FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 2 OF 3

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
FORT BRAGG, CITY OF	060184
MENDOCINO COUNTY UNINCORPORATED AREAS	060183
PINOLEVILLE INDIAN RESERVATION	060058
POINT ARENA, CITY OF	060185
UKIAH, CITY OF	060186
WILLITS, CITY OF	060187

FEMA

PRELIMINARY

SEP 14, 2015

REVISED:

FLOOD INSURANCE STUDY NUMBER
06045CV002B

Version Number 2.3.2.0

TABLE OF CONTENTS
Volume 1

Figures

TABLE OF CONTENTS
Volume 1, Continued

Tables

TABLE OF CONTENTS
Volume 2

TABLE OF CONTENTS
Volume 2, Continued

TABLE OF CONTENTS

Volume 3

Exhibits

Published Separately

5.3 Coastal Analyses

For the areas of Mendocino County that are impacted by coastal flooding processes, coastal flood hazard analyses were performed to provide estimates of coastal BFEs. Coastal BFEs reflect the increase in water levels during a flood event due to extreme tides and storm surge as well as overland wave effects.

The following subsections provide summaries of how each coastal process was considered for this FIS Report. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation. Table summarizes the methods and/or models used for the coastal analyses. Refer to Section 2.5.1 for descriptions of the terms used in this section.

Table 15: Summary of Coastal Analyses

Flooding Source	Study Limits From	Study Limits To	Hazard Evaluated	Model or Method Used	Date Analysis was Completed
Pacific Ocean	Border of Humboldt County	Border of Sonoma County	Wave Runup	TAW	10/28/2013

5.3.1 Total Stillwater Elevations

The total stillwater elevations (stillwater including storm surge plus wave setup) for the 1% annual chance flood were determined for areas subject to coastal flooding. The models and methods that were used to determine storm surge and wave setup are listed in Table . The stillwater elevation that was used for each transect in coastal analyses is shown in Table 17, "Coastal Transect Parameters." Figure shows the total stillwater elevations for the 1% annual chance flood that was determined for this coastal analysis.

Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas

Storm Surge Statistics

Storm surge is modeled based on characteristics of actual storms responsible for significant coastal flooding. The characteristics of these storms are typically determined by statistical study of the regional historical record of storms or by statistical study of tidal gages.

When historic records are used to calculate storm surge, characteristics such as the strength, size, track, etc., of storms are identified by site. Storm data was used in conjunction with numerical hydrodynamic models to determine the corresponding storm surge levels. An extreme value analysis was performed on the storm surge modeling results to determine a stillwater elevation for the 1% annual chance event.

Tidal gages can be used instead of historic records of storms when the available tidal gage record for the area represents both the astronomical tide component and the storm surge component. Table 16 provides the gage name, managing agency, gage type, gage identifier, start date, end date, and statistical methodology applied to each gage used to determine the stillwater elevations.

Table 16: Tide Gage Analysis Specifics

Gage Name	Managing Agency of Tide Gage Record	Gage Type	Start Date	End Date	Statistical Methodology
Arena Cove	NOAA	Tide	4/10/1933	12/31/2009	*
Crescent City	NOAA	Tide	8/16/1977	12/31/2009	*
Humboldt Bay, North Split	NOAA	Tide	4/9/1978	12/31/2009	*
La Jolla	NOAA	Tide	1/10/975	12/31/2009	*
Los Angeles	NOAA	Tide	6/30/1854	12/31/2009	*
Monterey	NOAA	Tide	11/4/1973	12/31/2009	*
Newport Bay Entrance	NOAA	Tide	5/31/1945	12/31/2009	*
Oil Platform Harvest	NOAA	Tide	5/13/1992	12/31/2009	*
Port San Luis	NOAA	Tide	2/26/1974	12/31/2009	*
Point Reyes	NOAA	Tide	11/25/1973	12/31/2009	*
San Diego	NOAA	Tide	11/28/1923	12/31/2009	*
San Francisco	NOAA	Tide	8/2/1955	12/31/2009	*
Santa Barbara	NOAA	Tide	8/1/1924	12/31/2009	*
Santa Monica	NOAA	Tide	1/26/1906	12/31/2009	*

*Data Not Available

Wave Setup Analysis

Wave setup was computed during the storm surge modeling through the methods and models listed in Table and included in the frequency analysis for the determination of the total stillwater elevations.

5.3.2 Waves

Water level and wave information from the tide gauge analysis and the SHELF model were used as inputs to the 1-dimensional onshore flood hazard analyses. Wave setup, runup, overtopping, event-based erosion, and overland wave propagation were analyzed, where appropriate, at transects placed along the coastline. Transects are shown on the FIRM panels and are depicted in the Transect Location Maps (Figure 9). Transect profiles were obtained from LiDAR

in the Transect Location Maps (Figure 9). Transect profiles were obtained from LiDAR collected by the Ocean Protection Council and the United States Geological Survey between 2009 and 2011. Bathymetric data was obtained from the NOAA. Various datasets were merged to create a seamless terrain for use in this study.

5.3.3 Coastal Erosion

A single storm episode can cause extensive erosion in coastal areas. Storm-induced erosion was evaluated to determine the modification to existing topography that is expected to be associated with flooding events. Erosion was evaluated using the methods listed in Table .

5.3.4 Wave Hazard Analyses

Overland wave hazards were evaluated to determine the combined effects of ground elevation, vegetation, and physical features on overland wave propagation and wave runup. These analyses were performed at representative transects along all shorelines for which waves were expected to be present during the floods of the selected recurrence intervals. The results of these analyses were used to determine elevations for the 1% annual chance flood.

Transect locations were chosen with consideration given to the physical land characteristics as well as development type and density so that they would closely represent conditions in their locality. Additional consideration was given to changes in the total stillwater elevation. Transects were spaced close together in areas of complex topography and dense development or where total stillwater elevations varied. In areas having more uniform characteristics, transects were spaced at larger intervals. Transects shown in Figure 9, "Transect Location Map," are also depicted on the FIRM. Table 17 provides the location, stillwater elevations, and starting wave conditions for each transect evaluated for overland wave hazards. In this table, "starting" indicates the parameter value at the beginning of the transect.

Wave Runup Analysis

Wave runup analyses were performed to determine the height and extent of runup beyond the limit of stillwater inundation for the 1% annual chance flood. Wave runup elevations were modeled using the methods and models listed in Table .

Table 17: Coastal Transect Parameters

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
1	413621.61	4427110.14	36.6	42.2	44.3	49.1	VE	44
2	417883.80	4421373.58	17.5	20.0	21.1	23.8	VE	21
3	421762.13	4414682.82	31.3	35.1	36.7	40.2	VE	37
4	424442.13	4411204.34	26.9	33.3	36.1	42.8	VE	36

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
5	427300.69	4409371.77	29.0	32.9	34.3	37.1	VE	34
6	427743.00	4407115.17	16.6	17.9	18.4	19.3	VE	18
7	428383.25	4403018.20	24.3	29.4	31.5	36.4	VE	32
8	429024.93	4398697.34	23.2	23.6	23.6	23.7	VE	24
9	430303.18	4396329.48	17.6	21.8	24.1	31.2	VE	24

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
10	431146.81	4395184.73	30.7	34.8	36.4	40.1	VE	36
11	432283.30	4391931.78	20.8	27.9	31.8	43.3	VE	32
12	432968.06	4389279.32	17.3	20.6	22.1	25.9	VE	22
13	432567.85	4387942.85	20.3	28.2	33.0	49.6	VE	33
14	432869.25	4385016.87	17.5	20.1	21.3	24.3	VE	21

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
15	432446.64	4383367.25	20.2	21.4	21.9	22.7	VE	22
16	433821.67	4380334.49	17.5	21.3	23.3	29.2	VE	23
17	434581.78	4378964.97	19.3	25.4	29.0[1]	38.5	VE	23
18	434259.93	4378757.19	18.6	25.4	29.0[1]	43.1	VE	23
19	433738.30	4375054.69	17.3	20.8	22.5	27.4	VE	23

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
20	432088.50	4372435.83	16.5	18.3	19.1	20.9	VE	19
21	432070.94	4371042.33	16.6	19.3	20.6	24.2	VE	21
22	431164.02	4371108.86	18.2	22.8	25.4	33.8	VE	25
23	431077.58	4369872.99	20.3	27.1	30.9	42.9	VE	31
24	430641.69	4368751.43	40.1	45.4	47.5	52.4	VE	48

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
25	430341.37	4367793.55	22.5	27.3	29.4	34.4	VE	29
26	429989.06	4366659.93	25.4	32.1	35.1	42.5	VE	35
27	430238.10	4366114.61	25.0	29.5	31.4	35.8	VE	31
28	430014.68	4365779.80	28.6	33.4	35.4	40.0	VE	35
29	429666.45	4365407.40	33.2	38.0	39.8	43.6	VE	40

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
30	430394.15	4364705.26	16.9	18.5	19.2	20.5	VE	19
31	430455.02	4364372.71	32.9	38.4	40.0[1]	45.0	VE	40
32	429834.81	4363852.09	24.9	32.3	35.9	45.3	VE	36
33	430393.79	4363441.60	16.0	17.6	18.2	19.6	VE	18
34	430001.99	4362465.52	23.0	28.2	30.0[1]	36.0	VE	30

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
35	429386.44	4361652.26	42.3	48.0	50.4	56.2	VE	50
36	429167.35	4358240.48	27.0	31.2	32.9	36.7	VE	33
37	429984.08	4356856.87	24.0	30.6	33.5	41.0	VE	34
38	428937.53	4356180.38	35.1	40.1	42.3	47.5	VE	42
39	428956.09	4355503.53	42.2	47.4	49.4	53.6	VE	49

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
40	429590.99	4353923.41	43.3	49.4	51.8	57.1	VE	52
41	431003.65	4352257.83	20.3	24.8	26.9	32.1	VE	27
42	430339.07	4351540.56	23.4	26.5	27.8	30.9	VE	28
43	430195.88	4350920.07	45.0	52.0	55.2	63.3	VE	55
44	430977.45	4350887.26	27.3	30.1	31.1	33.3	VE	31

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
45	431648.58	4350899.06	16.3	18.5	19.4	21.7	VE	19
46	431352.20	4349961.75	19.2	23.8	26.8	37.9	VE	27
47	430904.20	4348049.34	33.8	38.8	40.8	45.1	VE	41
48	431860.36	4347484.58	16.3	19.4	21.1	26.2	VE	21
49	432549.02	4344599.18	43.3	48.0	49.9	54.0	VE	50

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
50	433310.13	4340165.66	21.0	23.2	24.0	25.7	VE	24
51	434541.41	4338188.34	15.7	17.7	18.7	21.7	VE	19
52	435940.80	4335390.18	17.8	23.0	26.0	36.1	VE	26
53	437821.09	4331755.94	33.2	38.4	40.9	47.0	VE	41
54	438201.95	4331122.00	23.5	29.5	32.2	38.9	VE	32

