Years Experience

22

Areas of Expertise

Extensive 1-D and 2-D modeling experience in complex river and estuary systems

Planning, analysis, and design of flood control and habitat restoration projects under Corps, FEMA, state, and local planning processes

Mr. Collins is a senior engineer with broad based experience in hydraulic modeling and design for flood hazard reduction and habitat restoration on large river systems. His experience includes 16 years with Snohomish County where he performed project management, design team lead, hydraulic analysis, public outreach, and emergency flood response tasks. His technical experience includes one- and two-dimensional modeling of numerous complex habitat restoration and flood control projects using a variety of models. Mr. Collins has worked on numerous tidal/estuary restoration projects throughout his career.

Selected Project Experience

Project Manager, Project Exodus Flood Modeling, Tillamook County, OR. Project Manager and lead modeler for evaluation of flood control and habitat restoration alternatives on the Wilson River. Developed project objectives with stakeholder group, updated complex unsteady HEC-RAS model, formulated and evaluated alternative projects. Results were presented in written form and in committee and public meetings. Directed production of conceptual plan and cost estimate for the preferred alternative, including the Southern Flow Corridor. Conducted benefit-cost analysis requested by FEMA using HAZUS/BCAR individual structure approach.

Project Manager, Seaside Highway 101 Flood Analysis, Clatsop County, OR. Project manager and lead modeler for evaluation of alternatives to reduce chronic road flooding on Highway 101. Directed field survey, stream gaging and hydrologic modeling of the Necanicum River. Created calibrated HEC-RAS model and evaluated various alternatives to meet project objectives. Presented results and facilitated discussion on options at three meetings with stakeholders and three public meetings. Designed levee removal and habitat restoration project as first phase of selected alternative.

Project Manager, Smugglers Slough Habitat Restoration Project, Lummi Indian Tribe, Lummi Reservation – Whatcom County, WA. Designed a tidal restoration project including over 9000 feet of new berm and levees, 600 acres of fresh and saltwater wetland, and 4 miles of stream. Constraints included maintaining adjacent agricultural drainage and function of existing levee and sea dike system. Defined project objectives, performed alternatives analysis using FEQ and HEC-RAS models. Directed subconsultants in development of plans and specifications and provided construction oversight and direction.

Project Manager, North Meander Habitat Restoration Project, while at Snohomish County, WA. Led a $1.7 million restoration project from feasibility studies to construction in approximately 12 months. Responsible for managing consultants, budget and grants, alternatives analysis, acquiring permits, public outreach, plans and specifications, and construction supervision.

Hydraulic Engineer, Spencer Island Restoration, while at Snohomish County, WA. Performed hydraulic analysis and design of a 300 acre tidal restoration site. Designed breaches, a cross levee, and control structures to maximize natural restoration in one portion while providing stable water levels for waterfowl in the other. Reviewed plans and specifications and provided construction oversight.

Other Estuary Restoration Projects

- Diking District 6 Hydraulic Analysis, Snohomish County, WA
- China Camp Creek Restoration Project Hydraulic Analysis, Coquille, OR
- Cottonwood Slough Restoration Conceptual Design, Skagit County, WA
- McGlinn Jetty Lowering Preliminary Design, Skagit County, WA

LAURA S. BROPHY

Director, Estuary Technical Group
Institute for Applied Ecology
P.O. Box 2855
Corvallis, OR 97339-2855

Telephone: (541) 752-7671
Email: brophyonline@gmail.com
Website: www.appliedeco.org/estuary

SUMMARY

Laura Brophy provides leadership in estuarine wetland restoration and conservation for Oregon and the Pacific Northwest. Her work focuses on scientific outreach to decision-makers and restoration practitioners. At the state and regional scale she provides guidance for estuarine wetland resource management, including strategic planning and climate change adaptation. At the site scale, she provides estuarine wetland restoration design, implementation, and effectiveness monitoring. To "close the loop" from science to application, she conducts collaborative research to answer key questions in wetland restoration and management, and disseminates the results to restoration practitioners, scientists, and decision-makers.

PROFESSIONAL PREPARATION

M.Sc., 1985, University of Minnesota, St. Paul, MN (Agronomy)
B.A., 1979, Carleton College, Northfield, MN, Magna cum Laude (Biology)

APPOINTMENTS (PAST 15 YEARS)

Director, Estuary Technical Group, Institute for Applied Ecology, Corvallis, Oregon. 2010-present. Direct nonprofit affiliation of independent scientists; provide state and regional leadership for estuarine wetland habitat conservation and restoration; disseminate scientific information to practitioners.

Graduate Faculty, College of Oceanic and Atmospheric Sciences, Oregon State University. 2007-present. Advise graduate students, direct graduate theses, serve on graduate and administrative committees.

