

Tillamook County



DEPARTMENT OF COMMUNITY DEVELOPMENT
BUILDING, PLANNING & ON-SITE SANITATION SECTIONS

1510 - B Third Street
Tillamook, Oregon 97141
www.tillamook.or.us

Building (503) 842-3407
Planning (503) 842-3408
On-Site Sanitation (503) 842-3409
FAX (503) 842-1819
Toll Free 1 (800) 488-8280

Land of Cheese, Trees and Ocean Breeze

**Floodway/Estuary/Floodplain Development Permit #851-21-000432-PLNG:
Nehalem Bay Wastewater Agency Permit**

*NOTICE TO MORTGAGEE, LIENHOLDER, VENDOR OR SELLER:
ORS 215 REQUIRES THAT IF YOU RECEIVE THIS NOTICE,
IT MUST BE PROMPTLY FORWARDED TO THE PURCHASER*

March 25, 2022

Dear Property Owner:

This is to confirm that the Tillamook County Department of Community Development **APPROVED WITH CONDITIONS** the above-cited request on March 25, 2022. A copy of the application, along with a map of the request area and the applicable criteria for review are available for inspection on the Tillamook County Department of Community Development website:

<https://www.co.tillamook.or.us/commdev/landuseapps> and is also available for inspection at the Department of Community Development office located at 1510-B Third Street, Tillamook, Oregon 97141.

Appeal of this decision. This decision may be appealed to the Tillamook County Planning Commission, who will hold a public hearing. Forms and fees must be filed in the office of this Department before **4:00pm on April 6, 2022**. This decision will become final on April 6, 2022, after 4:00pm unless an appeal is filed in accordance with Tillamook County Land Use Ordinance Article X.

- Request:** Review of a Floodway/Estuary/Floodplain Development Permit to perform maintenance activities (including placement of fill) on the levee separating the Nehalem Bay Wastewater Treatment Plant along the east bank of the Nehalem River.
- Location:** The subject property is located east of the City of Nehalem at 14855 Tideland Road and is designated as Tax Lot 380 in Section 27 of Township 3 North, Range 10 West of the Willamette Meridian, Tillamook County, Oregon.
- Zone:** The project area is part of the Nehalem Bay Wastewater Agency property located in the Flood Hazard Overlay (FH) Zone, Farm (F-1) Zone and the Estuary Conservation 2 (EC 2) Zone.

Applicant/

Property Owner: Nehalem Bay Wastewater Agency, P.O. Box 319, Nehalem, OR 97131

CONDITIONS OF APPROVAL

By accepting this approval, the applicants/property owners agree to indemnify, defend, save and hold harmless Tillamook County, and its officers, agents, and employees from any claim, suit, action or activity undertaken under this approval, including construction under a Building Permit approved subject to this approval. The applicants/property owners shall obtain all of the necessary local, state, and federal permits and comply with all applicable regulations for the proposed building site.

Failure to comply with the Conditions for Development and ordinance provisions may result in nullification of this decision.

1. The Applicant/property owner shall obtain all required Federal, State, and Local permits and/or licenses and will comply with applicable rules and regulations.
2. Development shall be as described on the provided plans and descriptions.
3. Development shall comply with the applicable standards of TCLUO Section 3.108, 'Estuary Conservation 2 (EC2)', TCLUO Section 3.510, 'Flood Hazard Overlay (FH) Zone' and TCLUO Section 4.140, 'Requirements for Protection of Water Quality and Streambank Stabilization', and any other applicable standards.
4. The fill shall comply with all Building Code requirements for Construction Materials and Methods for a structure located in the 'AE' flood zones.
5. This approval shall be void on March 25, 2024, unless construction of approved plans has begun, or an extension is requested from, and approved by this Department.

Sincerely,

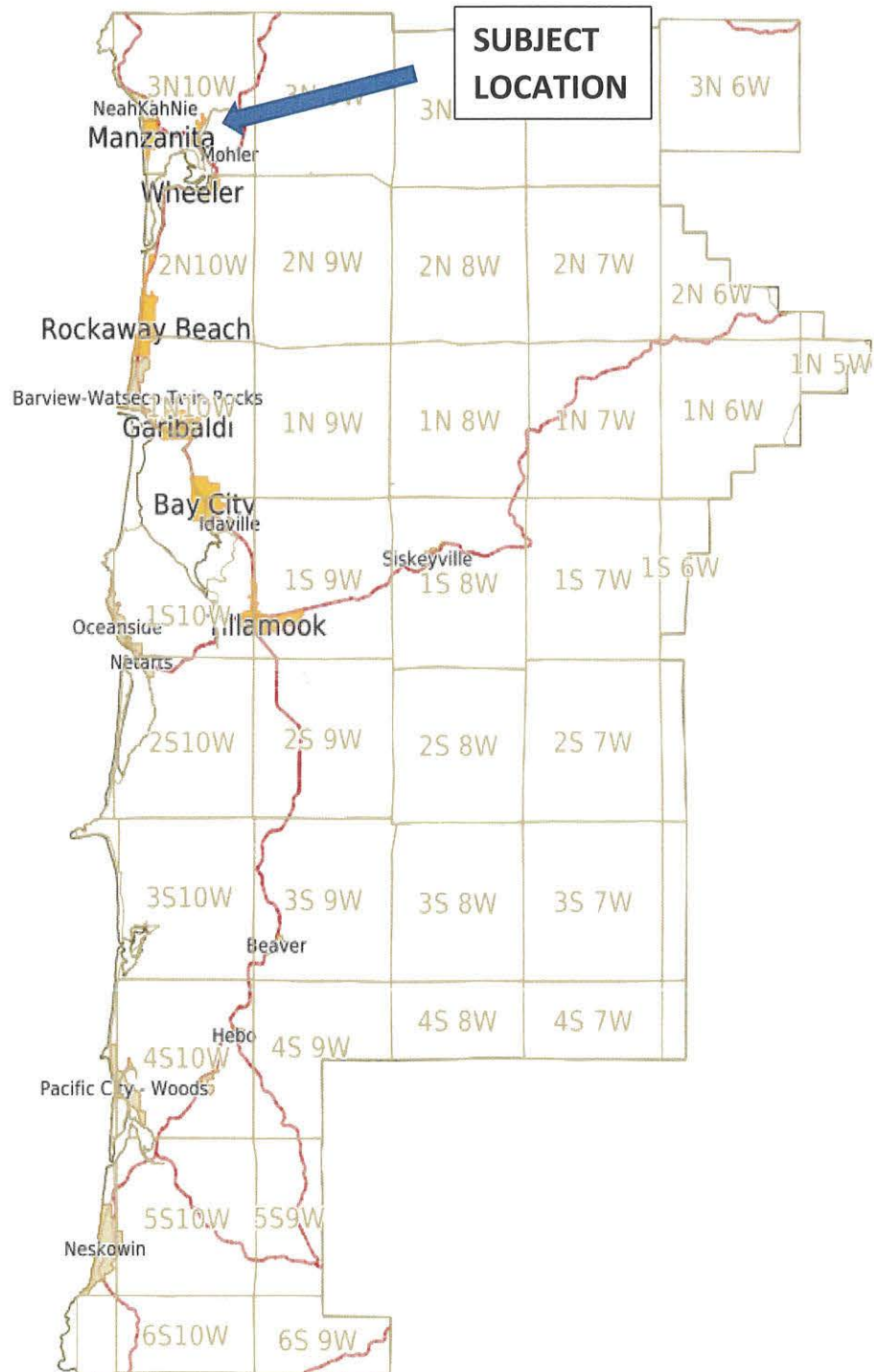
Tillamook County Department of Community Development



Sarah Absher, CFM, Director

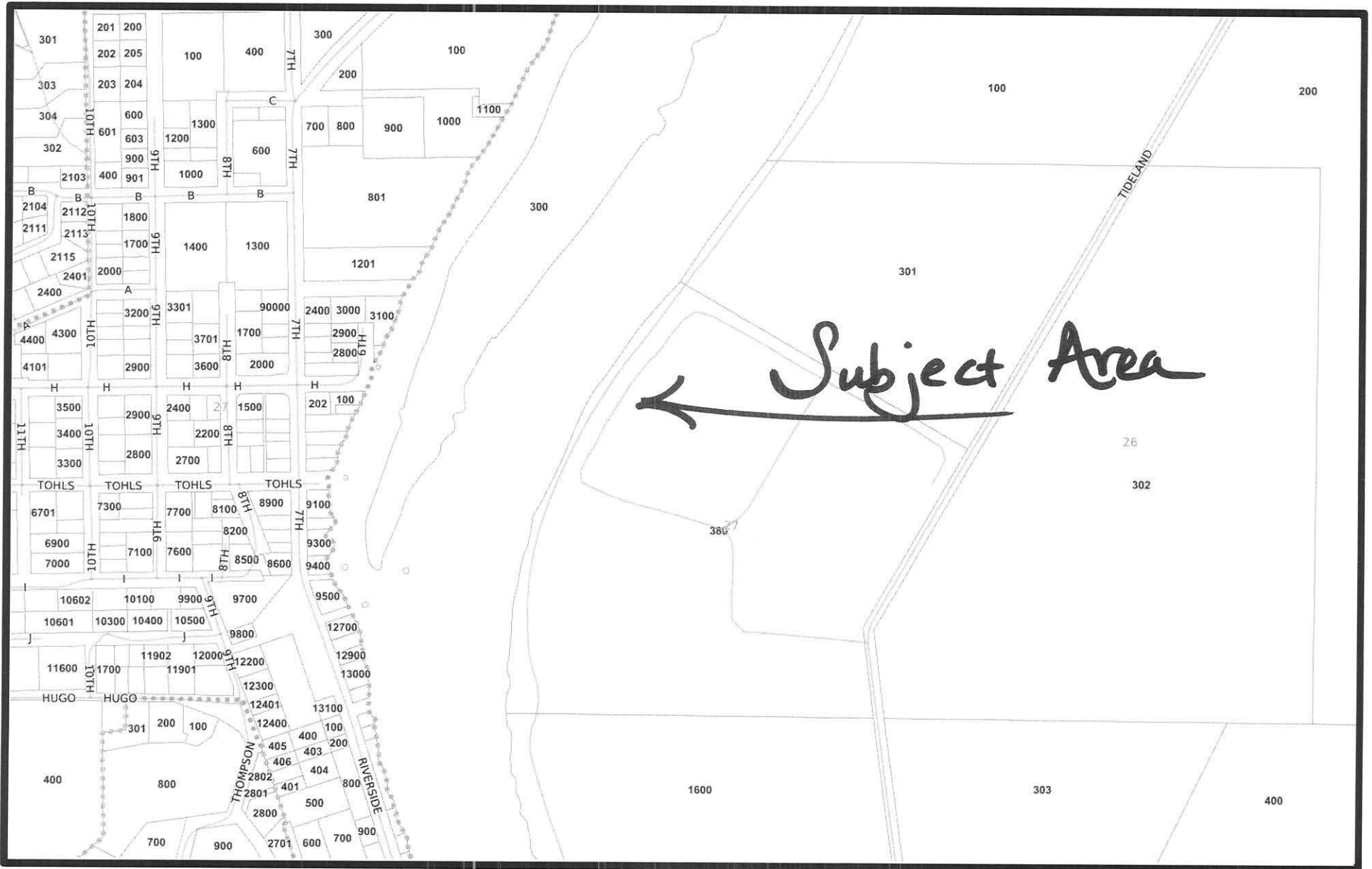
Enc.: Vicinity, Assessor's and Zoning maps

VICINITY MAP

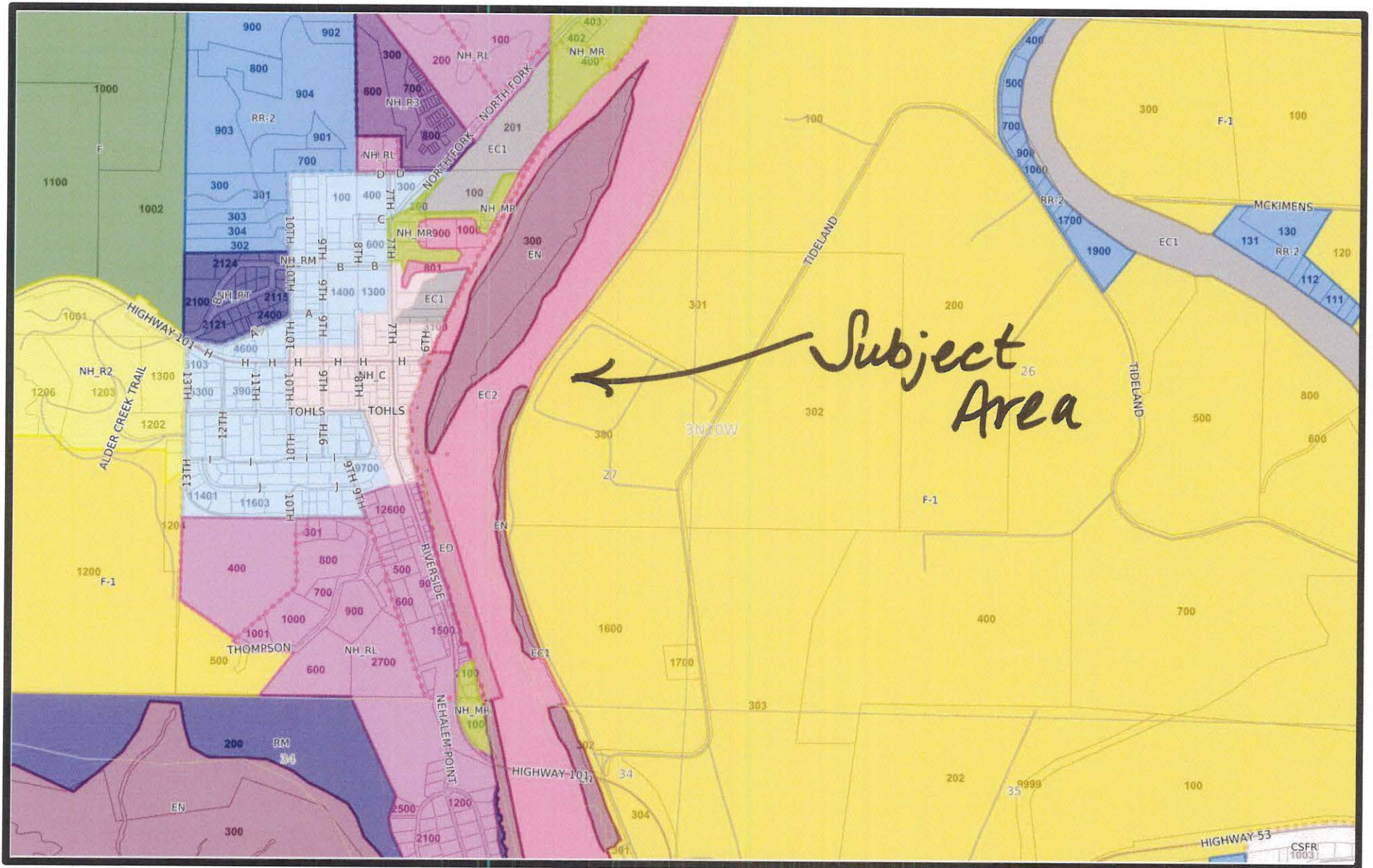


#851-21-000432-PLNG: NEHALEM BAY
WASTEWATER AGENCY

Map



Map



Generated with the GeoMOOSE Printing Utilities



Land of Cheese, Trees and Ocean Breeze

**Floodway/Estuary/Floodplain Development Permit #851-21-000432-PLNG:
Nehalem Bay Wastewater Agency Permit**

ADMINISTRATIVE DECISION & STAFF REPORT

Decision Date: March 25, 2022

**Decision: APPROVED WITH CONDITIONS
(This is not Building or Placement Permit Approval)**

Report Prepared by: Sarah Absher, CFM, Director

I. GENERAL INFORMATION:

Request: Review of a Floodway/Estuary/Floodplain Development Permit to perform maintenance activities (including placement of fill) on the levee separating the Nehalem Bay Wastewater Treatment Plant along the east bank of the Nehalem River.

Location: The subject property is located east of the City of Nehalem at 14855 Tideland Road and is designated as Tax Lot 380 in Section 27 of Township 3 North, Range 10 West of the Willamette Meridian, Tillamook County, Oregon.

Zone: The project area is part of the Nehalem Bay Wastewater Agency property located in the Flood Hazard Overlay (FH) Zone, Farm (F-1) Zone and the Estuary Conservation 2 (EC 2) Zone.

**Applicant/
Property Owner:** Nehalem Bay Wastewater Agency, P.O. Box 319, Nehalem, OR 97131

Proposal Description: The Nehalem River levee runs along the east riverbank of the Nehalem River, separating the river from roads, farms, residential development and the Nehalem Bay Wastewater Agency treatment plant. The proposed development is to repair areas of erosion along the toe of levee in 6 locations of a 500-foot stretch of levee identified in the Applicant's submittal is "Sites A-F" to prevent levee failure and protect the wastewater treatment plant (Exhibit B). Repairs consist of mechanically placing rocks 6-

inch to 18-inches in size (approximately 460 cubic yards) along the site areas with reseeding of levee post construction for vegetative cover and further stabilization (Exhibit B). Repair activities will take place below the ordinary high-water line of the Nehalem River with little to no work within along the high tide line (Exhibit B).

As indicated on FEMA FIRM #41057C0209F dated September 28, 2018, the subject property is located entirely in an 'AE' Area of Special Flood Hazard of the Nehalem River and the Nehalem River Floodway (Exhibit A). The repair areas are also located within the Nehalem River Estuary (Exhibit A).

The criteria and standards for this review is addressed below in this Staff Report.

II. APPLICABLE ORDINANCE AND COMPREHENSIVE PLAN PROVISIONS:

The desired use is governed through the following Sections of the Tillamook County Land Use Ordinance (TCLUO). The suitability of the proposed use, in light of these criteria, is discussed in Section III of this report:

- A. TCLUO Section 3.108, 'Estuary Conservation 2 (EC2) Zone'
- B. TCLUO Section 3.120, 'Regulated Activities and Impacts Assessments'
- C. TCLUO Section 3.140, 'Estuary Development Standards'
- D. TCLUO Section 3.510, 'Flood Hazard Overlay (FH) Zone'
- E. TCLUO Section 3.545, 'Shoreland Overlay'
- F. TCLUO Section 4.140, 'Requirements for Protection of Water Quality and Streambank Stabilization'

III. ANALYSIS

TCLUO Section 10.070 requires notification of Type II applications to be mailed to landowners within 750-feet of the subject properties, to allow at least 14 days for written comment and requires staff to consider comments received in making the decision.

Findings: Notice of the request was mailed to property owners and agencies on February 4, 2022. Staff finds that notification requirements have been met. Comments from the Oregon Department of Fish and Wildlife were received and are included in "Exhibit C".

A. TCLUO Section 3.108, 'Estuary Conservation 2 (EC2) Zone'

(1) PURPOSE AND AREAS INCLUDED: The purpose of the EC2 zone is to:

(a) Provide for long-term use of renewable resources that do not require major alterations of the estuary except for purposes of restoration.

(b) Other than minor navigational improvements, aquaculture facilities and water dependent recreational facilities, provide for new water-dependent industrial and commercial uses only where dredging and filling are not necessary and where consistent with the resource capabilities of the area and purposes of the management unit.

....
ESTUARY ZONES shall be applied to all estuarine waters, intertidal areas, submerged and submersible lands and tidal wetlands up to the line of non-aquatic vegetation or the Mean Higher High Water (MHHW) line, whichever is most landward.

...
(2) USES PERMITTED WITH STANDARDS:

...
(d) Structural shoreline stabilization, limited to riprap.

...
(4) *REGULATED ACTIVITIES: The following Regulated Activities are permitted subject to the procedure of Section 3.120 and the standards in Section 3.140.*

(a) *Regulated Activities in association with on-site maintenance and repair of existing structures or facilities, limited to:*

...
(2) *Fill or riprap for on-site maintenance of:*

...
c. *Shoreline stabilization structures.*

Findings: The proposed development is to repair areas of erosion along the toe of levee in 6 locations of a 500-foot stretch of the Nehalem River levee identified in the Applicant's submittal as "Sites A-F" to prevent levee failure and protect the wastewater treatment plant (Exhibit B). A site plan was included in 'Exhibit B', which demonstrates that the proposed siting location is within the EC2 zone (Exhibit B).

Staff finds that the proposed development is a permitted use in the Estuary Conservation (EC2) Zone, subject to TCLUO Section 3.120 and Section 3.140, as discussed below.

B. Section 3.120: Review of Regulated Activities

Findings: The purpose of this section is to provide an assessment process and criteria for local review and comment on State and Federal permit applications which could potentially alter the integrity of the estuarine ecosystem. This project includes regulated activities which are subject to State and Federal permits. Notification of the application was provided to Federal and State agencies in accordance with the provisions outlined in TCLUO Section 3.120(8).

Staff finds that the Army Corp Permit currently under review and comments from ODFW satisfy the development standards that must be addressed as part of the impact assessment outlined in TCLUO Section 3.120. ODFW comments include a statement that fill placement should be the minimum necessary to stabilize the erosion. ODFW also recommends that natural materials (i.e., large wood) be incorporated into the repairs. Planting of native vegetation should also be considered if opportunities exist that won't impact the levee structure or access to it (Exhibit C).

Applicant has provided an Impact Assessment prepared in accordance with TCLUO Section 3.120(5):

- No upland alternatives existing. Repair areas are targeted to six eroded areas along the toe of the levee.
- The amount of fill (460 cubic yards) proposed is the minimum necessary.
- Vegetative riprap will be utilized to promote bank stabilization and help prevent further erosion.
- A no-rise analysis has been provided.
- Erosion and stabilization measures (Best Management Practices) will be employed during construction to control erosion.
- Repairs are to stabilize the eroding bank which will have a positive impact on water quality.
- Repairs (placement of rock) will be done during low tide and during the ODFW recommended in-water work window.

Applicant has provided a Resource Capability Determination prepared in accordance with TCLUO Section 3.120(6):

- Project site does not contain subtidal aquatic beds mapped by ODFW.
- Potential impacts to wildlife habitat will be short term and disturbed areas will be reseeded.
- Repairs will be sloped in a manner to minimize placement of fill below ordinary high-water line.
- Project will not have a significant impact on estuarine species, habitat or biological productivity and should improve both habitat conditions and water quality.

Applicant has provided an analysis of estuarine natural values in accordance with TCLUO Section 3.120(7):

- Need is demonstrated.
- No feasible upland alternative locations exist.
- Adverse impacts are minimized to the extent possible.
- USACE indicates repairs qualify as a maintenance activity.
- Fill-Removal Permit is required from DSL.

Staff concludes these standards have been adequately addressed

C. Section 3.140: Estuary Development Standards

Applicable subsections with relevant standards:

- *Section 3.140(2): Diking*
- *Section 3.140(17): Shoreline Stabilization*

Findings: The Applicant's narrative addresses the relevant standards and subsections of TCLUO Section 3.140 (Exhibit B). Applicant states the following:

- Project consists of vegetated riprap. No structural shoreline stabilization is proposed.
- Riprap will be seeded.
- Maintenance activities are allowed and are required to keep the levee in good working order.
- A form will be placed at the lowest elevation to keep rock from entering the water.
- USACE has indicated repairs qualify as a maintenance activity under Section 408 and a permit is not required.
- DSL Fill-Removal Permit is required.
- Determination of no-rise analysis is that the placement of fill for levee repairs will not result in a rise in water surface elevations along the Nehalem River for either the base flood or floodway.

Staff concludes these standards have been adequately addressed.

D. TCLUO Section 3.510 'Flood Hazard (FH) Overlay'

(5) *GENERAL STANDARDS: In all areas of special flood hazards the following standards are required:*

...

CONSTRUCTION MATERIALS AND METHODS

(d) *All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.*

(e) *All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.*

(f) *Electrical, heating, ventilation, plumbing, and air-conditioning equipment and other service facilities shall be elevated to prevent water from entering or accumulating within the components during conditions of flooding. In Flood Zones A, A1-A30, AE, V, V1-V30 or VE, such facilities shall be elevated three feet above base flood elevation. In Flood Zone AO, such facilities shall be elevated above the highest grade*

adjacent to the building, a minimum of one foot above the depth number specified on the FIRM (at least two feet above the highest adjacent grade if no depth number is specified).

...

(14) Development Permit Review Criteria

- (1) The fill is not within a Coastal High Hazard Area.*
- (2) Fill placed within the Regulatory Floodway shall not result in any increase in flood levels during the occurrence of the base flood discharge.*
- (3) The fill is necessary for an approved use on the property.*
- (4) The fill is the minimum amount necessary to achieve the approved use.*
- (5) No feasible alternative upland locations exist on the property.*
- (6) The fill does not impede or alter drainage or the flow of floodwaters.*
- (7) If the proposal is for a new critical facility, no feasible alternative site is available.*

Findings: Applicant submitted the required information on forms provided by the Community Development Department and as attachments thereto (Exhibit B). The project area is located in an AE Area of Special Flood Hazard of the Nehalem River and Nehalem River Floodway, and no alternative upland location exists (Exhibits A and B). Applicant details that the proposed fill amount for the levee repairs to approximately 460 cubic yards of rocks along 6 sites of a 500-foot stretch of the levee (Exhibit B). The proposal is not for a new critical facility.

TCLUO Section 3.510(9) states that encroachments in the regulatory floodway including fill, new construction, substantial improvements and other development are prohibited unless certification is provided by a professional registered civil engineer demonstrating through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that such encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge.

A hydraulic (no-rise) analysis performed by Chris D. Bahner, PE, West Consultants Inc. has been submitted in accordance with TCLUO Section 3.510(9) (Exhibit B). The no-rise indicates the proposed modifications will not result in an increase in water surface elevations during the base flood (Exhibit B). The methodology for the analysis and results are summarized in the Nehalem Bay Wastewater Agency, No-Rise Analysis and Certification dated April 9, 2021 and included in "Exhibit B".

Staff finds that these criteria are met.

E. TCLUO Section 3.545 'Shoreland Overlay'

In the vicinity of the proposed project, the Goal 17 element of the Tillamook County Comprehensive Plan identifies all areas within 1,000 feet of estuaries and 500 feet of coastal lakes as within the Shorelands Boundary which may be subject to the provisions of TCLUO Section 3.545, 'SH Shoreland Overlay'. TCLUO Section 3.545 defines those areas within the Shorelands Boundary included within the Shoreland Overlay Zone. Relevant to the proposed development, TCLUO Section 3.545(2) identifies areas within 50 feet of estuaries as areas included in the Shorelands Overlay zone.

...

TCLUO Section 3.545(6) STANDARDS: Uses within the SHORELAND OVERLAY ZONE are subject to the provisions and standards of the underlying zone and of this section. Where the standards of the SHORELANDS OVERLAY ZONE and the underlying zone conflict, the more restrictive provisions shall apply.

(a) Riparian vegetation shall be protected and retained according to the provisions outlined in Section 4.140, REQUIREMENTS FOR PROTECTION OF WATER QUALITY AND STREAMBANK STABILIZATION.

(b) Development in flood hazard areas shall meet the requirements of Section 3.510, FLOOD HAZARD OVERLAY ZONE.

Findings: Staff finds the project is necessary and cannot be accommodated at an upload location (Exhibit B). The requirements of TCLUO Section 4.140 and 3.510 are addressed in this report.

Staff finds these standards have been met.

F. TCLUO Section 4.140, ‘Requirements for Protection of Water Quality and Streambank Stabilization’

1) *The following areas of riparian vegetation are defined:*

(a) Fifty (50) feet from lakes and reservoirs of one acre or more, estuaries, and the main stems of the following rivers where the river channel is more than 15 feet in width; Nestucca, Little Nestucca, Three Rivers, Tillamook, Trask, Wilson, Kilchis, Miami, Nehalem and North and South Fork Nehalem River.

...

For estuaries, all measurements are horizontal and perpendicular from the mean high water line or the line of non-aquatic vegetation, whichever is most landward. Setbacks for rivers, streams, and coastal lakes shall be measured horizontal and perpendicular from the ordinary high water line.

(3) All development shall be located outside of areas listed in (1) above, unless:

...

(b) Direct water access is required in conjunction with a water dependent use;

Findings: The proposal is for repairs to the Nehalem River levee as described throughout this report (Exhibit B). The Applicant describes measures taken for erosion control timing of construction activities to address the site (Exhibit B).

Staff finds that these standards have been met.

V. DECISION: APPROVED WITH CONDITIONS

Based on the findings shown above, Staff concludes that the Applicant has satisfied the review criteria, and can meet all applicable ordinance requirements at the time of application. Therefore, the Department approves Floodway/Estuary/Floodplain Development Permit #851-21-000432-PLNG subject to the Conditions of Approval in section VI of this report.

By accepting this approval, the applicants/property owners agree to indemnify, defend, save and hold harmless Tillamook County, and its officers, agents, and employees from any claim, suit, action or activity undertaken under this approval, including construction under a Building Permit approved subject to this approval. The applicants/property owners shall obtain all of the necessary local, state, and federal permits and comply with all applicable regulations for the proposed building site.

Failure to comply with the Conditions for Development and ordinance provisions may result in nullification of this decision.

Appeal of this decision. This decision may be appealed to the Tillamook County Planning Commission, who will hold a public hearing. The forms and fees must be filed in the office of this Department before **4:00 PM on April 6, 2022.**

VI. CONDITIONS OF APPROVAL:

1. The Applicant/property owner shall obtain all required Federal, State, and Local permits and/or licenses and will comply with applicable rules and regulations.
2. Development shall be as described on the provided plans and descriptions.
3. Development shall comply with the applicable standards of TCLUO Section 3.108, 'Estuary Conservation 2 (EC2)', TCLUO Section 3.510, 'Flood Hazard Overlay (FH) Zone' and TCLUO Section 4.140, 'Requirements for Protection of Water Quality and Streambank Stabilization', and any other applicable standards.
4. The fill shall comply with all Building Code requirements for Construction Materials and Methods for a structure located in the 'AE' flood zones.
5. This approval shall be void on March 25, 2024, unless construction of approved plans has begun, or an extension is requested from, and approved by this Department.

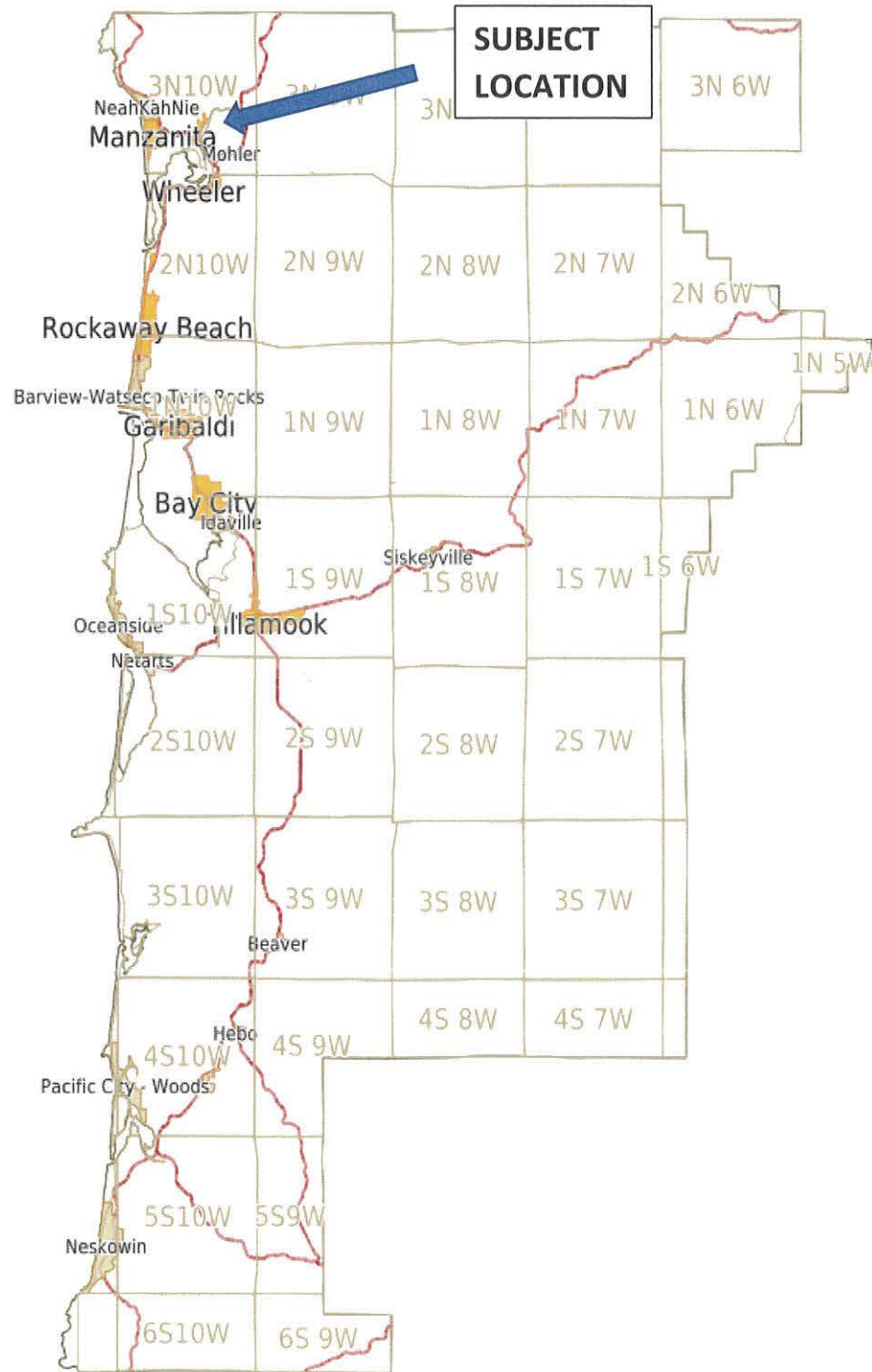
VII. EXHIBITS

All Exhibits referred to herein are, by this reference, made a part hereof:

- A. Location map, Assessor map, Zoning map, FEMA FIRM, NWI Wetlands map
- B. Applicant's submittal
- C. Public Comments

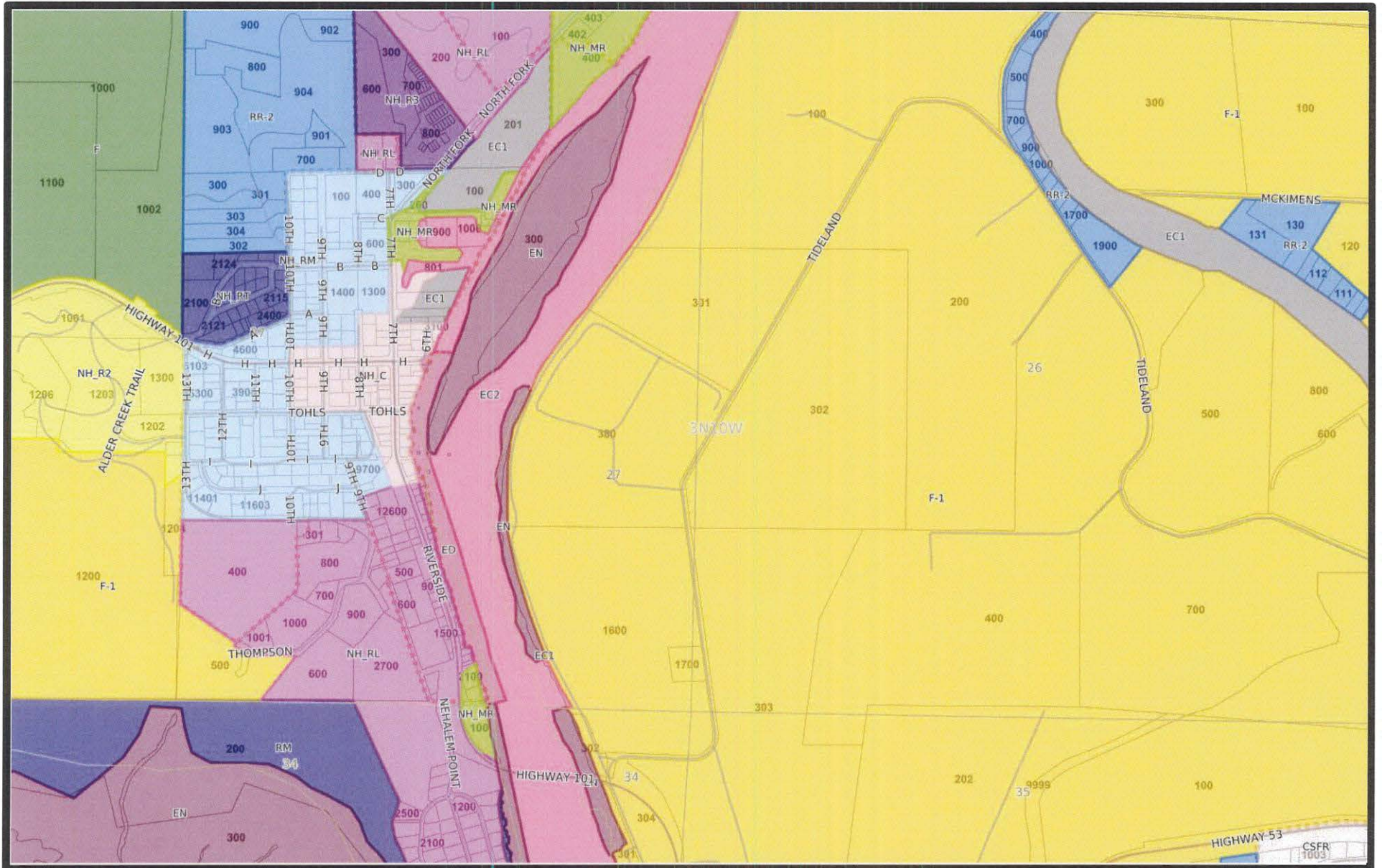
EXHIBIT A

VICINITY MAP



#851-21-000432-PLNG: NEHALEM BAY
WASTEWATER AGENCY

Map

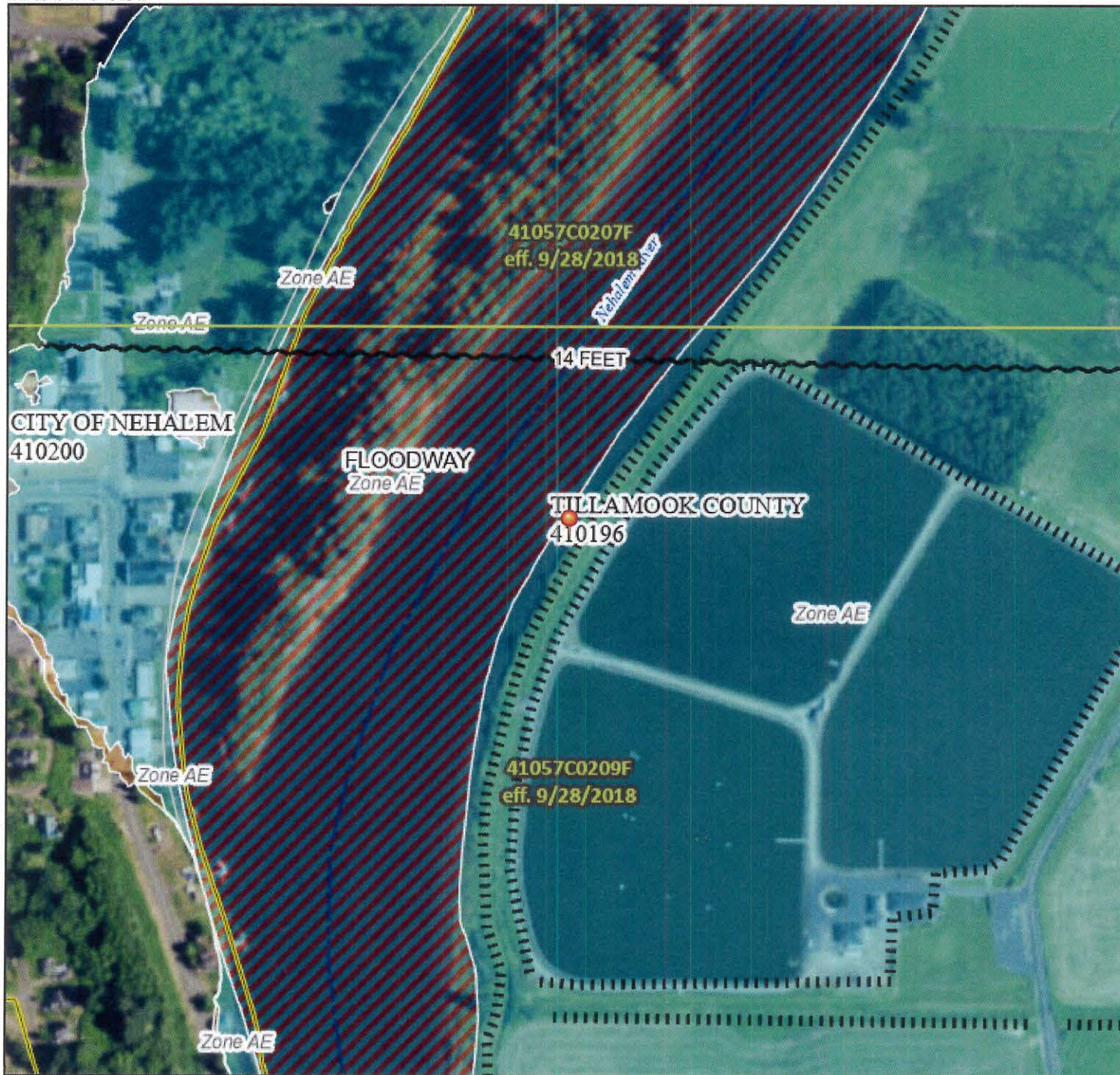


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National Flood Hazard Layer FIRMMette



123°53'43"W 45°43'15"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- | | |
|------------------------------------|---|
| SPECIAL FLOOD HAZARD AREAS | Without Base Flood Elevation (BFE)
<i>Zone A, V, A99</i> |
| | With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i> |
| | Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | 0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i> |
| | Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i> |
| | Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i> |
| | Area with Flood Risk due to Levee <i>Zone D</i> |
| OTHER AREAS | NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i> |
| | Effective LOMRs |
| | Area of Undetermined Flood Hazard <i>Zone X</i> |
| GENERAL STRUCTURES | Channel, Culvert, or Storm Sewer |
| | Levee, Dike, or Floodwall |
| OTHER FEATURES | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation |
| | 17.5 Water Surface Elevation |
| | Coastal Transect |
| | Base Flood Elevation Line (BFE) |
| | Limit of Study |
| | Jurisdiction Boundary |
| | Coastal Transect Baseline |
| | Profile Baseline |
| | Hydrographic Feature |
| MAP PANELS | Digital Data Available |
| | No Digital Data Available |
| | Unmapped |
- The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/25/2022 at 5:40 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

EXHIBIT B



Tillamook County Department of Community Development
 1510-B Third Street, Tillamook, OR 97141 | Tel: 503-842-3408 Fax: 503-842-1819
www.co.tillamook.or.us

PLANNING APPLICATION

OFFICE USE ONLY	
Date Stamp	
RECEIVED DEC 08 2021	
<input type="checkbox"/> Approved	<input type="checkbox"/> Denied
Received by:	
Receipt #:	
Fees: 983	
Permit No: 851-21-000432-PLNG	

Applicant (Check Box if Same as Property Owner)

Name: Nehalem Bay Wastewater Agency Phone: 503-368-5125
 Address: 14855 Tideland Road
 City: Nehalem State: OR Zip: 97131
 Email: nbwa2@nehalem.tel.net

Property Owner

Name: Nehalem Bay Wastewater Agency Phone: (503) 386-5125
 Address: PO Box 319
 City: Nehalem State: OR Zip: 97131
 Email: _____

Request: The purpose of this request is to obtain approval to perform maintenance activities on the levee separating the Nehalem Bay Wastewater Treatment Plant and the east bank of the Nehalem River within the Nehalem Bay Wastewater Agency property limits.

- | Type II | Type III | Type IV |
|---|--|---|
| <input type="checkbox"/> Farm/Forest Review | <input type="checkbox"/> Appeal of Director's Decision | <input type="checkbox"/> Appeal of Planning Commission Decision |
| <input type="checkbox"/> Conditional Use Review | <input type="checkbox"/> Extension of Time | <input type="checkbox"/> Ordinance Amendment |
| <input type="checkbox"/> Variance | <input type="checkbox"/> Detailed Hazard Report | <input type="checkbox"/> Large-Scale Zoning Map Amendment |
| <input type="checkbox"/> Exception to Resource or Riparian Setback | <input type="checkbox"/> Conditional Use (As deemed by Director) | <input type="checkbox"/> Plan and/or Code Text Amendment |
| <input type="checkbox"/> Nonconforming Review (Major or Minor) | <input type="checkbox"/> Ordinance Amendment | |
| <input checked="" type="checkbox"/> Development Permit Review for Estuary Development | <input type="checkbox"/> Map Amendment | |
| <input type="checkbox"/> Non-farm dwelling in Farm Zone | <input type="checkbox"/> Goal Exception | |
| <input type="checkbox"/> Fore-dune Grading Permit Review | | |
| <input type="checkbox"/> Neskowin Coastal Hazards Area | | |

Location:

Site Address: 14000 Tideland Rd

Map Number:	<u>3N</u>	<u>10W</u>	<u>27</u>	<u>380</u>
	Township	Range	Section	Tax Lot(s)

Clerk's Instrument #: _____

Authorization

This permit application does not assure permit approval. The applicant and/or property owner shall be responsible for obtaining any other necessary federal, state, and local permits. The applicant verifies that the information submitted is complete, accurate, and consistent with other information submitted with this application.