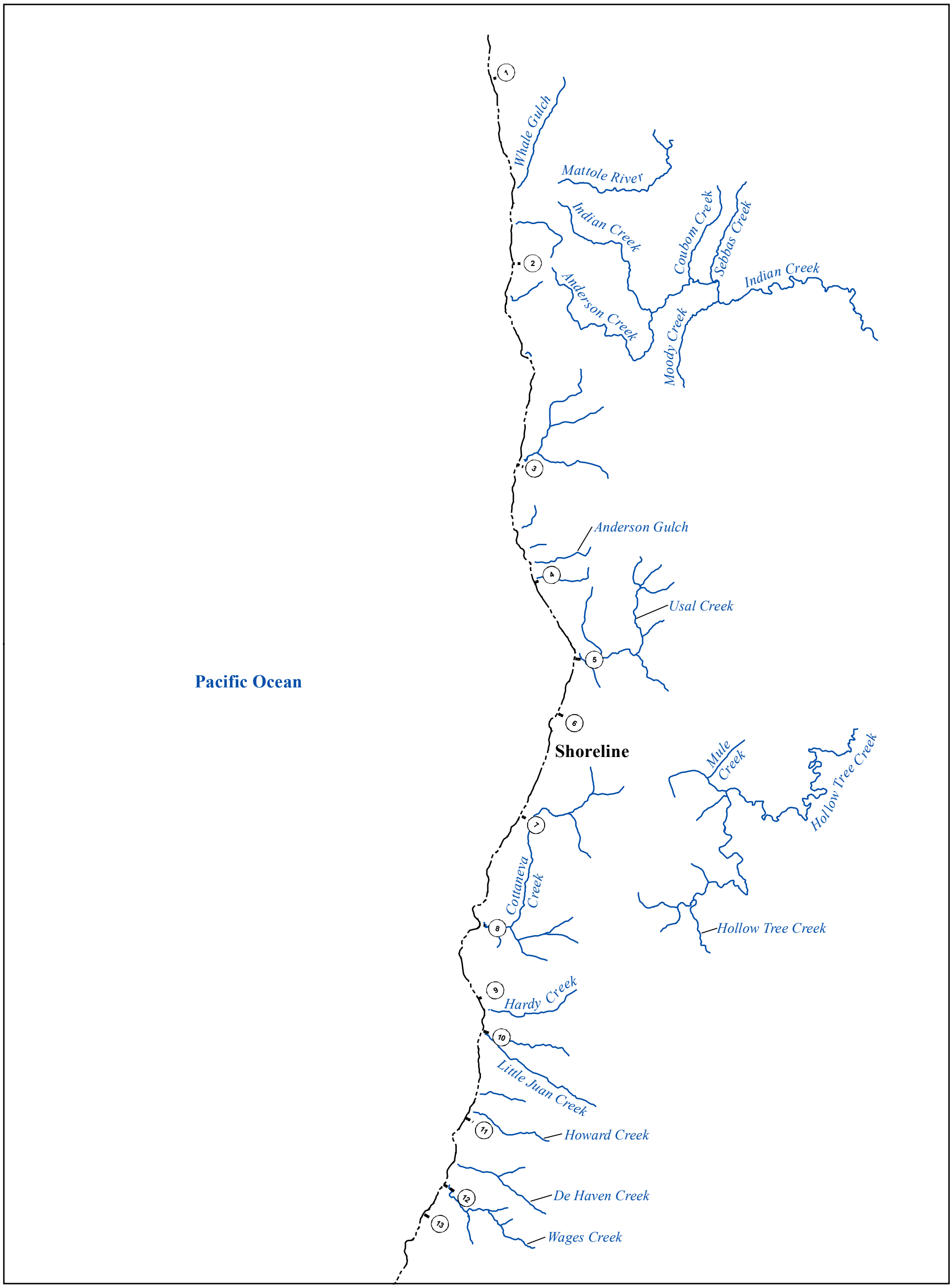
Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
55	439149.65	4328491.13	16.5	18.8	19.9	22.7	VE	20
56	439409.35	4324934.90	20.5	26.8	30.4	40.6	VE	30
57	439647.89	4317200.67	16.2	17.9	18.6	20.1	VE	19
58	438703.31	4313355.25	16.2	17.7	18.2	19.4	VE	18
59	436397.14	4311130.21	20.4	27.7	32.0	46.6	VE	32

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
60	438519.44	4307564.77	27.4	30.4	31.6	34.3	VE	32
61	442665.96	4303032.33	24.5	28.8	30.5	34.0	VE	31
62	443926.03	4300237.96	21.7	23.3	23.9	25.1	VE	24
63	444409.55	4299698.08	17.7	20.7	22.3	26.6	VE	22
64	446159.23	4298178.68	18.0	21.2	22.9	27.9	VE	23

Transect	X,Y Coordinates (Meters, NAD83 UTM Zone 10)		Total Water Elevation (feet NAVD88)[1]				Zone	BFE (ft)
	X	Y	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance		
65	449903.83	4294940.78	18.9	25.6	29.4	41.7	VE	29
66	450892.73	4294076.31	29.3	34.0	35.9	40.4	VE	36
67	452758.03	4292318.28	20.1	26.4	29.6	39.2	VE	30
68	453301.02	4291618.39	24.2	30.1	32.6	38.4	VE	33

[1]North American Vertical Datum of 1988

Figure 9: Transect Location Map



1 inch = 13,800 feet 1:165,604

Feet
0 4,000 8,000 16,000 24,000 32,000

Map Projection:
Universal Transeverse Mercator Zone 10 North;
North American Datum 1983

COUNTY LOCATOR

NATIONAL FLOOD INSURANCE PROGRAM

Transect Location Map

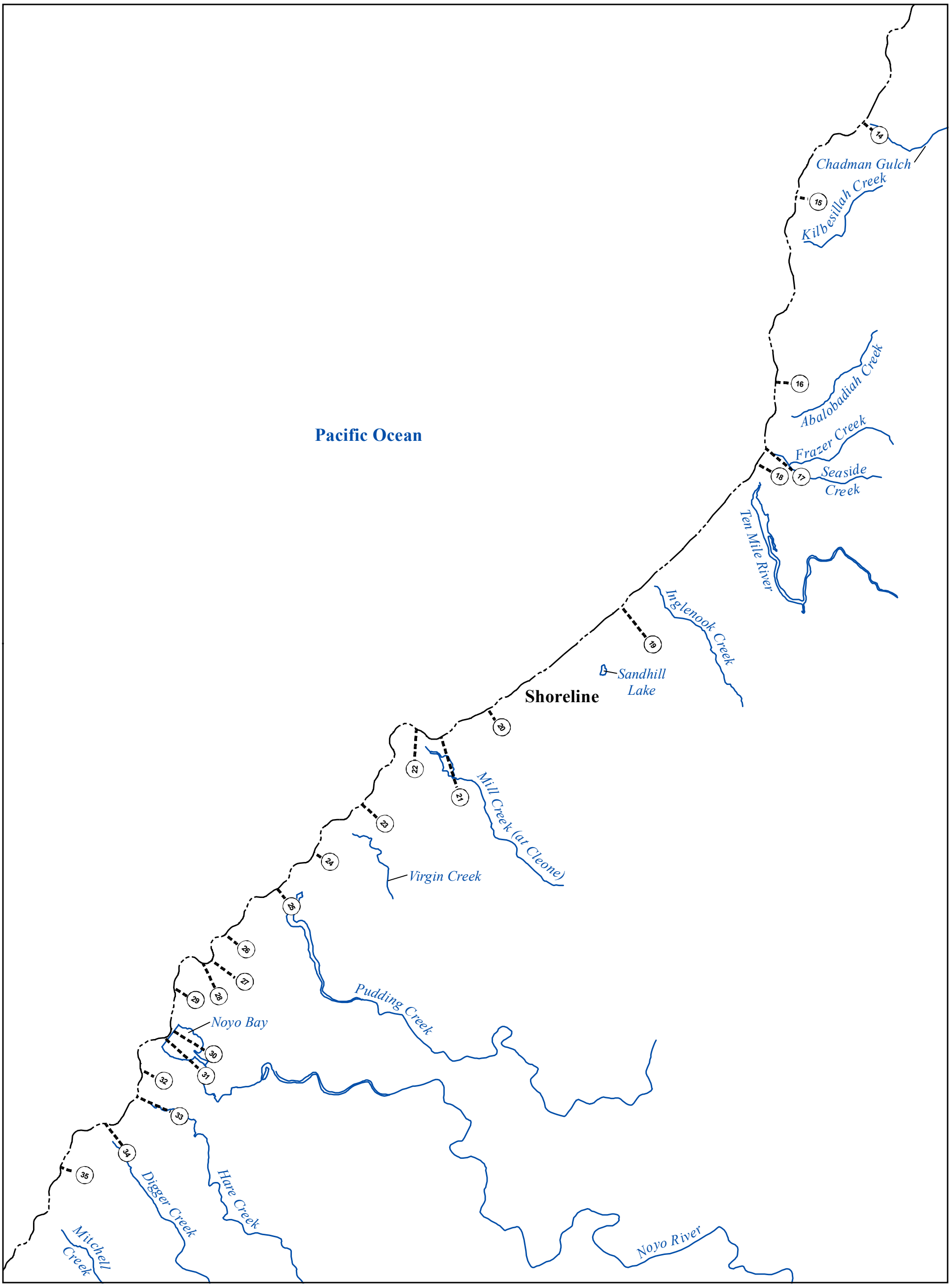
MENDOCINO COUNTY, CALIFORNIA

PANELS WITH TRANSECTS:

0135G, 0175G, 0385G, 0425G, 0625G, 0810G, 0820G, 1005G, 1010G, 1015G, 1016G, 1200G, 1385G, 1425G, 1600G, 1740G, 1750G, 1920G, 1950G

FEMA

Figure 9: Transect Location Map



1 inch = 6,515 feet 1:78,175

Feet
0 1,875 3,750 7,500 11,250 15,000

Map Projection:
Universal Transeverse Mercator Zone 10 North;
North American Datum 1983

COUNTY LOCATOR

NATIONAL FLOOD INSURANCE PROGRAM

Transect Location Map

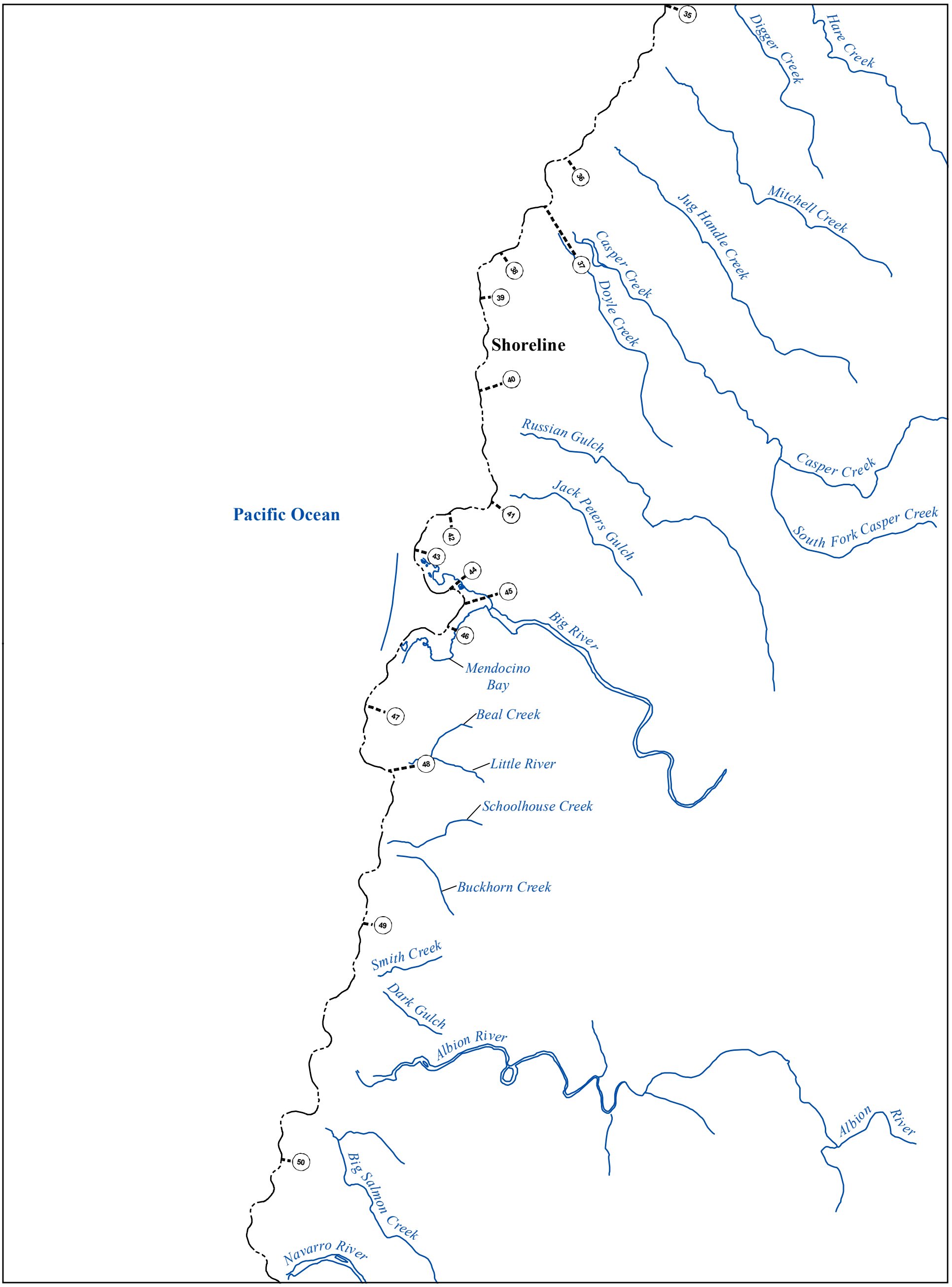
MENDOCINO COUNTY, CALIFORNIA

PANELS WITH TRANSECTS:

0135G, 0175G, 0385G, 0425G, 0625G, 0810G, 0820G, 1005G, 1010G, 1015G, 1016G, 1200G, 1385G, 1425G, 1600G, 1740G, 1750G, 1920G, 1950G

FEMA

Figure 9: Transect Location Map



1 inch = 6,515 feet 1:78,175

0 1,875 3,750 7,500 11,250 15,000 Feet

Map Projection:
Universal Transeverse Mercator Zone 10 North;
North American Datum 1983

COUNTY LOCATOR

NATIONAL FLOOD INSURANCE PROGRAM

Transect Location Map

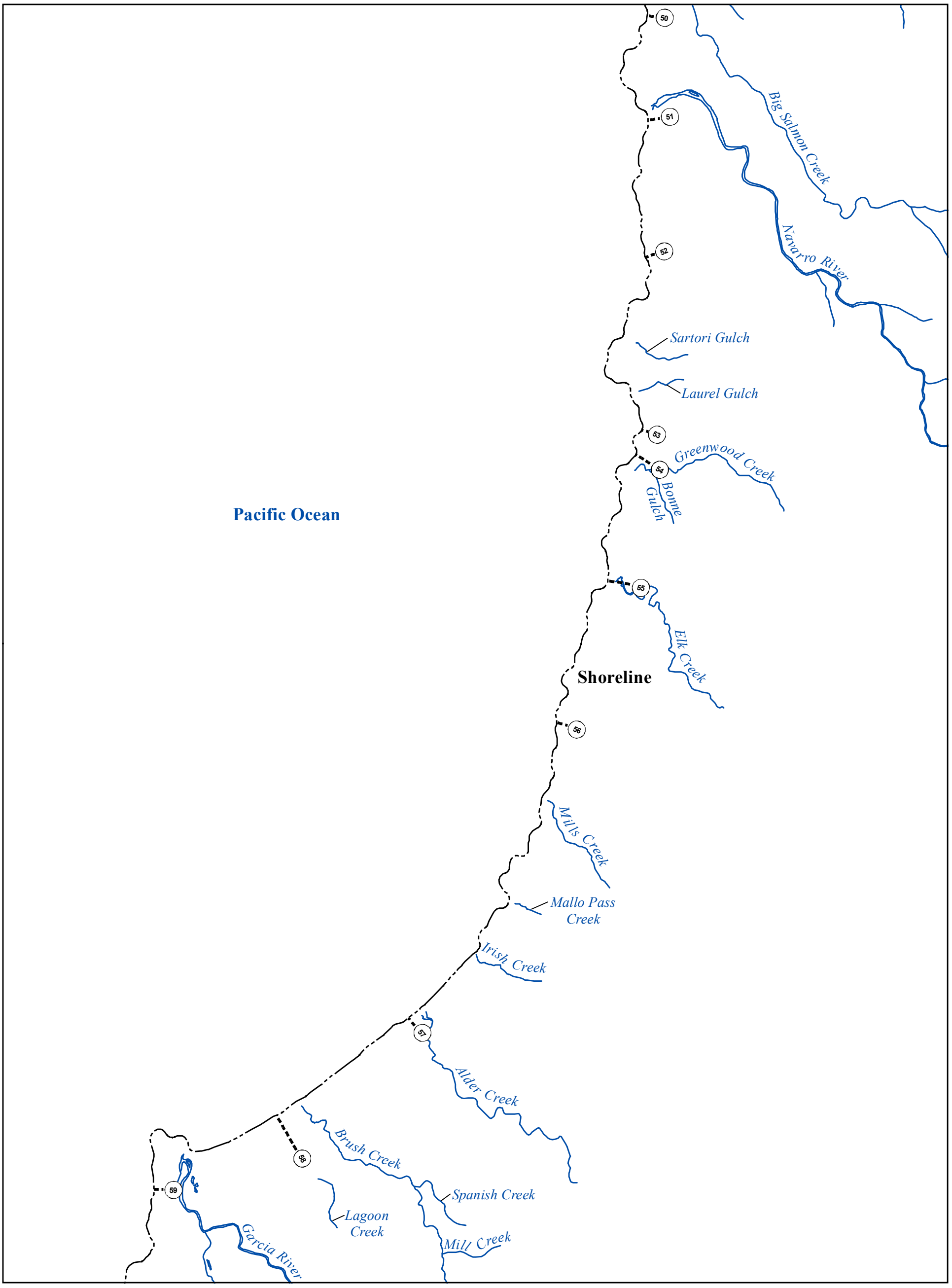
MENDOCINO COUNTY, CALIFORNIA

PANELS WITH TRANSECTS:

0135G, 0175G, 0385G, 0425G, 0625G, 0810G, 0820G, 1005G, 1010G, 1015G, 1016G, 1200G, 1385G, 1425G, 1600G, 1740G, 1750G, 1920G, 1950G

FEMA

Figure 9: Transect Location Map



1 inch = 8,333 feet 1:100,000

N

Feet
0 2,400 4,800 9,600 14,400 19,200

Map Projection:
Universal Transeverse Mercator Zone 10 North;
North American Datum 1983

COUNTY LOCATOR

NATIONAL FLOOD INSURANCE PROGRAM

Transect Location Map

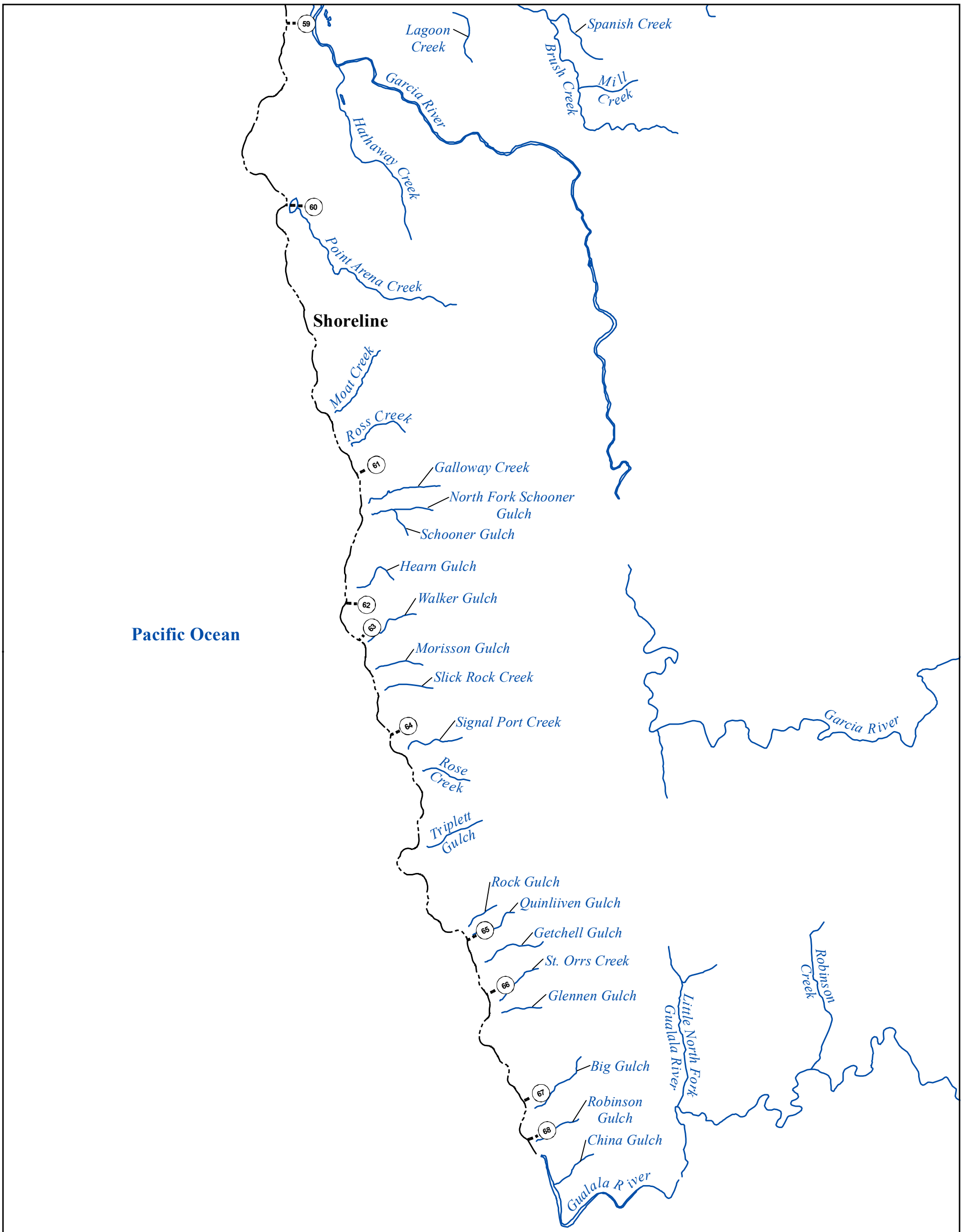
MENDOCINO COUNTY, CALIFORNIA

PANELS WITH TRANSECTS:

0135G, 0175G, 0385G, 0425G, 0625G, 0810G, 0820G, 1005G, 1010G, 1015G, 1016G, 1200G, 1385G, 1425G, 1600G, 1740G, 1750G, 1920G, 1950G

FEMA

Figure 9: Transect Location Map



1 inch = 8,333 feet 1:100,000

Feet
0 2,400 4,800 9,600 14,400 19,200

Map Projection:
Universal Transeverse Mercator Zone 10 North;
North American Datum 1983

COUNTY LOCATOR

NATIONAL FLOOD INSURANCE PROGRAM

Transect Location Map

MENDOCINO COUNTY, CALIFORNIA

PANELS WITH TRANSECTS:

0135G, 0175G, 0385G, 0425G, 0625G, 0810G, 0820G, 1005G, 1010G, 1015G, 1016G, 1200G, 1385G, 1425G, 1600G, 1740G, 1750G, 1920G, 1950G

FEMA

5.4 Alluvial Fan Analyses

This section is not applicable for this Flood Risk Project.