Principal, Green Point Consulting, Corvallis, Oregon. 1994-present. Provide scientific decision support for tidal wetland restoration efforts in Oregon. Maintain dual-scale project focus: regional, state, and basin-scale guidance for strategic planning for tidal wetland conservation and restoration, and site-scale restoration design, implementation, and effectiveness monitoring.

SELECTED CURRENT AND RECENT PROJECTS (COMPLETION DATE; *CLIENT*)

- Coastwide classification and mapping of estuarine habitats, State of Oregon (ongoing; *Oregon Dept. of Land Conservation and Development*)
- Tidal wetland assessment and prioritization, Tillamook Bay Estuary (2012; *Tillamook Estuary Partnership*)
- Tidal wetland assessment and prioritization, Necanicum River estuary (2012; *North Coast Land Conservancy*)
- GIS mapping and NWI updates for tidal wetlands of the Yaquina and Alsea River estuaries (2012; *USGS*)
- Development of a reference conditions database for least-disturbed tidal wetlands in Oregon (2011; *CICEET*)
- Development of the Oregon Estuary Assessment Method (2007; *Oregon Dept. of Land Conservation and Development*)
- Tidal wetland assessment and prioritization, Siuslaw River Estuary, OR (2005; *Siuslaw Watershed Council*)
- Tidal wetland assessment and prioritization, Nehalem River Estuary, OR (2005; *USFWS Coastal Program*)
- Tidal wetland assessment and prioritization, Umpqua River Estuary, OR (2005; *USFWS Coastal Program)*
- Tidal wetland assessment and prioritization, Yaquina and Alsea River Estuaries, OR (1999, *Midcoast Watersheds Council*)
- Effectiveness monitoring at Ni-les'tun tidal wetland restoration site, Bandon Marsh NWR, Coquille River estuary of Oregon (ongoing; *Ducks Unlimited/USFWS*)
- Effectiveness monitoring at Tamara Quays and Pixieland tidal wetland restoration sites, Salmon River Estuary of Oregon (ongoing; *USFS/Salmon-Drift Creek Watershed Council*)
- Effectiveness monitoring at 5 tidal wetland restoration and reference sites, Siuslaw River Estuary of Oregon **(**2009; *Ecotrust*)

Tillamook County

Board of Commissioners
Mark Labhart. Bill Baertlein. Tim Josi
201 Laurel Avenue
Tillamook, Oregon 97141
Phone 503-842-3403
Fax 503-842-1384
TTY Oregon Relay Service

Land of Cheese, Trees and Ocean Breeze

February 13, 2013

National Oceanic & Atmospheric
Administration

RE: Wilson-Trask Wetlands Restoration aka Southern Flow Corridor

To Whom It May Concern:

Tillamook County presently owns 392 acres within the proposed project area and is committed to the acquisition of an additional 128 acres. The Board of Commissioners strongly supports this project and urges that it be funded.

Sincerely,

BOARD OF COMMISSIONERS FOR
TILLAMOOK COUNTY, OREGON

(absent)
Mark Labhart, Chairperson

Bill Baertlein
Bill Baertlein, Vice Chairperson

Tim Josi, Commissioner

G:/LETTERS\SUPPORT\NOAA Grant Appl Wilson-Trask Wetlands Restoration 2013/doc

February 15, 2013

Dr. Jane Lubchenco
Administrator, National Oceanic and Atmospheric Administration
1401 Constitution Avenue, NW
Room 5128
Washington, DC 20230

Dear Dr. Lubchenco,

We are writing in support of Tillamook County's Wilson-Trask Wetland Restoration project grant application for Coastal and Marine Habitat Restoration with NOAA's Marine Habitat Restoration Center.

This wetland restoration project has multiple benefits. First, the work proposed will result in substantial reductions in flood elevations within the adjoining commercial, residential and agricultural areas. Secondly, with over 500 acres proposed for restoration, this project results in one of the largest wetland restoration projects in the northwest, benefiting all species of salmonid, as well as other fish and wildlife that utilize the estuary.

In 2007, former Governor Ted Kulongoski designated flooding in central Tillamook County as an Oregon Solutions project. Under the community governance model, Oregon Solutions brings together federal, state and local government agencies with community leaders to seek solutions. With over 30 partners, including city, county, and state officials, local farmers, and representatives from each of our offices, this multi-year planning project has identified challenges concerning flooding and collaborative solutions.

The Wilson-Trask Wetland Restoration project is a community driven project with a history of collaborative work that will help assure its success. We support this project and ask for your full and fair review of it.

Sincerely,

Ron Wyden	Jeff Merkley	Kurt Schrader
United States Senator	United States Senator	Member of Congress

JOHN A. KITZHABER, MD
Governor

February 5, 2013

Re: Wilson/Trask Wetland Restoration
AKA Southern Flow Corridor

To Whom It May Concern:

As we look toward the future of habitat restoration, projects which are community-driven and the result of collaborative efforts will be the most successful. In the Tillamook Bay Basin, a federally designated "bay of national significance," we have such a project.