	12/1/21
Property Owner Signature (Required)	Date
	12/1/21
Applicant Signature	Date

TYPE II DEVELOPMENT PERMIT REVIEW APPLICATION

Site Information

Site Address: 14000 Tideland Rd, Nehalem OR 97131

Map Number: Township 3N, Range 10 West, Section 27 Tax lot 380

Proposal & Reason for Request

The purpose of this request is to obtain approval to perform maintenance activities on the levee separating the Nehalem Bay Wastewater Treatment Plant and the east bank of the Nehalem Bay within the Nehalem Bay Wastewater Agency property limits.

The proposed maintenance project would place vegetated riprap (rocks or boulders, ranging in size from 6-inches to 18-inches), at six locations along the east bank of the bay where levee erosion is visible. The project area is located within a Special Flood Hazard Area of the Nehalem River floodplain in the left (east) overbank. Some of the locations where repairs will be made are within the regulated floodway.

The project is required to prevent further erosion of the existing levee and stabilize the bank. The areas of erosion along the toe of the levee could compromise the levee and endanger adjacent roads, farms, homes and the sewer treatment plant. Riprap repairs will prevent levee failure and protect the wastewater treatment plant.

Section 3.120 Estuary Zones Regulated Activities and Impact Assessments

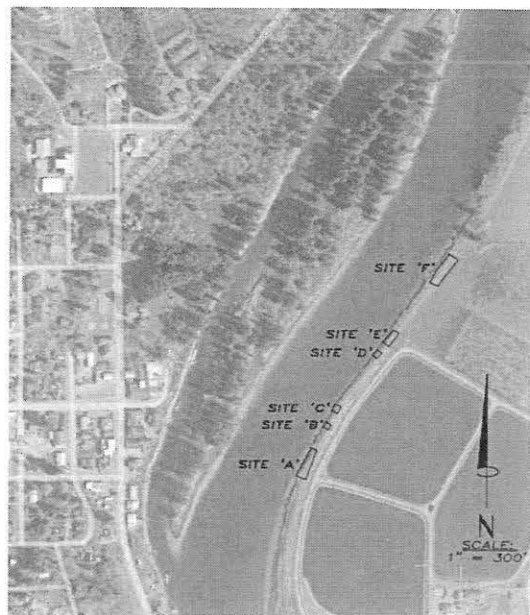
3.120(2) Regulated Activities

Response: This project is considered a regulated activity under local ordinance 3.120(2) a & e. The total volume of rock proposed for permanent placement is 460 cubic yards. Any fill utilized for shoreline stabilization in excess of 50 cubic yards is considered a regulated activity.

3.120(4) Zone Requirements

Response: This project meets the Tillamook County zoning requirements in sections 3.120 and 3.140 (2) and (7) of Tillamook Counties Land Use Ordinance. There are no alternatives to fill because the levee is eroding in six specific locations (see photo below). The proposed project prevents further erosion and provides stabilization (7.1) at these six locations. Site Plans are included as Attachment 1.

The requested maintenance activities are allowed within Estuary Conservation 2 zone. Repairing the erosion is needed to prevent levee failure and protect the wastewater treatment plant. The vegetated riprap will be placed in six locations on the levee and installed in a manner that will remain in place (7.2) and stabilize the bank from further erosion. Based on the survey of the levee where erosion is occurring, the amount of fill is the minimum needed to stabilize the banks and prevent further erosion. Construction will be performed during low tide to avoid placing material in water and to minimize sedimentation and turbidity (7.2d). Only contaminant-free material will be used (7.2e). A no rise analysis was conducted (Attachment 2) for the project and it was determined that the fill placement would not result in a rise in water surface elevations along the Nehalem River for either the base flood or the



floodway, thus the proposed repairs would not adversely impact adjacent properties (7.2g).

(a) The type and extent of alterations expected

Response: Approximately 460 cubic yards will be placed along a total of 500 feet of the east bank levee in six different locations where the levee is eroding. The following table summarizes the type and extent of the alterations at the six sites.

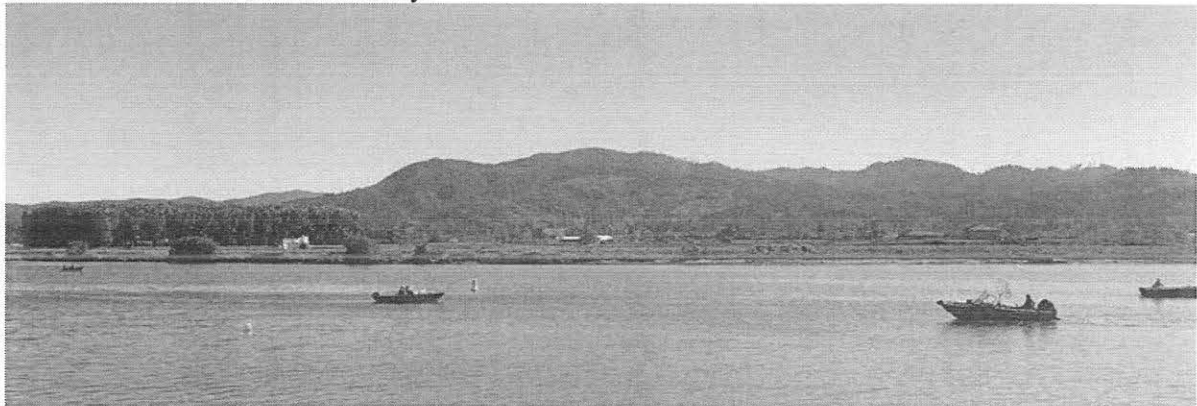
Site	Length (ft)	Width (ft)	Area (sq. ft)	Volume (cy)	Material
A	160	12	1,920	90	Rocks and boulders
B	25	8	200	5.5	Rocks and boulders
C	25	7	175	5	Rocks and boulders
D	40	8	320	12	Rocks and boulders
E	80	10	800	44	Rocks and boulders
F	170	12	2,040	33	Rocks and boulders

The project would place a total of 194.5 cy of fill below mean high water tidal elevation over a 5,455 sq. ft. area.

The riprap will be mechanically placed during low tide to prevent any in-water work. A form will be placed at the lowest elevation to prevent any riprap from going into the water. The riprap will be planted with willow stakes. Vehicles will travel along the access road on the levee to the six sites. The contractor will use Best Management Practices (BMPs) to control erosion.

(b) The type of resources affected including, but not limited to aquatic life and habitats, riparian vegetation, water quality and hydraulic characteristics

Response: Resources in the project area consist of the Nehalem Bay, the lowest reach of the Nehalem River. The Nehalem River is the largest of Oregon’s North Coast rivers, running over 100 miles from its mountain sources to Nehalem Bay.



The Nehalem Bay is an important refuge for several marine fish and shell fish species, including Coho salmon (*Oncorhynchus kisutch*), fall and early-run fall Chinook salmon (*O. tshawytscha*), chum salmon (*O. keta*), and winter steelhead (*O. mykiss*). Additionally, resident and anadromous cutthroat trout (*O. clarki clarki*), white sturgeon (*Acipenser transmontanus*), and Pacific lamprey (*Lampetra tridentata*) are also present. However, this reach generally only provides a migratory corridor for these species, and functionally little or no rearing or spawning habitat. Other species present would include limited aquatic invertebrates and occasionally river otters (*Lontra canadensis*). Only slackwater is present along the project reach, and it does not offer important habitat structure such as large wood, pools, riffles, runs, emergent vegetation, variable substrate, or shade. It is assumed, given the lack of habitat diversity, that the aquatic habitat in this reach mostly provides a pass-through

corridor. The project is outside areas mapped as significant or valuable subtidal habitat by Oregon Department of Fish and Wildlife (ODFW).

Aquatic life at all six project sites is functionally the same. The Bay within this reach has been confined by construction of dikes, isolating it from its natural floodplain and ability to maintain wetland (estuarine) habitat that would otherwise support a diverse array of aquatic species. The long-term and on-going maintenance of the levees has largely eliminated naturally occurring habitat features along the shore line. The Bay, which maintains tidal hydrology and brackish water in this reach, transitions abruptly to upland at the toe of the existing levee.

Water quality in the reach with all six project sites becomes compromised by its low positioning in the watershed, which corresponds to slack, tidal water and close proximity to areas of active logging and agriculture. In general, water in this reach typically becomes impaired in the fall, winter, and spring due to elevated levels of nutrients (ammonia, nitrate nitrogen, and total phosphates), biochemical oxygen demand, and total solids. These impairments are attributed to rising water levels during heavy precipitation which may remove organic materials from the surrounding fields, banks, and hillsides. Water temperatures can also become impaired during the warmest months. The tidal exchange in this reach slows flows for most of the year, saturating the levee lining the river and allowing sediments to settle-out of the water column. However, the constant influx and outflux of tidal water readily erodes and undermines the altered streambanks. The project area is located within a Special Flood Hazard Area of the Nehalem River floodplain in the left (east) overbank. Some of the locations where repairs will be made are within the regulated floodway.

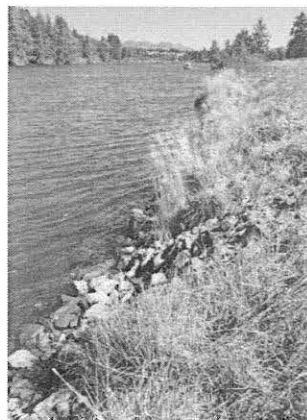
Habitat in the project area consists of actively eroding banks that contain a mix of imported aggregate and native soil. The areas of erosion are sparsely vegetated. The levee itself is covered in native vegetation such as twinberry (*Lonicera involucrata*), Douglas aster (*Symphotrichum subspicatum*), and fescue (*Festuca* sp.). There are patches of invasive species such as Himalayan blackberry (*Rubus bifrons*) and knotweed (*Polygonum* sp.). A few large conifers grow along the levee.

Sites A and E Vegetation - Riparian vegetation at these two locations consists primarily of weedy grasses, rushes, sedges, and limited herbs, and no woody species are present. These conditions are likely due to the long history of maintenance of the levee to maintain its integrity.

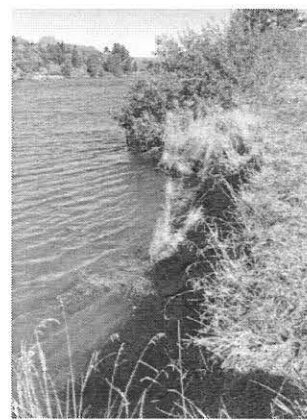
Sites B, C, D, and F Vegetation - Riparian vegetation at these locations is the same as what is present at Sites A and E, but also includes limited shrub structure composed of isolated patches of twinberry honeysuckle (*Lonicera involucrata*), Himalayan blackberry (*Rubus armeniacus*), and Hooker's willow (*Salix hookeriana*). This shrub structure is dense where it occurs, but overall shrub cover is approximately 15%. No trees are present.



Site C



Site E



Site F

(c) The expected extent of impacts of the proposed alteration on water quality and other physical characteristics of the estuary, living resources, recreation and aesthetic use, navigation and other existing and potential uses of the estuary

Response: The proposed repairs would stabilize the eroding bank, which would have a positive effect on water quality.

Approximately 5,455 sq ft of herbaceous riparian habitat will be impacted. The loss of riparian habitat would be short term as willow steaks will be planted in the riprap and the areas disturbed by construction would be reseeded with a native seed mix.

Approximately 460 cy of fill will be placed over the six sites. The existing banks range from 1:1 to 1.5:1 slopes. The repairs would be sloped at 1:1 to minimize the amount of fill placed below the mean ordinary high water. Repairs would be made on approximately 500 linear feet of the bank.

The no rise analysis conducted for the project concluded that the fill placement would not result in a rise in water surface elevations along the Nehalem River for either the base flood or the floodway. There would be no other physical impacts or changes to the estuary.

The bay is heavily used for recreation, including fishing, boating, hiking, and floating. Where the riprap is placed may be seen from boaters on the river, but this would be short term until vegetation became reestablished. There would be no effect to recreation, navigation, or other existing or potential uses of the estuary.

(d) The methods which could be employed to avoid or minimize adverse impacts.

Response: To minimize or avoid adverse impacts, rock for the toe of slope will be placed during low tide and during the ODFW recommended in-water window of November 1-February 15. Vehicles will travel along the access road on the levee to the six sites. The contractor will be responsible for developing and implementing erosion control BMPs to prevent sediment from entering the water. The areas disturbed will be reseeded after construction.

3.120(6) Requirements for Resource Capability Determinations. An activity will be found to be consistent with the resource capabilities of a management unit (as described in Section 2 of the Estuarine Resources Element of the Tillamook County Comprehensive Plan) when either (1) the impacts of the use on estuarine species, habitats, biological productivity and water quality are not significant or; (2) that the resources of the area are able to assimilate the use and activity and their effects and continue to function in a manner consistent with the purposes of the zone. The resource capability determination shall be based on information generated by the impact assessment.

Response: The project area is located in EC2 in management unit 22, *“in an area adjacent to existing development of moderate intensity not otherwise needed for preservation or development.”* The project site does not have any of the subtidal aquatic beds mapped by ODFW that would be affected by the proposed repairs. Approximately 5,455 sq ft of grassy riparian habitat will be impacted over 500 linear feet of bank. What impacts there maybe to wildlife habitat would be short term as the areas disturbed by construction would be reseeded. The existing banks range from 1:1 to 1.5:1 slopes. The repairs would be sloped at 1:1 to minimize the amount of fill placed below the mean ordinary high water. The repairs replace material that has eroded and stabilizes the bank from further erosion. This would not have a significant impact on estuarine species, habitat or biological productivity and in the long term would improve conditions and have a positive effect on water quality.

The proposed repair project stabilizes the levee by correcting the erosion problem. The upland and estuarine resources in the area would assimilate to the bank armoring and continue to function in a manner consistent with the EC2 zone.3.120.(7) Significant

Degradations or Reductions of Estuarine Natural Values. Reductions and degradations of estuarine natural values shall be allowed if:

- (1) A need is demonstrated and the use or alteration does not unreasonably interfere with public trust rights and**
- (2) No feasible alternative upland locations exist; and**
- (3) Adverse impacts are minimized as much as feasible.**

Response: The areas of erosion along the toe of the levee could compromise the levee and endanger adjacent roads, farms, homes and the sewer treatment plant. Riprap repairs will prevent levee failure and protect the wastewater treatment plant. The project will not unreasonably interfere with public trust rights. Since this is repair project of specific areas that are eroding along the toe of the bank, there are no feasible alternative upland locations. Best management practices such as performing construction activities during low tide and reseeding the bank following maintenance activities will minimize adverse effects.

3.120(6) State and Federal Review Agency Comments

Response: The US Army Corps of Engineers has indicated that the proposed repairs qualify as a maintenance activity under Section 408 and therefore do not require a permit.

A Removal-Fill Permit would be required from the Oregon Department of State Lands because the project would place 194.5 cy of fill below mean high water tidal elevation.

Section 3.140 Estuary Development Standards

3.140 Diking – Siting, design, construction, maintenance or expansion of dikes in estuary zones, shall be subject to the following standards:

(a) Diking policy requirements in the Tillamook County Comprehensive Plan shall be met.

Response: The diking policy requirements in the Tillamook County Comprehensive plan are being met because the levee has been damaged by erosion but has not reverted back to estuarine habitat (6.1(b)). The maintenance is required to keep the levee in good working order and is being permitted within the estuary zone.

Proposals for new dike construction or dike maintenance or repair shall be accompanied by a brief statement from the local Soil and Water Conservation Service or a certified engineer stating that:

- (1) The project is in conformance with good engineering practices and any applicable rules and regulations set forth by the Oregon Division of State Lands and the U. S. Army Corps of Engineers.**
- (2) Provides for suitable erosion protection for the dike face.**
- (3) Will produce no appreciable flood and erosion potential upstream or downstream of the proposed project.**

Response: The US Army Corps of Engineers has indicated that the proposed repairs qualify as a maintenance activity under Section 408 and therefore do not require a permit. A Removal-Fill Permit would be required from the Oregon Department of State Lands because the project would place 194.5 cy of fill below mean high water tidal elevation. The proposed repair provides a suitable erosion protection for the streambank (levee face). A no rise analysis was conducted (Attachment 2) for the project and it was determined that the fill placement would not result in a rise in water surface elevations along the Nehalem River for either the base flood or the floodway.

(c) When temporary dikes are constructed in intertidal areas or tidal wetlands, notice must be given to the D SL within 24 hours following the start of such activity and their approval for continuation of the project must be obtained (ORS 541.615(4)). Intertidal areas and tidal wetlands shall be restored by the sponsor of the dike to predike conditions after the removal of temporary dikes.

Response: Not applicable

(d) Fill, shoreline stabilization or other activities in conjunction with dike construction, maintenance or repair shall be subject to the respective standards for these activities.

Response: The project meets the standards for fill and shoreline stabilization in sections 3.140 (17) of the Tillamook County code.

(17) SHORELINE STABILIZATION: Shoreline stabilization projects in estuary zones, Water-Dependent Development (WDD) shoreland zones or other areas within the Shoreland Overlay Zone shall be subject to the following standards:

(a) Within estuarine waters, intertidal areas and tidal wetlands, and along Water- Dependent Development Zones and other shoreland areas, general priorities for shoreline stabilization for erosion control are, from highest to lowest:

- (1) Proper maintenance of existing riparian vegetation.**
- (2) Planting of riparian vegetation.**
- (3) Vegetated riprap.**
- (4) Non-vegetated riprap.**
- (5) Groins, bulkheads or other structural methods. Shoreline protection proposals shall include justification for the use of a lower priority method over a higher priority method.**

Response: The project will use vegetated riprap. Additionally, the areas disturbed by construction will be reseeded.

(b) Vegetative shoreline stabilization shall utilize native species, or non-native species approved by the Soil Conservation Service. Reference shall be made to the Inter-Agency Seeding Manual prepared by the Soil Conservation Service.

Response: After the riprap is placed and native willow stakes planted, the areas disturbed by construction will be reseeded with a native seed mix.

(c) When structural shoreline stabilization methods are proposed, evidence shall be presented by the applicant and findings made by the County that:

Response: Not applicable. No structural shoreline stabilization is proposed. The repair will use non-vegetated riprap that will be seeded.

(d) Shoreline stabilization projects shall be timed to minimize impacts on aquatic life.

Response: The lowest elevation rocks will be placed during low tide to avoid in-water work. A form will be placed at the lowest elevation to keep rock from entering into the water.

- (e) **Proposals for riprap shall include evidence that the rock to be used will be effective, and provide justification for use of a slope steeper than 1 1/2 feet horizontal to one foot vertical.**

Response: Proposed slope is 1:1. This steeper slope is justified because the existing banks range from 1:1 to 1.5:1 slopes. The repairs would be sloped at 1:1 to minimize the amount of fill placed below the mean ordinary high water and would blend to match the existing stream bank.

- (f) **When bulkheads are proposed, evidence shall be provided by the applicant and findings made by the County that the other forms of structural stabilization are inappropriate or will not meet the need. Bulkheads should be designed to be permeable to ground water and runoff. Fill policies and standards shall apply to bulkhead projects which involve fill within estuarine waters, intertidal areas or tidal wetlands.**

Response: Not applicable.

- (g) **When riprap is proposed in Estuary Natural (EN) zones, a resource capability determination shall be required for purposes other than the protection of unique natural resources, historical and archaeological values, public facilities and uses existing as of October 7, 1977.**

Response: Not applicable. The project is in the EC2 zone.

- (h) **When structural shoreline stabilization is proposed in Estuary Conservation Aquaculture (ECA), Conservation 1 (EC1) and Estuary Conservation 2 (EC2) zones, evidence shall be presented by the applicant and findings made by the County that the project is consistent with the resource capabilities of the area and the long-term use of renewable resources, and does not cause a major alteration of the estuary.**

Response: Not applicable. No structural shoreline stabilization is proposed. The repair will use non-vegetated riprap that will be seeded.

- (i) **When structural shoreline stabilization is proposed in Estuary Development (ED) zones, evidence shall be presented by the applicant and findings made by the County that the project is consistent with the maintenance of navigation and other needed public, commercial and industrial water-dependent uses.**

Response: Not applicable.

- (j) **Structural stabilization along ocean shorelands west of the Beach Zone Line shall be subject to the requirements of the Oregon Department of Transportation ocean shore permit and regulatory program.**

Response: Not applicable.

- (k) **An impact assessment shall be conducted during local, state and federal review of permit applications for structural shoreline stabilization seaward of the line of non-aquatic vegetation or the Mean Higher High Water (MHHW) line. The impact assessment shall follow the procedure outlined in Section 3.120. Identified adverse impacts shall be avoided or minimized to be consistent with the resource capabilities and purposes of the area.**

Response: Not applicable.

(e) Repair and maintenance of existing dikes, and construction of new dikes involving fill in intertidal areas and tidal wetlands are subject to the requirements of the State Fill and Removal Law (ORS 541.605 - 541.665) and the Clean Water Act of 1977 (P.L. 95217). (Applies to fill only).

Response: The US Army Corps of Engineers has indicated that the proposed repairs qualify as a maintenance activity under Section 408 and therefore do not require a permit. A Removal-Fill Permit would be required from the Oregon Department of State Lands because the project would place 194.5 cy of fill below mean high water tidal elevation.

Section Overlay Zones 3.510 FH Flood Hazard Overlay

3.1510 (9) Specific standards for floodways: Located within areas of special flood hazard established in Section 3.510(2) are areas designated as regulatory floodways. Since the floodway is an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles, and erosion potential, the following provisions apply:

(a) Encroachments in the regulatory floodway including fill, new construction, substantial improvements and other development are prohibited unless certification is provided by a professional registered civil engineer demonstrating through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that such encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge.

Response: The proposed repair provides a suitable erosion protection for the streambank (levee face). A no rise analysis was conducted (Attachment 2) for the project and it was determined that the fill placement would not result in a rise in water surface elevations along the Nehalem River for either the base flood or the floodway.

(b) If Subsection 9(a) is satisfied, all new construction and substantial improvement shall comply with all applicable flood hazard reduction provisions of Section 3.510(5) and (6).

Response: The project complies with flood hazard reduction provisions in the Tillamook County Land Use Ordinance. To meet sections 3.510 (5) and (6) the riprap installation plan and materials are designed to be resistant to flood damage. There will be no service facilities to keep elevated from the water. There are no structures, this is a levee repair. A certified engineer from West Consultants provided a No-Rise certification.

3.1510 (14) Development Permit Procedures:

(a) Application for a development permit shall be made on forms furnished by the Community Development Director and shall include but not necessarily be limited to: plans in duplicate drawn to scale showing the nature, location, dimensions, and elevations of the area in question, existing or proposed structures, fill, storage of materials, drainage facilities, and the location of the foregoing. Specifically, the following information in 3.510(14)(a)(1)–(4) is required and Development Permits required under this Section are subject to the Review Criteria put forth in Section 3.510(14)(b):

(1) Elevation in relation to mean sea level of the lowest floor, including basement, of all structures as documented on an Elevation Certificate;

Response: Not applicable. There are no structures being constructed because is a levee repair project.

(2) Elevation in relation to mean sea level to which any proposed structure will be floodproofed as documented on an Elevation Certificate;

Response: Not applicable. This is a levee repair project, there are no structures.

(4) If applicable, certification by a registered professional engineer or architect that the floodproofing methods for any nonresidential structure meet the floodproofing criteria in Subsection (6)(c)(3) of this Section; and

Response: A no rise analysis was conducted (Attachment 2) for the project and it was determined that the fill placement would not result in a rise in water surface elevations along the Nehalem River for either the base flood or the floodway.

(5) Description of the extent to which any watercourse will be altered or relocated as a result of the proposed development.

Response: The repair project would not alter or relocate the Nehalem Bay. The existing banks range from 1:1 to 1.5:1 slopes. The repairs would be sloped at 1:1 to minimize the amount of fill placed below the mean ordinary high water and would blend into the existing bank slopes.

(b) Development Permit Review Criteria

(1) The fill is not within a Coastal High Hazard Area.

Response: The fill is outside of the Coastal Hazard Area.

(2) Fill placed within the Regulatory Floodway shall not result in any increase in flood levels during the occurrence of the base flood discharge.

Response: A no rise analysis was conducted (Attachment 2) for the project and it was determined that the fill placement would not result in a rise in water surface elevations along the Nehalem River for either the base flood or the floodway.

(3) The fill is necessary for an approved use on the property.

Response: Repairing the existing riprap to keep the levee in good working condition is a requirement of Goal 16 part 6.3 (Diking) of the comprehensive plan.

(4) The fill is the minimum amount necessary to achieve the approved use.

Response: Based on the survey of the levee where erosion is occurring, the amount of fill is the minimum needed to stabilize the banks and prevent further erosion. Additionally, fill will be placed at a 1:1 slope to minimize the amount of fill needed. The existing bank ranges in slope from 1:1 to 1:1.5. Fill will be blended to match existing streambank slope.

(5) No feasible alternative upland locations exist on the property.

Response: The work is to repair six specific locations on the levee that are actively eroding; there are no alternative upland locations.

(6) The fill does not impede or alter drainage or the flow of floodwaters.

Response: A hydraulic analysis conducted for the project shows that the proposed repairs does not impede or alter drainage of the flow the floodwaters.

(7) If the proposal is for a new critical facility, no feasible alternative site is available.

Response: Not applicable. This is a repair project for an existing levee.

(8) For creation of new, and modification of, Flood Refuge Platforms,

Response: Not applicable

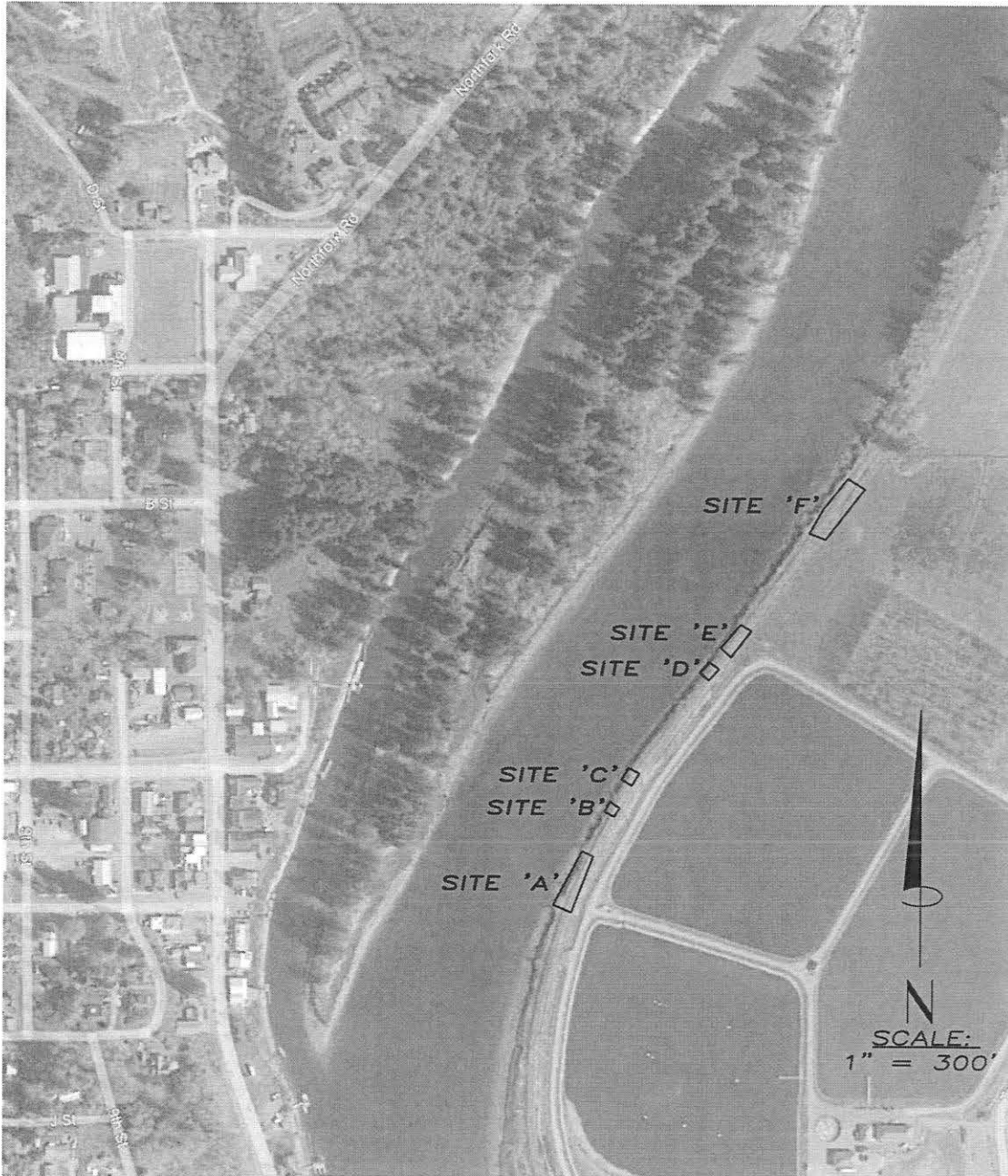
Conditions of approval may require that if the fill is found to not meet criterion (5), the fill shall be removed or, where reasonable and practical, appropriate mitigation measures shall be required of the property owner. Such measures shall be verified by a certified

engineer or hydrologist that the mitigation measures will not result in a net rise in floodwaters and be in coordination with applicable state, federal and local agencies, including the Oregon Department of Fish and Wildlife.

The project meets criterion 5. The work is to repair six specific locations on the levee; there are no alternative upland locations. The US Army Corps of Engineers has indicated that the proposed repairs qualify as a maintenance activity under Section 408 and therefore do not require a permit. A Removal-Fill Permit would be required from the Oregon Department of State Lands because the project would place 194.5 cy of fill below mean high water tidal elevation. The repairs replace in-kind what has eroded and provides stabilization and vegetative diversity. This would not have a significant impact on estuarine species, habitat or biological productivity and in the long term would improve habitat conditions and have a positive effect on water quality.

NOTES

THIS MAP DOES NOT CONSTITUTE A BOUNDARY SURVEY OF THE SUBJECT PROPERTY. THE PURPOSE OF THIS MAP IS TO SHOW THE LOCATION OF THE PROPOSED FILL/RIP RAP PLACEMENT FOR SHORELINE STABILIZATION. THE COORDINATES ON THIS MAP ARE BASED UPON NAD 83 OREGON STATE PLANE COORDINATES, OREGON NORTH ZONE. THE ELEVATIONS ON THIS MAP ARE NAVD 88, BASED ON NGS MONUMENT 711 AT THE INTERSECTION OF OREGON STATE HIGHWAY #53 AND OREGON COAST HIGHWAY #101. TO ADJUST FROM NAVD 88 TO MEAN LOWER LOW WATER, SUBTRACT 0.41' FROM ELEVATIONS SHOWN HEREON.



SHEET 1 OF 9
PERMIT SKETCHES FOR:
SUNSET DRAINAGE

VICINITY MAP

WEST 1/2, SECTION 27, T3N, R10W, W.M.
TILLAMOOK COUNTY
MAY 14, 2019

**ONION PEAK
DESIGN**

PO BOX 326
NEHALEM, OR 97131
(503) 368-6102
FAX (503) 368-6102

"SUNSET" #A2019
SUNSET1903-T.DWG

SITE 'A'

SITE A IS +/-160 FEET LONG AND WILL REQUIRE +/-185 CUBIC YARDS OF FILL MATERIAL TO REINFORCE AND STABILIZE THE RIVER BANK TO STOP AND PREVENT EROSION.

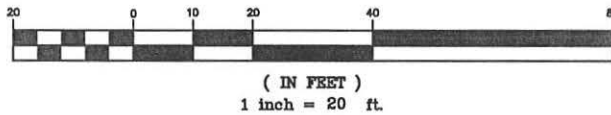
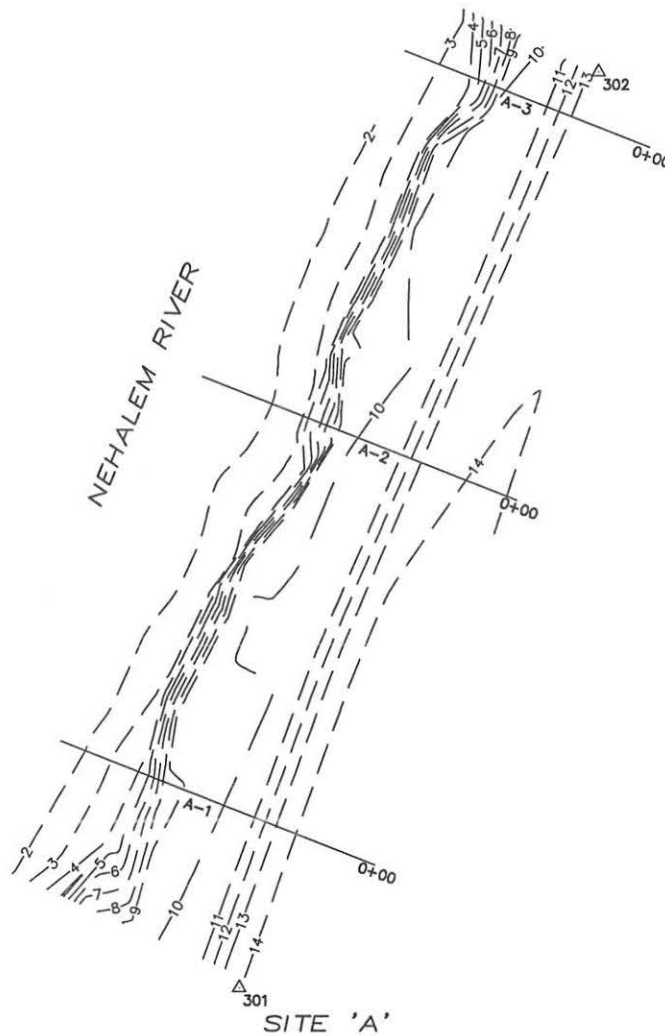
SITE DEFINITION

POINT#	NORTHING	EASTING	ELEVATION
301	765428.83	7336328.10	15.37'
302	765580.07	7336387.91	14.61'

TIDAL ELEVATIONS

HMT = HIGHEST MEASURED TIDE
 HTL = HIGH TIDE LINE
 MHW = MEAN HIGH WATER TIDAL ELEVATION

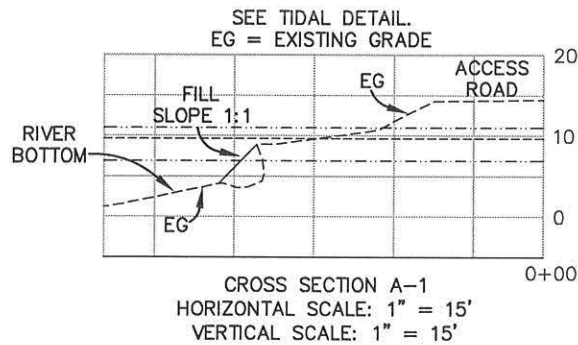
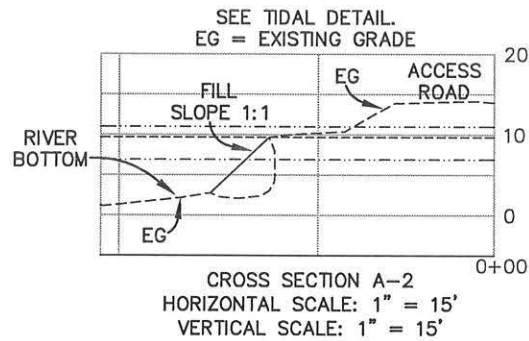
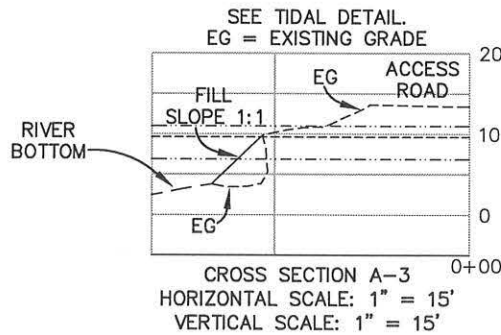
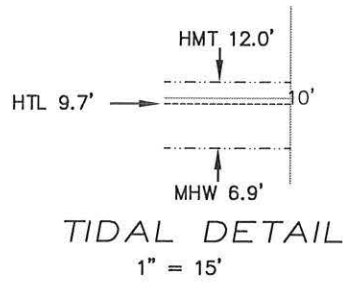
THE HIGHEST MEASURED TIDE DATA WAS ACQUIRED FROM OREGON.GOV COMPILATION OF HMT DATA AS PROVIDED BY NOAA AND OREGON DIVISION OF STATE LANDS.
 THE MEAN HIGH WATER TIDAL ELEVATION WAS ACQUIRED FROM NGS.NOAA.GOV TIDAL INFORMATION.
 THE HIGH TIDE LINE WAS DETERMINED BY MEASURING THE DEBRIS LINE ALONG THE RIVER BANK.
 SEE TIDAL DETAIL.



**ONION PEAK
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 NEHALEM, OR 97131
 (503) 368-6102
 FAX (503) 368-6102

SHEET 2 OF 9
 PERMIT SKETCHES FOR:
SUNSET DRAINAGE
 SITE A
 PLAN AND
 CALCULATIONS
 WEST 1/2, SECTION 27, T3N, R10W, W.M.
 TILLAMOOK COUNTY
 MAY 14, 2019

"SUNSET" #A2019
 SUNSET1903-T.DWG



**ONION PEAK
DESIGN**
PO BOX 326
NEHALEM, OR 97131
(503) 368-6102
FAX (503) 368-6102

SHEET 3 OF 9
PERMIT SKETCHES FOR:
SUNSET DRAINAGE
SITE A
CROSS SECTION &
CALCULATIONS
WEST 1/2, SECTION 27, T3N, R10W, W.M.
TILLAMOOK COUNTY
MAY 14, 2019

SITE 'B'

SITE B IS +/-25 FEET LONG AND WILL REQUIRE +/-10 CUBIC YARDS OF FILL MATERIAL TO REINFORCE AND STABILIZE THE RIVER BANK TO STOP AND PREVENT EROSION.

SITE 'C'

SITE C IS +/-25 FEET LONG AND WILL REQUIRE +/-10 CUBIC YARDS OF FILL MATERIAL TO REINFORCE AND STABILIZE THE RIVER BANK TO STOP AND PREVENT EROSION.

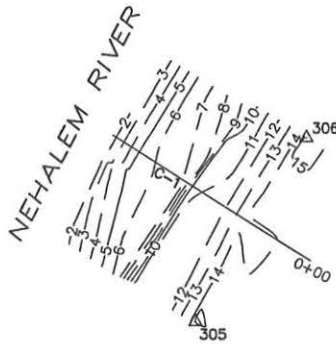
TIDAL ELEVATIONS

HMT = HIGHEST MEASURED TIDE
 HTL = HIGH TIDE LINE
 MHW = MEAN HIGH WATER TIDAL ELEVATION

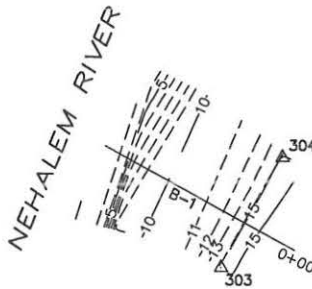
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SITE DEFINITION

POINT#	NORTHING	EASTING	ELEVATION
303	765692.60	7336448.84	15.24'
304	765710.75	7336459.02	15.45'
305	765775.16	7336495.18	15.16'
306	765805.52	7336513.58	15.32'



SITE 'C'



SITE 'B'



(IN FEET)
 1 inch = 20 ft.



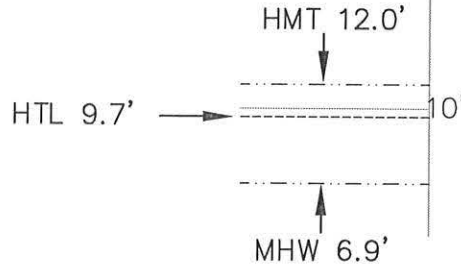
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 (503) 368-6102
 FAX (503) 368-6102

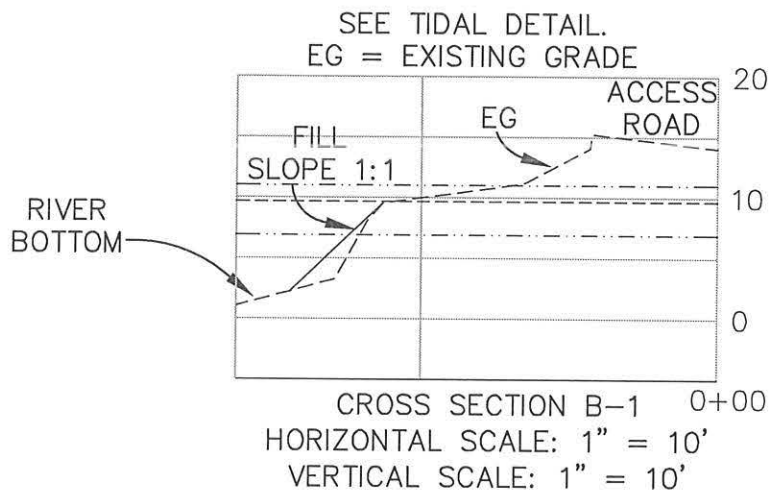
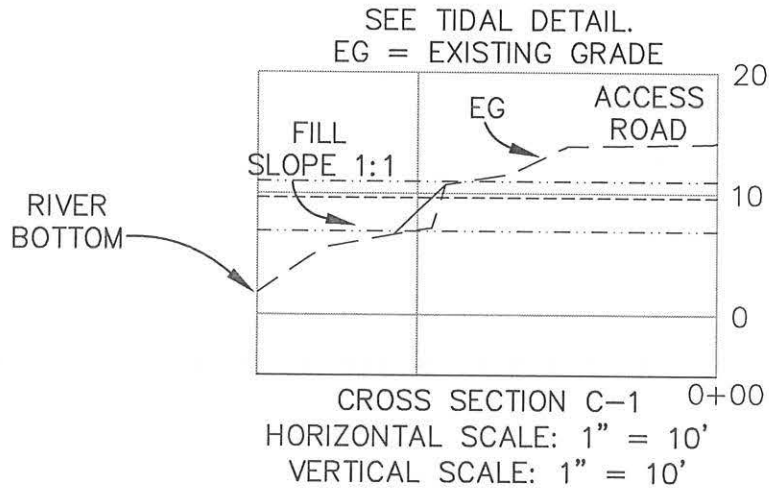
"SUNSET" #A2019
 SUNSET1903-T.DWG

SHEET 4 OF 9
 PERMIT SKETCHES FOR:
SUNSET DRAINAGE
 SITES B & C
 PLAN AND
 CALCULATIONS

WEST 1/2, SECTION 27, T3N, R10W, W.M.
 TILLAMOOK COUNTY
 MAY 14, 2019



TIDAL DETAIL
1" = 15'



SHEET 5 OF 9
PERMIT SKETCHES FOR:
SUNSET DRAINAGE

SITES B & C
CROSS SECTIONS &
CALCULATIONS

WEST 1/2, SECTION 27, T3N, R10W, W.M.
TILLAMOOK COUNTY
MAY 14, 2019

**ONION PEAK
DESIGN**

PO BOX 326
NEHALEM, OR 97131
(503) 368-6102
FAX (503) 368-6102

"SUNSET" #A2019
SUNSET1903-T.DWG

SITE 'D'

SITE E IS +/-40 FEET LONG AND WILL REQUIRE +/-25 CUBIC YARDS OF FILL MATERIAL TO REINFORCE AND STABILIZE THE RIVER BANK TO STOP AND PREVENT EROSION.

SITE 'E'

SITE E IS +/-80 FEET LONG AND WILL REQUIRE +/-75 CUBIC YARDS OF FILL MATERIAL TO REINFORCE AND STABILIZE THE RIVER BANK TO STOP AND PREVENT EROSION.