Table 18: Summary of Alluvial Fan Analyses

[Not Applicable to this Flood Risk Project]

Table 19: Results of Alluvial Fan Analyses

[Not Applicable to this Flood Risk Project]

SECTION 6.0 – MAPPING METHODS

6.1 Vertical and Horizontal Control

All FIS Reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS Reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS Reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS Report and on the FIRMs are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between NGVD29 and NAVD88 or other datum conversion, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the archived project documentation associated with the FIS Report and the FIRMs for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks in the area, please contact information services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

The datum conversion locations and values that were calculated for Mendocino County are provided in Table 20.

Table 20: Countywide Vertical Datum Conversion

[Not Applicable to this Flood Risk Project]

A countywide conversion factor could not be generated for Mendocino County because the maximum variance from average exceeds 0.25 feet. Calculations for the vertical offsets on a stream by stream basis are depicted in Table 21.

Table 21: Stream-Based Vertical Datum Conversion

Flooding Source	Average Vertical Datum Conversion Factor (feet)
Ackerman Creek	+2.88
Anderson Creek	+2.91
Broaddus Creek	+3.01
Davis Creek	+3.01
Doolin Creek	+2.87
East Fork Russian River	+2.86
Eel River	+2.96
Feliz Creek	+2.85
Forsythe Creek	+2.90
Gibson Creek	+2.88
Haehl/Baechtel Creek	+3.01
Hensley Creek	+2.88
Mill Creek (at Redwood Valley)	+2.98
Mill Creek (at Talmage)	+2.87
Mill Creek (at Willits)	+3.01
North Fork Mill Creek	+2.88
Noyo River	+2.95
Orrs Creek	+2.88
Robinson Creek	+2.91
Russian River	+2.85
Sulphur Creek	+2.87
Tenmile Creek	+3.05
Town Creek	+2.99
York Creek	+2.88
Static Zone at Arena Cove	+2.92
Static Zone at Gualala River	+2.84

6.2 Base Map

The FIRMs and FIS Report for this project have been produced in a digital format. The flood hazard information was converted to a Geographic Information System (GIS) format that meets FEMA's FIRM database specifications and geographic information standards. This information is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community. The FIRM Database includes most of the tabular information contained in the FIS Report in such a way that the data can be associated with pertinent spatial features. For

example, the information contained in the Floodway Data table and Flood Profiles can be linked to the cross sections that are shown on the FIRMs. Additional information about the FIRM Database and its contents can be found in FEMA's *Guidelines and Standards for Mapping Partners*, http://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping.

Base map information shown on the FIRM was derived from the sources described in Table 22.

Table 22: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Digital Orthophoto	USDA-FSA	2010	1 meter GSD	Orthophotography was downloaded from USDA site
Political boundaries	County of Mendocino	2008	Unknown	Political boundaries downloaded from the 2011 countywide study
Political boundaries	National Atlas of the United States	2004	Unknown	County boundary downloaded from the 2011 countywide study
Transportation Features	U.S. Census Bureau	2006	Unknown	Roads and railroads downloaded from the 2011 countywide study
Surface Water Features	USGS	2006	Unknown	Water features downloaded from the 2011 countywide study
Surface Water Features	Mendocino County	Unknown	Unknown	Surface water data downloaded from the 2011 countywide study
Public Land Survey System (PLSS)	California Spatial Information Library	1997	Unknown	PLSS data downloaded from the 2011 countywide study
Benchmarks	NGS	2002	1:24,000	Benchmarks downloaded from NGS website

6.3 Floodplain and Floodway Delineation

The FIRM shows tints, screens, and symbols to indicate floodplains and floodways as well as the locations of selected cross sections used in the hydraulic analyses and floodway computations.

For riverine flooding sources, the mapped floodplain boundaries shown on the FIRM have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 23. For each coastal flooding source studied as part of this FIS Report, the mapped floodplain boundaries on the FIRM have been delineated using the flood and wave elevations determined at each transect; between transects, boundaries were delineated using land use and land cover data, the topographic elevation data described in Table 23, and knowledge of coastal flood processes. In ponding areas, flood elevations were determined at each junction of the model; between junctions, boundaries were interpolated using the topographic elevation data described in Table 23.

In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

The floodway widths presented in this FIS Report and on the FIRM were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. Table 2 indicates the flooding sources for which floodways have been determined. The results of the floodway computations for those flooding sources have been tabulated for selected cross sections and are shown in Table 24, "Floodway Data."

Certain flooding sources may have been studied that do not have published BFEs on the FIRMs, or for which there is a need to report the 1% annual chance flood elevations at selected cross sections because a published Flood Profile does not exist in this FIS Report. These streams may have also been studied using methods to determine non-encroachment zones rather than floodways. For these flooding sources, the 1% annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 23. All topographic data used for modeling or mapping has been converted as necessary to NAVD 88. The 1% annual chance elevations for selected cross sections along these flooding sources, along with their non-encroachment widths, if calculated, are shown in Table 25, "Flood Hazard and Non-Encroachment Data for Selected Streams."

Table 23: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Scale	Contour Interval	Citation
Mendocino County	All within HUC 18010108	LiDAR OPC / USGS 2009-2011 & BATH NOAA	*	2 ft	11-09-0848S

*Data Not Available

BFEs shown at cross sections on the FIRM represent the 1% annual chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations.

Table 24: Floodway Data

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,750	75	938	5.7	616.5	616.1[2]	616.6	0.5
B	3,400	80	424	12.7	624.1	624.1	624.1	0.0
C	4,155	120	823	6.5	627.8	627.8	628.7	0.9
D	7,510	160	1,043	5.1	642.4	642.4	643.0	0.6
E	9,045	60	575	9.3	650.7	650.7	650.7	0.0
F	11,470	40	378	14.1	673.7	673.7	673.7	0.0

[1]Feet above confluence with Russian River
[2]Elevation computed without consideration of backwater effects from Russian River

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	0	250	1,339	6.8	290.7	290.7	291.7	1.0
B	3,280	240	843	10.8	309.2	309.2	309.2	0.0
C	6,215	420	1,025	8.9	327.5	327.5	327.5	0.0
D	8,650	115	754	8.6	347.6	347.6	347.8	0.2
E	10,475	200	1,070	5.6	362.6	362.6	363.5	0.9
F	12,330	100	537	11.1	378.7	378.7	378.7	0.0
G	14,010	75	687	8.7	399.4	399.4	399.8	0.4
H	16,500	130	623	9.6	422.5	422.5	423.1	0.6
I	19,030	40	287	14.5	456.2	456.2	456.2	0.0

[1]Feet above 180 feet upstream of the confluence with Con Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: ANDERSON CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	2,710	280	712	3.7	1,355.4	1,355.4	1,356.4	1.0
B	4,740	300	1,401	1.9	1,363.6	1,363.6	1,364.6	1.0
C	5,350	35	194	13.5	1,366.7	1,366.7	1,366.7	0.0
D	6,410	44	425	6.2	1,374.0	1,374.0	1,375.0	1.0
E	8,020	60	402	6.5	1,383.0	1,383.0	1,383.6	0.6
F	8,810	60	652	4.0	1,386.4	1,386.4	1,386.9	0.5

[1]Feet above confluence with Haehl/Baechtel Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BROADDUS CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	2,165	200	1,199	3.6	1,368.4	1,368.4	1,368.8	0.4
B	3,730	55	615	7.1	1,374.5	1,374.5	1,374.8	0.3
C	5,550	110	1,349	3.2	1,383.3	1,383.3	1,384.3	1.0

[1]Feet above Hearst-Willits Road

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: DAVIS CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	3,330	100	421	2.1	597.5	597.5	597.5	0.0
B	4,497	28	129	6.8	604.9	604.9	605.8	0.9
C	4,731	25	128	6.9	607.3	607.3	607.8	0.5
D	5,015	18	95	9.3	610.2	610.2	610.7	0.5
E	8,195	40	144	5.0	650.3	650.3	651.1	0.8
F	8,335	20	83	8.7	652.1	652.1	652.3	0.2
G	8,468	30	70	10.3	654.4	654.4	654.4	0.0
H	8,930	16	81	8.9	660.8	660.8	660.9	0.1

[1]Feet above confluence with Russian River

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: DOOLIN CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	10	70	1,070	6.4	932.2	932.2	933.2	1.0
B	1,750	70	967	7.0	936.0	936.0	936.6	0.6
C	3,115	115	1,587	4.3	940.5	940.5	941.1	0.6
D	4,670	70	921	7.4	943.0	943.0	944.0	1.0

[1]Feet above 0.3 mile downstream of Centerville Road

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: EAST FORK RUSSIAN RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	0	360	8,852	9.3	1,467.3	1,467.3	1,468.3	1.0
B	1,180	290	7,262	11.4	1,468.8	1,468.8	1,469.7	0.9
C	2,310	200	6,532	12.6	1,470.2	1,470.2	1,470.9	0.7
D	3,640	200	5,711	14.4	1,471.6	1,471.6	1,472.0	0.4
E	5,190	260	7,641	10.8	1,475.9	1,475.9	1,476.9	1.0
F	6,460	260	7,153	11.5	1,477.0	1,477.0	1,477.7	0.7
G	7,790	260	5,891	14.0	1,477.0	1,477.0	1,477.7	0.7
H	9,680	200	4,692	17.6	1,481.7	1,481.7	1,481.8	0.1
I	12,660	450	9,415	8.8	1,520.9	1,520.9	1,520.9	0.0
J	15,540	410	9,171	9.0	1,521.7	1,521.7	1,522.5	0.8

[1]Feet above confluence with Hale Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: EEL RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	3,945	1,000	1,922	4.8	498.7	491.7[2]	492.3	0.6
B	6,580	1,100	5,799	1.6	502.8	502.8	503.7	0.9
C	9,690	1,000	6,590	1.4	514.6	514.6	515.2	0.6
D	12,175	80	852	8.3	524.8	524.8	525.1	0.3

[1]to Feet above confluence with Russian River

[2]Elevation computed without consideration of backwater effects from Russian River

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: FELIZ CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,470	150	1,626	7.3	686.2	686.2	686.6	0.4
B	3,610	150	2,558	4.7	697.7	697.7	698.4	0.7
C	6,420	240	1,944	6.1	704.5	704.5	705.3	0.8
D	8,350	130	1,079	11.0	711.8	711.8	711.8	0.0
E	11,290	400	2,477	3.6	720.7	720.7	721.4	0.7
F	13,920	180	936	9.6	728.5	728.5	728.5	0.0
G	16,600	180	1,172	7.2	746.5	746.5	747.4	0.9
H	19,260	150	1,163	7.3	761.4	761.4	761.4	0.0
I	21,380	110	769	11.0	772.4	772.4	773.3	0.9
J	23,530	190	1,230	6.9	786.3	786.3	786.8	0.5
K	24,220	90	806	10.5	790.6	790.6	791.3	0.7

[1]Feet above confluence with Russian River

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: FORSYTHE CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	3,266	175	359	2.4	594.1	593.8[2]	594.7	0.9
B	4,320	50	209	4.1	598.4	598.4	599.4	1.0
C	5,565	20	125	6.8	603.6	603.6	604.2	0.6
D	5,823	25	128	6.7	605.1	605.1	605.5	0.4
E	7,280	29	170	5.0	612.2	612.2	613.1	0.9
F	7,755	50	130	6.5	619.6	619.6	619.6	0.0
G	8,748	80	156	5.5	626.3	626.3	626.4	0.1
H	9,190	90	218	3.9	628.6	628.6	629.1	0.5
I	9,480	20	89	9.6	632.4	632.4	632.4	0.0
J	9,745	30	142	6.0	634.5	634.5	635.2	0.7
K	10,043	100	205	4.2	639.4	639.4	639.4	0.0
L	10,350	60	211	4.0	640.5	640.5	641.2	0.7
M	11,755	20	100	8.5	658.4	658.4	659.1	0.7
N	13,530	30	97	8.8	697.5	697.5	697.5	0.0
O	14,475	20	68	7.9	720.2	720.2	720.2	0.0
P	15,360	15	57	9.4	812.7	812.7	812.7	0.0