In 2007, former Governor Ted Kulongoski designated flooding in central Tillamook County as an Oregon Solutions project. Under the community governance model, Oregon Solutions brings together federal, state and local government agencies with community leaders to seek solutions. With over 30 partners, this multi-year planning project has resulted in a project known as the Wilson/Trask Wetland Restoration.

In evaluating projects, Oregon Solutions realized that this project not only had the best flood reduction benefits but that it also provided amazing environmental benefits. With over 500 acres proposed for restoration, this project results in one of the largest wetland restoration projects in the northwest, benefiting all species of salmonid as well as multiple other fish and wildlife that utilize the estuary. All of this while also resulting in substantial reductions in flood elevations within the adjoining commercial, residential and agricultural areas. When evaluating projects through the economic, social and environmental filters, this project is a win-win on all counts.

As a representative of the people of Oregon, a state known for its strong environmental ethos and collaborative approach to solving challenges, I am proud to support this project and strongly encourage NOAA's funding of this grant application.

Sincerely,

John A. Kitzhaber, M.D.
Governor

JAK:gw/lrh

254 STATE CAPITOL, SALEM OR 97301-4047 (503) 378-3111 FAX (503) 378-6827
WWW.OREGON.GOV

Tillamook County Oregon Solutions Project

OREGON SOLUTIONS

Co-Conveners:
Oregon State Senator Betsy Johnson
Tillamook County Commissioner Mark Labhart

Congressional Representation:
- Senator Wyden's Office
- Congressman Schrader's Office
- Senator Merkley's Office

Oregon State Representative Deborah Boone
Tillamook County
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
NOAA's National Marine Fisheries
Oregon Watershed Enhancement Board
Oregon Farm Bureau
Oregon Department of Fish and Wildlife
Oregon Economic & Community Development Department
Oregon Department of Forestry
Oregon Department of Transportation
Department of Environmental Quality
Economic Revitalization Team
Trust for Public Lands
Department of State Lands
Department Of Land Conservation and Development
Tillamook County Emergency Management
City of Tillamook Mayor
Tillamook City Manager
Tillamook Bay Habitat and Estuary Improvement District
Tillamook Bay Community College
Tillamook County General Hospital
Tillamook Economic Development Council
Tillamook County Soil & Water Conservation District
Tillamook Estuaries Partnership
Port of Tillamook Bay
Tillamook County Creamery Association
Hwy 101 Business Owner Representative
Farming Community Representative
Local Fishing Guide Representative

January 25, 2013

Re: Wilson-Trask Wetland Restoration
AKA Southern Flow Corridor

To Whom It May Concern:

With passage of Oregon's Sustainability Act in 2001, the Governor's Office launched the Oregon Solutions program. Flooding in central Tillamook County was designated by Governor Ted Kulongoski as an Oregon Solutions project in April, 2007.

Under the community governance model, Oregon Solutions brings together federal, state and local government agencies with community leaders to seek solutions. The Declaration of Cooperation signed by all the Tillamook project participants identified in the left margin of this letter, seeks to reduce flooding and its adverse impacts while incorporating environmental, social and economic values.

Until this collaboratively-developed project came along, the notion that restoring natural flood plain functions would reduce flooding, was viewed with local skepticism. However, this project not only results in one of the largest habitat and wetland restorations in the northwest, but it also creates substantial reductions in flood elevations within the adjoining commercial, residential and agricultural areas.

On behalf of the Tillamook County Oregon Solutions participants, we strongly endorse our capstone project and urge your financial support.

Sincerely,

Betsy Johnson
Oregon State Senator

Mark Labhart
Mark Labhart, Chair by
Tillamook County Commissioner

Rick Klumph
Rick Klumph
Oregon Department of Fish and Wildlife
Chair, Oregon Solutions Design Team

January 31, 2013

To Whom It May Concern:

As landowners within the Southern Flow Corridor-Landowner Preferred Alternative (SFC) project area, we are aware that Tillamook County is seeking restoration funds for project implementation. We are further aware that the County has pending and secured funds for the purchase of our property. We support Tillamook County's effort to secure all funds necessary to implement the (SFC) project.

Asghar R. Sadri, Trustee
Asghar R. Sadri Living Trust
Taxlot T1S-R10W-S25 200

Ronald R. Jones
Taxlots T1S-R10W-S24 600
T1S-R10W-S23 500, 1500

Chuck Furhman, President
Diamond F., Inc.
Taxlot T1S-R10W-S14 401

As landowner within the Southern Flow Corridor-Landowner Preferred Alternative (SFC) project area, I am aware that Tillamook County is seeking restoration funds for project implementation. I support Tillamook County's effort to secure all funds necessary to implement the SFC project.

Loten Hooley
Taxlot T1S-R10W-S25AA-1400