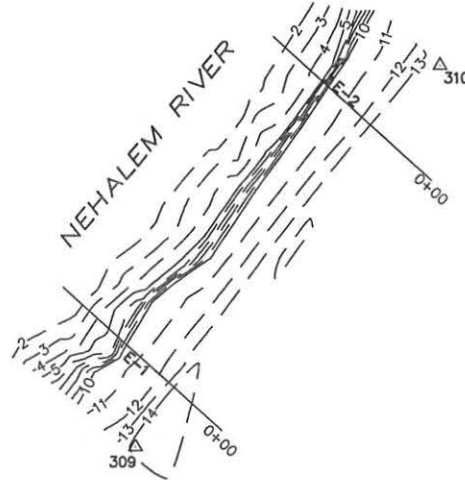
TIDAL ELEVATIONS

HMT = HIGHEST MEASURED TIDE
 HTL = HIGH TIDE LINE
 MHW = MEAN HIGH WATER TIDAL ELEVATION

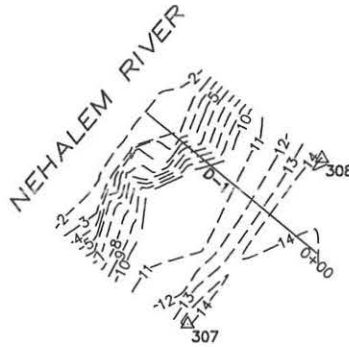
THE HIGHEST MEASURED TIDE DATA WAS ACQUIRED FROM OREGON.GOV COMPILATION OF HMT DATA AS PROVIDED BY NOAA AND OREGON DIVISION OF STATE LANDS.
 THE MEAN HIGH WATER TIDAL ELEVATION WAS ACQUIRED FROM NGS.NOAA.GOV TIDAL INFORMATION.
 THE HIGH TIDE LINE WAS DETERMINED BY MEASURING THE DEBRIS LINE ALONG THE RIVER BANK.
 SEE TIDAL DETAIL.

SITE DEFINITION

POINT#	NORTHING	EASTING	ELEVATION
307	766063.50	7336708.09	14.76'
308	766090.86	7336730.47	15.13'
309	766132.34	7336764.82	14.90'



SITE 'E'



SITE 'D'



(IN FEET)
 1 inch = 20 ft.

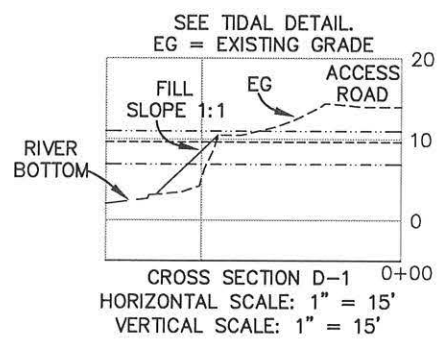
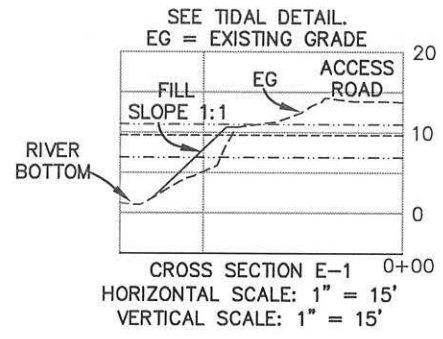
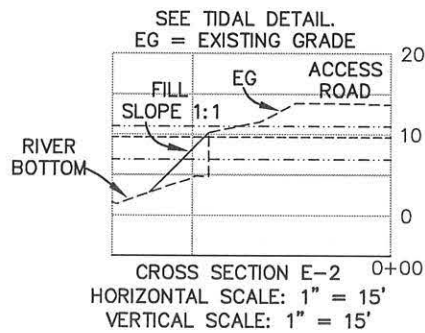
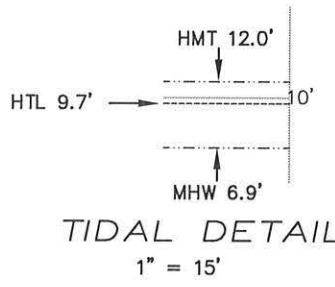
**ONION PEAK
 DESIGN**
 PO BOX 326
 NEHALEM, OR 97131
 (503) 368-6102
 FAX (503) 368-6102

SHEET 6 OF 9
 PERMIT SKETCHES FOR:
SUNSET DRAINAGE

SITES D & E
 PLAN AND
 CALCULATIONS

WEST 1/2, SECTION 27, T3N, R10W, W.M.1
 TILLAMOOK COUNTY
 MAY 14, 2019

"SUNSET" #A2019
 SUNSET1903-T.DWG



SHEET 7 OF 9
PERMIT SKETCHES FOR:
SUNSET DRAINAGE

SITES D & E
CROSS SECTIONS &
CALCULATIONS

WEST 1/2, SECTION 27, T3N, R10W, W.M.
TILLAMOOK COUNTY
MAY 14, 2019

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PO BOX 326
NEHALEM, OR 97131
(503) 368-6102
FAX (503) 368-6102

"SUNSET" #A2019
SUNSET1903-T.DWG

SITE 'F'

SITE E IS +/-170 FEET LONG AND WILL REQUIRE +/-155 CUBIC YARDS OF FILL MATERIAL TO REINFORCE AND STABILIZE THE RIVER BANK TO STOP AND PREVENT EROSION.

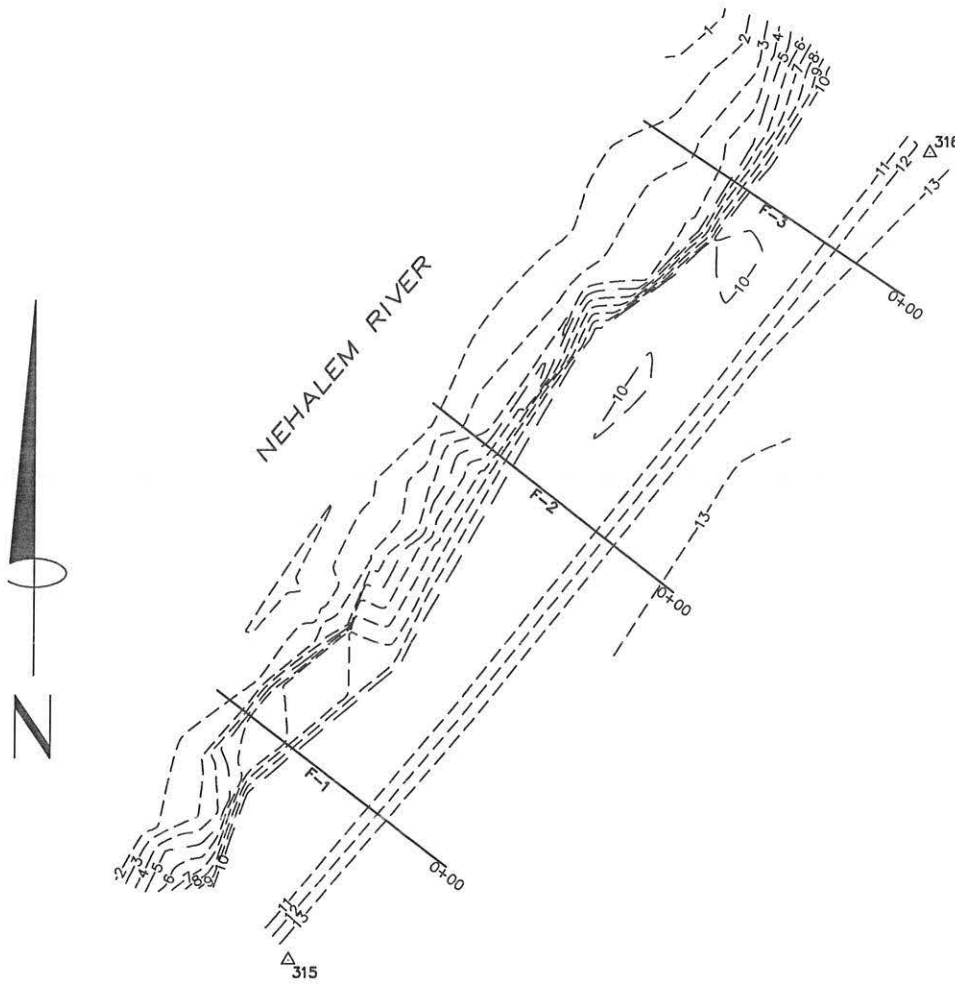
SITE DEFINITION

POINT#	NORTHING	EASTING	ELEVATION
315	766447.37	7337020.20	14.80'

TIDAL ELEVATIONS

HMT = HIGHEST MEASURED TIDE
 HTL = HIGH TIDE LINE
 MHW = MEAN HIGH WATER TIDAL ELEVATION

THE HIGHEST MEASURED TIDE DATA WAS ACQUIRED FROM OREGON.GOV COMPILATION OF HMT DATA AS PROVIDED BY NOAA AND OREGON DIVISION OF STATE LANDS.
 THE MEAN HIGH WATER TIDAL ELEVATION WAS ACQUIRED FROM NGS.NOAA.GOV TIDAL INFORMATION.
 THE HIGH TIDE LINE WAS DETERMINED BY MEASURING THE DEBRIS LINE ALONG THE RIVER BANK.
 SEE TIDAL DETAIL.



SITE 'E'



(IN FEET)
 1 inch = 20 ft.

**ONION PEAK
 DESIGN**

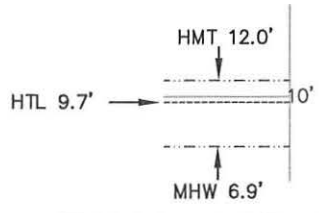
PO BOX 326
 NEHALEM, OR 97131
 (503) 368-6102
 FAX (503) 368-6102

**SHEET 8 OF 9
 PERMIT SKETCHES FOR:
 SUNSET DRAINAGE**

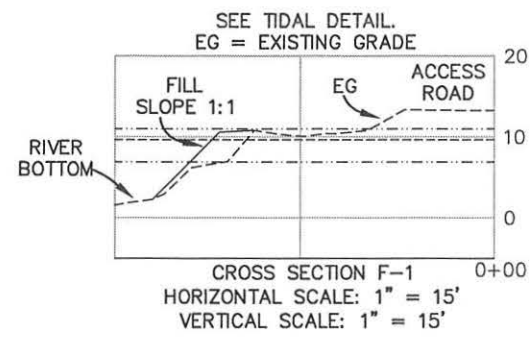
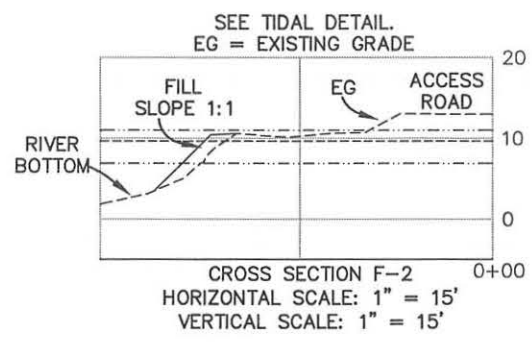
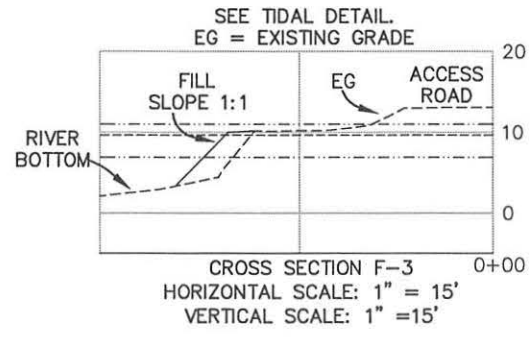
SITE F
 PLAN AND
 CALCULATIONS

WEST 1/2, SECTION 27, T3N, R10W, W.M.
 TILLAMOOK COUNTY
 MAY 14, 2019

"SUNSET" #A2019
 SUNSET1903-T.DWG



TIDAL DETAIL
1" = 15'



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PO BOX 326
NEHALEM, OR 97131
(503) 368-6102
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SHEET 9 OF 9
PERMIT SKETCHES FOR:
SUNSET DRAINAGE
SITE F
CROSS SECTION &
CALCULATIONS
WEST 1/2, SECTION 27, T3N, R10W, W.M.
TILLAMOOK COUNTY
MAY 14, 2019

"SUNSET" #A2019
SUNSET1903-T.DWG

ENGINEERING "NO-RISE" CERTIFICATION

This is to certify that I am a duly qualified engineer licensed to practice in the State of Oregon.

It is to further certify that the attached technical data supports the fact that the proposed Nehalem Bay Wastewater Agency revetment repair project will
(Name of Development)

not impact the 100-year flood elevations, floodway elevations and floodway widths for the Nehalem River at published sections
(Name of Stream)

in the Flood Insurance Study for Tillamook County & Incorporated Areas (41057C0209F and 207F),
(Name of Community)

dated September 28, 2018 and will not impact the 100-year flood elevations, floodway elevations, and floodway widths at unpublished cross-sections in the vicinity of the proposed development.

Attached are the following documents that support my findings:

Technical Memorandum by WEST Consultants, Inc. dated April 9, 2021.

(Date) April 9, 2021

(Signature) Chris Bannier

(Title) Project Manager

WEST Consultants, Inc.

2601 25th Street

Suite 450

Salem, OR 97302

(Address)



Figure 5 - FEMA No-Rise Certificate

Technical Memorandum

WEST Consultants, Inc.

2601 25th St. SE
Suite 450
Salem, OR 97302-1286
(503) 485 5490
(503) 485-5491 Fax
www.westconsultants.com

Name: Bruce Halverson
Date: 9 April 2021
From: Chris Bahner, P.E., D. WRE
Subject: Nehalem Bay Wastewater Agency, No-Rise Analysis and Certification



Introduction

Per your request, a FEMA "No-Rise" hydraulic analysis was conducted for the proposed streambank repairs located along the east bank of the Nehalem River within the Nehalem Bay Wastewater Agency property limits near the City of Nehalem in Tillamook County, Oregon. The property is located within a Special Flood Hazard Area (SFHA) of the Nehalem River floodplain in the left (east) overbank between FEMA lettered cross sections "C" and "D". Further, portions of the streambank repairs will be made within the regulatory floodway. The effective base flood elevation is 13.7 ft at FEMA cross section "C" and 14.8 ft at FEMA cross section "D". Both these elevations are referenced to the North American Vertical Datum of 1988 (NAVD88), and all elevations referenced in this memorandum will be based on this vertical datum. Figure 1 presents the study area and effective FEMA flood hazard mapping. All figures referenced in the text are found at the end of this memorandum.

As specified by Article 3, Section 2.03.510(9a) of the Tillamook County Code, new construction is prohibited within a regulatory floodway "unless certification is provided by a professional registered civil engineer demonstrating through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that such encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge."

A hydraulic study was conducted in accordance with standard engineering practice for a FEMA No-Rise analysis which indicates that the proposed modifications will not result in an increase in water surface elevations during the base flood. This memorandum summarizes the analysis methodology and results.

Analysis Approach

The hydraulic study utilized the U.S. Army Corps of Engineers' (USACE) software HEC-RAS (Hydraulic Engineering Center – River Analysis System) version 5.0.7 (USACE 2019). The effective hydraulic modeling of this reach of the Nehalem River was conducted by WEST in November 2014.

Procedures set forth by FEMA Region 10 call for a multi-step analysis approach for evaluating a proposed project for No-Rise certification (FEMA 2013). The steps are as follows:

1. **Current Effective Model:** Obtain the effective model upon which the current effective base flood elevations and floodway extents is based. Effective models are archived by FEMA.
2. **Duplicate Effective Model (DEM):** Use the Current Effective Model input data to create a Duplicate Effective Model to ensure that the results recorded in the effective FIS can be reproduced within an acceptable tolerance.
3. **Corrected Effective Model (CEM):** The Duplicate Effective Model is then modified to correct any errors and incorporate the most recent topographic information.
4. **Existing Conditions Model (ECM):** The Corrected Effective Model is revised to reflect any modifications that have occurred within the floodplain since the date of the original analysis but prior to the proposed project. This model should be the best depiction of existing conditions.
5. **Proposed Conditions Model (PCM):** The Proposed Conditions Model is to reflect conditions following the completion of the project and will be compared with the Existing Conditions Model to determine the projects effects (if any). The direct comparison of water surface elevations between the results of these two models is the basis of a No-Rise analysis.

The effective model was developed by WEST Consultants, Inc. (WEST) for a Letter of Map Revision (LOMR), effective September 24, 2015. The model produced for the LOMR was used to perform the hydraulic analysis for this No-Rise.

Effective Model

Documentation accompanying the effective model indicates that it was produced using Geographic Information System (GIS) data available in the digital flood insurance map (DFIRM) for Tillamook County (FEMA) and topographic data available from the Oregon Department of Geologic and Mineral Industries (DOGAMI 2009). The model includes FEMA lettered cross sections A through J and 21 unlettered cross sections. Bathymetry at all cross sections except for the reach between River Mile (RM) 1.4 and RM 1.7 was based on NOAA data and manual adjustment to the thalweg elevations to match the FIS profiles. Bathymetry for all cross sections located between RM 1.4 and RM 1.7 was based on the bathymetric survey data obtained by WEST in March 2021. Discharges and downstream boundary conditions are based on published values in the effective Flood Insurance Study. The limits of floodway encroachments were extracted from the 'S_FLD_HAZ_LN' GIS data layer in the DFIRM. All remaining hydraulic parameters in the effective model (Manning's roughness, flow-paths, etc.) were estimated based on data listed in the FIS, publicly available aerial imagery, engineering judgement, and from observations I made during the field reconnaissance on March 1, 2021.

Duplicate Effective Model (DEM)

A Duplicate Effective Model (DEM) was created from a copy of the effective. Results from the DEM were compared with water surface elevations published in the floodway data table and on flood profiles in the FIS. The DEM results are within the minimum agreement tolerance of 0.1 feet, so it is considered sufficient for conducting a No-Rise analysis. Table 1 presents the comparison of DEM and FIS water surface elevations.

Corrected Effective Model (CEM)

The DEM was modified to create the Corrected Effective Model (CEM). The modifications consisted of adding four additional cross section at locations where the proposed streambank repairs will be made. Figure 2 shows the added cross sections. Results from the CEM were compared with the water surface elevations computed by the DEM. That comparison is presented in Table 2.

As seen in Table 2, the CEM water surface elevations for the reach represented by the additional cross sections are about 0.02 to 0.11 ft higher than the DEM water surface elevations, and the CEM water surface elevations for the river reach upstream of the additional cross section are about 0.05 to 0.15 ft lower than the DEM water surface elevations. The floodway surcharge (which is not shown in the table) is still less than that maximum 1 foot increase allowed by FEMA.

Table 1 - Duplicate Effective Model vs. Effective FIS

River Station (RM) and FEMA XS Letter		Regulatory Water Surface Elevation (ft)			With Floodway Water Surface Elevation (ft)		
		FIS Effective Model	DEM	Difference (DEM - FIS)	FIS Effective Model	DEM	Difference (FIS - DEM)
0.45	A	13.11	13.11	0.00	13.45	13.45	0.00
0.60	--	13.32	13.32	0.00	13.61	13.61	0.00
0.73	--	13.36	13.36	0.00	13.65	13.65	0.00
0.78	--	13.40	13.40	0.00	13.70	13.70	0.00
0.80	--	13.50	13.50	0.00	13.80	13.80	0.00
0.86	--	13.55	13.55	0.00	13.86	13.86	0.00
0.95	--	13.63	13.63	0.00	13.94	13.94	0.00
0.994	B	13.68	13.68	0.00	14.00	14.00	0.00
1.05	C	13.70	13.70	0.00	14.01	14.01	0.00
1.33	--	13.88	13.88	0.00	14.20	14.20	0.00
1.50	--	14.04	14.04	0.00	14.36	14.36	0.00
1.74	--	14.31	14.31	0.00	14.64	14.64	0.00
1.92	--	14.74	14.74	0.00	15.13	15.13	0.00
2.01	D	14.84	14.84	0.00	15.26	15.26	0.00
2.28	--	14.95	14.95	0.00	15.35	15.35	0.00
2.49	--	15.15	15.15	0.00	15.53	15.53	0.00
2.92	E	15.53	15.53	0.00	15.89	15.89	0.00
3.12	--	15.68	15.68	0.00	16.12	16.12	0.00
3.24	--	15.75	15.75	0.00	16.25	16.25	0.00
3.28	--	15.79	15.79	0.00	16.33	16.33	0.00
3.66	F	16.22	16.22	0.00	16.96	16.96	0.00
3.80	--	15.98	15.98	0.00	16.77	16.77	0.00
4.78	G	17.53	17.53	0.00	18.34	18.34	0.00
5.17	--	17.60	17.6	0.00	18.41	18.41	0.00
5.26	--	17.63	17.63	0.00	18.45	18.45	0.00
5.34	--	17.66	17.66	0.00	18.48	18.48	0.00
5.55	H	17.54	17.54	0.00	18.39	18.39	0.00
5.65	--	17.50	17.50	0.00	18.34	18.34	0.00
5.79	--	17.86	17.86	0.00	18.70	18.70	0.00
5.88	I	18.09	18.09	0.00	18.87	18.87	0.00
5.951	--	17.98	17.98	0.00	18.74	18.74	0.00
5.98	J	18.04	18.04	0.00	18.80	18.80	0.00

Notes: --- Indicates unlettered FEMA cross section; estimated from FIS flood profile

Table 2 - Corrected Effective Model vs. Duplicate Effective Model

River Station (RM) and FEMA XS Letter		Regulatory Water Surface Elevation (ft)			With Floodway Water Surface Elevation (ft)		
		DEM	CEM	Difference (CEM - DEM)	DEM	CEM	Difference (CEM - DEM)
0.45	A	13.11	13.11	0.00	13.45	13.45	0.00
0.60	--	13.32	13.32	0.00	13.61	13.61	0.00
0.73	--	13.36	13.36	0.00	13.65	13.65	0.00
0.78	--	13.40	13.40	0.00	13.70	13.70	0.00
0.80	--	13.50	13.50	0.00	13.80	13.80	0.00
0.86	--	13.55	13.55	0.00	13.86	13.86	0.00
0.95	--	13.63	13.63	0.00	13.94	13.94	0.00
0.994	B	13.68	13.68	0.00	14.00	14.00	0.00
1.05	C	13.70	13.70	0.00	14.01	14.01	0.00
1.33	--	13.88	13.88	0.00	14.20	14.20	0.00
1.40*		13.95	14.06	0.11	14.27	14.38	0.11
1.50	--	14.04	14.11	0.07	14.36	14.43	0.07
1.59°		14.10	14.16	0.06	14.43	14.46	0.03
1.63°		14.18	14.26	0.08	14.51	14.53	0.02
1.69°		14.25	14.29	0.04	14.58	14.59	0.01
1.74	--	14.31	14.34	0.03	14.64	14.67	0.03
1.92	--	14.74	14.59	-0.15	15.13	15.01	-0.12
2.01	D	14.84	14.70	-0.14	15.26	15.13	-0.13
2.28	--	14.95	14.81	-0.14	15.35	15.23	-0.12
2.49	--	15.15	15.02	-0.13	15.53	15.42	-0.11
2.92	E	15.53	15.41	-0.12	15.89	15.78	-0.11
3.12	--	15.68	15.56	-0.12	16.12	16.01	-0.11
3.24	--	15.75	15.63	-0.12	16.25	16.14	-0.11
3.28	--	15.79	15.67	-0.12	16.33	16.22	-0.11
3.66	F	16.22	16.11	-0.11	16.96	16.86	-0.10
3.80	--	15.98	15.86	-0.12	16.77	16.67	-0.10
4.78	G	17.53	17.46	-0.07	18.34	18.28	-0.06
5.17	--	17.60	17.54	-0.06	18.41	18.35	-0.06
5.26	--	17.63	17.56	-0.07	18.45	18.39	-0.06
5.34	--	17.66	17.60	-0.06	18.48	18.42	-0.06
5.55	H	17.54	17.47	-0.07	18.39	18.32	-0.07
5.65	--	17.50	17.43	-0.07	18.34	18.28	-0.06
5.79	--	17.86	17.80	-0.06	18.70	18.65	-0.05
5.88	I	18.09	18.03	-0.06	18.87	18.82	-0.05
5.951	--	17.98	17.93	-0.05	18.74	18.69	-0.05
5.98	J	18.04	17.99	-0.05	18.80	18.75	-0.05

Notes: --- Indicates unlettered FEMA cross section; estimated from FIS flood profile
 * Indicates new cross section

Existing Conditions Model (ECM)

No changes were made for the ECM, so the ECM is the same as the CEM.

Proposed Conditions Model (PCM)

The proposed conditions incorporate the rock fill materials that will be used to make the streambank repairs. These repairs will be made within six individual reaches along the east bank of the Nehalem River adjacent to the Nehalem Bay Wasteway Agency property. The reaches are shown in Figure 3, and cross sections of the proposed revetment repairs are shown in Figure 4. The PCM was created from the ECM by modifying the cross sections to reflect the proposed changes associated with the rock revetment repairs.

Analysis Results

Water surface elevations predicted by the ECM and PCM models were compared to determine if the proposed rock revetment repairs would result in a rise in water surface elevations for either the base flood or the floodway. Table 3 presents the computed water surface elevations for the ECM and PCM, and the calculated difference. As the table indicates, the proposed revetment repairs will not result in a rise in water surface elevations along the Nehalem River for either the base flood or the floodway. A FEMA No-Rise Certificate is provided in Figure 5. Supporting data, including the effective FEMA flood hazard mapping and modeling cross sections, are included in Appendix A.

If you have any questions, please feel free to contact me by phone at (503) 485-5490, or by email at cbahner@westconsultants.com.

Table 3 - Proposed Conditions vs. Existing Conditions

River Station (RM) and FEMA XS Letter		Regulatory Water Surface Elevation (ft)			With Floodway Water Surface Elevation (ft)		
		ECM	PCM	Difference (PCM - ECM)	ECM	PCM	Difference (PCM - ECM)
0.45	A	13.11	13.11	0.00	13.45	13.45	0.00
0.60	--	13.32	13.32	0.00	13.61	13.61	0.00
0.73	--	13.36	13.36	0.00	13.65	13.65	0.00
0.78	--	13.40	13.40	0.00	13.70	13.70	0.00
0.80	--	13.50	13.50	0.00	13.80	13.80	0.00
0.86	--	13.55	13.55	0.00	13.86	13.86	0.00
0.95	--	13.63	13.63	0.00	13.94	13.94	0.00
0.994	B	13.68	13.68	0.00	14.00	14.00	0.00
1.05	C	13.70	13.70	0.00	14.01	14.01	0.00
1.33	--	13.88	13.88	0.00	14.20	14.20	0.00
1.40*		14.06	14.06	0.00	14.38	14.38	0.00
1.50*	--	14.11	14.11	0.00	14.43	14.43	0.00
1.59*		14.16	14.16	0.00	14.46	14.46	0.00
1.63*		14.26	14.26	0.00	14.53	14.53	0.00
1.69*		14.29	14.29	0.00	14.59	14.59	0.00
1.74	--	14.34	14.34	0.00	14.67	14.67	0.00
1.92	--	14.59	14.59	0.00	15.01	15.01	0.00
2.01	D	14.70	14.70	0.00	15.13	15.13	0.00
2.28	--	14.81	14.81	0.00	15.23	15.23	0.00
2.49	--	15.02	15.02	0.00	15.42	15.42	0.00
2.92	E	15.41	15.41	0.00	15.78	15.78	0.00
3.12	--	15.56	15.56	0.00	16.01	16.01	0.00
3.24	--	15.63	15.63	0.00	16.14	16.14	0.00
3.28	--	15.67	15.67	0.00	16.22	16.22	0.00
3.66	F	16.11	16.11	0.00	16.86	16.86	0.00
3.80	--	15.86	15.86	0.00	16.67	16.67	0.00
4.78	G	17.46	17.46	0.00	18.28	18.28	0.00
5.17	--	17.54	17.54	0.00	18.35	18.35	0.00
5.26	--	17.56	17.56	0.00	18.39	18.39	0.00
5.34	--	17.6	17.60	0.00	18.42	18.42	0.00
5.55	H	17.47	17.47	0.00	18.32	18.32	0.00
5.65	--	17.43	17.43	0.00	18.28	18.28	0.00
5.79	--	17.80	17.80	0.00	18.65	18.65	0.00
5.88	I	18.03	18.03	0.00	18.82	18.82	0.00
5.951	--	17.93	17.93	0.00	18.69	18.69	0.00
5.98	J	17.99	17.99	0.00	18.75	18.75	0.00

Notes: --- Indicates unlettered FEMA cross section; estimated from FIS flood profile

* Indicates cross sections modified per proposed revetment repairs

References

U.S. Army Corps of Engineers, Hydrologic Engineering Center; HEC-RAS, River Analysis System, Software Version 5.0.7; March 2019

U.S. Department of Homeland Security, Federal Emergency Management Agency; Flood Insurance Study for Tillamook County, OR and Incorporated Areas, 41057C002A, Vol. 1 and 2; Effective September 28, 2018

U.S. Department of Homeland Security, Federal Emergency Management Agency; Letter of Map Revision, Case No. 14-10-1695P; Effective September 24, 2015

U.S. Department of Homeland Security, Federal Emergency Management Agency, Region X; Procedures for "No-Rise" Certification for Proposed Developments in the Regulatory Floodway; October 2013

Oregon Department of Geology and Mineral Industries; Light Detection and Ranging (LiDAR) data; OLC North Coast 2020; Published August 2009

Figures

Figure 1 - Study Area with Effective FEMA Flood Hazard Mapping

Figure 2 - Cross Sections Added for CEM

Figure 3 - Proposed Revetment Repair Reaches

Figure 4 - Proposed Revetment Cross Sections

Figure 5 - FEMA No-Rise Certificate



Figure 1 - Study Area with Effective FEMA Flood Hazard Mapping

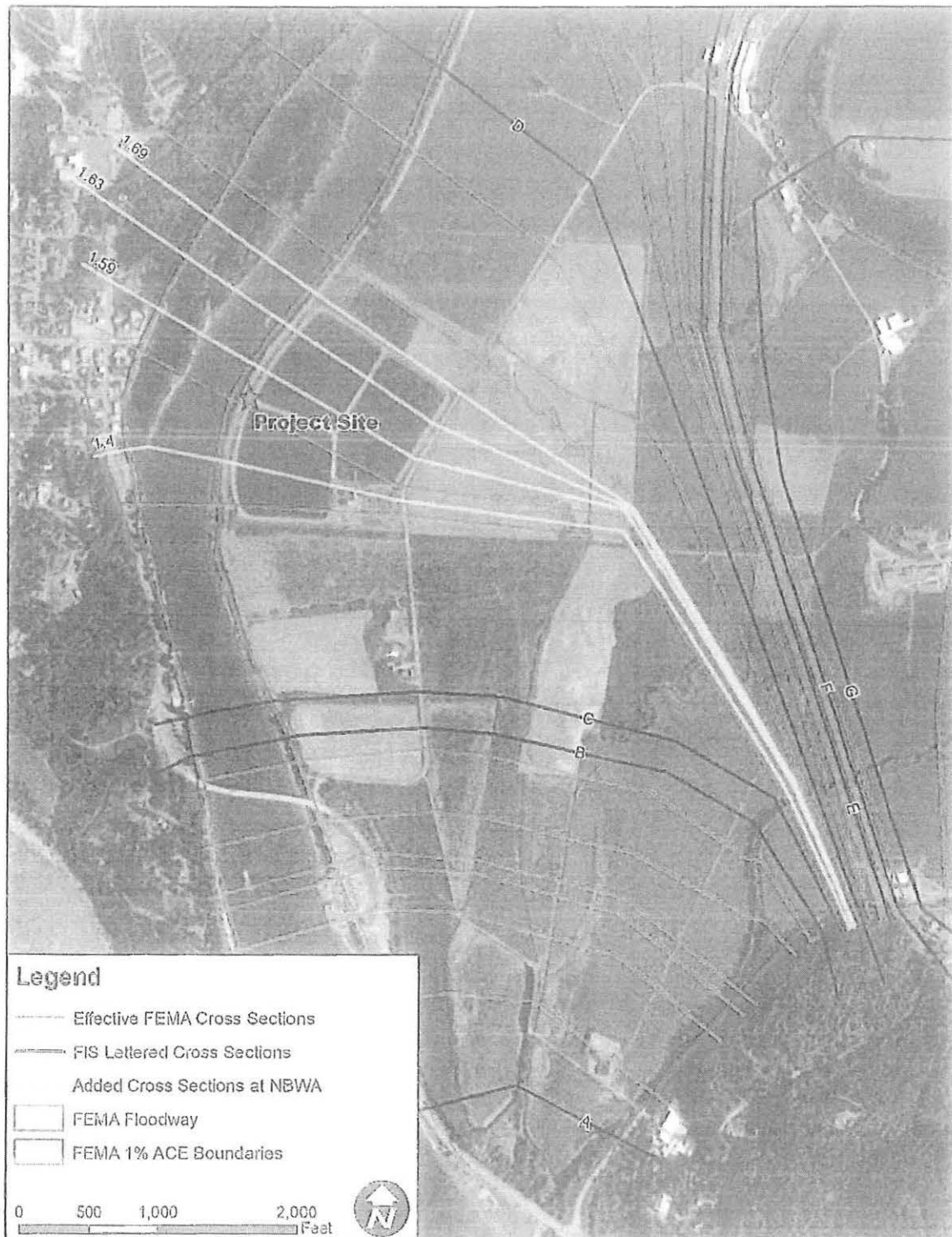


Figure 2 - Cross Sections Added for CEM



Figure 3 -- Proposed Revetment Repair Reaches

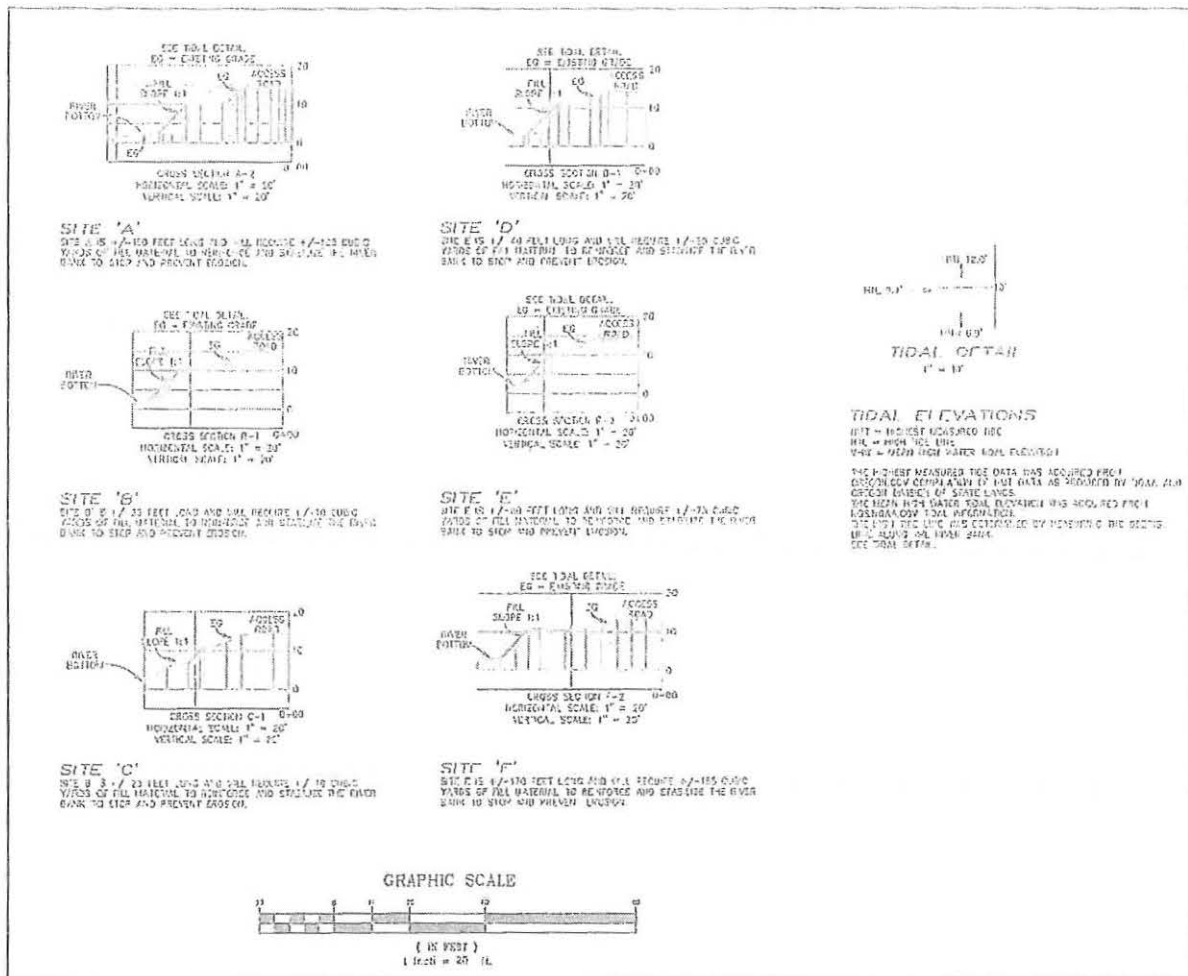


Figure 4 – Proposed Revetment Cross Sections

Appendix A

Effective FIRM Panel

Effective Floodway Data Table

HEC-RAS Cross Section Plots, Existing and Proposed Conditions

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LOCATION		FLOODWAY			1% ANNUAL CHANGE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	2,360	1,045	15,503	4.8	18.1	18.1	18.5	0.4
B	5,172	675	18,824	3.2	18.8	18.8	14.0	0.4
C	5,455	517	18,139	5.5	18.7	18.7	15.0	0.2
D	10,917	740	14,543	4.0	14.5	14.2	15.3	0.5
E	15,349	570	9,568	6.3	15.5	15.5	16.0	0.4
F	19,036	2,490	20,374	5.0	16.2	16.2	17.0	0.2
G	25,153	4,385	41,742	3.0	17.3	17.5	18.4	0.9
H	29,642	1,813	12,272	8.1	17.5	17.5	17.4	0.2
I	31,519	240	5,526	9.0	18.0	18.0	18.6	0.6
J	31,608	270	6,188	9.6	18.0	18.0	18.5	0.5
K	33,368	734	9,487	8.7	20.8	20.8	20.7	0.4
L	34,492	670	9,377	7.1	20.9	20.9	21.7	0.8
M	34,620	346	7,700	7.7	20.9	20.9	21.7	0.8
N	35,560	326	7,069	8.9	23.9	23.9	24.3	0.5
O	37,350	491	11,808	4.9	25.9	25.9	25.4	0.5
P	39,090	582	10,916	5.4	25.6	25.6	27.1	0.6
Q	40,680	296	5,870	8.8	27.4	27.4	27.9	0.5
R	41,490	456	10,047	5.8	28.8	28.8	29.4	0.6
S	41,890	495	9,629	5.6	29.0	29.0	29.3	0.3
T	42,830	286	6,434	8.8	29.5	29.5	30.9	0.6
U	43,210	378	6,362	7.1	30.7	30.7	31.2	0.5
V	45,790	970	7,901	7.7	32.4	32.4	32.0	0.5
W	47,330	696	8,370	6.7	32.9	32.9	33.7	0.8
X	48,885	531	12,388	4.5	33.7	33.7	34.7	1.0

¹Feet above confluence with Nehalem Bay

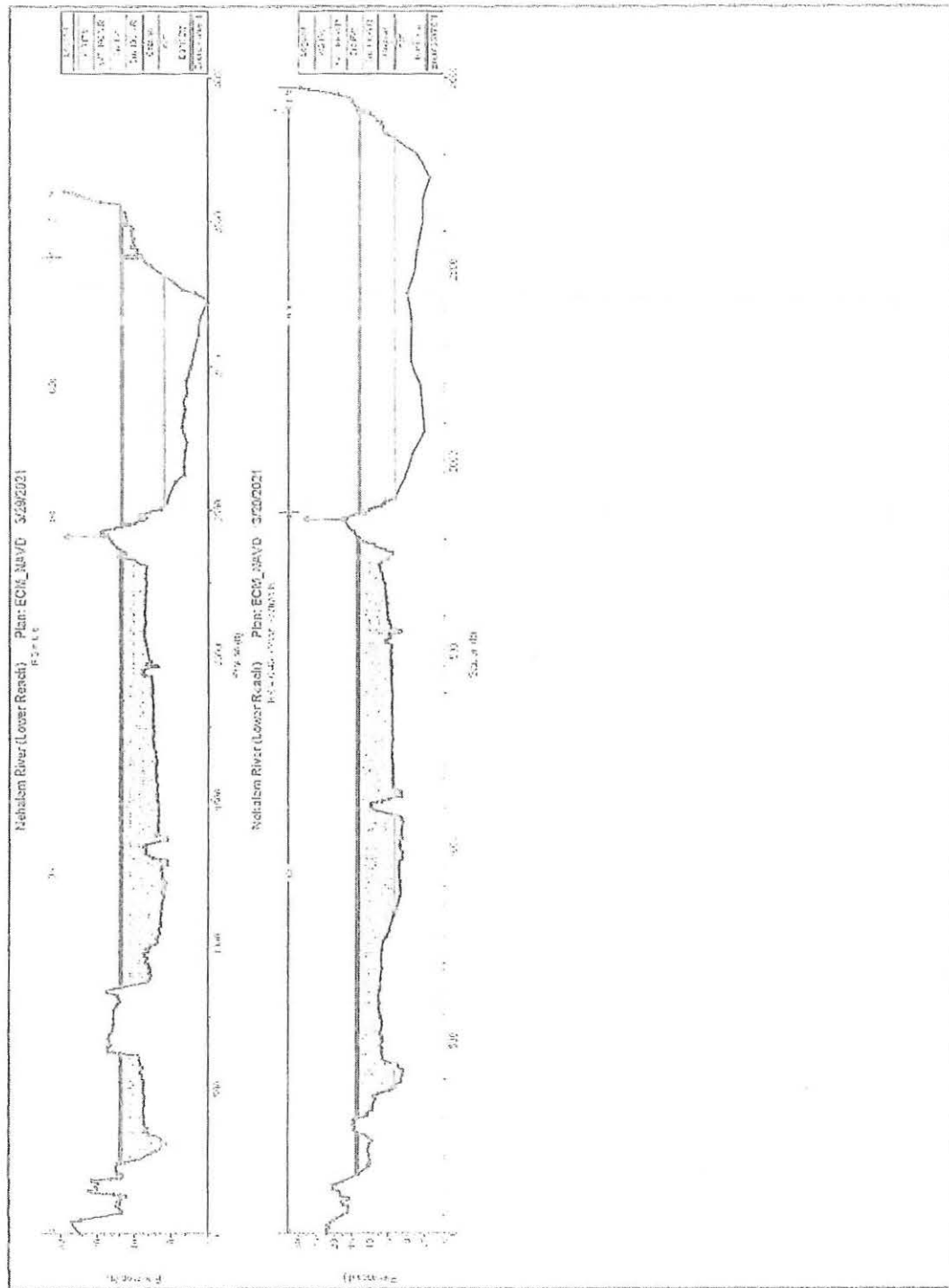
FEDERAL EMERGENCY MANAGEMENT AGENCY
TILLAMOOK COUNTY, OREGON
 AND INCORPORATED AREAS