[1]Feet above confluence with Doolin Creek

[2]Elevation computed without consideration of backwater from Russian River

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: GIBSON CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	12,300	1,350	3,770	1.8	1,351.1	1,351.1	1,351.2	0.1
B	13,420	980	3,367	2.0	1,353.2	1,353.2	1,354.1	0.9
C	14,050	1,510	3,982	1.7	1,355.1	1,355.1	1,355.8	0.7
D	15,185	900	2,253	2.1	1,358.3	1,358.3	1,359.0	0.7
E	15,410	900	4,338	1.1	1,361.5	1,361.5	1,361.5	0.0
F	17,850	55	387	8.4	1,369.4	1,369.4	1,369.4	0.0
G	18,130	340	951	3.4	1,370.3	1,370.3	1,370.5	0.2
H	19,060	115	396	8.2	1,374.5	1,374.5	1,374.5	0.0
I	21,220	40	457	6.1	1,387.1	1,387.1	1,387.1	0.0

[1]Feet above mouth

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: HAEHL/BAECHTEL CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,140	30	279	7.9	620.6	616.8[2]	617.3	0.5
B	1,240	30	180	12.3	620.6	620.4[2]	620.4	0.0
C	1,990	90	471	4.7	624.6	624.6	625.0	0.4
D	2,700	80	422	5.2	626.5	626.5	627.4	0.9
E	3,085	85	260	8.5	629.7	629.7	629.7	0.0
F	5,485	50	242	9.1	642.8	642.8	642.9	0.1
G	8,220	40	205	6.0	658.1	658.1	658.7	0.6
H	10,600	80	300	4.1	675.8	675.8	676.6	0.8
I	12,640	70	156	7.9	697.8	697.8	698.0	0.2
J	14,610	45	165	7.4	716.3	716.3	716.4	0.1
K	17,270	45	149	8.2	740.7	740.7	741.4	0.7

[1]Feet above confluence with Russian River

[2]Elevation computed without consideration of backwater effects from Russian River

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: HENSLEY CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	420	30	248	5.8	797.2	797.2	797.2	0.0
B	1,330	40	276	12.8	805.8	805.8	805.8	0.0
C	2,000	40	249	14.2	883.5	883.5	883.7	0.2
D	2,650	40	263	13.5	909.8	909.8	909.9	0.1
E	2,930	55	308	11.5	916.2	916.2	916.7	0.5
F	3,790	50	337	10.5	934.8	934.8	935.6	0.8
G	4,900	55	441	8.0	947.0	947.0	947.8	0.8
H	6,000	55	420	8.4	954.5	954.5	955.4	0.9
I	8,100	70	508	7.0	968.6	968.6	969.3	0.7
J	11,190	85	767	4.6	990.2	990.2	990.9	0.7
K	12,620	65	385	7.8	1,003.2	1,003.2	1,003.2	0.0
L	14,910	50	387	7.7	1,024.7	1,024.7	1,025.1	0.4

[1]Feet above confluence with Forsythe Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: MILL CREEK (AT REDWOOD VALLEY)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,750	650	2,125	1.8	591.3	591.3	592.1	0.8
B	2,270	390	870	4.4	594.7	594.7	595.3	0.6
C	2,370	390	1,061	3.6	595.5	595.5	596.4	0.9
D	2,670	400	1,426	1.6	599.1	599.1	599.1	0.0
E	3,830	400	552	4.1	602.7	602.7	603.6	0.9
F	4,570	500	772	3.0	610.3	610.3	611.0	0.7
G	6,370	290	596	3.8	625.8	625.8	626.5	0.7
H	7,845	310	784	2.9	644.3	644.3	644.9	0.6
I	9,430	150	707	3.2	666.6	666.6	667.5	0.9
J[2]	11,100	145	266	4.3	700.0	700.0	700.3	0.3
K	11,920	60	297	3.8	716.9	716.9	717.8	0.9

[1]Feet above confluence with Russian River

[2]Cross section is shared with North Fork Mill Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: MILL CREEK (NEAR TALMAGE)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	14,050	610	1,892	1.7	1,351.1	1,351.1	1,352.1	1.0
B	14,630	66/536[2]	905	3.5	1,352.3	1,352.3	1,353.1	0.8
C	15,320	400	1,152	2.8	1,357.0	1,357.0	1,358.0	1.0
D	16,010	100	497	6.4	1,362.3	1,362.3	1,363.2	0.9
E	17,400	32	242	13.2	1,370.7	1,370.7	1,371.0	0.3
F	18,670	55	532	6.0	1,378.3	1,378.3	1,378.9	0.6

[1]Feet above mouth

[2]Left Channel / Right Channel

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: MILL CREEK (AT WILLITS)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A[2]	1,470	80	261	5.4	699.5	699.5	699.8	0.3
B	2,550	60	277	5.1	715.6	715.6	716.4	0.8
C	3,440	60	175	8.1	737.1	737.1	737.5	0.4

[1]Feet above confluence with Mill Creek (near Talmage)

[2]Cross section shared with Mill Creek (near Talmage)

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: NORTH FORK MILL CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	2,550	45	341	8.2	603.3	603.7[2]	603.7	0.0
B	2,852	60	355	7.9	605.2	605.2	605.6	0.4
C	3,071	49	284	9.8	606.0	606.0	606.2	0.2
D	3,308	76	437	6.4	607.2	607.2	607.9	0.7
E	3,508	50	336	8.3	607.3	607.3	608.3	1.0
F	3,706	44	313	8.9	608.4	608.4	609.0	0.6
G	3,871	49	415	6.7	609.8	609.8	610.2	0.4
H	4,066	60	490	5.7	610.5	610.5	610.8	0.3
I	4,285	49	358	7.8	610.7	610.7	610.9	0.2
J	4,355	43	307	9.1	611.8	611.8	611.9	0.1
K	4,577	45	343	8.1	613.0	613.0	613.0	0.0
L	4,869	43	306	9.1	613.9	613.9	613.9	0.0
M	5,012	45	321	8.7	614.3	614.3	615.0	0.7
N	5,089	43	276	10.1	614.8	614.8	614.8	0.0
O	5,404	35	290	9.6	618.1	618.1	618.1	0.0
P	6,212	35	337	8.3	623.2	623.2	623.5	0.3
Q	7,306	95	668	4.2	627.8	627.8	628.7	0.9
R	8,013	35	284	9.8	630.1	630.1	630.7	0.6
S	8,640	50	354	7.9	634.9	634.9	635.8	0.9
T	10,565	50	425	6.6	645.7	645.7	645.9	0.2
U	13,330	50	407	6.9	661.5	661.5	661.9	0.4
V	15,020	30	191	13.2	678.9	678.9	679.2	0.3

[1]Feet above confluence with Russian River

[2]Elevation computed without consideration of backwater effects from Russian River

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: ORRS CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	2,525	450	2,478	2.7	577.2	577.2	578.2	1.0
B	4,760	240	1,551	4.3	583.6	583.6	584.5	0.9
C	6,635	160	1,108	5.9	588.7	588.7	589.6	0.9
D	8,800	140	1,264	5.2	603.2	603.2	604.1	0.9
E	11,890	110	1,010	6.5	617.5	617.5	618.4	0.9
F	15,630	70	690	8.2	642.7	642.7	642.9	0.2
G	18,160	65	582	9.8	665.7	665.7	666.1	0.4
H	23,780	85	429	11.1	781.1	781.1	781.2	0.1
I	26,750	85	372	8.7	864.3	864.3	865.0	0.7
J	29,480	60	379	8.5	886.3	886.3	886.8	0.5

[1]Feet above confluence with Russian River

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: ROBINSON CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	0	1,000	23,315	2.4	495.6	495.6	496.4	0.8
B	2,165	2,000	35,767	1.7	496.8	496.8	497.7	0.9
C	3,820	2,700	34,964	1.7	497.5	497.5	498.4	0.9
D	6,850	3,100	32,407	1.6	498.7	498.7	499.6	0.9
E	10,390	2,800	24,445	2.2	499.4	499.4	500.4	1.0
F	11,820	2,800	29,358	1.8	500.1	500.1	501.0	0.9
G	14,635	2,900	20,969	2.5	501.0	501.0	501.9	0.9
H	16,700	2,900	21,330	2.5	502.6	502.6	503.5	0.9
I	19,810	1,850	17,274	3.1	505.6	505.6	506.5	0.9
J	22,910	770	9,369	5.7	508.0	508.0	508.6	0.6
K	25,230	480	5,599	9.5	511.2	511.2	512.1	0.9
L	28,300	880	9,124	5.8	518.2	518.2	518.7	0.5
M	30,645	560	7,835	6.8	522.7	522.7	523.5	0.8
N	33,495	400	6,709	7.2	528.0	528.0	528.9	0.9
O	35,800	450	9,233	5.3	533.3	533.3	533.6	0.3
P	37,665	1,570	18,561	2.6	535.6	535.6	535.9	0.3
Q	40,450	390	3,876	12.5	535.6	535.6	535.9	0.3
R	42,820	430	9,174	5.3	544.0	544.0	545.0	1.0
S	45,310	400	8,619	5.6	546.7	546.7	547.5	0.8
T	48,460	900	14,421	3.4	550.3	550.3	551.0	0.7
U	51,250	1,300	14,328	3.4	552.7	552.7	553.2	0.5
V	53,860	1,320	12,439	3.9	555.5	555.5	556.0	0.5
W	56,770	1,000	11,529	4.2	558.7	558.7	559.3	0.6
X	59,350	1,780	14,876	2.8	561.6	561.6	562.2	0.6
Y	62,815	2,090	19,443	2.2	564.0	564.0	564.7	0.7
Z	67,360	1,970	13,860	3.0	566.6	566.6	567.4	0.8
AA	71,400	2,260	20,590	1.8	572.4	572.4	573.3	0.9

[1]Feet above 50 feet downstream of U.S. Highway 101

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: RUSSIAN RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AB	75,150	2,980	21,124	1.8	577.1	577.1	578.0	0.9
AC	78,980	3,625	23,151	1.6	582.2	582.2	583.2	1.0
AD	81,925	2,500	27,836	1.3	584.8	584.8	585.6	0.8
AE	90,730	1,800	12,150	2.6	595.3	595.3	596.2	0.9
AF	93,020	1,600	11,635	2.7	598.5	598.5	599.1	0.6
AG	98,720	1,000	14,564	5.4	604.8	604.8	605.8	1.0
AH	102,205	400	3,837	7.7	608.9	608.9	609.8	0.9
AI	104,625	400	5,594	4.8	616.4	616.4	616.6	0.2
AJ	106,950	500	5,955	4.0	619.8	619.8	620.5	0.7
AK	108,795	700	6,694	3.3	623.3	623.3	624.0	0.7
AL	111,715	258	3,913	5.5	630.2	630.2	630.7	0.5
AM	113,500	385	4,574	4.7	634.6	634.6	635.5	0.9
AN	117,640	466	6,173	3.1	642.1	642.1	642.6	0.5
AO	119,850	350	4,681	4.1	647.4	647.4	648.1	0.7
AP	123,575	210	3,005	6.4	656.4	656.4	656.9	0.5
AQ	126,100	360	5,722	3.4	661.0	661.0	661.9	0.9
AR	127,595	200	2,406	8.0	663.7	663.7	664.6	0.9
AS	129,620	150	2,478	7.7	671.7	671.7	671.8	0.1
AT	131,615	150	2,914	6.6	678.2	678.2	678.8	0.6
AU	133,780	350	3,203	6.0	682.6	682.6	683.1	0.5
AV	135,880	420	3,637	2.3	692.2	692.2	692.6	0.4
AW	138,300	140	1,760	4.0	695.6	695.6	696.4	0.8
AX	140,955	100	1,295	5.5	708.9	708.9	709.3	0.4
AY	142,250	200	1,803	3.9	713.5	713.5	714.1	0.6