FLOODWAY DATA
 FLOODING SOURCE: NEHALEM RIVER

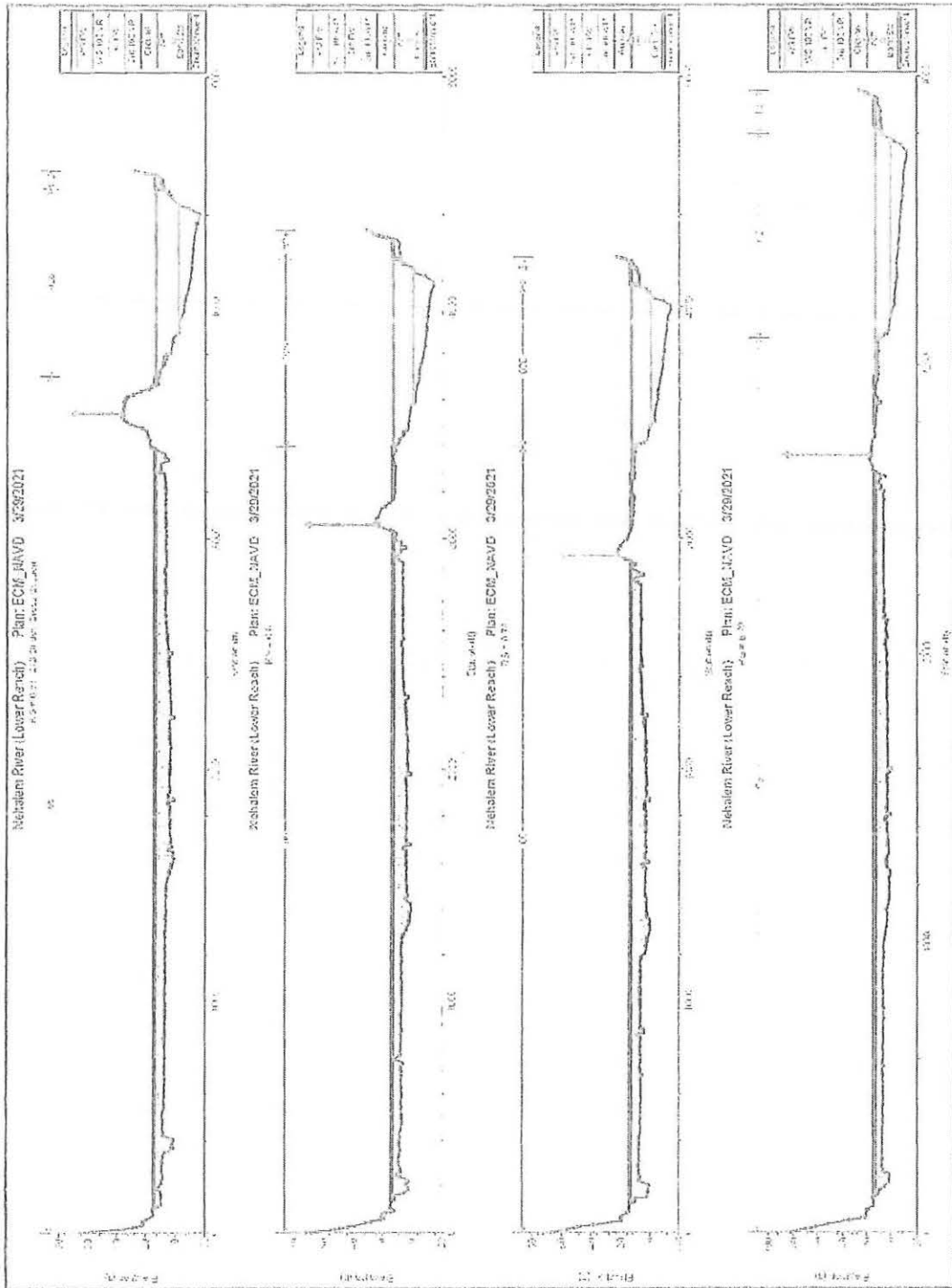
TABLE 3

Effective FEMA Floodway Data Table

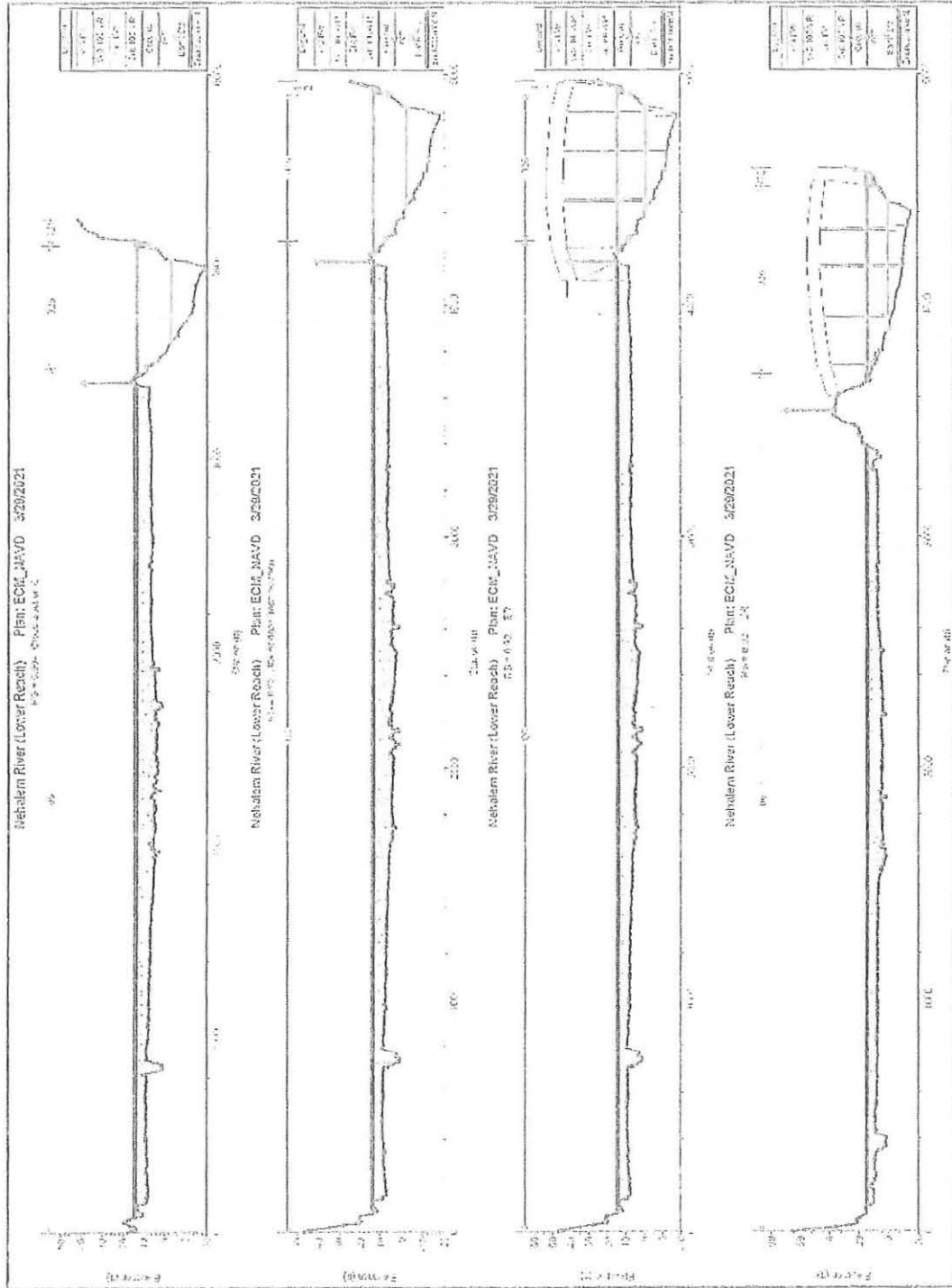
MEC-RAS Cross Section Plots – Existing Conditions



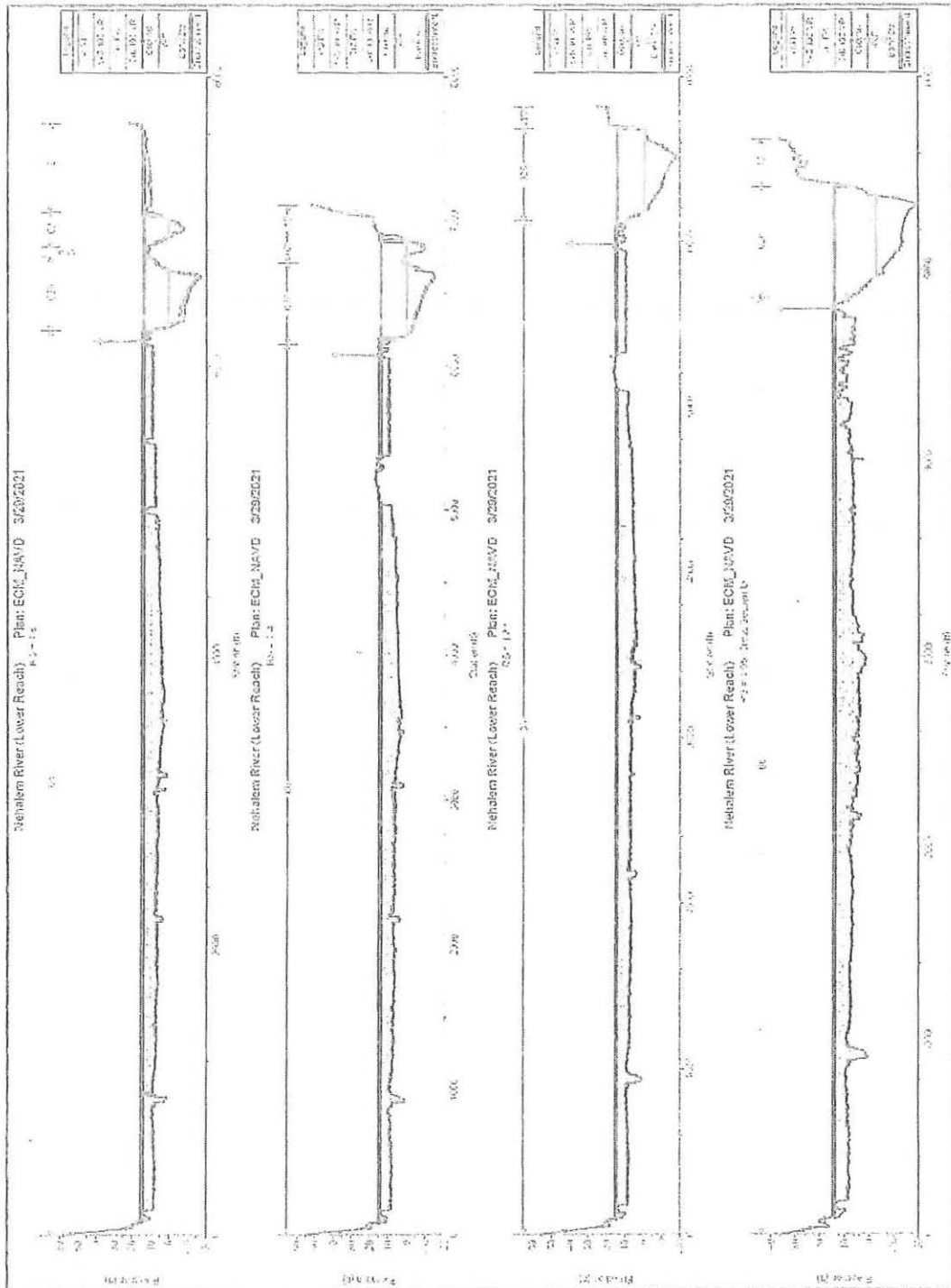
HEC-RAS Cross Section Plots – Existing Conditions



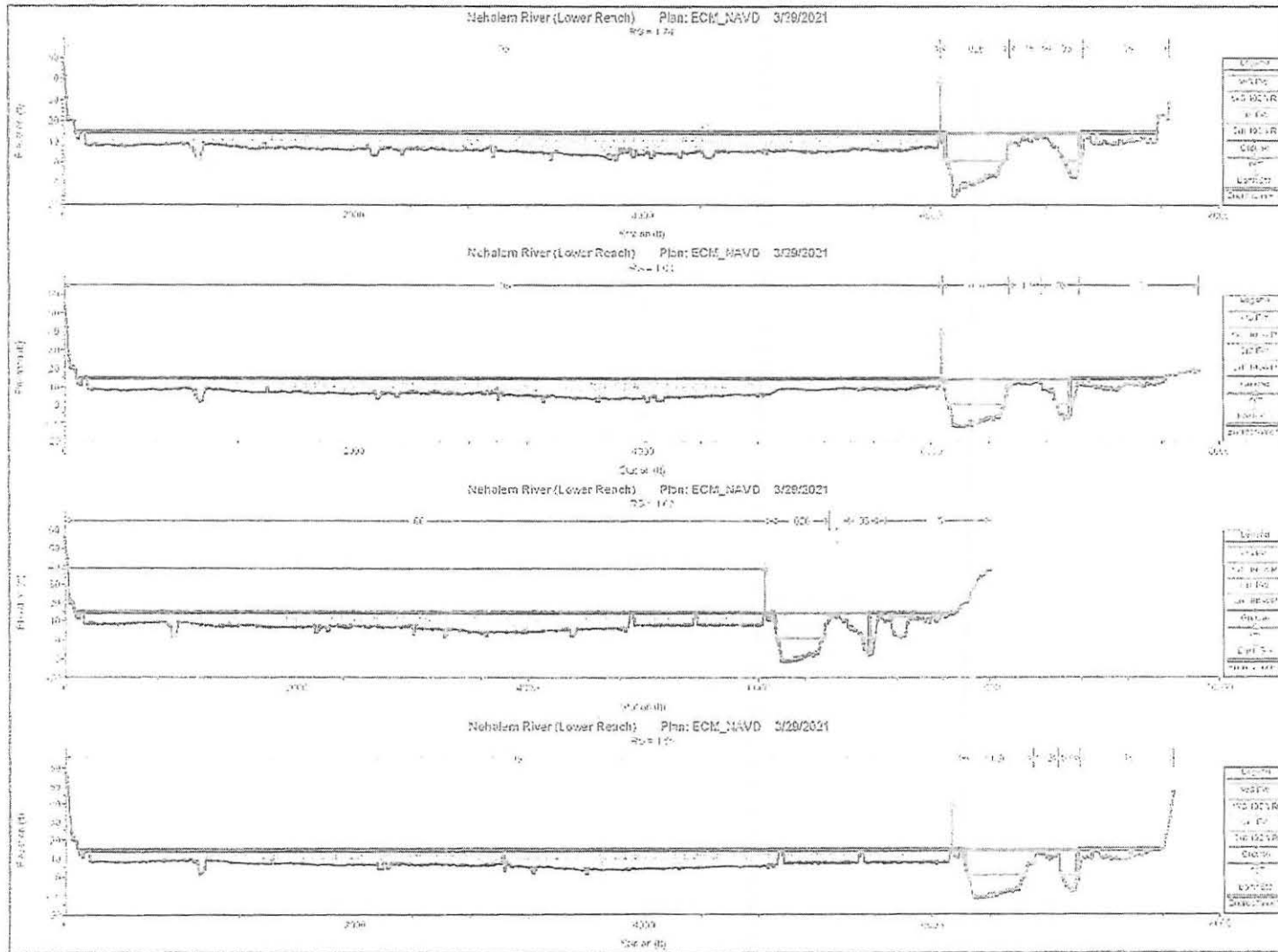
MEC-RAS Cross Section Plots – Existing Conditions



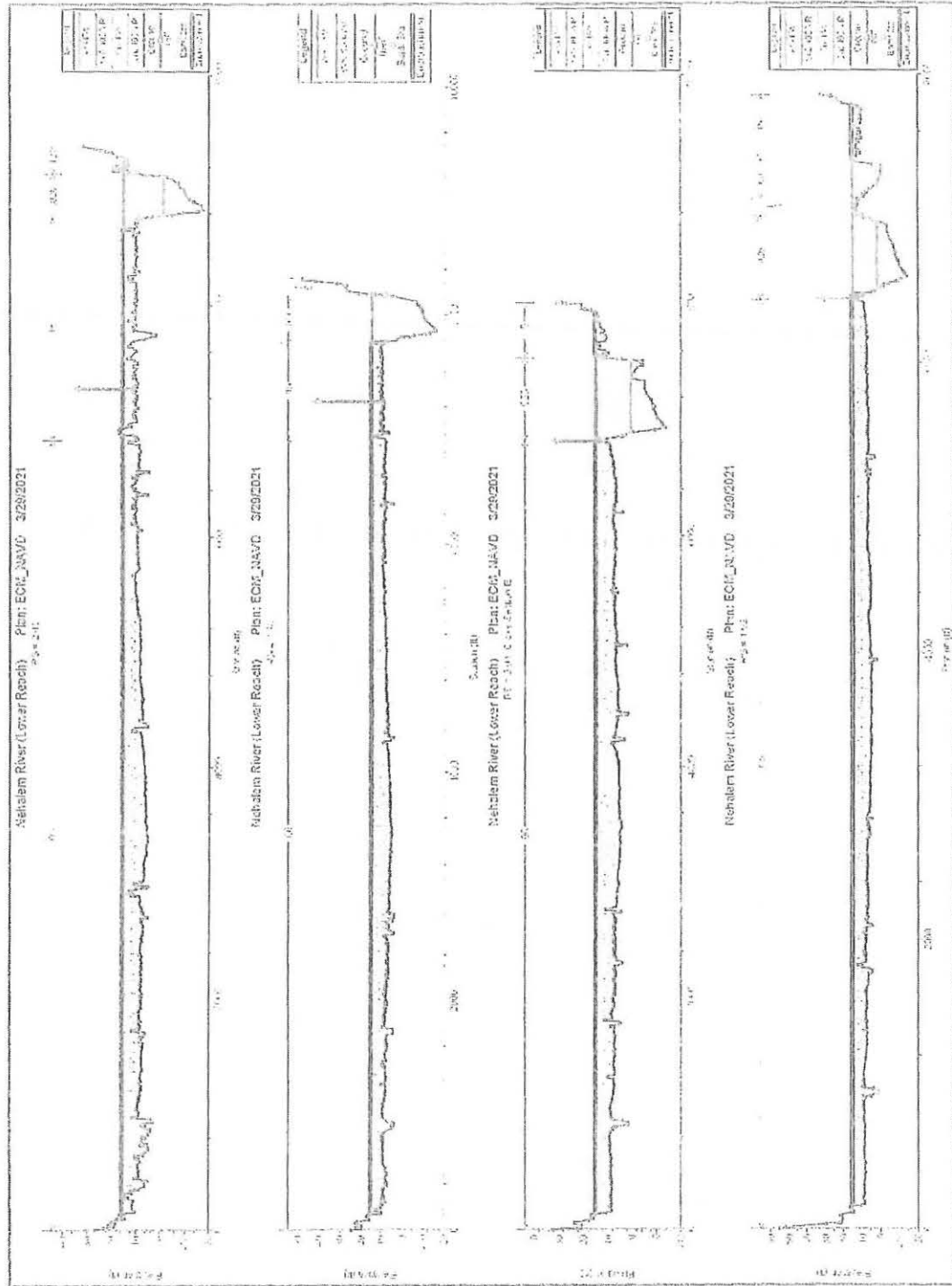
MEC-RAS Cross Section Plots - Existing Conditions



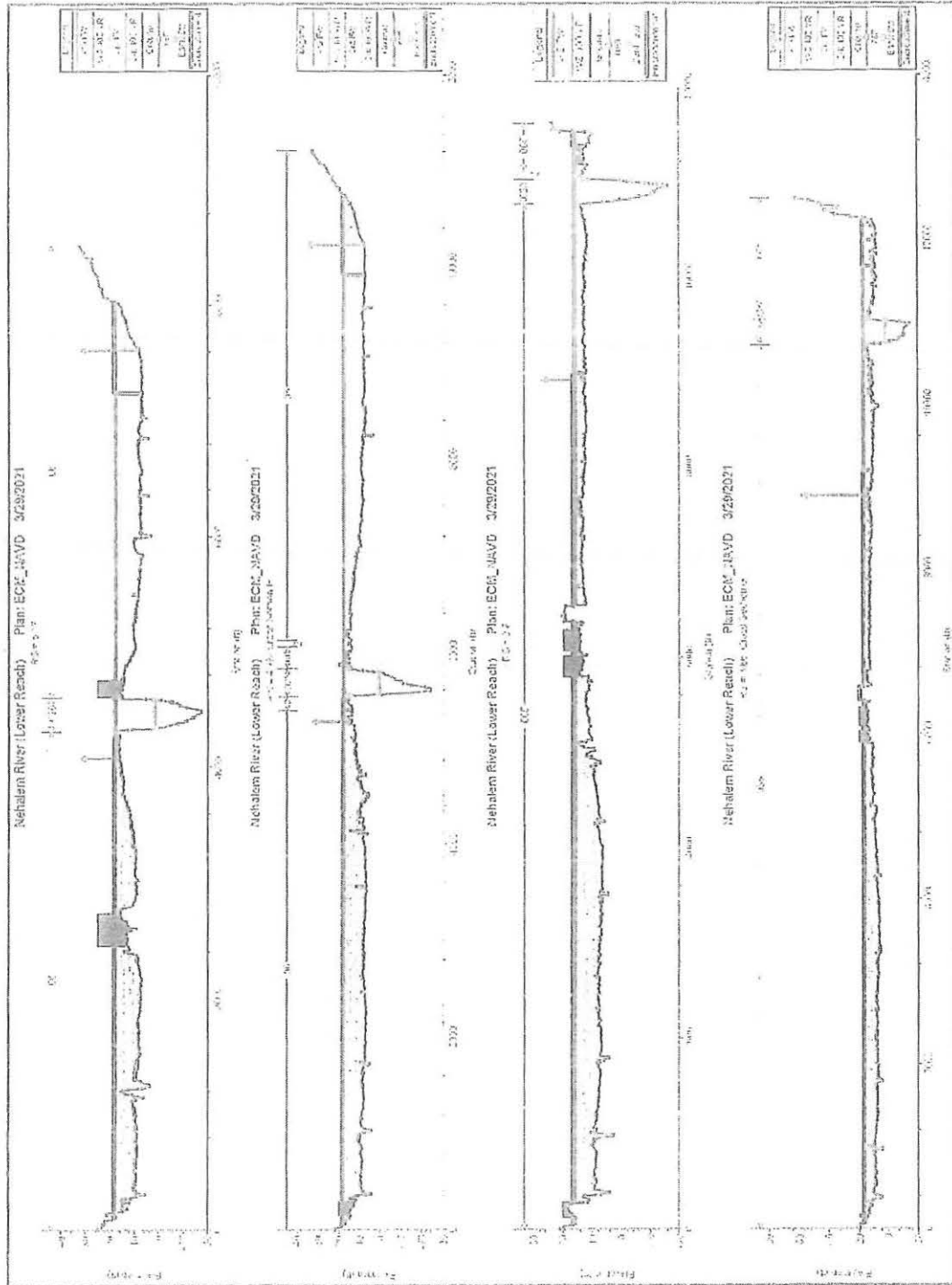
HEC-RAS Cross Section Plots – Existing Conditions



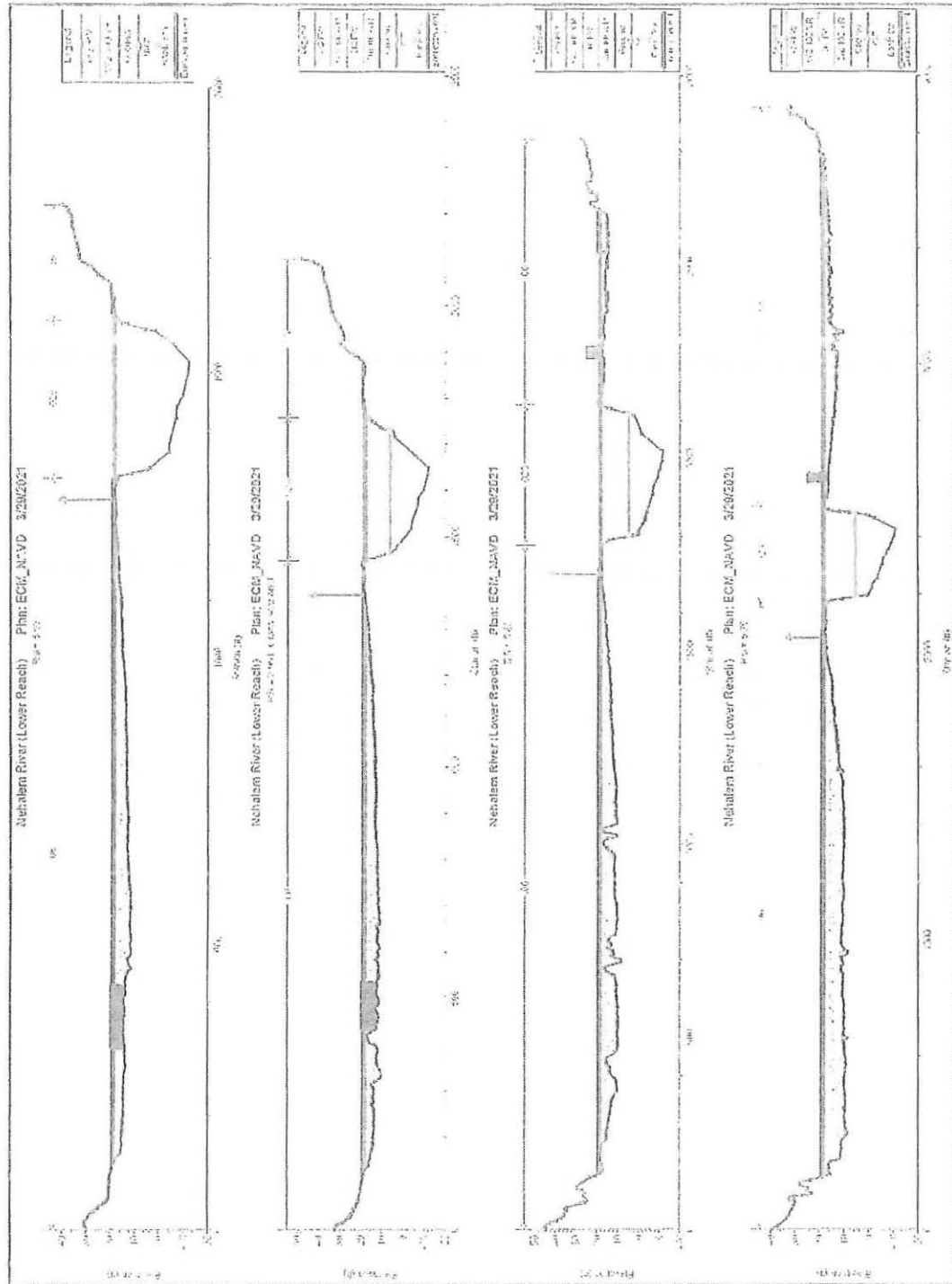
HEC-RAS Cross Section Plots – Existing Conditions



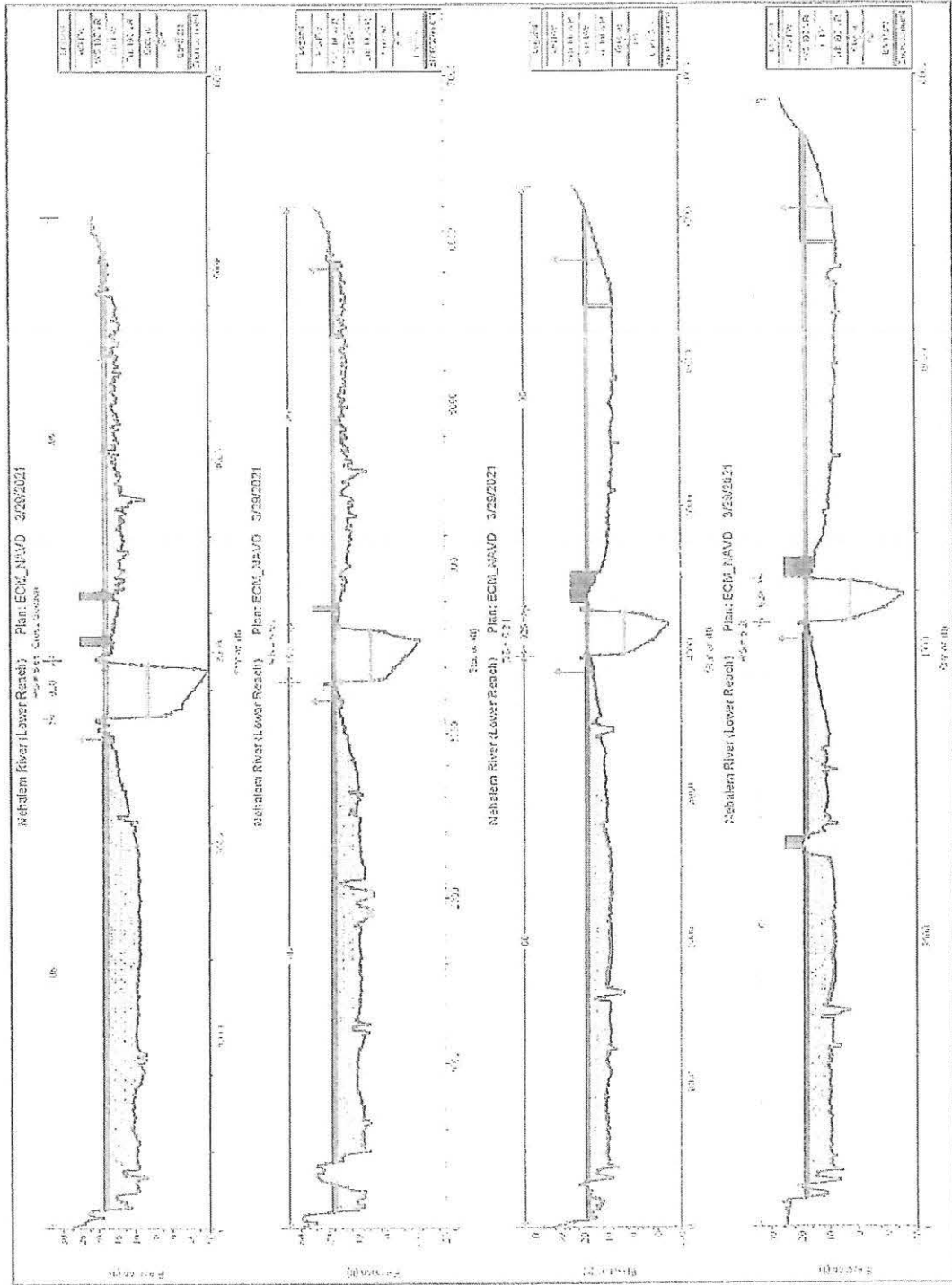
HEC-RAS Cross Section Plots - Existing Conditions



HEC-RAS Cross Section Plots – Existing Conditions



HEC-RAS Cross Section Plots – Existing Conditions

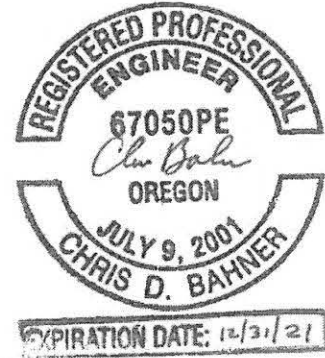


Technical Memorandum

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Name: Bruce Halverson
Date: 9 April 2021
From: Chris Bahner, P.E., D. WRE
Subject: Nehalem Bay Wastewater Agency, No-Rise Analysis and Certification



Introduction

Per your request, a FEMA "No-Rise" hydraulic analysis was conducted for the proposed streambank repairs located along the east bank of the Nehalem River within the Nehalem Bay Wastewater Agency property limits near the City of Nehalem in Tillamook County, Oregon. The property is located within a Special Flood Hazard Area (SFHA) of the Nehalem River floodplain in the left (east) overbank between FEMA lettered cross sections "C" and "D". Further, portions of the streambank repairs will be made within the regulatory floodway. The effective base flood elevation is 13.7 ft at FEMA cross section "C" and 14.8 ft at FEMA cross section "D". Both these elevations are referenced to the North American Vertical Datum of 1988 (NAVD88), and all elevations referenced in this memorandum will be based on this vertical datum. Figure 1 presents the study area and effective FEMA flood hazard mapping. All figures referenced in the text are found at the end of this memorandum.

As specified by Article 3, Section 2.03.510(9a) of the Tillamook County Code, new construction is prohibited within a regulatory floodway "unless certification is provided by a professional registered civil engineer demonstrating through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that such encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge."

A hydraulic study was conducted in accordance with standard engineering practice for a FEMA No-Rise analysis which indicates that the proposed modifications will not result in an increase in water surface elevations during the base flood. This memorandum summarizes the analysis methodology and results.

Analysis Approach

The hydraulic study utilized the U.S. Army Corps of Engineers' (USACE) software HEC-RAS (Hydraulic Engineering Center – River Analysis System) version 5.0.7 (USACE 2019). The effective hydraulic modeling of this reach of the Nehalem River was conducted by WEST in November 2014.

Procedures set forth by FEMA Region 10 call for a multi-step analysis approach for evaluating a proposed project for No-Rise certification (FEMA 2013). The steps are as follows:

1. Current Effective Model: Obtain the effective model upon which the current effective base flood elevations and floodway extents is based. Effective models are archived by FEMA.
2. Duplicate Effective Model (DEM): Use the Current Effective Model input data to create a Duplicate Effective Model to ensure that the results recorded in the effective FIS can be reproduced within an acceptable tolerance.
3. Corrected Effective Model (CEM): The Duplicate Effective Model is then modified to correct any errors and incorporate the most recent topographic information.
4. Existing Conditions Model (ECM): The Corrected Effective Model is revised to reflect any modifications that have occurred within the floodplain since the date of the original analysis but prior to the proposed project. This model should be the best depiction of existing conditions.
5. Proposed Conditions Model (PCM): The Proposed Conditions Model is to reflect conditions following the completion of the project and will be compared with the Existing Conditions Model to determine the projects effects (if any). The direct comparison of water surface elevations between the results of these two models is the basis of a No-Rise analysis.

The effective model was developed by WEST Consultants, Inc. (WEST) for a Letter of Map Revision (LOMR), effective September 24, 2015. The model produced for the LOMR was used to perform the hydraulic analysis for this No-Rise.

Effective Model

Documentation accompanying the effective model indicates that it was produced using Geographic Information System (GIS) data available in the digital flood insurance map (DFIRM) for Tillamook County (FEMA) and topographic data available from the Oregon Department of Geologic and Mineral Industries (DOGAMI 2009). The model includes FEMA lettered cross sections A through J and 21 unlettered cross sections. Bathymetry at all cross sections except for the reach between River Mile (RM) 1.4 and RM 1.7 was based on NOAA data and manual adjustment to the thalweg elevations to match the FIS profiles. Bathymetry for all cross sections located between RM 1.4 and RM 1.7 was based on the bathymetric survey data obtained by WEST in March 2021. Discharges and downstream boundary conditions are based on published values in the effective Flood Insurance Study. The limits of floodway encroachments were extracted from the 'S_FLD_HAZ_LN' GIS data layer in the DFIRM. All remaining hydraulic parameters in the effective model (Manning's roughness, flow-paths, etc.) were estimated based on data listed in the FIS, publicly available aerial imagery, engineering judgement, and from observations I made during the field reconnaissance on March 1, 2021.

Duplicate Effective Model (DEM)

A Duplicate Effective Model (DEM) was created from a copy of the effective. Results from the DEM were compared with water surface elevations published in the floodway data table and on flood profiles in the FIS. The DEM results are within the minimum agreement tolerance of 0.1 feet, so it is considered sufficient for conducting a No-Rise analysis. Table 1 presents the comparison of DEM and FIS water surface elevations.

Corrected Effective Model (CEM)

The DEM was modified to create the Corrected Effective Model (CEM). The modifications consisted of adding four additional cross section at locations where the proposed streambank repairs will be made. Figure 2 shows the added cross sections. Results from the CEM were compared with the water surface elevations computed by the DEM. That comparison is presented in Table 2.

As seen in Table 2, the CEM water surface elevations for the reach represented by the additional cross sections are about 0.02 to 0.11 ft higher than the DEM water surface elevations, and the CEM water surface elevations for the river reach upstream of the additional cross section are about 0.05 to 0.15 ft lower than the DEM water surface elevations. The floodway surcharge (which is not shown in the table) is still less than that maximum 1 foot increase allowed by FEMA.

Table 1 - Duplicate Effective Model vs. Effective FIS

River Station (RM) and FEMA XS Letter		Regulatory Water Surface Elevation (ft)			With Floodway Water Surface Elevation (ft)		
		FIS Effective Model	DEM	Difference (DEM - FIS)	FIS Effective Model	DEM	Difference (FIS - DEM)
0.45	A	13.11	13.11	0.00	13.45	13.45	0.00
0.60	--	13.32	13.32	0.00	13.61	13.61	0.00
0.73	--	13.36	13.36	0.00	13.65	13.65	0.00
0.78	--	13.40	13.40	0.00	13.70	13.70	0.00
0.80	--	13.50	13.50	0.00	13.80	13.80	0.00
0.86	--	13.55	13.55	0.00	13.86	13.86	0.00
0.95	--	13.63	13.63	0.00	13.94	13.94	0.00
0.994	B	13.68	13.68	0.00	14.00	14.00	0.00
1.05	C	13.70	13.70	0.00	14.01	14.01	0.00
1.33	--	13.88	13.88	0.00	14.20	14.20	0.00
1.50	--	14.04	14.04	0.00	14.36	14.36	0.00
1.74	--	14.31	14.31	0.00	14.64	14.64	0.00
1.92	--	14.74	14.74	0.00	15.13	15.13	0.00
2.01	D	14.84	14.84	0.00	15.26	15.26	0.00
2.28	--	14.95	14.95	0.00	15.35	15.35	0.00
2.49	--	15.15	15.15	0.00	15.53	15.53	0.00
2.92	E	15.53	15.53	0.00	15.89	15.89	0.00
3.12	--	15.68	15.68	0.00	16.12	16.12	0.00
3.24	--	15.75	15.75	0.00	16.25	16.25	0.00
3.28	--	15.79	15.79	0.00	16.33	16.33	0.00
3.66	F	16.22	16.22	0.00	16.96	16.96	0.00
3.80	--	15.98	15.98	0.00	16.77	16.77	0.00
4.78	G	17.53	17.53	0.00	18.34	18.34	0.00
5.17	--	17.60	17.6	0.00	18.41	18.41	0.00
5.26	--	17.63	17.63	0.00	18.45	18.45	0.00
5.34	--	17.66	17.66	0.00	18.48	18.48	0.00
5.55	H	17.54	17.54	0.00	18.39	18.39	0.00
5.65	--	17.50	17.50	0.00	18.34	18.34	0.00
5.79	--	17.86	17.86	0.00	18.70	18.70	0.00
5.88	I	18.09	18.09	0.00	18.87	18.87	0.00
5.951	--	17.98	17.98	0.00	18.74	18.74	0.00
5.98	J	18.04	18.04	0.00	18.80	18.80	0.00

Notes: --- Indicates unlettered FEMA cross section; estimated from FIS flood profile

Table 2 - Corrected Effective Model vs. Duplicate Effective Model

River Station (RM) and FEMA XS Letter		Regulatory Water Surface Elevation (ft)			With Floodway Water Surface Elevation (ft)		
		DEM	CEM	Difference (CEM - DEM)	DEM	CEM	Difference (CEM - DEM)
0.45	A	13.11	13.11	0.00	13.45	13.45	0.00
0.60	--	13.32	13.32	0.00	13.61	13.61	0.00
0.73	--	13.36	13.36	0.00	13.65	13.65	0.00
0.78	--	13.40	13.40	0.00	13.70	13.70	0.00
0.80	--	13.50	13.50	0.00	13.80	13.80	0.00
0.86	--	13.55	13.55	0.00	13.86	13.86	0.00
0.95	--	13.63	13.63	0.00	13.94	13.94	0.00
0.994	B	13.68	13.68	0.00	14.00	14.00	0.00
1.05	C	13.70	13.70	0.00	14.01	14.01	0.00
1.33	--	13.88	13.88	0.00	14.20	14.20	0.00
1.40*		13.95	14.06	0.11	14.27	14.38	0.11
1.50	--	14.04	14.11	0.07	14.36	14.43	0.07
1.59*		14.10	14.16	0.06	14.43	14.46	0.03
1.63*		14.18	14.26	0.08	14.51	14.53	0.02
1.69*		14.25	14.29	0.04	14.58	14.59	0.01
1.74	--	14.31	14.34	0.03	14.64	14.67	0.03
1.92	--	14.74	14.59	-0.15	15.13	15.01	-0.12
2.01	D	14.84	14.70	-0.14	15.26	15.13	-0.13
2.28	--	14.95	14.81	-0.14	15.35	15.23	-0.12
2.49	--	15.15	15.02	-0.13	15.53	15.42	-0.11
2.92	E	15.53	15.41	-0.12	15.89	15.78	-0.11
3.12	--	15.68	15.56	-0.12	16.12	16.01	-0.11
3.24	--	15.75	15.63	-0.12	16.25	16.14	-0.11
3.28	--	15.79	15.67	-0.12	16.33	16.22	-0.11
3.66	F	16.22	16.11	-0.11	16.96	16.86	-0.10
3.80	--	15.98	15.86	-0.12	16.77	16.67	-0.10
4.78	G	17.53	17.46	-0.07	18.34	18.28	-0.06
5.17	--	17.60	17.54	-0.06	18.41	18.35	-0.06
5.26	--	17.63	17.56	-0.07	18.45	18.39	-0.06
5.34	--	17.66	17.60	-0.06	18.48	18.42	-0.06
5.55	H	17.54	17.47	-0.07	18.39	18.32	-0.07
5.65	--	17.50	17.43	-0.07	18.34	18.28	-0.06
5.79	--	17.86	17.80	-0.06	18.70	18.65	-0.05
5.88	I	18.09	18.03	-0.06	18.87	18.82	-0.05
5.951	--	17.98	17.93	-0.05	18.74	18.69	-0.05
5.98	J	18.04	17.99	-0.05	18.80	18.75	-0.05

Notes: --- Indicates unlettered FEMA cross section; estimated from FIS flood profile
 * Indicates new cross section

Existing Conditions Model (ECM)

No changes were made for the ECM, so the ECM is the same as the CEM.

Proposed Conditions Model (PCM)

The proposed conditions incorporate the rock fill materials that will be used to make the streambank repairs. These repairs will be made within six individual reaches along the east bank of the Nehalem River adjacent to the Nehalem Bay Wasteway Agency property. The reaches are shown in Figure 3, and cross sections of the proposed revetment repairs are shown in Figure 4. The PCM was created from the ECM by modifying the cross sections to reflect the proposed changes associated with the rock revetment repairs.

Analysis Results

Water surface elevations predicted by the ECM and PCM models were compared to determine if the proposed rock revetment repairs would result in a rise in water surface elevations for either the base flood or the floodway. Table 3 presents the computed water surface elevations for the ECM and PCM, and the calculated difference. As the table indicates, the proposed revetment repairs will not result in a rise in water surface elevations along the Nehalem River for either the base flood or the floodway. A FEMA No-Rise Certificate is provided in Figure 5. Supporting data, including the effective FEMA flood hazard mapping and modeling cross sections, are included in Appendix A.

If you have any questions, please feel free to contact me by phone at (503) 485-5490, or by email at cbahner@westconsultants.com.