[1]Feet above 50 feet downstream of U.S. Highway 101

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: RUSSIAN RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	7,636	78	373	4.3	725.2	725.2	726.1	0.9
B	7,756	94	335	4.8	725.8	725.8	726.4	0.6
C	8,060	50	206	7.8	729.3	729.3	730.2	0.9
D	8,168	57	239	6.7	730.3	730.3	731.3	1.0
E	8,354	59	257	6.2	734.0	734.0	734.1	0.1
F	8,447	62	179	9.0	734.5	734.5	734.8	0.3
G	8,470	60	210	7.0	735.4	735.4	735.6	0.2
H	8,963	68	175	9.1	746.9	746.9	746.9	0.0
I	9,355	53	160	10.0	753.4	753.4	753.6	0.2
J	9,634	47	197	8.1	759.2	759.2	759.7	0.5
K	9,842	46	168	9.5	761.3	761.3	761.6	0.3
L	9,858	46	154	10.4	763.9	763.9	763.9	0.0
M	9,954	59	168	9.5	768.5	768.5	768.5	0.0
N	10,029	38	249	6.4	773.8	773.8	773.8	0.0
O	10,212	51	159	10.1	775.4	775.4	775.4	0.0
P	10,307	71	179	9.0	777.7	777.7	777.7	0.0

[1]Feet above 50 feet downstream of U.S. Highway 101

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: SULPHUR CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	565	400	2,088	3.3	1,610.9	1,610.9	1,611.8	0.9
B	895	300	1,610	4.3	1,612.0	1,612.0	1,612.6	0.6
C	2,855	250	1,678	4.1	1,617.5	1,617.5	1,618.1	0.6
D	4,210	270	1,799	3.8	1,619.6	1,619.6	1,620.4	0.8
E	5,020	300	2,795	2.5	1,620.3	1,620.3	1,621.2	0.9

[1]Feet above 0.2 mile downstream of Branscomb Road

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: TENMILE CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	240	200	955	2.9	1,382.3	1,382.3	1,383.0	0.7
B	1,085	200	740	3.7	1,387.8	1,387.8	1,388.5	0.7
C	2,750	55	445	6.0	1,397.1	1,397.1	1,397.4	0.8
D	4,185	145	920	3.0	1,402.1	1,402.1	1,402.7	0.6
E	5,140	100	595	4.6	1,406.9	1,406.9	1,407.5	0.6

[1]Feet above confluence with Grist Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: TOWN CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	620	55	474	6.9	639.2	634.9[2]	635.3	0.4
B	685	55	590	5.6	639.3	635.1[2]	636.1	1.0
C	1,655	80	673	4.9	641.5	641.5	642.5	1.0
D	3,300	120	968	3.4	645.1	645.1	646.0	0.9
E	4,700	70	513	6.4	650.7	650.7	650.9	0.2
F	7,225	90	587	5.6	664.4	664.4	664.8	0.4
G	9,925	110	665	3.6	680.2	680.2	680.9	0.7
H	12,955	90	619	3.9	698.7	698.7	699.4	0.7

[1]Feet above confluence with Russian River

[2]Elevation computed without consideration of influence from Russian River

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

MENDOCINO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: YORK CREEK

Table 25: Flood Hazard and Non-Encroachment Data for Selected Streams
[Not Applicable to this Flood Risk Project]

6.4 Coastal Flood Hazard Mapping

Flood insurance zones and BFEs including the wave effects were identified on each transect based on the results from the onshore wave hazard analyses. Between transects, elevations were interpolated using topographic maps, land-use and land-cover data, and knowledge of coastal flood processes to determine the aerial extent of flooding. Sources for topographic data are shown in Table 23.

Zone VE is subdivided into elevation zones and BFEs are provided on the FIRM.

The limit of Zone VE shown on the FIRM is defined as the farthest inland extent of any of these criteria (determined for the 1% annual chance flood condition):

- The *primary frontal dune zone* is defined in 44 CFR Section 59.1 of the NFIP regulations. The primary frontal dune represents a continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes that occur immediately landward and adjacent to the beach. The primary frontal dune zone is subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the primary frontal dune zone occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope.

- The *wave runup zone* occurs where the (eroded) ground profile is 3.0 feet or more below the 2-percent wave runup elevation and where the runup height above the Stillwater elevation is greater than 3 feet.

- The *wave overtopping splash zone* is the area landward of the crest of an overtopped barrier, in cases where the potential 2-percent wave runup exceeds the barrier crest elevation by 3.0 feet or more.

- The *breaking wave height zone* occurs where 3-foot or greater wave heights could occur (this is the area where the wave crest profile is 2.1 feet or more above the total stillwater elevation).

- The *high-velocity flow zone* is landward of the overtopping splash zone (or area on a sloping beach or other shore type), where the product of depth of flow times the flow velocity squared (hv^2) is greater than or equal to 200 ft^3/sec^2. This zone may only be used on the Pacific Coast.

The SFHA boundary indicates the limit of SFHAs shown on the FIRM as either "V" zones or "A" zones.

Table 26 indicates the coastal analyses used for floodplain mapping and the criteria used to determine the inland limit of the open-coast Zone VE and the SFHA boundary at each transect.

Table 26: Summary of Coastal Transect Mapping Considerations

Coastal Transect	Primary Frontal Dune (PFD) Identified	Wave Runup Analysis	Wave Height Analysis	Zone VE Limit	SFHA Boundary
		Zone Designation and BFE (ft NAVD 88)	Zone Designation and BFE (ft NAVD 88)		
1		VE 44	VE 44	Runup	
2		VE 21	VE 21	Runup	
3		VE 37	VE 37	Runup	Overtopping
4		VE 36	VE 36	Runup	
5		VE 34	VE 34	Runup	Overtopping
6		VE 18	VE 18	Runup	
7		VE 32	VE 32	Runup	
8		VE 24	VE 24	Runup	Overtopping
9		VE 24	VE 24	Runup	
10		VE 36	VE 36	Runup	
11		VE 32	VE 32	Runup	
12		VE 22	VE 22	Runup	Overtopping
13		VE 33	VE 33	Runup	
14		VE 21	VE 21	Runup	
15		VE 22	VE 22	Runup	
16		VE 23	VE 23	Runup	
17		VE 23	VE 23	Runup	Overtopping
18		VE 23	VE 23	Runup	
19	✓	VE 23	VE 23	PFD	
20		VE 19	VE 19	Runup	
21		VE 21	VE 21	Runup	
22		VE 25	VE 25	Runup	
23		VE 31	VE 31	Runup	
24		VE 48	VE 48	Runup	Overtopping
25		VE 29	VE 29	Runup	
26		VE 35	VE 35	Runup	
27		VE 31	VE 31	Runup	Overtopping
28		VE 35	VE 35	Runup	
29		VE 40	VE 40	Runup	
30		VE 19	VE 19	Runup	

Coastal Transect	Primary Frontal Dune (PFD) Identified	Wave Runup Analysis	Wave Height Analysis	Zone VE Limit	SFHA Boundary
		Zone Designation and BFE (ft NAVD 88)	Zone Designation and BFE (ft NAVD 88)		
31		VE 40	VE 40	Runup	
32		VE 36	VE 36	Runup	
33		VE 18	VE 18	Runup	Overtopping
34		VE 30	VE 30	Runup	
35		VE 50	VE 50	Runup	Overtopping
36		VE 33	VE 33	Runup	
37		VE 34	VE 34	Runup	Overtopping
38		VE 42	VE 42	Runup	
39		VE 49	VE 49	Runup	Overtopping
40		VE 52	VE 52	Runup	
41		VE 27	VE 27	Runup	
42		VE 28	VE 28	Runup	
43		VE 55	VE 55	Runup	Overtopping
44		VE 31	VE 31	Runup	
45		VE 19	VE 19	Runup	Overtopping
46		VE 27	VE 27	Runup	
47		VE 41	VE 41	Runup	
48		VE 21	VE 21	Runup	
49		VE 50	VE 50	Runup	
50		VE 24	VE 24	Runup	
51		VE 19	VE 19	Runup	Overtopping
52		VE 26	VE 26	Runup	
53		VE 41	VE 41	Runup	
54		VE 32	VE 32	Runup	Overtopping
55		VE 20	VE 20	Runup	Overtopping
56		VE 30	VE 30	Runup	
57		VE 19	VE 19	Runup	
58	✓	VE 18	VE 18	PFD	
59		VE 32	VE 32	Runup	
60		VE 32	VE 32	Runup	Overtopping
61		VE 31	VE 31	Runup	

Coastal Transect	Primary Frontal Dune (PFD) Identified	Wave Runup Analysis	Wave Height Analysis	Zone VE Limit	SFHA Boundary
		Zone Designation and BFE (ft NAVD 88)	Zone Designation and BFE (ft NAVD 88)		
62		VE 24	VE 24	Runup	
63		VE 22	VE 22	Runup	
64		VE 23	VE 23	Runup	
65		VE 29	VE 29	Runup	
66		VE 36	VE 36	Runup	
67		VE 30	VE 30	Runup	
68		VE 33	VE 33	Runup	

6.5 FIRM Revisions

This FIS Report and the FIRM are based on the most up-to-date information available to FEMA at the time of its publication; however, flood hazard conditions change over time. Communities or private parties may request flood map revisions at any time. Certain types of requests require submission of supporting data. FEMA may also initiate a revision. Revisions may take several forms, including Letters of Map Amendment (LOMAs), Letters of Map Revision Based on Fill (LOMR-Fs), Letters of Map Revision (LOMRs) (referred to collectively as Letters of Map Change (LOMCs)), Physical Map Revisions (PMRs), and FEMA-contracted restudies. These types of revisions are further described below. Some of these types of revisions do not result in the republishing of the FIS Report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data (shown in Table 31, "Map Repositories").

6.5.1 Letters of Map Amendment

A LOMA is an official revision by letter to an effective NFIP map. A LOMA results from an administrative process that involves the review of scientific or technical data submitted by the owner or lessee of property who believes the property has incorrectly been included in a designated SFHA. A LOMA amends the currently effective FEMA map and establishes that a specific property is not located in a SFHA. A LOMA cannot be issued for properties located on the PFD (primary frontal dune).

To obtain an application for a LOMA, visit www.fema.gov/floodplain-management/letter-map-amendment-loma and download the form "MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill". Visit the "Flood Map-Related Fees" section to determine the cost, if any, of applying for a LOMA.

FEMA offers a tutorial on how to apply for a LOMA. The LOMA Tutorial Series can be accessed at www.fema.gov/online-tutorials.

For more information about how to apply for a LOMA, call the FEMA Map Information

eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627).

6.5.2 Letters of Map Revision Based on Fill

A LOMR-F is an official revision by letter to an effective NFIP map. A LOMR-F states FEMA's determination concerning whether a structure or parcel has been elevated on fill above the base flood elevation and is, therefore, excluded from the SFHA.

Information about obtaining an application for a LOMR-F can be obtained in the same manner as that for a LOMA, by visiting www.fema.gov/floodplain-management/letter-map-amendment-loma for the "MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill" or by calling the FEMA Map Information eXchange, toll free, at 1-877-FEMA MAP (1-877-336-2627). Fees for applying for a LOMR-F, if any, are listed in the "Flood Map-Related Fees" section.

A tutorial for LOMR-F is available at www.fema.gov/online-tutorials.

6.5.3 Letters of Map Revision

A LOMR is an official revision to the currently effective FEMA map. It is used to change flood zones, floodplain and floodway delineations, flood elevations and planimetric features. All requests for LOMRs should be made to FEMA through the chief executive officer of the community, since it is the community that must adopt any changes and revisions to the map. If the request for a LOMR is not submitted through the chief executive officer of the community, evidence must be submitted that the community has been notified of the request.

To obtain an application for a LOMR, visit www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/mt-2-application-forms-and-instructions and download the form "MT-2 Application Forms and Instructions for Conditional Letters of Map Revision and Letters of Map Revision". Visit the "Flood Map-Related Fees" section to determine the cost of applying for a LOMR. For more information about how to apply for a LOMR, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627) to speak to a Map Specialist.

Previously issued mappable LOMCs (including LOMRs) that have been incorporated into the Mendocino County FIRM are listed in Table 27.

Table 27: Incorporated Letters of Map Change

[Not Applicable to this Flood Risk Project]

6.5.4 Physical Map Revisions

PMRs are an official republication of a community's NFIP map to effect changes to base flood elevations, floodplain boundary delineations, regulatory floodways and planimetric features. These changes typically occur as a result of structural works or improvements, annexations resulting in additional flood hazard areas or correction to base flood elevations or SFHAs.

The community's chief executive officer must submit scientific and technical data to FEMA to support the request for a PMR. The data will be analyzed and the map will be revised if warranted. The community is provided with copies of the revised information and is afforded a review period. When the base flood elevations are changed, a 90-day appeal period is provided. A 6-month adoption period for formal approval of the revised map(s) is also provided.

For more information about the PMR process, please visit www.fema.gov and visit the "Flood Map Revision Processes" section.

6.5.5 Contracted Restudies

The NFIP provides for a periodic review and restudy of flood hazards within a given community. FEMA accomplishes this through a national watershed-based mapping needs assessment strategy, known as the Coordinated Needs Management Strategy (CNMS). The CNMS is used by FEMA to assign priorities and allocate funding for new flood hazard analyses used to update the FIS Report and FIRM. The goal of CNMS is to define the validity of the engineering study data within a mapped inventory. The CNMS is used to track the assessment process, document engineering gaps and their resolution, and aid in prioritization for using flood risk as a key factor for areas identified for flood map updates. Visit www.fema.gov to learn more about the CNMS or contact the FEMA Regional Office listed in Section 8 of this FIS Report.

6.5.6 Community Map History

The current FIRM presents flooding information for the entire geographic area of Mendocino County. Previously, separate FIRMs, Flood Hazard Boundary Maps (FHBMs) and/or Flood Boundary and Floodway Maps (FBFMs) may have been prepared for the incorporated communities and the unincorporated areas in the county that had identified SFHAs. Current and historical data relating to the maps prepared for the project area are presented in Table 28, "Community Map History." A description of each of the column headings and the source of the date is also listed below.

- *Community Name* includes communities falling within the geographic area shown on the FIRM, including those that fall on the boundary line, nonparticipating communities, and communities with maps that have been rescinded. Communities with No Special Flood Hazards are indicated by a footnote. If all maps (FHBM, FBFM, and FIRM) were rescinded for a community, it is not listed in this table unless SFHAs have been identified in this community.

- *Initial Identification Date (First NFIP Map Published)* is the date of the first NFIP map that identified flood hazards in the community. If the FHBM has been converted to a FIRM, the initial FHBM date is shown. If the community has never been mapped, the upcoming effective date or "pending" (for Preliminary FIS Reports) is shown. If the community is listed in Table 28 but not identified on the map, the community is treated as if it were unmapped.

- *Initial FHBM Effective Date* is the effective date of the first Flood Hazard Boundary Map (FHBM). This date may be the same date as the Initial NFIP Map Date.

- *FHBM Revision Date(s)* is the date(s) that the FHBM was revised, if applicable.

- *Initial FIRM Effective Date* is the date of the first effective FIRM for the community. This is the first effective date that is shown on the FIRM panel.

- *FIRM Revision Date(s)* is the date(s) the FIRM was revised, if applicable. This is the revised date that is shown on the FIRM panel, if applicable. As countywide studies are completed or revised, each community listed should have its FIRM dates updated accordingly to reflect the date of the countywide study. Once the FIRMs exist in

countywide format, as Physical Map Revisions (PMR) of FIRM panels within the county are completed, the FIRM Revision Dates in the table for each community affected by the PMR are updated with the date of the PMR, even if the PMR did not revise all the panels within that community.

The initial effective date for the Mendocino County FIRMs in countywide format was 06/11/2011.

Table 28: Community Map History

Community Name	Initial Identification Date (First NFIP Map Published)	Initial FHBM Effective Date	FHBM Revision Date(s)	Initial FIRM Effective Date	FIRM Revision Date(s)
Fort Bragg, City of	05/10/1975	05/10/1975	N/A	12/07/1982	06/16/1992
Mendocino County (Unincorporated Areas)	01/03/1974	01/03/1974	04/25/1978	06/01/1983	06/03/1986 09/30/1988 06/16/1992
Pinoleville Indian Reservation	06/02/2011	N/A	N/A	06/02/2011	--
Point Arena, City of	10/18/1974	10/18/1974	12/26/1975	08/03/1984	06/03/1986
Ukiah, City of	08/09/1974	08/09/1974	09/17/1976 01/03/1978 06/06/1978	07/19/1982	08/05/1985
Willits, City of	02/08/1974	02/08/1974	07/30/1976	07/19/1982	09/30/1988

SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION

7.1 Contracted Studies

Table 29 provides a summary of the contracted studies, by flooding source, that are included in this FIS Report.

Table 29: Summary of Contracted Studies Included in this FIS Report

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
*	06/16/1992	Philip Williams and Associates	EMW-89-C-2845	September 1990	City of Fort Bragg
*	06/01/1983	Anderson-Nichols and Company, Inc.	H-4821	March 1981	Mendocino County, Unincorporated Areas

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Gualala River	04/25/1978	Ott Water Engineers, Inc.	EMW-83-C-1175	August 1984	Mendocino County, Unincorporated Areas
Noyo River	06/16/1992	Phillips Williams and Associates, Ltd.	EMW-89-C-2845	January 1991	Mendocino County, Unincorporated Areas
*	06/03/1986	Ott Water Engineers, Inc.	EMW-83-C-1175	August 1984	Point Arena, City of
*	06/01/1983	Anderson-Nichols and Company, Inc.	H-4821	April 1981	Ukiah, City of
Orrs Creek	08/05/1985	*	*	June 1984	Ukiah, City of
*	09/30/1988	Anderson-Nichols and Company, Inc.	H-4821	April 1981	Willits, City of

*Data Not Available

7.2 Community Meetings

The dates of the community meetings held for this Flood Risk Project and any previous Flood Risk Projects are shown in Table 30. These meetings may have previously been referred to by a variety of names (Community Coordination Officer (CCO), Scoping, Discovery, etc.), but all meetings represent opportunities for FEMA, community officials, study contractors, and other invited guests to discuss the planning for and results of the project.

Table 30: Community Meetings

Community	FIS Report Dated	Date of Meeting	Meeting Type	Attended By
City of Fort Bragg	N/A	09/09/1990	Initial CCO	FEMA, this community and the study contractor
		08/07/1991	Final CCO	FEMA, this community and the study contractor
City of Point Arena	N/A	May 1983	Initial CCO	FEMA, this community and the study contractor
City of Ukiah	N/A	July 1978	Initial CCO	FEMA, this community and the study contractor
City of Willits	N/A	07/06/1978	Initial CCO	FEMA, this community and the study contractor
		08/25/1981	Final CCO	FEMA, this community and the study contractor
Mendocino County, Unincorporated Areas[1]	10/1/1974	July 1978	Initial CCO	FEMA, county and the study contractor
		July 21, 1982	Final CCO	FEMA, county and the study contractor
		May 1983 (1986 Revision)	Initial CCO	FEMA, county and the study contractor
		12/13/2006	Initial CCO	FEMA, county and the study contractor
		06/03/2009	Final CCO	FEMA, county and the study contractor

[1]CCO meeting data not available for the 1988 or 1992 revisions

SECTION 8.0 – ADDITIONAL INFORMATION

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see www.fema.gov.

Table 31 is a list of the locations where FIRMs for Mendocino County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 31: Map Repositories

Community	Address	City	State	Zip Code
Mendocino County, Unincorporated Areas	501 Low Gap Road	Ukiah	CA	95482
City of Fort Bragg	416 N. Franklin Street	Fort Bragg	CA	95437
City of Point Arena	451 School Street	Point Arena	CA	95468
City of Ukiah	300 Seminary Avenue	Ukiah	CA	95482
City of Willits	111 East Commercial Street	Willits	CA	95490
Pinoleville Indian Reservation	500 B Pinoleville Drive	Ukiah	CA	95482

The National Flood Hazard Layer (NFHL) dataset is a compilation of effective FIRM databases and LOMCs. Together they create a GIS data layer for a State or Territory. The NFHL is updated as studies become effective and extracts are made available to the public monthly. NFHL data can be viewed or ordered from the website shown in Table 32.

Table 32 contains useful contact information regarding the FIS Report, the FIRM, and other relevant flood hazard and GIS data. In addition, information about the state NFIP Coordinator and GIS Coordinator is shown in this table. At the request of FEMA, each Governor has designated an agency of State or territorial government to coordinate that State's or territory's NFIP activities. These agencies often assist communities in developing and adopting necessary floodplain management measures. State GIS Coordinators are knowledgeable about the availability and location of state and local GIS data in their state.

Table 32: Additional Information

FEMA and the NFIP	
FEMA and FEMA Engineering Library website	www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/engineering-library
NFIP website	www.fema.gov/national-flood-insurance-program
NFHL Dataset	msc.fema.gov

FEMA Region IX	FEMA Region IX, 1111 Broadway, Suite 1200, Oakland, CA 94607 (510) 627-7029
Other Federal Agencies	
USGS website	www.usgs.gov
Hydraulic Engineering Center website	www.hec.usace.army.mil
State Agencies and Organizations	
State NFIP Coordinator	Ricardo Pineda, PE, CFM California Dept. of Water 1416 9th Street, Room 1601 Sacramento, CA 95814 916-574-0611 rpineda@water.ca.gov
State GIS Coordinator	David Harris Agency Information Officer California Resources Agency 1416 Ninth Street, Room 1311 Sacramento, CA 95814 916-445-5088 david.harris@resources.ca.gov

SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES

Table 33 includes sources used in the preparation of and cited in this FIS Report as well as additional studies that have been conducted in the study area.