Table 3 - Proposed Conditions vs. Existing Conditions

River Station (RM) and FEMA XS Letter		Regulatory Water Surface Elevation (ft)			With Floodway Water Surface Elevation (ft)		
		ECM	PCM	Difference (PCM - ECM)	ECM	PCM	Difference (PCM - ECM)
0.45	A	13.11	13.11	0.00	13.45	13.45	0.00
0.60	--	13.32	13.32	0.00	13.61	13.61	0.00
0.73	--	13.36	13.36	0.00	13.65	13.65	0.00
0.78	--	13.40	13.40	0.00	13.70	13.70	0.00
0.80	--	13.50	13.50	0.00	13.80	13.80	0.00
0.86	--	13.55	13.55	0.00	13.86	13.86	0.00
0.95	--	13.63	13.63	0.00	13.94	13.94	0.00
0.994	B	13.68	13.68	0.00	14.00	14.00	0.00
1.05	C	13.70	13.70	0.00	14.01	14.01	0.00
1.33	--	13.88	13.88	0.00	14.20	14.20	0.00
1.40*		14.06	14.06	0.00	14.38	14.38	0.00
1.50*	--	14.11	14.11	0.00	14.43	14.43	0.00
1.59*		14.16	14.16	0.00	14.46	14.46	0.00
1.63*		14.26	14.26	0.00	14.53	14.53	0.00
1.69*		14.29	14.29	0.00	14.59	14.59	0.00
1.74	--	14.34	14.34	0.00	14.67	14.67	0.00
1.92	--	14.59	14.59	0.00	15.01	15.01	0.00
2.01	D	14.70	14.70	0.00	15.13	15.13	0.00
2.28	--	14.81	14.81	0.00	15.23	15.23	0.00
2.49	--	15.02	15.02	0.00	15.42	15.42	0.00
2.92	E	15.41	15.41	0.00	15.78	15.78	0.00
3.12	--	15.56	15.56	0.00	16.01	16.01	0.00
3.24	--	15.63	15.63	0.00	16.14	16.14	0.00
3.28	--	15.67	15.67	0.00	16.22	16.22	0.00
3.66	F	16.11	16.11	0.00	16.86	16.86	0.00
3.80	--	15.86	15.86	0.00	16.67	16.67	0.00
4.78	G	17.46	17.46	0.00	18.28	18.28	0.00
5.17	--	17.54	17.54	0.00	18.35	18.35	0.00
5.26	--	17.56	17.56	0.00	18.39	18.39	0.00
5.34	--	17.6	17.60	0.00	18.42	18.42	0.00
5.55	H	17.47	17.47	0.00	18.32	18.32	0.00
5.65	--	17.43	17.43	0.00	18.28	18.28	0.00
5.79	--	17.80	17.80	0.00	18.65	18.65	0.00
5.88	I	18.03	18.03	0.00	18.82	18.82	0.00
5.951	--	17.93	17.93	0.00	18.69	18.69	0.00
5.98	J	17.99	17.99	0.00	18.75	18.75	0.00

Notes: --- Indicates unlettered FEMA cross section; estimated from FIS flood profile
 * Indicates cross sections modified per proposed revetment repairs

References

U.S. Army Corps of Engineers, Hydrologic Engineering Center; HEC-RAS, River Analysis System, Software Version 5.0.7; March 2019

U.S. Department of Homeland Security, Federal Emergency Management Agency; Flood Insurance Study for Tillamook County, OR and Incorporated Areas, 41057C002A, Vol. 1 and 2; Effective September 28, 2018

U.S. Department of Homeland Security, Federal Emergency Management Agency; Letter of Map Revision, Case No. 14-10-1695P; Effective September 24, 2015

U.S. Department of Homeland Security, Federal Emergency Management Agency, Region X; Procedures for “No-Rise” Certification for Proposed Developments in the Regulatory Floodway; October 2013

Oregon Department of Geology and Mineral Industries; Light Detection and Ranging (LiDAR) data; OLC North Coast 2020; Published August 2009

Figures

Figure 1 - Study Area with Effective FEMA Flood Hazard Mapping

Figure 2 - Cross Sections Added for CEM

Figure 3 – Proposed Revetment Repair Reaches

Figure 4 – Proposed Revetment Cross Sections

Figure 5 – FEMA No-Rise Certificate

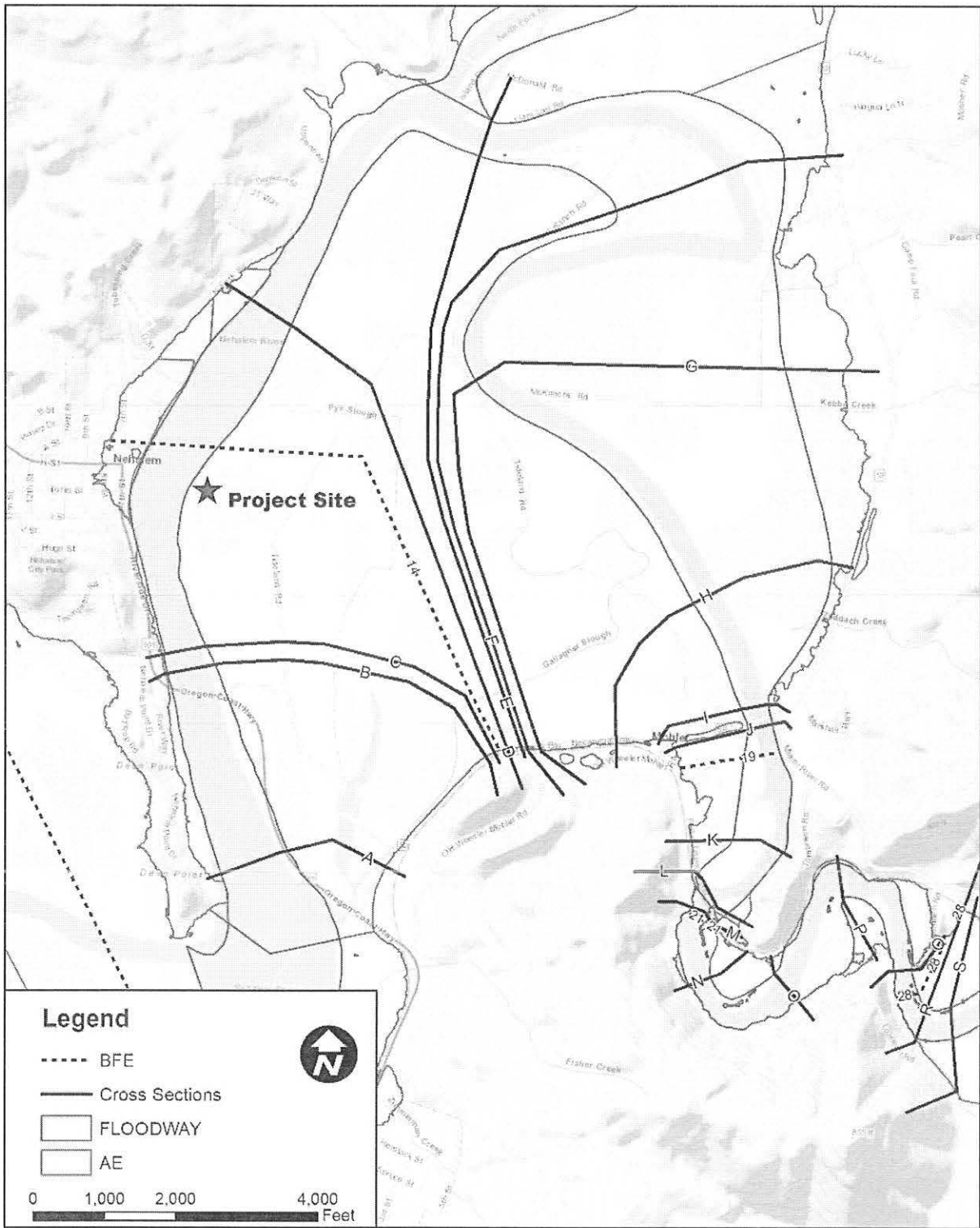


Figure 1 - Study Area with Effective FEMA Flood Hazard Mapping

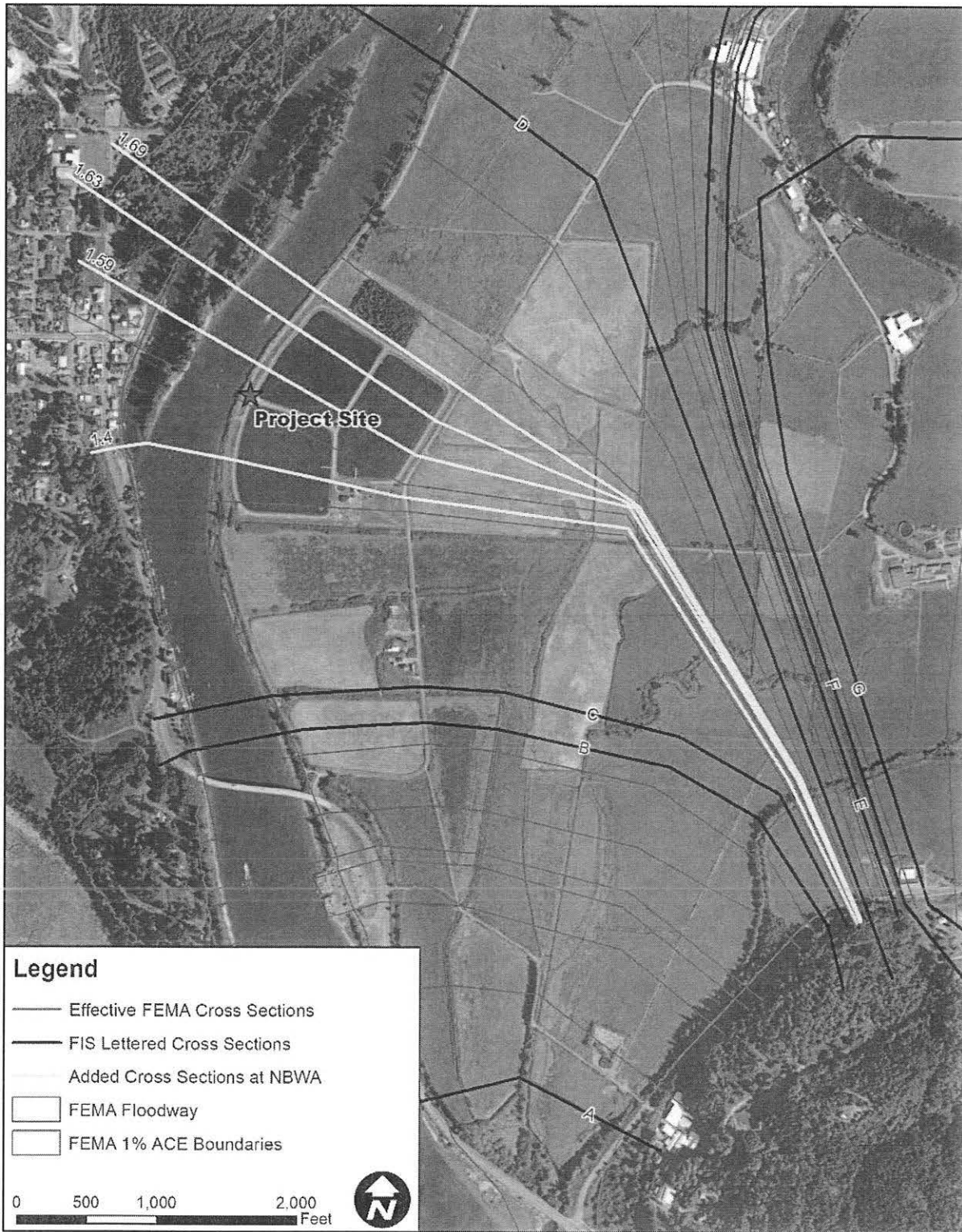


Figure 2 - Cross Sections Added for CEM

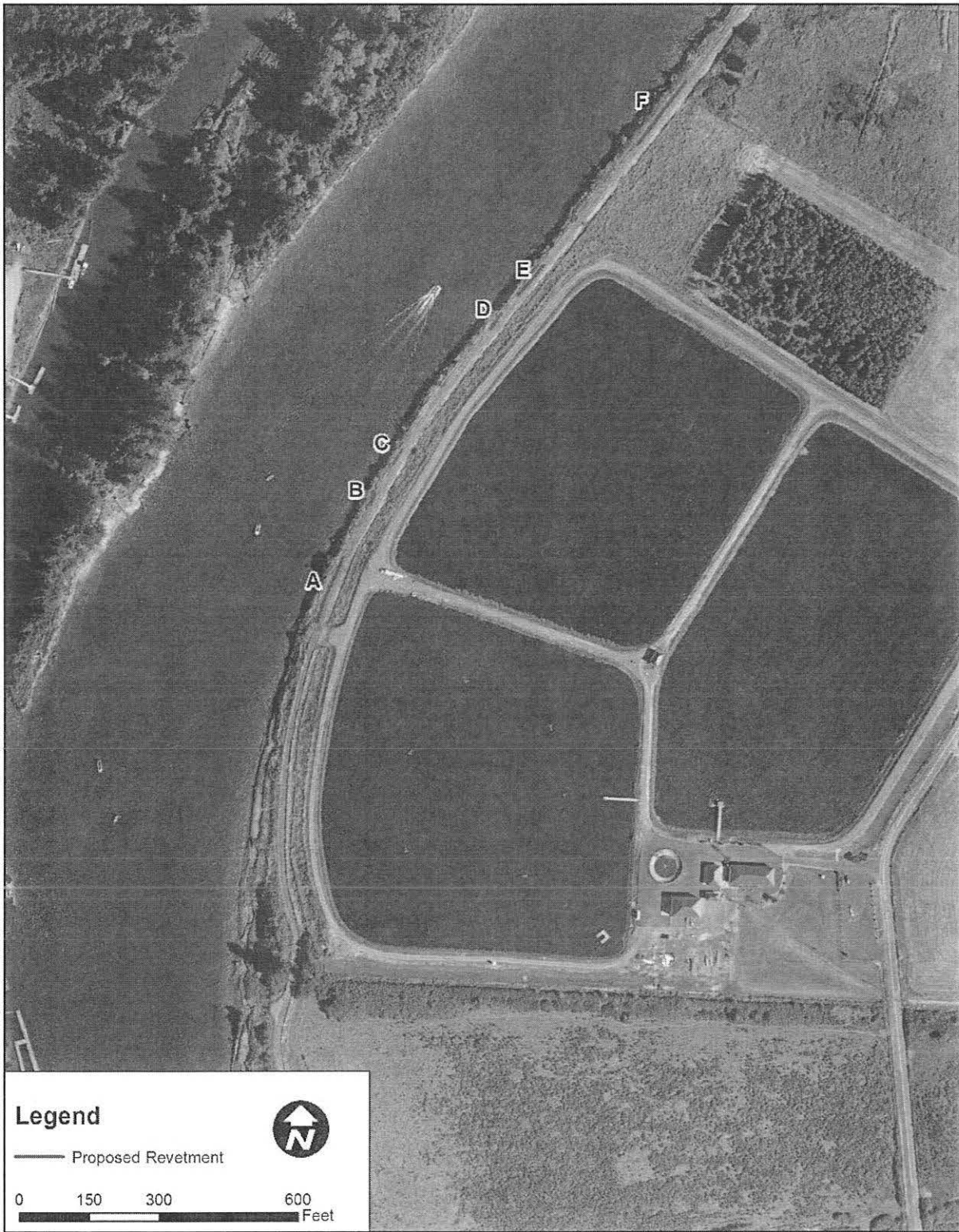


Figure 3 – Proposed Revetment Repair Reaches

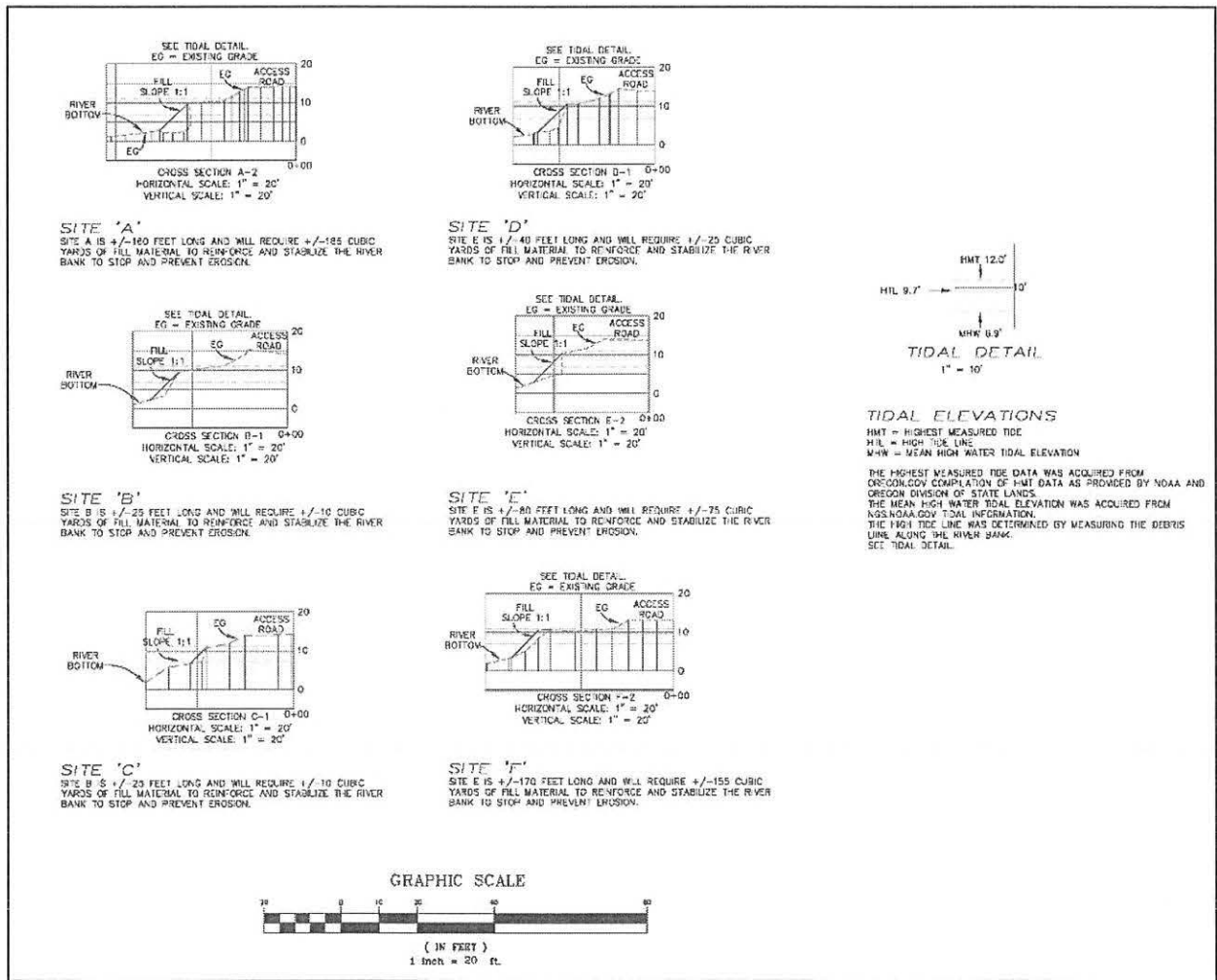


Figure 4 – Proposed Revetment Cross Sections

ENGINEERING "NO-RISE" CERTIFICATION

This is to certify that I am a duly qualified engineer licensed to practice in the State of Oregon.

It is to further certify that the attached technical data supports the fact that the proposed Nehalem Bay Wastewater Agency revetment repair project will
(Name of Development)

not impact the 100-year flood elevations, floodway elevations and floodway widths for the Nehalem River at published sections
(Name of Stream)

in the Flood Insurance Study for Tillamook County & Incorporated Areas (41057C0209F and 207F),
(Name of Community)

dated September 28, 2018 and will not impact the 100-year flood elevations, floodway elevations, and floodway widths at unpublished cross-sections in the vicinity of the proposed development.

Attached are the following documents that support my findings:

Technical Memorandum by WEST Consultants, Inc. dated April 9, 2021.

(Date) April 9, 2021

(Signature) Chris Bahner

(Title) Project Manager

WEST Consultants, Inc.
2601 25th Street
Suite 450
Salem, OR 97302

(Address)



Figure 5 – FEMA No-Rise Certificate

Appendix A

Effective FIRM Panel

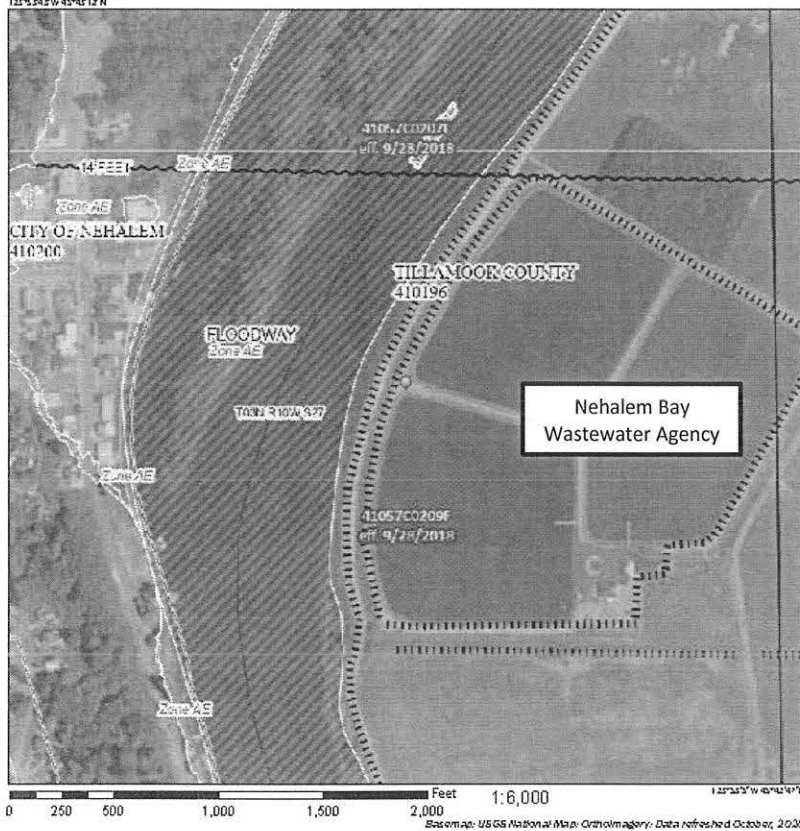
Effective Floodway Data Table

HEC-RAS Cross Section Plots, Existing and Proposed Conditions

National Flood Hazard Layer FIRMette



125°54'21" W 42°42'47" N



Legend

SEE PG REPORT FOR DETAILED LEGEND AND FIRM MAP FOR FIRM PANEL POINT

SPECIAL FLOOD HAZARD AREAS	Minimum Base Flood Elevation (BFE) Zone 1, 2 With BFE Elevation Zone 1, 2, 3, 4, 5, 6, 7, 8 Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with average depth less than one foot with average areas of less than one square mile, Zone 2 Future Outfalls 1% Annual Chance Flood Hazard Zone 2 Area with Reduced Flood Risk due to Lower, Dike, or Retention Area with Flood Risk due to Inlets/Low
OTHER AREAS	Area of Minimal Road Hazard Zone 2 Effective DMWAs Area of Unclassified Road Hazard Zone 2
GENERAL STRUCTURES	Channel, Outfall, or Storm Sewer Lower, Dike, or Retention
OTHER FEATURES	Cross Sections with 1% Annual Chance Water Surface Elevation Channel Transition Basic Flood Elevation Line (BFE) Lines of Survey Jurisdiction Boundary Channel Transition, Boundary Profile Boundary Hydrographic Feature
MAP PANELS	Digital Data Available No Digital Data Available Unmapped The spot displayed on the map is an approximate point selected by the user and does not represent an authoritative property boundary.

This map is consistent with FEMA's standards for the use of digital flood maps of a 1:6,000 scale as described below. The baseline shall conform with FEMA's baseline accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was captured on 4/7/2023 at 12:54:18 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map is valid if the user or more of the following map elements are present: Base map imagery, Flood zone labels, Legend, Scale bar, Map coordinate data, Contour lines, FIRM panel number, and FIRM effective date. Map images for unapproved and unapproved areas cannot be used for regulatory purposes.

Effective FEMA FIRM Panel

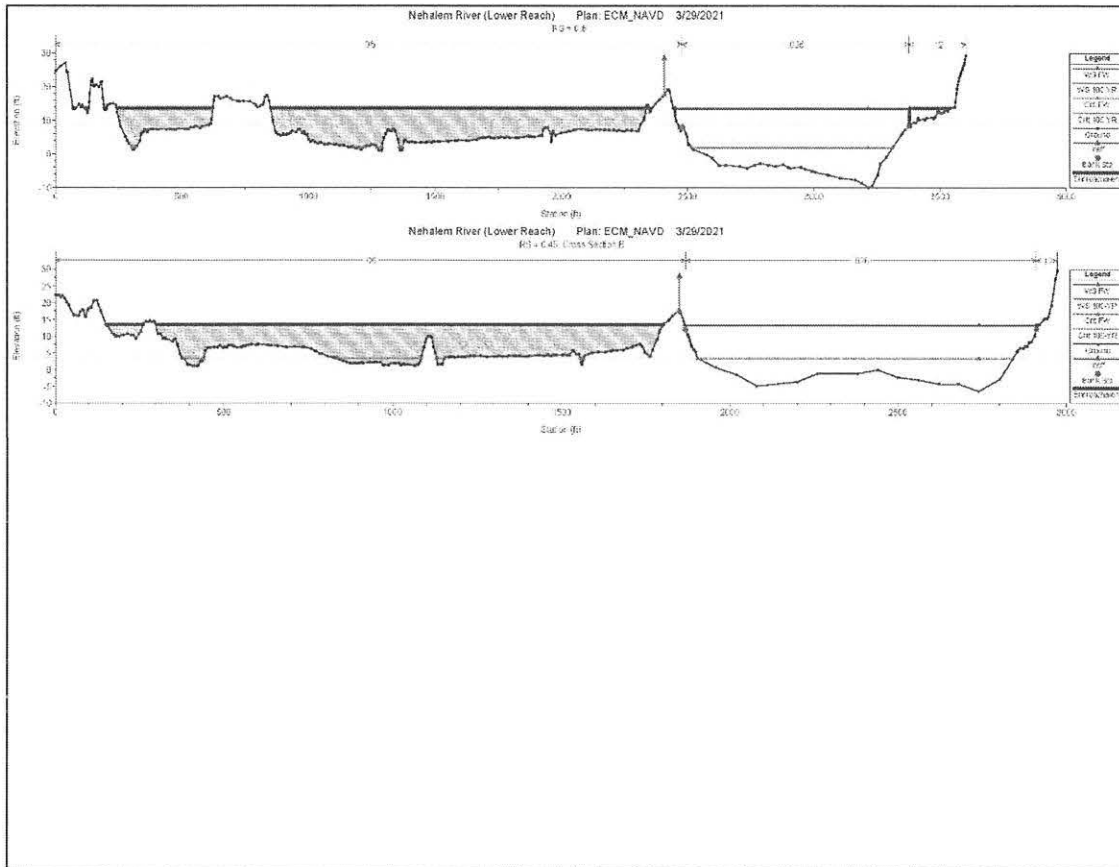
LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	2,360	1,045	15,503	4.8	13.1	13.1	13.5	0.4
B	5,178	675	13,824	5.2	13.6	13.6	14.0	0.4
C	5,455	617	13,139	5.5	13.7	13.7	14.0	0.3
D	10,617	740	14,543	4.9	14.8	14.8	15.3	0.5
E	15,349	570	9,568	6.5	15.5	15.5	15.9	0.4
F	19,086	2,480	20,374	6.0	16.2	16.2	17.0	0.8
G	25,158	4,388	41,742	3.8	17.5	17.5	18.4	0.9
H	29,642	1,813	12,272	8.1	17.5	17.5	18.4	0.9
I	31,318	349	6,529	9.0	18.0	18.0	18.8	0.8
J	31,608	270	6,183	9.6	18.0	18.0	18.8	0.8
K	33,368	734	9,487	8.7	20.3	20.3	20.7	0.4
L	34,492	670	9,877	7.1	20.8	20.8	21.7	0.9
M	34,620	346	7,700	7.7	20.8	20.8	21.7	0.9
N	35,660	326	7,069	8.3	23.8	23.8	24.3	0.5
O	37,350	491	11,908	4.9	25.9	25.9	26.4	0.5
P	39,090	532	10,916	5.4	26.6	26.6	27.1	0.5
Q	40,680	236	6,670	8.8	27.4	27.4	27.9	0.5
R	41,490	455	10,047	5.8	28.8	28.8	29.4	0.6
S	41,890	435	9,623	5.9	29.0	29.0	29.6	0.6
T	42,830	285	6,434	8.8	29.5	29.5	30.3	0.8
U	43,210	378	8,062	7.1	30.7	30.7	31.2	0.5
V	45,790	370	7,391	7.7	32.4	32.4	32.9	0.5
W	47,330	593	8,370	6.7	32.9	32.9	33.7	0.8
X	48,885	631	12,388	4.5	33.7	33.7	34.7	1.0

¹Feet above confluence with Nehalem Bay

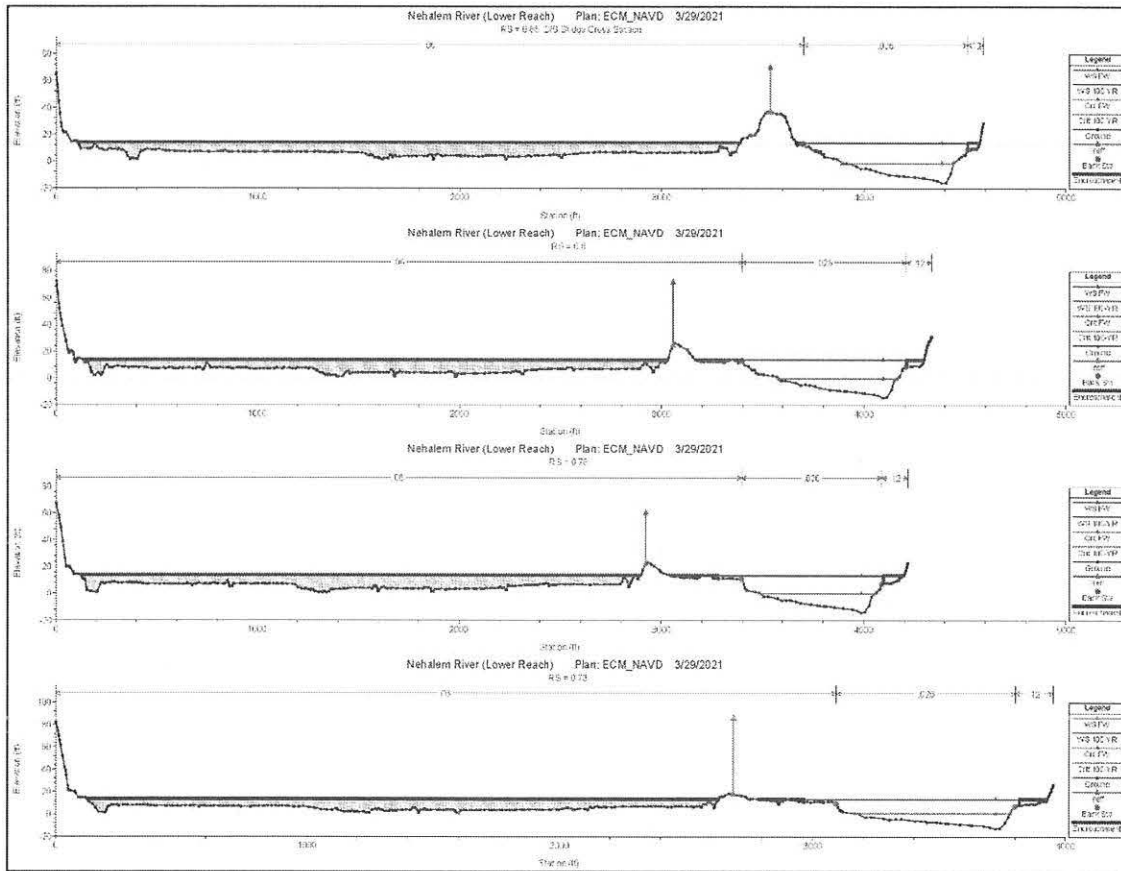
TABLE 24	FEDERAL EMERGENCY MANAGEMENT AGENCY TILLAMOOK COUNTY, OREGON AND INCORPORATED AREAS	FLOODWAY DATA
		FLOODING SOURCE: NEHALEM RIVER

Effective FEMA Floodway Data Table

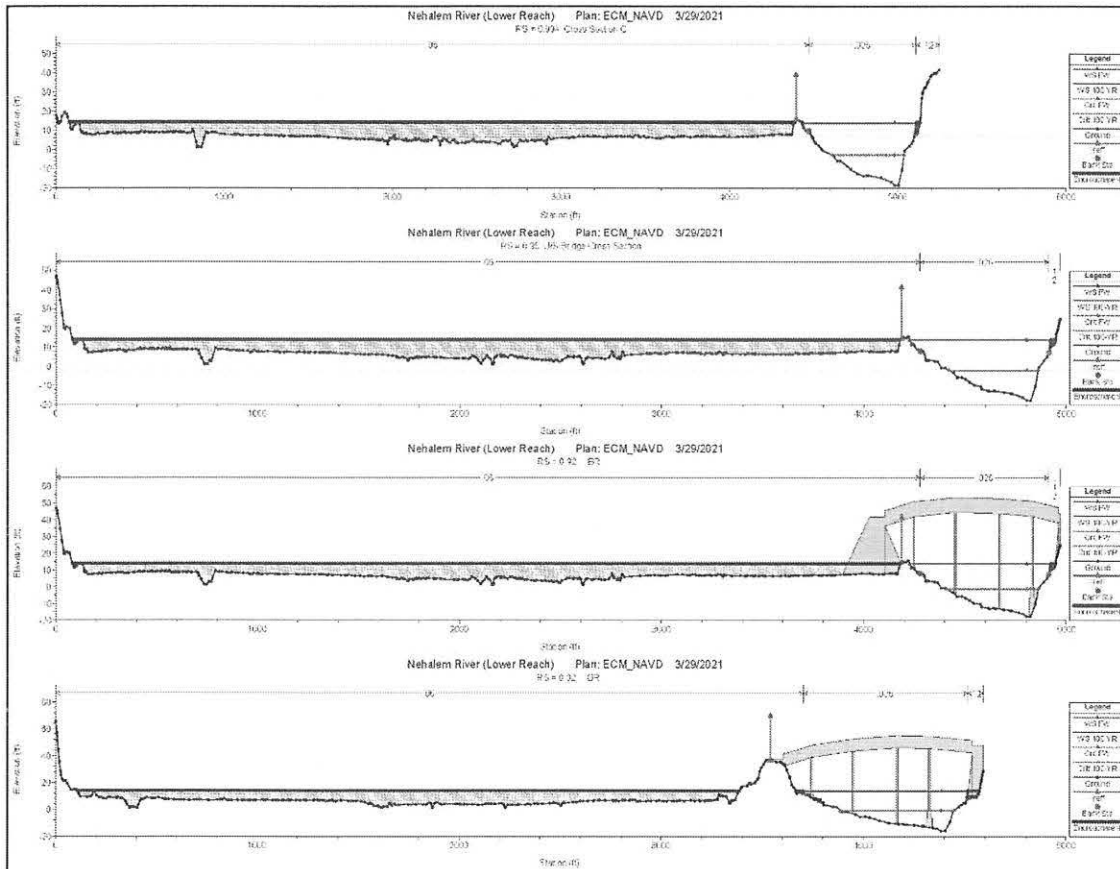
HEC-RAS Cross Section Plots – Existing Conditions



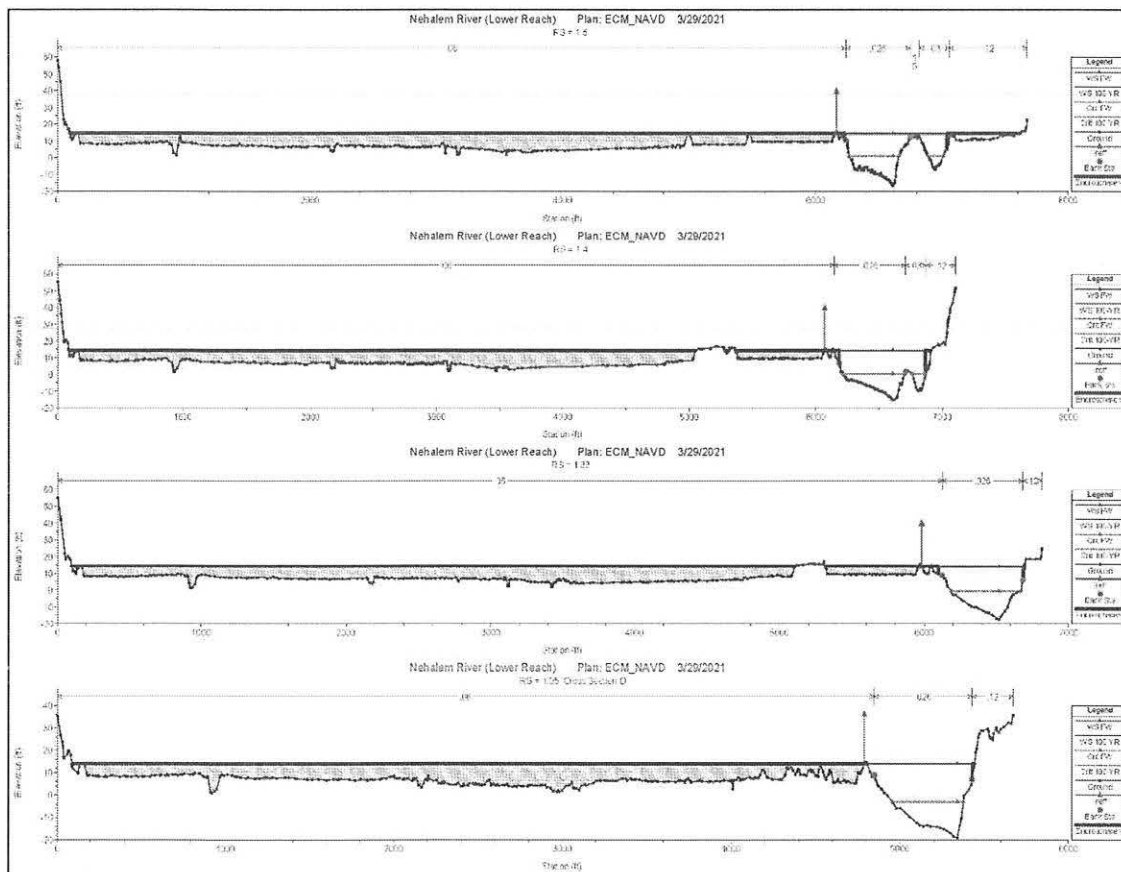
HEC-RAS Cross Section Plots – Existing Conditions



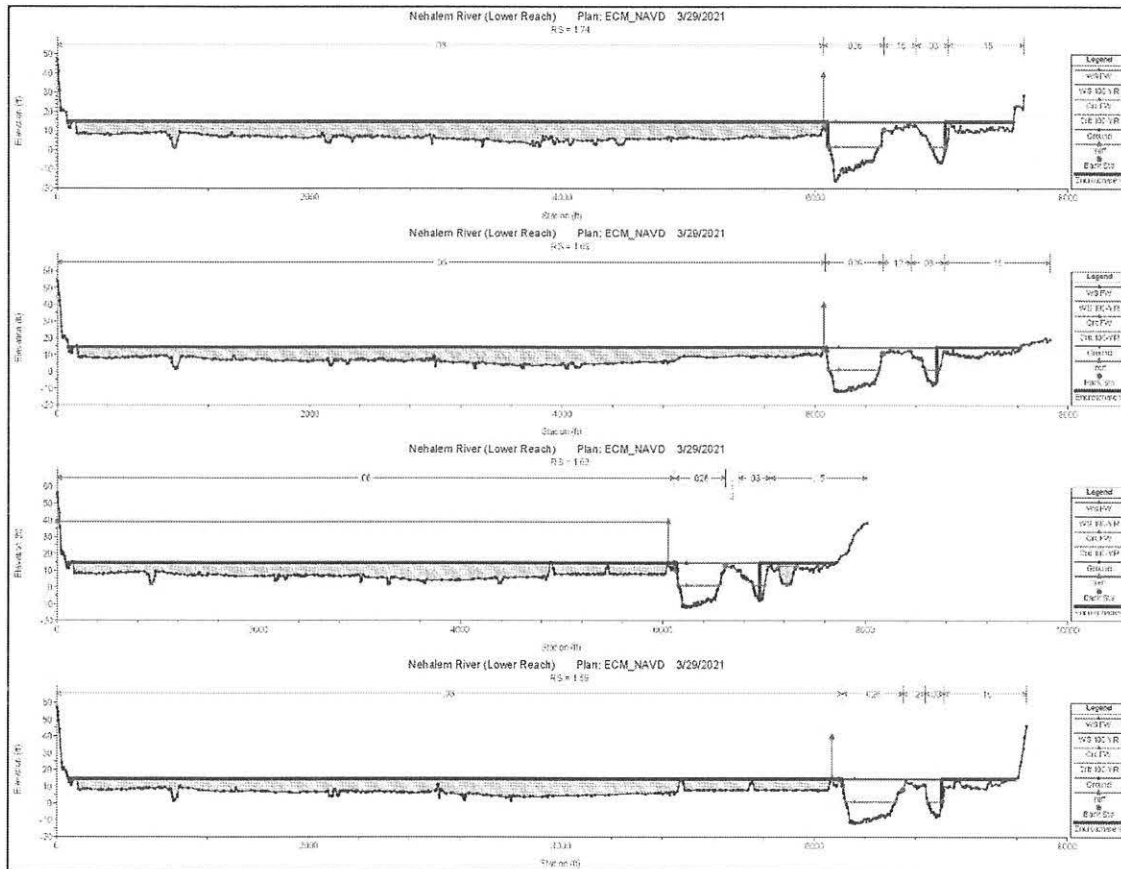
HEC-RAS Cross Section Plots – Existing Conditions



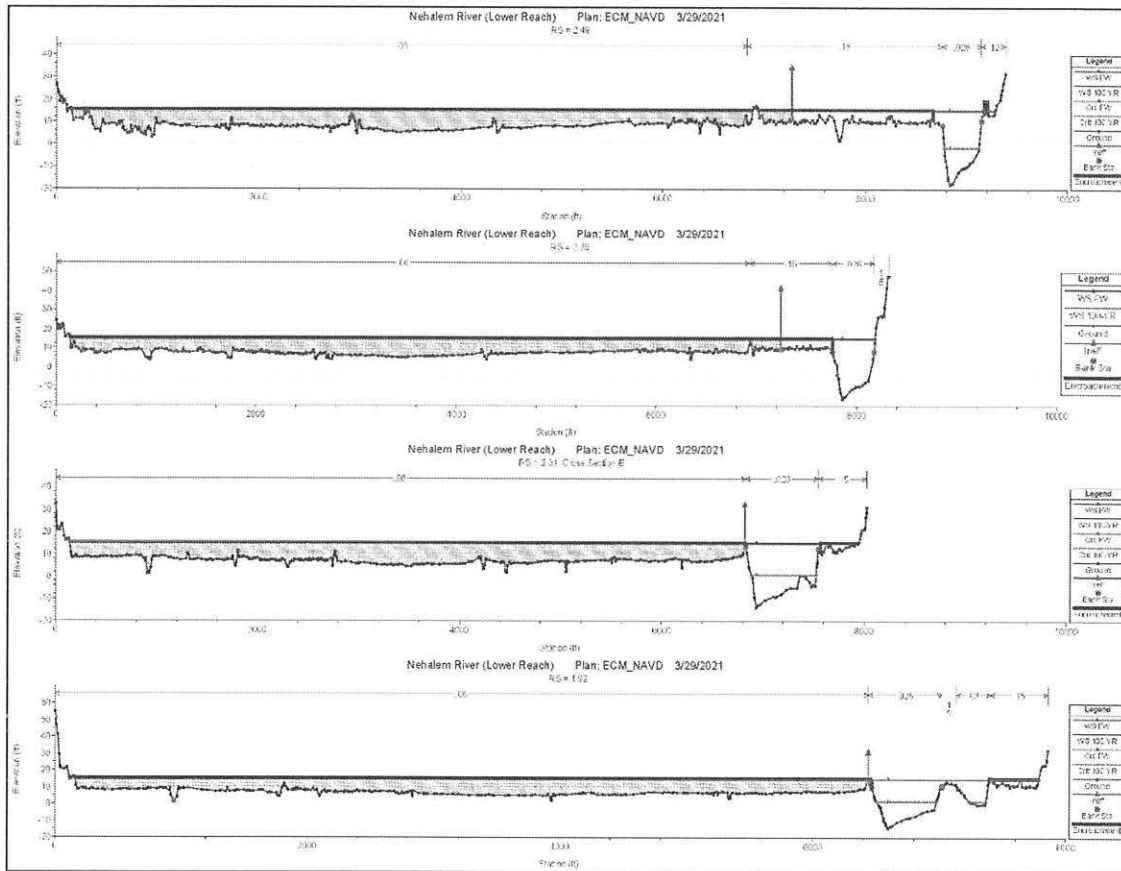
HEC-RAS Cross Section Plots – Existing Conditions



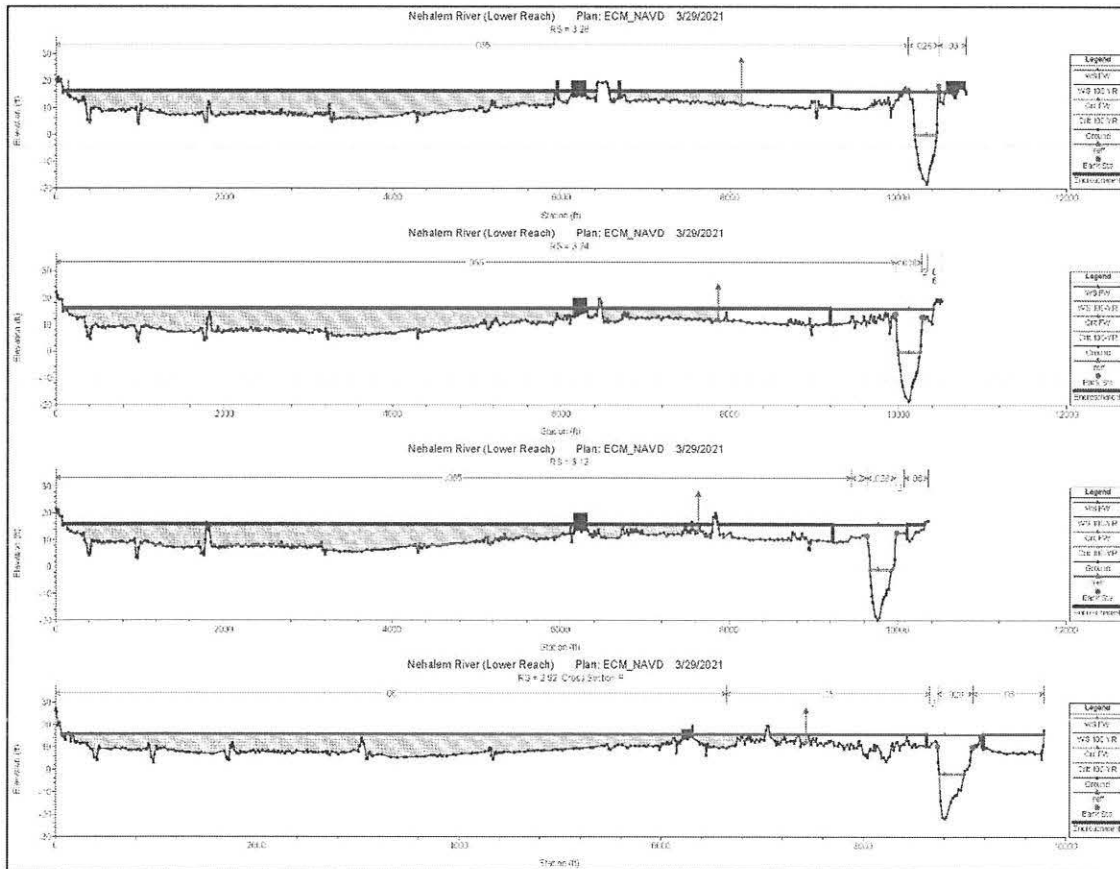
HEC-RAS Cross Section Plots – Existing Conditions



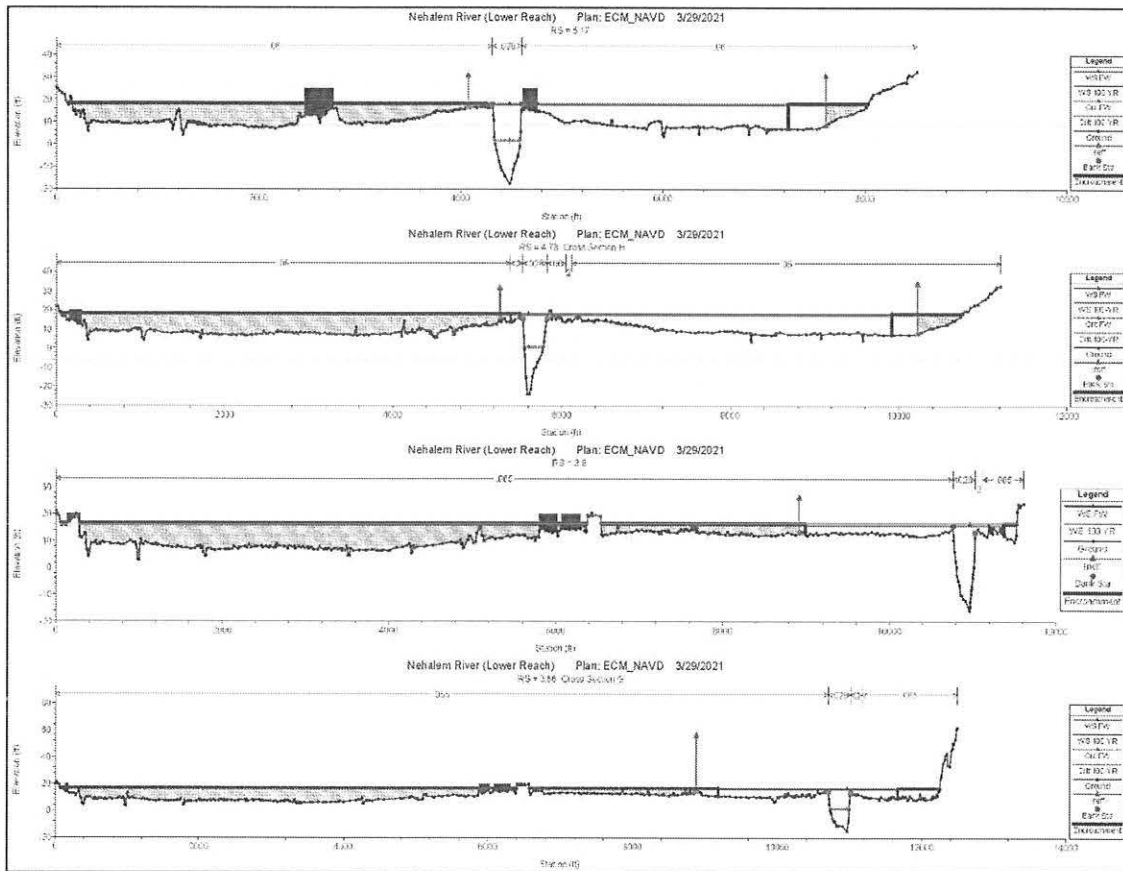
HEC-RAS Cross Section Plots – Existing Conditions



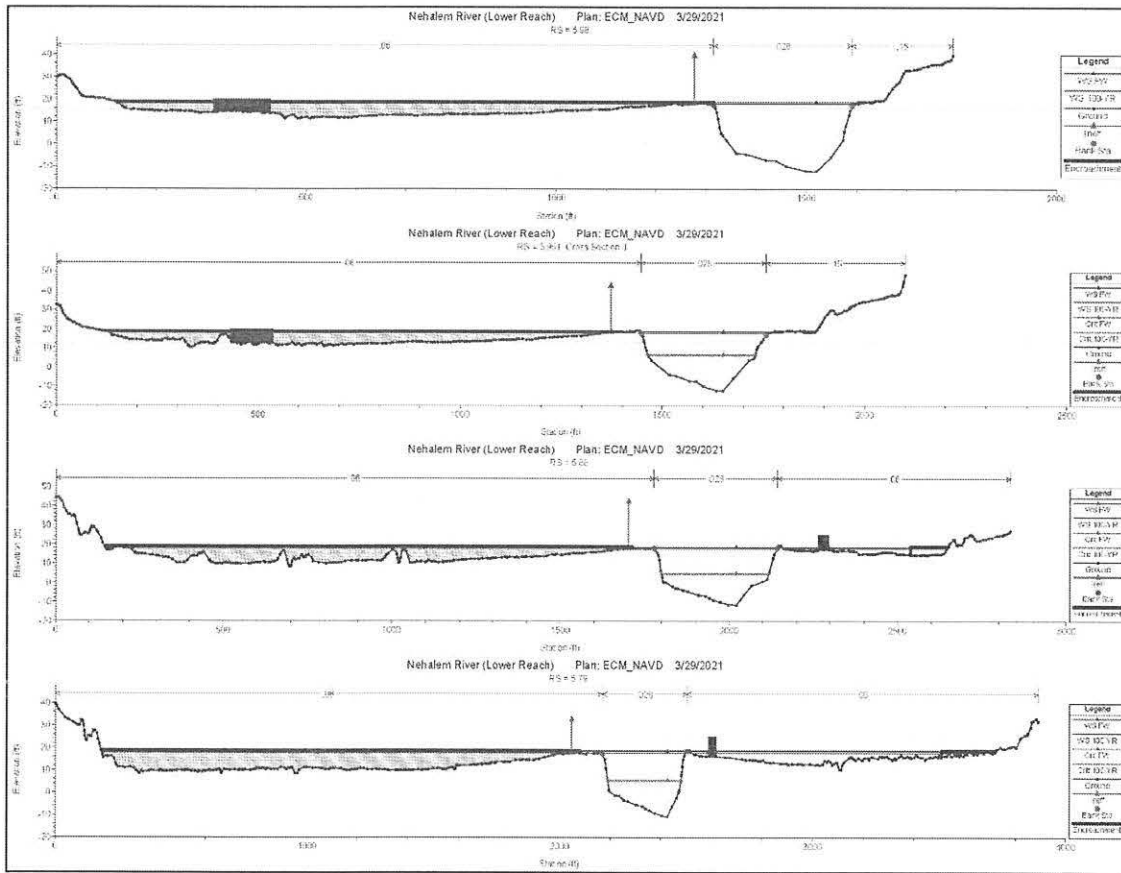
HEC-RAS Cross Section Plots – Existing Conditions



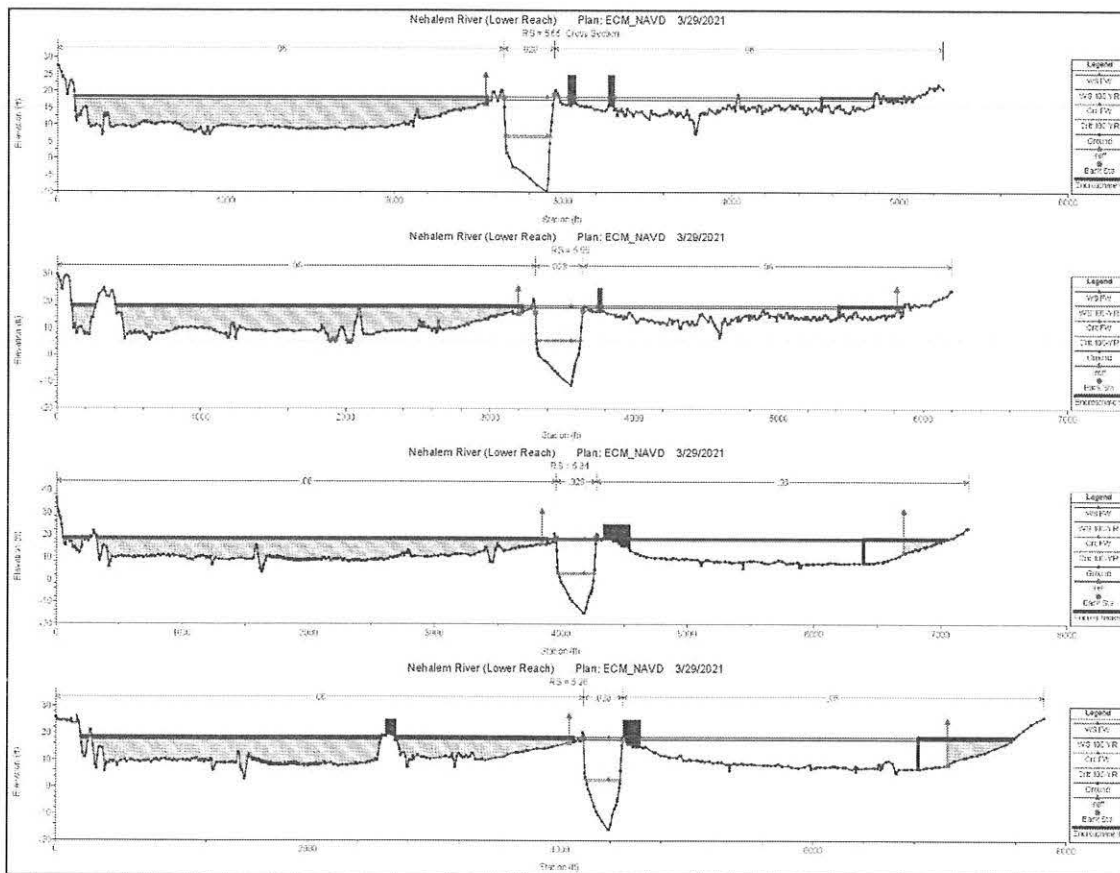
HEC-RAS Cross Section Plots – Existing Conditions



HEC-RAS Cross Section Plots – Existing Conditions



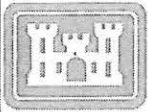

HEC-RAS Cross Section Plots – Existing Conditions



Joint Permit Application

This is a joint application, and must be sent to both agencies, who administer separate permit programs. Alternative forms of permit applications may be acceptable; contact the Corps and DSL for more information.

Date Stamp

	U.S. Army Corps of Engineers Portland District		Oregon Department of State Lands
Corps Action ID Number		DSL Number	

(1) TYPE OF PERMIT(S) IF KNOWN (check all that apply)

Corps: Individual Nationwide No.: _____ Regional General 13 Other _____

DSL: Individual General Permit No State Permit Required Waiver

(2) APPLICANT AND LANDOWNER CONTACT INFORMATION

	Applicant	Property Owner (if different)	Authorized Agent (if applicable) <input type="checkbox"/> Consultant <input type="checkbox"/> Contractor
Name (Required)	Jack Thayer	Nehalem Bay	
Business Name	Sunset Drainage District	Wastewater Agency (NBWA)	
Mailing Address 1	14855 Tideland Rd	PO Box 219	
Mailing Address 2			
City, State, Zip	Nehalem, OR 97131	Nehalem, OR 97131	
Business Phone	503-368-6908	503-368-5125	
Cell Phone	503801-6761		
Fax		503-368-7211	
Email	j.thayer@icloud.com		

(3) PROJECT INFORMATION

A. Provide the project location.

Project Name Sunset Drainage Levee Maintenance Latitude & Longitude*
45.7172, -123.8896

Project Address / Location 14000 Tideland Rd	City (nearest) Nehalem	County Tillamook		
Township	Range	Section	Quarter / Quarter	Tax Lot
3N	10	27		380

Brief Directions to the Site:
Highway 101 to Tideland Rd. Northerly on Tideland Rd for 0.8 miles to NBWA gate.

B. What types of waterbodies or wetlands are present in your project area? (Check all that apply.)

River / Stream Non-Tidal Wetland Lake / Reservoir / Pond
 Estuary or Tidal Wetland Other Pacific Ocean

Waterbody or Wetland Name** Nehalem River	River Mile 7.0	6 th Field HUC Name	6 th Field HUC (12 digits) 1
--	-------------------	--------------------------------	--

* In decimal format (e.g., 44.9399, -123.0283)

** If there is no official name for the wetland or waterbody, create a unique name (such as "Wetland 1" or "Tributary A").

C. Indicate the project category. (Check all that apply.)		
<input type="checkbox"/> Commercial Development	<input type="checkbox"/> Industrial Development	<input type="checkbox"/> Residential Development
<input type="checkbox"/> Institutional Development	<input type="checkbox"/> Agricultural	<input type="checkbox"/> Recreational
<input type="checkbox"/> Transportation	<input type="checkbox"/> Restoration	<input type="checkbox"/> Bridge
<input type="checkbox"/> Dredging	<input type="checkbox"/> Utility lines	<input type="checkbox"/> Survey or Sampling
<input type="checkbox"/> In- or Over-Water Structure	<input type="checkbox"/> Maintenance	<input type="checkbox"/> Other:

(4) PROJECT DESCRIPTION

A. Summarize the overall project including work in areas both in and outside of waters or wetlands.
 Rock will be machine placed along the river bank to halt and prevent erosion of the levee along the East river bank of the Nehalem River. Rock will range in size from 6" to 18".

B. Describe work within waters and wetlands. Placement of rock as described above will take place below the ordinary high water line, but little to no work will take place within the water i.e high tide.

C. Construction Methods. Describe how the removal and/or fill activities will be accomplished to minimize impacts to waters and wetlands.

To prevent in water work as much as possible, the lower elevation rock will be placed at or around low tide.

)
)

(4) PROJECT DESCRIPTION (continued)

D. Describe source of fill material and disposal locations if known

We do not anticipate the removal of materials from this site. The fill material will be 6" to 18" rock/boulders supplied by Mohler Sand and Gravel (local supplier).

E. Construction timeline.

What is the estimated project start date?

Summer 2019 *2021*

What is the estimated project completion date?

September 15, 2019 *2021*

Is any of the work underway or already complete?
If yes, please describe.

Yes No

F. Removal Volumes and Dimensions (if more than 7 impact sites, include a summary table as an attachment)

Wetland / Waterbody Name *	Removal Dimensions					Duration of Impact**	Material***
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq. ft. or ac.)	Volume (c.y.)		

G. Total Removal Volumes and Dimensions

Total Removal to Wetlands and Other Waters	Length (ft.)	Area (sq. ft or ac.)	Volume (c.y.)
Total Removal to Wetlands			
Total Removal Below Ordinary High Water			
Total Removal Below Highest Measured Tide			
Total Removal Below High Tide Line			
Total Removal Below Mean High Water Tidal Elevation			

H. Fill Volumes and Dimensions (if more than 7 impact sites, include a summary table as an attachment)

Wetland / Waterbody Name*	Fill Dimensions					Duration of Impact**	Material***
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq. ft. or ac.)	Volume (c.y.)		
Site A	160	12	Varies	1,920 sq. ft.	185	Permanent	Rock/Boulders
Site B	25	8	Varies	200 sq. ft.	10	Permanent	Rock/Boulders
Site C	25	7	Varies	175 sq. ft.	10	Permanent	Rock/Boulders
Site D	40	8	Varies	320 sq. ft.	25	Permanent	Rock/Boulders
Site E	80	10	Varies	800 sq. ft.	75	Permanent	Rock/Boulders
Site F	170	12	Varies	2,040 sq. ft.	155	Permanent	Rock/Boulders

(4) PROJECT DESCRIPTION (CONTINUED)

I. Total Fill Volumes and Dimensions

Total Fill to Wetlands and Other Waters	Length (ft.)	Area (sq. ft or ac.)	Volume (c.y.)
Total Fill to Wetlands			
Total Fill Below Ordinary High Water			
Total Fill Below <u>Highest Measured Tide</u>	500	5,455 sq. ft.	460
Total Fill Below <u>High Tide Line</u>	500	5,455 sq. ft.	460
Total Fill Below <u>Mean High Water Tidal Elevation</u>	500	5,455 sq. ft.	380

*If there is no official name for the wetland or waterbody, create a unique name (such as "Wetland 1" or "Tributary A").
**Indicate the days, months or years the fill or removal will remain. Enter "permanent" if applicable. For DSL, permanent removal or fill is defined as being in place for 24 months or longer.
*** Example: soil, gravel, wood, concrete, pilings, rock etc.

(5) PROJECT PURPOSE AND NEED

Provide a statement of the purpose and need for the overall project.

This project is needed to halt and prevent future erosion along the levee and East river bank of the Nehalem River. Areas of erosion into the toe of the levee are endangering adjacent roads, farms, homes and the sewer treatment plant.

(6) DESCRIPTION OF RESOURCES IN PROJECT AREA

A. Describe the existing physical and biological characteristics of each wetland or waterbody. Reference the wetland and waters delineation report if one is available. Include the list of items provided in the instructions.

B. Describe the existing navigation, fishing and recreational use of the waterbody or wetland.

River is used by boaters, fisherman, kayakers, etc year round.

(7) PROJECT SPECIFIC CRITERIA AND ALTERNATIVES ANALYSIS

Describe project-specific criteria necessary to achieve the project purpose. Describe alternative sites and project designs that were considered to avoid or minimize impacts to the waterbody or wetland.*
 No alternative sites exist as the project is needed to repair portions of the existing levee.

(8) ADDITIONAL INFORMATION

- Are there state or federally listed species on the project site? Yes No Unknown
- Is the project site within designated or proposed critical habitat? Yes No Unknown
- Is the project site within a national Wild and Scenic River ? Yes No Unknown
- Is the project site within a State Scenic Waterway? Yes No Unknown
- Is the project site within the 100-year floodplain? Yes No Unknown

If yes to any of the above, explain in Block 6 and describe measures to minimize adverse effects to these resources in Block 7.

- Is the project site within the Territorial Sea Plan (TSP) Area? Yes No Unknown
 If yes, attach TSP review as a separate document for DSL.

- Is the project site within a designated Marine Reserve? Yes No Unknown
 If yes, certain additional DSL restrictions will apply.

- Will the overall project involve ground disturbance of one acre or more? Yes No Unknown
 If yes, you may need a 1200-C permit from the Oregon Department of Environmental Quality (DEQ).

- Is the fill or dredged material a carrier of contaminants from on-site or off- site spills? Yes No Unknown
- Has the fill or dredged material been physically and/or chemically tested? Yes No Unknown
 If yes, explain in Block 6 and provide references to any physical/chemical testing report(s).

- Has a cultural resource (archaeological) survey been performed on the project area? Yes No Unknown
 If yes, provide a copy of the survey with this application to the Corps only. Do not describe any resources in this document.

Will the project result in new impervious surfaces or the redevelopment of existing surfaces? Yes No
 If yes, the Applicant must submit a post-construction stormwater management plan to DEQ's 401 WQC program for review and approval, see <http://www.deq.state.or.us/wq/sec401cert/docs/stormwaterGuidelines.pdf>

* Not required by the Corps for a complete application, but is necessary for individual permits before a permit decision can be rendered.

Identify any other federal agency that is funding, authorizing or implementing the project.

Agency Name	Contact Name	Phone Number	Most Recent Date of Contact
-------------	--------------	--------------	-----------------------------

List other certificates or approvals/denials required or received from other federal, state or local agencies for work described in this application. For example, certain activities that require a Corps permit also require 401 Water Quality Certification (WQC) from Oregon Department of Environmental Quality (DEQ). For DEQ, please note that all projects that qualify for a Nationwide 401 WQC will be invoiced a fee. Projects that do not qualify for the Nationwide certification will be invoiced based on project complexity. See <http://www.oregon.gov/deq/wq/wqpermits/Pages/Section-401-Fees.aspx>

Agency	Certificate/ approval / denial description	Date Applied
--------	--	--------------

Other DSL and/or Corps Actions Associated with this Site (Check all that apply.)

Work proposed on or over lands owned by or leased from the Corps (may require authorization pursuant to 33 USC 408).

State owned waterway DSL Waterway Lease # _____

Other Corps or DSL Permits Corps # _____ DSL # _____

Violation for Unauthorized Activity Corps # _____ DSL # _____

Wetland and Waters Delineation Corps # _____ DSL # _____

Submit the entire delineation report to the Corps; submit only the concurrence letter (if complete) and approved maps to DSL. If not previously submitted to DSL, send under a separate cover letter

(9) IMPACTS, RESTORATION/REHABILITATION, AND COMPENSATORY MITIGATION

A. Describe unavoidable environmental impacts that are likely to result from the proposed project. Include permanent, temporary, direct, and indirect impacts.

B. For temporary removal or fill or disturbance of vegetation in waterbodies, wetlands or riparian (i.e., streamside) areas, discuss how the site will be restored after construction to include the timeline for restoration.

Reseed levee and riverbank where needed immediately upon completion. Maintain emergency access for Nehalem Bay Wastewater Agency.

Compensatory Mitigation			
C. Proposed mitigation approach. Check all that apply:			
<input type="checkbox"/> Permittee-responsible Onsite Mitigation	<input type="checkbox"/> Permittee-responsible Offsite mitigation	<input type="checkbox"/> Mitigation Bank or in-lieu fee program	<input type="checkbox"/> Payment to Provide (not approved for use with Corps permits)
D. Provide a brief description of mitigation approach and the rationale for choosing that approach. If you believe mitigation should not be required, explain why.			
Mitigation Bank / In-Lieu Fee Information:			
Name of mitigation bank or in-lieu fee project:			
Type of credits to be purchased:			
If you are proposing permittee-responsible mitigation, have you prepared a compensatory mitigation plan?			
<input type="checkbox"/> Yes. Submit the plan with this application and complete the remainder of this section.			
<input type="checkbox"/> No. A mitigation plan will need to be submitted (for DSL, this plan is required for a complete application).			
Mitigation Location Information (Fill out only if permittee-responsible mitigation is proposed)			
Mitigation Site Name/Legal Description	Mitigation Site Address	Tax Lot #	
County	City	Latitude & Longitude (in DD.DDDD format)	
Township	Range	Section	Quarter/Quarter
(10) ADJACENT PROPERTY OWNERS FOR PROJECT AND MITIGATION SITE			
<input type="checkbox"/> Pre-printed mailing labels of adjacent property owners attached	Project Site Adjacent Property Owners	Mitigation Site Adjacent Property Owners	

Contact Name John & Sandra Esplin
Address 1 33555 Hwy 53
Address 2 Nehalem, OR 97131
City, ST ZIP Code

Contact Name Greengold Dairy, LLC
Address 1 35026 Seppa Ln
Address 2 Astoria, OR 97103
City, ST ZIP Code

Contact Name)
Address 1)
Address 2)
City, ST ZIP Code)

**(11) CITY/COUNTY PLANNING DEPARTMENT LAND USE AFFIDAVIT
(TO BE COMPLETED BY LOCAL PLANNING OFFICIAL)**

- I have reviewed the project described in this application and have determined that:
- This project is not regulated by the comprehensive plan and land use regulations
 - This project is consistent with the comprehensive plan and land use regulations
 - This project is consistent with the comprehensive plan and land use regulations with the following:
 - Conditional Use Approval
 - Development Permit
 - Other Permit (explain in comment section below)
 - This project is not currently consistent with the comprehensive plan and land use regulations. To be consistent requires:
 - Plan Amendment
 - Zone Change
 - Other Approval or Review (explain in comment section below)

An application or variance request has has not been filed for approvals required above

Local planning official name (print)	Title	City/County
SARAH ABSHER CFM	Director	Tillamook
Signature		Date
Sarah Absher		April 23, 2021
Comments:		
Estuary Floodway Development Permit required as per TCLUD Sections 3.102, 3.108, 3.120, 3.140 and Section 3.510. No-rise analysis required for floodway. Application has not been made.		

(12) COASTAL ZONE CERTIFICATION

If the proposed activity described in your permit application is within the Oregon coastal zone, the following certification is required before your application can be processed. The signed statement will be forwarded to the Oregon Department of Land Conservation and Development (DLCD) for its concurrence or objection. For additional information on the Oregon Coastal Zone Management Program and consistency reviews of federally permitted projects, contact DLCD at 635 Capitol Street NE, Suite 150, Salem, Oregon 97301 or call 503-373-0050 or click [here](#).

CERTIFICATION STATEMENT
I certify that, to the best of my knowledge and belief, the proposed activity described in this application complies with the approved Oregon Coastal Zone Management Program and will be completed in a manner consistent with the program.

Print /Type Applicant Name	Title
Applicant Signature	Date

**(11) CITY/COUNTY PLANNING DEPARTMENT LAND USE AFFIDAVIT
(TO BE COMPLETED BY LOCAL PLANNING OFFICIAL)**

I have reviewed the project described in this application and have determined that:

- This project is not regulated by the comprehensive plan and land use regulations
- This project is consistent with the comprehensive plan and land use regulations
- This project is consistent with the comprehensive plan and land use regulations with the following:
 - Conditional Use Approval
 - Development Permit
 - Other Permit (explain in comment section below)
- This project is not currently consistent with the comprehensive plan and land use regulations. To be consistent requires:
 - Plan Amendment
 - Zone Change
 - Other Approval or Review (explain in comment section below)

An application or variance request has has not been filed for approvals required above

Local planning official name (print)	Title	City / County
Signature		Date
Comments:		

(12) COASTAL ZONE CERTIFICATION

If the proposed activity described in your permit application is within the Oregon coastal zone, the following certification is required before your application can be processed. The signed statement will be forwarded to the Oregon Department of Land Conservation and Development (DLCD) for its concurrence or objection. For additional information on the Oregon Coastal Zone Management Program and consistency reviews of federally permitted projects, contact DLCD at 635 Capitol Street NE, Suite 150, Salem, Oregon 97301 or call 503-373-0050 or click [here](#).

CERTIFICATION STATEMENT

I certify that, to the best of my knowledge and belief, the proposed activity described in this application complies with the approved Oregon Coastal Zone Management Program and will be completed in a manner consistent with the program.


Print /Type Applicant Name	Title
Applicant Signature	Date

(13) SIGNATURES

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and, to the best of my knowledge and belief, this information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities. By signing this application I consent to allow Corps or DSL staff to enter into the above-described property to inspect the project location and to determine compliance with an authorization, if granted. I hereby authorize the person identified in the authorized agent block below to act in my behalf as my agent in the processing of this application and to furnish supplemental information in support of this permit application. I understand that the granting of other permits by local, county, state or federal agencies does not release me from the requirement of obtaining the permits requested before commencing the project. I understand that payment of the required state processing fee does not guarantee permit issuance. To be considered complete, the fee must accompany the application to DSL. The fee is not required for submittal of an application to the Corps.

Fee Amount Enclosed	\$
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Applicant Signature (required) must match the name in Block 2


Print Name Jack Thayer	Title President, Sunset Drainage District
Signature 	Date 4-23-21

Authorized Agent Signature

Print Name	Title
Signature	Date

Landowner Signature(s)*

Landowner of the Project Site (if different from applicant)

Print Name Bruce Halverson	Title Manager, Nehalem Bay Wastewater Agency
Signature 	Date 4/23/21

Landowner of the Mitigation Site (if different from applicant)

Print Name	Title
Signature	Date

Department of State Lands, Property Manager (to be completed by DSL)

If the project is located on state-owned submerged and submersible lands, DSL staff will obtain a signature from the Land Management Division of DSL. A signature by DSL for activities proposed on state-owned submerged/submersible lands only grants the applicant consent to apply for a removal-fill permit. A signature for activities on state-owned submerged and submersible lands grants no other authority, express or implied and a separate proprietary authorization may be required.

Print Name	Title
Signature	Date

* Not required by the Corps.

(14) ATTACHMENTS

- Drawings
 - Location map with roads identified
 - U.S.G.S topographic map
 - Tax lot map
 - Site plan(s)
 - Cross section drawing(s)
 - Recent aerial photo
 - Project photos
 - Erosion and Pollution Control Plan(s), if applicable
 - DSL/Corps Wetland Concurrence letter and map, if approved and applicable
- Pre-printed labels for adjacent property owners (Required if more than 5)
- Incumbency Certificate** if applicant is a partnership or corporation
- Restoration plan or rehabilitation plan for temporary impacts
- Mitigation plan
- Wetland functional assessment and/or stream functional assessment
- Alternatives analysis
- Biological assessment (if requested by Corps project manager during pre-application coordination.)
- Stormwater management plan (may be required by the Corps or DEQ)
- Other:
 - | |
|--|
| |
|--|
 - | |
|--|
| |
|--|

Send Completed form to:

U.S. Army Corps of Engineers
ATTN: CENWP-OD-GP
PO Box 2946
Portland, OR 97208-2946
Phone: 503-808-4373
portlandpermits@usace.army.mil

OR

U.S. Army Corps of Engineers
ATTN: CENWP-OD-GE
211 E. 7th AVE, Suite 105
Eugene, OR 97401-2722
Phone: 541-465-6868
portlandpermits@usace.army.mil

Counties:

Baker, Clackamas, Clatsop, Columbia, Gilliam, Grant, Hood River, Lincoln, Malheur, Morrow, Multnomah, Polk, Sherman, Tillamook, Umatilla, Union, Wallowa, Wasco, Washington, Wheeler, Yamhill

Counties:

Benton, Coos, Crook, Curry, Deschutes, Douglas, Jackson, Jefferson, Josephine, Harney, Klamath, Lake, Lane, Linn, Marion

Send Completed form to:

DSL - West of the Cascades:
Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
Phone: 503-986-5200

OR

DSL - East of the Cascades:
Department of State Lands
1645 NE Forbes Road, Suite 112
Bend, Oregon 97701
Phone: 541-388-6112

Send all Fees to:
Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
Pay by Credit Card Online:
<https://apps.oregon.gov/dsl/EPS/>

INSTRUCTIONS FOR PREPARING THE JOINT APPLICATION

This is a joint application and must be sent to both agencies, who administer separate permit processes. For more complete instructions, contact the Corps and/or DSL or refer to online resources:

- [DSL's Removal-Fill Guide](#); or,
- The Corps Regulatory website: <http://www.nwp.usace.army.mil/Missions/Regulatory.aspx>

General Instructions and Tips

- Provide the information in the appropriate blocks of the application form. If you need more space, provide a summary in the space provided and attach additional detail as an appendix to the application. Each appendix or attachment must reference which application block number it pertains to.
- Not all items on the application form will apply to all projects.
- Electronic submittal of applications and supporting material is preferred by the Corps. If hard copies are submitted to the Corps, the submittal must be on 8 ½ x 11-inch paper and reproducible in black and white. Currently DSL does not accept electronic submittals. DSL will accept color figures and 11 X 17. Use either all double sided or all single sided paper. Do not use staples or dividers.

For complex projects or for those that may have more than minimal impacts, additional information may be necessary to complete the evaluation and make a permit decision. Alternative forms of permit applications may be acceptable; contact the Corps and DSL for more information.

Section 1. If known, indicate the type of permit/authorization applying for.

Section 2. Applicant and Landowner Contact information

Applicant: The applicant is the responsible party. If the applicant is an agency, business entity or other organization, indicate the name of the organization and a person that has the authority to sign the application. If applicant is a partnership or corporation, applicant name must match the Incumbency Certificate, and business name as listed on OR Secretary of State business registry. Applicant must not be "doing business as" or has an "assumed business name." In such cases the applicant must be an individual.

Applicant Contact Name: If applicant is a business, provide contact name for an individual representing the business.

Authorized Agent: An authorized agent is someone who has permission from the applicant to represent their interests and supply information to the agencies. An agent can be a consultant, an attorney, builder, contractor, or any other person or organization. An authorized agent is optional.

Landowner: Provide landowner information if different from the applicant. DSL requires the landowner's signature, unless the project qualifies as a linear project, e.g. road, pipeline, utility.

Section 3. Project Information

Provide location information. Latitude and longitude must be reported in decimal format and can be found by zooming in to your respective project location and reading off the coordinates displayed on the bottom of the map.

Provide information on wetlands and waterbodies within the project area. Indicate the category of activities that make up your project. For projects with multiple locations, provide latitude and longitude for each location. For linear projects, provide the latitude and longitude for the start and end points.

Section 4. Project Description

A. Overall Description: Provide a description of the overall project, including:

- o All associated work with the project both outside and within waters or wetlands.
- o Total ground disturbance for all associated work (i.e., area and volume of ground disturbance).
- o Total area of impervious surfaces created or modified by the project, if applicable.

B. Work within Waters and Wetlands: Provide a description of the proposed work within waters and wetlands, including:

- o Each removal or fill activity proposed in waters or wetlands, as well as any construction or maintenance of in- water or over-water structures.
- o The number and dimensions of in-water or over-water structures (i.e., pilings, floating docks) proposed within waters or wetlands.

C. Construction Methods: Describe how the removal and/or fill activities will be accomplished including the following:

- o Construction methods, equipment to be used, access and staging areas, etc.
- o Measures you will use during construction to minimize impacts to the waterbody or wetland. Examples may include isolating work areas, controlling construction access, site specific erosion and sediment control methods, site specific best management practices, and using specialized equipment or materials. Attach work area isolation and/or erosion and pollution control plans, if applicable.

D. Fill Material and Disposal: Provide a description of fill material and procedure for disposal of removed material, including:

- o The source(s) of fill materials (if known).
- o Locations for disposal area(s) for dredged material, if applicable. If dredged material is to be discharged on an upland site, identify the site and the steps to be taken (if necessary) to prevent runoff from the dredged material back into jurisdictional waters. If using an upland disposal area that is not a Department of Environmental Quality (DEQ) -regulated landfill, a Solid Waste Letter of Authorization or a Beneficial Use Determination from DEQ may be required.

E. Construction Timing: Provide the proposed start and completion date for the project. Describe project work that is already complete, if applicable.

F. – I. Summary of removal and fill activities: Summarize the dimensions, volume and type/composition of material being placed or removed in each waterbody or wetland. Describe each impact on a separate row. For instance, if two culverts are being removed from Clear Creek, use two rows. Add extra rows if needed, or include an attachment.

The DSL and the Corps use different elevations for determining whether an activity in tidal waters is regulated by the State's Removal-Fill law, the Clean Water Act, and/or the Rivers and Harbors Act. DSL regulates activities below the highest measured tide. The Clean Water Act applies below the high tide line. The Rivers and Harbors Act applies below the mean high water.

If jurisdictional limits are not the same for each agency, prepare a table for each agency stating impacts within that agency's jurisdiction.

Section 5. Project Purpose and Need

Explain the purpose and need for the project. Also include a brief description of any related activities needed to accomplish the project objectives.

The following items are required by DSL, as applicable:

- If the removal-fill would satisfy a public need and the applicant is a public body, include any pertinent findings regarding public need and benefit.
- If the project involves fill in the estuary for a non-water dependent use, explain how the project is for public use and/or satisfies a public need.
- If the project is located within a marine reserve or marine protected area, explain how the project is needed to study, monitor, evaluate, enforce or protect the designated area.

Section 6. Description of Resources in Project Area

Territorial Sea: For activities in the Territorial Sea (mean lower low water seaward 3 nautical miles), provide a separate evaluation of the resources and effects determination.

For each wetland, include:

- Whether the wetland is freshwater or tidal, and the Cowardin class and Hydrogeomorphic (HGM) class.
- Source of hydrology and direction of flow (if any).
- Dominant plant species by layer (herb, shrub, tree).
- A functional assessment of the wetland to be impacted (for impacts greater than 0.2 acre or any amount in estuarine waters), DSL requires use of ORWAP or HGM, should be attached as a separate document.
- Identify any vernal pools, bogs, fens, mature forested wetland, seasonal mudflats, or native wet prairies in or near the project area.
- Include relevant summary information from the wetland delineation report if available. Provide a copy of the wetland delineation report to **the Corps**, if not previously provided to Corps. If a delineation report has not been previously submitted to DSL, then submit to DSL under a separate cover.
- Describe existing uses, including fish and wildlife use (type, abundance, period of use, significance of site).

For rivers, streams, other waterbodies, lakes and ponds, include a description of, as applicable:

- Streamflow regime (e.g., perennial year-round flow, intermittent seasonal flow, ephemeral event-driven flow). If flow is ephemeral, provide streamflow assessment data sheet or other information that supports your determination.
- Field indicators used to identify the Ordinary High Water Mark (OHWM).
- Channel and bank conditions.
- Type and condition of riparian (streamside) vegetation.
- Channel morphology (structure and shape).
- Stream substrate.
- Assessment of the functional attributes including hydrologic, geomorphic, biological and chemical and nutrient related functions.
- Fish and wildlife (type, abundance, period of use, significance of site).

Section 7. Project Specific Criteria and Alternative Analysis

Provide an explanation describing how impacts to waters and wetlands are being avoided and minimized on the project site. For DSL, the alternatives analysis must include:

- Project-specific criteria that are needed to accomplish the stated project purpose.
- A range of alternative sites and designs that were considered with less impact.
- An evaluation of each alternative site and design against the project criteria and a reason for why the alternative was not chosen.
- If the project involves fill in an estuary for a non-water dependent use, a description of Alternative non- estuarine sites must be included.

The level of rigor required in this analysis should be commensurate with the level of impact proposed. Please note that additional information regarding alternatives may be necessary for Corps Individual Permits to comply with the Clean Water Act Section 404(b)(1) Guidelines. Please check with your local Corps contact early in the planning process to determine what level of analysis is required. An alternative analysis is not required for a complete application by the Corps; however, it may be required before a permit decision can be rendered.

Section 8. Additional Information

Any additional information you provide helps the reviewer(s) understand your project and the other approvals or reviews that may be required.

Section 9. Impacts, Restoration/Rehabilitation, and Compensatory Mitigation

A. Description of Impacts: Clearly identify the permanent, temporary, direct and indirect impacts. Provide a written analysis of potential changes the project may make to the hydrologic characteristics of the affected wetlands or waterbodies, and an explanation of measures taken to avoid or minimize any adverse effects of those changes, such as: impeding, restricting or increasing flows; relocating or redirecting flow; and potential flooding or erosion downstream of the project. Provide a table summarizing permanent and temporary impacts by HGM and Cowardin Classifications

B. Site Restoration/Rehabilitation: For temporary disturbance of soils and/or vegetation in waterbodies, wetlands or riparian (streamside) areas, discuss how you will restore the site after construction. This may include the following:

- Grading plans to restore pre-existing elevations.
- Planting plans and species list (native species only) to replace vegetation in riparian or wetland areas.
- Maintenance and monitoring plans to document restoration to wetland condition and/or vegetation establishment.
- Associated erosion control for site stabilization.

C.-D. Compensatory Mitigation. Describe your proposed compensatory mitigation approach, or explain why you believe compensatory mitigation is not required. If proposing permittee-responsible mitigation for permanent impact to wetlands, see OAR 141-085-0705 and 33 CFR 332.4(c) for plan requirements. For permanent impact to waters other than wetlands, see OAR 141-085-0765 and 33 CFR 332.4(c) for plan requirements.

For activities involving discharges of dredged or fill material into waters of the United States, the Corps requires the application to include a statement describing how impacts to waters of the United States are to be avoided and minimized. The application must also include either a statement describing how impacts to waters of the United States are to be compensated for or a

statement explaining why compensatory mitigation should not be required for the proposed impacts.

Section 10. Adjacent Property Owners for Project and Mitigation Site(s)

Names and addresses for properties that are adjacent to the project site and permittee responsible mitigation site (if applicable), are required. "Adjacent" means those properties that share or touch upon a common property line or are across the street or stream. If more than 5, attach pre-printed labels. A list of property owners may be obtained by contacting the county tax assessor's office.

Section 11. City/County Planning Department Land Use Affidavit

This section is required to demonstrate land use compatibility for removal fill permits and water quality certifications. Provide this form to your local planning official for them to complete and sign.

Section 12. Coastal Zone Certification

Your signature for this statement is required for projects within the coastal zone (generally, west of the summit of the Coast Range).

Section 13. Signatures

The application must be signed by the responsible party as identified in section 1. DSL also requires the landowner's signature. Linear Facilities, e.g. road, pipeline, utility, do not require landowner signature.

Section 14: Attachments

Project Drawings. A complete application must include a location map, site plan, and cross-section drawings. DSL also requires a recent aerial photo. All drawings should be clear, legible, and to scale. For the Corps, drawings must be on 8.5 by 11-inch paper and must be in black and white or clearly reproducible in black and white. DSL will accept color and 11 x 17, but all figures must be clear when reproduced in black and white. While illustrations need not be professionally prepared, they should be clear, accurate, and contain all necessary information, as follows:

Location maps (with project boundaries, including staging and construction access, scale bar and north arrow on all):

- Location map with roads identified
- U.S.G.S. Topographic map
- Tax lot map

Site plan(s), including:

- Entire project site and activity areas, which includes staging and construction access areas
- Existing and proposed contours
- Stormwater outfalls and other features
- Location of ordinary high water, wetland boundaries or other jurisdictional boundaries. Clearly identify temporary, permanent, direct and indirect impact areas within waterbodies or wetlands
- Scale bar and north arrow
- Location of staging areas and construction access
- Location of cross section(s), as applicable
- Location of mitigation area, if applicable

Cross section drawing(s), including:

- Existing and proposed elevations
- Clearly identification temporary, permanent, direct and indirect impact areas within waterbodies or wetlands
- Ordinary high water and/or wetland boundary or other jurisdictional boundaries
- Scale bar (horizontal and vertical scale)

Recent Aerial photo

- 1:200, or if not available for your site, highest resolution possible

DSL Wetland Concurrence (map and letter only)

Do NOT submit the following items to DSL (unless specifically requested by DSL for your project):

- Wetland delineation report
- Biological assessment
- Cultural/archeological reports
- Stormwater calculations
- Geotechnical reports
- Marketing reports
- Contract agreements
- Applications for other agencies such as local land use applications
- Contractor/construction specifications
- Other extraneous drawings and information

ENGINEERING "NO-RISE" CERTIFICATION

This is to certify that I am a duly qualified engineer licensed to practice in the State of Oregon.

It is to further certify that the attached technical data supports the fact that the proposed Nehalem Bay Wastewater Agency revetment repair project will
(Name of Development)

not impact the 100-year flood elevations, floodway elevations and floodway widths for the Nehalem River at published sections
(Name of Stream)

in the Flood Insurance Study for Tillamook County & Incorporated Areas (41057C0209F and 207F),
(Name of Community)

dated September 28, 2018 and will not impact the 100-year flood elevations, floodway elevations, and floodway widths at unpublished cross-sections in the vicinity of the proposed development.

Attached are the following documents that support my findings:

Technical Memorandum by WEST Consultants, Inc. dated April 9, 2021.

(Date) April 9, 2021

(Signature) Chris Bannier

(Title) Project Manager

WEST Consultants, Inc.
2601 25th Street
Suite 450
Salem, OR 97302

(Address)



Figure 5 - FEMA No-Rise Certificate

Technical Memorandum

WEST Consultants, Inc.

2601 25th St. SE
Suite 450
Salem, OR 97302-1286
(503) 485 5490
(503) 485-5491 Fax
www.westconsultants.com

Name: Bruce Halverson
Date: 9 April 2021
From: Chris Bahner, P.E., D. WRE
Subject: Nehalem Bay Wastewater Agency, No-Rise Analysis and Certification



Introduction

Per your request, a FEMA "No-Rise" hydraulic analysis was conducted for the proposed streambank repairs located along the east bank of the Nehalem River within the Nehalem Bay Wastewater Agency property limits near the City of Nehalem in Tillamook County, Oregon. The property is located within a Special Flood Hazard Area (SFHA) of the Nehalem River floodplain in the left (east) overbank between FEMA lettered cross sections "C" and "D". Further, portions of the streambank repairs will be made within the regulatory floodway. The effective base flood elevation is 13.7 ft at FEMA cross section "C" and 14.8 ft at FEMA cross section "D". Both these elevations are referenced to the North American Vertical Datum of 1988 (NAVD88), and all elevations referenced in this memorandum will be based on this vertical datum. Figure 1 presents the study area and effective FEMA flood hazard mapping. All figures referenced in the text are found at the end of this memorandum.

As specified by Article 3, Section 2.03.510(9a) of the Tillamook County Code, new construction is prohibited within a regulatory floodway "unless certification is provided by a professional registered civil engineer demonstrating through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that such encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge."

A hydraulic study was conducted in accordance with standard engineering practice for a FEMA No-Rise analysis which indicates that the proposed modifications will not result in an increase in water surface elevations during the base flood. This memorandum summarizes the analysis methodology and results.

Analysis Approach

The hydraulic study utilized the U.S. Army Corps of Engineers' (USACE) software HEC-RAS (Hydraulic Engineering Center – River Analysis System) version 5.0.7 (USACE 2019). The effective hydraulic modeling of this reach of the Nehalem River was conducted by WEST in November 2014.