Table 33: Bibliography and References

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
CH2M Hill, Inc., February 1979	CH2M Hill, Inc.	*Russian River Bridge on Vichy Springs Road Drainage Study*	CH2M Hill, Inc.	Redding, California	February 1979	
Dobson, March 1967	Stanford University	*A Program to Construct Refraction Diagrams and Compute Wave Heights for Waves Moving into Shoaling Waters*	Dobson, R.S.	Stanford University	March 1967	
FEMA 1982	Federal Emergency Management Agency, Federal Insurance Administration	*Flood Insurance Rate Map, City of Fort Bragg, Mendocino County, California, Scale 1:9,600*		Washington, D.C.	December 7, 1982	FEMA Map Service Center http://msc.fema.gov
FEMA 1984	Federal Emergency Management Agency	*Flood Insurance Rate Map, City of Point Arena, California*		Washington, D.C.	August 3, 1984	FEMA Map Service Center http://msc.fema.gov
FEMA 1985	Federal Emergency Management Agency	*Flood Insurance Study, City of Ukiah, Mendocino County, California*		Washington, D.C.	August 5, 1985	FEMA Map Service Center http://msc.fema.gov
FEMA 1986	Federal Emergency Management Agency	*Flood Insurance Study, City of Point Arena, Mendocino County, California*		Washington, D.C.	June 3, 1986	FEMA Map Service Center http://msc.fema.gov

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
FEMA 1988(a)	Federal Emergency Management Agency	*Flood Insurance Study, City of Willits, Mendocino County, California*		Washington, D.C.	September 30, 1988	FEMA Map Service Center http://msc.fema.gov
FEMA 1988(b)	Federal Emergency Management Agency	*Flood Insurance Study, Mendocino County, California (Unincorporated Areas),*		Washington, D.C.	September 30, 1988	FEMA Map Service Center http://msc.fema.gov
FEMA 1992(a)	Federal Emergency Management Agency	*Flood Insurance Study, City of Fort Bragg, Mendocino County, California*		Washington, D.C	June 16, 1992	FEMA Map Service Center http://msc.fema.gov
FEMA, September 1988(a)	Federal Emergency Management Agency	*Flood Insurance Study, City of Willits, Mendocino County, California*		Washington, D.C	September 30, 1988	FEMA Map Service Center http://msc.fema.gov
FEMA, September 1988(b)	Federal Emergency Management Agency	*Flood Insurance Study, Mendocino County, California (Unincorporated Areas)*		Washington, D.C	September 30, 1988	FEMA Map Service Center http://msc.fema.gov
FEMA June 1992(a)	Federal Emergency Management Agency	*Flood Insurance Study, City of Fort Bragg, Mendocino County, California*		Washington, D.C	June 16, 1992	FEMA Map Service Center http://msc.fema.gov
FEMA 1992(b)	Federal Emergency Management Agency	*Flood Insurance Study, Mendocino County, California (Unincorporated Areas)*		Washington, D.C	June 16, 1992	FEMA Map Service Center http://msc.fema.gov

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
FEMA 2005	Federal Emergency Management Agency	*Flood Insurance Study, Lake County and Incorporated Areas, California*		Washington, D.C	September 30, 2005	FEMA Map Service Center http://msc.fema.gov
FEMA Unpublished (a)	Federal Emergency Management Agency	*Flood Insurance Study, Humboldt County and Incorporated Areas, California*		Washington, D.C		FEMA Map Service Center http://msc.fema.gov/
FEMA Unpublished (b)	Federal Emergency Management Agency	*Flood Insurance Study, Sonoma County and Incorporated Areas, California*		Washington, D.C		FEMA Map Service Center http://msc.fema.gov
FEMA Unpublished (c)	Federal Emergency Management Agency	*Flood Insurance Study, Trinity County and Incorporated Areas, California*		Washington, D.C		FEMA Map Service Center http://msc.fema.gov
Felton 1965	Pacific Books	*California's Many Climates*	Felton, E.L.	Palo Alto, California	1965	
Hunt 1959	Proceedings of the ASCE, Vol. 85, No. WW3	*Design of Seawalls and Breakwaters*	Hunt, I.J.		1959	
County Zoning Regulations	Mendocino County Planning Department	*County Zoning Regulations, Section 20-71*		Ukiah, California		

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
Meteorology International, Inc., n.d.	Meteorology International, Inc., n.d., California Department of Boating and Waterways	*Deep-Water Wave Statistics for the California Coast*				
Noyo Port District, 1989	Noyo Port District, Noyo Harbor District	*Request for Proposal Waterfront Restoration Plan*			May 17, 1989	
Ott Water Engineers, Inc. 1983a	Ott Water Engineers, Inc.	*Aerial Photography, Scale 1:4,800, Contour Interval of 4 feet*			1983	
Ott Water Engineers, Inc. 1983b	Ott Water Engineers, Inc.	*Aerial Photography, Scale 1:4,800, Contour Interval 4 feet: point Arena Cove*			1983	
Ott Water Engineers, Inc. 1984	Ott Water Engineers, Inc	*Northern California Coastal Flood Studies, prepared for the Federal Emergency Management Agency*			1984	
Pacific Gas and Electric, April 1979	Pacific Gas and Electric	*Telephone Communication*		Paul Land, San Francisco, California	April 1979	
Pagenkopf, August 1976	R.M. Parsons Laboratory, M.I.T., August 1976, with modification made by Ott Water Engineers, Inc.	*A Two-Dimensional Finite Element Circulation Model, A User's Manual for CAFE-1*	Pagenkopf, James R.		August 1976	

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
Philip Williams and Associates, October 1990	Philip Williams and Associates, October 1990	*Work Map, Flood Insurance Study, Noyo River, Mendocino County, California, scale 1:2,400, Contour Interval 2 feet*			October 31, 1990	
State of California, January 1965	State of California, Department of Water Resources	*Department of Water Resources, Bulletin 161, Flood! December 1964 - January 1965*			January 1965	
Towill Corporation, September 1979(a)	Towill Corporation	*Contour Map of Select Areas of Mendocino County, Scale 1:4,800, Contour Interval 5 feet*		San Francisco, California	September 1979	
Towill Corporation, September 1979(b)	Towill Corporation	*Contour Map of the City of Ukiah, Scale 1:4,800, Contour Interval 5 feet*		San Francisco, California	September 1979	
Towill Corporation, September 1979(c)	Towill Corporation	*Contour Map of the City of Willits, Scale 1:4800, Contour Interval 5 feet*		San Francisco, California	September 1979	
U.S. Census Bureau, 2008	U.S. Census Bureau	*State and County Quick Facts*			October 15, 2008	http://quickfacts.census.gov/qfd/states/06/06045.html

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
USACE, n.d. (a)	U.S. Department of the Army, Corps of Engineers, San Francisco District	*Reservoir Regulation Manual - Coyote Dam*		San Francisco, California	Not Provided	
USACE, n.d. (b)	U.S. Department of the Army, Corps of Engineers, San Francisco District	*High Water Mark Data for Eel River, Flood of December 1964*		San Francisco, California	Not Provided	
USACE, n.d. (c)	U.S. Department of the Army, Corps of Engineers, San Francisco District	*High- Water-Mark Data for Russian River Flood of December 1964*		San Francisco, California	Not Provided	
USACE, June 1956	U.S. Department of the Army, Corps of Engineers, San Francisco District	*Report of Floods of December 1955 and January 1956 in Northern California Coastal Streams*		San Francisco, California	June 1956	
USACE, January 1965	U.S. Department of the Army, Corps of Engineers, San Francisco District	*Inspection of Northwestern California Disaster Area*	Special Subcommittee on Flood Disasters, Committee on Public Works, U.S. House of Representatives	San Francisco, California	January 10-12, 1965	

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
USACE, December 1965	U.S. Department of the Army, Corps of Engineers, San Francisco District	*Report on Floods of December 1964 in Northern California Coastal Streams, Volume III, Flood Plains on the Eel River, Northern California Coastal Streams, and the Russian River*		San Francisco, California	December 1965	
USACE, May 1974	U.S. Department of the Army, Corps of Engineers, Waterway Experiment Station	*Technical Report H-74-3, Flood Insurance Study: Tsunami Prediction for Pacific Coastal Communities*	J.R. Houston and A.W. Garcia		May 1974	
USACE, June 1975	U.S. Department of the Army, Corps of Engineers, Galveston District	*Guidelines for Identifying Coastal High Hazard Zones*			June 1975	
USACE, August 1975	U.S. Department of the Army, Office of the Chief of Engineers	*Final Environmental statement, Maintenance Dredging, Noyo River Channel, Noyo Harbor, Mendocino County, California*			August 1975	
USACE, 1977	U.S. Department of the Army, Corps of Engineers	*Shore Protection Manual*			1977	
USACE, 1978	U.S. Department of the Army, Corps of Engineers	*California Coast Storm Damage, Winter 1977-1978*	G.W. Domurat		1978	

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
USACE, July 1978	U.S. Department of the Army, Corps of Engineers, Coastal Engineering Research Center	*Technical Aid No. 78-2, Revised Wave Run-up Curves for Smooth Slopes*	P.N. Stoa		July 1978	
USACE, December 1978	U.S. Department of the Army, Corps of Engineers, Waterway Experiment Station	*Technical Report H-78-26, Flood Insurance Study: Tsunami Prediction for the West Coast of the Continental United States*	J.R. Houston and A.W. Garcia		December 1978	
USACE, February 1979	U.S. Department of the Army, Corps of Engineers, Waterway Experiment Station	*Technical Report HL-79-2, A Numerical Model for Tsunami Inundation*	J.R. Houston and H.L. Butler		February 1979	
USACE, August 1979	U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center	*Hydrologic Engineering Center, HEC-2 Water-Surface Profiles, Users Manual*		Davis, California	August 1979	
USACE, 1984	U.S. Army Corps of Engineers	*Shore Protection Manual, Volumes 1 – 3*	U.S. Government Printing Office	Washington, D.C.	1984	
NCDC, 1944-1983	U.S. Department of Commerce, National Climatic Data Center	*Meteorological Record for San Francisco, California, Airport*		Asheville, North Carolina	1944-1983	
NCDC, 1955-1983	U.S. Department of Commerce, National Climatic Data Center	*Three- Hourly North American Surface Weather Maps*		Asheville, North Carolina	1955-1983	

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
NOAA, 1945-1983	U.S. Department of Commerce, National Oceanic and Atmospheric Administration	*Tide Tables, High and Low Water Predictions, West Coast of North and South America*			1945-1983	
U.S. Departme nt of Commerce , n.d.	U.S. Department of Commerce, National Ocean Survey, Tidal Datums and Information Branch, Tides and Water Levels Division	*Summary of Extreme Water Levels for San Francisco, Point Reyes, Arena Cove, and Crescent City*			n.d.	
USHUD, July 1976	U.S. Department of Housing and Urban Development, Federal Insurance Administration	*Flood Hazard Boundary Map, City of Willits, Mendocino County, California, Scale 1:9600*			July 1976	
USHUD, April 1978	U.S. Department of Housing and Urban Development, Federal Insurance Administration	*Flood Hazard Boundary Map, Mendocino County, California (Unincorporated Areas)*			April 25, 1978	
USGS, 1958	U.S. Department of the Interior, Geological Survey	*15-Minute Series Topographic Maps, Scale 1:62,500, Contour Interval 80 feet*		Ukiah, California	1958	
USGS, 1961	U.S. Department of the Interior, Geological Survey	*15-Minute Series Topographic Maps, Scale 1:62,500, Contour Interval 80 feet*		Willits, California	1961	

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
USGS, 1969	Water-Supply Paper 1866	*Floods of December 1964 and January 1965 Far Western States*			1969	
USGS, May 1975	U.S. Department of the Interior, Geological Survey, Technical Memorandum	*Supplementary Guidelines for Flood Discharge Computation in HUD Type-15 Studies*			May 5, 1975	
USGS, June 1977	U.S. Department of the Interior, Geological Survey, Water-Resources Investigations 77-21	*Magnitude and Frequency of Floods in California*	A.O. Waananen and J.R. Crippen	Menlo Park, California	June 1977	
USWRC, June 1977	U.S. Water Resources Council, Bulletin 17A	*Guidelines for Determining Flood Flow Frequency*			June 1977	
van der Meer, J.W., 2002	Technical Advisory Committee for Water Retaining Structures (TAW)	*Wave Run-up and Overtopping at Dikes*	van der Meer, J.W.	Delft, Netherlands	2002	
Winsler & Kelly Consulting Engineers, May 1970	Humboldt County Board of Supervisors	*Humboldt County Water Requirements and Water Resources, Phase 1*	Winsler and Kelly Consulting Engineers	Eureka, California	May 1970	