Procedures set forth by FEMA Region 10 call for a multi-step analysis approach for evaluating a proposed project for No-Rise certification (FEMA 2013). The steps are as follows:

1. **Current Effective Model:** Obtain the effective model upon which the current effective base flood elevations and floodway extents is based. Effective models are archived by FEMA.
2. **Duplicate Effective Model (DEM):** Use the Current Effective Model input data to create a Duplicate Effective Model to ensure that the results recorded in the effective FIS can be reproduced within an acceptable tolerance.
3. **Corrected Effective Model (CEM):** The Duplicate Effective Model is then modified to correct any errors and incorporate the most recent topographic information.
4. **Existing Conditions Model (ECM):** The Corrected Effective Model is revised to reflect any modifications that have occurred within the floodplain since the date of the original analysis but prior to the proposed project. This model should be the best depiction of existing conditions.
5. **Proposed Conditions Model (PCM):** The Proposed Conditions Model is to reflect conditions following the completion of the project and will be compared with the Existing Conditions Model to determine the projects effects (if any). The direct comparison of water surface elevations between the results of these two models is the basis of a No-Rise analysis.

The effective model was developed by WEST Consultants, Inc. (WEST) for a Letter of Map Revision (LOMR), effective September 24, 2015. The model produced for the LOMR was used to perform the hydraulic analysis for this No-Rise.

Effective Model

Documentation accompanying the effective model indicates that it was produced using Geographic Information System (GIS) data available in the digital flood insurance map (DFIRM) for Tillamook County (FEMA) and topographic data available from the Oregon Department of Geologic and Mineral Industries (DOGAMI 2009). The model includes FEMA lettered cross sections A through J and 21 unlettered cross sections. Bathymetry at all cross sections except for the reach between River Mile (RM) 1.4 and RM 1.7 was based on NOAA data and manual adjustment to the thalweg elevations to match the FIS profiles. Bathymetry for all cross sections located between RM 1.4 and RM 1.7 was based on the bathymetric survey data obtained by WEST in March 2021. Discharges and downstream boundary conditions are based on published values in the effective Flood Insurance Study. The limits of floodway encroachments were extracted from the 'S_FLD_HAZ_LN' GIS data layer in the DFIRM. All remaining hydraulic parameters in the effective model (Manning's roughness, flow-paths, etc.) were estimated based on data listed in the FIS, publicly available aerial imagery, engineering judgement, and from observations I made during the field reconnaissance on March 1, 2021.

Duplicate Effective Model (DEM)

A Duplicate Effective Model (DEM) was created from a copy of the effective. Results from the DEM were compared with water surface elevations published in the floodway data table and on flood profiles in the FIS. The DEM results are within the minimum agreement tolerance of 0.1 feet, so it is considered sufficient for conducting a No-Rise analysis. Table 1 presents the comparison of DEM and FIS water surface elevations.

Corrected Effective Model (CEM)

The DEM was modified to create the Corrected Effective Model (CEM). The modifications consisted of adding four additional cross section at locations where the proposed streambank repairs will be made. Figure 2 shows the added cross sections. Results from the CEM were compared with the water surface elevations computed by the DEM. That comparison is presented in Table 2.

As seen in Table 2, the CEM water surface elevations for the reach represented by the additional cross sections are about 0.02 to 0.11 ft higher than the DEM water surface elevations, and the CEM water surface elevations for the river reach upstream of the additional cross section are about 0.05 to 0.15 ft lower than the DEM water surface elevations. The floodway surcharge (which is not shown in the table) is still less than that maximum 1 foot increase allowed by FEMA.

Table 1 - Duplicate Effective Model vs. Effective FIS

River Station (RM) and FEMA MS Letter		Regulatory Water Surface Elevation (ft)			With Floodway Water Surface Elevation (ft)		
		FIS Effective Model	DEM	Difference (DEM - FIS)	FIS Effective Model	DEM	Difference (FIS - DEM)
0.45	A	13.11	13.11	0.00	13.45	13.45	0.00
0.60	--	13.32	13.32	0.00	13.61	13.61	0.00
0.73	--	13.36	13.36	0.00	13.65	13.65	0.00
0.78	--	13.40	13.40	0.00	13.70	13.70	0.00
0.80	--	13.50	13.50	0.00	13.80	13.80	0.00
0.86	--	13.55	13.55	0.00	13.86	13.86	0.00
0.95	--	13.63	13.63	0.00	13.94	13.94	0.00
0.994	B	13.68	13.68	0.00	14.00	14.00	0.00
1.05	C	13.70	13.70	0.00	14.01	14.01	0.00
1.33	--	13.88	13.88	0.00	14.20	14.20	0.00
1.50	--	14.04	14.04	0.00	14.36	14.36	0.00
1.74	--	14.31	14.31	0.00	14.64	14.64	0.00
1.92	--	14.74	14.74	0.00	15.13	15.13	0.00
2.01	D	14.84	14.84	0.00	15.26	15.26	0.00
2.28	--	14.95	14.95	0.00	15.35	15.35	0.00
2.49	--	15.15	15.15	0.00	15.53	15.53	0.00
2.92	E	15.53	15.53	0.00	15.89	15.89	0.00
3.12	--	15.68	15.68	0.00	16.12	16.12	0.00
3.24	--	15.75	15.75	0.00	16.25	16.25	0.00
3.28	--	15.79	15.79	0.00	16.33	16.33	0.00
3.66	F	16.22	16.22	0.00	16.96	16.96	0.00
3.80	--	15.98	15.98	0.00	16.77	16.77	0.00
4.78	G	17.53	17.53	0.00	18.34	18.34	0.00
5.17	--	17.60	17.6	0.00	18.41	18.41	0.00
5.26	--	17.63	17.63	0.00	18.45	18.45	0.00
5.34	--	17.66	17.66	0.00	18.48	18.48	0.00
5.55	H	17.54	17.54	0.00	18.39	18.39	0.00
5.65	--	17.50	17.50	0.00	18.34	18.34	0.00
5.79	--	17.86	17.86	0.00	18.70	18.70	0.00
5.83	I	18.09	18.09	0.00	18.87	18.87	0.00
5.951	--	17.98	17.98	0.00	18.74	18.74	0.00
5.98	J	18.04	18.04	0.00	18.80	18.80	0.00

Notes: --- Indicates unlettered FEMA cross section; estimated from FIS flood profile

Table 2 - Corrected Effective Model vs. Duplicate Effective Model

River Station (RM) and FEMA XS Letter		Regulatory Water Surface Elevation (ft)			With Floodway Water Surface Elevation (ft)		
		DEM	CEM	Difference (CEM - DEM)	DEM	CEM	Difference (CEM - DEM)
0.45	A	13.11	13.11	0.00	13.45	13.45	0.00
0.60	--	13.32	13.32	0.00	13.61	13.61	0.00
0.73	--	13.36	13.36	0.00	13.65	13.65	0.00
0.78	--	13.40	13.40	0.00	13.70	13.70	0.00
0.80	--	13.50	13.50	0.00	13.80	13.80	0.00
0.86	--	13.55	13.55	0.00	13.86	13.86	0.00
0.95	--	13.63	13.63	0.00	13.94	13.94	0.00
0.994	B	13.68	13.68	0.00	14.00	14.00	0.00
1.05	C	13.70	13.70	0.00	14.01	14.01	0.00
1.33	--	13.88	13.88	0.00	14.20	14.20	0.00
1.40*		13.95	14.06	0.11	14.27	14.38	0.11
1.50	--	14.04	14.11	0.07	14.36	14.43	0.07
1.59*		14.10	14.16	0.06	14.43	14.46	0.03
1.63*		14.18	14.26	0.08	14.51	14.53	0.02
1.69*		14.25	14.29	0.04	14.58	14.59	0.01
1.74	--	14.31	14.34	0.03	14.64	14.67	0.03
1.92	--	14.74	14.59	-0.15	15.13	15.01	-0.12
2.01	D	14.84	14.70	-0.14	15.26	15.13	-0.13
2.28	--	14.95	14.81	-0.14	15.35	15.23	-0.12
2.49	--	15.15	15.02	-0.13	15.53	15.42	-0.11
2.92	E	15.53	15.41	-0.12	15.89	15.78	-0.11
3.12	--	15.68	15.56	-0.12	16.12	16.01	-0.11
3.24	--	15.75	15.63	-0.12	16.25	16.14	-0.11
3.28	--	15.79	15.67	-0.12	16.33	16.22	-0.11
3.66	F	16.22	16.11	-0.11	16.96	16.86	-0.10
3.80	--	15.98	15.86	-0.12	16.77	16.67	-0.10
4.78	G	17.53	17.46	-0.07	18.34	18.28	-0.06
5.17	--	17.60	17.54	-0.06	18.41	18.35	-0.06
5.26	--	17.63	17.56	-0.07	18.45	18.39	-0.06
5.34	--	17.66	17.60	-0.06	18.48	18.42	-0.06
5.55	H	17.54	17.47	-0.07	18.39	18.32	-0.07
5.65	--	17.50	17.43	-0.07	18.34	18.28	-0.06
5.79	--	17.86	17.80	-0.06	18.70	18.65	-0.05
5.88	I	18.09	18.03	-0.06	18.87	18.82	-0.05
5.951	--	17.98	17.93	-0.05	18.74	18.69	-0.05
5.98	J	18.04	17.99	-0.05	18.80	18.75	-0.05

Notes: --- Indicates unlettered FEMA cross section; estimated from FIS flood profile
 * Indicates new cross section

Existing Conditions Model (ECM)

No changes were made for the ECM, so the ECM is the same as the CEM.

Proposed Conditions Model (PCM)

The proposed conditions incorporate the rock fill materials that will be used to make the streambank repairs. These repairs will be made within six individual reaches along the east bank of the Nehalem River adjacent to the Nehalem Bay Wasteway Agency property. The reaches are shown in Figure 3, and cross sections of the proposed revetment repairs are shown in Figure 4. The PCM was created from the ECM by modifying the cross sections to reflect the proposed changes associated with the rock revetment repairs.

Analysis Results

Water surface elevations predicted by the ECM and PCM models were compared to determine if the proposed rock revetment repairs would result in a rise in water surface elevations for either the base flood or the floodway. Table 3 presents the computed water surface elevations for the ECM and PCM, and the calculated difference. As the table indicates, the proposed revetment repairs will not result in a rise in water surface elevations along the Nehalem River for either the base flood or the floodway. A FEMA No-Rise Certificate is provided in Figure 5. Supporting data, including the effective FEMA flood hazard mapping and modeling cross sections, are included in Appendix A.

If you have any questions, please feel free to contact me by phone at (503) 485-5490, or by email at cbahner@westconsultants.com.

Table 3 - Proposed Conditions vs. Existing Conditions

River Station (RM) and FEMA MS Letter		Regulatory Water Surface Elevation (ft)			With Floodway Water Surface Elevation (ft)		
		ECM	PCM	Difference (PCM - ECM)	ECM	PCM	Difference (PCM - ECM)
0.45	A	13.11	13.11	0.00	13.45	13.45	0.00
0.60	--	13.32	13.32	0.00	13.61	13.61	0.00
0.73	--	13.36	13.36	0.00	13.65	13.65	0.00
0.78	--	13.40	13.40	0.00	13.70	13.70	0.00
0.80	--	13.50	13.50	0.00	13.80	13.80	0.00
0.86	--	13.55	13.55	0.00	13.85	13.85	0.00
0.95	--	13.63	13.63	0.00	13.94	13.94	0.00
0.994	B	13.68	13.68	0.00	14.00	14.00	0.00
1.05	C	13.70	13.70	0.00	14.01	14.01	0.00
1.33	--	13.88	13.88	0.00	14.20	14.20	0.00
1.40*		14.06	14.06	0.00	14.38	14.38	0.00
1.50*	--	14.11	14.11	0.00	14.43	14.43	0.00
1.59*		14.16	14.16	0.00	14.46	14.46	0.00
1.63*		14.26	14.26	0.00	14.53	14.53	0.00
1.69*		14.29	14.29	0.00	14.59	14.59	0.00
1.74	--	14.34	14.34	0.00	14.67	14.67	0.00
1.92	--	14.59	14.59	0.00	15.01	15.01	0.00
2.01	D	14.70	14.70	0.00	15.13	15.13	0.00
2.28	--	14.81	14.81	0.00	15.23	15.23	0.00
2.49	--	15.02	15.02	0.00	15.42	15.42	0.00
2.92	E	15.41	15.41	0.00	15.78	15.78	0.00
3.12	--	15.56	15.56	0.00	16.01	16.01	0.00
3.24	--	15.63	15.63	0.00	16.14	16.14	0.00
3.28	--	15.67	15.67	0.00	16.22	16.22	0.00
3.66	F	16.11	16.11	0.00	16.86	16.86	0.00
3.80	--	15.86	15.86	0.00	16.67	16.67	0.00
4.78	G	17.46	17.46	0.00	18.28	18.28	0.00
5.17	--	17.54	17.54	0.00	18.35	18.35	0.00
5.26	--	17.56	17.56	0.00	18.39	18.39	0.00
5.34	--	17.6	17.60	0.00	18.42	18.42	0.00
5.55	H	17.47	17.47	0.00	18.32	18.32	0.00
5.65	--	17.43	17.43	0.00	18.28	18.28	0.00
5.79	--	17.80	17.80	0.00	18.65	18.65	0.00
5.88	I	18.03	18.03	0.00	18.82	18.82	0.00
5.951	--	17.93	17.93	0.00	18.69	18.69	0.00
5.98	J	17.99	17.99	0.00	18.75	18.75	0.00

Notes: --- Indicates unlettered FEMA cross section; estimated from FIS flood profile

* Indicates cross sections modified per proposed revetment repairs

References

U.S. Army Corps of Engineers, Hydrologic Engineering Center; HEC-RAS, River Analysis System, Software Version 5.0.7; March 2019

U.S. Department of Homeland Security, Federal Emergency Management Agency; Flood Insurance Study for Tillamook County, OR and Incorporated Areas, 41057C002A, Vol. 1 and 2; Effective September 28, 2018

U.S. Department of Homeland Security, Federal Emergency Management Agency; Letter of Map Revision, Case No. 14-10-1695P; Effective September 24, 2015

U.S. Department of Homeland Security, Federal Emergency Management Agency, Region X; Procedures for "No-Rise" Certification for Proposed Developments in the Regulatory Floodway; October 2013

Oregon Department of Geology and Mineral Industries; Light Detection and Ranging (LIDAR) data; OLC North Coast 2020; Published August 2009

Figures

Figure 1 - Study Area with Effective FEMA Flood Hazard Mapping

Figure 2 - Cross Sections Added for CEM

Figure 3 - Proposed Revetment: Repair Reaches

Figure 4 - Proposed Revetment: Cross Sections

Figure 5 - FEMA No-Rise Certificate

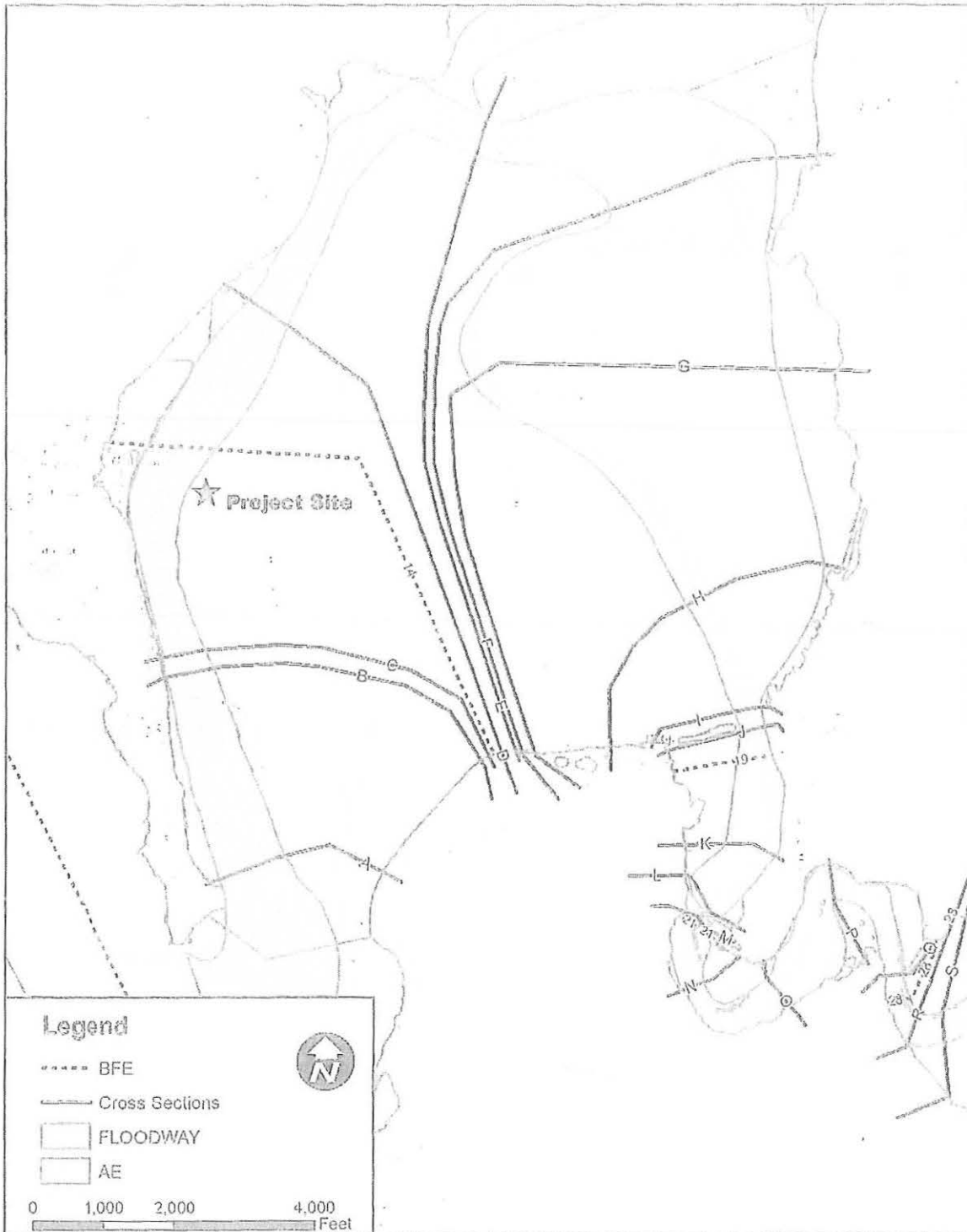


Figure 1 - Study Area with Effective FEMA Flood Hazard Mapping

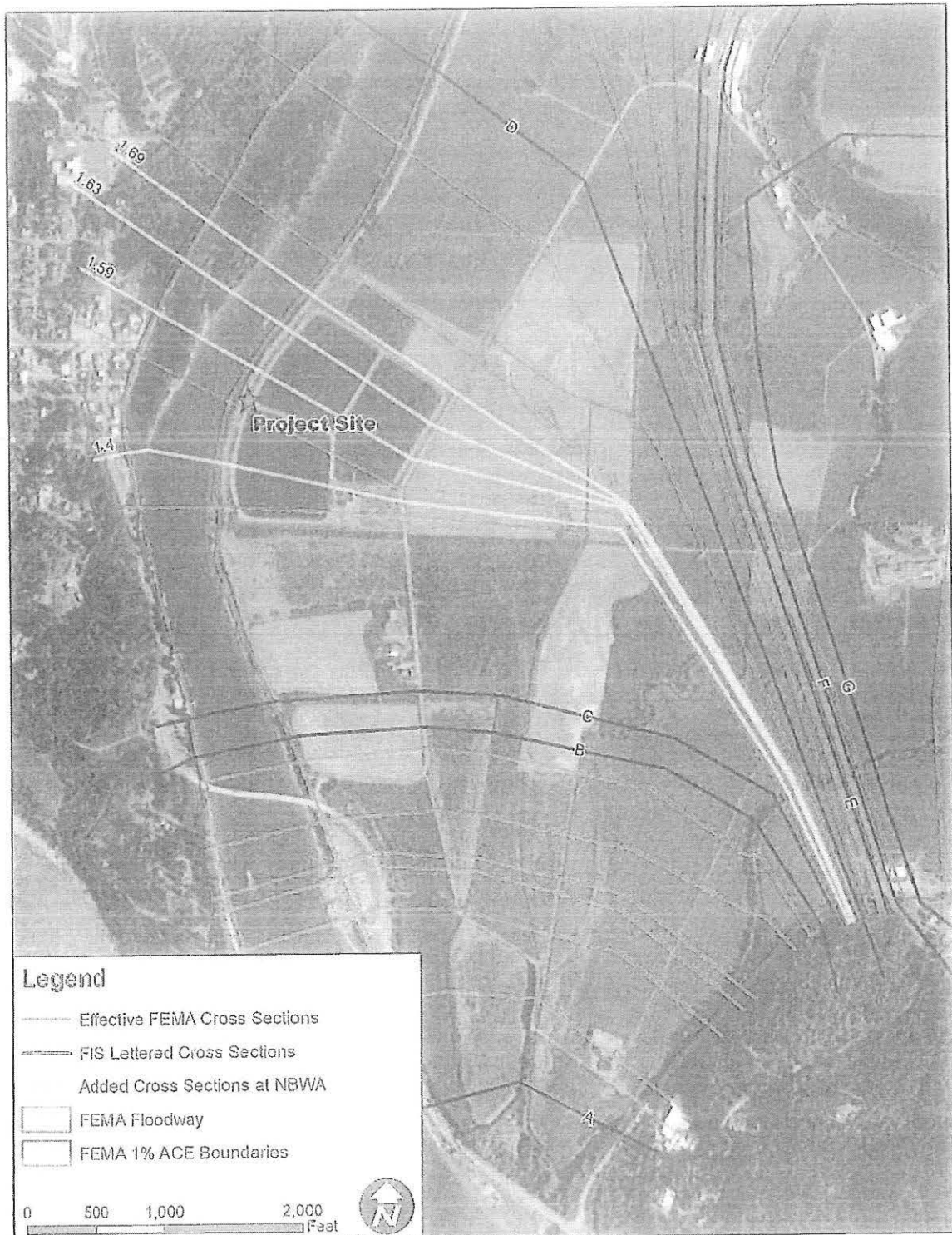


Figure 2 - Cross Sections Added for CEM



Figure 3 – Proposed Revetment Repair Reaches

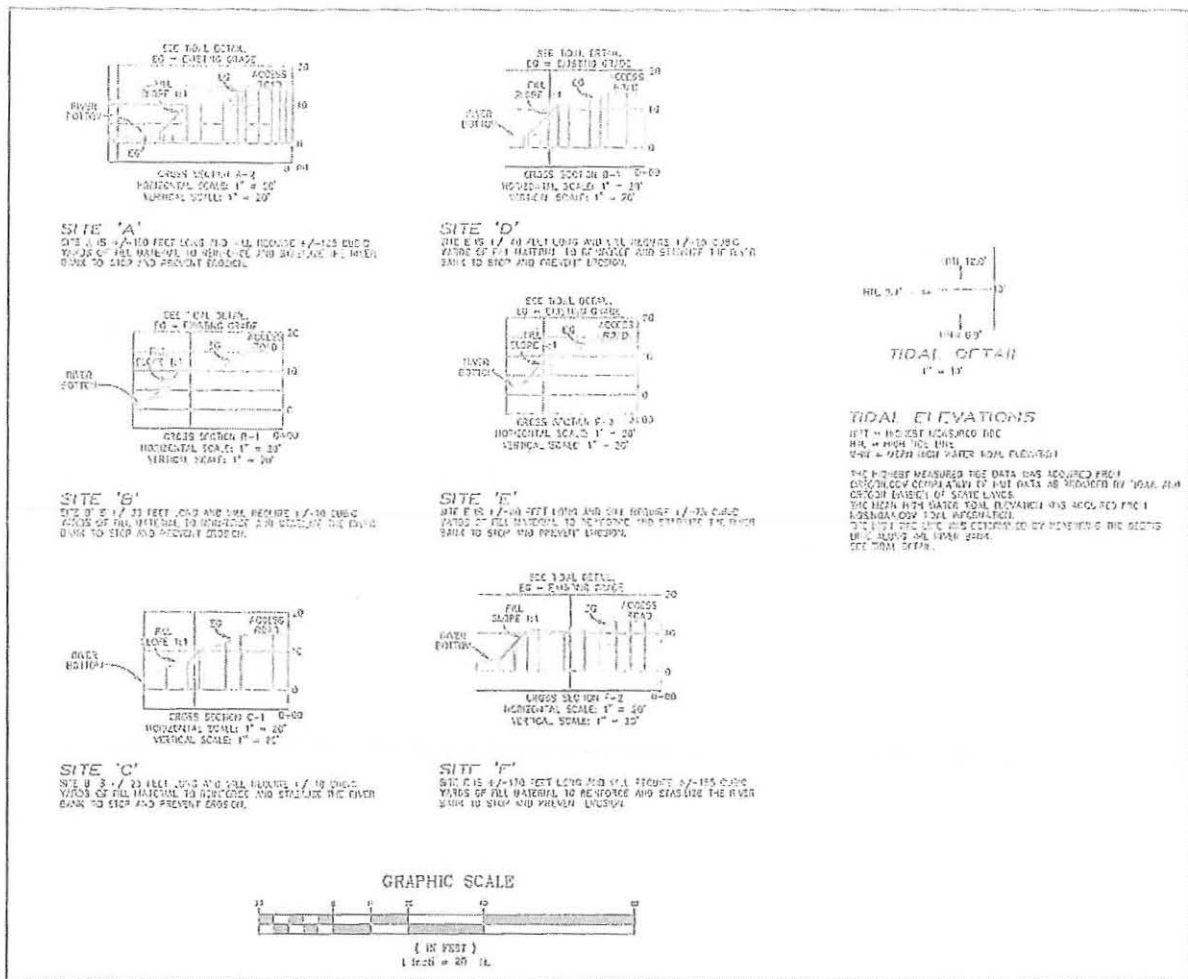


Figure 4 - Proposed Revetment Cross Sections

Appendix A

Effective FIRM Panel

Effective Floodway Data Table

HEC-RAS Cross Section Plots, Existing and Proposed Conditions

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National Flood Hazard Layer FIRMaple



Legend

1:250,000 Scale National Flood Hazard Layer FIRMaple

SPECIAL FLOOD HAZARD AREAS
 Special Flood Hazard Areas (SFHA) are areas of land that are subject to flooding and are designated as such by the Federal Emergency Management Agency (FEMA). SFHAs are divided into several categories, including Special Flood Hazard Areas (SFHA), Special Flood Hazard Areas (SFHA), and Special Flood Hazard Areas (SFHA).

OTHER AREAS OF FLOOD HAZARD
 Other areas of flood hazard include areas that are subject to flooding but are not designated as SFHAs. These areas include areas that are subject to flooding but are not designated as SFHAs, areas that are subject to flooding but are not designated as SFHAs, and areas that are subject to flooding but are not designated as SFHAs.

OTHER AREAS
 Other areas include areas that are not subject to flooding but are designated as such by FEMA. These areas include areas that are not subject to flooding but are designated as such by FEMA, areas that are not subject to flooding but are designated as such by FEMA, and areas that are not subject to flooding but are designated as such by FEMA.

GENERAL FEATURES
 General features include roads, water bodies, and other infrastructure. These features are shown in various colors and line styles to indicate their type and importance. General features include roads, water bodies, and other infrastructure. These features are shown in various colors and line styles to indicate their type and importance.

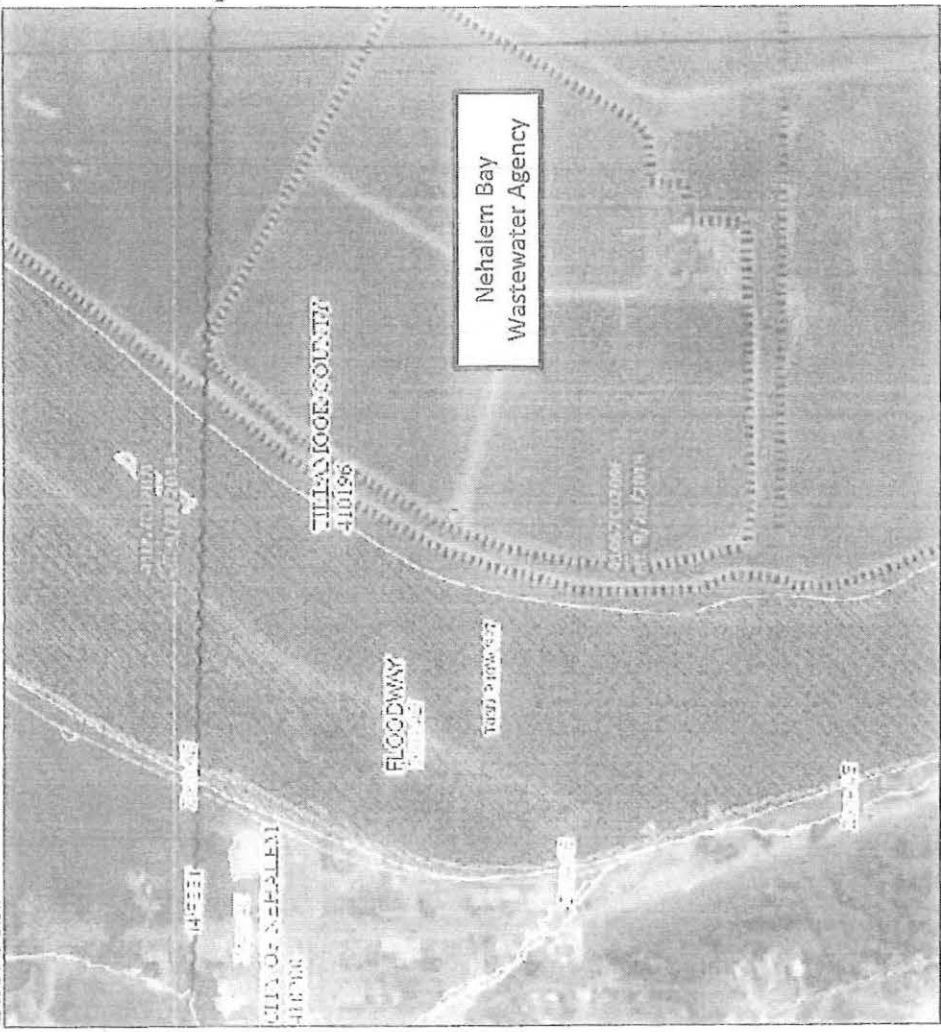
OTHER FEATURES
 Other features include areas that are not subject to flooding but are designated as such by FEMA. These areas include areas that are not subject to flooding but are designated as such by FEMA, areas that are not subject to flooding but are designated as such by FEMA, and areas that are not subject to flooding but are designated as such by FEMA.

SCALE
 The scale of the map is 1:6,000. This means that 1 inch on the map represents 6,000 feet in reality. The scale is indicated by the scale bar at the bottom of the map.

PROJECTION
 The map uses the North American Datum of 1983 (NAD83) projection. This projection is used for most maps of the United States and is based on the Earth's shape and the location of the map.

DATA SOURCES
 The data for this map was collected from several sources, including the National Flood Hazard Layer (NFHL) and the National Flood Insurance Program (NFIP). The data was collected from several sources, including the National Flood Hazard Layer (NFHL) and the National Flood Insurance Program (NFIP).

DISCLAIMER
 This map is for informational purposes only and should not be used for any other purpose. The map is not a guarantee of accuracy and should be used in conjunction with other information. This map is for informational purposes only and should not be used for any other purpose. The map is not a guarantee of accuracy and should be used in conjunction with other information.



Effective FEMA FIRMaple Panel

LOCATION		FLOODWAY			1% ANNUAL CHANGE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	2,360	1,045	16,508	4.8	19.1	12.1	19.5	0.4
B	5,172	675	13,924	5.2	19.6	13.8	14.0	0.4
C	5,455	617	13,139	5.5	19.7	13.7	14.0	0.3
D	10,617	740	14,548	4.0	14.8	14.2	15.3	0.5
E	15,349	570	9,568	6.5	15.5	15.5	15.9	0.4
F	19,036	2,430	20,974	6.0	16.2	16.0	17.0	0.8
G	25,156	4,355	41,742	3.3	17.5	17.5	18.4	0.9
H	29,642	1,816	12,272	6.1	17.5	17.5	18.4	0.9
I	31,318	349	5,523	9.0	16.0	16.0	16.6	0.6
J	31,608	270	6,188	9.8	16.0	16.0	16.6	0.6
K	33,368	734	9,487	6.7	20.3	20.3	20.7	0.4
L	34,492	670	9,377	7.1	20.3	20.3	21.7	0.9
M	34,620	846	7,700	7.7	20.3	20.3	21.7	0.9
N	35,660	326	7,069	8.9	23.5	23.5	24.5	0.5
O	37,350	491	11,808	4.8	25.3	25.3	26.4	0.6
P	39,090	582	10,916	5.4	23.6	23.6	27.1	0.6
Q	40,680	285	5,970	8.8	37.4	37.4	37.9	0.5
R	41,490	466	10,047	5.8	28.8	28.8	29.4	0.3
S	41,800	405	9,623	5.9	29.0	29.0	29.5	0.3
T	42,830	286	6,434	8.2	29.5	29.5	30.9	0.9
U	43,210	373	6,362	7.1	30.7	30.7	31.2	0.5
V	45,790	370	7,391	7.7	32.4	32.4	32.9	0.5
W	47,330	596	9,370	6.7	32.9	32.9	33.7	0.3
X	48,885	681	12,588	4.5	33.7	33.7	34.7	1.0

¹Feet above confluence with Nehalem Bay

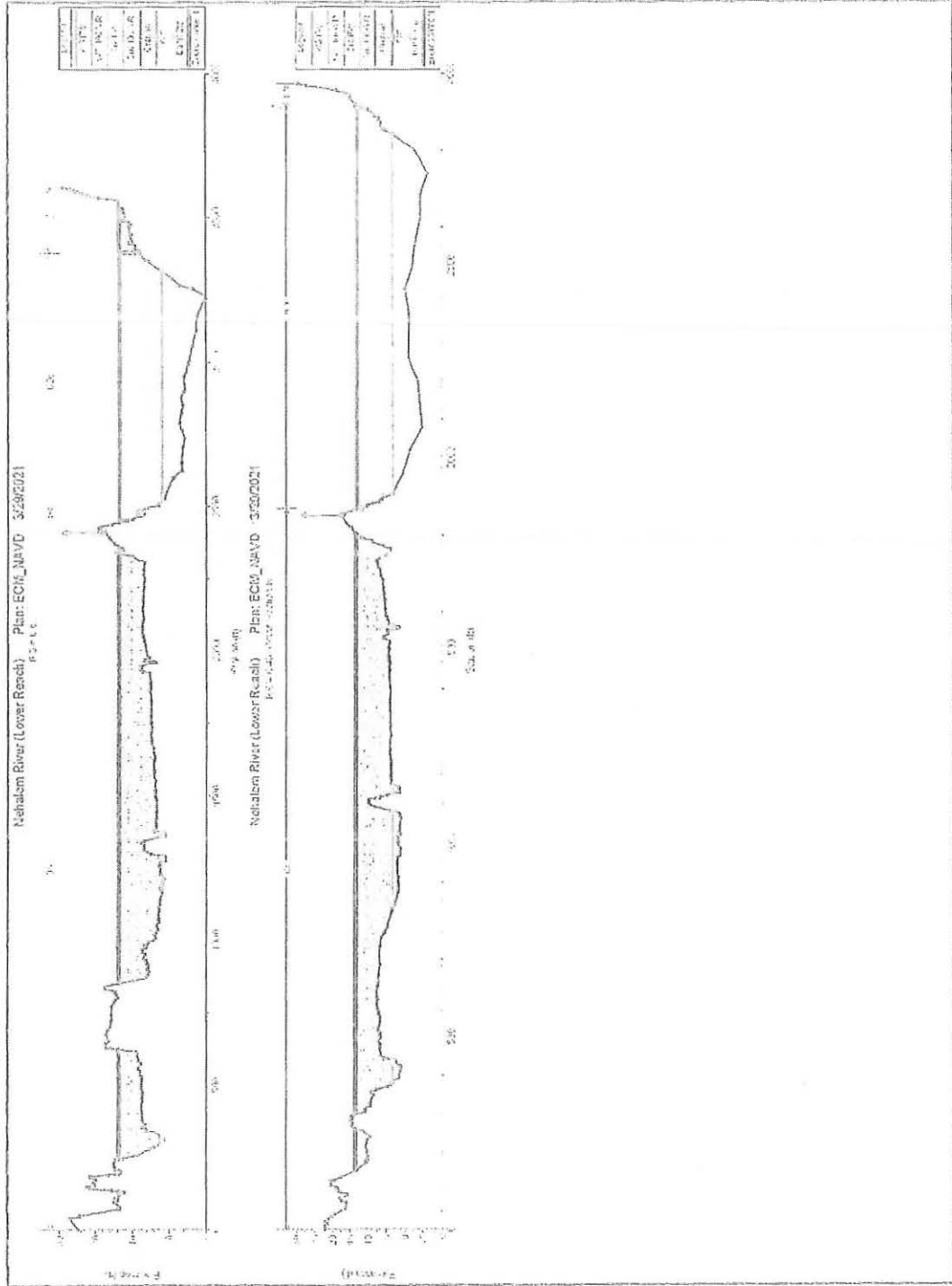
TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY
 TILLAMOOK COUNTY, OREGON
 AND INCORPORATED AREAS

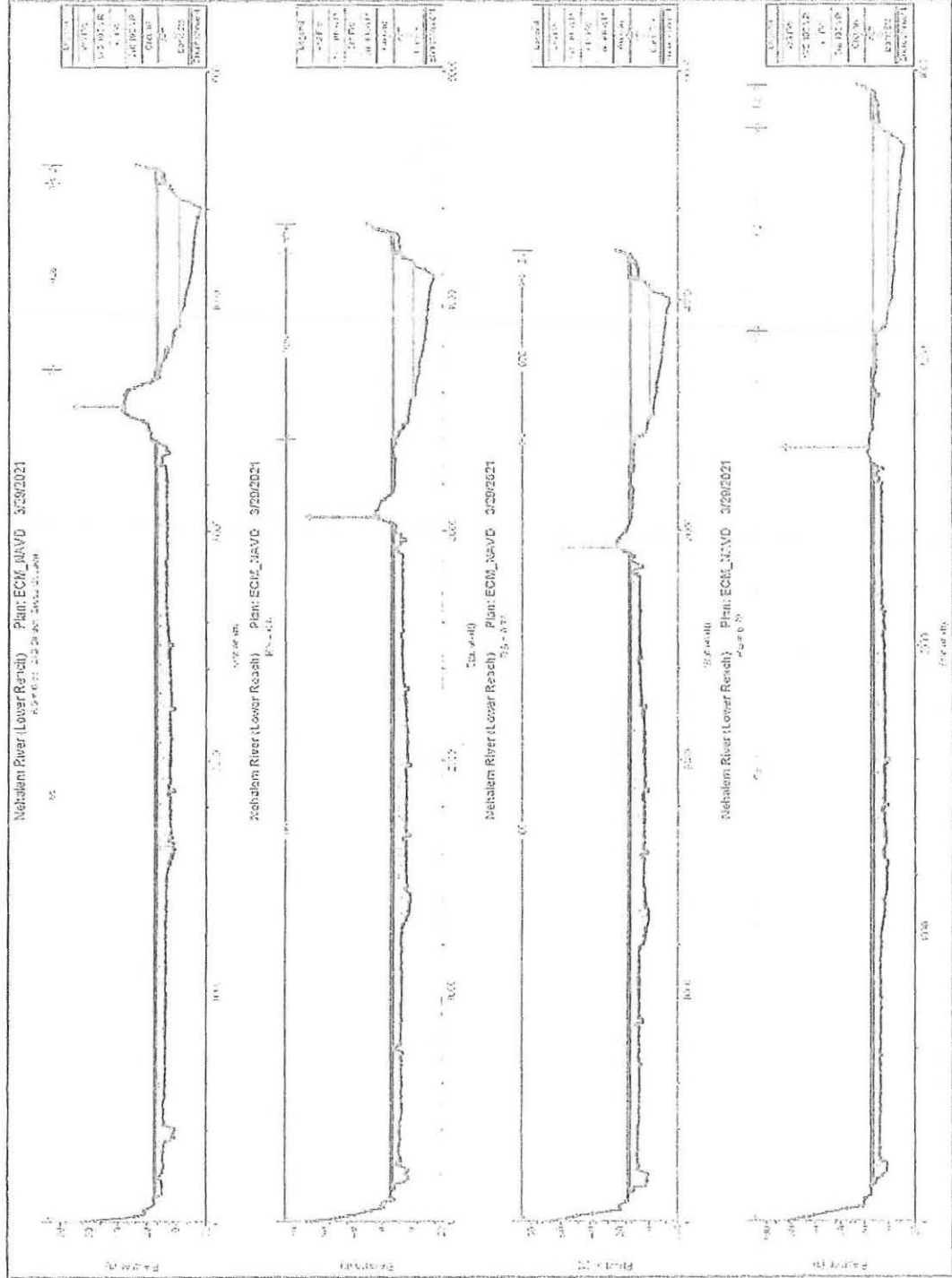
FLOODWAY DATA

FLOODING SOURCE: NEHALEM RIVER

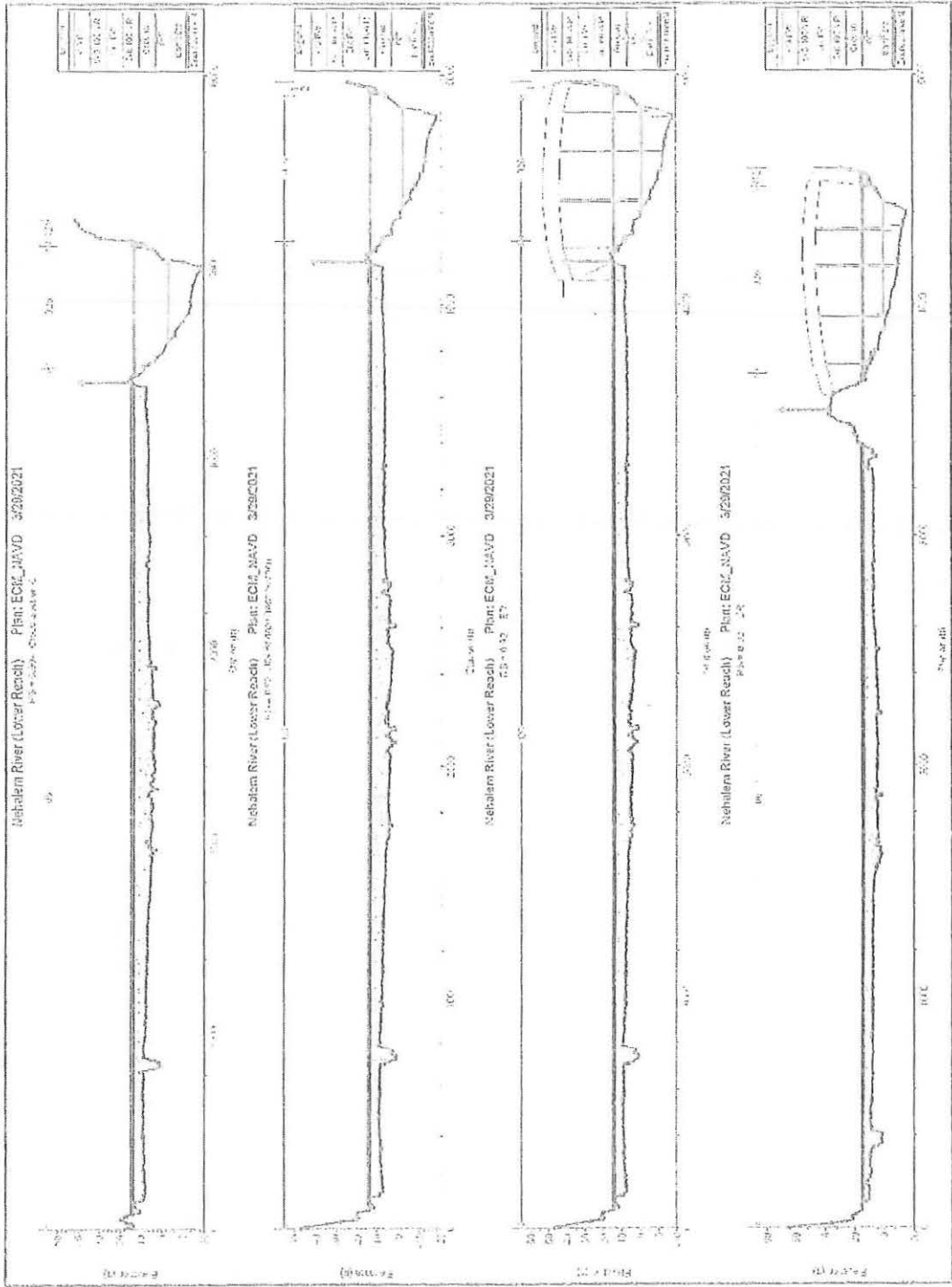
MEC-RAS Cross Section Plots - Existing Conditions



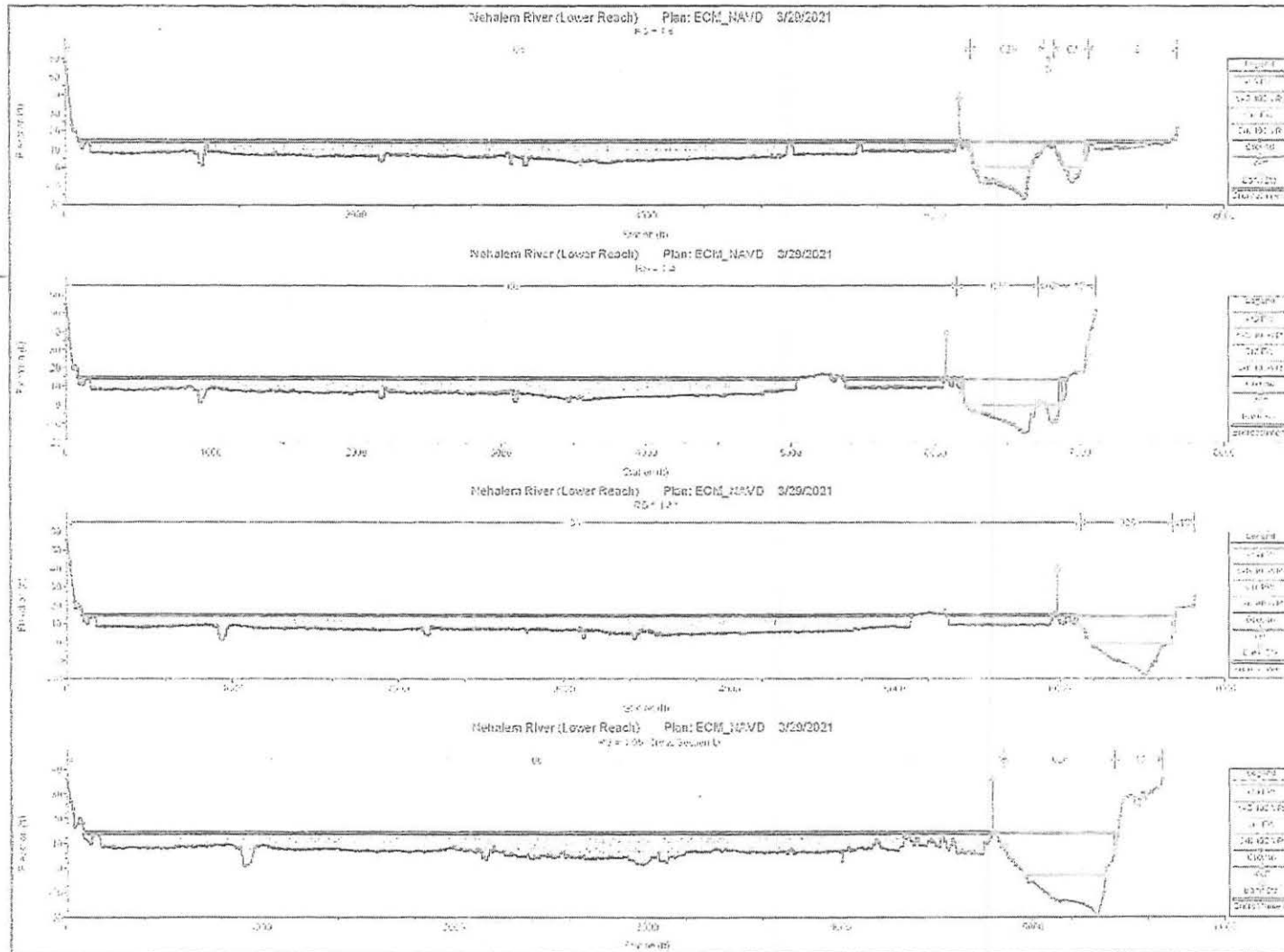
HEC-RAS Cross Section Plots – Existing Conditions



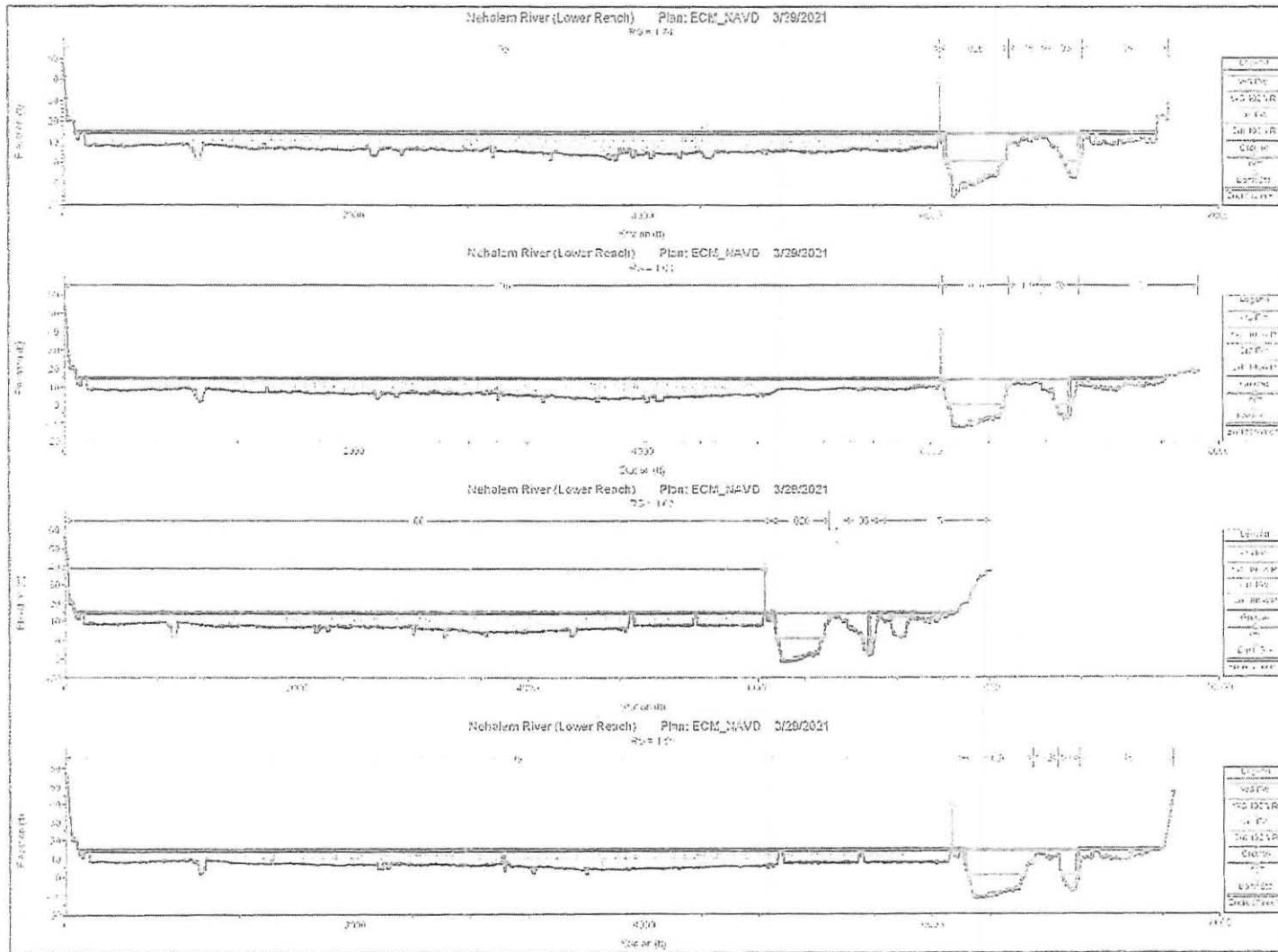
MEC-RAS Cross Section Plots – Existing Conditions



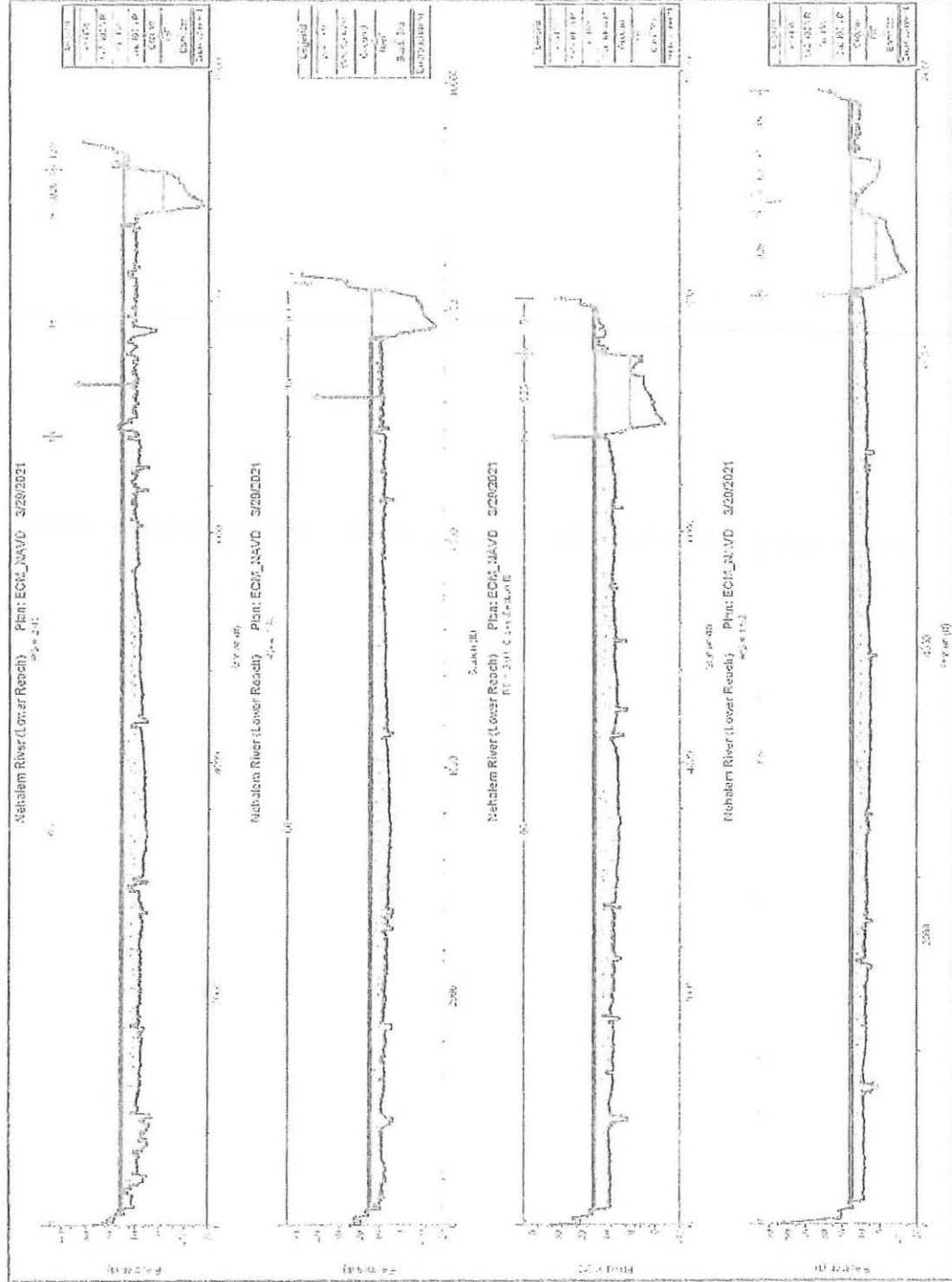
MEC-RAS Cross Section Plots – Existing Conditions



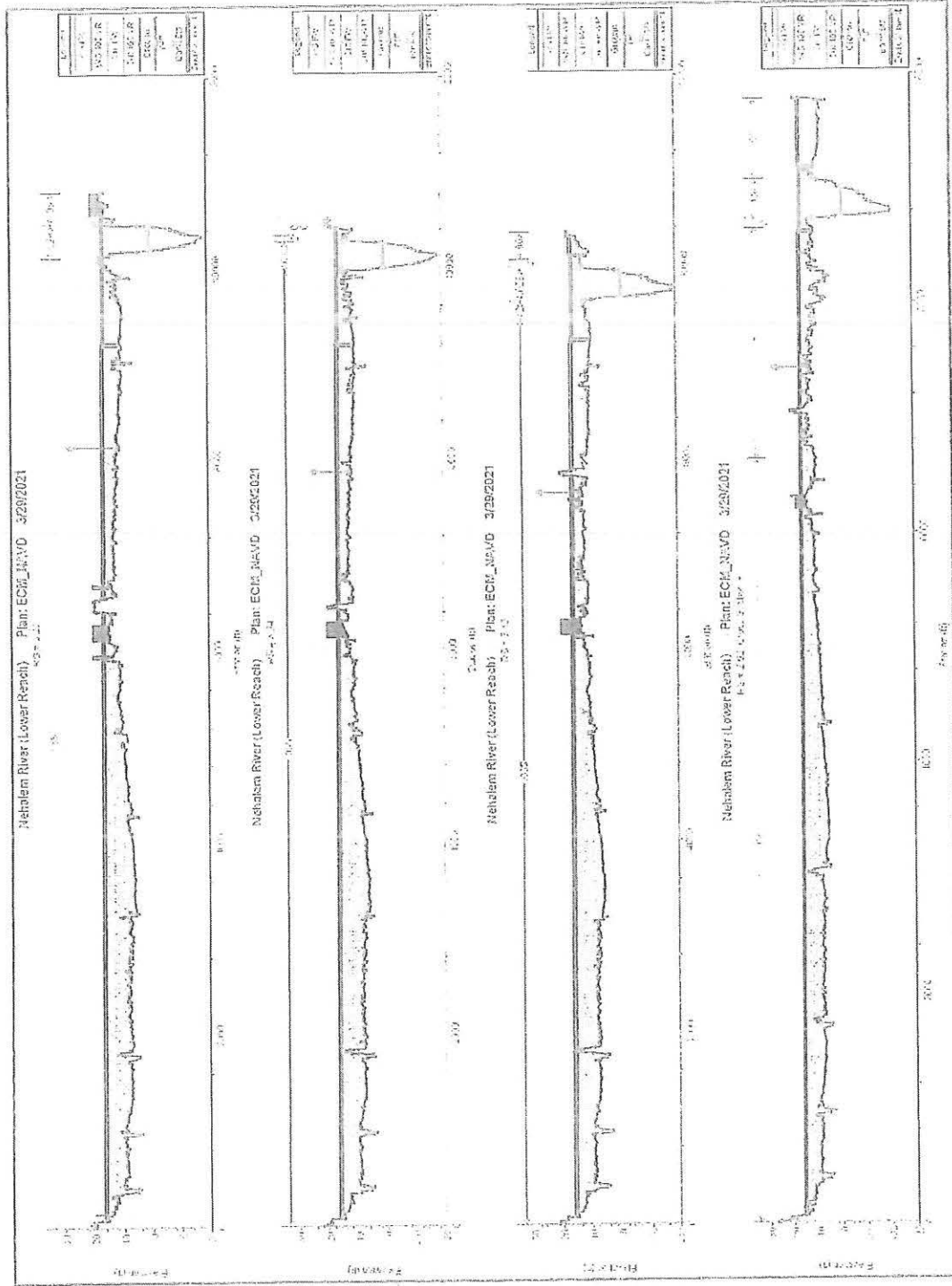
HEC-RAS Cross Section Plots – Existing Conditions



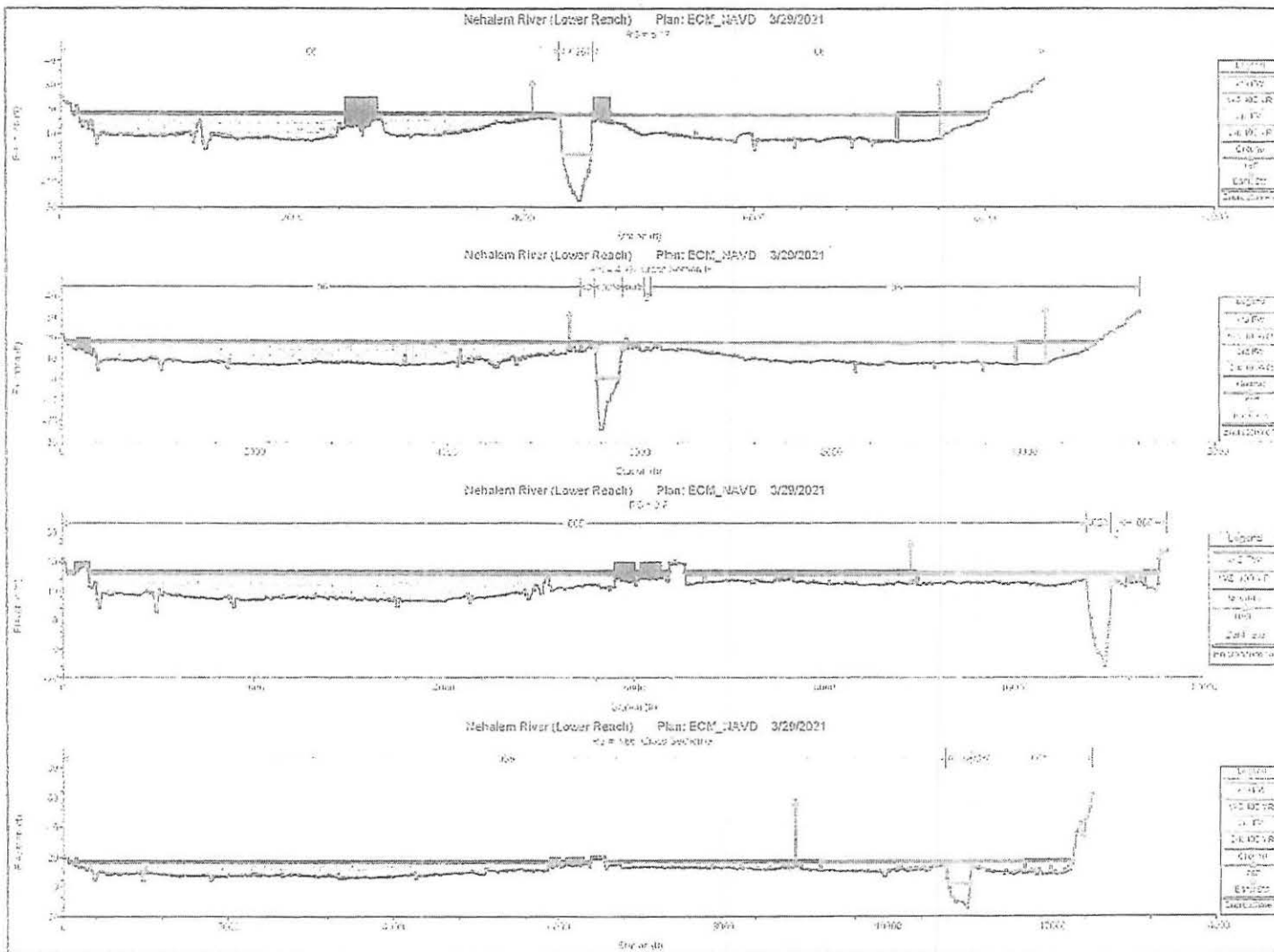
HEC-RAS Cross Section Plots - Existing Conditions



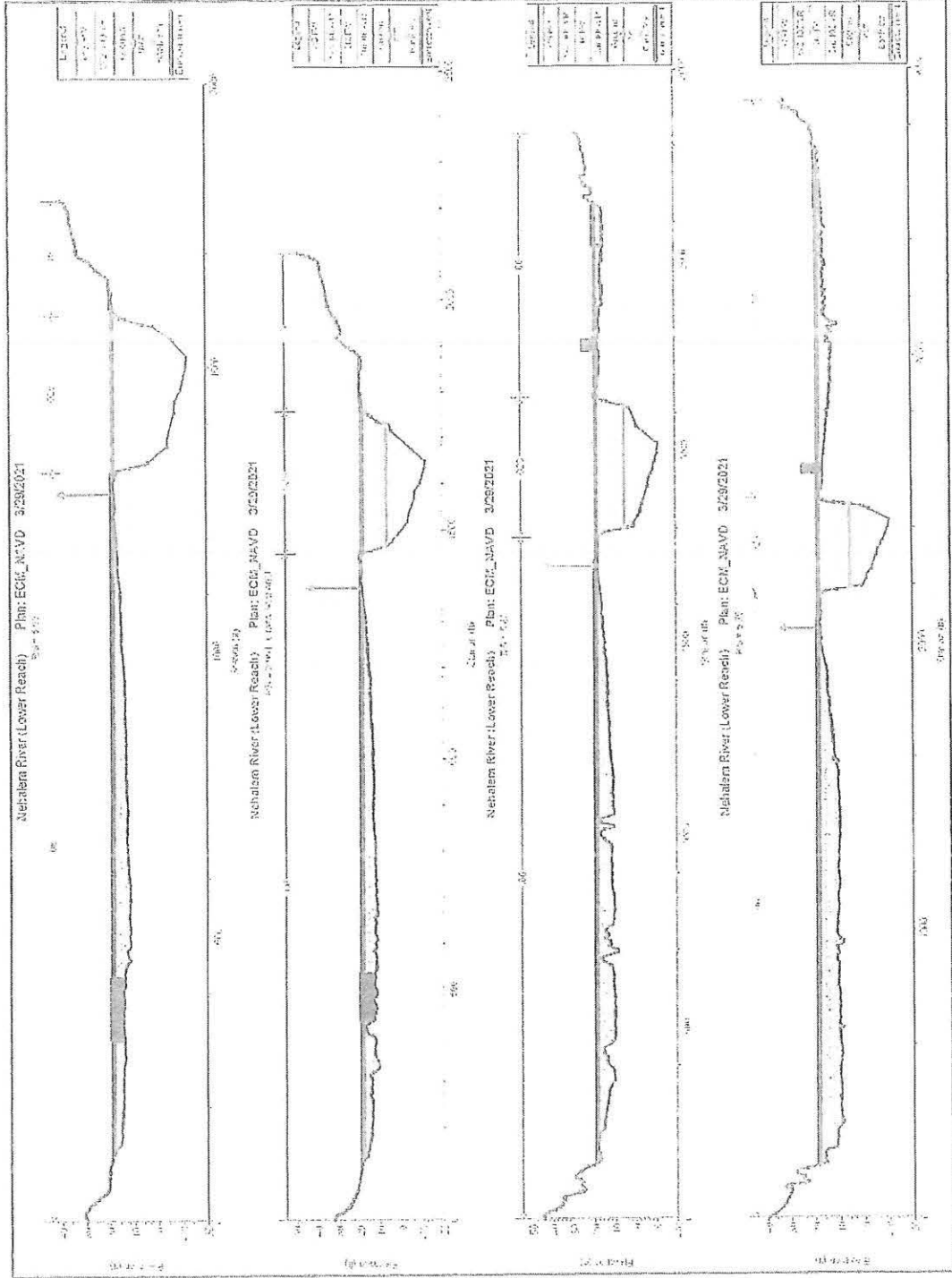
HEC-RAS Cross Section Plots – Existing Conditions



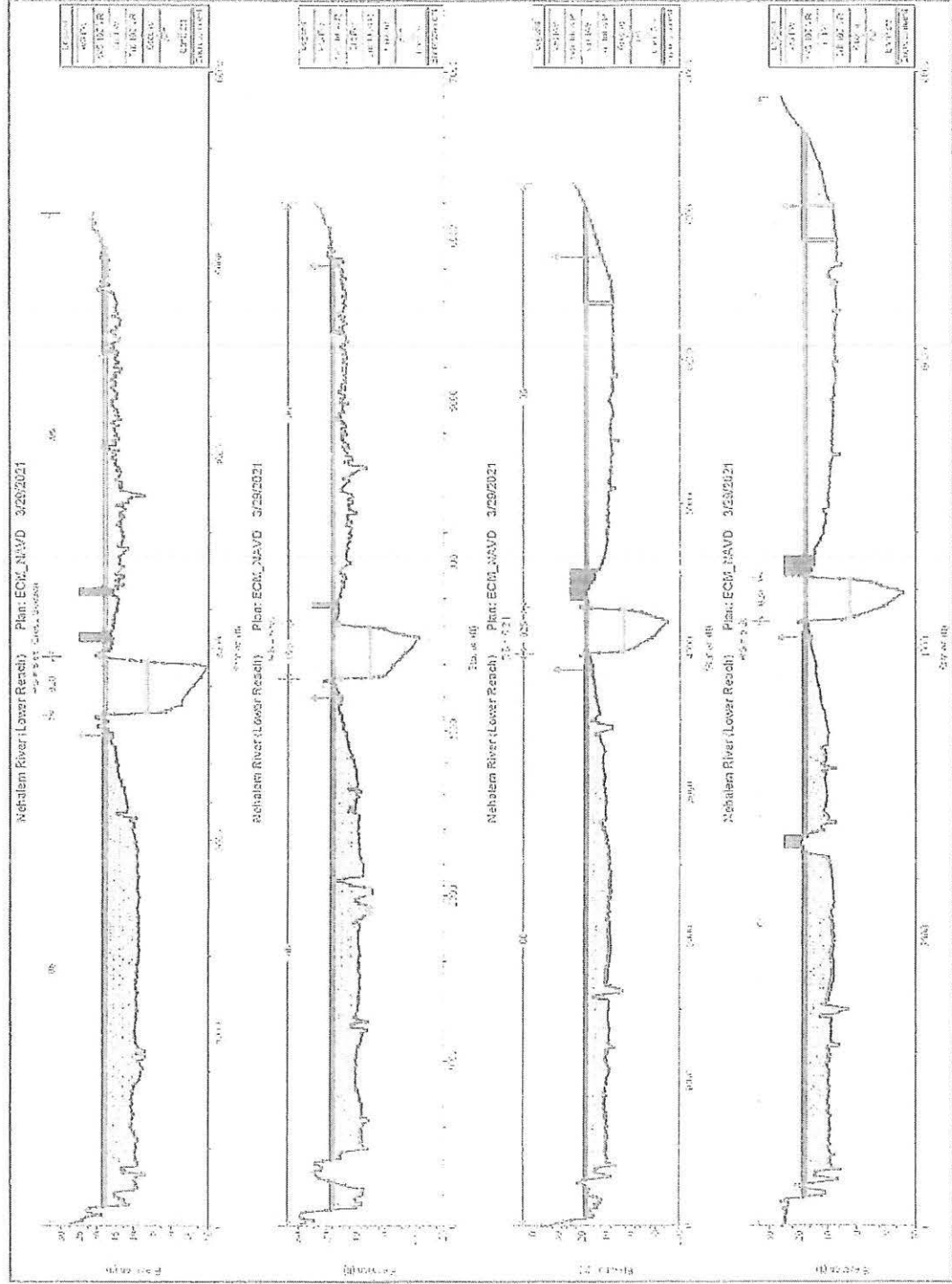
HEC-RAS Cross Section Plots – Existing Conditions



HEC-RAS Cross Section Plots - Existing Conditions



HEC-RAS Cross Section Plots - Existing Conditions



NOTES

THIS MAP DOES NOT CONSTITUTE A BOUNDARY SURVEY OF THE SUBJECT PROPERTY. THE PURPOSE OF THIS MAP IS TO SHOW THE LOCATION OF THE PROPOSED FILL/RIP RAP PLACEMENT FOR SHORELINE STABILIZATION.
THE COORDINATES ON THIS MAP ARE BASED UPON NAD 83 OREGON STATE PLANE COORDINATES, OREGON NORTH ZONE.
THE ELEVATIONS ON THIS MAP ARE NAVD 88, BASED ON NGS MONUMENT 711 AT THE INTERSECTION OF OREGON STATE HIGHWAY #53 AND OREGON COAST HIGHWAY #101.
TO ADJUST FROM NAVD 88 TO MEAN LOWER LOW WATER, SUBTRACT 0.41' FROM ELEVATIONS SHOWN HEREON.



SHEET 1 OF 5
PERMIT SKETCHES FOR:
SUNSET DRAINAGE

VICINITY MAP

WEST 1/2, SECTION 27, T3N, R10W, W.M.
TILLAMOOK COUNTY
MAY 14, 2019

**ONION PEAK
DESIGN**

PO BOX 326
NEHALEM, OR 97131
(503) 368-6102
FAX (503) 368-6102

"SUNSET" #A2019
SUNSET1903-T.DWG

SITE 'A'

SITE A IS +/- 160 FEET LONG AND WILL REQUIRE +/- 195 CUBIC YARDS OF FILL MATERIAL TO REINFORCE AND STABILIZE THE RIVER BANK TO STOP AND PREVENT EROSION.

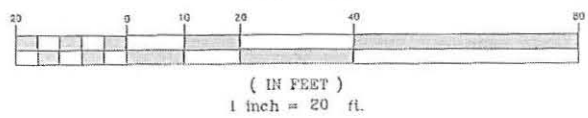
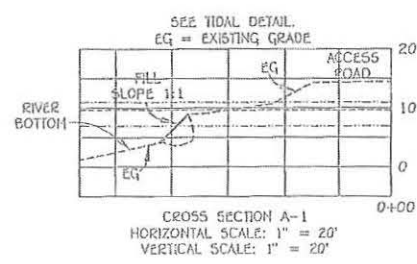
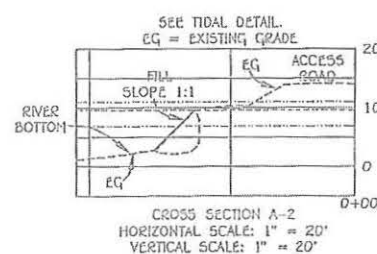
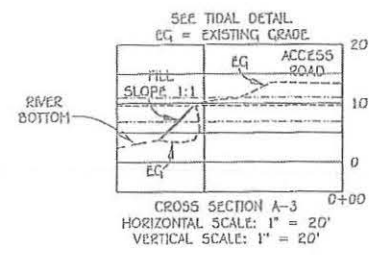
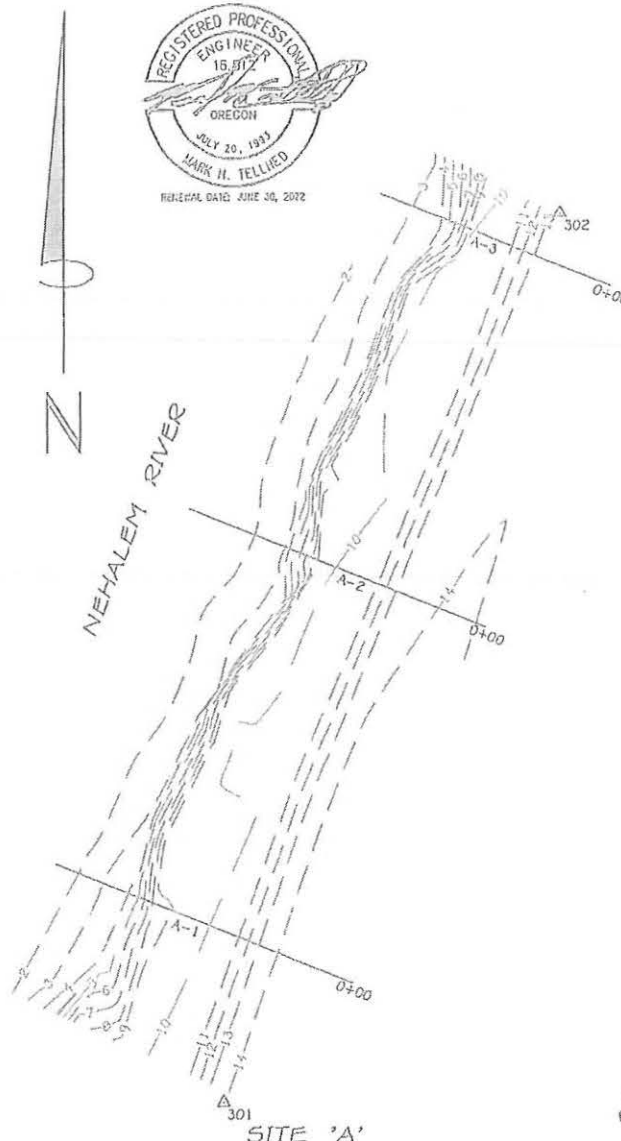
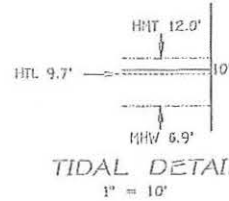
SITE DEFINITION

POINT#	NORTHING	EASTING	ELEVATION
301	765428.83	7336328.10	15.37'
302	765580.07	7336387.91	14.61'

TIDAL ELEVATIONS

HMT = HIGHEST MEASURED TIDE
 HTL = HIGH TIDE LINE
 MHW = MEAN HIGH WATER TIDAL ELEVATION

THE HIGHEST MEASURED TIDE DATA WAS ACQUIRED FROM OREGON.GOV COMPILATION OF HMT DATA AS PROVIDED BY NOAA AND OREGON DIVISION OF STATE LANDS.
 THE MEAN HIGH WATER TIDAL ELEVATION WAS ACQUIRED FROM NGS.NOAA.GOV TIDAL INFORMATION.
 THE HIGH TIDE LINE WAS DETERMINED BY MEASURING THE DEBRIS LINE ALONG THE RIVER BANK.
 SEE TIDAL DETAIL.



**ONION PEAK
 DESIGN**
 PO BOX 326
 NEHALEM, OR 97131
 (503) 368-6102
 FAX (503) 368-6102

"SUNSET" #A2019
 SUNSET1903-T.DWG

SHEET 2 OF 5
 PERMIT SKETCHES FOR:
SUNSET DRAINAGE
 SITE A
 CROSS SECTION &
 CALCULATIONS
 WEST 1/2, SECTION 27, T3N, R10W, W.M.
 TILLAMOOK COUNTY
 MAY 14, 2019

SITE 'D'

SITE D IS +/-40 FEET LONG AND WILL REQUIRE +/-25 CUBIC YARDS OF FILL MATERIAL TO REINFORCE AND STABILIZE THE RIVER BANK TO STOP AND PREVENT EROSION.

SITE 'E'

SITE E IS +/-80 FEET LONG AND WILL REQUIRE +/-75 CUBIC YARDS OF FILL MATERIAL TO REINFORCE AND STABILIZE THE RIVER BANK TO STOP AND PREVENT EROSION.

SITE DEFINITION

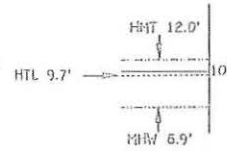
POINT#	NORTHING	EASTING	ELEVATION
307	766063.50	7336708.03	14.76'
308	766090.65	7336730.47	15.13'
309	766132.34	7336764.82	14.90'
310	766193.35	7336815.65	15.15'



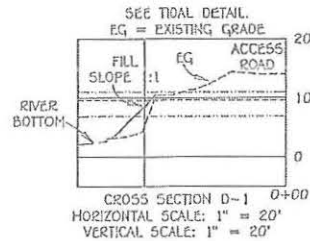
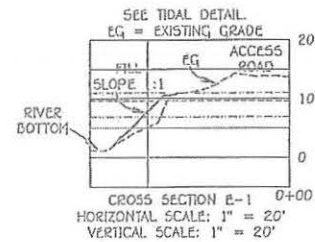
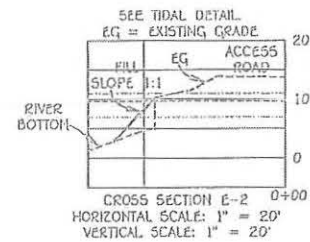
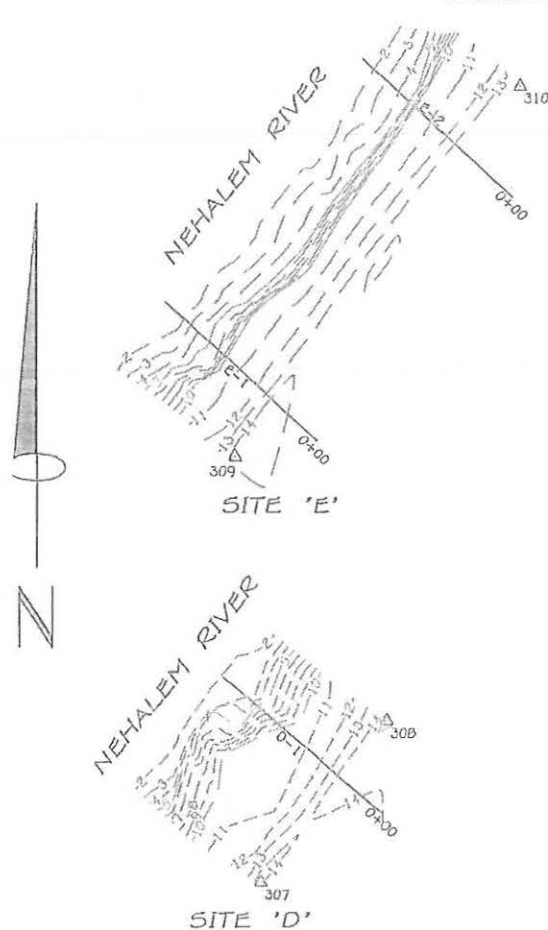
TIDAL ELEVATIONS

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 HTL = HIGH TIDE LINE
 MHW = MEAN HIGH WATER TIDAL ELEVATION

THE HIGHEST MEASURED TIDE DATA WAS ACQUIRED FROM OREGON.GOV COMPILATION OF HMT DATA AS PROVIDED BY NOAA AND OREGON DIVISION OF STATE LANDS.
 THE MEAN HIGH WATER TIDAL ELEVATION WAS ACQUIRED FROM NGS.NOAA.GOV TIDAL INFORMATION.
 THE HIGH TIDE LINE WAS DETERMINED BY MEASURING THE DEBRIS LINE ALONG THE RIVER BANK.
 SEE TIDAL DETAIL.



TIDAL DETAIL
 1" = 10'



(IN FEET)
 1 inch = 20 ft.

**ONION PEAK
 DESIGN**

PO BOX 326
 NEHALEM, OR 97131
 (503) 368-6102
 FAX (503) 368-6102

"SUNSET" #A2019
 SUNSET1903-T.DWG

SHEET 4 OF 5
 PERMIT SKETCHES FOR:
SUNSET DRAINAGE

SITES D & E
 CROSS SECTIONS &
 CALCULATIONS

WEST 1/2, SECTION 27, T3N, R10W, W.M.
 TILLAMOOK COUNTY
 MAY 14, 2019

SITE 'F'

SITE F IS +/-170 FEET LONG AND WILL REQUIRE +/-155 CUBIC YARDS OF FILL MATERIAL TO REINFORCE AND STABILIZE THE RIVER BANK TO STOP AND PREVENT EROSION.

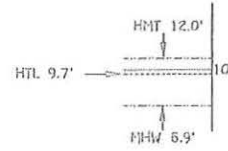
SITE DEFINITION

POINT#	NORTHING	EASTING	ELEVATION
315	766447.37	7337020.20	14.80'
316	766501.33	7337126.40	14.18'

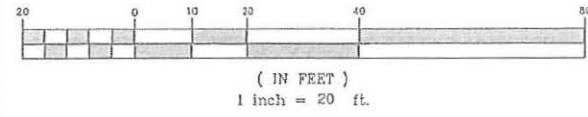
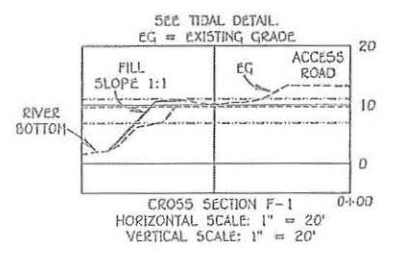
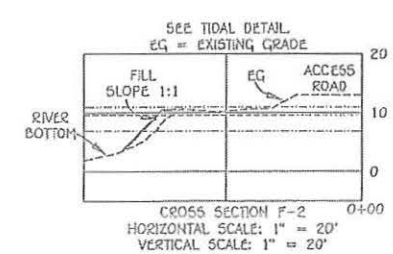
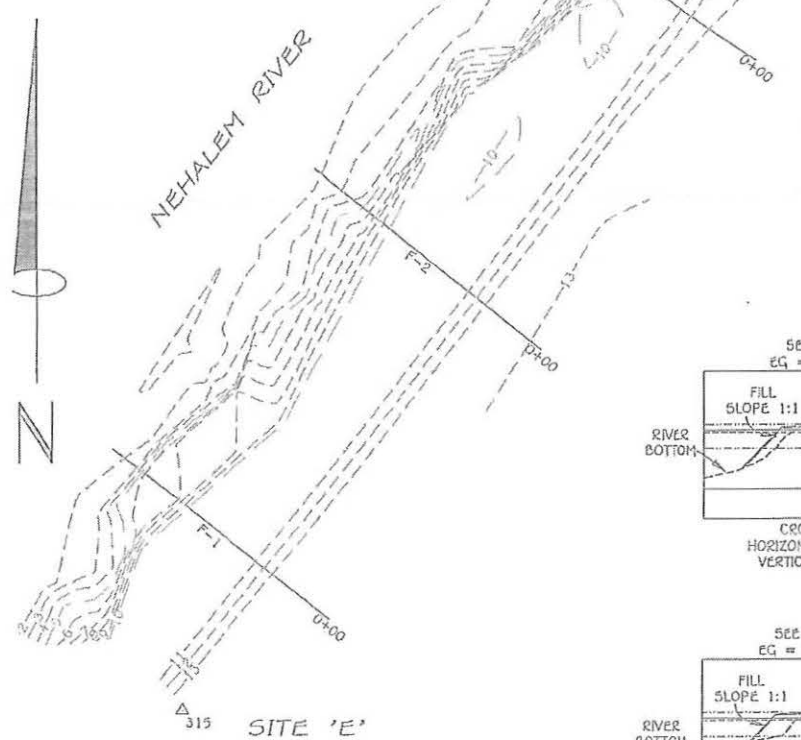
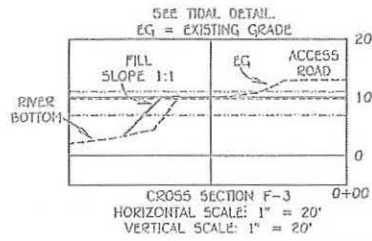
TIDAL ELEVATIONS

HMT = HIGHEST MEASURED TIDE
 HTL = HIGH TIDE LINE
 MHW = MEAN HIGH WATER TIDAL ELEVATION

THE HIGHEST MEASURED TIDE DATA WAS ACQUIRED FROM OREGON.GOV COMPILATION OF HMT DATA AS PROVIDED BY NOAA AND OREGON DIVISION OF STATE LANDS.
 THE MEAN HIGH WATER TIDAL ELEVATION WAS ACQUIRED FROM NGS.NOAA.GOV TIDAL INFORMATION.
 THE HIGH TIDE LINE WAS DETERMINED BY MEASURING THE DEBRIS LINE ALONG THE RIVER BANK.
 SEE TIDAL DETAIL.



TIDAL DETAIL
 1" = 10'



ONION PEAK DESIGN
 PO BOX 326
 NEHALEM, OR 97131
 (503) 368-6102
 FAX (503) 368-6102

SHEET 5 OF 5
 PERMIT SKETCHES FOR:
SUNSET DRAINAGE
 SITE F
 CROSS SECTION &
 CALCULATIONS
 WEST 1/2, SECTION 27, T3N, R10W, W.M.
 TILLAMOOK COUNTY
 MAY 14, 2019

"SUNSET" #A2019
 SUNSET1903-T.DWG

EXHIBIT C

Sarah Absher

From: BRADLEY Robert * ODFW <Robert.BRADLEY@odfw.oregon.gov>
Sent: Thursday, February 17, 2022 10:10 AM
To: Sarah Absher
Subject: EXTERNAL: RE: Notice of Application 851-21-000432

[NOTICE: This message originated outside of Tillamook County -- **DO NOT CLICK** on links or open attachments unless you are sure the content is safe.]

Sarah,

The applicant needs to obtain and comply with applicable state and federal permits in addition to the county. I believe they have not received a fill/removal permit from DSL yet, though the Corp may have issued one.

Placed fill should be the minimum necessary to stabilize the erosion. ODFW would recommend some natural materials (i.e., large wood) incorporated into the repairs. Planting of native vegetation should also be considered if opportunities exist that won't impact the levee structure or access to it.

Robert

Robert W. Bradley
District Fish Biologist
Oregon Department of Fish and Wildlife
North Coast Watershed District
4907 Third St
Tillamook, OR 97141
503-842-2741 x18613 (w)
503-842-8385 (fax)

Note new email address as of 4/26/21: Robert.Bradley@odfw.oregon.gov

From: Sarah Absher <sabsher@co.tillamook.or.us>
Sent: Friday, February 04, 2022 5:36 PM
To: Sarah Absher <sabsher@co.tillamook.or.us>
Cc: Lynn Tone <ltone@co.tillamook.or.us>
Subject: Notice of Application
Importance: High

Sincerely,



Sarah Absher, CFM, Director
TILLAMOOK COUNTY | Community Development
1510-B Third Street
Tillamook, OR 97141
Phone (503) 842-3408 x3317
sabsher@co.tillamook.or.us